REVIEW OF 2013 FISHERIES AND SUMMARY OF 2014 STOCK ABUNDANCE FORECASTS

Each year, the Council reviews the Stock Assessment and Fisheries Evaluation (SAFE) document (Review of Ocean Salmon Fisheries) and stock abundance projections (Preseason Report I). Stock status for non-ESA-listed and non-hatchery stocks is evaluated in the SAFE document relative to status determination criteria (SDC) for overfishing, overfished, not overfished/rebuilding, and rebuilt. These stocks are evaluated relative to SDC for approaching an overfished condition in Preseason Report I.

Two stock complexes are required to have annual catch limits (ACLs) specified – the Central Valley fall (CVF) and the Southern Oregon/Northern California (SONC) Chinook complexes. ACLs for these complexes are specified for the indicator stocks identified in the Fishery Management Plan (FMP): Sacramento River fall Chinook for the CVF Chinook complex and Klamath River fall Chinook for the SONC Chinook complex. The ACLs are equivalent to acceptable biological catch (ABC), and are specified based on formulas described in the Salmon FMP (Agenda Item F.1.a, Attachment 1) and the abundance forecasts in Preseason Report I.

Preseason Report I also contains an analysis of 2013 regulations on projected 2014 abundance for coho and some Chinook stocks. This analysis is intended to provide perspective for how fisheries might need to be modified in 2013 to accommodate the new abundance forecasts.

The Salmon Technical Team will review the results of the SAFE document for 2013 and the stock abundance projections and ACLs for 2014.

The Scientific and Statistical Committee will review the forecasts and recommend approval for using them in modeling 2014 ocean salmon fisheries, specifying ABCs, and setting ACLs.

Council Action:

1. **Take action relative to stock status determinations as necessary.**
2. **Adopt 2014 stock abundance forecasts, ABCs, and ACLs.**

Reference Materials:

1. *Review of 2013 Ocean Salmon Fisheries* (Included with Briefing Book).
2. Agenda Item F.1.a, Attachment 1: Excerpts from Chapter 3 of the Pacific Coast Salmon Fishery Management Plan.
3. *Preseason Report I: Stock Abundance Analysis and Environmental Assessment Part 1 for 2014 Ocean Salmon Fishery Regulations* (Supplemental Briefing Material).

<u>Agenda Order</u>:

a. Agenda Item Overview Mike Burner
b. Reports and Comments of Advisory Bodies and Management Entities
c. Public Comment
d. **Council Action:** Review and Discuss Relevant Fishery Information, Act on Relevant Status Determinations, and Adopt 2014 Abundance Forecasts and Annual Catch Limits as Necessary

PFMC
02/11/14

Agenda Item F.1.a
Attachment 1
March 2014

EXCERPTS FROM PACIFIC COAST SALMON FISHERY MANAGEMENT PLAN
UPDATED THROUGH AMENDMENT 17

The entire Salmon FMP may be viewed at: http://www.pcouncil.org/salmon/fishery-management-plan/current-management-plan/

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))

"Approaching an overfished condition. A stock or stock complex is approaching an overfished condition when it is projected that there is more than a 50 percent chance that the biomass of the stock or stock complex will decline below the MSST within two years."
NS1Gs (600.310(e)(2)(i)(G)

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 hatchery 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 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. Second, 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 historical 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 MSA, 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 NS1 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 generally defined as less than or equal to 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 and NMFS 2011). Stock-specific overfishing determinations will be made annually and are based on exploitation during a single biological year.

3.1.2.1 Council Action

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 also may be necessary for other responsible entities to take action to end ongoing 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 shall (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, where MSST is generally defined as $0.5*S_{MSY}$ or $0.75*S_{MSY}$, although there are some exceptions (Table 3-1). Overfished determinations will be made annually using the three most recently available postseason estimates of spawning escapement.

3.1.4.1 Council Action

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 shall include:

1) an evaluation of the roles of fishing, marine and freshwater survival in the overfished determination;
2) any modifications to the criteria set forth in section 3.1.6 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 if appropriate, 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 changing hatchery practices.

Based on the results of the STT's recommended rebuilding plan, the Council will adopt a rebuilding plan for recommendation to the Secretary. Adoption of a rebuilding plan will require implementation either through an FMP amendment or notice and comment rule-making process. Subject to Secretarial approval, the Council will implement the 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, three years for coho, and five years for Chinook). If sufficient recruits are not available to achieve spawning escapement at or above MSY in a particular year, the control rules provide for the potential use of *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 ensure that the adopted rebuilding plan 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 the overfished 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 consider appropriate 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}, or other identified rebuilding criteria, 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 default 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 and recommend such criteria, to be implemented 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.

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.

3.1.7 Changes or Additions to Status Determination Criteria

Status determination criteria are defined in terms of quantifiable, biologically-based reference points, or population parameters, specifically, S_{MSY}, MFMT (F_{MSY}), and MSST. These reference points are generally regarded as fixed quantities and are also 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 OY and are used for status determinations as described above. Changes to how these status determination criteria are defined, such as MSST = $0.50*S_{MSY}$, must be made through a plan amendment. However, 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 of the estimated values of these reference points, changes to the values may be made without 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 methodology reviews and 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: 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 OY, prevent overfishing, and assure rebuilding of salmon stocks whose abundance has been depressed to an overfished level, this plan establishes 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 information is available 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 FMP objectives. Details of the conservation objectives in effect at the time the initial framework 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 Appendix A of the most recent Preseason Report I, and Table 5 of the most recent Preseason Report III produced each year by the STT (PFMC 2012d).

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 the Pacific Salmon Treaty or 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 OY. Changes or additions to conservation objectives may be made either through a plan amendment or notice and comment rulemaking 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, proposed changes for natural stocks will only be reviewed and approved within the schedule established for salmon estimation methodology reviews completed prior to 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.

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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 FMP objectives. Details of the conservation objectives in effect at the time the initial framework 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 Appendix A of the most recent Preseason Report I, and Table 5 of the most recent Preseason Report III produced each year by the STT (PFMC 2011d).

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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 OY. Changes or additions to conservation objectives may be made either through a plan amendment or notice and comment rulemaking 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, proposed changes for natural stocks will only be reviewed and approved within the schedule established for salmon estimation methodology reviews completed prior to 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.

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 MSY, MFMT, OFL, MSST, ABC, and 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.

Reference points defined by the MSA and/or 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.

3.3.1 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 reasonable and prudent alternatives 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. NMFS may periodically revise consultation standards and the annual NMFS guidance letter reflects the most current information. Consultation standards that were in place in 2011 when Amendment 16 was completed are shown in the table of conservation objectives (Table 3-1), which is reproduced each year in the latest annual addition of Preseason Report I (PFMC 2012b).

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 consistent with recovered habitat conditions can be developed. As species are delisted, the Council will establish conservation objectives and associated reference points consistent with the MSA.

3.3.2 Relationship to the Pacific Salmon Treaty

Pacific salmon stocks subject to fisheries in both the US and Canada are managed under the provisions of the Pacific Salmon Treaty (PST). Natural stocks managed under the provisions of the PST include: (1) Puget Sound pink salmon stocks, (2) most non-ESA-listed Chinook stocks from the mid-Oregon coast to the US/Canada border, and (3) all non-ESA-listed coho stocks except Willapa Bay natural coho. 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 MSA provides an exception to the requirement for a fishery management plan to specify ACLs and Accountability Measures (AMs) for stocks managed under an international agreement in which the United States participates. 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. 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. However, it is still necessary to specify MSY and SDC reference points for these stocks.

3.3.3 Acceptable Biological Catch

Specification of ABC is 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, 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 for salmon. 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} equals F_{MSY} reduced by ten percent.

Tier-1: $F_{ABC} = F_{MSY} \times 0.95$.
Tier-2: $F_{ABC} = F_{MSY} \times 0.90$.

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.

3.3.4 Annual Catch Limits

ACLs and OFLs, in addition to ABCs, are required for all stocks or stock complexes classified as 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 management performance.

S_{ACL} and S_{OFL} are determined based on stock abundance, in spawner equivalent units, (N) and the corresponding reference point 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 the MFMT, which generally corresponds to and F_{MSY}, and

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

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.

3.3.4.1 Preseason ACLs

During the annual preseason salmon management process, S_{ACL} will be estimated using the fixed F_{ACL} exploitation rate and the preseason stock abundance forecast (N). 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}.

SCIENTIFIC AND STATISTICAL COMMITTEE REPORT ON THE REVIEW OF 2013 FISHERIES AND SUMMARY OF 2014 STOCK ABUNDANCE FORECASTS

2013 Review of Ocean Salmon Fisheries

Dr. Robert Kope discussed the *Review of 2013 Ocean Salmon Fisheries* report with the Scientific and Statistical Committee (SSC). The report includes sections on status determination criteria in chapters II and III for Chinook and coho salmon stocks, respectively. Table II-5 reports the performance of Chinook stocks relative to 2013 preseason conservation objectives while Table II-6 summarizes Chinook stock status relative to overfished and overfishing criteria. There were no Chinook stocks classified as overfished based on the geometric mean spawning escapement using the most recent three years of available data. Tables III-6 and III-7 present this same information for coho. There were no coho stocks classified as overfished.

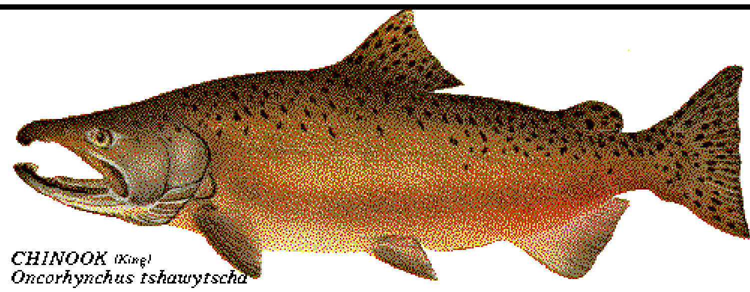
2014 Stock Abundance Forecasts

Dr. Kope also discussed Chinook and coho stock abundance predictions for 2014. In March 2013 the SSC recommended a review of Sacramento Index (SI) forecast methodologies and exploration of options. As a result the Council approved a new forecast method for Sacramento River fall Chinook in November 2013. Using the new method, the SI forecast is 634,650 for 2014. This is lower than the 2013 post-season SI estimate of 862,525.

The SSC endorses the 2014 forecasts, acceptable biological catches, and overfishing limits in Preseason Report I as the best available science for use in 2014 salmon management.

PFMC
03/08/14

Agenda Item F.1.b
Supplemental WDFW Report
March 2014



PSC Chinook Technical Committee

TO: Susan Farlinger
Chair Commissioner
Fisheries and Oceans Canada

Robert Turner
Vice-Chair Commissioner
United States Section

CC: Pete McHugh, Kris Ryding, Kirt Hughes, Mike Scharpf, and Curt Holt,
Washington Dept. of Fish and Wildlife
Gary Morishima, Larry Gilbertson, Rick Coshow, Jim Jorgersen, and Tyler Jurasin,
Quinault Dept. of Natural Resources

FROM: Chinook Technical Committee, Pacific Salmon Commission

DATE: February 14, 2014

SUBJECT: Biologically Based Escapement Goal for Grays Harbor fall Chinook, Washington

At its bilateral meeting February 11th, the Chinook Technical Committee (CTC) was presented a new maximum sustained yield escapement goal for naturally spawning adults for Grays Harbor fall Chinook, and reviewed nearly final documentation of it supplied by the Washington Department of Fish and Wildlife (WDFW) and the Quinault Indian Nation (QIN). The CTC accepted escapement goal of 13,500 adults will be used to evaluate management actions for consistency with the Pacific Salmon Treaty objectives of rebuilding and sustaining healthy Chinook salmon stocks.

The escapement goal is based on spawner-recruit relationships using estimates of production resulting from naturally spawning fish in the Chehalis and Humptulips river basins from brood years 1986 through 2005. The CTC considers the data and methods documenting the escapement goal of 13,500 to be sound and biologically-based. Further details will be summarized in TCCHINOOK (14)-02, Appendix D.

The CTC recommends some minor modifications to the final report, but does not expect these to affect the escapement goal more than 5% and does not anticipate that further review by the CTC is required as a result of incorporating the following suggestions:

1. Tabulate adult spawners and recruits (excluding jacks) by brood year for each river basin (Chehalis and Humptulips) and for the total Grays Harbor production, to facilitate independent analyses and reproducibility.

2. Further clarify the rationale for using the Queets exploitation rate indicator stock.

3. Cite the Little Hoquiam River mark-recapture study supporting the use of 2.5 fish/redd.

4. Explain the analyses exploring marine survival indices or other environmental covariates and why none were used, i.e., that there was no correlation with residuals.

5. Include, where available, estimates of stray rates and percentage hatchery origin by basin, and associated coefficients of variation.

6. Document the proportion of reaches not surveyed.

The CTC appreciates the work done to provide this improved metric and the effort to address 1) the list of desired elements for documentation, as listed in TCCHINOOK (99)-3, and 2) whether the analysis met the recommended data standards for biologically-based escapement goals, as listed in CTC Technical Note 1301 in TCCHINOOK(13)-1.

IDENTIFICATION OF MANAGEMENT OBJECTIVES AND PRELIMINARY DEFINITION OF 2014 SALMON MANAGEMENT ALTERNATIVES

Using the Salmon Advisory Subpanel (SAS) management recommendations as a base, the Council should identify the range of management elements in the alternatives for public review (harvest ranges, special restrictions, and basic season structure). The Salmon Technical Team (STT) will attempt to collate the Council's identified management elements into coordinated coastwide alternatives. The collated alternatives will be returned to the Council for review and any further direction on Monday, March 10, 2014, followed by STT analysis and final adoption of the alternatives on Thursday, March 13, 2014. Agenda Item F.2.a, Attachment 1 provides guidance for developing and assessing the alternatives.

Any alternative considered for adoption that deviates from Salmon Fishery Management Plan (FMP) objectives will require implementation by emergency rule. If an emergency rule appears to be necessary, the Council must clearly identify and justify the need for such an action consistent with emergency criteria established by the Council (Agenda Item F.2.a, Attachment 2) and National Marine Fisheries Service (Agenda Item F.2.a, Attachment 3).

Before defining the alternatives, the Council should be briefed on any pertinent management constraints resulting from: actions by the Pacific Salmon Commission; action by the California Fish and Game Commission to set the allocation of Klamath River fall Chinook or Sacramento River fall Chinook for the inside recreational fisheries; and National Marine Fisheries Service constraints for stocks listed under the Endangered Species Act.

The Council may also want to consider recommendations for inseason action to modify fisheries that may open prior to May 1, 2014, as impacts accrued in these fisheries may affect opportunity in summer fisheries. Currently, the Oregon commercial fishery from Cape Falcon to the Oregon/California border and the Oregon recreational fishery from Cape Falcon to Humbug Mt. are scheduled to open March 15, 2014. The California commercial fishery from Horse Mountain to Point Arena is scheduled to open April 16-30, 2014, and the California recreational fisheries from Horse Mt. to the U.S./Mexico border are scheduled to open April 6, 2014.

Additionally, under the new Area 2A Catch Sharing Plan for Pacific Halibut (see Agenda Item G.2), incidental halibut retention in commercial salmon troll fisheries will begin April 1 rather than the previous May 1 start date. To accommodate this change, the Council may discuss changes to incidental Pacific halibut retention when considering 2014 regulations for fisheries opening prior to May 1, 2014.

Council Task:

1. **Using the SAS proposals and other agency and public input, define basic management elements and alternatives for STT collation into coastwide management alternatives.**
2. **Consider the need for inseason action to address salmon fisheries opening prior to May 1, 2014.**

Reference Materials:

1. Agenda Item F.2.a, Attachment 1: Guidance for Alternative Development and Assessment.
2. Agenda Item F.2.a, Attachment 2: Emergency Changes to the Salmon FMP.
3. Agenda Item F.2.a, Attachment 3: FR 97-22094: Policy Guidelines for the Use of Emergency Rules.
4. Agenda Item F.2.c, Supplemental SAS Report: SAS Proposed Initial Salmon Management Alternatives for 2014 Non-Indian Ocean Fisheries.

Agenda Order:

a. Agenda Item Overview — Mike Burner
b. Report of the Pacific Salmon Commission — Gordy Williams
c. Reports and Comments of Advisory Bodies and Management Entities
d. Public Comment
e. **Council Action**: Adopt Council Recommendations for Initial Alternatives for Salmon Technical Team Collation and Description

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GUIDANCE FOR ALTERNATIVE DEVELOPMENT AND ASSESSMENT

Developing management alternatives is a complex process which may be assisted by following consistent procedures wherever possible. The recommendations below were developed by the Salmon Technical Team (STT), with input from the Salmon Advisory Subpanel (SAS), and approved by the Council to help guide the alternative development process. They are suggested guidelines and not inflexible requirements.

1. March Management Alternatives:

    a. To aid alternative assessment, the Council urges pertinent agency and tribal managers to have the Fishery Regulation Assessment Models (FRAMs) ready to run no later than the first day of the March Council meeting.

    b. On the first day of the March meeting, the Council should provide specific guidance for the allowable level of impacts on Oregon coastal natural coho and priorities for the allocation of impacts on critical stocks (e.g., Klamath River fall Chinook, Columbia River natural tule Chinook, Lower Columbia natural coho, etc.). Council staff can modify the alternative tables to ensure these objectives are clearly identified and addressed. Each time the Council reviews the alternatives, it should confirm or amend its guidance on the objectives and priorities.

    c. Generally, Alternative I should include the SAS' priority seasons and management measures. Alternatives II and III are used to show seasons in which one group or the other gets more or less of its priorities, to illustrate the effect of other management measures (e.g., variations in bag limits for recreational fisheries), or to allow for different inside/outside allocations (e.g., alternatives north of Cape Falcon). The final adopted alternatives should meet basic conservation requirements.

    d. SAS representatives should clearly identify their fishery priorities (e.g., first two fish, continuous season between Point X and Y, etc.) and engage in negotiations as necessary to resolve conflicts among gear groups and areas to arrive at cohesive and coordinated alternatives.

    e. The SAS requests assessments of impacts off California include tables with data for all harvest cells, not just those below Point Arena.

    f. Avoid adopting more than three alternatives. The Council should attempt to identify all significant or new management measures that might be considered for final adoption. However, it is not necessary or possible to model each potential alternative. Many variations can simply be noted in the description of the three main alternatives. Additional alternatives or variations may be provided for Council consideration during the public comment period which follows the March Council meeting. This period ends with completion of public comment on the tentative adoption of final management measures during the first day of the April Council meeting.

2. April Meeting:

   The Council has indicated that on the last day of the March meeting, it will determine the schedule for final adoption of management measures at the April Council meeting.

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EMERGENCY CHANGES TO THE SALMON FISHERY MANAGEMENT PLAN (FMP)
(Excerpt from Council Operating Procedure 10)

CRITERIA FOR REQUESTING EMERGENCY CHANGES TO THE SALMON FMP

Section 305(c) of the Magnuson-Stevens Fishery Conservation and Management Act allows the U.S. Secretary of Commerce (Secretary) to implement emergency regulations independently or in response to a Council recommendation of an emergency if one is found to exist. The Secretary has not published criteria for determining when an emergency exists. A Council FMP may be altered by emergency regulations, which are treated as an amendment to the FMP for a limited period of 180 days and which can be extended for an additional 180 days.

Council FMPs can be changed by the amendment process, which takes at least one to two years, or modified temporarily by emergency regulations, which can be implemented in a few weeks. Framework plans, like the Council's Salmon FMP, have been developed to allow flexibility in modifying management measures between seasons and during the season.

Some measures, like most conservation objectives and allocation schemes, are deliberately fixed in the plan and can be changed only by amendment or temporarily modified by emergency regulation. (Certain conservation objectives also may be changed by court order or without an amendment if, in the view of the Salmon Technical Team [STT], Scientific and Statistical Committee, and Council, a comprehensive review justifies a change.) They are fixed because of their importance and because the Council wanted to require a rigorous analysis, including extensive public review, to change them. Such an analysis and review were conducted when these management measures were originally adopted. It is the Council's intent to incorporate any desired flexibility of conservation objectives into the framework plan, making emergency changes prior to the season unnecessary. The Oregon coastal natural coho conservation objective is an example of a flexible objective, which is more conservative when stock abundance is low.

The use of the emergency process essentially "short-circuits" the plan amendment process and reduces public participation, thus there needs to be sufficient rationale for using it. Moreover, experience demonstrates that if there is disagreement or controversy over a Council's request for emergency regulations, the Secretary is unlikely to approve it. An exception would be an extreme resource emergency.

To avoid protracted, last-minute debates each year over whether or not the Council should request an emergency deviation from the Salmon FMP, criteria have been developed and adopted by the Council to screen proposals for emergency changes. The intent is to limit requests to those which are justified and have a reasonable chance of approval, so that the time spent in developing the case is not wasted and expectations are not unnecessarily raised.

Criteria

The following criteria will be used to evaluate requests for emergency action by the Secretary:

1. The issue was not anticipated or addressed in the salmon plan, or an error was made.

2. Waiting for a plan amendment to be implemented would have substantial adverse biological or economic consequences.

3. In the case of allocation issues, the affected user representatives support the proposed emergency action.

4. The action is necessary to meet FMP objectives.

5. If the action is taken, long-term yield from the stock complex will not be decreased.

Process

The Council will consider proposals for emergency changes at the March meeting and decide whether or not a specific issue appears to meet all the applicable criteria. If the Council decides to pursue any proposal, it will direct the STT to prepare an impact assessment for review by the Council at the April meeting, prior to final action. Any proposals for emergency change will be presented at the public hearings between the March and April meetings. It is the clear intent of the Council that any proposals for emergency change be considered no later than the March meeting in order that appropriate attention be devoted at the April meeting to developing management recommendations which maximize the social and economic benefits of the harvestable portion of the stocks.

The Council may consider other proposals for emergency change at the April meeting if suggested during the public review process, however, such proposals must clearly satisfy all of the applicable criteria and are subject to the requirements for an impact assessment by the STT.

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02/12/14

THEFT RATES OF MODEL YEAR 1995 PASSENGER MOTOR VEHICLES STOLEN IN CALENDAR YEAR 1995—Continued

	Manufacturer	Make/model (line)	Thefts 1995	Production (mfgr's) 1995	1995 (per 1,000 vehicles produced) theft rate
205	ROLLS-ROYCE	SIL SPIRIT/SPUR/MULS	0	132	0.0000
206	ROLLS-ROYCE	TURBO R	0	19	0.0000
207	VOLKSWAGEN	EUROVAN	0	1,814	0.0000
208	VOLVO	LIMOUSINE	0	6	0.0000

Issued on: August 18, 1997.

L. Robert Shelton,

Associate Administrator for Safety Performance Standards.

[FR Doc. 97–22263 Filed 8–20–97; 8:45 am]

BILLING CODE 4910–59–P

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

50 CFR Chapter VI

[Docket No. 970728184–7184–01; I.D. 060997C]

Policy Guidelines for the Use of Emergency Rules

AGENCY: National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

ACTION: Policy guidelines for the use of emergency rules.

SUMMARY: NMFS is issuing revised guidelines for the Regional Fishery Management Councils (Councils) in determining whether the use of an emergency rule is justified under the authority of the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act). The guidelines were also developed to provide the NMFS Regional Administrators guidance in the development and approval of regulations to address events or problems that require immediate action. These revisions make the guidelines consistent with the requirements of section 305(c) of the Magnuson-Stevens Act, as amended by the Sustainable Fisheries Act.

DATES: Effective August 21, 1997.

FOR FURTHER INFORMATION CONTACT: Paula N. Evans, NMFS, 301/713–2341.

SUPPLEMENTARY INFORMATION:

Background

On February 5, 1992, NMFS issued policy guidelines for the use of emergency rules that were published in the **Federal Register** on January 6, 1992 (57 FR 375). These guidelines were consistent with the requirements of section 305(c) of the Magnuson Fishery Conservation and Management Act. On October 11, 1996, President Clinton signed into law the Sustainable Fisheries Act (Public Law 104–297), which made numerous amendments to the Magnuson-Stevens Act. The amendments significantly changed the process under which fishery management plans (FMPs), FMP amendments, and most regulations are reviewed and implemented. Because of these changes, NMFS is revising the policy guidelines for the preparation and approval of emergency regulations. Another change to section 305(c), concerning interim measures to reduce overfishing, will be addressed in revisions to the national standards guidelines.

Rationale for Emergency Action

Section 305(c) of the Magnuson-Stevens Act provides for taking emergency action with regard to any fishery, but does not define the circumstances that would justify such emergency action. Section 305(c) provides that:

1. The Secretary of Commerce (Secretary) may promulgate emergency regulations to address an emergency if the Secretary finds that an emergency exists, without regard to whether a fishery management plan exists for that fishery;

2. The Secretary shall promulgate emergency regulations to address the emergency if the Council, by a unanimous vote of the voting members, requests the Secretary to take such action;

3. The Secretary may promulgate emergency regulations to address the emergency if the Council, by less than a unanimous vote of its voting members, requests the Secretary to take such action; and

4. The Secretary may promulgate emergency regulations that respond to a public health emergency or an oil spill. Such emergency regulations may remain in effect until the circumstances that created the emergency no longer exist, provided that the public has had an opportunity to comment on the regulation after it has been published, and in the case of a public health emergency, the Secretary of Health and Human Services concurs with the Secretary's action.

Policy

The NOAA Office of General Counsel has defined the phrase ''unanimous vote,'' in paragraphs 2 and 3 above, to mean the unanimous vote of a quorum of the voting members of the Council only. An abstention has no effect on the unanimity of the quorum vote. The only legal prerequisite for use of the Secretary's emergency authority is that an emergency must exist. Congress intended that emergency authority be available to address conservation, biological, economic, social, and health emergencies. In addition, emergency regulations may make direct allocations among user groups, if strong justification and the administrative record demonstrate that, absent emergency regulations, substantial harm will occur to one or more segments of the fishing industry. Controversial actions with serious economic effects, except under extraordinary circumstances, should be done through normal notice-and-comment rulemaking.

The preparation or approval of management actions under the emergency provisions of section 305(c) of the Magnuson-Stevens Act should be limited to extremely urgent, special circumstances where substantial harm to or disruption of the resource, fishery, or community would be caused in the time it would take to follow standard rulemaking procedures. An emergency action may not be based on administrative inaction to solve a long-recognized problem. In order to approve an emergency rule, the Secretary must have an administrative record justifying emergency regulatory action and demonstrating its compliance with the national standards. In addition, the preamble to the emergency rule should indicate what measures could be taken or what alternative measures will be considered to effect a permanent solution to the problem addressed by the emergency rule.

The process of implementing emergency regulations limits substantially the public participation in rulemaking that Congress intended under the Magnuson-Stevens Act and the Administrative Procedure Act. The Councils and the Secretary must, whenever possible, afford the full scope of public participation in rulemaking. In addition, an emergency rule may delay the review of non-emergency rules, because the emergency rule takes precedence. Clearly, an emergency action should not be a routine event.

Guidelines

NMFS provides the following guidelines for the Councils to use in determining whether an emergency exists:

Emergency Criteria

For the purpose of section 305(c) of the Magnuson-Stevens Act, the phrase ''an emergency exists involving any fishery'' is defined as a situation that:

(1) Results from recent, unforeseen events or recently discovered circumstances; and

(2) Presents serious conservation or management problems in the fishery; and

(3) Can be addressed through emergency regulations for which the immediate benefits outweigh the value of advance notice, public comment, and deliberative consideration of the impacts on participants to the same extent as would be expected under the normal rulemaking process.

Emergency Justification

If the time it would take to complete notice-and-comment rulemaking would result in substantial damage or loss to a living marine resource, habitat, fishery, industry participants or communities, or substantial adverse effect to the public health, emergency action might be justified under one or more of the following situations:

(1) Ecological—(A) to prevent overfishing as defined in an FMP, or as defined by the Secretary in the absence of an FMP, or (B) to prevent other serious damage to the fishery resource or habitat; or

(2) Economic—to prevent significant direct economic loss or to preserve a significant economic opportunity that otherwise might be foregone; or

(3) Social—to prevent significant community impacts or conflict between user groups; or

(4) Public health—to prevent significant adverse effects to health of participants in a fishery or to the consumers of seafood products.

Dated: August 14, 1997.

Gary C. Matlock,

Acting Assistant Administrator for Fisheries, National Marine Fisheries Service.

[FR Doc. 97–22094 Filed 8–20–97; 8:45 am]

BILLING CODE 3510–22–F

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

50 CFR Part 285

[Docket No. 970702161–7197–02; I.D. 041097C]

RIN 0648–AJ93

Atlantic Highly Migratory Species Fisheries; Import Restrictions

AGENCY: National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

ACTION: Final rule.

SUMMARY: NMFS amends the regulations governing the Atlantic highly migratory species fisheries to prohibit importation of Atlantic bluefin tuna (ABT) and its products in any form harvested by vessels of Panama, Honduras, and Belize. The amendments are necessary to implement International Commission for the Conservation of Atlantic Tunas (ICCAT) recommendations designed to help achieve the conservation and management objectives for ABT fisheries.

DATES: Effective August 20, 1997. Restrictions on Honduras and Belize are applicable August 20, 1997; restrictions on Panama are applicable January 1, 1998.

ADDRESSES: Copies of the supporting documentation are available from Rebecca Lent, Chief, Highly Migratory Species Management Division, Office of Sustainable Fisheries (F/SF1), NMFS, 1315 East-West Highway, Silver Spring, MD 20910–3282.

FOR FURTHER INFORMATION CONTACT: Chris Rogers or Jill Stevenson, 301–713–2347.

SUPPLEMENTARY INFORMATION: The Atlantic tuna fisheries are managed under the authority of the Atlantic Tunas Convention Act (ATCA). Section 971d(c)(1) of the ATCA authorizes the Secretary of Commerce (Secretary) to issue regulations as may be necessary to carry out the recommendations of the ICCAT. The authority to issue regulations has been delegated from the Secretary to the Assistant Administrator for Fisheries, NOAA (AA).

Background information about the need to implement trade restrictions and the related ICCAT recommendation was provided in the preamble to the proposed rule (62 FR 38246, July 17, 1997) and is not repeated here. These regulatory changes will further NMFS' management objectives for the Atlantic tuna fisheries.

Proposed Import Restrictions

In order to conserve and manage North Atlantic bluefin tuna, ICCAT adopted two recommendations at its 1996 meeting requiring its Contracting Parties to take the appropriate measures to prohibit the import of ABT and its products in any form from Belize, Honduras, and Panama. The first recommendation was that its Contracting Parties take appropriate steps to prohibit the import of ABT and its products in any form harvested by vessels of Belize and Honduras as soon as possible following the entry into force of the ICCAT recommendation. Accordingly, the prohibition with respect to these countries is effective August 20, 1997. The second recommendation was that the Contracting Parties take appropriate steps to prohibit such imports harvested by vessels of Panama effective January 1, 1998. This would allow Panama an opportunity to present documentary evidence to ICCAT, at its 1997 meeting or before, that Panama has brought its fishing practices for ABT into consistency with ICCAT conservation and management measures. Accordingly, the prohibition with respect to Panama will become effective January 1, 1998.

Under current regulations, all ABT shipments imported into the United States are required to be accompanied by a Bluefin Statistical Document (BSD). Under this final rule, United States Customs officials, using the BSD, will deny entry into the customs territory of the United States of shipments of ABT harvested by vessels of Panama, Honduras, and Belize and exported after the effective dates of the trade restrictions. Entry will not be denied for any shipment in transit prior to the effective date of trade restrictions.

Upon determination by ICCAT that Panama, Honduras, and/or Belize has brought its fishing practices into consistency with ICCAT conservation and management measures, NMFS will publish a final rule in the **Federal Register** that will remove import restrictions for the relevant party. In

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Supplemental PSC Report
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PACIFIC SALMON COMMISSION REPORT ON IDENTIFICATION OF MANAGEMENT OBJECTIVES AND PRELIMINARY DEFINITION OF 2014 SALMON MANAGEMENT ALTERNATIVES

Report on recent activities of the Pacific Salmon Commission:

The Pacific Salmon Commission held its Post-Season meeting in January in Portland and its Annual Meeting in February in Vancouver.

In addition to review of Pacific Salmon Treaty fisheries in 2013 and work on a number of on-going topics, both sessions had a significant focus on domestic and bilateral concerns about funding and budget for the current fiscal year and beyond. Among other concerns, the U.S. Section and the bi-lateral Commission was presented with serious reservations contained in a letter from the co-chairs of Commission technical committees about the persistent degradation of management infrastructure, including the coded wire tag program.

Much as for the Pacific Council, passage of the FY 14 Omnibus Appropriations during the meetings provided the U.S. Section some financial breathing room for this fiscal year. Longer term funding challenges remain.

Difficult short-term budget issues were resolved with agreed approaches that relate to:

Administration of the Commission;
Fraser River stock assessment and fishery management;
The continuation projects supporting the coast-wide CWT program;
And on-going chinook conservation and management projects.

The Analytical Work Group of the PSC Chinook Technical Committee will meet the week of March 17 for model runs that determine the 2013 Post-season and the 2014 Pre-season indexes for the three PSC Aggregate Abundance Based Management (AABM) fisheries for chinook. Those fisheries are Southeast Alaska (SEAK), Northern B.C. (NBC), and West Coast Vancouver Island (WCVI). Thanks to the urging of Director Anderson and other commissioners, it is anticipated that the 2014 pre-season indexes that determine the allowable catches for the AABM fisheries will be released by the Chinook Technical Committee on or about March 25 in order to be utilized in the PFMC salmon management process for the April 2014 meeting.

PFMC
03/09/14

Agenda Item F.2.c
Supplemental NMFS Report
March 2014

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
West Coast Region
7600 Sand Point Way N.E.
Seattle, Washington 98115

March 4, 2014

Ms. Dorothy M. Lowman, Chair
Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 200
Portland, Oregon 97220-1384

Dear Ms. Lowman:

The Pacific Coast Salmon Fishery Management Plan (Salmon FMP) requires that the Pacific Fishery Management Council (Council) develop management recommendations for fisheries under the Salmon FMP consistent with consultation standards developed by the National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NOAA Fisheries) to protect species listed under the Endangered Species Act (ESA). This letter summarizes NOAA Fisheries' ESA Section 7 consultation standards and provides guidance regarding the potential effects of the 2014 season on listed salmonid species. As in previous years, this letter is intended to offer NOAA Fisheries' preliminary guidance regarding conservation needs for listed salmonid species. The only new consultation in 2014 regarding listed salmon and steelhead ESUs will be for the effect of Puget Sound salmon fisheries on Puget Sound Chinook and steelhead. The ultimate ESA-determination shall be provided when the biological opinion for those species are completed.

We also use this opportunity to comment on other subjects of general interest. We comment briefly on developing circumstances related to Southern Resident killer whales and our expectations for the genetic stock identification (GSI) sampling program in 2014. Because of circumstances in recent years and their relative importance to the fisheries, we also provide guidance for Sacramento River fall Chinook and Klamath River fall Chinook and our expectations for management of these stocks in 2014.

Southern Resident Killer Whales
This section updates information regarding Southern Resident killer whales (Southern Residents) provided in our 2013 guidance letter. NOAA Fisheries and other researchers continue to develop new scientific information and analyses regarding the ecology of Southern Residents, which are listed as endangered under the ESA. Much of this new information focuses on their migration patterns, feeding habits, and preference for Chinook salmon for prey. While there remains much to learn, it is now clear that Chinook salmon are very important to the survival and recovery of Southern Residents, perhaps throughout the year and within the migration range of Southern Residents. This finding has potentially serious implications for any activity that affects the abundance of Chinook salmon available to Southern Residents. Fisheries that occur within the range of the Southern Residents, or that affect Chinook abundance within their range, are potentially implicated.

Because Southern Residents also are listed as endangered pursuant to Canada's Species at Risk Act, the Canadian Department of Fisheries and Oceans (DFO) joined with NOAA Fisheries to collaboratively evaluate the status of the relevant science and analyses. The two agencies sponsored a series of three scientific workshops during 2012 and 2013 to undertake a transparent, collaborative, and scientifically rigorous bilateral review of the available information about Southern Residents, their feeding habits, and the potential effects of salmon fisheries on the whales through reduction in the abundance of their prey. A panel of seven independent scientists was selected to oversee and participate in the process and produce a report documenting its findings. A diverse and multidisciplinary group of approximately a hundred scientists actively participated in the workshop process. The independent panel issued its final report on November 30, 2012[1]. We requested comments on the final report and implications for fisheries management by January 31, 2013.

NOAA Fisheries is carefully considering all aspects of the final report of the independent science panel, as well as the public comments received on the report to inform new consultations on fisheries and continued evaluation of the need to reinitiate existing ESA Section 7 fisheries consultations. To assist with this process NOAA Fisheries is developing a risk assessment framework based on the scientific information reviewed by the panel. We are developing a structured process to evaluate the effects of changes in salmon abundance on survival and recovery of the Southern Residents. We will seek input from the public and fisheries management entities on the framework and specific risk criteria prior to incorporating this approach into new consultations. Meanwhile, Canada also is considering the ramifications of the panel's report to its fisheries in the context of its domestic fishery consultative processes. In 2014, NOAA Fisheries will focus its efforts on completing this work. Given the time it will take to complete development of the framework and procedures for its implementation, we do not foresee implementing a new process for consultations on fisheries in 2014.

Genetic Stock Identification Sampling

In 2013, at-sea sampling of Chinook salmon by fishermen was conducted in most open times and areas off Oregon and California, and full season sampling occurred off Washington. The overall effort was part of the West Coast Salmon Genetic Stock Identification (WCS-GSI) collaboration; a partnership of west coast fishermen's organizations, universities, states, tribes, and NOAA Fisheries, formed in 2006 to apply GSI to the study of west coast salmon fisheries.

The data collected in 2013 represent the fourth year of fine-scale GSI sampling over a broad geographic area for a full season, although coverage was less comprehensive than in some previous years. Current results show informative contrasts in catch rates and distributions relative to previous years. Results are being analyzed for a variety of purposes, including updating the Chinook FRAM model and improving the Sacramento and Klamath Ocean Harvest Models.

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

Genetic stock identification is one of many stock identification tools widely used in fisheries management. A related genetic methodology, Parentage-based Tagging, is also gaining acceptance. Coded-wire tags, PIT tags, and genetic technologies, in combination, now provide fine-scale, timely stock-specific information to meet the needs of the management and scientific communities. We anticipate that workshops and discussion will increasingly focus on using multiple stock identification and marking technologies for management. The experience of the WCS-GSI collaboration, combined with analysis of their data, has become central to these discussions.

In 2010 and 2012 non-retention GSI sampling was conducted in closed areas, which required set-asides during the preseason process to account for associated impacts. In 2011 and 2013, sampling was conducted only in open areas, with resulting data gaps that make it more difficult to construct a complete coast-wide picture of stock distribution and movement. Samples from 2012 are the first to include a full season of sampling in Washington, and that effort was repeated in 2013. Washington sampling in 2014 will cover the entire fishing season, although the Columbia area will not be included and, due to funding constraints, only half the fish collected will be analyzed. Funding constraints will also limit sampling in California and Oregon to just a few weeks in 2014. Consequently, there will be less than full time/area coverage south of Leadbetter Point (46.7° north latitude). All sampling in 2014 is funded through grants from the NOAA Fisheries National Cooperative Research Program. Because we do not have resources to sample in closed areas, all sampling will be during open fishing: no special action from the Council will be required.

CHINOOK SALMON

Sacramento River Fall Chinook

NOAA Fisheries Guidance for 2014 is to follow the FMP-defined control rule, which specifies an expected 2014 escapement greater than or equal to the preseason S_{ACL} of 190,395 hatchery and natural-area adult spawners.

Klamath River Fall Chinook

NOAA Fisheries Guidance for 2014 is to follow the FMP-defined control rule, which specifies an expected 2014 escapement greater than or equal to the S_{MSY} of 40,700 natural-area adult spawners. Given the forecasted abundance, NOAA Fisheries anticipates harvest opportunity on Klamath River fall Chinook will be more constrained than in 2013.

California Coastal Chinook Salmon

The California Coastal (CC) Chinook salmon Evolutionarily Significant Unit (ESU) has been listed as threatened under the ESA since 1999 (64 FR 50394, September 16, 1999). The current consultation standard for CC-Chinook is from a NOAA Fisheries biological opinion dated April 28, 2000. On June 13, 2005, NOAA Fisheries completed additional consultation on CC-Chinook, and specified actions necessary to implement the Reasonable and Prudent Alternatives (RPAs) of the 2000 biological opinion for this ESU.

The RPAs of the 2000 biological opinion stated that to ensure that CC-Chinook are not subject to increasing harvest rates in the future, limits on the forecast KRFC age-4 ocean harvest rates would serve as the consultation standard. The 2005 re-initiation of consultation affirmed that management measures shall result in a forecast KRFC age-4 ocean harvest rate of no greater than 16 percent. The 2000 biological opinion and 2005 consultation require NOAA Fisheries to collect and examine information that would allow re-evaluation of this consultation standard. NOAA Fisheries is actively engaged in this effort, including completion of a technical memo describing the current state of data available for this ESU[2].

During the April 2013 Council meeting, the Council held a joint session of the Salmon Technical Team and the Salmon Advisory Subpanel to discuss the feasibility of abundance-based management for Sacramento River winter-run and CC-Chinook. During this joint session, NOAA Fisheries and other attendees discussed alternative management strategies for CC-Chinook and determined that insufficient data are available at this time to move forward with a new management alternative. Until alternative management strategies become feasible, the 16 percent KRFC age-4 ocean harvest rate will remain as the consultation standard for CC-Chinook.

Sacramento River Winter Chinook Salmon

The Sacramento River winter Chinook salmon ESU (winter-run) was listed under the ESA as threatened in 1990 and reclassified as endangered in 1994 (59 FR 440, January 4, 1994). The current consultation standard for winter-run is derived from a NOAA Fisheries biological opinion completed on April 30, 2010. The 2010 biological opinion[3] found that the ocean salmon fishery, as managed under the Salmon FMP, was likely to jeopardize the continued existence of the winter-run. This determination was based on the lack of an explicit management process to avoid or reduce impacts to winter-run when this stock is declining and/or facing increased extinction risks. To avoid the likelihood of jeopardizing the existence of winter-run while enabling the continuation of the ocean salmon fishery, NOAA Fisheries developed an RPA[3] which implemented a new abundance-based management framework for winter-run that is responsive to changes in stock status. The framework was first implemented in the 2012 ocean salmon fishing year.

NOAA Fisheries continues to examine new information and consider options that will provide the most effective management of winter-run impacts in the ocean salmon fishery. To achieve this goal and based on feedback provided during the workshop held at the April 2013 Council meeting mentioned above, NOAA Fisheries is requesting public comment on alternative abundance-based management approaches analyzed through a Management Strategy Evaluation (MSE)[4]. Information on the MSE and how to submit public comment can be found here: https://federalregister.gov/a/2014-01239. NOAA Fisheries will accept public comment through April 23, 2014. The Council has also designated time during its March 2014 meeting to discuss the issue[5].

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[2] O'Farrell, M.R., W.H. Satterthwaithe, and B.C. Spence. 2012. California Coastal Chinook salmon: status, data, and feasibility of alternative fishery management strategies. NOAA-TM-NMFS-SWFSC-494. December, 2012.

[3] http://www.westcoast.fisheries.noaa.gov/fisheries/salmon_steelhead/ocean_fisheries.html

[4] https://www.federalregister.gov/articles/2014/01/23/2014-01239/domestic-fisehries-management-strategy-evaluation-for-sacramento-river-winter-chinook-salmon#h-6

[5] http://www.pcouncil.org/wp-content/uploads/Prelim_Quick_Ref_Agenda.pdf

For 2014, NOAA Fisheries guidance is to follow the existing winter-run RPA, which specifies two components. The first component contains season and size limits that apply in every year. The second component specifies impact rate limitations based on the most current three-year geometric mean escapement of winter-run. The geometric mean escapement for 2011-2013 was 2,380; therefore, under the RPA a predicted age-3 impact rate of no greater than 15.4 percent in fisheries south of Point Arena, California is specified for 2014.

Central Valley Spring Chinook Salmon

The Central Valley spring Chinook ESU was first listed as threatened in 1999 (64 FR 50394, September 16, 1999). The current consultation standard for Central Valley spring Chinook is from the NOAA Fisheries biological opinion, dated April 28, 2000, on the effects of the ocean salmon fishery on Central Valley spring Chinook and CC-Chinook. The 2000 opinion concluded that the ocean salmon fishery, as regulated under the Salmon FMP and NOAA Fisheries consultation standards for winter-run, is not likely to jeopardize the continued existence of Central Valley spring Chinook. The new management framework implemented for Sacramento River winter Chinook offers at least equivalent, and/or additional, restrictions on the ocean salmon fishery than those provided by the previous Sacramento River winter Chinook consultation standards. As a result, NOAA Fisheries has determined that the current management framework, along with other regulatory measures in the Salmon FMP, provides sufficient protection for Central Valley spring Chinook for the 2014 fishing year.

Lower Columbia River Chinook Salmon

Lower Columbia River Chinook (LCR) salmon were listed as threatened under the ESA on March 24, 1999 (64 FR 14308). Lower Columbia River Chinook are caught primarily in fisheries from British Columbia to central Oregon, and in the Columbia River in the area below Bonneville Dam. NOAA Fisheries' most recent biological opinion regarding the effects of Council fisheries on LCR Chinook was completed in 2012. The 2012 opinion provides the basis for our guidance in 2014.

The LCR Chinook ESU is comprised of a spring component, a "far-north" migrating bright component, and a component of north migrating tules. The bright and tule components both have fall run timing. Of nine historical spring Chinook populations, two are considered extinct including the White Salmon and Hood River populations, both located in the Columbia River Gorge above Bonneville Dam. Condit Dam on the White Salmon was removed in 2011. The river will be monitored for the next four or five years to allow for natural recolonization before deciding whether to proceed with a reintroduction program. Spring Chinook from the Deschutes River, an out of ESU stock, are being used to reestablish natural production in Hood River. Four of the remaining seven populations are targeted to achieve high viability including the Upper Cowlitz, Cispus (a tributary of the Cowlitz), North Fork Lewis, and Sandy River populations. The historic spawning habitat for the Upper Cowlitz, Cispus, and Lewis populations in Washington is now largely inaccessible to salmon due to impassable dams. These populations are therefore dependent, for the time being, on the associated hatchery programs. The Lower Columbia Salmon and Steelhead Recovery Plan[6] specifies actions to be taken to facilitate

[6]http://www.westcoast.fisheries.noaa.gov/protected_species/salmon_steelhead/recovery_planning_and_implementation/lower_columbia_river/lower_columbia_recovery_plan.html

recovery of spring Chinook populations in Washington State. The Cowlitz and Lewis River hatcheries are being used, for example, for reintroduction of spring Chinook into the upper basins above the existing dams.

The hatchery programs are therefore critical to the overall recovery effort. The status of the Sandy River population is better than that of the other spring populations. The average escapement of natural origin fish in Sandy has exceeded the target abundance objective of 1,230 in recent years. The Sandy River hatchery is currently being managed as a segregated program for fishery augmentation but Oregon Department of Fish and Wildlife (ODFW) has proposed to begin again to include natural-origin fish into the broodstock. Although additional progress is required to meet the high viability objective for the Sandy, harvest objectives specified for the population through recovery planning are being met. Given the circumstances, maintaining the hatchery brood stocks for the Cowlitz and Lewis River hatcheries is essential for implementation of specified recovery actions. The hatcheries have met their escapement objectives in recent years with few exceptions, although the Lewis hatchery may not make its escapement objective in 2014 based on the run size forecast. The general pattern of meeting the goals ensures that what remains of the genetic legacy is preserved and can be used to advance recovery. NOAA Fisheries expects that the management agencies will continue to manage in-river fisheries to meet hatchery escapement goals, but no additional management constraints on Council fisheries are considered necessary at this time.

There are two extant natural-origin bright populations in the LCR Chinook ESU including the North Fork Lewis and Sandy River populations. Both populations are considered to be relatively healthy. The North Fork Lewis River population is used as a harvest indicator for ocean and in-river fisheries. The escapement goal used for management purposes for the Lewis population is 5,700, based on estimates of maximum sustained yield derived from spawner-recruit analysis. Escapements have averaged 8,830 over the last ten years and, with few exceptions, have met or exceeded the goal since at least 1980. The Sandy River population is considered to be viable under current harvest conditions in the Lower Columbia River Salmon and Steelhead Recovery Plan (NMFS 2013). Given the long history of healthy returns, and management constraints that will be in place this year for other stocks, NOAA Fisheries does not anticipate the need to take specific management actions in the ocean to protect the bright component of the LCR Chinook ESU in 2014. NOAA Fisheries does expect that the states of Washington and Oregon will continue to monitor the status of the LCR bright populations, and take the specific actions necessary through their usual authorities to deliver spawning escapement through the fisheries they manage sufficient to maintain the health of these populations.

There are twenty one separate populations within the tule component of the LCR Chinook ESU. Unlike the spring or bright populations of the ESU, LCR tule populations are caught in large numbers in Council fisheries, as well as fisheries to the north and in the Columbia River. Harvest on LCR tule Chinook has been reduced significantly since they were first listed in 1999.

NOAA Fisheries has relied on interim and short term consultation standards in recent years to provide time to improve our understanding of the status of the populations and complete work on a comprehensive recovery plan. Those efforts have now come to fruition and brought us to the point where we can begin to implement a recovery plan that provides a longer term perspective about harvest actions and other elements of an overall strategy.

One of the key recommendations for the harvest sector from recovery planning was consideration of an abundance based management (ABM) framework for tule Chinook. Subsequently the Ad Hoc Tule Chinook Work Group (TCW), appointed by the Council and consisting of state, tribal, Council, and NOAA Fisheries scientists, produced a report outlining the technical details for such a framework. Based on the TCW report and other input, the Council recommended, and NOAA Fisheries adopted via biological opinion, an ABM framework in 2012 to set ESA consultation standards for fisheries. The ABM framework sets the annual exploitation rate limit depending on the abundance of Lower River Hatchery (LRH) tule Chinook. The abundance framework, as implemented over time, should have a conservation benefit that is equal or greater to the previous consultation standard of a fixed exploitation rate of 0.36. This is accomplished by reducing harvest when abundance is low and populations are most in need of protection while providing some increase in opportunity when abundance is relatively high.

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

The ABM framework was used in 2012 and 2013 and allowed for an exploitation rate limit of 0.41 in both years. The ABM framework also provides the basis for managing Council area fisheries in 2014.

The preseason forecast for LRH Chinook in 2014 is 110,000, which allows for an exploitation rate in 2014 of 0.41. Based on the above described circumstances, NOAA Fisheries concludes that Council fisheries in 2014 should be managed such that the total exploitation rate in all fisheries on LCR tule Chinook below Bonneville Dam does not exceed 0.41.

In 2014 and beyond, NOAA Fisheries will continue to focus on implementation of a comprehensive transitional strategy described in the recovery plan that links harvest actions to progress on the suite of actions necessary to achieve long term recovery. In that regard, NOAA Fisheries continues to urge that the parties focus on all aspects of the overall recovery strategy. Monitoring will be critical to verify that the actions specified in the plan are being taken and that populations are responding as expected. Success on both fronts will be necessary to avoid further constraints on harvest in the future.

Upper Columbia River Spring Chinook Salmon, Upper Willamette River Chinook Salmon, and Snake River Spring/Summer Chinook Salmon

NOAA Fisheries has considered the effects of Council area fisheries on spring stocks from the Upper Columbia River and Upper Willamette River Basins and spring/summer stocks from the Snake River in prior biological opinions. These stocks are rarely caught in Council fisheries.

NOAA Fisheries has determined that management actions designed to limit catch from these ESUs beyond what will be provided by harvest constraints for other stocks are not necessary.

Snake River Fall Chinook Salmon

NOAA Fisheries completed a biological opinion on the new Pacific Salmon Treaty Agreement in 2008 where we again considered the effects of fisheries, including Council area fisheries, on Snake River fall Chinook. In that opinion we evaluated the effect of fisheries, in part, by using the guidance standard for ocean fisheries used over the last several years. We concluded that the existing standard continued to provide a necessary and appropriate level of protection for Snake River fall Chinook. NOAA Fisheries' guidance with respect to Snake River fall Chinook is therefore unchanged from that of the last several years. NOAA Fisheries requires that the Southeast Alaskan, Canadian, and Council fisheries, in combination, achieve a 30.0% reduction in the age-3 and age-4 adult equivalent total exploitation rate relative to the 1988-1993 base period. The Council fisheries therefore must be managed to ensure that the 30.0% base period reduction criterion for the aggregate of all ocean fisheries is achieved.

Puget Sound Chinook Salmon

Under the current management structure, Council fisheries are included as part of the suite of fisheries that comprise the fishing regime negotiated each year by the co-managers under U.S. v. Washington to meet management objectives for Puget Sound and Washington Coastal salmon stocks. The comprehensive nature of the management objectives and the management planning structure strongly connect Council and Puget Sound fisheries. Therefore, in adopting its regulations, the Council must determine that its fisheries, when combined with the suite of other fisheries impacting this ESU, meet the management targets set for populations within this ESU. For that reason, NOAA Fisheries prefers to issue guidance for the full suite of Council and Puget Sound fisheries consistent with the nature of the planning process.

Since 2001, our guidance has relied on a series of comprehensive, joint Resource Management Plans (RMP) developed by the Washington Department of Fish and Wildlife and the Puget Sound Treaty Tribes (Puget Sound co-managers). The most recent RMP and the ESA take limit for fisheries implemented under the terms of that RMP expire on May 1, 2014. NOAA Fisheries anticipates receiving a new multi-year RMP later this year. In the interim, NOAA Fisheries will consult on 2014 fisheries. The co-managers recently provided NOAA Fisheries with its proposed management objectives for the 2014 fishing season. They are summarized in Table 1. Conservation objectives for Puget Sound Chinook include harvest-related mortality in all southern U.S. fisheries, including those under the Council's jurisdiction. Therefore, NOAA Fisheries provides the following guidance for fisheries managed under the PFMC and describes its expectations for the full suite of southern U.S. fisheries that will affect Puget Sound Chinook stocks in 2014.

Although Council and Puget Sound fisheries are intertwined, impacts on Puget Sound Chinook stocks in Council fisheries are generally quite low. Exploitation rates on Puget Sound spring Chinook and fall Chinook stock aggregates have been less than one percent and five percent on average, respectively, in recent years. In 2004, NOAA Fisheries issued a biological opinion on the anticipated effects of Council fisheries on the listed Puget Sound Chinook ESU for 2004 and future fishing years. The 2004 opinion found that exploitation rates in Council fisheries within the range observed for brood years 1991-1998 would not jeopardize the continued existence of the species. Consistent with the findings of that opinion, the 2014 Council fisheries should be managed such that exploitation rates on Puget Sound spring and fall Chinook populations do not exceed 3 and 6 percent, respectively.

The management framework we are discussing with the co-managers for 2014 is similar to that of past years. The management approach consists of a two-tiered harvest regime (normal and critical) that is responsive to stock and northern fishery status. The harvest objectives in the RMP are a mixture of total and southern U.S. exploitation rates and escapement goals. Under conditions of normal abundance, the exploitation rates and escapement goals, listed on the left of Table 1, apply. However, when a particular management unit is 1) not expected to meet its low abundance threshold, or, 2) if the anticipated northern fisheries exploitation rate is projected to exceed the difference between a management unit's Exploitation Rate Ceiling and the Critical Exploitation Rate Ceiling (CERC), the co-managers will constrain their fisheries such that either the Exploitation Rate Ceiling is not exceeded, or the CERC, listed on the right of Table 1, is not exceeded. At this time, preliminary run size information indicates that the Nooksack early, Dungeness, Elwha, and South Fork Stillaguamish populations are below their low abundance thresholds in 2014. The Mid-Hood Canal Chinook population is close to its low abundance threshold.

In summary, while this document provides formal guidance for the Council fisheries in 2014, we acknowledge the importance of the integrated management structure between the Council and North of Falcon planning processes. Because impacts in Council fisheries are so low, management actions taken to meet conservation objectives will occur primarily in Puget Sound fisheries. However, since impacts in all fisheries are considered in meeting the objectives, the final option adopted at the April Council meeting must, when combined with Puget Sound fisheries negotiated during the North of Falcon process, meet the escapement goals and exploitation rates for each Puget Sound Chinook management unit included in Table 1, after applying the appropriate regime to the status of each management unit anticipated in 2014.

The objectives summarized in Table 1 are the result of several months of discussions between NOAA Fisheries and the co-managers and informed by the best information available at the time. With respect to Nisqually chinook, NOAA Fisheries agreed to a management objective for an exploitation rate of 52% instead of the 47% scheduled to be implemented in 2014[7] because of compelling information that FRAM estimates of exploitation rates are biased high for this population[8,9]. We are now aware that the co-managers are considering several adjustments to the FRAM model inputs in 2014 that could substantially reduce the bias and therefore affect the rationale used to justify our consideration of the 52% exploitation rate. NOAA Fisheries would prefer that these adjustments be considered within the Council's Salmon Methodology review process that is already underway. A comprehensive review of the age-2 forecast methodology

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[7] PSIT and WDFW (Puget Sound Indian Tribes and Washington Department of Fish and Wildlife). 2010a. Comprehensive Management Plan for Puget Sound Chinook: Harvest Management Component. April 12. 230 pp.
[8] McHugh, P., L. LaVoy, and A. Hagen-Breaux. 2013. Comparison of FRAM and coded-wire tag exploitation rates of landed catch for Puget Sound Chinook. Memo. May 2013. 12 pages + attachments
[9] McHugh, P., L. LaVoy, and A. Hagen-Breaux. 2013. Unmarked total mortality supplement to FRAM vs. CWT comparison. Memo. June 2013. 2 pages + attachments

and a FRAM base period review were initiated in 2013 and are schedule for action in 2014. Nonetheless we understand that the co-managers are considering changes in 2014 that would be specific to Nisqually and possibly a limited set of other stocks. However, because the effect of the adjustments is directly relevant to the basis of its decision to change the objective, NOAA Fisheries may revisit its guidance for the Nisqually population depending on whether the adjustments are implemented and the resulting model outcome.

Table 1. Puget Sound Chinook conservation objectives for the 2014 fishing year.

Management Unit/Population	Normal Abundance Regime: Exploitation Rate Ceiling – Total	Normal Abundance Regime: Exploitation Rate Ceiling – Southern US (PT=Preterminal)	Normal Abundance Regime: Escape-ment Goal	Minimum Fishing Regime: Low Abundance Threshold	Minimum Fishing Regime: Critical Exploitation Rate – So. US	Minimum Fishing Regime: Critical Exploitation Rate – Preterminal So. US
Nooksack spring	Minimum Fishing Regime applies				7.0%[1]	
NF Nooksack				1,000[2]		
SF Nooksack				1,000[2]		
Skagit Summer/Fall	50.0%			4,800	15.0%	
Upper Skagit				2,200		
Lower Skagit				900		
Lower Sauk				400		
Skagit Spring	38.0%			576	18.0%	
Suiattle				170		
Upper Sauk				130		
Cascade				170		
Stillaguamish	25.0%			700[2]	15.0%	
NF Stillaguamish				500[2]		
SF Stillaguamish				200[2]		
Snohomish	21.0%			2,800[2]	15.0%	
Skykomish				1,745[2]		
Snoqualmie				521[2]		
Lake Washington		20.0%				10.0%
Cedar River				200		
Green	Minimum Fishing Regime applies			1,800		12.0%
White River	20.0%			200	15.0%	
Puyallup	50.0%			500		12.0%[3]
Nisqually[4]	52.0%			700		50% reduction of SUS ER[6]
Skokomish	50.0%			800 natural[5] 500 hatchery[5]		12.0%
Mid-Hood Canal		15.0% PT		400		12.0%
Dungeness		10.0%		500	6.0%	
Elwha		10.0%		1,000	6.0%	

[1] Expected Southern US rate will not exceed 7.0% in 4 out of 5 years and 9.0% in 1 out of 5 years. In 2011 the expected southern U.S. rate was 7.9%.
[2] Threshold expressed as natural-origin spawners.
[3] The total southern U.S. exploitation rate for the Puyallup is expected to fall within the range of 23% to 27%.
[4] Managers shall take actions to ensure that an adequate number of Chinook salmon arrive at the weir to produce upstream escapements within the range observed from 2005 to 2009, after factoring anticipated weir-related Chinook salmon impacts. Managers shall pass upstream the number, or proportion of the total return, of hatchery-origin Chinook salmon required to meet this goal if there are insufficient natural-origin Chinook (NMFS 2010). Co-manager weir protocols in place for 2013 were found by NOAA Fisheries to be consistent with this guidance.
[5] Anticipated hatchery or natural escapements below these spawner abundances trigger specific additional management actions.
[6] Southern U.S. ER ceiling will be 50% of the difference between 52% and the expected ER associated with fisheries in Alaska and British Columbia

COHO SALMON

Oregon Coast Coho Salmon

The ESA listing status of Oregon Coast (OC) coho has changed over the years. On February 11, 2008 NOAA Fisheries again listed OC coho as threatened under the ESA (73 FR 7816). Regardless of their listing status, the Council has managed OC coho consistent with the terms of Amendment 13 to the Salmon FMP as modified by the expert advice of the 2000 ad hoc Work Group. NOAA Fisheries approved the management provisions for OC coho through its ESA Section 7 consultation on Amendment 13 in 1999, and has since supported use of the related expert advice. For the 2014 season, the applicable spawner status for the northern, north-central, and south-central sub-aggregates is in the high category. The marine survival index is in the "medium" category. Under these circumstances, the Work Group report requires that the exploitation rate be limited to no more than 0.30. Although the south sub-aggregate is included in the harvest matrix described in Amendment 13 as modified by the 2000 Work Group, the south sub-aggregate is part of the Southern Oregon/Northern California Coastal coho ESU and is managed subject to provisions that are described below for that ESU.

Managers should continue to coordinate ocean fishery impacts with desired terminal fishery opportunities for wild coho salmon to ensure that the impacts remain within the overall limits specified in the states' Fishery Management and Evaluation Plans for sport fisheries in the rivers and lakes that affect the OC coho ESU.

Lower Columbia River Coho

Lower Columbia River coho were listed as threatened under the ESA on June 25, 2005 (70 FR 37160). Lower Columbia River (LCR) coho are caught primarily in fisheries off the Washington and Oregon coast, and in the Columbia River in the area below Bonneville Dam. NOAA Fisheries' most recent biological opinion regarding the effects of Council fisheries and fisheries in the Columbia River on LCR coho was completed in 2008. The 2008 opinion provides the basis for our guidance in 2014.

The states of Oregon and Washington have focused on use of a harvest matrix for LCR coho, developed by Oregon, following their listing under Oregon's State ESA. Under the matrix, the allowable harvest in a given year depends on indicators of marine survival and brood year escapement. The matrix has both ocean and inriver components which can be combined to define a total exploitation rate limit for all ocean and inriver fisheries. The full set of matrices was implemented from 2001-2005 to establish exploitation limits for LCR coho. Generally, NOAA Fisheries supports use of management planning tools that allow harvest to vary depending on the year-specific circumstances. Conceptually, we think Oregon's approach is a good one. However, NOAA Fisheries has taken a more conservative approach for LCR coho since 2006 because of unresolved issues related to application of the matrix. NOAA Fisheries relied on the matrix, but limited the total harvest impact rate to that allowed for ocean fisheries. Given the particular circumstances regarding marine survival and escapement, the allowable exploitation rates in recent years has ranged from 0.08 to 0.20.

The harvest matrix for LCR coho is based on the status of Clackamas and Sandy populations, as both populations are considered essential to the recovery of the LCR coho ESU (NMFS 2013). The parental escapement for each population is applied to the ocean harvest matrix and a maximum harvest rate for each population estimated. If escapement levels differ for the populations resulting in different allowable harvest rates, the two harvest rates are averaged to obtain the overall maximum impact rate for LCR coho. However, NOAA Fisheries believes it is appropriate to reconsider whether reliance on these two indicators is adequately protective of other populations in the ESU. We also think that it is appropriate to review the information related to seeding capacity that sets the abundance criteria in the matrix for each population. NOAA Fisheries has conferred with Oregon and Washington in the past and discussed the information that would be needed to reinitiate consultation and consider a revised fishery management proposal. In its 2010 management unit plan (ODFW 2010, NMFS 2013), Oregon raised similar concerns and suggested the matrices could also incorporate weak stock management concepts to assure harvest impacts do not disproportionally impact weaker populations. NOAA Fisheries is aware that the states have made substantial progress related to development of a new fishery management plan including analyses combining the matrices with a weak stock component and supports completion of this work. For 2014, it is clear that outstanding questions related to the matrix remain unresolved. As a result, NOAA Fisheries will continue to apply the matrix as we have in the past, which includes limiting the total harvest to that allowed for the ocean fisheries. However, the circumstances in 2014 described below underscore the need to address the questions and complete the work to refine the harvest matrix approach in the near term.

Guidance to the Council for 2014 depends on the matrix and the particular circumstances for the indicator populations. The 2011 brood year escapements for the Clackamas and Sandy are in the low and high status categories, respectively. The marine survival index is in the medium category. Therefore, the exploitation rate limit is 0.15 for Clackamas and 0.30 for Sandy. When the parent seeding categories result in different exploitation rate limits, then the average of the exploitation rates for the two populations are used. This is the first time since its implementation that the matrix has resulted in different exploitation rate categories for the two populations. Given these circumstances, ocean salmon fisheries under the Council's jurisdiction in 2014, and commercial and recreational salmon fisheries in the mainstem Columbia River, including select area fisheries (e.g., Youngs Bay), should be managed subject to a total exploitation rate limit on LCR coho for all fisheries not to exceed 0.225.

Southern Oregon/Northern California Coastal Coho Salmon
The Southern Oregon/Northern California Coastal coho ESU (SONCC coho) has been listed as threatened under the ESA since 1997 (62 FR 24855, May 6, 1997; also, 70 FR 37160, June 28, 2005). The current consultation standard for SONCC coho is from a NOAA Fisheries biological opinion dated April 28, 1999. The Rogue/Klamath coho hatchery stock is used as an indicator of fishery impacts on SONCC coho. The 1999 biological opinion requires that management measures developed under the Salmon FMP achieve an ocean exploitation rate on Rogue/Klamath coho hatchery stocks of no more than 0.13.

Central California Coastal Coho Salmon
The Central California Coastal coho ESU (CCC coho) was listed as threatened under the ESA in 1996 and relisted as endangered in 2005 (70 FR 37160, June 28, 2005; also, 77 FR 19552, April 2, 2012). The current consultation standard for CCC coho is from a NOAA Fisheries biological opinion dated April 28, 1999. Information on past harvest or non-retention mortality rates is

lacking for CCC coho. In the absence of more specific information, the 1999 biological opinion requires that directed fishing for coho and retention of coho in Chinook-directed fisheries be prohibited off California.

CHUM SALMON

Hood Canal Summer Chum

Chum salmon are not targeted and are rarely caught in Council salmon fisheries. However, the Salmon FMP requires fisheries to be managed consistent with NOAA Fisheries' ESA standards for listed species, which includes the Hood Canal summer-run chum salmon ESU. The Summer Chum Salmon Conservation Initiative (PNPTC and WDFW 2000), approved by NOAA Fisheries under Limit 6 of the ESA 4(d) Rule, describes the harvest actions that must be taken to protect listed Hood Canal summer-run chum salmon both in Washington fisheries managed under the jurisdiction of the Council and Puget Sound fisheries managed by the state and tribal fishery managers.

Under the terms of the Conservation Initiative, chum salmon must be released in non-treaty sport and troll fisheries in Washington Catch Area 4 from August 1 through September 30. The Conservation Initiative does not require release of chum salmon in tribal fisheries in Catch Area 4 during the same period, but does recommend that release provisions be implemented. As in previous years, tribal managers will discuss implementation of these provisions during the North of Falcon planning process.

SOCKEYE SALMON

Snake River Sockeye Salmon and Ozette Lake Sockeye Salmon

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

STEELHEAD

NOAA Fisheries has listed two Distinct Population Segment (DPS) of steelhead as endangered and nine DPSs as threatened in Washington, Oregon, Idaho, and California. All eleven listed DPSs have been considered in biological opinions on the effects of Council fisheries.

Steelhead are rarely caught in ocean fisheries and retention of steelhead in non-treaty fisheries is currently prohibited. Based on currently available information, NOAA Fisheries concludes that ocean fishery management actions beyond those already in place that seek to shape fisheries to minimize impacts to steelhead are not necessary. The Council and states should continue to prohibit the retention of steelhead with intact adipose fins in ocean non-treaty fisheries and encourage the same in treaty tribal fisheries to minimize the effect of whatever catch may occur.

NOAA Fisheries looks forward to working with the Council to develop fisheries consistent with the conservation and management objectives of the Salmon FMP and the ESA. We are committed to working with the Council to address the issues outlined in this letter.

Sincerely,

William W. Stelle, Jr.
Regional Administrator

Agenda Item F.2.c
Supplemental SAS Report
March 2014

SALMON ADVISORY SUBPANEL

PROPOSED INITIAL SALMON MANAGEMENT ALTERNATIVES FOR 2014 NON-INDIAN OCEAN FISHERIES

March 9, 2014

<table>
<tr><td colspan="3">TABLE 1. Commercial troll management Alternatives proposed by the SAS for non-Indian ocean salmon fisheries, 2014 (Page 1 of 9) 3/9/2014 8:01 AM</td></tr>
<tr><td colspan="3">A. SEASON ALTERNATIVE DESCRIPTIONS</td></tr>
<tr><td>ALTERNATIVE I</td><td>ALTERNATIVE II</td><td>ALTERNATIVE III</td></tr>
<tr><td>North of Cape Falcon</td><td>North of Cape Falcon</td><td>North of Cape Falcon</td></tr>
<tr><td>Supplemental Management Information</td><td>Supplemental Management Information</td><td>Supplemental Management Information</td></tr>
<tr>
<td>1. Overall non-Indian TAC: ___,___ (non-mark-selective equivalent of 125,000) Chinook and 250,000 coho marked with a healed adipose fin clip (marked).
2. Non-Indian commercial troll TAC: 65,000 Chinook and 40,000 marked coho.
3. Trade: May be considered at the April Council meeting
4. Overall Chinook and/or coho TACs may need to be reduced or fisheries adjusted to meet NMFS ESA guidance, FMP requirements, upon conclusion of negotiations in the North of Falcon forum, or upon receipt of preseason catch and abundance expectations for Canadian and Alaskan fisheries.</td>
<td>1. Overall non-Indian TAC: __,___ (non-mark-selective equivalent of 110,000) Chinook and 220,000 coho marked with a healed adipose fin clip (marked).
2. Non-Indian commercial troll TAC: 56,000 Chinook and 35,200 marked coho.
3. Trade: May be considered at the April Council meeting
4. Overall Chinook and/or coho TACs may need to be reduced or fisheries adjusted to meet NMFS ESA guidance, FMP requirements, upon conclusion of negotiations in the North of Falcon forum, or upon receipt of preseason catch and abundance expectations for Canadian and Alaskan fisheries.</td>
<td>1. Overall non-Indian TAC: __,___ (non-mark-selective equivalent of 95,000) Chinook and 190,000 coho marked with a healed adipose fin clip (marked).
2. Non-Indian commercial troll TAC: 47,500 Chinook and 30,400 marked coho.
3. Trade: May be considered at the April Council meeting
4. Overall Chinook and/or coho TACs may need to be reduced or fisheries adjusted to meet NMFS ESA guidance, FMP requirements, upon conclusion of negotiations in the North of Falcon forum, or upon receipt of preseason catch and abundance expectations for Canadian and Alaskan fisheries.</td>
</tr>
<tr>
<td>U.S./Canada Border to Cape Falcon
• May 1 through earlier of June 30 or 43,300 Chinook, no more than 14,000 of which may be caught in the area between the U.S./Canada border and the Queets River.
Seven days per week (C.1). All salmon except coho (C.4, C.7). Chinook minimum size limit of 28 inches total length (B, C.1). Vessels in possession of salmon north of the Queets River may not cross the Queets River line without first notifying WDFW at 360-902-2739 with area fished, total Chinook and halibut catch aboard, and destination. Vessels in possession of salmon south of the Queets River may not cross the Queets River line without first notifying WDFW at 360-902-2739 with area fished, total Chinook and halibut catch aboard, and destination. See compliance requirements (C.1) and gear restrictions and definitions (C.2, C.3). When it is projected that 32,475 Chinook have been landed overall, or 10,500 Chinook have been landed in the area between the U.S/Canada border and the Queets River, inseason action modifying the open period to five days per week and adding landing and possession limits will be considered to ensure the guideline is not exceeded.</td>
<td>U.S./Canada Border to Cape Falcon
• May 1 through earlier of June 30 or 37,300 Chinook, no more than 12,000 of which may be caught in the area between the U.S./Canada border and the Queets River.
Seven days per week (C.1). All salmon except coho (C.4, C.7). Chinook minimum size limit of 28 inches total length (B, C.1). Vessels in possession of salmon north of the Queets River may not cross the Queets River line without first notifying WDFW at 360-902-2739 with area fished, total Chinook and halibut catch aboard, and destination. Vessels in possession of salmon south of the Queets River may not cross the Queets River line without first notifying WDFW at 360-902-2739 with area fished, total Chinook and halibut catch aboard, and destination. See compliance requirements (C.1) and gear restrictions and definitions (C.2, C.3). When it is projected that 27,975 Chinook have been landed overall, or 9,000 Chinook have been landed in the area between the U.S/Canada border and the Queets River, inseason action modifying the open period to five days per week and adding landing and possession limits will be considered to ensure the guideline is not exceeded.</td>
<td>U.S./Canada Border to Cape Falcon
• May 1 through earlier of June 30 or 31,700 Chinook.
Seven days per week (C.1). All salmon except coho (C.4, C.7). Chinook minimum size limit of 28 inches total length (B, C.1). See compliance requirements (C.1) and gear restrictions and definitions (C.2, C.3). An inseason conference call may be considered when it is projected that 23,775 Chinook have been landed to consider modifying the open period to five days per week and adding landing and possession limits to ensure the guideline is not exceeded.</td>
</tr>
<tr><td colspan="3">Cape Flattery, Mandatory Yelloweye Rockfish Conservation Area, and Columbia Control Zones closed (C.5). Vessels must land and deliver their fish within 24 hours of any closure of this fishery. Under state law, vessels must report their catch on a state fish receiving ticket. Vessels fishing or in possession of salmon while fishing north of Leadbetter Point must land and deliver their fish within the area and north of Leadbetter Point. Vessels fishing or in possession of salmon while fishing south of Leadbetter Point must land and deliver their fish within the area and south of Leadbetter Point, except that Oregon permitted vessels may also land their fish in Garibaldi, Oregon. Oregon State regulations require all fishers landing salmon into Oregon from any fishery between Leadbetter Point, Washington and Cape Falcon, Oregon must notify ODFW within one hour of delivery or prior to transport away from the port of landing by either calling 541-867-0300 Ext. 271 or sending notification via e-mail to nfalcon.trollreport@state.or.us. Notification shall include vessel name and number, number of salmon by species, port of landing and location of delivery, and estimated time of delivery. Inseason actions may modify harvest guidelines in later fisheries to achieve or prevent exceeding the overall allowable troll harvest impacts.</td></tr>
</table>

TABLE 1. Commercial troll management Alternatives proposed by the SAS for non-Indian ocean salmon fisheries, 2014. (Page 2 of 9) 3/9/2014 8:01 AM

A. SEASON ALTERNATIVE DESCRIPTIONS

ALTERNATIVE I	ALTERNATIVE II	ALTERNATIVE III
U.S./Canada Border to Cape Falcon • July 1 through earlier of September 16 or attainment of the quota of 21,700 Chinook, no more than 10,000 of which may be caught in the area between the U.S./Canada border and the Queets River, or 40,000 marked coho (C.8.d). July 1-8 then Friday through Tuesday July 11-August 19 **with a landing and possession limit of 75 Chinook and 60 coho per vessel per open period**; Friday through Tuesday August 22-September 16 **with a landing and possession limit of 20 Chinook and 50 coho per vessel per open period** (C.1). Vessels in possession of salmon north of the Queets River may not cross the Queets River line without first notifying WDFW at 360-902-2739 with area fished, total Chinook, coho, and halibut catch aboard, and destination. Vessels in possession of salmon south of the Queets River may not cross the Queets River line without first notifying WDFW at 360-902-2739 with area fished, total Chinook, coho, and halibut catch aboard, and destination. When it is projected that 16,275 Chinook have been landed overall, or 7,500 Chinook have been landed in the area between the U.S/Canada border and the Queets River, inseason action modifying the open period to five days per week and adding landing and possession limits will be considered to ensure the guideline is not exceeded.. No earlier than September 1, if at least 5,000 marked coho remain on the quota, inseason action may be considered to allow non-selective coho retention (C.8). All salmon except no chum retention north of Cape Alava, Washington in August and September (C.7). Chinook minimum size limit of 28 inches total length (B, C.1). All coho must be marked except as noted above (C.8.d). See compliance requirements (C.1) and gear restrictions and definitions (C.2, C.3).	**U.S./Canada Border to Cape Falcon** • July 1 through earlier of September 16 or attainment of the quota of 18,700 preseason Chinook, no more than 8,600 of which may be caught in the area between the U.S./Canada border and the Queets River, or 35,200 marked coho (C.8.d) July 1-2, July 4-8, then Friday through Tuesday July 11-August 19 **with a landing and possession limit of 65 Chinook and 45 coho per vessel per open period**; Friday through Tuesday August 22-September 16 **with a landing and possession limit of 15 Chinook and 50 coho per vessel per open period** (C.1). Vessels in possession of salmon north of the Queets River may not cross the Queets River line without first notifying WDFW at 360-902-2739 with area fished, total Chinook, coho, and halibut catch aboard, and destination. Vessels in possession of salmon south of the Queets River may not cross the Queets River line without first notifying WDFW at 360-902-2739 with area fished, total Chinook, coho, and halibut catch aboard, and destination. All salmon except no chum retention north of Cape Alava, Washington in August and September (C.7). Chinook minimum size limit of 28 inches total length (B, C.1). All coho must be marked except as noted above (C.8.d). See compliance requirements (C.1) and gear restrictions and definitions (C.2, C.3).	**U.S./Canada Border to Cape Falcon** • July 1 through earlier of September 16 or 15,800 preseason Chinook guideline (C.8) or a 30,400 marked coho quota (C.8.d) July 1-4, July 6-8, then Friday through Tuesday July 11-August 26 **with a landing and possession limit of 50 Chinook and 45 coho per vessel per open period**; Friday through Tuesday August 29-September 16 **with a landing and possession limit of 15 Chinook and 50 coho per vessel per open period** (C.1). All salmon except no chum retention north of Cape Alava, Washington in August and September (C.7). Chinook minimum size limit of 28 inches total length (B, C.1). All coho must be marked except as noted above (C.8.d). See compliance requirements (C.1) and gear restrictions and definitions (C.2, C.3).
Mandatory Yelloweye Rockfish Conservation Area, Cape Flattery and Columbia Control Zones, **and beginning August 9, Grays Harbor Control Zone closed** (C.5). Vessels must land and deliver their fish within 24 hours of any closure of this fishery. **Vessels fishing or in possession of salmon while fishing north of Leadbetter Point must land and deliver their fish within the area and north of Leadbetter Point. Vessels fishing or in possession of salmon while fishing south of Leadbetter Point must land and deliver their fish within the area and south of Leadbetter Point**, except that Oregon permitted vessels may also land their fish in Garibaldi, Oregon. Under state law, vessels must report their catch on a state fish receiving ticket. Oregon State regulations require all fishers landing salmon into Oregon from any fishery between Leadbetter Point, Washington and Cape Falcon, Oregon must notify ODFW within one hour of delivery or prior to transport away from the port of landing by either calling 541-867-0300 Ext. 271 or sending notification via e-mail to nfalcon.trollreport@state.or.us. Notification shall include vessel name and number, number of salmon by species, port of landing and location of delivery, and estimated time of delivery. Inseason actions may modify harvest guidelines in later fisheries to achieve or prevent exceeding the overall allowable troll harvest impacts.		

TABLE 1. Commercial troll management Alternatives proposed by the SAS for non-Indian ocean salmon fisheries, 2014. (Page 3 of 9)		3/9/2014 8:01 AM
A. SEASON ALTERNATIVE DESCRIPTIONS		
ALTERNATIVE I	ALTERNATIVE II	ALTERNATIVE III
South of Cape Falcon	**South of Cape Falcon**	**South of Cape Falcon**
Supplemental Management Information	**Supplemental Management Information**	**Supplemental Management Information**
1. Sacramento River Basin recreational fishery catch assumption: __,___ adult Sacramento River fall Chinook (__._ % of the total allowable harvest). 2. Sacramento River fall Chinook spawning escapement of ___,___ adults. 3. Klamath River recreational fishery allocation: __,___ adult Klamath River fall Chinook. 4. Klamath tribal allocation: ___,___ adult Klamath River fall Chinook. 5. Fisheries may need to be adjusted to meet NMFS ESA consultation standards, FMP requirements, other management objectives, or upon receipt of new allocation recommendations from the California Fish and Game Commission.	1. Sacramento River Basin recreational fishery catch assumption: __,___ adult Sacramento River fall Chinook (__._% of the total allowable harvest). 2. Sacramento River fall Chinook spawning escapement of ___,___ adults. 3. Klamath River recreational fishery allocation: __,___ adult Klamath River fall Chinook. 4. Klamath tribal allocation: ___,___ adult Klamath River fall Chinook. 5. Fisheries may need to be adjusted to meet NMFS ESA consultation standards, FMP requirements, other management objectives, or upon receipt of new allocation recommendations from the California Fish and Game Commission.	_. Sacramento River Basin recreational fishery catch assumption: __,___ adult Sacramento River fall Chinook (__._ % of the total allowable harvest). 2. Sacramento River fall Chinook spawning escapement of ___,___ adults. 3. Klamath River recreational fishery allocation: __,___ adult Klamath River fall Chinook. 4. Klamath tribal allocation: ___,___ adult Klamath River fall Chinook. 5. Fisheries may need to be adjusted to meet NMFS ESA consultation standards, FMP requirements, other management objectives, or upon receipt of new allocation recommendations from the California Fish and Game Commission.
Cape Falcon to Humbug Mt. • April 1-August 29; • September 3-October 31 (C.9.a). Seven days per week. **All salmon except coho except as listed below for September non-selective coho incidental retention** (C.4, C.7). Chinook minimum size limit of 28 inches total length (B, C.1). All vessels fishing in the area must land their fish in the State of Oregon. See gear restrictions and definitions (C.2, C.3) and Oregon State regulations for a description of special regulations at the mouth of Tillamook Bay. Beginning September 3, no more than 100 Chinook per vessel per landing week (Wed.-Tues.). **Non-selective incidental coho retention:** • September 3 through the earlier of the quota or September 30, retention of coho will be limited to no more than one coho for each landed Chinook with a landing week limit of no more than 20 coho per vessel if sufficient quota is available for transfer from the Cape Falcon to Humbug Mt. non-selective recreational fishery (C.8.b). • Oregon State regulations require all fishers landing coho salmon from this season to notify ODFW within one hour of delivery or prior to transport away from the port of landing by calling 541-867-0300 Ext. 252. Notification shall include vessel name and number, number of salmon by species, port of landing and location of delivery, and estimated time of delivery. In 2015, the season will open March 15 for all salmon except coho. Chinook minimum size limit of 28 inches total length. Gear restrictions same as in 2014. This opening could be modified following Council review at its March 2015 meeting.	**Cape Falcon to Humbug Mt.** • April **1**-August 29; • September **3**-October **31** (C.9). Seven day per week. All salmon except coho (C.7). Chinook minimum size limit of 28 inches total length (B). All vessels fishing in the area must land their fish in the State of Oregon. See gear restrictions and definitions (C.2, C.3) and Oregon State regulations for a description of special regulations at the mouth of Tillamook Bay. Beginning September **3**, no more than 75 Chinook per vessel per landing week (Wed.-Tues.). In 2015, same as Alternative I	**Cape Falcon to Humbug Mt.** • April **1**-July 31; and August 6-29; • September **3**-October **31** (C.9). Seven day per week. All salmon except coho (C.7). Chinook minimum size limit of 28 inches total length (B). All vessels fishing in the area must land their fish in the State of Oregon. See gear restrictions and definitions (C.2, C.3) and Oregon State regulations for a description of special regulations at the mouth of Tillamook Bay. Beginning September **3**, no more than 50 Chinook per vessel per landing week (Wed.-Tues.). In 2015, same as Alternative I

TABLE 1. Commercial troll management Alternatives proposed by the SAS for non-Indian ocean salmon fisheries, 2014. (Page 4 of 9)		3/9/2014 8:01 AM
A. SEASON ALTERNATIVE DESCRIPTIONS		
ALTERNATIVE I	ALTERNATIVE II	ALTERNATIVE III
Humbug Mt. to OR/CA Border (Oregon KMZ) • April 1-May 31; • June 1 through earlier of June 30, or a 4,000 Chinook quota; • July 1 through earlier of July 31, or a 3,000 Chinook quota; • August 1 through earlier of August 29, or a 2,000 Chinook quota; • September 16 through earlier of September 27 or a 1,000 Chinook quota (C.9.a). Seven days per week. All salmon except coho (C.4, C.7). Chinook minimum size limit of 28 inches total length (B, C.1). **Prior to June 1, all fish caught in this area must be landed and delivered in the State of Oregon.** June 1 – August 29 landing and possession limit of 40 Chinook per vessel per day. September 16-27 landing and possession limit of 20 Chinook per vessel per day. Any remaining portion of the June and/or July Chinook quotas may be transferred inseason on an impact neutral basis to the next open quota period (C.8). All vessels fishing in this area must land and deliver all fish within this area or Port Orford, within 24 hours of any closure of this fishery, and prior to fishing outside of this area. State regulations require fishers intending to transport and deliver their catch to other locations after first landing in one of these ports notify ODFW prior to transport away from the port of landing by calling 541-867-0300 Ext. 252, with vessel name and number, number of salmon by species, location of delivery, and estimated time of delivery. See compliance requirements (C.1) and gear restrictions and definitions (C.2, C.3). In 2015, the season will open March 15 for all salmon except coho, with a 28 inch Chinook minimum size limit. This opening could be modified following Council review at its March 2015 meeting.	**Humbug Mt. to OR/CA Border (Oregon KMZ)** • April 1-May 31; • June 1 through earlier of June 30, or a 3,000 Chinook quota; • July 1 through earlier of July 31, or a 2,000 Chinook quota; • August 1 through earlier of August 29, or a 1,500 Chinook quota; • September 15 through earlier of September 27 or a 500 Chinook quota (C.9.a). Seven days per week. All salmon except coho (C.4, C.7). Chinook minimum size limit of 28 inches total length (B, C.1). **Prior to June 1, all fish caught in this area must be landed and delivered in the State of Oregon.** June 1 – August 29 landing and possession limit of 30 Chinook per vessel per day. September 15-27 landing and possession limit of 20 Chinook per vessel per day. Any remaining portion of the June and/or July Chinook quotas may be transferred inseason on an impact neutral basis to the next open quota period (C.8). All vessels fishing in this area must land and deliver all fish within this area or Port Orford, within 24 hours of any closure of this fishery, and prior to fishing outside of this area. State regulations require fishers intending to transport and deliver their catch to other locations after first landing in one of these ports notify ODFW prior to transport away from the port of landing by calling 541-867-0300 Ext. 252, with vessel name and number, number of salmon by species, location of delivery, and estimated time of delivery. See compliance requirements (C.1) and gear restrictions and definitions (C.2, C.3). In 2015, same as Alternative I.	**Humbug Mt. to OR/CA Border (Oregon KMZ)** • April 1-May 31; • June 1 through earlier of June 30, or a 2,000 Chinook quota; • July 1 through earlier of July 31, or a 1,500 Chinook quota; • August 1 through earlier of August 29, or a 1,000 Chinook quota; (C.9.a). Seven days per week. All salmon except coho (C.4, C.7). Chinook minimum size limit of 28 inches total length (B, C.1). **Prior to June 1, all fish caught in this area must be landed and delivered in the State of Oregon.** June 1 – August 29 landing and possession limit of 20 Chinook per vessel per day. Any remaining portion of the June and/or July Chinook quotas may be transferred inseason on an impact neutral basis to the next open quota period (C.8). All vessels fishing in this area must land and deliver all fish within this area or Port Orford, within 24 hours of any closure of this fishery, and prior to fishing outside of this area. State regulations require fishers intending to transport and deliver their catch to other locations after first landing in one of these ports notify ODFW prior to transport away from the port of landing by calling 541-867-0300 Ext. 252, with vessel name and number, number of salmon by species, location of delivery, and estimated time of delivery. See compliance requirements (C.1) and gear restrictions and definitions (C.2, C.3). In 2015, same as Alternative I.

TABLE 1. Commercial troll management Alternatives proposed by the SAS for non-Indian ocean salmon fisheries, 2014. (Page 5 of 9) 3/9/2014 8:01 AM

A. SEASON ALTERNATIVE DESCRIPTIONS

ALTERNATIVE I	ALTERNATIVE II	ALTERNATIVE III
OR/CA Border to Humboldt South Jetty (California KMZ) • September 5 through earlier of September 30, or 10,000 Chinook quota (C.9.b). Seven days per week. All salmon except coho (C.4, C.7). Chinook minimum size limit of 27 inches total length (B, C.1). Landing and possession limit of 30 Chinook per vessel per day (C.8.g). Any remaining portion of the May, June and/or July Chinook quotas may be transferred inseason on an impact neutral basis to the next open quota period (C.8.c).	**OR/CA Border to Humboldt South Jetty (California KMZ)** • September 12 through earlier of September 30, or 6,000 Chinook quota (C.9.b). Seven days per week. All salmon except coho (C.4, C.7). Chinook minimum size limit of 27 inches total length (B, C.1). Landing and possession limit of 20 Chinook per vessel per day (C.8.g). Any remaining portion of the May, June and/or July Chinook quotas may be transferred inseason on an impact neutral basis to the next open quota period (C.8.c).	**OR/CA Border to Humboldt South Jetty (California KMZ)** • September 16 through earlier of September 30, or 3,000 Chinook quota (C.9.b). Seven days per week. All salmon except coho (C.4, C.7). Chinook minimum size limit of 27 inches total length (B, C.1). Landing and possession limit of 20 Chinook per vessel per day (C.8.g). Any remaining portion of the May, June and/or July Chinook quotas may be transferred inseason on an impact neutral basis to the next open quota period (C.8.c).
All fish caught in this area must be landed within the area and within 24 hours of any closure of the fishery and prior to fishing outside the area (C.10). See compliance requirements (C.1) and gear restrictions and definitions (C.2, C.3). Klamath Control Zone closed (C.5.e). See California State regulations for additional closures adjacent to the Smith and Klamath rivers. When the fishery is closed between the OR/CA border and Humbug Mountain and open to the south, vessels with fish on board caught in the open area off California may seek temporary mooring in Brookings, Oregon prior to landing in California only if such vessels first notify the Chetco River Coast Guard Station via VHF channel 22A between the hours of 0500 and 2200 and provide the vessel name, number of fish on board, and estimated time of arrival (C.6.).		
Humboldt South Jetty to Horse Mt. Closed.	**Humboldt South Jetty to Horse Mt.** Closed.	**Humboldt South Jetty to Horse Mt.** Closed.
Horse Mt. to Point Arena (Fort Bragg) • April 16-30 • June 17-30 • July 11-31; • August 1-29; • September 1-30 (C.9.b). Seven days per week. All salmon except coho (C.4, C.7). Chinook minimum size limit of 27 inches total length (B, C.1). In 2015, the season will open April 16-30 for all salmon except coho, with a 27 inch Chinook minimum size limit and the same gear restrictions as in 2014. All fish caught in the area must be landed in the area. This opening could be modified following Council review at its March 2015 meeting.	**Horse Mt. to Point Arena (Fort Bragg)** • April 16-30 • June 8-30 • July 8-31; • August 1-29; • September 1-30 (C.9.b). Seven days per week. All salmon except coho (C.4, C.7). Chinook minimum size limit of 27 inches total length (B, C.1). In 2015, same as Alternative I.	**Horse Mt. to Point Arena (Fort Bragg)** • April 16-30 • June 5-30 • July 8-31; • August 1-29; • September 1-30 (C.9.b). Seven days per week. All salmon except coho (C.4, C.7). Chinook minimum size limit of 27 inches total length (B, C.1). In 2015, same as Alternative I.
All fish must be landed in California and offloaded within 24 hours of the August 29 closure (C.6). When the CA KMZ fishery is open, all fish caught in the area must be landed south of Horse Mountain (C.6). During September, all fish must be landed north of Point Arena (C.6). See compliance requirements (C.1) and gear restrictions and definitions (C.2, C.3).		

TABLE 1. Commercial troll management Alternatives proposed by the SAS for non-Indian ocean salmon fisheries, 2014. (Page 6 of 9) 3/9/2014 8:01 AM

A. SEASON ALTERNATIVE DESCRIPTIONS

ALTERNATIVE I	ALTERNATIVE II	ALTERNATIVE III
Pt. Arena to Pigeon Pt. (San Francisco) • May 1-31; • June 1-30; • July 8-31; • August 1-29; • September 1-30 (C.9.b). Seven days per week. All salmon except coho (C.4, C.7). Chinook minimum size limit of 27 inches total length prior to September 1, 26 inches thereafter (B, C.1). All fish must be landed in California and offloaded within 24 hours of the August 29 closure (C.6). During September, all fish must be landed south of Point Arena (C.6). See compliance requirements (C.1) and gear restrictions and definitions (C.2, C.3). **Point Reyes to Point San Pedro (Fall Area Target Zone)** • October 1-3, 5-10, and 13-15. All salmon except coho (C.4, C.7). Chinook minimum size limit of 26 inches total length (B, C.1). All fish caught in this area must be landed between Point Arena and Pigeon Point (C.6). See compliance requirements (C.1) and gear restrictions and definitions (C.2, C.3).	**Pt. Arena to Pigeon Pt. (San Francisco)** • May 1-31; • June 8-30; • July 8-31; • August 1-29; • September 1-30 (C.9.b). Seven days per week. All salmon except coho (C.4, C.7). Chinook minimum size limit of 27 inches total length prior to September 1, 26 inches thereafter (B, C.1). All fish must be landed in California and offloaded within 24 hours of the August 29 closure (C.6). During September, all fish must be landed south of Point Arena (C.6). See compliance requirements (C.1) and gear restrictions and definitions (C.2, C.3). **Point Reyes to Point San Pedro (Fall Area Target Zone)** • October 1-3, 5-10, and 13-15. All salmon except coho (C.4, C.7). Chinook minimum size limit of 26 inches total length (B, C.1). All fish caught in this area must be landed between Point Arena and Pigeon Point (C.6). See compliance requirements (C.1) and gear restrictions and definitions (C.2, C.3).	**Pt. Arena to Pigeon Pt. (San Francisco)** • May 1-31; • June 8-30; • July 17-31; • August 1-29; • September 1-30 (C.9.b). Seven days per week. All salmon except coho (C.4, C.7). Chinook minimum size limit of 27 inches total length prior to September 1, 26 inches thereafter (B, C.1). All fish must be landed in California and offloaded within 24 hours of the August 29 closure (C.6). During September, all fish must be landed south of Point Arena (C.6). See compliance requirements (C.1) and gear restrictions and definitions (C.2, C.3). **Point Reyes to Point San Pedro (Fall Area Target Zone)** • October 1-3, 5-10, and 13-15. All salmon except coho (C.4, C.7). Chinook minimum size limit of 26 inches total length (B, C.1). All fish caught in this area must be landed between Point Arena and Pigeon Point (C.6). See compliance requirements (C.1) and gear restrictions and definitions (C.2, C.3).
Pigeon Point to U.S./Mexico Border (Monterey) • May 1-31; • June 1-30; • July 8-31; • August 1-29; • September 1-30 (C.9.b). Seven days per week. All salmon except coho (C.4, C.7). Chinook minimum size limit of 27 inches total length prior to September 1, 26 inches thereafter (B, C.1). All fish must be landed in California and offloaded within 24 hours of the August 29 closure (C.6). During September, all fish must be landed south of Point Arena (C.6). See compliance requirements (C.1) and gear restrictions and definitions (C.2, C.3).	**Pigeon Point to U.S./Mexico Border (Monterey))** • May 1-31; • June 8-30; • July 8-31; • August 1-29; • September 1-30 (C.9.b). Seven days per week. All salmon except coho (C.4, C.7). Chinook minimum size limit of 27 inches total length prior to September 1, 26 inches thereafter (B, C.1). All fish must be landed in California and offloaded within 24 hours of the August 29 closure (C.6). During September, all fish must be landed south of Point Arena (C.6). See compliance requirements (C.1) and gear restrictions and definitions (C.2, C.3).	**Pigeon Point to U.S./Mexico Border (Monterey)** • May 1-31; • June 8-30; • July 17-31; • August 1-29; • September 1-30 (C.9.b). Seven days per week. All salmon except coho (C.4, C.7). Chinook minimum size limit of 27 inches total length prior to September 1, 26 inches thereafter (B, C.1). All fish must be landed in California and offloaded within 24 hours of the August 29 closure (C.6). During September, all fish must be landed south of Point Arena (C.6). See compliance requirements (C.1) and gear restrictions and definitions (C.2, C.3).

California State regulations require all salmon be made available to a California Department of Fish and Wildlife (CDFW) representative for sampling immediately at port of landing. Any person in possession of a salmon with a missing adipose fin, upon request by an authorized agent or employee of the CDFW, shall immediately relinquish the head of the salmon to the state. (California Fish and Game Code §8226)

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

Area (when open)		Chinook Total Length	Chinook Head-off	Coho Total Length	Coho Head-off	Pink
North of Cape Falcon		28.0	21.5	16.0	12.0	None
Cape Falcon to OR/CA Border		28.0	21.5	-	-	None
OR/CA Border to Humboldt South Jetty		27.0	20.5	-	-	None
Horse Mt. to Pt. Arena		27.0	20.5	-	-	None
Pt. Arena to U.S./Mexico Border	≤ Aug. 29	27.0	20.5	-	-	None
	≥ Sept. 1	26.0	19.5	-	-	None

C. REQUIREMENTS, DEFINITIONS, RESTRICTIONS, OR EXCEPTIONS

C.1. Compliance with Minimum Size or Other Special Restrictions: All salmon on board a vessel must meet the minimum size, landing/possession limit, or other special requirements for the area being fished and the area in which they are landed if the area is open or has been closed less than 96 hours for that species of salmon. Salmon may be landed in an area that has been closed for a species of salmon more than 96 hours only if they meet the minimum size, landing/possession limit, or other special requirements for the area in which they were caught.

States may require fish landing/receiving tickets be kept on board the vessel for 90 days after landing to account for all previous salmon landings.

C.2. Gear Restrictions:

a. Salmon may be taken only by hook and line using single point, single shank, barbless hooks.

b. Cape Falcon, Oregon, to the OR/CA border: No more than 4 spreads are allowed per line.

c. OR/CA border to U.S./Mexico border: No more than 6 lines are allowed per vessel, and barbless circle hooks are required when fishing with bait by any means other than trolling.

C.3. Gear Definitions:

Trolling defined: Fishing from a boat or floating device that is making way by means of a source of power, other than drifting by means of the prevailing water current or weather conditions.

Troll fishing gear defined: One or more lines that drag hooks behind a moving fishing vessel. In that portion of the fishery management area off Oregon and Washington, the line or lines must be affixed to the vessel and must not be intentionally disengaged from the vessel at any time during the fishing operation.

Spread defined: A single leader connected to an individual lure and/or bait.

Circle hook defined: A hook with a generally circular shape and a point which turns inward, pointing directly to the shank at a 90º angle.

C.4. Vessel Operation in Closed Areas with Salmon on Board:

a. Except as provided under C.4.b below, it is unlawful for a vessel to have troll or recreational gear in the water while in any area closed to fishing for a certain species of salmon, while possessing that species of salmon; however, fishing for species other than salmon is not prohibited if the area is open for such species, and no salmon are in possession.

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

b. When Genetic Stock Identification (GSI) samples will be collected in an area closed to commercial salmon fishing, the scientific research permit holder shall notify NOAA OLE, USCG, CDFW and OSP at least 24 hours prior to sampling and provide the following information: the vessel name, date, location and time collection activities will be done. Any vessel collecting GSI samples in a closed area shall not possess any salmon other than those from which GSI samples are being collected. Salmon caught for collection of GSI samples must be immediately released in good condition after collection of samples.

C.5. Control Zone Definitions:

a. *Cape Flattery Control Zone* - The area from Cape Flattery (48º23'00" N. lat.) to the northern boundary of the U.S. EEZ; and the area from Cape Flattery south to Cape Alava (48º10'00" N. lat.) and east of 125º05'00" W. long.

b. *Mandatory Yelloweye Rockfish Conservation Area* – The area in Washington Marine Catch Area 3 from 48°00.00' N. lat.; 125°14.00' W. long. to 48°02.00' N. lat.; 125°14.00' W. long. to 48°02.00' N. lat.; 125°16.50' W. long. to 48°00.00' N. lat.; 125°16.50' W. long. and connecting back to 48°00.00' N. lat.; 125°14.00' W. long.

c. *Grays Harbor Control Zone* - The area defined by a line drawn from the Westport Lighthouse (46° 53'18" N. lat., 124° 07'01" W. long.) to Buoy #2 (46° 52'42" N. lat., 124°12'42" W. long.) to Buoy #3 (46° 55'00" N. lat., 124°14'48" W. long.) to the Grays Harbor north jetty (46° 55'36" N. lat., 124°10'51" W. long.).

d. *Columbia Control Zone* - An area at the Columbia River mouth, bounded on the west by a line running northeast/southwest between the red lighted Buoy #4 (46°13'35" N. lat., 124°06'50" W. long.) and the green lighted Buoy #7 (46°15'09' N. lat., 124°06'16" W. long.); on the east, by the Buoy #10 line which bears north/south at 357° true from the south jetty at 46°14'00" N. lat.,124°03'07" W. long. to its intersection with the north jetty; on the north, by a line running northeast/southwest between the green lighted Buoy #7 to the tip of the north jetty (46°15'48" N. lat., 124°05'20" W. long.), and then along the north jetty to the point of intersection with the Buoy #10 line; and, on the south, by a line running northeast/southwest between the red lighted Buoy #4 and tip of the south jetty (46°14'03" N. lat., 124°04'05" W. long.), and then along the south jetty to the point of intersection with the Buoy #10 line.

e. *Klamath Control Zone* - The ocean area at the Klamath River mouth bounded on the north by 41°38'48" N. lat. (approximately six nautical miles north of the Klamath River mouth); on the west, by 124°23'00" W. long. (approximately 12 nautical miles off shore); and on the south, by 41°26'48" N. lat. (approximately six nautical miles south of the Klamath River mouth).

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

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

C.7. Incidental Halibut Harvest: During authorized periods, the operator of a vessel that has been issued an incidental halibut harvest license may retain Pacific halibut caught incidentally in Area 2A while trolling for salmon. Halibut retained must be no less than 32 inches in total length, measured from the tip of the lower jaw with the mouth closed to the extreme end of the middle of the tail, and must be landed with the head on. License applications for incidental harvest must be obtained from the International Pacific Halibut Commission (phone: 206-634-1838). Applicants must apply prior to April 1, 2013 for 2013 permits and mid-March 2014 (*exact date to be set by the IPHC in early 2014*) for 2014 permits. Incidental harvest is authorized only during May and June of the 2013 troll seasons and April, May, and June of the 2014 troll seasons and after June 30 in 2013 or 2014 if quota remains and if announced on the NMFS hotline (phone: 800-662-9825). WDFW, ODFW, and CDFW will monitor landings. If the landings are projected to exceed the 30,568 pound preseason allocation or the total Area 2A non-Indian commercial halibut allocation, NMFS will take inseason action to prohibit retention of halibut in the non-Indian salmon troll fishery.

Alternative I - May 1, 2014 through December 31, 2014 and April 1-30, 2015, license holders may land or possess no more than one Pacific halibut per each three Chinook, except one Pacific halibut may be possessed or landed without meeting the ratio requirement, and no more than 15 halibut may be possessed or landed per trip. Pacific halibut retained must be no less than 32 inches in total length (with head on).

Alternative II - May 1, 2014 through December 31, 2014 and April 1-30, 2015, license holders may land or possess no more than ____ Pacific halibut per each _____ Chinook, except one Pacific halibut may be possessed or landed without meeting the ratio requirement, and no more than ___ halibut may be possessed or landed per trip. Pacific halibut retained must be no less than 32 inches in total length (with head on).

Alternative III - May 1, 2014 through December 31, 2014 and April 1-30, 2015, license holders may land or possess no more than ____ Pacific halibut per each _____ Chinook, except one Pacific halibut may be possessed or landed without meeting the ratio requirement, and no more than ___ halibut may be possessed or landed per trip. Pacific halibut retained must be no less than 32 inches in total length (with head on).

TABLE 1. Commercial troll management Alternatives proposed by the SAS for non-Indian ocean salmon fisheries, 2014. (Page 9 of 9)	3/9/2014 8:01 AM
C. REQUIREMENTS, DEFINITIONS, RESTRICTIONS, OR EXCEPTIONS (continued)	

Incidental Pacific halibut catch regulations in the commercial salmon troll fishery adopted for 2014 will be in effect when incidental Pacific halibut retention opens on April 1, 2015 unless otherwise modified by inseason action.

a. "C-shaped" yelloweye rockfish conservation area is an area to be voluntarily avoided for salmon trolling. NMFS and the Council request salmon trollers voluntarily avoid this area in order to protect yelloweye rockfish. The area is defined in the Pacific Council Halibut Catch Sharing Plan in the North Coast subarea (Washington marine area 3), with the following coordinates in the order listed:
48°18' N. lat.; 125°18' W. long.;
48°18' N. lat.; 124°59' W. long.;
48°11' N. lat.; 124°59' W. long.;
48°11' N. lat.; 125°11' W. long.;
48°04' N. lat.; 125°11' W. long.;
48°04' N. lat.; 124°59' W. long.;
48°00' N. lat.; 124°59' W. long.;
48°00' N. lat.; 125°18' W. long.;
and connecting back to 48°18' N. lat.; 125°18' W. long.

C.8. Inseason Management: In addition to standard inseason actions or modifications already noted under the season description, the following inseason guidance is provided to NMFS:

a. Chinook remaining from the May through June non-Indian commercial troll harvest guideline north of Cape Falcon may be transferred to the July through September harvest guideline if the transfer would not result in exceeding preseason impact expectations on any stocks.

b. If at least 35,000 coho are available for the recreational non-selective coho salmon season quota between Cape Falcon and Humbug Mt. (combined initial quota and impact neutral rollover from the recreational selective coho between Cape Falcon and the Oregon-California Border). Consideration will be made to transfer any remaining coho in excess of the recreational quota to the commercial troll season between Cape Falcon and Humbug Mt. Landing week limits and coho per Chinook ratios may be adjusted inseason.

c. Chinook remaining from the June and/or July non-Indian commercial troll quotas in the Oregon KMZ may be transferred to the Chinook quota for the next open period if the transfer would not result in exceeding preseason impact expectations on any stocks.

c. ~~Chinook remaining from the May, June and/or July non-Indian commercial troll quotas in the California KMZ may be transferred to the Chinook quota for the next open period if the transfer would not result in exceeding preseason impact expectations on any stocks.~~

d. NMFS may transfer fish between the recreational and commercial fisheries north of Cape Falcon if there is agreement among the areas' representatives on the Salmon Advisory Subpanel (SAS), and if the transfer would not result in exceeding preseason impact expectations on any stocks.

e. At the March 2015 meeting, the Council will consider inseason recommendations for special regulations for any experimental fisheries (proposals must meet Council protocol and be received in November 2014).

f. If retention of unmarked coho is permitted by inseason action, the allowable coho quota will be adjusted to ensure preseason projected impacts on all stocks is not exceeded.

g. Landing limits may be modified inseason to sustain season length and keep harvest within overall quotas.

C.9. State Waters Fisheries: Consistent with Council management objectives:

a. The State of Oregon may establish additional late-season fisheries in state waters.

b. The State of California may establish limited fisheries in selected state waters.

Check state regulations for details.

C.10. For the purposes of California Fish and Game Code, Section 8232.5, the definition of the Klamath Management Zone (KMZ) for the ocean salmon season shall be that area from Humbug Mountain, Oregon, to Horse Mountain, California.

TABLE 2. Recreational management Alternatives proposed by the SAS for non-Indian ocean salmon fisheries, 2014. (Page 1 of 9) 3/9/2014 8:02 AM

A. SEASON ALTERNATIVE DESCRIPTIONS

ALTERNATIVE I	ALTERNATIVE II	ALTERNATIVE III
North of Cape Falcon	**North of Cape Falcon**	**North of Cape Falcon**
Supplemental Management Information	**Supplemental Management Information**	**Supplemental Management Information**
1. Overall non-Indian TAC: __,___ (non-mark-selective equivalent of 125,000) Chinook and 250,000 coho marked with a healed adipose fin clip (marked). 2. Recreational TAC: __,___ (non-mark selective equivalent of __,___) Chinook and 210,000 marked coho; all retained coho must be marked. 4. No Area 4B add-on fishery. 5. Buoy 10 fishery opens August 1 with an expected landed catch of 50,000 marked coho in August and September. 6. Overall Chinook and/or coho TACs may need to be reduced or fisheries adjusted to meet NMFS ESA guidance, FMP requirements, upon conclusion of negotiations in the North of Falcon forum, or upon receipt of preseason catch and abundance expectations for Canadian and Alaskan fisheries.	1. Overall non-Indian TAC: __,___ (non-mark-selective equivalent of 110,000) Chinook and 220,000 coho marked with a healed adipose fin clip (marked). 2. Recreational TAC: __,___ (non-mark selective equivalent of __,___) Chinook and 184,800 marked coho; all retained coho must be marked. 4. No Area 4B add-on fishery. 5. Buoy 10 fishery opens August 1 with an expected landed catch of 60,000 marked coho in August and September. 6. Overall Chinook and/or coho TACs may need to be reduced or fisheries adjusted to meet NMFS ESA guidance, FMP requirements, upon conclusion of negotiations in the North of Falcon forum, or upon receipt of preseason catch and abundance expectations for Canadian and Alaskan fisheries.	1.Overall non-Indian TAC: __,___ (non-mark-selective equivalent of 95,000) Chinook and 190,000 coho marked with a healed adipose fin clip (marked). 2. Recreational TAC: __,___ (non-mark selective equivalent of __,___) Chinook and 159,600 marked coho; all retained coho must be marked. 4. No Area 4B add-on fishery. 5. Buoy 10 fishery opens August 1 with an expected landed catch of 70,000 marked coho in August and September. 6. Overall Chinook and/or coho TACs may need to be reduced or fisheries adjusted to meet NMFS ESA guidance, FMP requirements, upon conclusion of negotiations in the North of Falcon forum, or upon receipt of preseason catch and abundance expectations for Canadian and Alaskan fisheries.
U.S./Canada Border to Queets Rivers • May 16-17, May 23-24, and May 31-June 20 or a coastwide **marked Chinook quota of 10,000** (C.5). Seven days per week. Two fish per day, all salmon except coho, **all Chinook must be marked with a healed adipose fin clip (C.1).** Chinook 24-inch total length minimum size limit (B). See gear restrictions (C.2). Inseason management may be used to sustain season length and keep harvest within the overall Chinook recreational TAC for north of Cape Falcon (C.5).	**U.S./Canada Border to Queets Rivers** • May 23-24 and June 7-20 or a coastwide **marked Chinook quota of 8,000** (C.5). Seven days per week. Two fish per day, all salmon except coho, **all Chinook must be marked with a healed adipose fin clip (C.1).** Chinook 24-inch total length minimum size limit (B). See gear restrictions (C.2). Inseason management may be used to sustain season length and keep harvest within the overall Chinook recreational TAC for north of Cape Falcon (C.5).	**U.S./Canada Border to Queets Rivers**
Queets Rivers to Leadbetter Point • May 31 through earlier of June 20 or a coastwide **marked Chinook quota of 10,000** (C.5). Seven days per week. Two fish per day, all salmon except coho, **all Chinook must be marked with a healed adipose fin clip (C.1)**. Chinook 24-inch total length minimum size limit (B). See gear restrictions (C.2). Inseason management may be used to sustain season length and keep harvest within the overall Chinook recreational TAC for north of Cape Falcon (C.5).	**Queets Rivers to Leadbetter Point** • June 7 through earlier of June 20 or a coastwide **marked Chinook quota of 8,000** (C.5). Seven days per week. Two fish per day, all salmon except coho, **all Chinook must be marked with a healed adipose fin clip (C.1)**. Chinook 24-inch total length minimum size limit (B). See gear restrictions (C.2). Inseason management may be used to sustain season length and keep harvest within the overall Chinook recreational TAC for north of Cape Falcon (C.5).	**Queets Rivers to Leadbetter Point**

TABLE 2. Recreational management Alternatives proposed by the SAS for non-Indian ocean salmon fisheries, 2014. (Page 2 of 9) 3/9/2014 8:02 AM

A. SEASON ALTERNATIVE DESCRIPTIONS

ALTERNATIVE I	ALTERNATIVE II	ALTERNATIVE III
Leadbetter Point to Cape Falcon • May 31 through earlier of June 20 or a coastwide **marked Chinook quota of 10,000** (C.5). Seven days per week. Two fish per day, all salmon except coho, **all Chinook must be marked with a healed adipose fin clip (C.1)**. Chinook 24-inch total length minimum size limit (B). See gear restrictions (C.2). Inseason management may be used to sustain season length and keep harvest within the overall Chinook recreational TAC for north of Cape Falcon (C.5).	**Leadbetter Point to Cape Falcon** • June 7 through earlier of June 20 or a coastwide **marked Chinook quota of 8,000** (C.5). Seven days per week. Two fish per day, all salmon except coho, **all Chinook must be marked with a healed adipose fin clip (C.1)**. Chinook 24-inch total length minimum size limit (B). See gear restrictions (C.2). Inseason management may be used to sustain season length and keep harvest within the overall Chinook recreational TAC for north of Cape Falcon (C.5).	**Leadbetter Point to Cape Falcon**
U.S./Canada Border to Cape Alava (Neah Bay) • June 21 through earlier of September 21 or 21,840 marked coho subarea quota with a subarea guideline of 7,600 Chinook (C.5). Seven days per week. All salmon except no chum beginning August 1; two fish per day. All coho must be marked (C.1). Beginning August 1, Chinook non-retention east of the Bonilla-Tatoosh line (C.4.a) during Council managed ocean fishery. See gear restrictions and definitions (C.2, C.3). Inseason management may be used to sustain season length and keep harvest within the overall Chinook and coho recreational TACs for north of Cape Falcon (C.5).	**U.S./Canada Border to Cape Alava (Neah Bay)** • June 21 through earlier of September 21 or 19,220 marked coho subarea quota with a subarea guideline of 6,900 Chinook (C.5). Seven days per week. All salmon except no chum beginning August 1; two fish per day. All coho must be marked (C.1). Beginning August 1, Chinook non-retention east of the Bonilla-Tatoosh line (C.4.a) during Council managed ocean fishery. See gear restrictions and definitions (C.2, C.3). Inseason management may be used to sustain season length and keep harvest within the overall Chinook and coho recreational TACs for north of Cape Falcon (C.5).	**U.S./Canada Border to Cape Alava (Neah Bay)** • June 14 through earlier of September 21 or 16,600 marked coho subarea quota with a subarea guideline of 6,000 Chinook (C.5). Seven days per week. All salmon except no chum beginning August 1; two fish per day. All coho must be marked (C.1). Beginning August 1, Chinook non-retention east of the Bonilla-Tatoosh line (C.4.a) during Council managed ocean fishery. See gear restrictions and definitions (C.2, C.3). Inseason management may be used to sustain season length and keep harvest within the overall Chinook and coho recreational TACs for north of Cape Falcon (C.5).
Cape Alava to Queets River (La Push Subarea) • June 21 through earlier of September 21 or 5,410 marked coho subarea quota with a subarea guideline of 2,650 Chinook (C.5). • September 27 through earlier of October 12 or 50 marked coho quota or 50 Chinook quota (C.5) in the area north of 47°50'00 N. lat. and south of 48°00'00" N. lat. Seven days per week. All salmon, two fish per day. All coho must be marked (see *Ocean Boat Limits*, C.1). See gear restrictions and definitions (C.2, C.3). Inseason management may be used to sustain season length and keep harvest within the overall Chinook and coho recreational TACs for north of Cape Falcon (C.5).	**Cape Alava to Queets River (La Push Subarea)** • June 21 through earlier of September 21 or 4,750 marked coho subarea quota with a subarea guideline of 2,350 Chinook (C.5). • September 27 through earlier of October 12 or 50 marked coho quota or 50 Chinook quota (C.5) in the area north of 47°50'00 N. lat. and south of 48°00'00" N. lat. Seven days per week. All salmon, two fish per day. All coho must be marked (see *Ocean Boat Limits*, C.1). See gear restrictions and definitions (C.2, C.3). Inseason management may be used to sustain season length and keep harvest within the overall Chinook and coho recreational TACs for north of Cape Falcon (C.5).	**Cape Alava to Queets River (La Push Subarea)** • June 14 through earlier of September 21 or 4,100 marked coho subarea quota with a subarea guideline of 2,050 Chinook (C.5). • September 27 through earlier of October 12 or 50 marked coho quota or 50 Chinook quota (C.5) in the area north of 47°50'00 N. lat. and south of 48°00'00" N. lat. Seven days per week. All salmon, two fish per day. All coho must be marked (see *Ocean Boat Limits*, C.1). See gear restrictions and definitions (C.2, C.3). Inseason management may be used to sustain season length and keep harvest within the overall Chinook and coho recreational TACs for north of Cape Falcon (C.5).

TABLE 2. Recreational management Alternatives proposed by the SAS for non-Indian ocean salmon fisheries, 2014. (Page 3 of 9) 3/9/2014 8:02 AM

A. SEASON ALTERNATIVE DESCRIPTIONS

ALTERNATIVE I	ALTERNATIVE II	ALTERNATIVE III
Queets River to Leadbetter Point (Westport Subarea) • June 21 through earlier of September 30 or 77,700 marked coho subarea quota with a subarea guideline of 30,300 Chinook (C.5). Seven days per week. All salmon; two fish per day. All coho must be marked (C.1). See gear restrictions and definitions (C.2, C.3). Grays Harbor Control Zone closed beginning August 11 (C.4). Inseason management may be used to sustain season length and keep harvest within the overall Chinook and coho recreational TACs for north of Cape Falcon (C.5).	**Queets River to Leadbetter Point (Westport Subarea)** • June 21 through earlier of September 21 or 68,300 marked coho subarea quota with a subarea guideline of 27,600 Chinook (C.5). Seven days per week. All salmon; two fish per day, no more than one of which can be a Chinook. All coho must be marked (C.1). See gear restrictions and definitions (C.2, C.3). Grays Harbor Control Zone closed beginning August 11 (C.4). Inseason management may be used to sustain season length and keep harvest within the overall Chinook and coho recreational TACs for north of Cape Falcon (C.5).	**Queets River to Leadbetter Point (Westport Subarea)** • June 15 through earlier of September 30 or 59,050 marked coho subarea quota with a subarea guideline of 24,000 Chinook (C.5). Five days per week, Sunday through Thursday. All salmon; two fish per day, no more than one of which can be a Chinook. All coho must be marked (C.1). See gear restrictions and definitions (C.2, C.3). Grays Harbor Control Zone closed beginning August 11 (C.4). Inseason management may be used to sustain season length and keep harvest within the overall Chinook and coho recreational TACs for north of Cape Falcon (C.5).
Leadbetter Point to Cape Falcon (Columbia River Subarea) • June 21.through earlier of September 30 or 105,000 marked coho subarea quota with a subarea guideline of 14,400 Chinook (C.5). Seven days per week. All salmon, two fish per day. All coho must be marked (C.1). See gear restrictions and definitions (C.2, C.3). Columbia Control Zone closed (C.4). Inseason management may be used to sustain season length and keep harvest within the overall Chinook and coho recreational TACs for north of Cape Falcon (C.5).	**Leadbetter Point to Cape Falcon (Columbia River Subarea)** • June 21 through earlier of September 30 or 92,400 marked coho subarea quota with a subarea guideline of 13,100 Chinook (C.5). Seven days per week. All salmon, two fish per day, only one of which can be a Chinook. All coho must be marked (C.1). See gear restrictions and definitions (C.2, C.3). Columbia Control Zone closed (C.4). Inseason management may be used to sustain season length and keep harvest within the overall Chinook and coho recreational TACs for north of Cape Falcon (C.5).	**Leadbetter Point to Cape Falcon (Columbia River Subarea)** • June 14 through earlier of September 30 or 79,800 marked coho subarea quota with a subarea guideline of 11,400 Chinook (C.5). Seven days per week. All salmon, two fish per day, only one of which can be a Chinook. All coho must be marked (C.1). See gear restrictions and definitions (C.2, C.3). Columbia Control Zone closed (C.4). Inseason management may be used to sustain season length and keep harvest within the overall Chinook and coho recreational TACs for north of Cape Falcon (C.5).

TABLE 2. Recreational management Alternatives proposed by the SAS for non-Indian ocean salmon fisheries, 2014. (Page 4 of 9) 3/9/2014 8:02 AM

A. SEASON ALTERNATIVE DESCRIPTIONS

South of Cape Falcon	**South of Cape Falcon**	**South of Cape Falcon**
ALTERNATIVE I	ALTERNATIVE II	ALTERNATIVE III
Supplemental Management Information	**Supplemental Management Information**	**Supplemental Management Information**
1. Sacramento River Basin recreational fishery catch assumption: __,___ adult Sacramento River fall Chinook (__._ % of the total allowable harvest). 2. Sacramento River fall Chinook spawning escapement of ___,___ adults. 3. Klamath River recreational fishery allocation: __,___ adult Klamath River fall Chinook. 4. Klamath tribal allocation: ___,___ adult Klamath River fall Chinook. 5. Overall recreational coho TAC: __,___ mark-selective coho fishery and __,___ in the non-mark-selective coho fishery. 6. Fisheries may need to be adjusted to meet NMFS ESA consultation standards, FMP requirements, other management objectives, or upon receipt of new allocation recommendations from the CFGC.	1. Sacramento River Basin recreational fishery catch assumption: __,___ adult Sacramento River fall Chinook (__._ % of the total allowable harvest). 2. Sacramento River fall Chinook spawning escapement of ___,___ adults. 3. Klamath River recreational fishery allocation: __,___ adult Klamath River fall Chinook. 4. Klamath tribal allocation: ___,___ adult Klamath River fall Chinook. 5. Overall recreational coho TAC: __,___ mark-selective coho fishery and __,___ in the non-mark-selective coho fishery. 6. Fisheries may need to be adjusted to meet NMFS ESA consultation standards, FMP requirements, other management objectives, or upon receipt of new allocation recommendations from the CFGC.	1. Sacramento River Basin recreational fishery catch assumption: __,___ adult Sacramento River fall Chinook (__._ % of the total allowable harvest). 2. Sacramento River fall Chinook spawning escapement of ___,___ adults. 3. Klamath River recreational fishery allocation: __,___ adult Klamath River fall Chinook. 4. Klamath tribal allocation: ___,___ adult Klamath River fall Chinook. 5. Overall recreational coho TAC: __,___ mark-selective coho fishery and __,___ in the non-mark-selective coho fishery. 6. Fisheries may need to be adjusted to meet NMFS ESA consultation standards, FMP requirements, other management objectives, or upon receipt of new allocation recommendations from the CFGC.
Cape Falcon to Humbug Mt. • March **15** through October **31** (C.6), except as provided below during the July all-salmon mark-selective and September non-mark-selective coho fisheries. Seven days per week. All salmon except coho; two fish per day (C.1). Chinook minimum size limit of 24 inches total length (B). See gear restrictions and definitions (C.2, C.3). • **Non-mark-selective coho fishery**: **September 1 through the earlier of September 30 or a landed catch of 20,000 non-mark-selective coho quota** (C.5). **All salmon**, two fish per day (C.5); The all salmon except coho season reopens the earlier of October 1 or attainment of the coho quota (C.5). In 2015, the season between Cape Falcon and Humbug Mountain will open March 15 for all salmon except coho, two fish per day (B, C.1, C.2, C.3).	**Cape Falcon to Humbug Mt.** • March **15** through October **31** (C.6), except as provided below during the July all-salmon mark-selective and September non-mark-selective coho fisheries. Seven days per week. All salmon except coho; two fish per day (C.1). Chinook minimum size limit of 24 inches total length (B). See gear restrictions and definitions (C.2, C.3). • **Non-mark-selective coho fishery**: **September 1 through the earlier of September 30 or a landed catch of 25,000 non-mark-selective coho quota** (C.5). **All salmon**, two fish per day (C.5); The all salmon except coho season reopens the earlier of October 1 or attainment of the coho quota (C.5). In 2015, same as Alternative I	**Cape Falcon to Humbug Mt.** • March **15** through October **31** (C.6), except as provided below during the July all-salmon mark-selective and September non-mark-selective coho fisheries. Seven days per week. All salmon except coho; two fish per day (C.1). Chinook minimum size limit of 24 inches total length (B). See gear restrictions and definitions (C.2, C.3). • **Non-mark-selective coho fishery**: **August 30 through the earlier of September 30 or a landed catch of 20,000 non-mark-selective coho quota** (C.5). **All salmon**, two fish per day (C.5); The all salmon except coho season reopens the earlier of October 1 or attainment of the coho quota (C.5). In 2015, same as Alternative I

Fishing in the Stonewall Bank yelloweye rockfish conservation area restricted to trolling only on days the all depth recreational halibut fishery is open (call the halibut fishing hotline 1-800-662-9825 for specific dates) (C.3.b, C.4.d).

TABLE 2. Recreational management Alternatives proposed by the SAS for non-Indian ocean salmon fisheries, 2014. (Page 5 of 9) 3/9/2014 8:02 AM

A. SEASON ALTERNATIVE DESCRIPTIONS

ALTERNATIVE I	ALTERNATIVE II	ALTERNATIVE III
Cape Falcon to OR/CA Border • All-**salmon mark-selective coho fishery**: **June 21** through earlier of **August 10** or a landed catch of **80,000** marked coho. Seven days per week. All salmon, two fish per day. All retained coho must be marked (C.1). Chinook minimum size limit of 24 inches total length (B). Any remainder of the mark selective coho quota will be transferred on an impact neutral basis to the September non-selective coho quota from Cape Falcon to Humbug Mountain. The all salmon except coho season reopens the earlier of August 11 or attainment of the coho quota. Fishing in the Stonewall Bank yelloweye rockfish conservation area restricted to trolling only on days the all depth recreational halibut fishery is open (call the halibut fishing hotline 1-800-662-9825 for specific dates) (C.3.b, C.4.d).	**Cape Falcon to OR/CA Border** • All-**salmon mark-selective coho fishery**: **June 28** through earlier of **August 3** or a landed catch of **65,000** marked coho. Seven days per week. All salmon, two fish per day. All retained coho must be marked (C.1). Chinook minimum size limit of 24 inches total length (B). Any remainder of the mark selective coho quota will be transferred on an impact neutral basis to the September non-selective coho quota from Cape Falcon to Humbug Mountain. The all salmon except coho season reopens the earlier of August 4 or attainment of the coho quota. Fishing in the Stonewall Bank yelloweye rockfish conservation area restricted to trolling only on days the all depth recreational halibut fishery is open (call the halibut fishing hotline 1-800-662-9825 for specific dates) (C.3.b, C.4.d).	**Cape Falcon to OR/CA Border** • All-**salmon mark-selective coho fishery**: **July 1** through earlier of **July 31** or a landed catch of **50,000** marked coho. Seven days per week. All salmon, two fish per day. All retained coho must be marked (C.1). Chinook minimum size limit of 24 inches total length (B). Any remainder of the mark selective coho quota will be transferred on an impact neutral basis to the September non-selective coho quota from Cape Falcon to Humbug Mountain. The all salmon except coho season reopens the earlier of August 1 or attainment of the coho quota. Fishing in the Stonewall Bank yelloweye rockfish conservation area restricted to trolling only on days the all depth recreational halibut fishery is open (call the halibut fishing hotline 1-800-662-9825 for specific dates) (C.3.b, C.4.d).
Humbug Mt. to OR/CA Border. (Oregon KMZ) • May 1 through September 7 except as provided above during the all-salmon mark-selective coho fishery (C.6). All salmon except coho, except as noted above in the all-salmon mark-selective coho fishery. Seven days per week, two fish per day (C.1). Chinook minimum size limit of 24 inches total length (B). See gear restrictions and definitions (C.2, C.3).	**Humbug Mt. to OR/CA Border. (Oregon KMZ)** • May 17 through September 7 except as provided above during the all-salmon mark-selective coho fishery (C.6). All salmon except coho, except as noted above in the all-salmon mark-selective coho fishery. Seven days per week, two fish per day (C.1). Chinook minimum size limit of 24 inches total length (B). See gear restrictions and definitions (C.2, C.3).	**Humbug Mt. to OR/CA Border. (Oregon KMZ)** • May 24 through September 1 except as provided above during the all-salmon mark-selective coho fishery (C.6). All salmon except coho, except as noted above in the all-salmon mark-selective coho fishery. Seven days per week, two fish per day (C.1). Chinook minimum size limit of 20 inches total length (B). See gear restrictions and definitions (C.2, C.3).
OR/CA Border to Horse Mt. (California KMZ) • May 1 through September 7 (C.6). Seven days per week. All salmon except coho, two fish per day (C.1). Chinook minimum size limit of 24 inches total length (B). See gear restrictions and definitions (C.2, C.3). Klamath Control Zone closed in August (C.4.e). See California State regulations for additional closures adjacent to the Smith, Eel, and Klamath rivers.	**OR/CA Border to Horse Mt. (California KMZ)** • May 17 through September 7 (C.6). Seven days per week. All salmon except coho, two fish per day (C.1). Chinook minimum size limit of 24 inches total length (B). See gear restrictions and definitions (C.2, C.3). Klamath Control Zone closed in August (C.4.e). See California State regulations for additional closures adjacent to the Smith, Eel, and Klamath rivers.	**OR/CA Border to Horse Mt. (California KMZ)** • May 24 through September 1 (C.6). Seven days per week. All salmon except coho, two fish per day (C.1). Chinook minimum size limit of 20 inches total length (B). See gear restrictions and definitions (C.2, C.3). Klamath Control Zone closed in August (C.4.e). See California State regulations for additional closures adjacent to the Smith, Eel, and Klamath rivers.

TABLE 2. Recreational management Alternatives proposed by the SAS for non-Indian ocean salmon fisheries, 2014. (Page 6 of 9) 3/9/2014 8:02 AM

A. SEASON ALTERNATIVE DESCRIPTIONS

ALTERNATIVE I	ALTERNATIVE II	ALTERNATIVE III
Horse Mt. to Point Arena (Fort Bragg) • April 5 through November 9. Seven days per week. All salmon except coho, two fish per day (C.1). Chinook minimum size limit of 20 inches total length (B). See gear restrictions and definitions (C.2, C.3). In 2015, season opens April 4 for all salmon except coho, two fish per day (C.1). Chinook minimum size limit of 20 inches total length (B); and the same gear restrictions as in 2014 (C.2, C.3).	**Horse Mt. to Point Arena (Fort Bragg)** • April 5 through November 2. Seven days per week. All salmon except coho, two fish per day (C.1). Chinook minimum size limit of 20 inches total length (B). See gear restrictions and definitions (C.2, C.3). In 2015, same as Alternative I.	**Horse Mt. to Point Arena (Fort Bragg)** • April 5 through November 2. Seven days per week. All salmon except coho, two fish per day (C.1). Chinook minimum size limit of 24 inches total length (B). See gear restrictions and definitions (C.2, C.3). In 2015, same as Alternative I.
Point Arena to Pigeon Point (San Francisco) • April 5 through November 9. Seven days per week. All salmon except coho, two fish per day (C.1). Chinook minimum size limit of 20 inches total length (B). See gear restrictions and definitions (C.2, C.3). In 2015, season opens April 4 for all salmon except coho, two fish per day (C.1). Chinook minimum size limit of 24 inches total length (B); and the same gear restrictions as in 2014 (C.2, C.3).	**Point Arena to Pigeon Point (San Francisco)** • April 5 through November 9. Seven days per week. All salmon except coho, two fish per day (C.1). Chinook minimum size limit of 24 inches total length through May 31; 20 inches thereafter (B). See gear restrictions and definitions (C.2, C.3). In 2015, same as Alternative I.	**Point Arena to Pigeon Point (San Francisco)** • April 5 through November 9 Seven days per week. All salmon except coho, two fish per day (C.1). Chinook minimum size limit of 24 inches total length through June 30; 20 inches thereafter (B). See gear restrictions and definitions (C.2, C.3). In 2015, same as Alternative I.
Pigeon Point to U.S./Mexico Border (Monterey South) • April 5 through October 5. Seven days per week. All salmon except coho, two fish per day (C.1). Chinook minimum size limit of 20 inches total length (B). See gear restrictions and definitions (C.2, C.3). In 2015, season opens April 4 for all salmon except coho, two fish per day (C.1). Chinook minimum size limit of 24 inches total length (B); and the same gear restrictions as in 2014 (C.2, C.3).	**Pigeon Point to U.S./Mexico Border (Monterey)** • April 5 through October 5. Seven days per week. All salmon except coho, two fish per day (C.1). Chinook minimum size limit of 24 inches total length through May 31; 20 inches thereafter (B). See gear restrictions and definitions (C.2, C.3). In 2015, same as Alternative I.	**Pigeon Point to U.S./Mexico Border (Monterey)** • April 5 through October 5. Seven days per week. All salmon except coho, two fish per day (C.1). Chinook minimum size limit of 24 inches total length through June 30; 20 inches thereafter (B). See gear restrictions and definitions (C.2, C.3). In 2015, same as Alternative I.
California State regulations require all salmon be made available to a CDFW representative for sampling immediately at port of landing. Any person in possession of a salmon with a missing adipose fin, upon request by an authorized agent or employee of the CDFW, shall immediately relinquish the head of the salmon to the state. (California Fish and Game Code §8226)		

TABLE 2. Recreational management Alternatives proposed by the SAS for non-Indian ocean salmon fisheries, 2014. (Page 7 of 9) 3/9/2014 8:02 AM

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

Area (when open)		Chinook	Coho	Pink
North of Cape Falcon		24.0	16.0	None
Cape Falcon to Humbug Mt.		24.0	16.0	None
Humbug Mt. to OR/CA Border	Alt. I & II	24.0	16.0	None
	Alt.III	20.0	16.0	None
OR/CA Border to Horse Mountain	Alt. I & II	24.0	-	20.0
	Alt. III	20.0		
Horse Mt. to Pt. Arena	Alt. I & II	20.0	-	20.0
	Alt. III	24.0		
Pt. Arena. to U.S./Mexico Border:	Alt. I	20.0	-	24.0
	Alt II ≤ May 31	24.0		20.0
	Alt II ≥ June 1	20.0		26.0
	Alt III ≤ June 30	24.0		20.0
	Alt III ≥ July 1	20.0	-	24.0

C. REQUIREMENTS, DEFINITIONS, RESTRICTIONS, OR EXCEPTIONS

C.1. Compliance with Minimum Size and Other Special Restrictions: All salmon on board a vessel must meet the minimum size or other special requirements for the area being fished and the area in which they are landed if that area is open. Salmon may be landed in an area that is closed only if they meet the minimum size or other special requirements for the area in which they were caught.

Ocean Boat Limits: Off the coast of Washington, Oregon, and California, each fisher aboard a vessel may continue to use angling gear until the combined daily limits of Chinook and coho salmon for all licensed and juvenile anglers aboard have been attained (additional state restrictions may apply).

TABLE 2. Recreational management Alternatives proposed by the SAS for non-Indian ocean salmon fisheries, 2014. (Page 8 of 9) 3/9/2014 8:02 AM

C. REQUIREMENTS, DEFINITIONS, RESTRICTIONS, OR EXCEPTIONS

C.2. Gear Restrictions: Salmon may be taken only by hook and line using barbless hooks. All persons fishing for salmon, and all persons fishing from a boat with salmon on board, must meet the gear restrictions listed below for specific areas or seasons.

a. *U.S./Canada Border to Point Conception, California*: No more than one rod may be used per angler; and no more than two single point, single shank barbless hooks are required for all fishing gear. [Note: ODFW regulations in the state-water fishery off Tillamook Bay may allow the use of barbed hooks to be consistent with inside regulations.]

b. *Horse Mountain, California, to Point Conception, California*: Single point, single shank, barbless circle hooks (see gear definitions below) are required when fishing with bait by any means other than trolling, and no more than two such hooks shall be used. When angling with two hooks, the distance between the hooks must not exceed five inches when measured from the top of the eye of the top hook to the inner base of the curve of the lower hook, and both hooks must be permanently tied in place (hard tied). Circle hooks are not required when artificial lures are used without bait.

C.3. Gear Definitions:

a. *Recreational fishing gear defined*: Off Oregon and Washington, angling tackle consists of a single line that must be attached to a rod and reel held by hand or closely attended; the rod and reel must be held by hand while playing a hooked fish. No person may use more than one rod and line while fishing off Oregon or Washington. Off California, the line must be attached to a rod and reel held by hand or closely attended; weights directly attached to a line may not exceed four pounds (1.8 kg). While fishing off California north of Point Conception, no person fishing for salmon, and no person fishing from a boat with salmon on board, may use more than one rod and line. Fishing includes any activity which can reasonably be expected to result in the catching, taking, or harvesting of fish.

b. *Trolling defined*: Angling from a boat or floating device that is making way by means of a source of power, other than drifting by means of the prevailing water current or weather conditions.

c. *Circle hook defined*: A hook with a generally circular shape and a point which turns inward, pointing directly to the shank at a 90° angle.

C.4. Control Zone Definitions:

a. *The Bonilla-Tatoosh Line*: A line running from the western end of Cape Flattery to Tatoosh Island Lighthouse (48°23'30" N. lat., 124°44'12" W. long.) to the buoy adjacent to Duntze Rock (48°24'37" N. lat., 124°44'37" W. long.), then in a straight line to Bonilla Point (48°35'39" N. lat., 124°42'58" W. long.) on Vancouver Island, British Columbia.

b. *Grays Harbor Control Zone* - The area defined by a line drawn from the Westport Lighthouse (46° 53'18" N. lat., 124° 07'01" W. long.) to Buoy #2 (46° 52'42" N. lat., 124°12'42" W. long.) to Buoy #3 (46° 55'00" N. lat., 124°14'48" W. long.) to the Grays Harbor north jetty (46° 55'36" N. lat., 124°10'51" W. long.).

c. *Columbia Control Zone*: An area at the Columbia River mouth, bounded on the west by a line running northeast/southwest between the red lighted Buoy #4 (46°13'35" N. lat., 124°06'50" W. long.) and the green lighted Buoy #7 (46°15'09' N. lat., 124°06'16" W. long.); on the east, by the Buoy #10 line which bears north/south at 357° true from the south jetty at 46°14'00" N. lat., 124°03'07" W. long. to its intersection with the north jetty; on the north, by a line running northeast/southwest between the green lighted Buoy #7 to the tip of the north jetty (46°15'48" N. lat., 124°05'20" W. long. and then along the north jetty to the point of intersection with the Buoy #10 line; and on the south, by a line running northeast/southwest between the red lighted Buoy #4 and tip of the south jetty (46°14'03" N. lat., 124°04'05" W. long.), and then along the south jetty to the point of intersection with the Buoy #10 line.

d. *Stonewall Bank Yelloweye Rockfish Conservation Area*: The area defined by the following coordinates in the order listed:

44°37.46' N. lat.; 124°24.92' W. long.;
44°37.46' N. lat.; 124°23.63' W. long.;
44°28.71' N. lat.; 124°21.80' W. long.;
44°28.71' N. lat.; 124°24.10' W. long.;
44°31.42' N. lat.; 124°25.47' W. long.;
and connecting back to 44°37.46' N. lat.; 124°24.92' W. long.

e. *Klamath Control Zone*: The ocean area at the Klamath River mouth bounded on the north by 41°38'48" N. lat. (approximately six nautical miles north of the Klamath River mouth); on the west, by 124°23'00" W. long. (approximately 12 nautical miles off shore); and, on the south, by 41°26'48" N. lat. (approximately 6 nautical miles south of the Klamath River mouth).

TABLE 2. Recreational management measures adopted by the Council for non-Indian ocean salmon fisheries, 2014. (Page 9 of 9)
C. REQUIREMENTS, DEFINITIONS, RESTRICTIONS, OR EXCEPTIONS

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

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

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

TESTIMONY OF THE COLUMBIA RIVER TREATY TRIBES
BEFORE PACIFIC FISHERIES MANAGEMENT COUNCIL
March 9, 2014, Sacramento, CA

Good day members of the Council. My name is Chris Williams. I am a member of the fish and wildlife committee of the Umatilla Tribes. I am here with Wilbur Slockish, and Herb Jackson and to provide testimony on behalf of the four Columbia River treaty tribes: the Yakama, Warm Springs, Umatilla and Nez Perce tribes.

Salmon are of critical cultural importance to us as well as all tribes. Our relationship with the fish goes back to time immemorial. Our treaties with the United States promised that we would have fish and wildlife to harvest and plants to gather forever. The Constitution indicates that treaties are the supreme law of the land and are the highest form of commitment the United States can make between sovereigns. We expect the treaties to be fully upheld so that we can maintain our ties to our resources. The tribal relationship to our environment is centered around our First Foods which consist of water, salmon, deer, roots, and berries such as huckleberry. Salmon are essential to these first foods and to our cultural lives.

We have several items we would like to bring to the attention to the Council.

Beginning with the good news, we are pleased to again report that the preliminary run reconstruction for Snake River fall chinook indicates that another record return of natural origin fall chinook returned to Lower Granite Dam last fall. This was a run of just approximately 21,000 natural origin fish which was about 10,000 more fish than last year. The total adult run was around 56,000. So it was not only a record run but the proportion of the run comprised of wild fish was above average. This program is precisely the type of supplementation that the tribes have long advocated as a way to rebuild listed salmon stocks. The forecast for this year is for a run that may even be larger than last year. These returns demonstrate that it is possible to use the hatchery tool to help rebuild the wild fish without having adverse effects on wild productivity.

Snake River fall chinook are part of the Upriver Bright stock which is also forecast to have a record return this year. Most of the Upriver Bright fish are destined for the Hanford Reach. The Hanford Brights are another example of a run that has been restored from its very low abundance in the late 1970’s and early 1980’s when it was rare to get counts of more than 30,000 fish at McNary Dam. Through better water management and the judicious use of hatchery production, the Hanford Reach fish are now setting records. On average over the past five years about 85% of the fish spawning on the Hanford Reach have been wild fish which also demonstrates that hatcheries can be a valuable tool to support wild populations.

There are several issues that the tribes are concerned about this year.

We have some concerns about a couple of the forecasts. The tribes do not agree with incorporating the tule production at Bonneville Hatchery as part of the LRH tule stock. These fish are BPH stock fish from Spring Creek Hatchery. They will have the same ocean distribution patterns as the rest of the BPH stock fish from Spring Creek which is not the same as the rest of the LRH stock fish. We would not expect ocean fishery impacts on these fish to be the same as other LRH tules. In our opinion incorporating these fish into the LRH forecast will artificially inflate the true LRH abundance and may produce a bias in estimating ocean fishery impacts.

We also have some concerns about the Columbia River coho forecast. We have trouble reconciling this high forecast abundance with what seems reasonable to assume about the abundance of different components of the Columbia Run – especially the upriver coho destined for above Bonneville Dam. We expect the upriver coho to be an average sized run at best, not a very large run. We urge caution in setting ocean fisheries based on a very large forecast that may have a very similar and very large error as occurred last year.

We also need to point out some concerns about the conditions these fish may face when returning up-river. Last year we saw very poor migration conditions in the Snake River primarily due to high temperatures. There were significant passage delays at Lower Granite Dam in the summer and fall. There were some signs that fish were stressed in the early part of the fall when temperatures were highest and we feel fortunate that we didn't observe more mortality on these fish. We also very nearly did not meet the hatchery broodstock needs because of temperature related trapping limits. High temperatures at Lower Granite may be a significant concern again this year. We have done a great deal of work to benefit these fish and we do not want it to go to waste.

Temperatures were not only a problem in the Snake. The temperatures at Bonneville were also quite high last fall. We did note a number of fish that were injured and apparently diseased in our catch both upstream and downstream of Bonneville. We suspect that naturally occurring pathogens may have increased due to the combination of large numbers of fish and high temperatures. Pathogens were not a problem when the river was free flowing.

As the Habitat Committee reported today, another issue of concern is the recent damage to Wanapum Dam. To add some detail and clarification to the information presented by the Habitat Committee, there will be no adult passage at Wanapum or Rock Island dam until either they are able to refill the Wanapum Pool or until modifications are made to the fish ladders. Normally, fish counting begins at Wanapum Dam on April 15. While there does appear to be juvenile passage at Wanapum, the current operations of 100% spill at Rock Island create concern that this spill may be extremely hazardous to juveniles passing downstream. Currently, there are no estimates of when passage could be restored. Even downstream, we are worried about what the large increase in flows may do to the juvenile fall chinook which will be emerging from the gravel in the Hanford Reach this month. This incident points to a need to examine the integrity of all the mainstem dams. Wanapum Dam is clearly an issue of high importance to Columbia Basin fish managers and will be a concern for Council because this incident will affect three stocks that are important for Council managed fisheries, the upper Columbia summer chinook, the Upriver Bright fall chinook, and part of the upriver coho. We are very curious to learn what NMFS intends to do to ensure passage of endangered upper Columbia Spring Chinook and threatened upper Columbia steelhead which would normally be passing Wanapum Dam at least by mid-April.

We plan on carefully reviewing the modeled impacts on upriver chinook and coho stocks in this year's proposed ocean fisheries and will likely have more comments on these proposed fisheries at a later time.

This concludes our statement. Thank You.

Preliminary Definition of 2014 Management Options to the Pacific Fishery Management Council March 9, 2014

The forecasts for coho on the Washington coast for both wild and hatchery stocks are lower than last year; Puget Sound coho is slightly higher. We are also encouraged that the forecasts for the OPI stocks and OCN's have increased. We believe that these forecasts will allow for moderate harvest this year even while taking into consideration the needs of the Queets River coho and the Canadian Thompson River coho.

For Chinook, the tule hatchery stocks should provide harvest opportunity in the ocean fisheries. We continue to live up to the commitment that we made in 1988 to the Columbia River Tribes to not increase our impacts on Columbia River chinook stocks of concern.

The Tribes support the use of the updated age 2 recruit scalars for Mid Puget Sound for use in the Chinook FRAM modeling. The tribes also continue to encourage the States to keep their rigorous monitoring and sampling of mark selective fisheries in the Ocean, Columbia River and Puget Sound.

I offer the following range of preliminary options for the ocean Treaty troll fishery for compilation and analysis by the Salmon Technical Team with the understanding that this is only the first step towards finalizing options this week that will be adopted by the Council to be sent out for public review.

Treaty Troll Options

	Chinook	Coho
Option I	70,000	60,000
Option II	62,500	55,000
Option III	55,000	47,500

For Chinook:
Option I to be modeled with 42,000 taken in the May/June chinook directed fishery and 28,000 would be taken in the July/August/ September all-species fishery.

Option II 36,250 taken in the May/June chinook directed fishery and 26,250 in the July/August/ September all-species fishery.

Option III 27,500 taken in the May/June chinook directed fishery and 27,500 in the July/August/ September all-species fishery.

Tribal and Washington Department of Fish and Wildlife 2014 Management Objectives for Puget Sound Chinook and Coho Salmon

As provided for in Amendment 14, and pursuant to rules and procedures established under U.S. v. Washington, WDFW and the affected Tribes have established management objectives for Puget Sound Chinook and coho salmon. The management objectives applicable to the 2014 regulation setting process are presented in the following tables. They are based on a similar management approach and methodologies as the objectives provided to the Council the past several years. The management objectives define the maximum impact levels allowed for 2014-15 salmon fisheries.

For Puget Sound Chinook salmon, the management objectives in Table 1 are part of the current harvest management plan developed by the Puget Sound Tribes and WDFW. The state and tribal co-managers expect that fishing considered by the Council for the 2014-15 seasons will be consistent with these objectives. The Puget Sound Harvest Management plan is in the process of being approved by NOAA Fisheries and is consistent with the NOAA Guidance Letter presented in Agenda item F.2.c.

2014 Puget Sound Primary Natural Coho Management Unit Exploitation Rate Ceilings

Management Unit	Preseason Forecast Of Abundance (Ocean Age Three)	Management Status	Total Exploitation Rate Ceiling
Strait of Juan de Fuca	**12,540**	**low**	**40%**
Hood Canal	47,600	normal	65%
Skagit	112,440	normal	60%
Stillaguamish	32,450	normal	50%
Snohomish	150,000	normal	60%

Table 1. Exploitation rate ceilings, low abundance thresholds and critical exploitation rate ceilings for Puget Sound Chinook management units for the 2014-2015 season.

Management Unit	Exploitation Rate	Upper Management Threshold	Low Abundance Threshold	Critical Exploitation Rate Ceiling
Nooksack		4,000		
North Fork		2,000	1,000[1/]	7% / 9% SUS[3/]
South Fork		2,000	1,000[1/]	
Skagit Summer/Fall		14,500	4,800	
Upper Skagit			2,200	15% SUS even-years
Sauk	50%		400	17% SUS odd-years
Lower Skagit			900	
Skagit Spring		2,000	576	
Upper Sauk	38%		130	18% SUS
Upper Cascade			170	
Suiattle			170	
Stillaguamish		900	700[1/]	
North Fork Summer	25%	600	500[1/]	15% SUS
South Fk & MS Fall		300	200[1/]	
Snohomish		4,600	2,800[1/]	
Skykomish	21%	3,600	1,745[1/]	15% SUS
Snoqualmie		1,000	521[1/]	
Lake Washington	20% SUS			10% PT SUS
Cedar River		1,680	200	
Green	15% PT SUS	5,800	1,800	12% PT SUS
White River Spring	20%	1,000	200	15% SUS
Puyallup Fall	50%	500 (South Prairie Cr.)	500	12% PT SUS
Nisqually	52%		700	50% reduction of SUS ER[4/]
Skokomish	50%	3,650	1,300[2/]	12% PT SUS
Mid-Hood Canal	15% PT SUS	750	400	12% PT SUS
Dungeness	10% SUS	925	500	6% SUS
Elwha	10% SUS	2,900	1,000	6% SUS
Western JDF	10% SUS	850	500	6% SUS

1/ Natural-origin spawners
2/ Skokomish LAT comprises natural escapement of 800 and/or 500 hatchery
3/ SUS ER will not exceed 7% in 4 out of 5 years
4/ SUS ER ceiling will be 50% of the difference between 52% and the expected ER associated with fisheries in Alaska and British Columbia

Tribal and Washington Department of Fish and Wildlife 2014 Management Objectives for Grays Harbor Fall Chinook Salmon

As provided for in Amendment 14, and pursuant to rules and procedures established under U.S. v. Washington, WDFW and the Quinault Indian Nation (QIN) have established new management objectives for Grays Harbor fall Chinook salmon. These objectives were reviewed by the Chinook Technical Committee of the Pacific Salmon Commission in February, 2014. The new objectives are based on spawner-recruit relationships using estimates of production resulting from naturally spawning fish in the Chehalis and Humptulips river basins from brood years 1986 through 2005. It is the intent of WDFW and QIN to use for management purposes an aggregate natural spawning escapement goal of 13,500 for Grays Harbor fall Chinook salmon.

From: **Steve Godin** <stevegodin@rconnects.com>
Date: Sat, Mar 1, 2014 at 2:29 PM
Subject: Coho Salmon Fishing Regulations 2014
To: pfmc.comments@noaa.gov

Dear PFMC Council Members,

I am a recreational fishermen and Oregon STEP volunteer. I have attended the PFMC Public meeting held in Coos Bay in March for the last four years. Every year I make the same recommendation. I and most fishermen that I talk to would prefer a change in the regulations for harvesting Coho. I would prefer one season July through September where you are allowed to keep one unmarked Coho per day, that would be your daily limit of salmon. Once you have filled out your harvest tag, you are finished fishing for that day. Most of us are sportsman and would be happy to take that one fish and call it a day. There have been many days that I have caught six to eight Coho and gone home with no fish. Even though I try to avoid catching Coho, I catch them down in one hundred feet of water. Regarding marked Coho and Chinook Salmon, they would count toward the normal two salmon limit (assuming there is one in 2014). So, if you caught a marked Coho first and keep it, you are done for the day. This would reduce the mortality of catch and release Coho fishing. The PFMC can protect from over-harvesting by setting the appropriate quota. I feel a regulation change as described would be an improvement over the past regulations, conserve endangered COHO Salmon and be welcomed by fishermen. Thanks for your consideration.

Sincerely Yours,
Steve Godin

NATIONAL MARINE FISHERIES SERVICE REPORT

National Marine Fisheries Service (NMFS) Northwest and Southwest Fisheries Science Centers and Northwest and Southwest Regions will briefly report on recent developments relevant to salmon fisheries and issues of interest to the Pacific Fishery Management Council (Council).

Council Task:

Discussion.

Reference Materials:

None.

Agenda Order:

a.	Agenda Item Overview	Mike Burner
b.	Regulatory Activities	Bob Turner
c.	Fisheries Science Center Activities	Pete Lawson
d.	Reports and Comments of Advisory Bodies and Management Entities	
e.	Public Comment	
f.	Council Discussion	

PFMC
02/11/14

Agenda Item F.3.b
Supplemental NMFS Science Center PowerPoint
March 2014

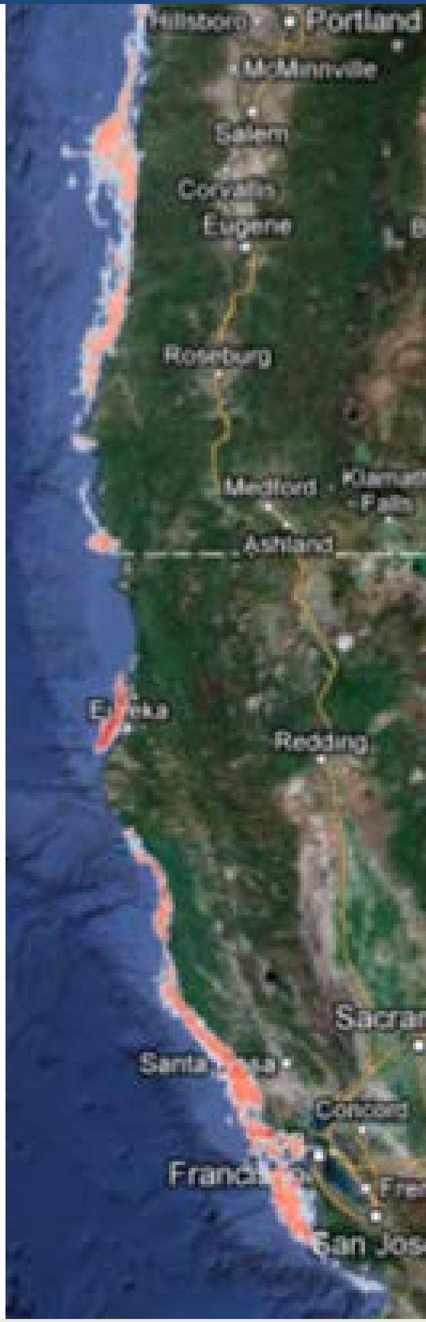
Report on Science Center Activities

- West Coast Salmon GSI
  - Washington: GSI – FRAM comparison
  - California: stock composition and Klamath – California Coastal distribution
  - Oregon: stock specific CPUE and fine-scale distribution
- Sacramento Index forecasts
- Ocean Indicators Update
- Salish Sea Marine Survival and Ecosystem Indicators Workshops
- Elwah Dam Removal

WCS-GSI Collaboration 2013

- Full season sampling in all three states
  - More that 8000 samples collected
    - Washington
      - ~2100 samples
    - Oregon
      - 2444 samples
    - California
      - 3605 samples

Funding in 2012, 2013, and 2014 has come from NMFS cooperative research grants.



Genetic stock composition estimates

Objective:

Compare Chinook stock composition estimates from CWTs and GSI in the 2012 and 2013 Washington commercial troll fishery

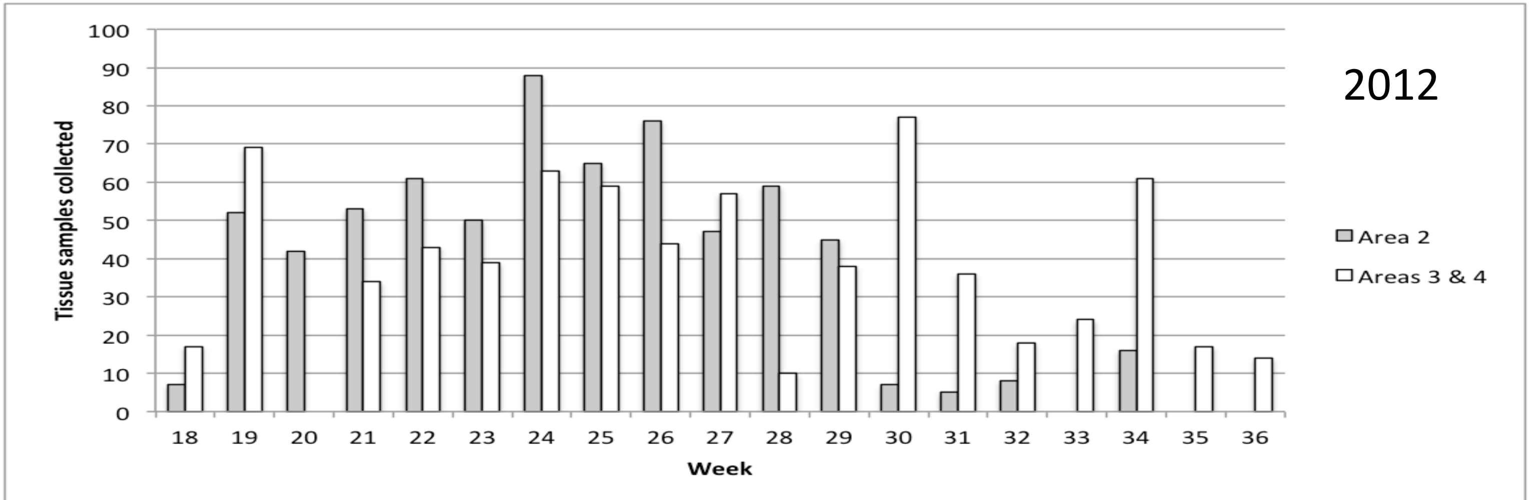
NMFS PI: Paul Moran

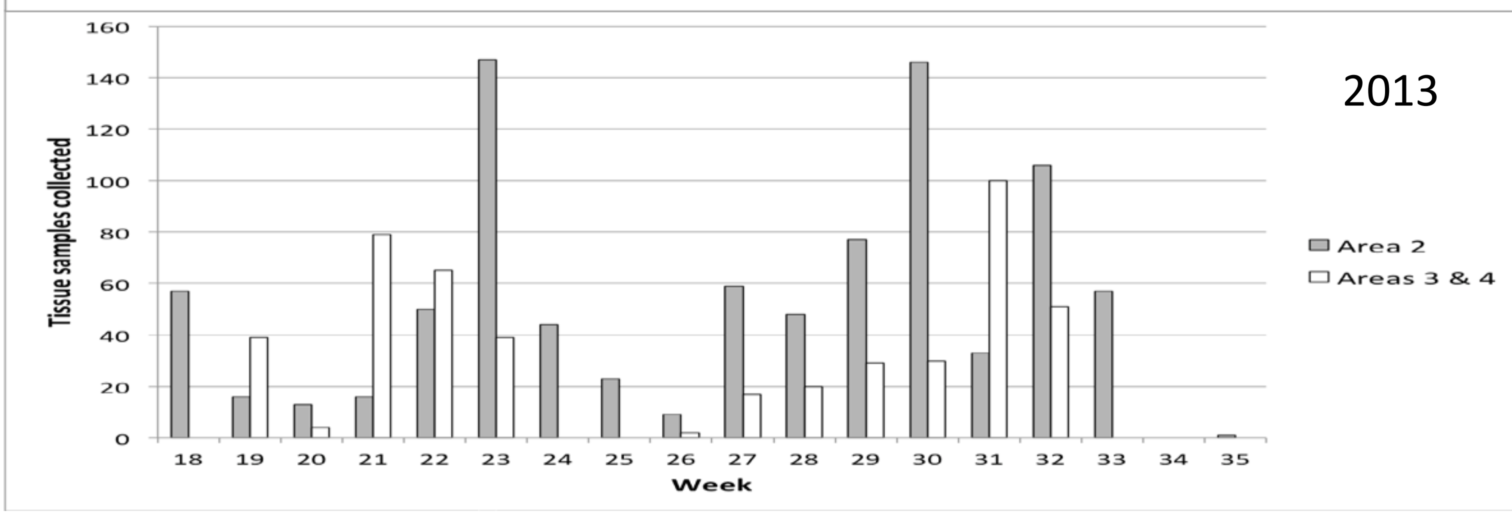
Amount: $151,079 and $153,687
Contractor: WDFW/Washington Trollers Association
Fishermen participants: 17 and 9
Money to WDFW and fishermen: $95,658 and $110,042

Photo by Bruce Sanford

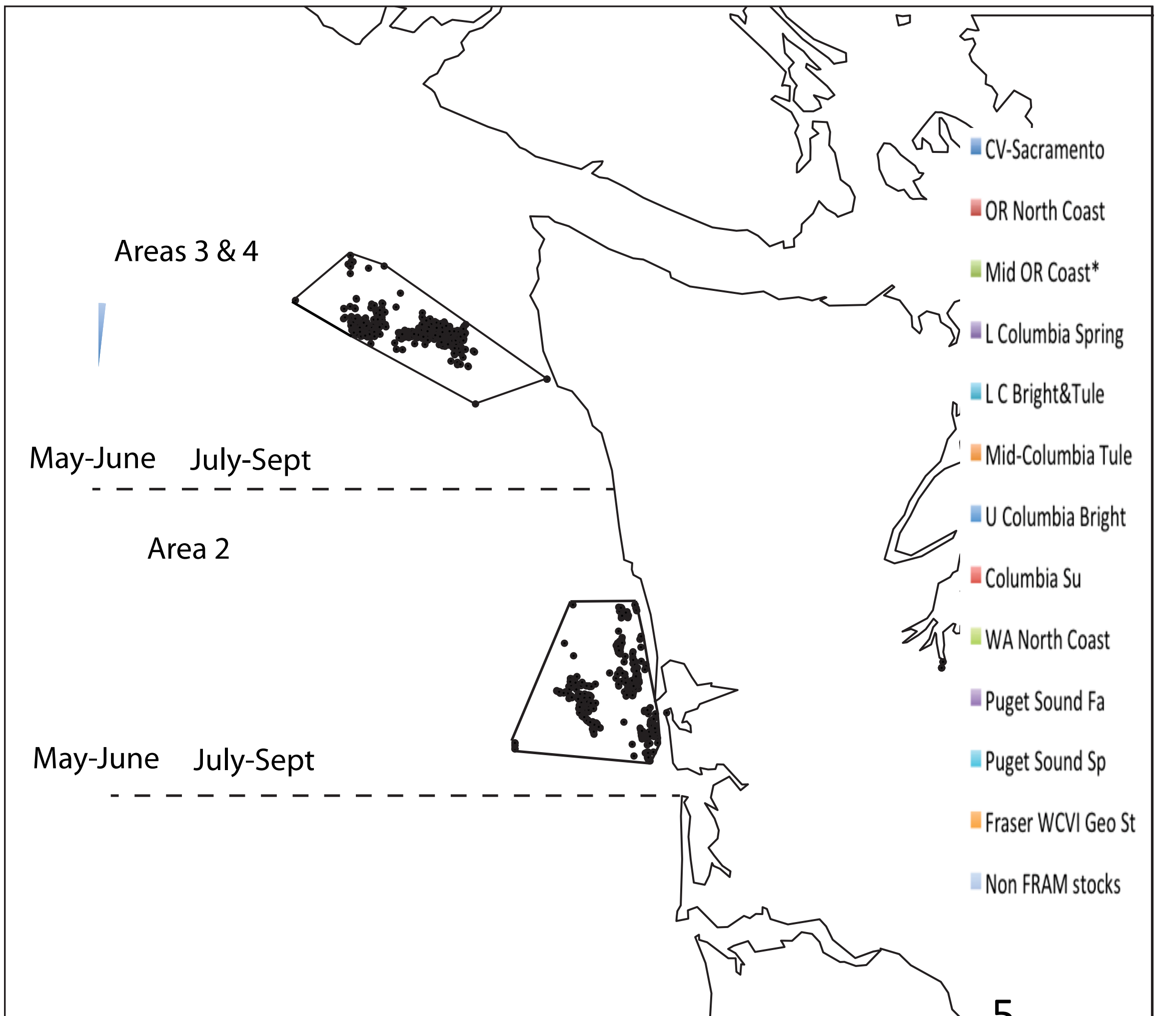
Washington Sample Coverage by Area

2012 and 2013

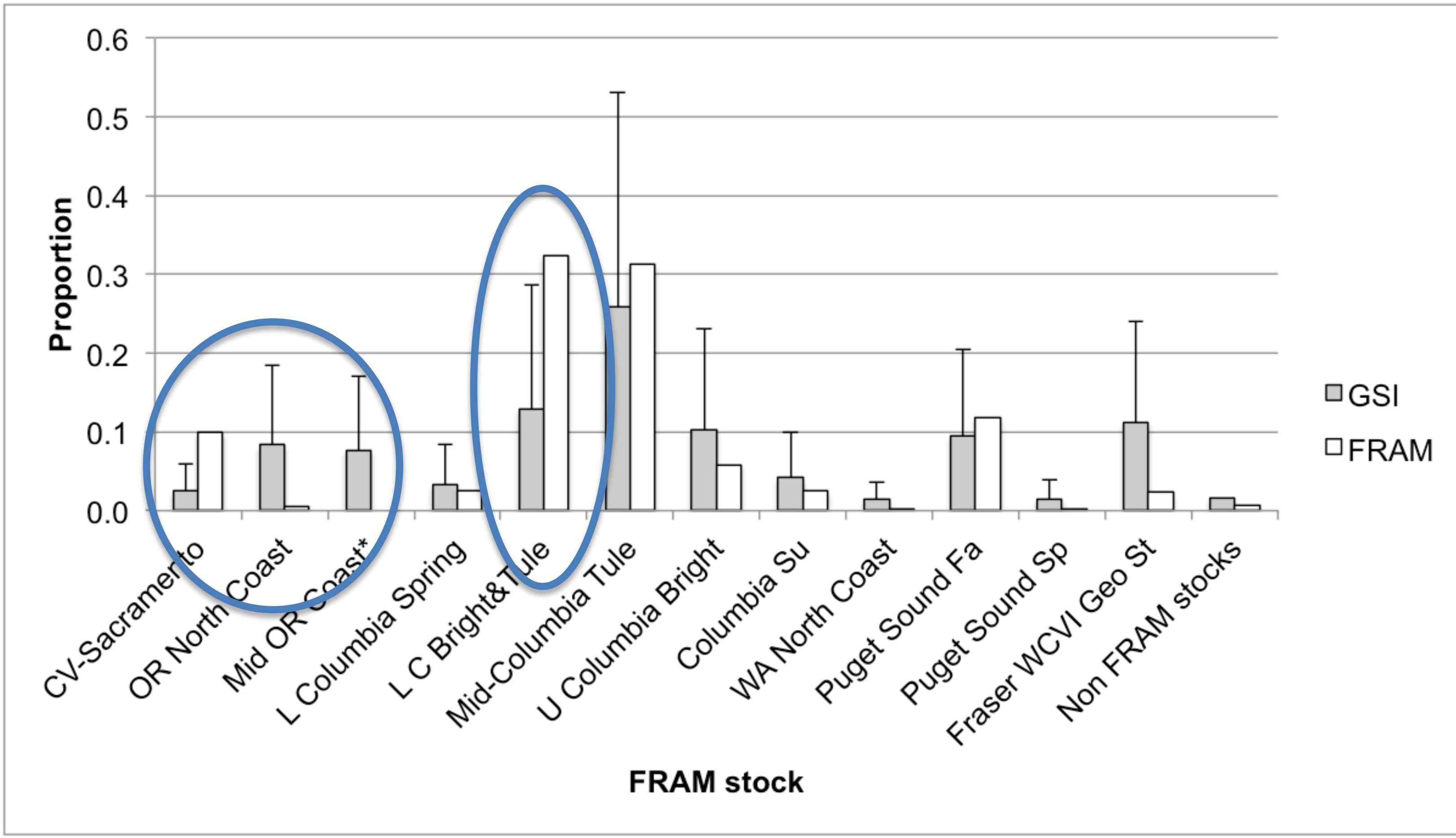




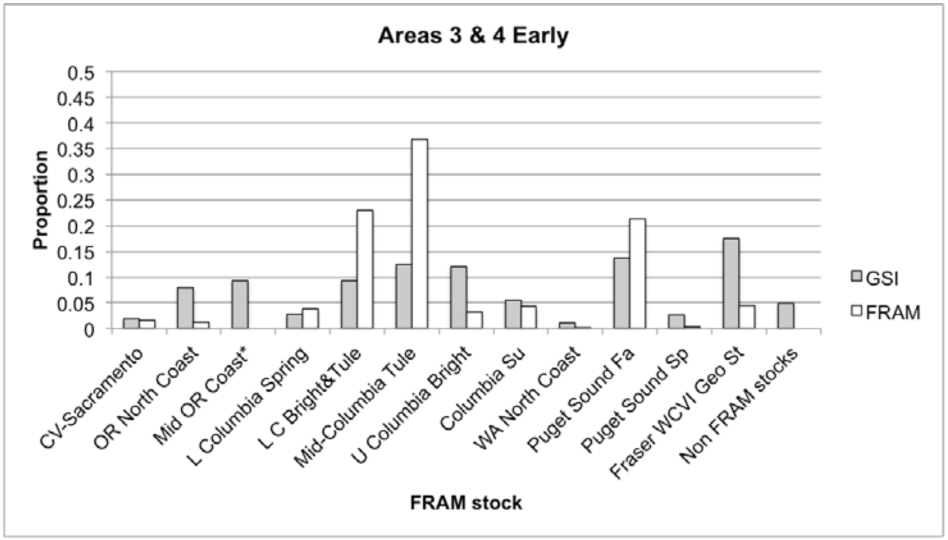
Sample distribution and stock composition 2012

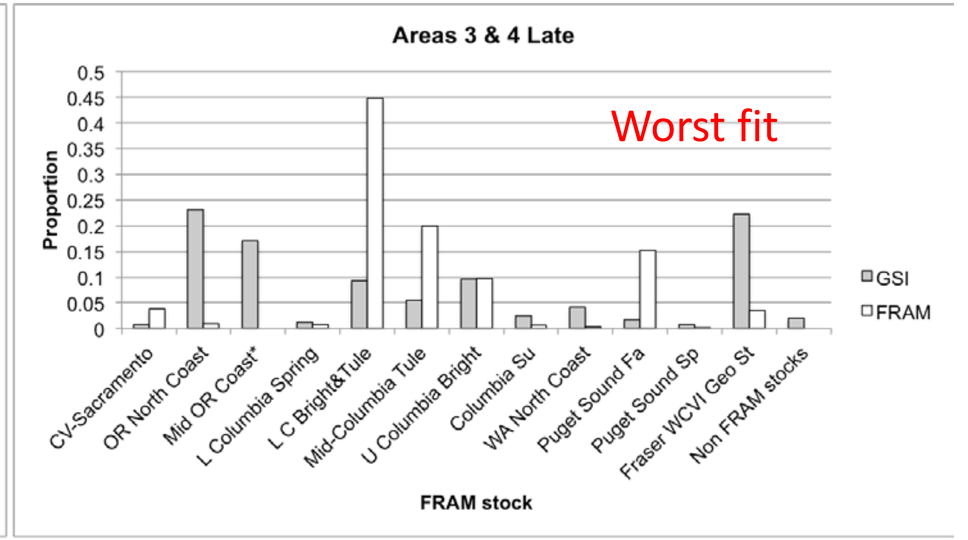


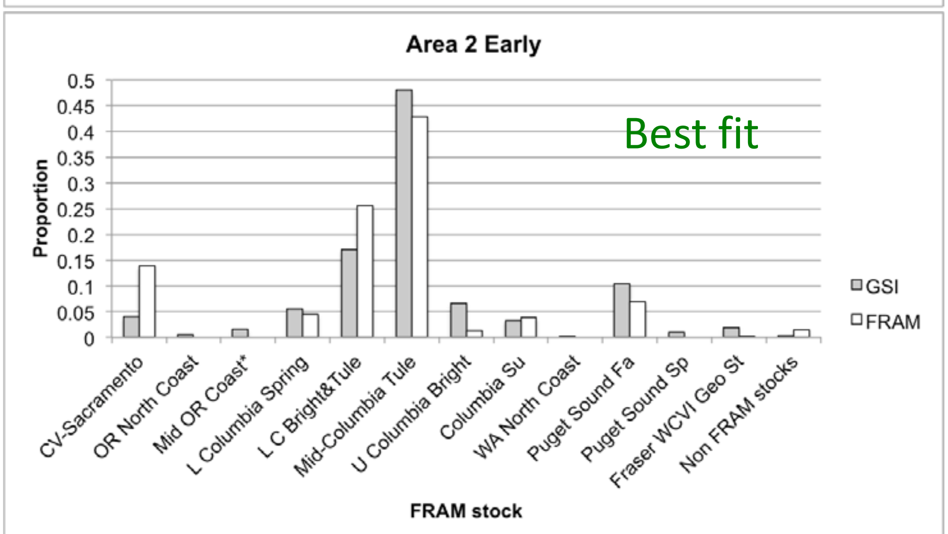
GSI (gray) and FRAM (white) Stock Proportions, 2012

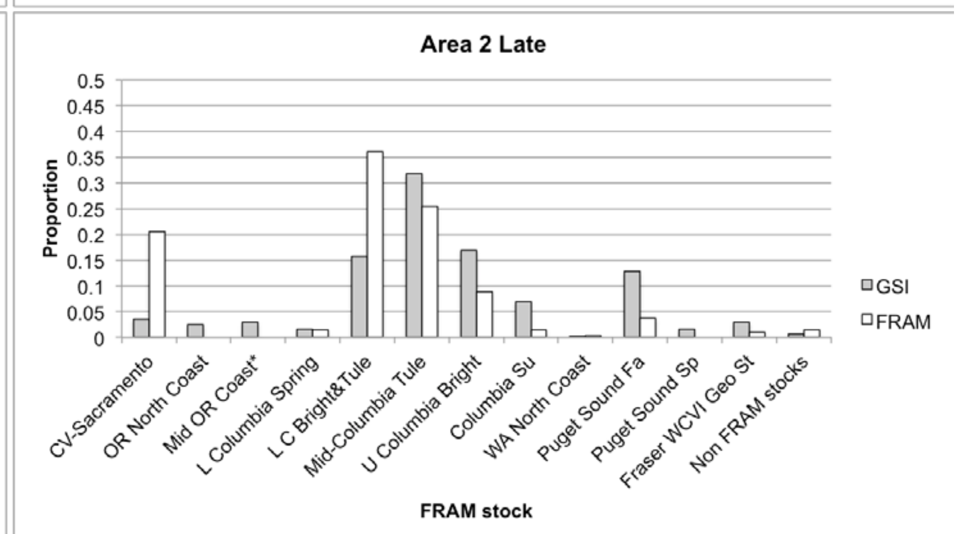


2012 GSI and FRAM by time and area









Relative to FRAM, GSI estimated:

Overall 2012 composition:

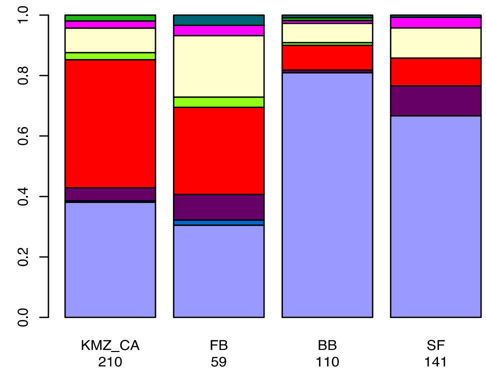
- More contributing stocks
- More Oregon coastal fish
- More Upriver Brights
- More Canadian fish
- Fewer Central Valley fish
- *Many* fewer Columbia River tules

Stratified by time and area:

- Highest concordance in Spring, Area 2
- Areas 3 and 4 dramatically different, especially in Summer
- Lower proportions of Lower Columbia tules in all strata (4x lower in Areas 3 & 4 in July-Sept)

West Coast Salmon GSI Collaboration California-2013

May
n=520



June
n=882

July
n=758

August
n=469

Fourth consecutive year of genetic tissue and GPS effort data sampling
All in-season (retention) collection

Total sample size in CA = 2901
stock IDs from 2885

Klamath

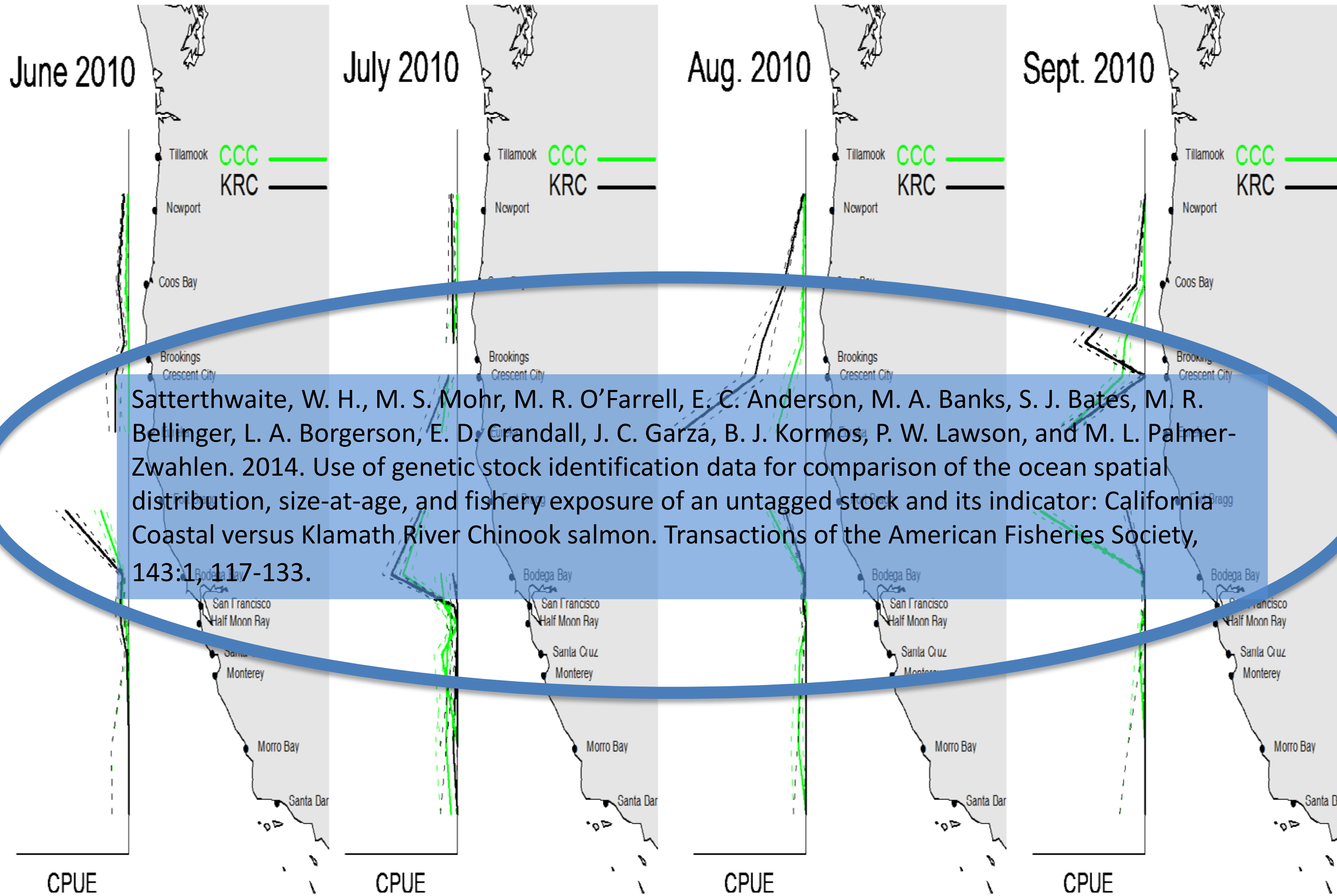
Central Valley

September
n=256

Oregon Coast
Deschutes Fall
Columbia River – Spring Creek
Snake River Fall
Upper Columbia Summer Fall

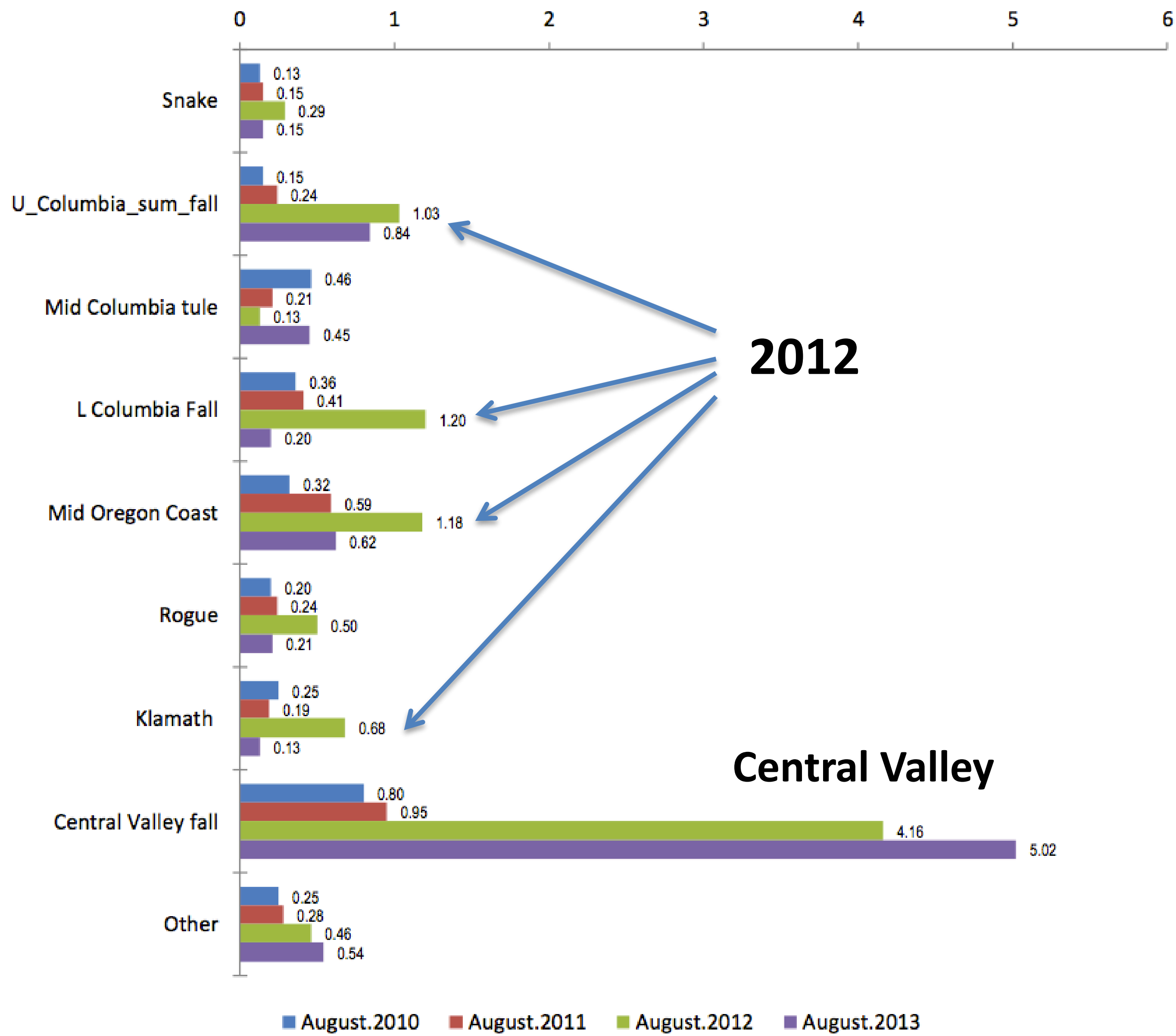
KMZ-CA FB BB SF

Klamath and California Coastal Chinook Seasonal Distribution

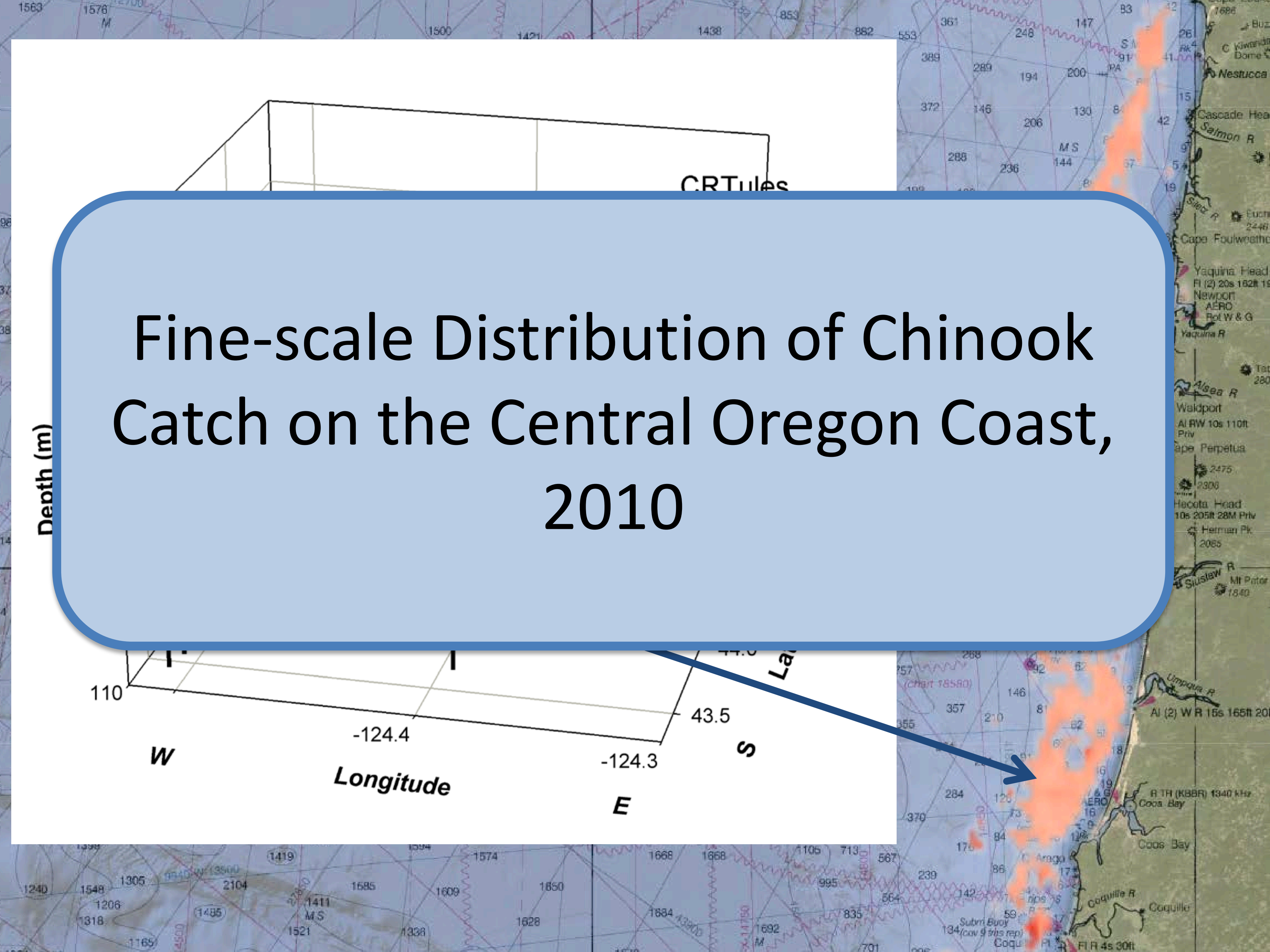


Satterthwaite, W. H., M. S. Mohr, M. R. O'Farrell, E. C. Anderson, M. A. Banks, S. J. Bates, M. R. Bellinger, L. A. Borgerson, E. D. Crandall, J. C. Garza, B. J. Kormos, P. W. Lawson, and M. L. Palmer-Zwahlen. 2014. Use of genetic stock identification data for comparison of the ocean spatial distribution, size-at-age, and fishery exposure of an untagged stock and its indicator: California Coastal versus Klamath River Chinook salmon. Transactions of the American Fisheries Society, 143:1, 117-133.

Oregon CPUE by Stock, August 2010 to 2013



Fine-scale Distribution of Chinook Catch on the Central Oregon Coast, 2010

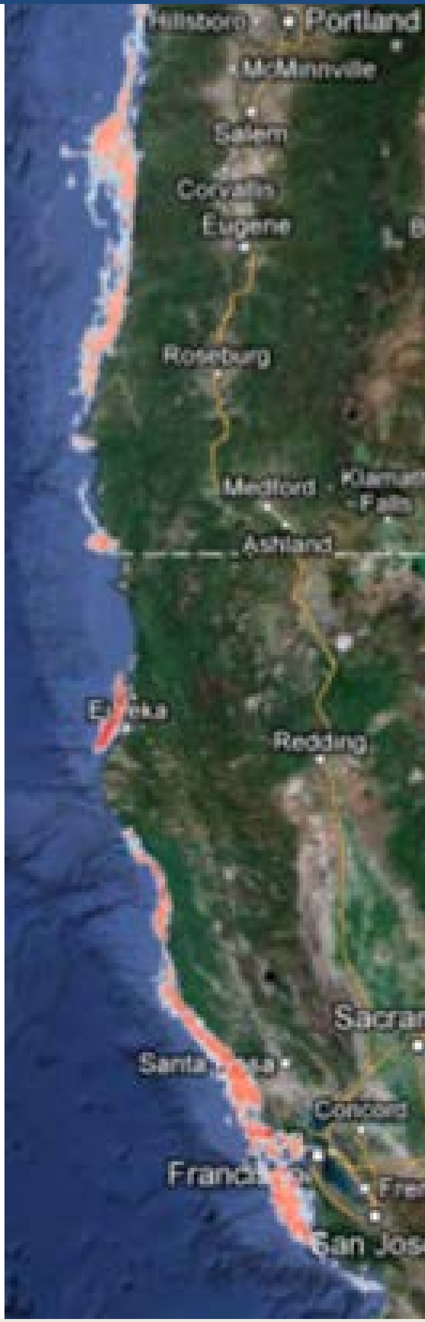


WCS-GSI Collaboration 2014

- Washington – full season
  - Broad-scale distributions
- Oregon –100 sample “snapshots”
  - Fine-scale distributions
- California – limited sampling
  - Concentrate on SF area

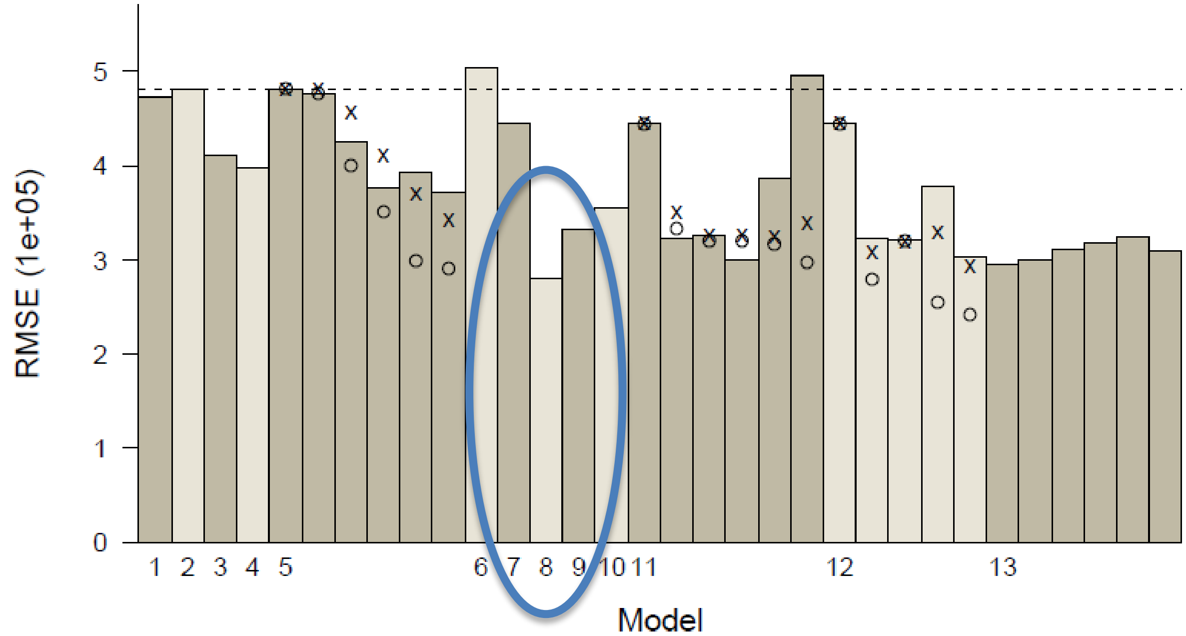
All sampling will be in retention fisheries so there will be no need for non-retention fishing permits in 2014.

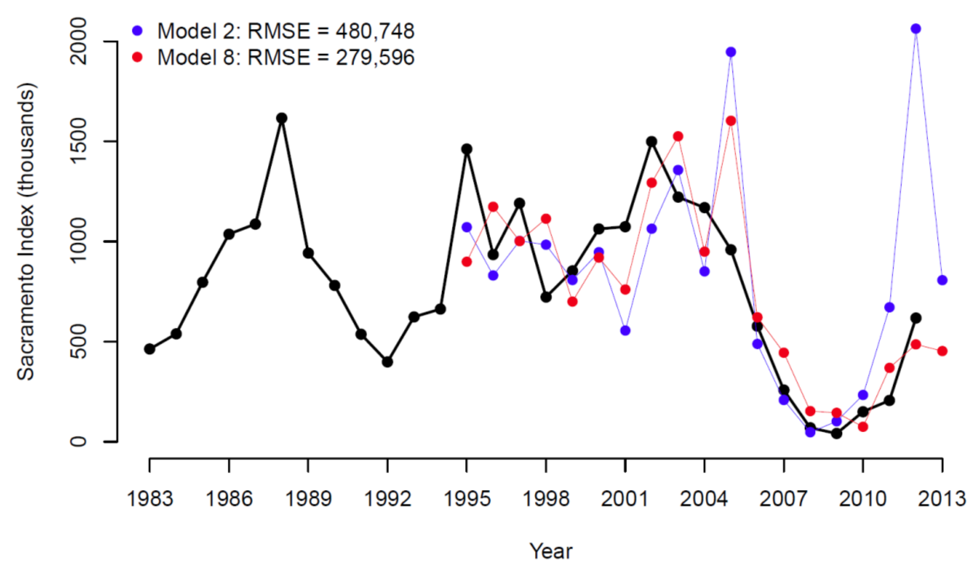
Funding in 2012, 2013, and 2014 has come from NMFS cooperative research grants.



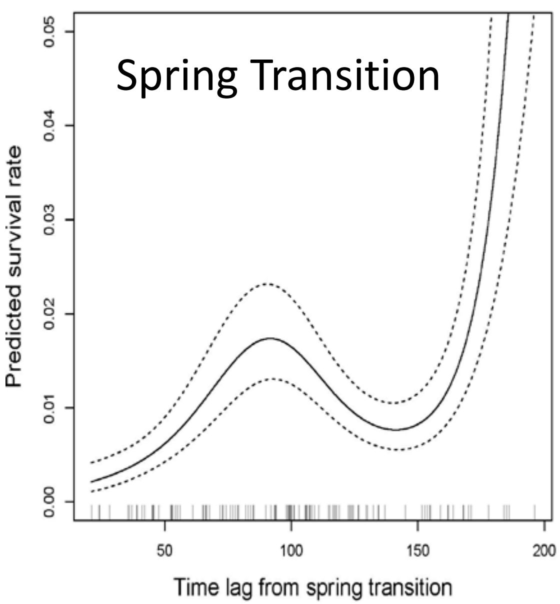
Sacramento Index forecast evaluation

- Root-mean squared error (RMSE) one metric used to evaluate forecast performance among models
- Lower RMSE = better forecast performance
- Model 8 had best performance- adopted for use beginning in 2014



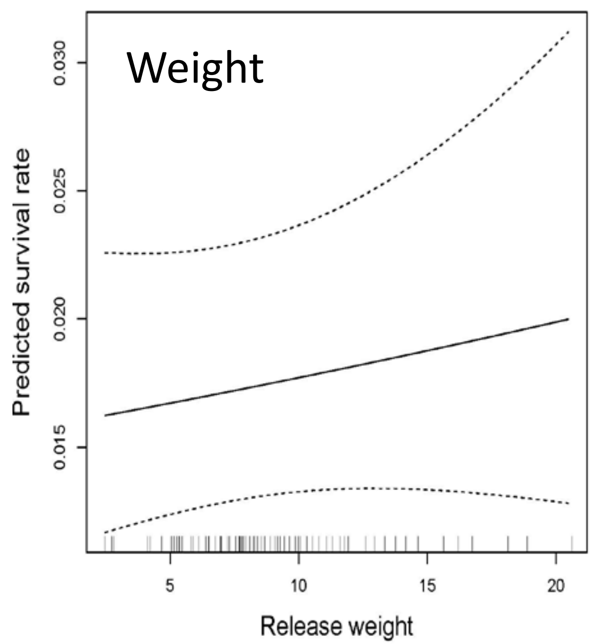


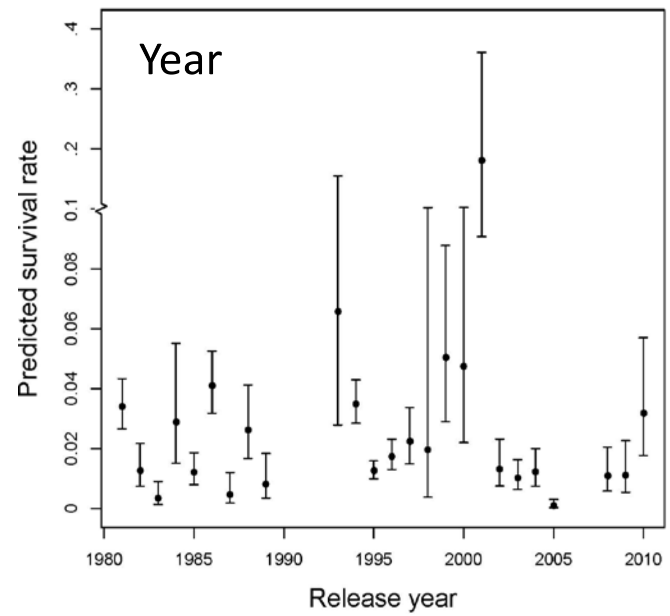
Match-mismatch for Sacramento River fall Chinook



Feather River Hatchery

Evaluated effects of release time, weight, and year on SRFC ocean recovery rates





NWFSC stoplight rankings

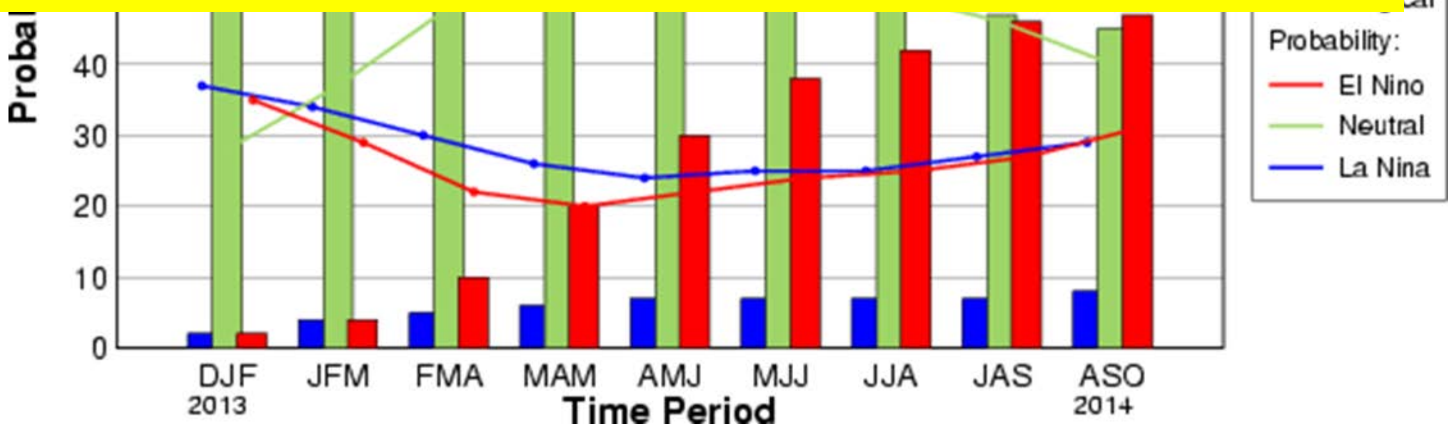
www.nwfsc.noaa.gov

Ecosystem Indicators	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
PDO and ENSO																
PDO (December-March)	15	6	3	11	7	16	10	14	12	9	5	1	13	4	2	8
PDO (May-September)	10	4	6	5	11	15	14	16	12	13	2	9	7	3	1	8
ONI Jan-June	16	2	1	5	12	13	11	14	7	10	3	9	15	4	5	7
Temperature																
46050 SST (May-Sept)	14	8	3	4	1	7	16	13	5	15	2	9	6	10	11	12
NH 05 Upper 20 m T winter prior (Nov-Mar)	16	10	7	9	5	13	14	11	12	4	1	8	15	3	2	6
NH 05 Upper 20 m T (May-Sept)	13	10	12	4	1	3	16	15	7	8	2	5	11	9	6	14
NH 05 Deep Temperature	16	6	8	4	1	9	12	14	10	5	2	7	13	11	3	15
NH 05 Deep Salinity	16	3	7	4	5	13	14	8	6	1	2	11	15	10	9	12
Biology																
Copepod Richness Anomaly	16	3	1	7	6	12	11	15	13	10	8	9	14	4	5	2
N. Copepod Biomass Anomaly	15	12	7	8	5	14	13	16	9	11	4	10	6	1	2	3
S. Copepod Biomass Anomaly	16	3	5	4	2	11	13	15	12	10	1	8	14	9	7	6
Biological Transition	16	11	7	3	8	12	10	15	14	4	1	2	13	5	9	6
Winter Ichthyoplankton	16	8	2	4	6	15	14	10	13	12	1	9	3	11	7	5
Chinook Juv Catches (June)	15	4	5	13	9	11	14	16	10	8	1	6	7	12	3	2
Coho Juv Catches (Sept)	11	2	1	4	3	6	12	14	8	9	7	15	13	5	10	NA
Mean of Ranks	14.7	6.1	5.0	5.9	5.5	11.3	12.9	13.7	10.0	8.6	2.8	7.9	11.0	6.7	5.5	7.6
RANK of the Mean Rank	16	6	2	5	3	13	14	15	11	10	1	9	12	7	3	8
Principle Component Scores (PC1)	6.58	-2.18	-2.93	-1.56	-2.07	2.19	3.11	4.28	1.00	-0.24	-4.41	-0.96	1.67	-1.40	-2.07	-1.01
Principle Component Scores (PC2)	0.04	0.21	0.42	-1.04	-2.20	-1.73	2.24	-0.73	-1.18	0.15	-0.78	0.58	-0.35	1.24	0.96	2.16
Ecosystem Indicators not included in the mean of ranks or statistical analyses																
Physical Spring Trans (UI Based)	3	6	15	13	4	10	12	16	10	1	5	2	7	9	14	8
Upwelling Anomaly (Apr-May)	7	1	14	3	6	11	10	16	7	2	4	5	12	14	12	9
Length of Upwelling Season (UI Based)	6	2	15	9	1	10	8	16	5	3	7	3	12	14	12	11
NH 05 SST (May-Sept)	10	6	5	4	1	3	16	14	8	12	2	15	9	7	11	13
Copepod Community Structure	16	4	5	7	1	12	13	15	14	10	2	6	11	9	8	3

ENSO Forecast (6 March 2014)

El Niño Watch

ENSO-neutral conditions are expected to continue through spring 2014, with about a 50% chance of El Niño developing during the summer or fall.



www.elnino.noaa.gov

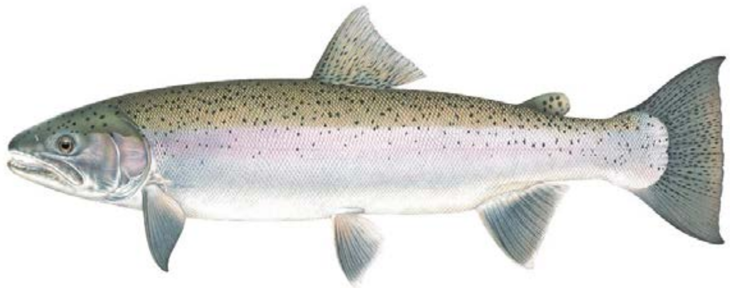
Salish Sea Marine Survival Project

LONG LIVE THE KINGS

PACIFIC SALMON FOUNDATION

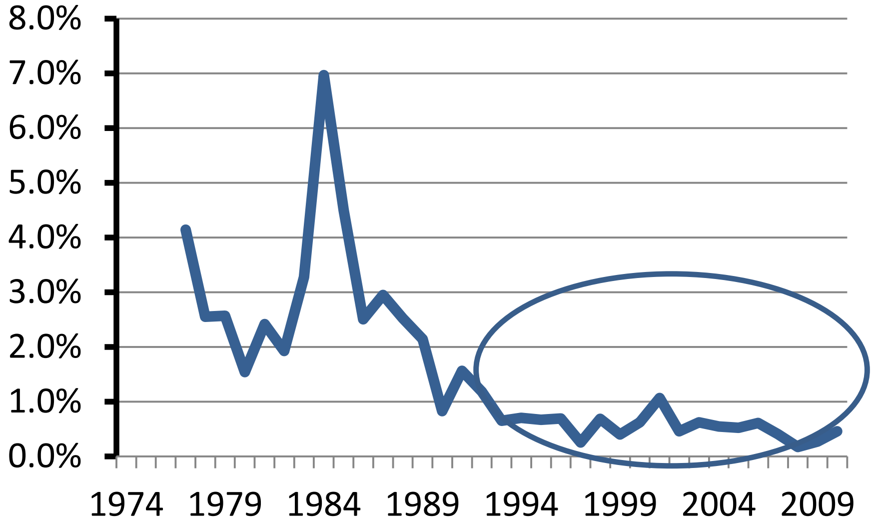
Objectives

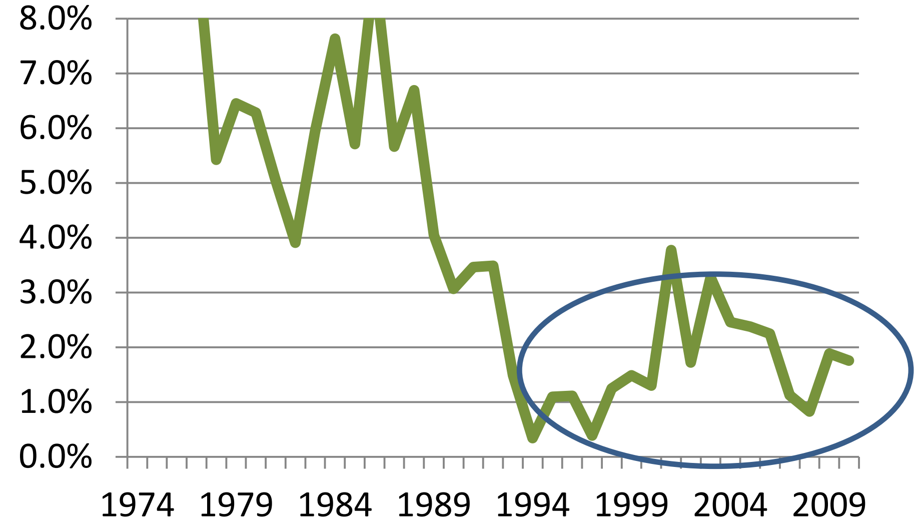
- Identify & prioritize management actions to **increase the survival** of Salish Sea wild and hatchery salmon and steelhead;
- Improve the accuracy of **adult return forecasting** for natural spawning, harvest, and hatchery management; and
- More accurately evaluate the success of freshwater habitat restoration activities by **reducing uncertainty around the role of the marine environment** in overall productivity.
- Focus on Chinook and coho salmon and steelhead



Steelhead

(Smolt-to-Adult) Marine Survival



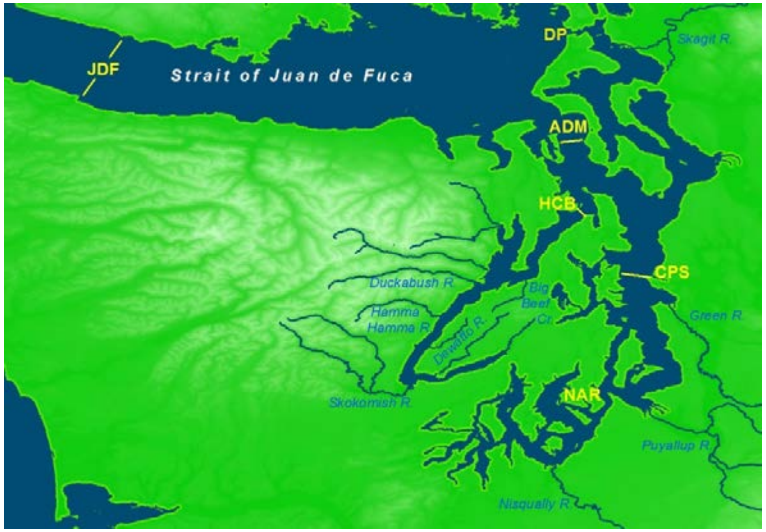


Puget Sound

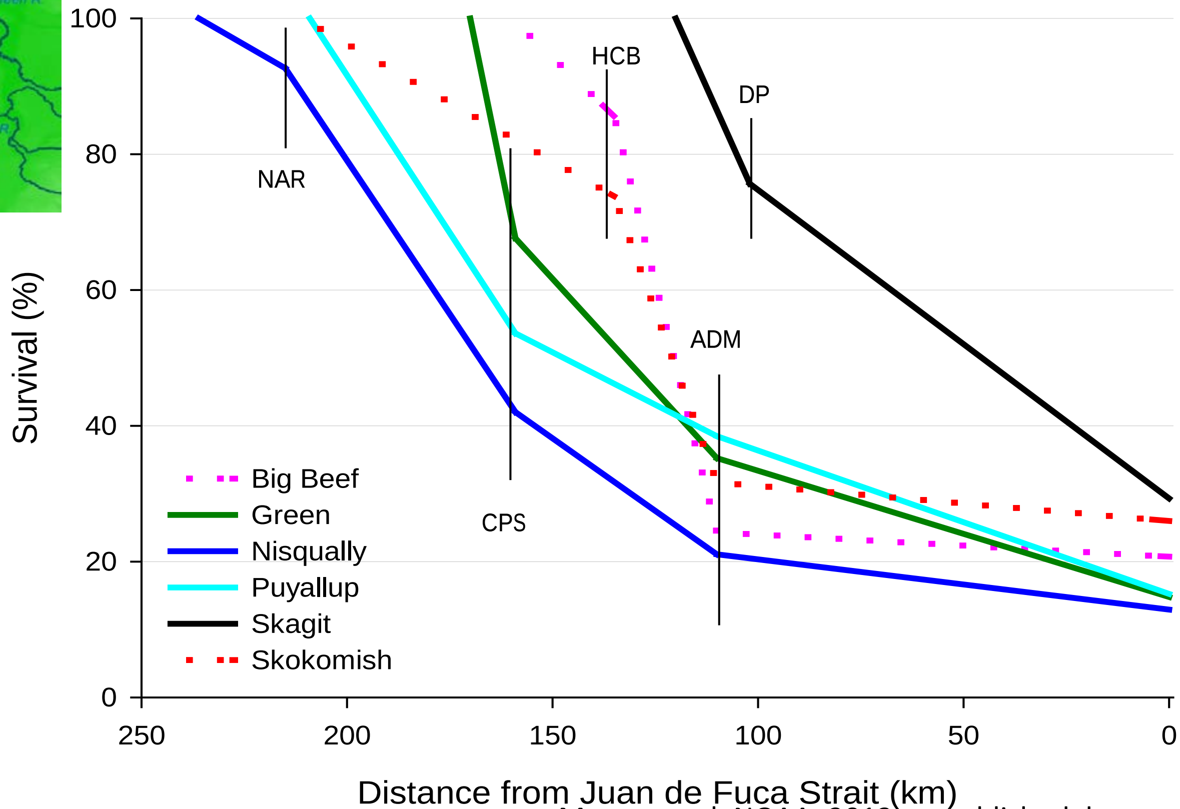
VS

Washington / B.C. Coast

Where within Puget Sound is steelhead mortality occurring?



Early marine mortality by migration segment, in Puget Sound, of acoustic tagged populations between 2006 and 2009



NAR = Tacoma Narrows
CPS = Central Puget Sound
ADM = Admiralty Inlet
HCB = Hood Canal Bridge
DP = Deception Pass

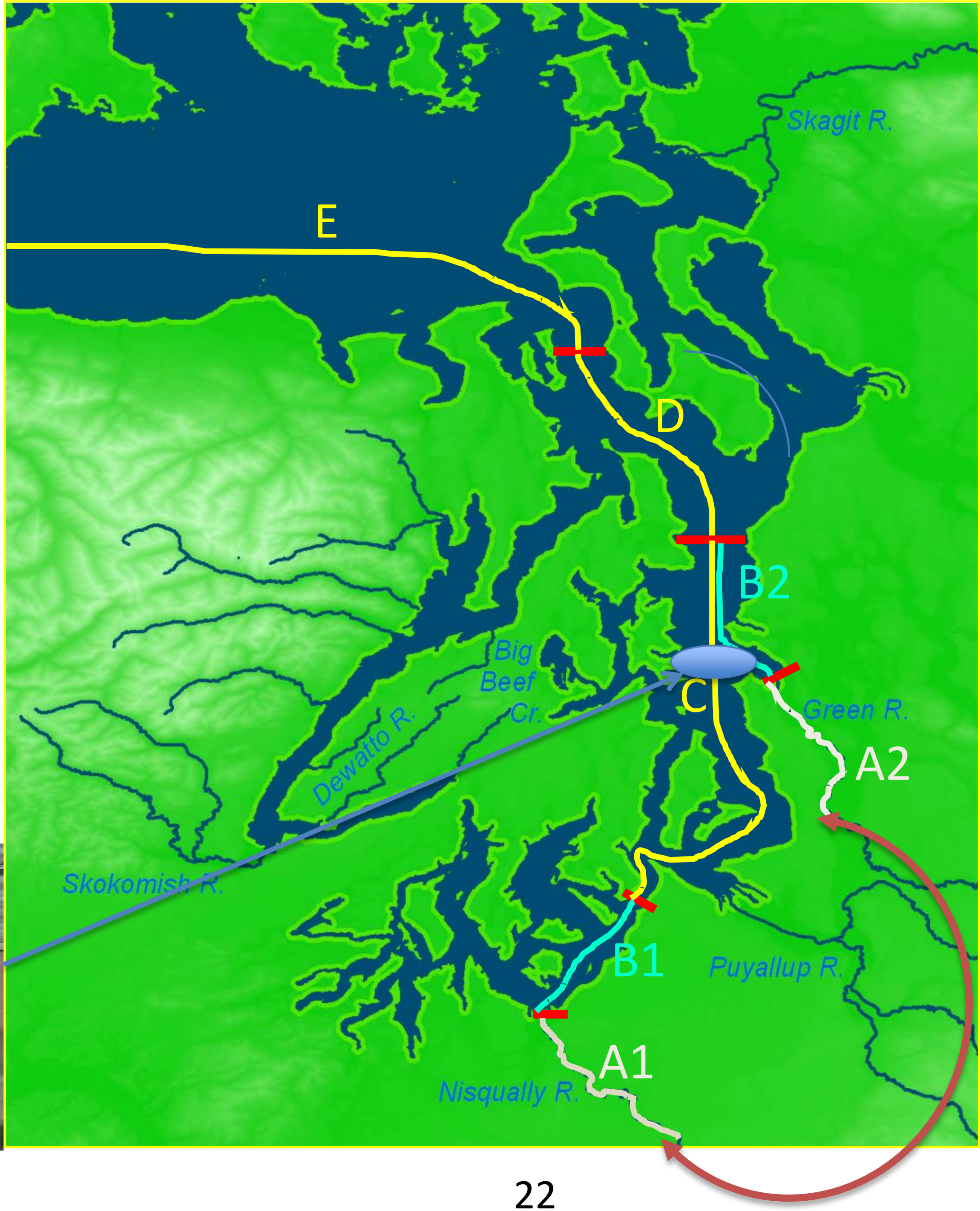
Moore et. al. NOAA, 2013, unpublished data

Reciprocal transplant experiment and predator-prey interactions

Quantify

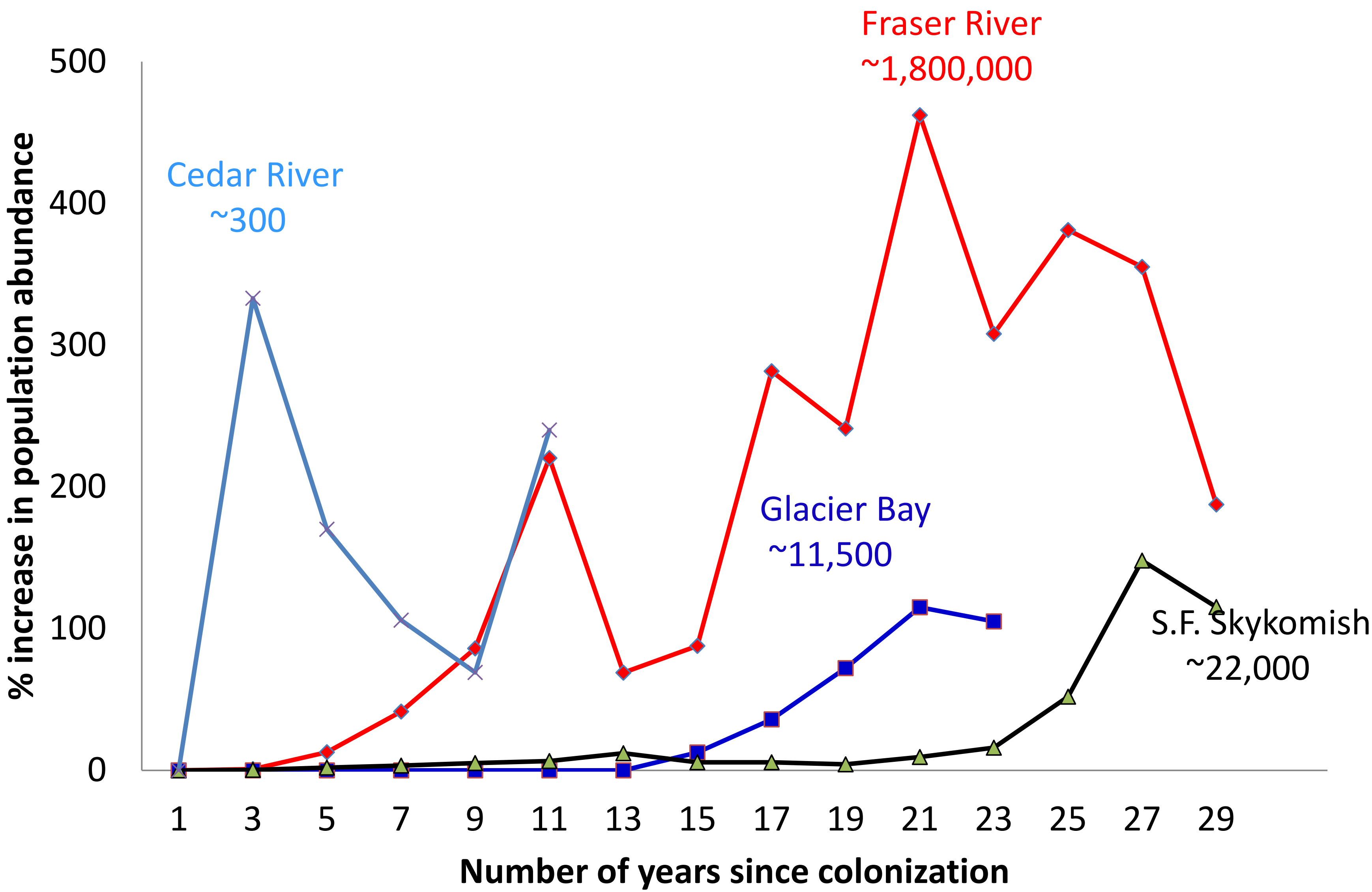
- core foraging areas of harbor seals during the steelhead smolt outmigration;
- spatial and temporal overlap of harbor seals and steelhead smolts in specific areas of Puget Sound;
- predation events by seals on tagged steelhead smolts

GPS, acoustic tag/receiver, VHF



Elwha Dam removal

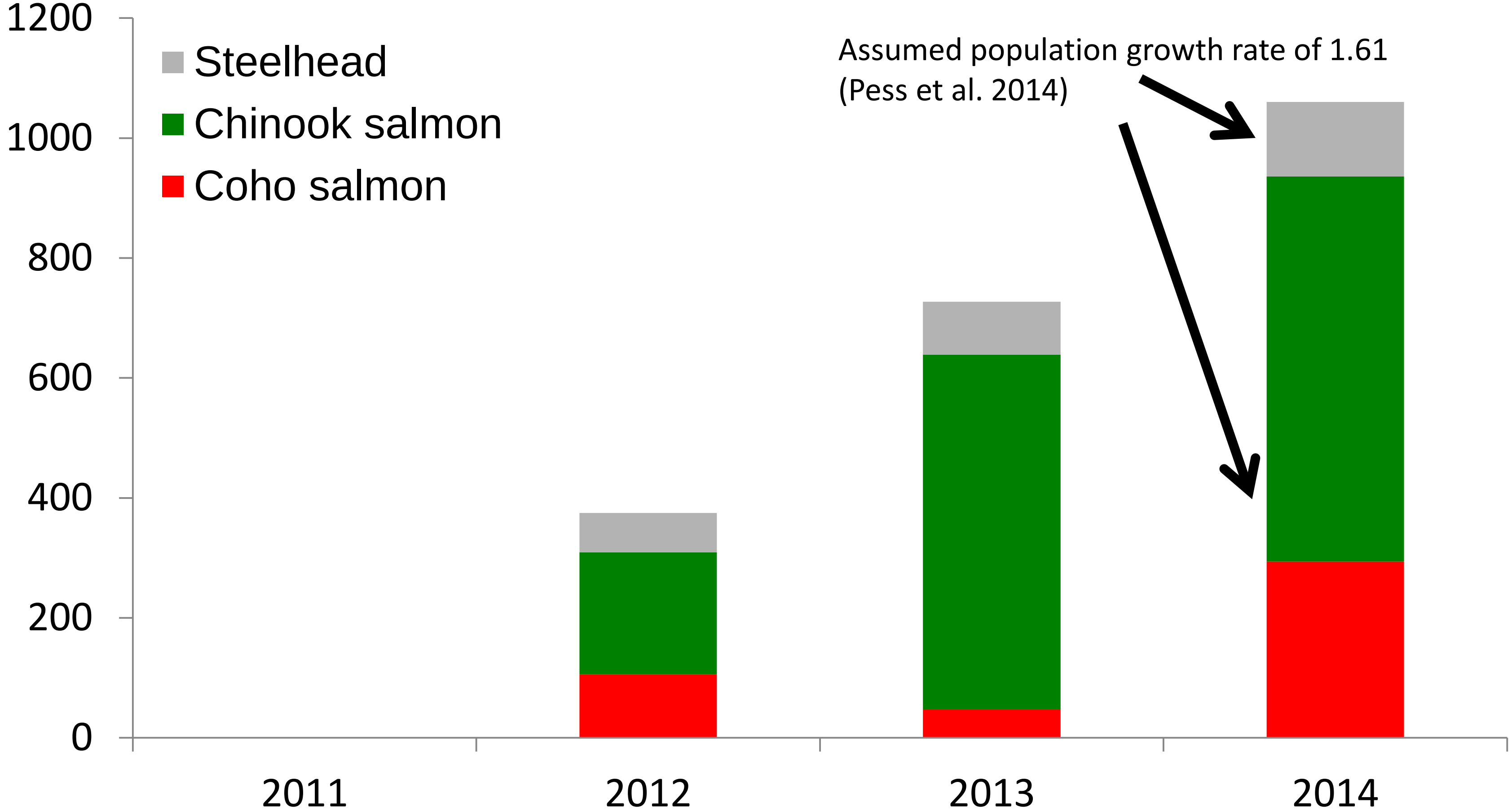
Salmon can successfully colonize newly available habitats



Fish recolonization in the middle Elwha

- 2011-2014 Relocation
  - Hatchery & wild adult coho salmon
  - Wild steelhead
- 2011-2014 Natural colonization
  - Steelhead
  - Pink salmon
  - Chinook salmon
  - Coho salmon
- Life stage specific distribution & abundance
  - Redd counts
  - Snorkel surveys
  - Summer parr estimates
  - Smolt estimates

Number of actual & estimated redds above former Elwha dam 2012 to 2014



COUNCIL RECOMMENDATIONS FOR 2014 MANAGEMENT ALTERNATIVE ANALYSIS

The Salmon Technical Team (STT) will present the Council with coordinated coastwide management alternatives which embody, to the extent possible, the management elements identified by the Council under Agenda Item F.2 on Sunday, March 9, 2014. At this time, the Council may need to clarify STT questions and should assure the alternatives presented are those for which the Council desires full STT analysis and consideration for final adoption on Thursday, March 13.

Council Task:

1. **Clarify STT questions.**
2. **Confirm management alternatives for STT analysis.**

Reference Materials:

1. Agenda Item F.4.b, Supplemental STT Report: Collation of Preliminary Salmon Management Alternatives for 2014 Ocean Fisheries.

Agenda Order:

a. Agenda Item Overview — Mike Burner
b. Reports and Comments of Advisory Bodies and Management Entities
c. Public Comment
d. Council Direction to the Salmon Technical Team and Salmon Advisory Subpanel on Alternative Development and Analysis

PFMC
02/06/14

ENFORCEMENT CONSULTANTS REPORT ON COUNCIL RECOMMENDATIONS FOR 2014 MANAGEMENT ALTERNATIVE ANALYSIS

The Enforcement Consultants (EC) has the following comments regarding filleting salmon at sea, as discussed on the Council floor under Agenda Item F.2:

Federal regulations currently do not explicitly prohibit filleting salmon at sea. Therefore, the EC is in support of a federal regulation prohibiting filleting salmon at sea coast wide, with the below rationale:

Although currently not prohibited, filleting salmon at sea would likely result in violation of several existing federal regulations, as summarized in the "EXISTING FEDERAL REGULATIONS" summary below, which was compiled with the assistance of NMFS.

For example, filleting fish at sea would:

- Interfere with determining whether or not landed fish comply with minimum size requirements.
- Make it impossible to identify adipose fin-clipped salmon at landing.

Therefore, a Federal prohibition of filleting salmon at sea would provide a level of additional security to ensure compliance with existing regulations.

In addition, a prohibition of filleting salmon at sea would also be consistent with existing regulations for all three West Coast states.

EXISTING FEDERAL REGULATIONS

50 CFR 660.402 Definitions

Dressed, head-off length of salmon means the shortest distance between the midpoint of the clavicle arch and the fork of the tail, measured along the lateral line while the fish is lying on its side, without resort to any force or mutilation of the fish other than removal of the head, gills, and entrails.

Dressed, head-off salmon means salmon that have been beheaded, gilled, and gutted without further separation of vertebrae, and are either being prepared for on-board freezing, or are frozen and will remain frozen until landed.

Total length of salmon means the shortest distance between the tip of the snout or jaw (whichever extends furthest while the mouth is closed) and the tip of the longest lobe of the tail, without resort to any force or mutilation of the salmon other than fanning or swinging the tail.

50 CFR 660.405 Prohibitions

(a) In addition to the general prohibitions specified in § 600.725 of this chapter, it is unlawful for any person to do any of the following:

(4) Remove the head of any salmon caught in the fishery management area, or 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.

(5) Take and retain or possess on board a fishing vessel any species of salmon that is less than the applicable minimum total length, including the applicable minimum length for dressed, head-off salmon.

(6) Possess on board a fishing vessel a salmon, for which a minimum total length is extended or cannot be determined, except that dressed, head-off salmon may be possessed on board a freezer trolling vessel, unless the adipose fin of such salmon has been removed.

PFMC
03/09/14

Agenda Item F.4.b
Supplemental STT Report
March 2014

SALMON TECHNICAL TEAM

COLLATION OF PRELIMINARY SALMON MANAGEMENT ALTERNATIVES FOR 2014 OCEAN FISHERIES

March 10, 2014

TABLE 1. Commercial troll management Alternatives collated by the STT for non-Indian ocean salmon fisheries, 2014 (Page 1 of 9)		3/9/2014 9:52 PM
A. SEASON ALTERNATIVE DESCRIPTIONS		
ALTERNATIVE I	ALTERNATIVE II	ALTERNATIVE III
North of Cape Falcon	**North of Cape Falcon**	**North of Cape Falcon**
Supplemental Management Information	**Supplemental Management Information**	**Supplemental Management Information**
1. Overall non-Indian TAC: ___,___ (non-mark-selective equivalent of 125,000) Chinook and 250,000 coho marked with a healed adipose fin clip (marked). 2. Non-Indian commercial troll TAC: 65,000 Chinook and 40,000 marked coho. 3. Trade: May be considered at the April Council meeting 4. Overall Chinook and/or coho TACs may need to be reduced or fisheries adjusted to meet NMFS ESA guidance, FMP requirements, upon conclusion of negotiations in the North of Falcon forum, or upon receipt of preseason catch and abundance expectations for Canadian and Alaskan fisheries.	1. Overall non-Indian TAC: __,___ (non-mark-selective equivalent of 110,000) Chinook and 220,000 coho marked with a healed adipose fin clip (marked). 2. Non-Indian commercial troll TAC: 56,000 Chinook and 35,200 marked coho. 3. Trade: May be considered at the April Council meeting 4. Overall Chinook and/or coho TACs may need to be reduced or fisheries adjusted to meet NMFS ESA guidance, FMP requirements, upon conclusion of negotiations in the North of Falcon forum, or upon receipt of preseason catch and abundance expectations for Canadian and Alaskan fisheries.	1. Overall non-Indian TAC: __,___ (non-mark-selective equivalent of 95,000) Chinook and 190,000 coho marked with a healed adipose fin clip (marked). 2. Non-Indian commercial troll TAC: 47,500 Chinook and 30,400 marked coho. 3. Trade: May be considered at the April Council meeting 4. Overall Chinook and/or coho TACs may need to be reduced or fisheries adjusted to meet NMFS ESA guidance, FMP requirements, upon conclusion of negotiations in the North of Falcon forum, or upon receipt of preseason catch and abundance expectations for Canadian and Alaskan fisheries.
U.S./Canada Border to Cape Falcon • May 1 through earlier of June 30 or 43,300 Chinook, no more than 14,000 of which may be caught in the area between the U.S./Canada border and the Queets River. Seven days per week (C.1). All salmon except coho (C.4, C.7). Chinook minimum size limit of 28 inches total length (B, C.1). Vessels in possession of salmon north of the Queets River may not cross the Queets River line without first notifying WDFW at 360-902-2739 with area fished, total Chinook and halibut catch aboard, and destination. Vessels in possession of salmon south of the Queets River may not cross the Queets River line without first notifying WDFW at 360-902-2739 with area fished, total Chinook and halibut catch aboard, and destination. See compliance requirements (C.1) and gear restrictions and definitions (C.2, C.3). When it is projected that 32,475 Chinook have been landed overall, or 10,500 Chinook have been landed in the area between the U.S/Canada border and the Queets River, inseason action modifying the open period to five days per week and adding landing and possession limits will be considered to ensure the guideline is not exceeded.	**U.S./Canada Border to Cape Falcon** • May 1 through earlier of June 30 or 37,300 Chinook, no more than 12,000 of which may be caught in the area between the U.S./Canada border and the Queets River. Seven days per week (C.1). All salmon except coho (C.4, C.7). Chinook minimum size limit of 28 inches total length (B, C.1). Vessels in possession of salmon north of the Queets River may not cross the Queets River line without first notifying WDFW at 360-902-2739 with area fished, total Chinook and halibut catch aboard, and destination. Vessels in possession of salmon south of the Queets River may not cross the Queets River line without first notifying WDFW at 360-902-2739 with area fished, total Chinook and halibut catch aboard, and destination. See compliance requirements (C.1) and gear restrictions and definitions (C.2, C.3). When it is projected that 27,975 Chinook have been landed overall, or 9,000 Chinook have been landed in the area between the U.S/Canada border and the Queets River, inseason action modifying the open period to five days per week and adding landing and possession limits will be considered to ensure the guideline is not exceeded.	**U.S./Canada Border to Cape Falcon** • May 1 through earlier of June 30 or 31,700 Chinook. Seven days per week (C.1). All salmon except coho (C.4, C.7). Chinook minimum size limit of 28 inches total length (B, C.1). See compliance requirements (C.1) and gear restrictions and definitions (C.2, C.3). When it is projected that 23,775 Chinook have been landed inseason action modifying the open period to five days per week and adding landing and possession limits will be considered to ensure the guideline is not exceeded.
Cape Flattery, Mandatory Yelloweye Rockfish Conservation Area, and Columbia Control Zones closed (C.5). Vessels must land and deliver their fish within 24 hours of any closure of this fishery. Under state law, vessels must report their catch on a state fish receiving ticket. Vessels fishing or in possession of salmon while fishing north of Leadbetter Point must land and deliver their fish within the area and north of Leadbetter Point. Vessels fishing or in possession of salmon while fishing south of Leadbetter Point must land and deliver their fish within the area and south of Leadbetter Point, except that Oregon permitted vessels may also land their fish in Garibaldi, Oregon. Oregon State regulations require all fishers landing salmon into Oregon from any fishery between Leadbetter Point, Washington and Cape Falcon, Oregon must notify ODFW within one hour of delivery or prior to transport away from the port of landing by either calling 541-867-0300 Ext. 271 or sending notification via e-mail to nfalcon.trollreport@state.or.us. Notification shall include vessel name and number, number of salmon by species, port of landing and location of delivery, and estimated time of delivery. Inseason actions may modify harvest guidelines in later fisheries to achieve or prevent exceeding the overall allowable troll harvest impacts.		

<table>
<tr><td colspan="2">TABLE 1. Commercial troll management Alternatives collated by the STT for non-Indian ocean salmon fisheries, 2014. (Page 2 of 9)</td><td>3/9/2014 9:52 PM</td></tr>
<tr><td colspan="3">A. SEASON ALTERNATIVE DESCRIPTIONS</td></tr>
<tr><th>ALTERNATIVE I</th><th>ALTERNATIVE II</th><th>ALTERNATIVE III</th></tr>
<tr>
<td>U.S./Canada Border to Cape Falcon
• July 1 through earlier of September 16 or attainment of the quota of 21,700 Chinook, no more than 10,000 of which may be caught in the area between the U.S./Canada border and the Queets River, or 40,000 marked coho (C.8.d).
July 1-8 then Friday through Tuesday July 11-August 19 with a landing and possession limit of 75 Chinook and 60 coho per vessel per open period; Friday through Tuesday August 22-September 16 with a landing and possession limit of 20 Chinook and 50 coho per vessel per open period (C.1). Vessels in possession of salmon north of the Queets River may not cross the Queets River line without first notifying WDFW at 360-902-2739 with area fished, total Chinook, coho, and halibut catch aboard, and destination. Vessels in possession of salmon south of the Queets River may not cross the Queets River line without first notifying WDFW at 360-902-2739 with area fished, total Chinook, coho, and halibut catch aboard, and destination. When it is projected that 16,275 Chinook have been landed overall, or 7,500 Chinook have been landed in the area between the U.S/Canada border and the Queets River, inseason action modifying the open period to five days per week and adding landing and possession limits will be considered to ensure the guideline is not exceeded.. No earlier than September 1, if at least 5,000 marked coho remain on the quota, inseason action may be considered to allow non-selective coho retention (C.8). All salmon except no chum retention north of Cape Alava, Washington in August and September (C.7). Chinook minimum size limit of 28 inches total length (B, C.1). All coho must be marked except as noted above (C.8.d). See compliance requirements (C.1) and gear restrictions and definitions (C.2, C.3).</td>
<td>U.S./Canada Border to Cape Falcon
• July 1 through earlier of September 16 or attainment of the quota of 18,700 Chinook, no more than 8,600 of which may be caught in the area between the U.S./Canada border and the Queets River, or 35,200 marked coho (C.8.d)
July 1-2, July 4-8, then Friday through Tuesday July 11-August 19 with a landing and possession limit of 65 Chinook and 45 coho per vessel per open period; Friday through Tuesday August 22-September 16 with a landing and possession limit of 15 Chinook and 50 coho per vessel per open period (C.1). Vessels in possession of salmon north of the Queets River may not cross the Queets River line without first notifying WDFW at 360-902-2739 with area fished, total Chinook, coho, and halibut catch aboard, and destination. Vessels in possession of salmon south of the Queets River may not cross the Queets River line without first notifying WDFW at 360-902-2739 with area fished, total Chinook, coho, and halibut catch aboard, and destination. All salmon except no chum retention north of Cape Alava, Washington in August and September (C.7). Chinook minimum size limit of 28 inches total length (B, C.1). All coho must be marked except as noted above (C.8.d). See compliance requirements (C.1) and gear restrictions and definitions (C.2, C.3).</td>
<td>U.S./Canada Border to Cape Falcon
• July 1 through earlier of September 16 or 15,800 Chinook (C.8) or a 30,400 marked coho quota (C.8.d)
July 1-4, July 6-8, then Friday through Tuesday July 11-August 26 with a landing and possession limit of 50 Chinook and 45 coho per vessel per open period; Friday through Tuesday August 29-September 16 with a landing and possession limit of 15 Chinook and 50 coho per vessel per open period (C.1). All salmon except no chum retention north of Cape Alava, Washington in August and September (C.7). Chinook minimum size limit of 28 inches total length (B, C.1). All coho must be marked except as noted above (C.8.d). See compliance requirements (C.1) and gear restrictions and definitions (C.2, C.3).</td>
</tr>
<tr><td colspan="3">Mandatory Yelloweye Rockfish Conservation Area, Cape Flattery and Columbia Control Zones, and beginning August 9, Grays Harbor Control Zone closed (C.5). Vessels must land and deliver their fish within 24 hours of any closure of this fishery. Vessels fishing or in possession of salmon while fishing north of Leadbetter Point must land and deliver their fish within the area and north of Leadbetter Point. Vessels fishing or in possession of salmon while fishing south of Leadbetter Point must land and deliver their fish within the area and south of Leadbetter Point, except that Oregon permitted vessels may also land their fish in Garibaldi, Oregon. Under state law, vessels must report their catch on a state fish receiving ticket. Oregon State regulations require all fishers landing salmon into Oregon from any fishery between Leadbetter Point, Washington and Cape Falcon, Oregon must notify ODFW within one hour of delivery or prior to transport away from the port of landing by either calling 541-867-0300 Ext. 271 or sending notification via e-mail to nfalcon.trollreport@state.or.us. Notification shall include vessel name and number, number of salmon by species, port of landing and location of delivery, and estimated time of delivery. Inseason actions may modify harvest guidelines in later fisheries to achieve or prevent exceeding the overall allowable troll harvest impacts.</td></tr>
</table>

TABLE 1. Commercial troll management Alternatives collated by the STT for non-Indian ocean salmon fisheries, 2014. (Page 3 of 9)		3/9/2014 9:52 PM
	A. SEASON ALTERNATIVE DESCRIPTIONS	
ALTERNATIVE I	ALTERNATIVE II	ALTERNATIVE III
South of Cape Falcon	**South of Cape Falcon**	**South of Cape Falcon**
Supplemental Management Information	**Supplemental Management Information**	**Supplemental Management Information**
1. Sacramento River Basin recreational fishery catch assumption: __,___ adult Sacramento River fall Chinook (__._ % of the total allowable harvest). 2. Sacramento River fall Chinook spawning escapement of ___,___ adults. 3. Klamath River recreational fishery allocation: __,___ adult Klamath River fall Chinook. 4. Klamath tribal allocation: ___,___ adult Klamath River fall Chinook. 5. Fisheries may need to be adjusted to meet NMFS ESA consultation standards, FMP requirements, other management objectives, or upon receipt of new allocation recommendations from the California Fish and Game Commission.	1. Sacramento River Basin recreational fishery catch assumption: __,___ adult Sacramento River fall Chinook (__._% of the total allowable harvest). 2. Sacramento River fall Chinook spawning escapement of ___,___ adults. 3. Klamath River recreational fishery allocation: __,___ adult Klamath River fall Chinook. 4. Klamath tribal allocation: ___,___ adult Klamath River fall Chinook. 5. Fisheries may need to be adjusted to meet NMFS ESA consultation standards, FMP requirements, other management objectives, or upon receipt of new allocation recommendations from the California Fish and Game Commission.	_. Sacramento River Basin recreational fishery catch assumption: __,___ adult Sacramento River fall Chinook (__._ % of the total allowable harvest). 2. Sacramento River fall Chinook spawning escapement of ___,___ adults. 3. Klamath River recreational fishery allocation: __,___ adult Klamath River fall Chinook. 4. Klamath tribal allocation: ___,___ adult Klamath River fall Chinook. 5. Fisheries may need to be adjusted to meet NMFS ESA consultation standards, FMP requirements, other management objectives, or upon receipt of new allocation recommendations from the California Fish and Game Commission.
Cape Falcon to Humbug Mt. • April 1-August 29; • September 3-October 31 (C.9.a). Seven days per week. **All salmon except coho except as listed below for September non-selective coho incidental retention** (C.4, C.7). Chinook minimum size limit of 28 inches total length (B, C.1). All vessels fishing in the area must land their fish in the State of Oregon. See gear restrictions and definitions (C.2, C.3) and Oregon State regulations for a description of special regulations at the mouth of Tillamook Bay. Beginning September 3, no more than 100 Chinook per vessel per landing week (Wed.-Tues.). **Non-selective incidental coho retention:** • September 3 through the earlier of the quota or September 30, retention of coho will be limited to no more than one coho for each landed Chinook with a landing week limit of no more than 20 coho per vessel if sufficient quota is available for transfer from the Cape Falcon to Humbug Mt. non-selective recreational fishery (C.8.b). • Oregon State regulations require all fishers landing coho salmon from this season to notify ODFW within one hour of delivery or prior to transport away from the port of landing by calling 541-867-0300 Ext. 252. Notification shall include vessel name and number, number of salmon by species, port of landing and location of delivery, and estimated time of delivery. In 2015, the season will open March 15 for all salmon except coho. Chinook minimum size limit of 28 inches total length. Gear restrictions same as in 2014. This opening could be modified following Council review at its March 2015 meeting.	**Cape Falcon to Humbug Mt.** • April **1**-August 29; • September **3**-October **31** (C.9). Seven day per week. All salmon except coho (C.7). Chinook minimum size limit of 28 inches total length (B). All vessels fishing in the area must land their fish in the State of Oregon. See gear restrictions and definitions (C.2, C.3) and Oregon State regulations for a description of special regulations at the mouth of Tillamook Bay. Beginning September **3**, no more than 75 Chinook per vessel per landing week (Wed.-Tues.). In 2015, same as Alternative I	**Cape Falcon to Humbug Mt.** • April **1**-July 31; and August 6-29; • September **3**-October **31** (C.9). Seven day per week. All salmon except coho (C.7). Chinook minimum size limit of 28 inches total length (B). All vessels fishing in the area must land their fish in the State of Oregon. See gear restrictions and definitions (C.2, C.3) and Oregon State regulations for a description of special regulations at the mouth of Tillamook Bay. Beginning September **3**, no more than 50 Chinook per vessel per landing week (Wed.-Tues.). In 2015, same as Alternative I

TABLE 1. Commercial troll management Alternatives collated by the STT for non-Indian ocean salmon fisheries, 2014. (Page 4 of 9) 3/9/2014 9:52 PM

A. SEASON ALTERNATIVE DESCRIPTIONS

ALTERNATIVE I	ALTERNATIVE II	ALTERNATIVE III
Humbug Mt. to OR/CA Border (Oregon KMZ) • April 1-May 31; • June 1 through earlier of June 30, or a 4,000 Chinook quota; • July 1 through earlier of July 31, or a 3,000 Chinook quota; • August 1 through earlier of August 29, or a 2,000 Chinook quota; • September 16 through earlier of September 27 or a 1,000 Chinook quota (C.9.a). Seven days per week. All salmon except coho (C.4, C.7). Chinook minimum size limit of 28 inches total length (B, C.1). **Prior to June 1, all fish caught in this area must be landed and delivered in the State of Oregon.** June 1 – August 29 landing and possession limit of 40 Chinook per vessel per day. September 16-27 landing and possession limit of 20 Chinook per vessel per day. Any remaining portion of the June and/or July Chinook quotas may be transferred inseason on an impact neutral basis to the next open quota period (C.8). All vessels fishing in this area must land and deliver all fish within this area or Port Orford, within 24 hours of any closure of this fishery, and prior to fishing outside of this area. State regulations require fishers intending to transport and deliver their catch to other locations after first landing in one of these ports notify ODFW prior to transport away from the port of landing by calling 541-867-0300 Ext. 252, with vessel name and number, number of salmon by species, location of delivery, and estimated time of delivery. See compliance requirements (C.1) and gear restrictions and definitions (C.2, C.3). In 2015, the season will open March 15 for all salmon except coho, with a 28 inch Chinook minimum size limit. This opening could be modified following Council review at its March 2015 meeting.	**Humbug Mt. to OR/CA Border (Oregon KMZ)** • April 1-May 31; • June 1 through earlier of June 30, or a 3,000 Chinook quota; • July 1 through earlier of July 31, or a 2,000 Chinook quota; • August 1 through earlier of August 29, or a 1,500 Chinook quota; • September 15 through earlier of September 27 or a 500 Chinook quota (C.9.a). Seven days per week. All salmon except coho (C.4, C.7). Chinook minimum size limit of 28 inches total length (B, C.1). **Prior to June 1, all fish caught in this area must be landed and delivered in the State of Oregon.** June 1 – August 29 landing and possession limit of 30 Chinook per vessel per day. September 15-27 landing and possession limit of 20 Chinook per vessel per day. Any remaining portion of the June and/or July Chinook quotas may be transferred inseason on an impact neutral basis to the next open quota period (C.8). All vessels fishing in this area must land and deliver all fish within this area or Port Orford, within 24 hours of any closure of this fishery, and prior to fishing outside of this area. State regulations require fishers intending to transport and deliver their catch to other locations after first landing in one of these ports notify ODFW prior to transport away from the port of landing by calling 541-867-0300 Ext. 252, with vessel name and number, number of salmon by species, location of delivery, and estimated time of delivery. See compliance requirements (C.1) and gear restrictions and definitions (C.2, C.3). In 2015, same as Alternative I.	**Humbug Mt. to OR/CA Border (Oregon KMZ)** • April 1-May 31; • June 1 through earlier of June 30, or a 2,000 Chinook quota; • July 1 through earlier of July 31, or a 1,500 Chinook quota; • August 1 through earlier of August 29, or a 1,000 Chinook quota; (C.9.a). Seven days per week. All salmon except coho (C.4, C.7). Chinook minimum size limit of 28 inches total length (B, C.1). **Prior to June 1, all fish caught in this area must be landed and delivered in the State of Oregon.** June 1 – August 29 landing and possession limit of 20 Chinook per vessel per day. Any remaining portion of the June and/or July Chinook quotas may be transferred inseason on an impact neutral basis to the next open quota period (C.8). All vessels fishing in this area must land and deliver all fish within this area or Port Orford, within 24 hours of any closure of this fishery, and prior to fishing outside of this area. State regulations require fishers intending to transport and deliver their catch to other locations after first landing in one of these ports notify ODFW prior to transport away from the port of landing by calling 541-867-0300 Ext. 252, with vessel name and number, number of salmon by species, location of delivery, and estimated time of delivery. See compliance requirements (C.1) and gear restrictions and definitions (C.2, C.3). In 2015, same as Alternative I.

<table>
<tr><td colspan="2">TABLE 1. Commercial troll management Alternatives collated by the STT for non-Indian ocean salmon fisheries, 2014. (Page 5 of 9)</td><td>3/9/2014 9:52 PM</td></tr>
<tr><td colspan="3">A. SEASON ALTERNATIVE DESCRIPTIONS</td></tr>
<tr><td>ALTERNATIVE I</td><td>ALTERNATIVE II</td><td>ALTERNATIVE III</td></tr>
<tr><td>OR/CA Border to Humboldt South Jetty (California KMZ)
• September 5 through earlier of September 30, or 10,000 Chinook quota (C.9.b).
Five days per week, Friday through Tuesday. All salmon except coho (C.4, C.7). Chinook minimum size limit of 27 inches total length (B, C.1). Landing and possession limit of 30 Chinook per vessel per day (C.8.g).</td><td>OR/CA Border to Humboldt South Jetty (California KMZ)
• September 12 through earlier of September 30, or 6,000 Chinook quota (C.9.b).
Five days per week, Friday through Tuesday. All salmon except coho (C.4, C.7). Chinook minimum size limit of 27 inches total length (B, C.1). Landing and possession limit of 20 Chinook per vessel per day (C.8.g).</td><td>OR/CA Border to Humboldt South Jetty (California KMZ)
• September 12 through earlier of September 30, or 3,000 Chinook quota (C.9.b).
Five days per week, Friday through Tuesday. All salmon except coho (C.4, C.7). Chinook minimum size limit of 27 inches total length (B, C.1). Landing and possession limit of 20 Chinook per vessel per day (C.8.g).</td></tr>
<tr><td colspan="3">All fish caught in this area must be landed within the area and within 24 hours of any closure of the fishery and prior to fishing outside the area (C.10). See compliance requirements (C.1) and gear restrictions and definitions (C.2, C.3). Klamath Control Zone closed (C.5.e). See California State regulations for additional closures adjacent to the Smith and Klamath rivers. When the fishery is closed between the OR/CA border and Humbug Mountain and open to the south, vessels with fish on board caught in the open area off California may seek temporary mooring in Brookings, Oregon prior to landing in California only if such vessels first notify the Chetco River Coast Guard Station via VHF channel 22A between the hours of 0500 and 2200 and provide the vessel name, number of fish on board, and estimated time of arrival (C.6.).</td></tr>
<tr><td>Humboldt South Jetty to Horse Mt.
Closed.</td><td>Humboldt South Jetty to Horse Mt.
Closed.</td><td>Humboldt South Jetty to Horse Mt.
Closed.</td></tr>
<tr><td>Horse Mt. to Point Arena (Fort Bragg)
• April 16-30
• June 17-30
• July 8-31;
• August 1-29;
• September 1-30 (C.9.b).
Seven days per week. All salmon except coho (C.4, C.7). Chinook minimum size limit of 27 inches total length (B, C.1). All fish must be landed in California and offloaded within 24 hours of the August 29 closure (C.6). When the CA KMZ fishery is open, all fish caught in the area must be landed south of Horse Mountain (C.6). During September, all fish must be landed north of Point Arena (C.6). See compliance requirements (C.1) and gear restrictions and definitions (C.2, C.3).

In 2015, the season will open April 16-30 for all salmon except coho, with a 27 inch Chinook minimum size limit and the same gear restrictions as in 2014. All fish caught in the area must be landed in the area. This opening could be modified following Council review at its March 2015 meeting.</td><td>Horse Mt. to Point Arena (Fort Bragg)
• April 16-30
• June 8-30
• July 8-31;
• August 1-29;
• September 1-30 (C.9.b).
Seven days per week. All salmon except coho (C.4, C.7). Chinook minimum size limit of 27 inches total length (B, C.1). All fish must be landed in California and offloaded within 24 hours of the August 29 closure (C.6). When the CA KMZ fishery is open, all fish caught in the area must be landed south of Horse Mountain (C.6). During September, all fish must be landed north of Point Arena (C.6). See compliance requirements (C.1) and gear restrictions and definitions (C.2, C.3).

In 2015, same as Alternative I.</td><td>Horse Mt. to Point Arena (Fort Bragg)
• April 16-30
• June 5-30
• July 8-31;
• August 1-29;
• September 1-30 (C.9.b).
Seven days per week. All salmon except coho (C.4, C.7). Chinook minimum size limit of 27 inches total length (B, C.1). All fish must be landed in California and offloaded within 24 hours of the August 29 closure (C.6). When the CA KMZ fishery is open, all fish caught in the area must be landed south of Horse Mountain (C.6). During September, all fish must be landed north of Point Arena (C.6). See compliance requirements (C.1) and gear restrictions and definitions (C.2, C.3).

In 2015, same as Alternative I.</td></tr>
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TABLE 1. Commercial troll management Alternatives collated by the STT for non-Indian ocean salmon fisheries, 2014. (Page 6 of 9) 3/9/2014 9:52 PM

A. SEASON ALTERNATIVE DESCRIPTIONS

ALTERNATIVE I	ALTERNATIVE II	ALTERNATIVE III
Pt. Arena to Pigeon Pt. (San Francisco) • May 1-31; • June 1-30; • July 8-31; • August 1-29; • September 1-30 (C.9.b). Seven days per week. All salmon except coho (C.4, C.7). Chinook minimum size limit of 27 inches total length prior to September 1, 26 inches thereafter (B, C.1). All fish must be landed in California and offloaded within 24 hours of the August 29 closure (C.6). During September, all fish must be landed south of Point Arena (C.6). See compliance requirements (C.1) and gear restrictions and definitions (C.2, C.3). **Point Reyes to Point San Pedro (Fall Area Target Zone)** • October 1-3, 6-10, and 13-15. All salmon except coho (C.4, C.7). Chinook minimum size limit of 26 inches total length (B, C.1). All fish caught in this area must be landed between Point Arena and Pigeon Point (C.6). See compliance requirements (C.1) and gear restrictions and definitions (C.2, C.3).	**Pt. Arena to Pigeon Pt. (San Francisco)** • May 1-31; • June 8-30; • July 8-31; • August 1-29; • September 1-30 (C.9.b). Seven days per week. All salmon except coho (C.4, C.7). Chinook minimum size limit of 27 inches total length prior to September 1, 26 inches thereafter (B, C.1). All fish must be landed in California and offloaded within 24 hours of the August 29 closure (C.6). During September, all fish must be landed south of Point Arena (C.6). See compliance requirements (C.1) and gear restrictions and definitions (C.2, C.3). **Point Reyes to Point San Pedro (Fall Area Target Zone)** • October 1-3, 6-10, and 13-15. All salmon except coho (C.4, C.7). Chinook minimum size limit of 26 inches total length (B, C.1). All fish caught in this area must be landed between Point Arena and Pigeon Point (C.6). See compliance requirements (C.1) and gear restrictions and definitions (C.2, C.3).	**Pt. Arena to Pigeon Pt. (San Francisco)** • May 1-31; • June 8-30; • July 17-31; • August 1-29; • September 1-30 (C.9.b). Seven days per week. All salmon except coho (C.4, C.7). Chinook minimum size limit of 27 inches total length prior to September 1, 26 inches thereafter (B, C.1). All fish must be landed in California and offloaded within 24 hours of the August 29 closure (C.6). During September, all fish must be landed south of Point Arena (C.6). See compliance requirements (C.1) and gear restrictions and definitions (C.2, C.3). **Point Reyes to Point San Pedro (Fall Area Target Zone)** • October 1-3, 6-10, and 13-15. All salmon except coho (C.4, C.7). Chinook minimum size limit of 26 inches total length (B, C.1). All fish caught in this area must be landed between Point Arena and Pigeon Point (C.6). See compliance requirements (C.1) and gear restrictions and definitions (C.2, C.3).
Pigeon Point to U.S./Mexico Border (Monterey) • May 1-31; • June 1-30; • July 8-31; • August 1-29; • September 1-30 (C.9.b). Seven days per week. All salmon except coho (C.4, C.7). Chinook minimum size limit of 27 inches total length prior to September 1, 26 inches thereafter (B, C.1). All fish must be landed in California and offloaded within 24 hours of the August 29 closure (C.6). During September, all fish must be landed south of Point Arena (C.6). See compliance requirements (C.1) and gear restrictions and definitions (C.2, C.3).	**Pigeon Point to U.S./Mexico Border (Monterey))** • May 1-31; • June 8-30; • July 8-31; • August 1-29; • September 1-30 (C.9.b). Seven days per week. All salmon except coho (C.4, C.7). Chinook minimum size limit of 27 inches total length prior to September 1, 26 inches thereafter (B, C.1). All fish must be landed in California and offloaded within 24 hours of the August 29 closure (C.6). During September, all fish must be landed south of Point Arena (C.6). See compliance requirements (C.1) and gear restrictions and definitions (C.2, C.3).	**Pigeon Point to U.S./Mexico Border (Monterey)** • May 1-31; • June 8-30; • July 17-31; • August 1-29; • September 1-30 (C.9.b). Seven days per week. All salmon except coho (C.4, C.7). Chinook minimum size limit of 27 inches total length prior to September 1, 26 inches thereafter (B, C.1). All fish must be landed in California and offloaded within 24 hours of the August 29 closure (C.6). During September, all fish must be landed south of Point Arena (C.6). See compliance requirements (C.1) and gear restrictions and definitions (C.2, C.3).

California State regulations require all salmon be made available to a California Department of Fish and Wildlife (CDFW) representative for sampling immediately at port of landing. Any person in possession of a salmon with a missing adipose fin, upon request by an authorized agent or employee of the CDFW, shall immediately relinquish the head of the salmon to the state. (California Fish and Game Code §8226)

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

		Chinook		Coho		
Area (when open)		Total Length	Head-off	Total Length	Head-off	Pink
North of Cape Falcon		28.0	21.5	16.0	12.0	None
Cape Falcon to OR/CA Border		28.0	21.5	-	-	None
OR/CA Border to Humboldt South Jetty		27.0	20.5	-	-	None
Horse Mt. to Pt. Arena		27.0	20.5	-	-	None
Pt. Arena to U.S./Mexico Border	≤ Aug. 29	27.0	20.5	-	-	None
	≥ Sept. 1	26.0	19.5	-	-	None

C. REQUIREMENTS, DEFINITIONS, RESTRICTIONS, OR EXCEPTIONS

C.1. Compliance with Minimum Size or Other Special Restrictions: All salmon on board a vessel must meet the minimum size, landing/possession limit, or other special requirements for the area being fished and the area in which they are landed if the area is open or has been closed less than 96 hours for that species of salmon. Salmon may be landed in an area that has been closed for a species of salmon more than 96 hours only if they meet the minimum size, landing/possession limit, or other special requirements for the area in which they were caught.

States may require fish landing/receiving tickets be kept on board the vessel for 90 days after landing to account for all previous salmon landings.

C.2. Gear Restrictions:

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

C.3. Gear Definitions:

Trolling defined: Fishing from a boat or floating device that is making way by means of a source of power, other than drifting by means of the prevailing water current or weather conditions.

Troll fishing gear defined: One or more lines that drag hooks behind a moving fishing vessel. In that portion of the fishery management area off Oregon and Washington, the line or lines must be affixed to the vessel and must not be intentionally disengaged from the vessel at any time during the fishing operation.

Spread defined: A single leader connected to an individual lure and/or bait.

Circle hook defined: A hook with a generally circular shape and a point which turns inward, pointing directly to the shank at a 90º angle.

C.4. Vessel Operation in Closed Areas with Salmon on Board:

a. Except as provided under C.4.b below, it is unlawful for a vessel to have troll or recreational gear in the water while in any area closed to fishing for a certain species of salmon, while possessing that species of salmon; however, fishing for species other than salmon is not prohibited if the area is open for such species, and no salmon are in possession.

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

b. When Genetic Stock Identification (GSI) samples will be collected in an area closed to commercial salmon fishing, the scientific research permit holder shall notify NOAA OLE, USCG, CDFW and OSP at least 24 hours prior to sampling and provide the following information: the vessel name, date, location and time collection activities will be done. Any vessel collecting GSI samples in a closed area shall not possess any salmon other than those from which GSI samples are being collected. Salmon caught for collection of GSI samples must be immediately released in good condition after collection of samples.

C.5. Control Zone Definitions:

a. *Cape Flattery Control Zone* - The area from Cape Flattery (48º23'00" N. lat.) to the northern boundary of the U.S. EEZ; and the area from Cape Flattery south to Cape Alava (48º10'00" N. lat.) and east of 125º05'00" W. long.

b. *Mandatory Yelloweye Rockfish Conservation Area* – The area in Washington Marine Catch Area 3 from 48°00.00' N. lat.; 125°14.00' W. long. to 48°02.00' N. lat.; 125°14.00' W. long. to 48°02.00' N. lat.; 125°16.50' W. long. to 48°00.00' N. lat.; 125°16.50' W. long. and connecting back to 48°00.00' N. lat.; 125°14.00' W. long.

c. *Grays Harbor Control Zone* - The area defined by a line drawn from the Westport Lighthouse (46° 53'18" N. lat., 124° 07'01" W. long.) to Buoy #2 (46° 52'42" N. lat., 124°12'42" W. long.) to Buoy #3 (46° 55'00" N. lat., 124°14'48" W. long.) to the Grays Harbor north jetty (46° 55'36" N. lat., 124°10'51" W. long.).

d. *Columbia Control Zone* - An area at the Columbia River mouth, bounded on the west by a line running northeast/southwest between the red lighted Buoy #4 (46°13'35" N. lat., 124°06'50" W. long.) and the green lighted Buoy #7 (46°15'09' N. lat., 124°06'16" W. long.); on the east, by the Buoy #10 line which bears north/south at 357° true from the south jetty at 46°14'00" N. lat.,124°03'07" W. long. to its intersection with the north jetty; on the north, by a line running northeast/southwest between the green lighted Buoy #7 to the tip of the north jetty (46°15'48" N. lat., 124°05'20" W. long.), and then along the north jetty to the point of intersection with the Buoy #10 line; and, on the south, by a line running northeast/southwest between the red lighted Buoy #4 and tip of the south jetty (46°14'03" N. lat., 124°04'05" W. long.), and then along the south jetty to the point of intersection with the Buoy #10 line.

e. *Klamath Control Zone* - The ocean area at the Klamath River mouth bounded on the north by 41°38'48" N. lat. (approximately six nautical miles north of the Klamath River mouth); on the west, by 124°23'00" W. long. (approximately 12 nautical miles off shore); and on the south, by 41°26'48" N. lat. (approximately six nautical miles south of the Klamath River mouth).

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

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

C.7. Incidental Halibut Harvest: During authorized periods, the operator of a vessel that has been issued an incidental halibut harvest license may retain Pacific halibut caught incidentally in Area 2A while trolling for salmon. Halibut retained must be no less than 32 inches in total length, measured from the tip of the lower jaw with the mouth closed to the extreme end of the middle of the tail, and must be landed with the head on. License applications for incidental harvest must be obtained from the International Pacific Halibut Commission (phone: 206-634-1838). Applicants must apply prior to April 1, 2013 for 2013 permits and mid-March 2014 (*exact date to be set by the IPHC in early 2014*) for 2014 permits. Incidental harvest is authorized only during May and June of the 2013 troll seasons and April, May, and June of the 2014 troll seasons and after June 30 in 2013 or 2014 if quota remains and if announced on the NMFS hotline (phone: 800-662-9825). WDFW, ODFW, and CDFW will monitor landings. If the landings are projected to exceed the 30,568 pound preseason allocation or the total Area 2A non-Indian commercial halibut allocation, NMFS will take inseason action to prohibit retention of halibut in the non-Indian salmon troll fishery.

Alternative I - May 1, 2014 through December 31, 2014 and April 1-30, 2015, license holders may land or possess no more than one Pacific halibut per each three Chinook, except one Pacific halibut may be possessed or landed without meeting the ratio requirement, and no more than 15 halibut may be possessed or landed per trip. Pacific halibut retained must be no less than 32 inches in total length (with head on).
Alternative II - May 1, 2014 through December 31, 2014 and April 1-30, 2015, license holders may land or possess no more than ____ Pacific halibut per each _____ Chinook, except one Pacific halibut may be possessed or landed without meeting the ratio requirement, and no more than ___ halibut may be possessed or landed per trip. Pacific halibut retained must be no less than 32 inches in total length (with head on).
Alternative III - May 1, 2014 through December 31, 2014 and April 1-30, 2015, license holders may land or possess no more than ____ Pacific halibut per each _____ Chinook, except one Pacific halibut may be possessed or landed without meeting the ratio requirement, and no more than ___ halibut may be possessed or landed per trip. Pacific halibut retained must be no less than 32 inches in total length (with head on).

TABLE 1. Commercial troll management Alternatives collated by the STT for non-Indian ocean salmon fisheries, 2014. (Page 9 of 9)	3/9/2014 9:52 PM
C. REQUIREMENTS, DEFINITIONS, RESTRICTIONS, OR EXCEPTIONS (continued)	

Incidental Pacific halibut catch regulations in the commercial salmon troll fishery adopted for 2014, prior to any 2014 inseason action, will be in effect when incidental Pacific halibut retention opens on April 1, 2015 unless otherwise modified by inseason action at the March 2015 Council meeting.

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a. "C-shaped" yelloweye rockfish conservation area is an area to be voluntarily avoided for salmon trolling. NMFS and the Council request salmon trollers voluntarily avoid this area in order to protect yelloweye rockfish. The area is defined in the Pacific Council Halibut Catch Sharing Plan in the North Coast subarea (Washington marine area 3), with the following coordinates in the order listed:
48°18' N. lat.; 125°18' W. long.;
48°18' N. lat.; 124°59' W. long.;
48°11' N. lat.; 124°59' W. long.;
48°11' N. lat.; 125°11' W. long.;
48°04' N. lat.; 125°11' W. long.;
48°04' N. lat.; 124°59' W. long.;
48°00' N. lat.; 124°59' W. long.;
48°00' N. lat.; 125°18' W. long.;
and connecting back to 48°18' N. lat.; 125°18' W. long.

C.8. Inseason Management: In addition to standard inseason actions or modifications already noted under the season description, the following inseason guidance is provided to NMFS:

a. Chinook remaining from the May through June non-Indian commercial troll harvest guideline north of Cape Falcon may be transferred to the July through September harvest guideline if the transfer would not result in exceeding preseason impact expectations on any stocks.
b. If at least 35,000 coho are available for the recreational non-selective coho salmon season quota between Cape Falcon and Humbug Mt. (combined initial quota and impact neutral rollover from the recreational selective coho between Cape Falcon and the Oregon-California Border). Consideration will be made to transfer any remaining coho in excess of the recreational quota to the commercial troll season between Cape Falcon and Humbug Mt. Landing week limits and coho per Chinook ratios may be adjusted inseason.
c. Chinook remaining from the June and/or July non-Indian commercial troll quotas in the Oregon KMZ may be transferred to the Chinook quota for the next open period if the transfer would not result in exceeding preseason impact expectations on any stocks.
d. NMFS may transfer fish between the recreational and commercial fisheries north of Cape Falcon if there is agreement among the areas' representatives on the Salmon Advisory Subpanel (SAS), and if the transfer would not result in exceeding preseason impact expectations on any stocks.
e. At the March 2015 meeting, the Council will consider inseason recommendations for special regulations for any experimental fisheries (proposals must meet Council protocol and be received in November 2014).
f. If retention of unmarked coho is permitted by inseason action, the allowable coho quota will be adjusted to ensure preseason projected impacts on all stocks is not exceeded.
g. Landing limits may be modified inseason to sustain season length and keep harvest within overall quotas.

C.9. State Waters Fisheries: Consistent with Council management objectives:

a. The State of Oregon may establish additional late-season fisheries in state waters.
b. The State of California may establish limited fisheries in selected state waters.

Check state regulations for details.

C.10. For the purposes of California Fish and Game Code, Section 8232.5, the definition of the Klamath Management Zone (KMZ) for the ocean salmon season shall be that area from Humbug Mountain, Oregon, to Horse Mountain, California.

TABLE 2. Recreational management Alternatives collated by the STT for non-Indian ocean salmon fisheries, 2014. (Page 1 of 9) 3/9/2014 9:52 PM

A. SEASON ALTERNATIVE DESCRIPTIONS

ALTERNATIVE I	ALTERNATIVE II	ALTERNATIVE III
North of Cape Falcon	**North of Cape Falcon**	**North of Cape Falcon**
Supplemental Management Information	**Supplemental Management Information**	**Supplemental Management Information**
1. Overall non-Indian TAC: __,___ (non-mark-selective equivalent of 125,000) Chinook and 250,000 coho marked with a healed adipose fin clip (marked). 2. Recreational TAC: __,___ (non-mark selective equivalent of __,___) Chinook and 210,000 marked coho; all retained coho must be marked. 4. No Area 4B add-on fishery. 5. Buoy 10 fishery opens August 1 with an expected landed catch of 50,000 marked coho in August and September. 6. Overall Chinook and/or coho TACs may need to be reduced or fisheries adjusted to meet NMFS ESA guidance, FMP requirements, upon conclusion of negotiations in the North of Falcon forum, or upon receipt of preseason catch and abundance expectations for Canadian and Alaskan fisheries.	1. Overall non-Indian TAC: __,___ (non-mark-selective equivalent of 110,000) Chinook and 220,000 coho marked with a healed adipose fin clip (marked). 2. Recreational TAC: __,___ (non-mark selective equivalent of __,___) Chinook and 184,800 marked coho; all retained coho must be marked. 4. No Area 4B add-on fishery. 5. Buoy 10 fishery opens August 1 with an expected landed catch of 60,000 marked coho in August and September. 6. Overall Chinook and/or coho TACs may need to be reduced or fisheries adjusted to meet NMFS ESA guidance, FMP requirements, upon conclusion of negotiations in the North of Falcon forum, or upon receipt of preseason catch and abundance expectations for Canadian and Alaskan fisheries.	1.Overall non-Indian TAC: __,___ (non-mark-selective equivalent of 95,000) Chinook and 190,000 coho marked with a healed adipose fin clip (marked). 2. Recreational TAC: __,___ (non-mark selective equivalent of __,___) Chinook and 159,600 marked coho; all retained coho must be marked. 4. No Area 4B add-on fishery. 5. Buoy 10 fishery opens August 1 with an expected landed catch of 70,000 marked coho in August and September. 6. Overall Chinook and/or coho TACs may need to be reduced or fisheries adjusted to meet NMFS ESA guidance, FMP requirements, upon conclusion of negotiations in the North of Falcon forum, or upon receipt of preseason catch and abundance expectations for Canadian and Alaskan fisheries.
U.S./Canada Border to Queets Rivers • May 16-17, May 23-24, and May 31-June 20 or a coastwide **marked Chinook quota of 10,000** (C.5). Seven days per week. Two fish per day, all salmon except coho, **all Chinook must be marked with a healed adipose fin clip (C.1).** Chinook 24-inch total length minimum size limit (B). See gear restrictions (C.2). Inseason management may be used to sustain season length and keep harvest within the overall Chinook recreational TAC for north of Cape Falcon (C.5).	**U.S./Canada Border to Queets Rivers** • May 23-24 and June 7-20 or a coastwide **marked Chinook quota of 8,000** (C.5). Seven days per week. Two fish per day, all salmon except coho, **all Chinook must be marked with a healed adipose fin clip (C.1).** Chinook 24-inch total length minimum size limit (B). See gear restrictions (C.2). Inseason management may be used to sustain season length and keep harvest within the overall Chinook recreational TAC for north of Cape Falcon (C.5).	**U.S./Canada Border to Queets Rivers**
Queets Rivers to Leadbetter Point • May 31 through earlier of June 20 or a coastwide **marked Chinook quota of 10,000** (C.5). Seven days per week. Two fish per day, all salmon except coho, **all Chinook must be marked with a healed adipose fin clip (C.1)**. Chinook 24-inch total length minimum size limit (B). See gear restrictions (C.2). Inseason management may be used to sustain season length and keep harvest within the overall Chinook recreational TAC for north of Cape Falcon (C.5).	**Queets Rivers to Leadbetter Point** • June 7 through earlier of June 20 or a coastwide **marked Chinook quota of 8,000** (C.5). Seven days per week. Two fish per day, all salmon except coho, **all Chinook must be marked with a healed adipose fin clip (C.1)**. Chinook 24-inch total length minimum size limit (B). See gear restrictions (C.2). Inseason management may be used to sustain season length and keep harvest within the overall Chinook recreational TAC for north of Cape Falcon (C.5).	**Queets Rivers to Leadbetter Point**

TABLE 2. Recreational management Alternatives collated by the STT for non-Indian ocean salmon fisheries, 2014. (Page 2 of 9)		3/9/2014 9:52 PM
	A. SEASON ALTERNATIVE DESCRIPTIONS	
ALTERNATIVE I	ALTERNATIVE II	ALTERNATIVE III
Leadbetter Point to Cape Falcon • May 31 through earlier of June 20 or a coastwide **marked Chinook quota of 10,000** (C.5). Seven days per week. Two fish per day, all salmon except coho, **all Chinook must be marked with a healed adipose fin clip (C.1)**. Chinook 24-inch total length minimum size limit (B). See gear restrictions (C.2). Inseason management may be used to sustain season length and keep harvest within the overall Chinook recreational TAC for north of Cape Falcon (C.5).	**Leadbetter Point to Cape Falcon** • June 7 through earlier of June 20 or a coastwide **marked Chinook quota of 8,000** (C.5). Seven days per week. Two fish per day, all salmon except coho, **all Chinook must be marked with a healed adipose fin clip (C.1)**. Chinook 24-inch total length minimum size limit (B). See gear restrictions (C.2). Inseason management may be used to sustain season length and keep harvest within the overall Chinook recreational TAC for north of Cape Falcon (C.5).	**Leadbetter Point to Cape Falcon**
U.S./Canada Border to Cape Alava (Neah Bay) • June 21 through earlier of September 21 or 21,840 marked coho subarea quota with a subarea guideline of 7,600 Chinook (C.5). Seven days per week. All salmon except no chum beginning August 1; two fish per day. All coho must be marked (C.1). Beginning August 1, Chinook non-retention east of the Bonilla-Tatoosh line (C.4.a) during Council managed ocean fishery. See gear restrictions and definitions (C.2, C.3). Inseason management may be used to sustain season length and keep harvest within the overall Chinook and coho recreational TACs for north of Cape Falcon (C.5).	**U.S./Canada Border to Cape Alava (Neah Bay)** • June 21 through earlier of September 21 or 19,220 marked coho subarea quota with a subarea guideline of 6,900 Chinook (C.5). Seven days per week. All salmon except no chum beginning August 1; two fish per day. All coho must be marked (C.1). Beginning August 1, Chinook non-retention east of the Bonilla-Tatoosh line (C.4.a) during Council managed ocean fishery. See gear restrictions and definitions (C.2, C.3). Inseason management may be used to sustain season length and keep harvest within the overall Chinook and coho recreational TACs for north of Cape Falcon (C.5).	**U.S./Canada Border to Cape Alava (Neah Bay)** • June 14 through earlier of September 21 or 16,600 marked coho subarea quota with a subarea guideline of 6,600 Chinook (C.5). Seven days per week. All salmon except no chum beginning August 1; two fish per day. All coho must be marked (C.1). Beginning August 1, Chinook non-retention east of the Bonilla-Tatoosh line (C.4.a) during Council managed ocean fishery. See gear restrictions and definitions (C.2, C.3). Inseason management may be used to sustain season length and keep harvest within the overall Chinook and coho recreational TACs for north of Cape Falcon (C.5).
Cape Alava to Queets River (La Push Subarea) • June 21 through earlier of September 21 or 5,410 marked coho subarea quota with a subarea guideline of 2,650 Chinook (C.5). • September 27 through earlier of October 12 or 50 marked coho quota or 50 Chinook quota (C.5) in the area north of 47°50'00 N. lat. and south of 48°00'00" N. lat. Seven days per week. All salmon, two fish per day. All coho must be marked (see *Ocean Boat Limits*, C.1). See gear restrictions and definitions (C.2, C.3). Inseason management may be used to sustain season length and keep harvest within the overall Chinook and coho recreational TACs for north of Cape Falcon (C.5).	**Cape Alava to Queets River (La Push Subarea)** • June 21 through earlier of September 21 or 4,750 marked coho subarea quota with a subarea guideline of 2,350 Chinook (C.5). • September 27 through earlier of October 12 or 50 marked coho quota or 50 Chinook quota (C.5) in the area north of 47°50'00 N. lat. and south of 48°00'00" N. lat. Seven days per week. All salmon, two fish per day. All coho must be marked (see *Ocean Boat Limits*, C.1). See gear restrictions and definitions (C.2, C.3). Inseason management may be used to sustain season length and keep harvest within the overall Chinook and coho recreational TACs for north of Cape Falcon (C.5).	**Cape Alava to Queets River (La Push Subarea)** • June 14 through earlier of September 21 or 4,100 marked coho subarea quota with a subarea guideline of 2,250 Chinook (C.5). • September 27 through earlier of October 12 or 50 marked coho quota or 50 Chinook quota (C.5) in the area north of 47°50'00 N. lat. and south of 48°00'00" N. lat. Seven days per week. All salmon, two fish per day. All coho must be marked (see *Ocean Boat Limits*, C.1). See gear restrictions and definitions (C.2, C.3). Inseason management may be used to sustain season length and keep harvest within the overall Chinook and coho recreational TACs for north of Cape Falcon (C.5).

TABLE 2. Recreational management Alternatives collated by the STT for non-Indian ocean salmon fisheries, 2014. (Page 3 of 9) 3/9/2014 9:52 PM

A. SEASON ALTERNATIVE DESCRIPTIONS

ALTERNATIVE I	ALTERNATIVE II	ALTERNATIVE III
Queets River to Leadbetter Point (Westport Subarea) • June 21 through earlier of September 30 or 77,700 marked coho subarea quota with a subarea guideline of 30,300 Chinook (C.5). Seven days per week. All salmon; two fish per day. All coho must be marked (C.1). See gear restrictions and definitions (C.2, C.3). Grays Harbor Control Zone closed beginning August 11 (C.4). Inseason management may be used to sustain season length and keep harvest within the overall Chinook and coho recreational TACs for north of Cape Falcon (C.5).	**Queets River to Leadbetter Point (Westport Subarea)** • June 21 through earlier of September 21 or 68,300 marked coho subarea quota with a subarea guideline of 27,600 Chinook (C.5). Seven days per week. All salmon; two fish per day, no more than one of which can be a Chinook. All coho must be marked (C.1). See gear restrictions and definitions (C.2, C.3). Grays Harbor Control Zone closed beginning August 11 (C.4). Inseason management may be used to sustain season length and keep harvest within the overall Chinook and coho recreational TACs for north of Cape Falcon (C.5).	**Queets River to Leadbetter Point (Westport Subarea)** • June 15 through earlier of September 30 or 59,050 marked coho subarea quota with a subarea guideline of 26,200 Chinook (C.5). Five days per week, Sunday through Thursday. All salmon; two fish per day, no more than one of which can be a Chinook. All coho must be marked (C.1). See gear restrictions and definitions (C.2, C.3). Grays Harbor Control Zone closed beginning August 11 (C.4). Inseason management may be used to sustain season length and keep harvest within the overall Chinook and coho recreational TACs for north of Cape Falcon (C.5).
Leadbetter Point to Cape Falcon (Columbia River Subarea) • June 21.through earlier of September 30 or 105,000 marked coho subarea quota with a subarea guideline of 14,400 Chinook (C.5). Seven days per week. All salmon, two fish per day. All coho must be marked (C.1). See gear restrictions and definitions (C.2, C.3). Columbia Control Zone closed (C.4). Inseason management may be used to sustain season length and keep harvest within the overall Chinook and coho recreational TACs for north of Cape Falcon (C.5).	**Leadbetter Point to Cape Falcon (Columbia River Subarea)** • June 21 through earlier of September 30 or 92,400 marked coho subarea quota with a subarea guideline of 13,100 Chinook (C.5). Seven days per week. All salmon, two fish per day, only one of which can be a Chinook. All coho must be marked (C.1). See gear restrictions and definitions (C.2, C.3). Columbia Control Zone closed (C.4). Inseason management may be used to sustain season length and keep harvest within the overall Chinook and coho recreational TACs for north of Cape Falcon (C.5).	**Leadbetter Point to Cape Falcon (Columbia River Subarea)** • June 14 through earlier of September 30 or 79,800 marked coho subarea quota with a subarea guideline of 12,400 Chinook (C.5). Seven days per week. All salmon, two fish per day, only one of which can be a Chinook. All coho must be marked (C.1). See gear restrictions and definitions (C.2, C.3). Columbia Control Zone closed (C.4). Inseason management may be used to sustain season length and keep harvest within the overall Chinook and coho recreational TACs for north of Cape Falcon (C.5).

TABLE 2. Recreational management Alternatives collated by the STT for non-Indian ocean salmon fisheries, 2014. (Page 4 of 9) 3/9/2014 9:52 PM

A. SEASON ALTERNATIVE DESCRIPTIONS

South of Cape Falcon	**South of Cape Falcon**	**South of Cape Falcon**
ALTERNATIVE I	ALTERNATIVE II	ALTERNATIVE III
Supplemental Management Information	**Supplemental Management Information**	**Supplemental Management Information**
1. Sacramento River Basin recreational fishery catch assumption: __,___ adult Sacramento River fall Chinook (__._ % of the total allowable harvest). 2. Sacramento River fall Chinook spawning escapement of ___,___ adults. 3. Klamath River recreational fishery allocation: __,___ adult Klamath River fall Chinook. 4. Klamath tribal allocation: ___,___ adult Klamath River fall Chinook. 5. Overall recreational coho TAC: __,___ mark-selective coho fishery and __,___ in the non-mark-selective coho fishery. 6. Fisheries may need to be adjusted to meet NMFS ESA consultation standards, FMP requirements, other management objectives, or upon receipt of new allocation recommendations from the CFGC.	1. Sacramento River Basin recreational fishery catch assumption: __,___ adult Sacramento River fall Chinook (__._ % of the total allowable harvest). 2. Sacramento River fall Chinook spawning escapement of ___,___ adults. 3. Klamath River recreational fishery allocation: __,___ adult Klamath River fall Chinook. 4. Klamath tribal allocation: ___,___ adult Klamath River fall Chinook. 5. Overall recreational coho TAC: __,___ mark-selective coho fishery and __,___ in the non-mark-selective coho fishery. 6. Fisheries may need to be adjusted to meet NMFS ESA consultation standards, FMP requirements, other management objectives, or upon receipt of new allocation recommendations from the CFGC.	1. Sacramento River Basin recreational fishery catch assumption: __,___ adult Sacramento River fall Chinook (__._ % of the total allowable harvest). 2. Sacramento River fall Chinook spawning escapement of ___,___ adults. 3. Klamath River recreational fishery allocation: __,___ adult Klamath River fall Chinook. 4. Klamath tribal allocation: ___,___ adult Klamath River fall Chinook. 5. Overall recreational coho TAC: __,___ mark-selective coho fishery and __,___ in the non-mark-selective coho fishery. 6. Fisheries may need to be adjusted to meet NMFS ESA consultation standards, FMP requirements, other management objectives, or upon receipt of new allocation recommendations from the CFGC.
Cape Falcon to Humbug Mt. • March **15** through October **31** (C.6), except as provided below during the summer all-salmon mark-selective and September non-mark-selective coho fisheries. Seven days per week. All salmon except coho; two fish per day (C.1). Chinook minimum size limit of 24 inches total length (B). See gear restrictions and definitions (C.2, C.3). • **Non-mark-selective coho fishery**: **September 1 through the earlier of September 30 or a landed catch of 20,000 non-mark-selective coho quota** (C.5). **All salmon**, two fish per day (C.5); The all salmon except coho season reopens the earlier of October 1 or attainment of the coho quota (C.5). In 2015, the season between Cape Falcon and Humbug Mountain will open March 15 for all salmon except coho, two fish per day (B, C.1, C.2, C.3).	**Cape Falcon to Humbug Mt.** • March **15** through October **31** (C.6), except as provided below during the summer all-salmon mark-selective and September non-mark-selective coho fisheries. Seven days per week. All salmon except coho; two fish per day (C.1). Chinook minimum size limit of 24 inches total length (B). See gear restrictions and definitions (C.2, C.3). • **Non-mark-selective coho fishery**: **September 1 through the earlier of September 30 or a landed catch of 25,000 non-mark-selective coho quota** (C.5). **All salmon**, two fish per day (C.5); The all salmon except coho season reopens the earlier of October 1 or attainment of the coho quota (C.5). In 2015, same as Alternative I	**Cape Falcon to Humbug Mt.** • March **15** through October **31** (C.6), except as provided below during the summer all-salmon mark-selective and September non-mark-selective coho fisheries. Seven days per week. All salmon except coho; two fish per day (C.1). Chinook minimum size limit of 24 inches total length (B). See gear restrictions and definitions (C.2, C.3). • **Non-mark-selective coho fishery**: **August 30 through the earlier of September 30 or a landed catch of 20,000 non-mark-selective coho quota** (C.5). **All salmon**, two fish per day (C.5); The all salmon except coho season reopens the earlier of October 1 or attainment of the coho quota (C.5). In 2015, same as Alternative I

Fishing in the Stonewall Bank yelloweye rockfish conservation area restricted to trolling only on days the all depth recreational halibut fishery is open (call the halibut fishing hotline 1-800-662-9825 for specific dates) (C.3.b, C.4.d).

TABLE 2. Recreational management Alternatives collated by the STT for non-Indian ocean salmon fisheries, 2014. (Page 5 of 9) 3/9/2014 9:52 PM

A. SEASON ALTERNATIVE DESCRIPTIONS

ALTERNATIVE I	ALTERNATIVE II	ALTERNATIVE III
Cape Falcon to OR/CA Border • All-**salmon mark-selective coho fishery**: **June 21** through earlier of **August 10** or a landed catch of **80,000** marked coho. Seven days per week. All salmon, two fish per day. All retained coho must be marked (C.1). Chinook minimum size limit of 24 inches total length (B). Any remainder of the mark selective coho quota will be transferred on an impact neutral basis to the September non-selective coho quota from Cape Falcon to Humbug Mountain. The all salmon except coho season reopens the earlier of August 11 or attainment of the coho quota. Fishing in the Stonewall Bank yelloweye rockfish conservation area restricted to trolling only on days the all depth recreational halibut fishery is open (call the halibut fishing hotline 1-800-662-9825 for specific dates) (C.3.b, C.4.d).	**Cape Falcon to OR/CA Border** • All-**salmon mark-selective coho fishery**: **June 28** through earlier of **August 3** or a landed catch of **65,000** marked coho. Seven days per week. All salmon, two fish per day. All retained coho must be marked (C.1). Chinook minimum size limit of 24 inches total length (B). Any remainder of the mark selective coho quota will be transferred on an impact neutral basis to the September non-selective coho quota from Cape Falcon to Humbug Mountain. The all salmon except coho season reopens the earlier of August 4 or attainment of the coho quota. Fishing in the Stonewall Bank yelloweye rockfish conservation area restricted to trolling only on days the all depth recreational halibut fishery is open (call the halibut fishing hotline 1-800-662-9825 for specific dates) (C.3.b, C.4.d).	**Cape Falcon to OR/CA Border** • All-**salmon mark-selective coho fishery**: **July 1** through earlier of **July 31** or a landed catch of **50,000** marked coho. Seven days per week. All salmon, two fish per day. All retained coho must be marked (C.1). Chinook minimum size limit of 24 inches total length (B). Any remainder of the mark selective coho quota will be transferred on an impact neutral basis to the September non-selective coho quota from Cape Falcon to Humbug Mountain. The all salmon except coho season reopens the earlier of August 1 or attainment of the coho quota. Fishing in the Stonewall Bank yelloweye rockfish conservation area restricted to trolling only on days the all depth recreational halibut fishery is open (call the halibut fishing hotline 1-800-662-9825 for specific dates) (C.3.b, C.4.d).
Humbug Mt. to OR/CA Border. (Oregon KMZ) • May 1 through September 7 except as provided above during the all-salmon mark-selective coho fishery (C.6). All salmon except coho, except as noted above in the all-salmon mark-selective coho fishery. Seven days per week, two fish per day (C.1). Chinook minimum size limit of 24 inches total length (B). See gear restrictions and definitions (C.2, C.3).	**Humbug Mt. to OR/CA Border. (Oregon KMZ)** • May 17 through September 7 except as provided above during the all-salmon mark-selective coho fishery (C.6). All salmon except coho, except as noted above in the all-salmon mark-selective coho fishery. Seven days per week, two fish per day (C.1). Chinook minimum size limit of 24 inches total length (B). See gear restrictions and definitions (C.2, C.3).	**Humbug Mt. to OR/CA Border. (Oregon KMZ)** • May 24 through September 1 except as provided above during the all-salmon mark-selective coho fishery (C.6). All salmon except coho, except as noted above in the all-salmon mark-selective coho fishery. Seven days per week, two fish per day (C.1). Chinook minimum size limit of 20 inches total length (B). See gear restrictions and definitions (C.2, C.3).
OR/CA Border to Horse Mt. (California KMZ) • May 1 through September 7 (C.6). Seven days per week. All salmon except coho, two fish per day (C.1). Chinook minimum size limit of 24 inches total length (B). See gear restrictions and definitions (C.2, C.3). Klamath Control Zone closed in August (C.4.e). See California State regulations for additional closures adjacent to the Smith, Eel, and Klamath rivers.	**OR/CA Border to Horse Mt. (California KMZ)** • May 17 through September 7 (C.6). Seven days per week. All salmon except coho, two fish per day (C.1). Chinook minimum size limit of 24 inches total length (B). See gear restrictions and definitions (C.2, C.3). Klamath Control Zone closed in August (C.4.e). See California State regulations for additional closures adjacent to the Smith, Eel, and Klamath rivers.	**OR/CA Border to Horse Mt. (California KMZ)** • May 24 through September 1 (C.6). Seven days per week. All salmon except coho, two fish per day (C.1). Chinook minimum size limit of 20 inches total length (B). See gear restrictions and definitions (C.2, C.3). Klamath Control Zone closed in August (C.4.e). See California State regulations for additional closures adjacent to the Smith, Eel, and Klamath rivers.

TABLE 2. Recreational management Alternatives collated by the STT for non-Indian ocean salmon fisheries, 2014. (Page 6 of 9) 3/9/2014 9:52 PM

A. SEASON ALTERNATIVE DESCRIPTIONS

ALTERNATIVE I	ALTERNATIVE II	ALTERNATIVE III
Horse Mt. to Point Arena (Fort Bragg) • April 5 through November 9. Seven days per week. All salmon except coho, two fish per day (C.1). Chinook minimum size limit of 20 inches total length (B). See gear restrictions and definitions (C.2, C.3). In 2015, season opens April 4 for all salmon except coho, two fish per day (C.1). Chinook minimum size limit of 20 inches total length (B); and the same gear restrictions as in 2014 (C.2, C.3).	**Horse Mt. to Point Arena (Fort Bragg)** • April 5 through November 2. Seven days per week. All salmon except coho, two fish per day (C.1). Chinook minimum size limit of 20 inches total length (B). See gear restrictions and definitions (C.2, C.3). In 2015, same as Alternative I.	**Horse Mt. to Point Arena (Fort Bragg)** • April 5 through November 2. Seven days per week. All salmon except coho, two fish per day (C.1). Chinook minimum size limit of 24 inches total length (B). See gear restrictions and definitions (C.2, C.3). In 2015, same as Alternative I.
Point Arena to Pigeon Point (San Francisco) • April 5 through November 9. Seven days per week. All salmon except coho, two fish per day (C.1). Chinook minimum size limit of 20 inches total length (B). See gear restrictions and definitions (C.2, C.3). In 2015, season opens April 4 for all salmon except coho, two fish per day (C.1). Chinook minimum size limit of 24 inches total length (B); and the same gear restrictions as in 2014 (C.2, C.3).	**Point Arena to Pigeon Point (San Francisco)** • April 5 through November 9. Seven days per week. All salmon except coho, two fish per day (C.1). Chinook minimum size limit of 24 inches total length through May 31; 20 inches thereafter (B). See gear restrictions and definitions (C.2, C.3). In 2015, same as Alternative I.	**Point Arena to Pigeon Point (San Francisco)** • April 5 through November 9 Seven days per week. All salmon except coho, two fish per day (C.1). Chinook minimum size limit of 24 inches total length through June 30; 20 inches thereafter (B). See gear restrictions and definitions (C.2, C.3). In 2015, same as Alternative I.
Pigeon Point to U.S./Mexico Border (Monterey South) • April 5 through October 5. Seven days per week. All salmon except coho, two fish per day (C.1). Chinook minimum size limit of 20 inches total length (B). See gear restrictions and definitions (C.2, C.3). In 2015, season opens April 4 for all salmon except coho, two fish per day (C.1). Chinook minimum size limit of 24 inches total length (B); and the same gear restrictions as in 2014 (C.2, C.3).	**Pigeon Point to U.S./Mexico Border (Monterey)** • April 5 through October 5. Seven days per week. All salmon except coho, two fish per day (C.1). Chinook minimum size limit of 24 inches total length through May 31; 20 inches thereafter (B). See gear restrictions and definitions (C.2, C.3). In 2015, same as Alternative I.	**Pigeon Point to U.S./Mexico Border (Monterey)** • April 5 through October 5. Seven days per week. All salmon except coho, two fish per day (C.1). Chinook minimum size limit of 24 inches total length through June 30; 20 inches thereafter (B). See gear restrictions and definitions (C.2, C.3). In 2015, same as Alternative I.

California State regulations require all salmon be made available to a CDFW representative for sampling immediately at port of landing. Any person in possession of a salmon with a missing adipose fin, upon request by an authorized agent or employee of the CDFW, shall immediately relinquish the head of the salmon to the state. (California Fish and Game Code §8226)

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

Area (when open)		Chinook	Coho	Pink
North of Cape Falcon		24.0	16.0	None
Cape Falcon to Humbug Mt.		24.0	16.0	None
Humbug Mt. to OR/CA Border	Alt. I & II	24.0	16.0	None
	Alt.III	20.0	16.0	None
OR/CA Border to Horse Mountain	Alt. I & II	24.0	-	20.0
	Alt. III	20.0		
Horse Mt. to Pt. Arena	Alt. I & II	20.0	-	20.0
	Alt. III	24.0		
Pt. Arena. to U.S./Mexico Border:	Alt. I	20.0	-	24.0
	Alt II ≤ May 31	24.0		20.0
	Alt II ≥ June 1	20.0		26.0
	Alt III ≤ June 30	24.0		20.0
	Alt III ≥ July 1	20.0	-	24.0

C. REQUIREMENTS, DEFINITIONS, RESTRICTIONS, OR EXCEPTIONS

C.1. Compliance with Minimum Size and Other Special Restrictions: All salmon on board a vessel must meet the minimum size or other special requirements for the area being fished and the area in which they are landed if that area is open. Salmon may be landed in an area that is closed only if they meet the minimum size or other special requirements for the area in which they were caught.

Ocean Boat Limits: Off the coast of Washington, Oregon, and California, each fisher aboard a vessel may continue to use angling gear until the combined daily limits of Chinook and coho salmon for all licensed and juvenile anglers aboard have been attained (additional state restrictions may apply).

C. REQUIREMENTS, DEFINITIONS, RESTRICTIONS, OR EXCEPTIONS

C.2. Gear Restrictions: Salmon may be taken only by hook and line using barbless hooks. All persons fishing for salmon, and all persons fishing from a boat with salmon on board, must meet the gear restrictions listed below for specific areas or seasons.

a. *U.S./Canada Border to Point Conception, California*: No more than one rod may be used per angler; and no more than two single point, single shank barbless hooks are required for all fishing gear. [Note: ODFW regulations in the state-water fishery off Tillamook Bay may allow the use of barbed hooks to be consistent with inside regulations.]

b. *Horse Mountain, California, to Point Conception, California*: Single point, single shank, barbless circle hooks (see gear definitions below) are required when fishing with bait by any means other than trolling, and no more than two such hooks shall be used. When angling with two hooks, the distance between the hooks must not exceed five inches when measured from the top of the eye of the top hook to the inner base of the curve of the lower hook, and both hooks must be permanently tied in place (hard tied). Circle hooks are not required when artificial lures are used without bait.

C.3. Gear Definitions:

a. *Recreational fishing gear defined*: Off Oregon and Washington, angling tackle consists of a single line that must be attached to a rod and reel held by hand or closely attended; the rod and reel must be held by hand while playing a hooked fish. No person may use more than one rod and line while fishing off Oregon or Washington. Off California, the line must be attached to a rod and reel held by hand or closely attended; weights directly attached to a line may not exceed four pounds (1.8 kg). While fishing off California north of Point Conception, no person fishing for salmon, and no person fishing from a boat with salmon on board, may use more than one rod and line. Fishing includes any activity which can reasonably be expected to result in the catching, taking, or harvesting of fish.

b. *Trolling defined*: Angling from a boat or floating device that is making way by means of a source of power, other than drifting by means of the prevailing water current or weather conditions.

c. *Circle hook defined*: A hook with a generally circular shape and a point which turns inward, pointing directly to the shank at a 90° angle.

C.4. Control Zone Definitions:

a. *The Bonilla-Tatoosh Line*: A line running from the western end of Cape Flattery to Tatoosh Island Lighthouse (48°23'30" N. lat., 124°44'12" W. long.) to the buoy adjacent to Duntze Rock (48°24'37" N. lat., 124°44'37" W. long.), then in a straight line to Bonilla Point (48°35'39" N. lat., 124°42'58" W. long.) on Vancouver Island, British Columbia.

b. *Grays Harbor Control Zone* - The area defined by a line drawn from the Westport Lighthouse (46° 53'18" N. lat., 124° 07'01" W. long.) to Buoy #2 (46° 52'42" N. lat., 124°12'42" W. long.) to Buoy #3 (46° 55'00" N. lat., 124°14'48" W. long.) to the Grays Harbor north jetty (46° 55'36" N. lat., 124°10'51" W. long.).

c. *Columbia Control Zone*: An area at the Columbia River mouth, bounded on the west by a line running northeast/southwest between the red lighted Buoy #4 (46°13'35" N. lat., 124°06'50" W. long.) and the green lighted Buoy #7 (46°15'09' N. lat., 124°06'16" W. long.); on the east, by the Buoy #10 line which bears north/south at 357° true from the south jetty at 46°14'00" N. lat., 124°03'07" W. long. to its intersection with the north jetty; on the north, by a line running northeast/southwest between the green lighted Buoy #7 to the tip of the north jetty (46°15'48" N. lat., 124°05'20" W. long. and then along the north jetty to the point of intersection with the Buoy #10 line; and on the south, by a line running northeast/southwest between the red lighted Buoy #4 and tip of the south jetty (46°14'03" N. lat., 124°04'05" W. long.), and then along the south jetty to the point of intersection with the Buoy #10 line.

d. *Stonewall Bank Yelloweye Rockfish Conservation Area*: The area defined by the following coordinates in the order listed:

44°37.46' N. lat.; 124°24.92' W. long.;
44°37.46' N. lat.; 124°23.63' W. long.;
44°28.71' N. lat.; 124°21.80' W. long.;
44°28.71' N. lat.; 124°24.10' W. long.;
44°31.42' N. lat.; 124°25.47' W. long.;
and connecting back to 44°37.46' N. lat.; 124°24.92' W. long.

e. *Klamath Control Zone*: The ocean area at the Klamath River mouth bounded on the north by 41°38'48" N. lat. (approximately six nautical miles north of the Klamath River mouth); on the west, by 124°23'00" W. long. (approximately 12 nautical miles off shore); and, on the south, by 41°26'48" N. lat. (approximately 6 nautical miles south of the Klamath River mouth).

TABLE 2. Recreational management measures adopted by the Council for non-Indian ocean salmon fisheries, 2014. (Page 9 of 9)
C. REQUIREMENTS, DEFINITIONS, RESTRICTIONS, OR EXCEPTIONS

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

a. Actions could include modifications to bag limits, or days open to fishing, and extensions or reductions in areas open to fishing.

b. Coho may be transferred inseason among recreational subareas north of Cape Falcon to help meet the recreational season duration objectives (for each subarea) after conferring with representatives of the affected ports and the Council's SAS recreational representatives north of Cape Falcon, and if the transfer would not result in exceeding preseason impact expectations on any stocks.

c. Chinook and coho may be transferred between the recreational and commercial fisheries north of Cape Falcon if there is agreement among the representatives of the Salmon Advisory Subpanel (SAS), and if the transfer would not result in exceeding preseason impact expectations on any stocks.

d. Fishery managers may consider inseason action modifying regulations restricting retention of unmarked coho. To remain consistent with preseason expectations, any inseason action shall consider, if significant, the difference between observed and preseason forecasted mark rates. Such a consideration may also include a change in bag limit of two salmon, no more than one of which may be a coho.

e. Marked coho remaining from the July Cape Falcon to OR/CA border recreational coho quota may be transferred inseason to the September Cape Falcon to Humbug Mountain non-mark-selective recreational fishery if the transfer would not result in exceeding preseason impact expectations on any stocks.

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

TABLE 3. Treaty Indian troll management Alternatives collated by the STT for ocean salmon fisheries, 2014. (Page 1 of 2) 3/9/2014 9:53 PM

A. SEASON ALTERNATIVE DESCRIPTIONS

ALTERNATIVE I	ALTERNATIVE II	ALTERNATIVE III
Supplemental Management Information	**Supplemental Management Information**	**Supplemental Management Information**
,1.Overall Treaty-Indian TAC: 70,000 Chinook and 60,000 coho. 2. Overall Chinook and/or coho TACs may need to be reduced or fisheries adjusted to meet NMFS ESA guidance, FMP requirements, upon conclusion of negotiations in the North of Falcon forum, or upon receipt of preseason catch and abundance expectations for Canadian and Alaskan fisheries	1. Overall Treaty-Indian TAC: 62,500 Chinook and 55,000 coho. 2. Overall Chinook and/or coho TACs may need to be reduced or fisheries adjusted to meet NMFS ESA guidance, FMP requirements, upon conclusion of negotiations in the North of Falcon forum, or upon receipt of preseason catch and abundance expectations for Canadian and Alaskan fisheries	1. Overall Treaty-Indian TAC: 55,000 Chinook and 47,500 coho. 2. Overall Chinook and/or coho TACs may need to be reduced or fisheries adjusted to meet NMFS ESA guidance, FMP requirements, upon conclusion of negotiations in the North of Falcon forum, or upon receipt of preseason catch and abundance expectations for Canadian and Alaskan fisheries
• May 1 through the earlier of June 30 or 42,000 Chinook quota. All salmon except coho. If the Chinook quota is exceeded, the excess will be deducted from the later all-salmon season (C.5). See size limit (B) and other restrictions (C). • July 1 through the earlier of September 15, or 28,000 Chinook quota, or 60,000 coho quota. All Salmon. See size limit (B) and other restrictions (C).	• May 1 through the earlier of June 30 or 36,250 Chinook quota. All salmon except coho. If the Chinook quota is exceeded, the excess will be deducted from the later all-salmon season. See size limit (B) and other restrictions (C). • July 1 through the earlier of September 15, or 26,250 Chinook quota, or 55,000 coho quota. All salmon. See size limit (B) and other restrictions (C).	• May 1 through the earlier of June 30 or 27,500 Chinook quota. All salmon except coho. If the Chinook quota is exceeded, the excess will be deducted from the later all-salmon season. See size limit (B) and other restrictions (C). • July 1 through the earlier of September 15, or 27,500 Chinook quota, or 47,500 coho quota. All salmon. See size limit (B) and other restrictions (C)

TABLE 3. Treaty Indian troll management Alternatives collated by the STT for ocean salmon fisheries, 2014. (Page 2 of 2)	3/9/2014 9:53 PM

B. MINIMUM SIZE (Inches)

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

C. REQUIREMENTS, DEFINITIONS, RESTRICTIONS, OR EXCEPTIONS

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

S'KLALLAM - Washington State Statistical Area 4B (All).

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

QUILEUTE - That portion of the FMA between 48°07'36" N. lat. (Sand Pt.) and 47°31'42" N. lat. (Queets River) and east of 125°44'00" W. long.

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

QUINAULT - That portion of the FMA between 47°40'06" N. lat. (Destruction Island) and 46°53'18"N. lat. (Point Chehalis) and east of 125°44'00" W. long.

C.2. Gear restrictions

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

C.3. Quotas

a. The quotas include troll catches by the S'Klallam and Makah tribes in Washington State Statistical Area 4B from May 1 through September 15.
b. The Quileute Tribe will continue a ceremonial and subsistence fishery during the time frame of September 15 through October 15 in the same manner as in 2004-2013. Fish taken during this fishery are to be counted against treaty troll quotas established for the 2013 season (estimated harvest during the October ceremonial and subsistence fishery: 100 Chinook; 200 coho).

C.4. Area Closures

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

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

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

TABLE 5. Projected key stock escapements (thousands of fish) or management criteria for 2014 ocean fishery Alternatives analyzed by the STT.[a/] (Page 1 of 3)

Key Stock/Criteria	Projected Ocean Escapement[b/] or Other Criteria (Council Area Impacts in Parens) Alternative I	Alternative II	Alternative III	Spawner Objective or Other Comparative Standard as Noted	
			CHINOOK		
Columbia Upriver Brights	917.1	918.5	919.5	74.0	Minimum ocean escapement to attain 60.0 adults over McNary Dam, with normal distribution and no mainstem harvest.
Mid-Columbia Brights	339.3	339.8	340.2	11.0	Minimum ocean escapement to attain 4.7 adults for Bonneville Hatchery and 7.0 for Little White Salmon Hatchery egg-take, assuming average conversion and no mainstem harvest.
Columbia Lower River Hatchery Tules	98.5	100.4	102.9	25.0	Minimum ocean escapement to attain 14.5 adults for hatchery egg-take, with average conversion and no lower river mainstem or tributary harvest.
Columbia Lower River Natural Tules (threatened)	**43.0%**	**41.4%**	39.6%	≤ 41.0%	Total adult equivalent fishery exploitation rate (2014 NMFS ESA guidance).
Columbia Lower River Wild[c/] (threatened)	33.3	33.3	33.4	6.9	Minimum ocean escapement to attain MSY spawner goal of 5.7 for N. Lewis River fall Chinook (NMFS ESA consultation standard).
Spring Creek Hatchery Tules	99.0	103.3	108.5	8.2	Minimum ocean escapement to attain 7.0 adults for Spring Creek Hatchery egg-take, assuming average conversion and no mainstem harvest.
Snake River Fall (threatened) SRFI	51.1%	49.1%	46.9%	≤ 70.0%	Of 1988-1993 base period exploitation rate for all ocean fisheries (NMFS ESA consultation standard).
Klamath River Fall	**33,979**	**33,203**	**32,280**	40,700	MSY natural area adult spawners
Federally recognized tribal harvest	50.0%	50.0%	50.0%	50.0%	Equals 32.4, 32.9, and 33.6 (thousand) adult fish for Yurok and Hoopa Valley tribal fisheries.
Spawner Reduction Rate	**55.8%**	**56.9%**	**58.1%**	≤ 47.1%	FMP; equals 43.0, 43.7, and 44.7 (thousand) fewer natural area adult spawners due to fishing.
Adult river mouth return	89.7	89.3	88.9	NA	Total adults.
Age 4 ocean harvest rate	**19.1%**	**19.5%**	**20.0%**	≤ 16.0%	NMFS ESA consultation standard for threatened California Coastal Chinook.
KMZ sport fishery share	7.7%	7.1%	6.9%		No Council guidance for 2014.
River recreational fishery share	15.0%	15.0%	15.0%	NA	Equals 4.9, 4.9, and 5.0 (thousand) adult fish for recreational inriver fisheries.
Sacramento River Winter (endangered)	**20.9%**	**17.7%**	**16.0%**	≤ 15.4%	Age-3 ocean impact rate in fisheries south of Pt. Arena. In addition, the following season restrictions apply: Recreational- Pt. Arena to Pigeon Pt. between the first Saturday in April and the second Sunday in November; Pigeon Pt. to the U.S./Mexico Border between the first Saturday in April and the first Sunday in October. Minimum size limit ≥ 20 inches total length. Commercial- Pt. Arena to the U.S./Mexico border between May 1 and September 30, except Pt. Reyes to Pt. San Pedro between October 1 and 15. Minimum size limit ≥ 26 inches total length (NMFS 2014 ESA Guidance).

TABLE 5. Projected key stock escapements (thousands of fish) or management criteria for 2014 ocean fishery Alternatives adopted by the Council.[a/] (Page 2 of 3)

Key Stock/Criteria	Projected Ocean Escapement[b/] or Other Criteria (Council Area Impacts in Parens) Alternative I	Alternative II	Alternative III	Spawner Objective or Other Comparative Standard as Noted	
Sacramento River Fall	287.2	295.4	300.4	≥ 190.4	2014 preseason ACL.
Sacramento Index exploitation rate	54.7%	53.5%	52.7%	≤ 70.0%	FMP.
Ocean commercial impacts	222.7	214.5	209.2		All Alternatives include fall (Sept-Dec) 2013 impacts (35.3 thousand SRFC).
Ocean recreational impacts	78.0	76.6	76.1		All Alternatives include fall 2013 impacts (3.8 thousand SRFC).
River recreational impacts	46.8	48.1	48.9		No guidance in 2014.
Hatchery spawner goal	Met	Met	Met	22.0	Aggregate number of adults to achieve egg take goals at Coleman, Feather River, and Nimbus hatcheries.
				COHO	
Interior Fraser (Thompson River)	**12.6% (5.7%)**	**12.0% (5.2%)**	**11.4% (4.5%)**	≤ 10.0%	2014 Southern U.S. exploitation rate ceiling; 2002 PSC coho agreement.
Skagit	37.2% (5.4%)	38.9% (4.9%)	38.6% (4.3%)	≤ 60.0%	2014 total exploitation rate ceiling; FMP matrix[d/]
Stillaguamish	33.0% (3.6%)	32.6% (3.3%)	32.3% (2.9%)	≤ 50.0%	2014 total exploitation rate ceiling; FMP matrix[d/]
Snohomish	31.4% (3.7%)	31.1% (3.3%)	30.8% (2.9%)	≤ 60.0%	2014 total exploitation rate ceiling; FMP matrix[d/]
Hood Canal	56.2% (5.9%)	55.9% (5.3%)	55.5% (4.6%)	≤ 65.0%	2014 total exploitation rate ceiling; FMP matrix[d/]
Strait of Juan de Fuca	14.9% (4.7%)	14.6% (4.4%)	14.0% (3.8%)	≤ 40.0%	2014 total exploitation rate ceiling; FMP matrix[d/]
Quillayute Fall	16.9	17.0	17.1	6.3	FMP MSY adult spawner estimate[d/]. Value depicted is ocean escapement.
Hoh	7.3	7.4	7.6	2.5	FMP MSY adult spawner estimate[d/]. Value depicted is ocean escapement.
Queets Wild	7.8	7.9	8.1	5.8	FMP MSY adult spawner estimate[d/]. Value depicted is ocean escapement.
Grays Harbor	95.6	96.4	97.3	24.4	FMP MSY adult spawner estimate[d/]. Value depicted is ocean escapement.
Lower Columbia River Natural (threatened)	15.7%	14.1%	11.9%	≤ 22.5%	Total marine and mainstem Columbia River fishery exploitation rate (2014 NMFS ESA guidance). Value depicted is ocean fishery exploitation rate only. Bolded values identify ocean exploitation rates that, when combined with 2013 freshwater harvest rates, will exceed the total allowable exploitation rate of 22.5 percent.
Upper Columbia[e/]	>50%	>50%	>50%	≥ 50%	Minimum percentage of the run to Bonneville Dam.
Columbia River Hatchery Early	308.8	320.6	335.4	41.2	Minimum ocean escapement to attain hatchery egg-take goal of 21.8 early adult coho, with average conversion and no mainstem or tributary fisheries.
Columbia River Hatchery Late	245.7	263.0	282.6	8.8	Minimum ocean escapement to attain hatchery egg-take goal of 6.3 late adult coho, with average conversion and no mainstem or tributary fisheries.
Oregon Coastal Natural	23.3%	22.9%	20.7%	≤ 30.0%	Marine and freshwater fishery exploitation rate (NMFS ESA consultation standard).
Southern Oregon/Northern California Coast (threatened)	7.8%	7.5%	7.2%	≤ 13.0%	Marine fishery exploitation rate for R/K hatchery coho (NMFS ESA consultation standard).

TABLE 5. Projected key stock escapements (thousands of fish) or management criteria for 2014 ocean fishery Alternatives analyzed by the STT.[a/] (Page 3 of 3)

a/ Projections in the table assume a WCVI mortality for coho of the 2013 preseason level. Chinook fisheries in Southeast Alaska, North Coast BC, and WCVI troll and outside sport fisheries were assumed to have the same exploitation rates as expected preseason in 2013, as modified by the 2008 PST agreement. Assumptions for these Chinook fisheries will be changed prior to the April meeting when allowable catch levels for 2014 under the PST are known.

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

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

d/ Annual management objectives may be different than FMP goals, and are subject to agreement between WDFW and the treaty tribes under U.S. District Court orders. Total exploitation rate includes Alaskan, Canadian, Council area, Puget Sound, and freshwater fisheries and is calculated as total fishing mortality divided by total fishing mortality plus spawning escapement. These total exploitation rates reflect the initial base package for inside fisheries developed by state and tribal comanagers. It is anticipated that total exploitation rates will be adjusted by state and tribal comanagers during the preseason planning process to comply with stock specific exploitation rate constraints.

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

TABLE 7. Expected coastwide lower Columbia Natural (LCN) Oregon coastal natural (OCN) and Rogue/Klamath (RK) coho, and Lower Columbia River (LCR) tule Chinook exploitation rates by fishery for 2014 ocean fisheries management Alternatives adopted by the Council.

	Exploitation Rate (Percent)											
	LCN Coho			OCN Coho			RK Coho			LCR Tule Chinook		
Fishery	I	II	III	I	II	III	I	II	III	I	II	III
SOUTHEAST ALASKA	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.0%	2.0%	2.0%
BRITISH COLUMBIA	0.1%	0.1%	0.1%	0.3%	0.3%	0.3%	0.0%	0.0%	0.0%	12.7%	12.8%	13.0%
PUGET SOUND/STRAIT	0.2%	0.2%	0.2%	0.1%	0.1%	0.1%	0.0%	0.0%	0.0%	0.4%	0.4%	0.4%
NORTH OF CAPE FALCON												
Treaty Indian Ocean Troll	2.4%	2.2%	2.0%	0.5%	0.5%	0.4%	0.0%	0.0%	0.0%	6.6%	6.0%	5.2%
Recreational	6.4%	5.5%	4.6%	1.1%	0.9%	0.8%	0.0%	0.0%	0.0%	3.6%	3.3%	2.8%
Non-Indian Troll	2.2%	1.9%	1.6%	0.5%	0.4%	0.4%	0.0%	0.0%	0.0%	8.2%	7.1%	6.1%
SOUTH OF CAPE FALCON												
Recreational:										0.1%	0.1%	0.1%
Cape Falcon to Humbug Mt.	3.4%	3.2%	2.5%	8.5%	8.4%	6.5%	0.7%	0.5%	0.3%			
Humbug Mt. to OR/CA border (KMZ)	0.1%	0.1%	0.1%	0.4%	0.4%	0.3%	1.0%	0.9%	0.7%			
OR/CA border to Horse Mt. (KMZ)	0.1%	0.0%	0.0%	0.4%	0.4%	0.4%	1.9%	1.9%	1.7%			
Fort Bragg	0.0%	0.0%	0.0%	0.3%	0.3%	0.3%	1.1%	1.1%	1.1%			
South of Pt. Arena	0.0%	0.0%	0.0%	0.3%	0.3%	0.3%	0.7%	0.7%	0.7%			
Troll:										1.8%	1.8%	1.8%
Cape Falcon to Humbug Mt.	0.7%	0.7%	0.7%	0.9%	0.9%	0.9%	0.2%	0.2%	0.1%			
Humbug Mt. to OR/CA border (KMZ)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	0.0%			
OR/CA border to Horse Mt. (KMZ)	0.0%	0.0%	0.0%	0.1%	0.1%	0.1%	0.4%	0.4%	0.4%			
Fort Bragg	0.0%	0.0%	0.0%	0.5%	0.5%	0.6%	1.2%	1.3%	1.5%			
South of Pt. Arena	0.0%	0.0%	0.0%	0.3%	0.3%	0.3%	0.2%	0.2%	0.2%			
BUOY 10	1.8%	2.0%	2.3%	0.1%	0.1%	0.2%	0.0%	0.0%	0.0%	7.8%	8.0%	8.2%
ESTUARY/FRESHWATER	N/A	N/A	N/A	8.9%	8.9%	8.9%	0.2%	0.2%	0.2%			
TOTAL[a/]	15.7%	14.1%	11.9%	23.3%	22.9%	20.7%	7.8%	7.5%	7.2%	**43.0%**	**41.4%**	39.6%

a/ Totals do not include estuary/freshwater for LCN coho.

TABLE A-1. Sacramento River Winter run Chinook age-3 ocean impact rate south of Pt. Arena by fishery and alternative. The age-3 SRWC impact rate was projected for each of the proposed 2014 fishing season alternatives. The impacts are displayed as a percent for each alternative by fishery, port area, and month.

Commercial

Alternative I 20.9 Total

Port Area	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year Total
SF	0.20	1.00	0.43	0.15	0.01	0.00			1.78
MO	0.44	1.32	0.37	0.67	0.15				2.95
Total	0.65	2.32	0.80	0.82	0.15	0.00	0.00	0.00	**4.73**

Alternative II 17.7 Total

Port Area	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year Total
SF	0.21	0.84	0.45	0.16	0.01	0.00			1.66
MO	0.45	0.80	0.38	0.70	0.15				2.49
Total	0.66	1.64	0.83	0.86	0.16	0.00	0.00	0.00	**4.15**

Alternative II 16.0 Total

Port Area	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year Total
SF	0.21	0.84	0.28	0.16	0.01	0.00			1.50
MO	0.45	0.80	0.24	0.72	0.15				2.37
Total	0.66	1.64	0.53	0.87	0.16	0.00	0.00	0.00	**3.87**

Recreational

Alternative I

Port Area	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year Total
SF	0.54	0.86	1.52	1.95	0.59	0.05	0.16	0.03		5.71
MO	2.65	1.17	2.27	3.32	1.01	0.09	0.00			10.51
Total	3.19	2.04	3.79	5.27	1.60	0.14	0.16	0.03	0.00	**16.21**

Alternative II

Port Area	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year Total
SF	0.54	0.86	1.52	1.95	0.59	0.05	0.16	0.03		5.03
MO	2.65	1.17	2.27	3.32	1.01	0.09	0.00			8.51
Total	3.19	2.04	3.79	5.27	1.60	0.14	0.16	0.03	0.00	**13.54**

Alternative III

Port Area	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year Total
SF	0.17	0.39	1.57	2.04	0.62	0.06	0.17	0.03		4.46
MO	1.00	0.56	2.35	3.46	1.05	0.09	0.00			7.71
Total	1.17	0.95	3.92	5.50	1.67	0.15	0.17	0.03	0.00	**12.18**

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

TABLE A-2. Klamath River fall Chinook **age-4 ocean HARVEST** by fishery and alternative. In 2014, a harvest of 10,779 age-4 KRFC equals a 16% ocean harvest rate.

Commercial

Alternative I 19.1%

Port	Fall 2013			Summer 2014						Summer	Year
Area	Sept	Oct	Nov-Dec	Mar	Apr	May	Jun	Jul	Aug	Total	Total
NO					92	189	65	60	203	609	609
CO	1,164	488			237	302	219	329	669	1,756	3,408
KO						24	256	267	167	714	714
KC											
FB					511		1,178	2,429	602	4,720	4,720
SF						326	776	760	78	1,940	1,940
MO						86	99	70	1	256	256
Total	1,164	488			841	928	2,593	3,915	1,720	9,997	11,649
											17.3%

Alternative II 19.5%

Port	Fall 2013			Summer 2014						Summer	Year
Area	Sep	Oct	Nov-Dec	Mar	Apr	May	Jun	Jul	Aug	Total	Total
NO					92	189	65	60	201	607	607
CO	1,164	488			237	302	220	326	664	1,749	3,401
KO						24	192	177	125	518	518
KC											
FB					511		1,938	2,405	597	5,451	5,451
SF						326	635	752	77	1,790	1,790
MO						86	58	69	1	214	214
Total	1,164	488			841	928	3,107	3,789	1,665	10,330	11,982
											17.8%

Alternative II 20.0%

Port	Fall 2013			Summer 2014						Summer	Year
Area	Sep	Oct	Nov-Dec	Mar	Apr	May	Jun	Jul	Aug	Total	Total
NO					92	189	65	59	165	570	570
CO	1,164	488			237	302	220	321	542	1,622	3,274
KO						24	128	132	83	367	367
KC											
FB					511		2,636	2,690	590	6,427	6,427
SF						326	635	464	76	1,501	1,501
MO						86	58	43	1	188	188
Total	1,164	488			841	928	3,742	3,709	1,457	10,677	12,329
											18.3%

Recreational

Alternative I

Port	Fall 2013			Summer 2014						Summer	Year
Area	Sep	Oct	Nov-Dec	Mar	Apr	May	Jun	Jul	Aug	Total	Total
NO								7	3	10	10
CO	155					1	10	19	11	41	196
KO	28					2	19	43	143	207	235
KC						82	116	104	187	489	489
FB					2	18	45	57	13	135	135
SF					20	12	47	44	2	125	125
MO					15	3	5	10	1	34	34
Total	183				37	120	242	284	360	1,043	1,226
											1.8%

Alternative II

Port	Fall 2013			Summer 2014						Summer	Year
Area	Sep	Oct	Nov-Dec	Mar	Apr	May	Jun	Jul	Aug	Total	Total
NO								7	2	9	9
CO	155					1	6	19	10	36	191
KO	28					1	19	43	141	204	232
KC						40	116	103	186	445	445
FB					2	18	45	56	13	134	134
SF					20	12	47	43	2	124	124
MO					15	3	5	10	1	34	34
Total	183				37	76	238	281	355	987	1,170
											1.7%

Alternative III

Port	Fall 2013			Summer 2014						Summer	Year
Area	Sep	Oct	Nov-Dec	Mar	Apr	May	Jun	Jul	Aug	Total	Total
NO								7	2	9	9
CO	155					1	4	18	10	33	188
KO	28					1	19	42	140	202	230
KC						21	116	102	184	423	423
FB					2	18	45	55	13	133	133
SF					20	12	47	43	2	124	124
MO					15	3	5	10	1	34	34
Total	183				37	57	236	278	350	958	1,141
											1.7%

FURTHER COUNCIL DIRECTION FOR 2014 MANAGEMENT ALTERNATIVES

If necessary, the Salmon Technical Team (STT) will request clarification or direction regarding the management elements identified by the Council under Agenda Item F.2 on Sunday, March 9, 2014 and/or Agenda Item F.4 on Monday, March 10. The Council should assure the alternatives presented are those for which the Council desires full STT analysis and consideration for final adoption on Thursday, March 13.

Council Task:

1. **Clarify STT questions.**
2. **Additional direction on management alternative development and STT analysis, as necessary.**

Reference Materials:

None.

Agenda Order:

a. Agenda Item Overview — Mike Burner
b. Reports and Comments of Advisory Bodies and Management Entities
c. Public Comment
d. Council Guidance and Direction

PFMC
02/11/14

Agenda Item F.5.b
Supplemental EC Report
March 2014

ENFORCEMENT CONSULTANTS REPORT ON
FURTHER COUNCIL DIRECTION FOR 2014 MANAGEMENT ALTERNATIVES

Regarding recording the numbers of salmon and halibut on state fish tickets as discussed in the Enforcement Consultants (EC) statement under Agenda Item G.2, incidental retention of Pacific halibut, after further discussion with the Salmon Technical Team, the EC would like to provide additional information for consideration.

Under current state regulations, numbers of salmon and halibut are required to be recorded on state fish tickets as follows:

- Washington: Both species are required
- Oregon: No recording requirement
- California: Only salmon are required

Therefore, the EC recommends the following information shall be required for all West Coast commercial salmon landings on the state tickets for Washington, Oregon and California:

1) Individual number of salmon
2) Individual number of Pacific halibut (as applicable when incidentally retained)

Recording this information would allow for effective enforcement of salmon fisheries involving ratios, as well as catch landing limits where individual numbers of fish are involved.

PFMC
03/12/14

SALMON TECHNICAL TEAM

INITIAL ANALYSIS OF PRELIMINARY SALMON MANAGEMENT ALTERNATIVES FOR 2014 OCEAN FISHERIES

March 12, 2014

TABLE 1. Commercial troll management Alternatives collated by the STT for non-Indian ocean salmon fisheries, 2014 (Page 1 of 9)		3/11/2014 4:37 PM
A. SEASON ALTERNATIVE DESCRIPTIONS		
ALTERNATIVE I	ALTERNATIVE II	ALTERNATIVE III
North of Cape Falcon	**North of Cape Falcon**	**North of Cape Falcon**
Supplemental Management Information	**Supplemental Management Information**	**Supplemental Management Information**
1. Overall non-Indian TAC: 125,000 (non-mark-selective equivalent of 120,000) Chinook and 230,000 coho marked with a healed adipose fin clip (marked). 2. Non-Indian commercial troll TAC: 62,000 Chinook and 36,800 marked coho. 3. Trade: May be considered at the April Council meeting 4. Overall Chinook and/or coho TACs may need to be reduced or fisheries adjusted to meet NMFS ESA guidance, FMP requirements, upon conclusion of negotiations in the North of Falcon forum, or upon receipt of preseason catch and abundance expectations for Canadian and Alaskan fisheries.	1. Overall non-Indian TAC: 114,000 (non-mark-selective equivalent of 110,000) Chinook and 210,000 coho marked with a healed adipose fin clip (marked). 2. Non-Indian commercial troll TAC: 56,000 Chinook and 33,600 marked coho. 3. Trade: May be considered at the April Council meeting 4. Overall Chinook and/or coho TACs may need to be reduced or fisheries adjusted to meet NMFS ESA guidance, FMP requirements, upon conclusion of negotiations in the North of Falcon forum, or upon receipt of preseason catch and abundance expectations for Canadian and Alaskan fisheries.	1. Overall non-Indian TAC: 95,000 Chinook and 190,000 coho marked with a healed adipose fin clip (marked). 2. Non-Indian commercial troll TAC: 47,500 Chinook and 30,400 marked coho. 3. Trade: May be considered at the April Council meeting 4. Overall Chinook and/or coho TACs may need to be reduced or fisheries adjusted to meet NMFS ESA guidance, FMP requirements, upon conclusion of negotiations in the North of Falcon forum, or upon receipt of preseason catch and abundance expectations for Canadian and Alaskan fisheries.
U.S./Canada Border to Cape Falcon • May 1 through earlier of June 30 or 41,300 Chinook, no more than 13,200 of which may be caught in the area between the U.S./Canada border and the Queets River. Seven days per week (C.1). All salmon except coho (C.4, C.7). Chinook minimum size limit of 28 inches total length (B, C.1). Vessels in possession of salmon north of the Queets River may not cross the Queets River line without first notifying WDFW at 360-902-2739 with area fished, total Chinook and halibut catch aboard, and destination. Vessels in possession of salmon south of the Queets River may not cross the Queets River line without first notifying WDFW at 360-902-2739 with area fished, total Chinook and halibut catch aboard, and destination. See compliance requirements (C.1) and gear restrictions and definitions (C.2, C.3). When it is projected that 30,975 Chinook have been landed overall, or 9,900 Chinook have been landed in the area between the U.S/Canada border and the Queets River, inseason action modifying the open period to five days per week and adding landing and possession limits will be considered to ensure the guideline is not exceeded.	**U.S./Canada Border to Cape Falcon** • May 1 through earlier of June 30 or 37,300 Chinook, no more than 12,000 of which may be caught in the area between the U.S./Canada border and the Queets River. Seven days per week (C.1). All salmon except coho (C.4, C.7). Chinook minimum size limit of 28 inches total length (B, C.1). Vessels in possession of salmon north of the Queets River may not cross the Queets River line without first notifying WDFW at 360-902-2739 with area fished, total Chinook and halibut catch aboard, and destination. Vessels in possession of salmon south of the Queets River may not cross the Queets River line without first notifying WDFW at 360-902-2739 with area fished, total Chinook and halibut catch aboard, and destination. See compliance requirements (C.1) and gear restrictions and definitions (C.2, C.3). When it is projected that 27,975 Chinook have been landed overall, or 9,000 Chinook have been landed in the area between the U.S/Canada border and the Queets River, inseason action modifying the open period to five days per week and adding landing and possession limits will be considered to ensure the guideline is not exceeded.	**U.S./Canada Border to Cape Falcon** • May 1 through earlier of June 30 or 31,700 Chinook. Seven days per week (C.1). All salmon except coho (C.4, C.7). Chinook minimum size limit of 28 inches total length (B, C.1). See compliance requirements (C.1) and gear restrictions and definitions (C.2, C.3). When it is projected that 23,775 Chinook have been landed inseason action modifying the open period to five days per week and adding landing and possession limits will be considered to ensure the guideline is not exceeded.
Cape Flattery, Mandatory Yelloweye Rockfish Conservation Area, and Columbia Control Zones closed (C.5). Vessels must land and deliver their fish within 24 hours of any closure of this fishery. Under state law, vessels must report their catch on a state fish receiving ticket. Vessels fishing or in possession of salmon while fishing north of Leadbetter Point must land and deliver their fish within the area and north of Leadbetter Point. Vessels fishing or in possession of salmon while fishing south of Leadbetter Point must land and deliver their fish within the area and south of Leadbetter Point, except that Oregon permitted vessels may also land their fish in Garibaldi, Oregon. Oregon State regulations require all fishers landing salmon into Oregon from any fishery between Leadbetter Point, Washington and Cape Falcon, Oregon must notify ODFW within one hour of delivery or prior to transport away from the port of landing by either calling 541-867-0300 Ext. 271 or sending notification via e-mail to nfalcon.trollreport@state.or.us. Notification shall include vessel name and number, number of salmon by species, port of landing and location of delivery, and estimated time of delivery. Inseason actions may modify harvest guidelines in later fisheries to achieve or prevent exceeding the overall allowable troll harvest impacts.		

TABLE 1. Commercial troll management Alternatives collated by the STT for non-Indian ocean salmon fisheries, 2014. (Page 2 of 9) 3/11/2014 4:37 PM		
A. SEASON ALTERNATIVE DESCRIPTIONS		
ALTERNATIVE I	ALTERNATIVE II	ALTERNATIVE III
U.S./Canada Border to Cape Falcon • July 1 through earlier of September 16 or attainment of the quota of 20,700 Chinook, no more than 9,500 of which may be caught in the area between the U.S./Canada border and the Queets River, or 36,800 marked coho (C.8.d). July 1-8 then Friday through Tuesday July 11-August 19 **with a landing and possession limit of 75 Chinook and 60 coho per vessel per open period**; Friday through Tuesday August 22-September 16 **with a landing and possession limit of 20 Chinook and 50 coho per vessel per open period** (C.1). Vessels in possession of salmon north of the Queets River may not cross the Queets River line without first notifying WDFW at 360-902-2739 with area fished, total Chinook, coho, and halibut catch aboard, and destination. Vessels in possession of salmon south of the Queets River may not cross the Queets River line without first notifying WDFW at 360-902-2739 with area fished, total Chinook, coho, and halibut catch aboard, and destination. When it is projected that 15,525 Chinook have been landed overall, or 7,125 Chinook have been landed in the area between the U.S/Canada border and the Queets River, inseason action modifying the open period to five days per week and adding landing and possession limits will be considered to ensure the guideline is not exceeded.. No earlier than September 1, if at least 5,000 marked coho remain on the quota, inseason action may be considered to allow non-selective coho retention (C.8). All salmon except no chum retention north of Cape Alava, Washington in August and September (C.7). Chinook minimum size limit of 28 inches total length (B, C.1). All coho must be marked except as noted above (C.8.d). See compliance requirements (C.1) and gear restrictions and definitions (C.2, C.3).	**U.S./Canada Border to Cape Falcon** • July 1 through earlier of September 16 or attainment of the quota of 18,700 Chinook, no more than 8,600 of which may be caught in the area between the U.S./Canada border and the Queets River, or 33,600 marked coho (C.8.d) July 1-2, July 4-8, then Friday through Tuesday July 11-August 19 **with a landing and possession limit of 65 Chinook and 45 coho per vessel per open period**; Friday through Tuesday August 22-September 16 **with a landing and possession limit of 15 Chinook and 50 coho per vessel per open period** (C.1). Vessels in possession of salmon north of the Queets River may not cross the Queets River line without first notifying WDFW at 360-902-2739 with area fished, total Chinook, coho, and halibut catch aboard, and destination. Vessels in possession of salmon south of the Queets River may not cross the Queets River line without first notifying WDFW at 360-902-2739 with area fished, total Chinook, coho, and halibut catch aboard, and destination. All salmon except no chum retention north of Cape Alava, Washington in August and September (C.7). Chinook minimum size limit of 28 inches total length (B, C.1). All coho must be marked except as noted above (C.8.d). See compliance requirements (C.1) and gear restrictions and definitions (C.2, C.3).	**U.S./Canada Border to Cape Falcon** • July 1 through earlier of September 16 or 15,800 Chinook (C.8) or a 30,400 marked coho quota (C.8.d) July 1-4, July 6-8, then Friday through Tuesday July 11-August 26 **with a landing and possession limit of 50 Chinook and 45 coho per vessel per open period**; Friday through Tuesday August 29-September 16 **with a landing and possession limit of 15 Chinook and 50 coho per vessel per open period** (C.1). All salmon except no chum retention north of Cape Alava, Washington in August and September (C.7). Chinook minimum size limit of 28 inches total length (B, C.1). All coho must be marked except as noted above (C.8.d). See compliance requirements (C.1) and gear restrictions and definitions (C.2, C.3).
Mandatory Yelloweye Rockfish Conservation Area, Cape Flattery and Columbia Control Zones, **and beginning August 9, Grays Harbor Control Zone closed** (C.5). Vessels must land and deliver their fish within 24 hours of any closure of this fishery. **Vessels fishing or in possession of salmon while fishing north of Leadbetter Point must land and deliver their fish within the area and north of Leadbetter Point. Vessels fishing or in possession of salmon while fishing south of Leadbetter Point must land and deliver their fish within the area and south of Leadbetter Point**, except that Oregon permitted vessels may also land their fish in Garibaldi, Oregon. Under state law, vessels must report their catch on a state fish receiving ticket. Oregon State regulations require all fishers landing salmon into Oregon from any fishery between Leadbetter Point, Washington and Cape Falcon, Oregon must notify ODFW within one hour of delivery or prior to transport away from the port of landing by either calling 541-867-0300 Ext. 271 or sending notification via e-mail to nfalcon.trollreport@state.or.us. Notification shall include vessel name and number, number of salmon by species, port of landing and location of delivery, and estimated time of delivery. Inseason actions may modify harvest guidelines in later fisheries to achieve or prevent exceeding the overall allowable troll harvest impacts.		

TABLE 1. Commercial troll management Alternatives collated by the STT for non-Indian ocean salmon fisheries, 2014. (Page 3 of 9)		3/11/2014 4:37 PM
A. SEASON ALTERNATIVE DESCRIPTIONS		
ALTERNATIVE I	ALTERNATIVE II	ALTERNATIVE III
South of Cape Falcon	**South of Cape Falcon**	**South of Cape Falcon**
Supplemental Management Information	**Supplemental Management Information**	**Supplemental Management Information**
1. Sacramento River Basin recreational fishery catch assumption: __,___ adult Sacramento River fall Chinook (__._ % of the total allowable harvest). 2. Sacramento River fall Chinook spawning escapement of ___,___ adults. 3. Klamath River recreational fishery allocation: __,___ adult Klamath River fall Chinook. 4. Klamath tribal allocation: ___,___ adult Klamath River fall Chinook. 5. Fisheries may need to be adjusted to meet NMFS ESA consultation standards, FMP requirements, other management objectives, or upon receipt of new allocation recommendations from the California Fish and Game Commission.	1. Sacramento River Basin recreational fishery catch assumption: __,___ adult Sacramento River fall Chinook (__._% of the total allowable harvest). 2. Sacramento River fall Chinook spawning escapement of ___,___ adults. 3. Klamath River recreational fishery allocation: __,___ adult Klamath River fall Chinook. 4. Klamath tribal allocation: ___,___ adult Klamath River fall Chinook. 5. Fisheries may need to be adjusted to meet NMFS ESA consultation standards, FMP requirements, other management objectives, or upon receipt of new allocation recommendations from the California Fish and Game Commission.	1..Sacramento River Basin recreational fishery catch assumption: __,___ adult Sacramento River fall Chinook (__._ % of the total allowable harvest). 2. Sacramento River fall Chinook spawning escapement of ___,___ adults. 3. Klamath River recreational fishery allocation: __,___ adult Klamath River fall Chinook. 4. Klamath tribal allocation: ___,___ adult Klamath River fall Chinook. 5. Fisheries may need to be adjusted to meet NMFS ESA consultation standards, FMP requirements, other management objectives, or upon receipt of new allocation recommendations from the California Fish and Game Commission.
Cape Falcon to Humbug Mt. • April 1-August 29; • September 3-October 31 (C.9.a). Seven days per week. **All salmon except coho except as listed below for September non-selective coho incidental retention** (C.4, C.7). Chinook minimum size limit of 28 inches total length (B, C.1). All vessels fishing in the area must land their fish in the State of Oregon. See gear restrictions and definitions (C.2, C.3) and Oregon State regulations for a description of special regulations at the mouth of Tillamook Bay. Beginning September 3, no more than 100 Chinook per vessel per landing week (Wed.-Tues.). **Non-selective incidental coho retention:** • September 3 through the earlier of the quota or September 30, retention of coho will be limited to no more than one coho for each landed Chinook with a landing week limit of no more than 20 coho per vessel if sufficient quota is available for transfer from the Cape Falcon to Humbug Mt. non-selective recreational fishery (C.8.b). • Oregon State regulations require all fishers landing coho salmon from this season to notify ODFW within one hour of delivery or prior to transport away from the port of landing by calling 541-867-0300 Ext. 252. Notification shall include vessel name and number, number of salmon by species, port of landing and location of delivery, and estimated time of delivery. In 2015, the season will open March 15 for all salmon except coho. Chinook minimum size limit of 28 inches total length. Gear restrictions same as in 2014. This opening could be modified following Council review at its March 2015 meeting.	**Cape Falcon to Humbug Mt.** • April 1-July 31, August 4-29; • September 3-October 31 (C.9). Seven day per week. All salmon except coho (C.7). Chinook minimum size limit of 28 inches total length (B). All vessels fishing in the area must land their fish in the State of Oregon. See gear restrictions and definitions (C.2, C.3) and Oregon State regulations for a description of special regulations at the mouth of Tillamook Bay. Beginning September **3**, no more than 75 Chinook per vessel per landing week (Wed.-Tues.). In 2015, same as Alternative I	**Cape Falcon to Humbug Mt.** • April **1**-July 31; and August 6-29; • September **3**-October **31** (C.9). Seven day per week. All salmon except coho (C.7). Chinook minimum size limit of 28 inches total length (B). All vessels fishing in the area must land their fish in the State of Oregon. See gear restrictions and definitions (C.2, C.3) and Oregon State regulations for a description of special regulations at the mouth of Tillamook Bay. Beginning September **3**, no more than 50 Chinook per vessel per landing week (Wed.-Tues.). In 2015, same as Alternative I

TABLE 1. Commercial troll management Alternatives collated by the STT for non-Indian ocean salmon fisheries, 2014. (Page 4 of 9) 3/11/2014 4:37 PM

A. SEASON ALTERNATIVE DESCRIPTIONS

ALTERNATIVE I	ALTERNATIVE II	ALTERNATIVE III
Humbug Mt. to OR/CA Border (Oregon KMZ) • April 1-May 31; • June 1 through earlier of June 30, or a 3,000 Chinook quota; • July 1 through earlier of July 31, or a 2,000 Chinook quota; • August 1 through earlier of August 29, or a 1,500 Chinook quota; • September 16 through earlier of September 27 or a 500 Chinook quota (C.9.a). Seven days per week. All salmon except coho (C.4, C.7). Chinook minimum size limit of 28 inches total length (B, C.1). **Prior to June 1, all fish caught in this area must be landed and delivered in the State of Oregon.** June 1 – August 29 landing and possession limit of 40 Chinook per vessel per day. September 16-27 landing and possession limit of 20 Chinook per vessel per day. Any remaining portion of the June and/or July Chinook quotas may be transferred inseason on an impact neutral basis to the next open quota period (C.8). All vessels fishing in this area must land and deliver all fish within this area or Port Orford, within 24 hours of any closure of this fishery, and prior to fishing outside of this area. State regulations require fishers intending to transport and deliver their catch to other locations after first landing in one of these ports notify ODFW prior to transport away from the port of landing by calling 541-867-0300 Ext. 252, with vessel name and number, number of salmon by species, location of delivery, and estimated time of delivery. See compliance requirements (C.1) and gear restrictions and definitions (C.2, C.3). In 2015, the season will open March 15 for all salmon except coho, with a 28 inch Chinook minimum size limit. This opening could be modified following Council review at its March 2015 meeting.	**Humbug Mt. to OR/CA Border (Oregon KMZ)** • April 1-May 31; • June 1 through earlier of June 30, or a 3,000 Chinook quota; • July 1 through earlier of July 31, or a 2,000 Chinook quota; • August 4 through earlier of August 29, or a 1,500 Chinook quota; • September 15 through earlier of September 27 or a 500 Chinook quota (C.9.a). Seven days per week. All salmon except coho (C.4, C.7). Chinook minimum size limit of 28 inches total length (B, C.1). **Prior to June 1, all fish caught in this area must be landed and delivered in the State of Oregon.** June 1 – August 29 landing and possession limit of 30 Chinook per vessel per day. September 15-27 landing and possession limit of 20 Chinook per vessel per day. Any remaining portion of the June and/or July Chinook quotas may be transferred inseason on an impact neutral basis to the next open quota period (C.8). All vessels fishing in this area must land and deliver all fish within this area or Port Orford, within 24 hours of any closure of this fishery, and prior to fishing outside of this area. State regulations require fishers intending to transport and deliver their catch to other locations after first landing in one of these ports notify ODFW prior to transport away from the port of landing by calling 541-867-0300 Ext. 252, with vessel name and number, number of salmon by species, location of delivery, and estimated time of delivery. See compliance requirements (C.1) and gear restrictions and definitions (C.2, C.3). In 2015, same as Alternative I.	**Humbug Mt. to OR/CA Border (Oregon KMZ)** • April 1-May 31; • June 1 through earlier of June 30, or a 2,000 Chinook quota; • July 1 through earlier of July 31, or a 1,500 Chinook quota; • August 6 through earlier of August 29, or a 1,000 Chinook quota; (C.9.a). Seven days per week. All salmon except coho (C.4, C.7). Chinook minimum size limit of 28 inches total length (B, C.1). **Prior to June 1, all fish caught in this area must be landed and delivered in the State of Oregon.** June 1 – August 29 landing and possession limit of 20 Chinook per vessel per day. Any remaining portion of the June and/or July Chinook quotas may be transferred inseason on an impact neutral basis to the next open quota period (C.8). All vessels fishing in this area must land and deliver all fish within this area or Port Orford, within 24 hours of any closure of this fishery, and prior to fishing outside of this area. State regulations require fishers intending to transport and deliver their catch to other locations after first landing in one of these ports notify ODFW prior to transport away from the port of landing by calling 541-867-0300 Ext. 252, with vessel name and number, number of salmon by species, location of delivery, and estimated time of delivery. See compliance requirements (C.1) and gear restrictions and definitions (C.2, C.3). In 2015, same as Alternative I.

TABLE 1. Commercial troll management Alternatives collated by the STT for non-Indian ocean salmon fisheries, 2014. (Page 5 of 9)		3/11/2014 4:37 PM
A. SEASON ALTERNATIVE DESCRIPTIONS		
ALTERNATIVE I	ALTERNATIVE II	ALTERNATIVE III
OR/CA Border to Humboldt South Jetty (California KMZ) • September 5 through earlier of September 30, or 10,000 Chinook quota (C.9.b). Five days per week, Friday through Tuesday. All salmon except coho (C.4, C.7). Chinook minimum size limit of 27 inches total length (B, C.1). Landing and possession limit of 30 Chinook per vessel per day (C.8.g).	**OR/CA Border to Humboldt South Jetty (California KMZ)** • September 12 through earlier of September 30, or 6,000 Chinook quota (C.9.b). Five days per week, Friday through Tuesday. All salmon except coho (C.4, C.7). Chinook minimum size limit of 27 inches total length (B, C.1). Landing and possession limit of 20 Chinook per vessel per day (C.8.g).	**OR/CA Border to Humboldt South Jetty (California KMZ)** • September 12 through earlier of September 30, or 3,000 Chinook quota (C.9.b). Five days per week, Friday through Tuesday. All salmon except coho (C.4, C.7). Chinook minimum size limit of 27 inches total length (B, C.1). Landing and possession limit of 20 Chinook per vessel per day (C.8.g).
All fish caught in this area must be landed within the area and within 24 hours of any closure of the fishery and prior to fishing outside the area (C.10). See compliance requirements (C.1) and gear restrictions and definitions (C.2, C.3). Klamath Control Zone closed (C.5.e). See California State regulations for additional closures adjacent to the Smith and Klamath rivers. When the fishery is closed between the OR/CA border and Humbug Mountain and open to the south, vessels with fish on board caught in the open area off California may seek temporary mooring in Brookings, Oregon prior to landing in California only if such vessels first notify the Chetco River Coast Guard Station via VHF channel 22A between the hours of 0500 and 2200 and provide the vessel name, number of fish on board, and estimated time of arrival (C.6.).		
Humboldt South Jetty to Horse Mt. Closed.	**Humboldt South Jetty to Horse Mt.** Closed.	**Humboldt South Jetty to Horse Mt.** Closed.
Horse Mt. to Point Arena (Fort Bragg) • June 17-30; • July 10-31; • August 1-29; • September 1-30 (C.9.b). Seven days per week. All salmon except coho (C.4, C.7). Chinook minimum size limit of 27 inches total length (B, C.1). All fish must be landed in California and offloaded within 24 hours of the August 29 closure (C.6). When the CA KMZ fishery is open, all fish caught in the area must be landed south of Horse Mountain (C.6). During September, all fish must be landed north of Point Arena (C.6). See compliance requirements (C.1) and gear restrictions and definitions (C.2, C.3). In 2015, the season will open April 16-30 for all salmon except coho, with a 27 inch Chinook minimum size limit and the same gear restrictions as in 2014. All fish caught in the area must be landed in the area. This opening could be modified following Council review at its March 2015 meeting.	**Horse Mt. to Point Arena (Fort Bragg)** • June 20-30; • July 13-31; • August 1-29; • September 1-30 (C.9.b). Seven days per week. All salmon except coho (C.4, C.7). Chinook minimum size limit of 27 inches total length (B, C.1). All fish must be landed in California and offloaded within 24 hours of the August 29 closure (C.6). When the CA KMZ fishery is open, all fish caught in the area must be landed south of Horse Mountain (C.6). During September, all fish must be landed north of Point Arena (C.6). See compliance requirements (C.1) and gear restrictions and definitions (C.2, C.3). In 2015, same as Alternative I.	**Horse Mt. to Point Arena (Fort Bragg)** • June 15-30; • July 15-31; • August 1-29; • September 1-30 (C.9.b). Seven days per week. All salmon except coho (C.4, C.7). Chinook minimum size limit of 27 inches total length (B, C.1). All fish must be landed in California and offloaded within 24 hours of the August 29 closure (C.6). When the CA KMZ fishery is open, all fish caught in the area must be landed south of Horse Mountain (C.6). During September, all fish must be landed north of Point Arena (C.6). See compliance requirements (C.1) and gear restrictions and definitions (C.2, C.3). In 2015, same as Alternative I.

TABLE 1. Commercial troll management Alternatives collated by the STT for non-Indian ocean salmon fisheries, 2014. (Page 6 of 9) 3/11/2014 4:37 PM

A. SEASON ALTERNATIVE DESCRIPTIONS

ALTERNATIVE I	ALTERNATIVE II	ALTERNATIVE III
Pt. Arena to Pigeon Pt. (San Francisco) • May 1-31; • June 5-30; • July 10-31; • August 1-29; • September 1-30 (C.9.b). Seven days per week. All salmon except coho (C.4, C.7). Chinook minimum size limit of 27 inches total length prior to September 1, 26 inches thereafter (B, C.1). All fish must be landed in California and offloaded within 24 hours of the August 29 closure (C.6). During September, all fish must be landed south of Point Arena (C.6). See compliance requirements (C.1) and gear restrictions and definitions (C.2, C.3). **Point Reyes to Point San Pedro (Fall Area Target Zone)** • October 1-3, 6-10, and 13-15. All salmon except coho (C.4, C.7). Chinook minimum size limit of 26 inches total length (B, C.1). All fish caught in this area must be landed between Point Arena and Pigeon Point (C.6). See compliance requirements (C.1) and gear restrictions and definitions (C.2, C.3).	**Pt. Arena to Pigeon Pt. (San Francisco)** • May 1-31; • June 1-30; • July 13-31; • August 1-29; • September 1-30 (C.9.b). Seven days per week. All salmon except coho (C.4, C.7). Chinook minimum size limit of 27 inches total length prior to September 1, 26 inches thereafter (B, C.1). All fish must be landed in California and offloaded within 24 hours of the August 29 closure (C.6). During September, all fish must be landed south of Point Arena (C.6). See compliance requirements (C.1) and gear restrictions and definitions (C.2, C.3). **Point Reyes to Point San Pedro (Fall Area Target Zone)** • October 1-3, 6-10, and 13-15. All salmon except coho (C.4, C.7). Chinook minimum size limit of 26 inches total length (B, C.1). All fish caught in this area must be landed between Point Arena and Pigeon Point (C.6). See compliance requirements (C.1) and gear restrictions and definitions (C.2, C.3).	**Pt. Arena to Pigeon Pt. (San Francisco)** • May 1-31; • June 7-30; • July 15-31; • August 1-29; • September 1-30 (C.9.b). Seven days per week. All salmon except coho (C.4, C.7). Chinook minimum size limit of 27 inches total length prior to September 1, 26 inches thereafter (B, C.1). All fish must be landed in California and offloaded within 24 hours of the August 29 closure (C.6). During September, all fish must be landed south of Point Arena (C.6). See compliance requirements (C.1) and gear restrictions and definitions (C.2, C.3). **Point Reyes to Point San Pedro (Fall Area Target Zone)** • October 1-3, 6-10, and 13-15. All salmon except coho (C.4, C.7). Chinook minimum size limit of 26 inches total length (B, C.1). All fish caught in this area must be landed between Point Arena and Pigeon Point (C.6). See compliance requirements (C.1) and gear restrictions and definitions (C.2, C.3).
Pigeon Point to U.S./Mexico Border (Monterey) • May 1-31; • June 5-30; • July 10-31; • August 1-29; • September 1-30 (C.9.b). Seven days per week. All salmon except coho (C.4, C.7). Chinook minimum size limit of 27 inches total length prior to September 1, 26 inches thereafter (B, C.1). All fish must be landed in California and offloaded within 24 hours of the August 29 closure (C.6). During September, all fish must be landed south of Point Arena (C.6). See compliance requirements (C.1) and gear restrictions and definitions (C.2, C.3).	**Pigeon Point to U.S./Mexico Border (Monterey))** • May 1-31; • June 1-30; • July 13-31; • August 1-29; • September 1-30 (C.9.b). Seven days per week. All salmon except coho (C.4, C.7). Chinook minimum size limit of 27 inches total length prior to September 1, 26 inches thereafter (B, C.1). All fish must be landed in California and offloaded within 24 hours of the August 29 closure (C.6). During September, all fish must be landed south of Point Arena (C.6). See compliance requirements (C.1) and gear restrictions and definitions (C.2, C.3).	**Pigeon Point to U.S./Mexico Border (Monterey)** • May 1-31; • June 7-30; • July 15-31; • August 1-29; • September 1-30 (C.9.b). Seven days per week. All salmon except coho (C.4, C.7). Chinook minimum size limit of 27 inches total length prior to September 1, 26 inches thereafter (B, C.1). All fish must be landed in California and offloaded within 24 hours of the August 29 closure (C.6). During September, all fish must be landed south of Point Arena (C.6). See compliance requirements (C.1) and gear restrictions and definitions (C.2, C.3).

California State regulations require all salmon be made available to a California Department of Fish and Wildlife (CDFW) representative for sampling immediately at port of landing. Any person in possession of a salmon with a missing adipose fin, upon request by an authorized agent or employee of the CDFW, shall immediately relinquish the head of the salmon to the state. (California Fish and Game Code §8226)

TABLE 1. Commercial troll management Alternatives collated by the STT for non-Indian ocean salmon fisheries, 2014. (Page 7 of 9) 3/11/2014 4:37 PM

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

		Chinook		Coho		
Area (when open)		Total Length	Head-off	Total Length	Head-off	Pink
North of Cape Falcon		28.0	21.5	16.0	12.0	None
Cape Falcon to OR/CA Border		28.0	21.5	-	-	None
OR/CA Border to Humboldt South Jetty		27.0	20.5	-	-	None
Horse Mt. to Pt. Arena		27.0	20.5	-	-	None
Pt. Arena to U.S./Mexico Border	≤ Aug. 29	27.0	20.5	-	-	None
	≥ Sept. 1	26.0	19.5	-	-	None

C. REQUIREMENTS, DEFINITIONS, RESTRICTIONS, OR EXCEPTIONS

C.1. Compliance with Minimum Size or Other Special Restrictions: All salmon on board a vessel must meet the minimum size, landing/possession limit, or other special requirements for the area being fished and the area in which they are landed if the area is open or has been closed less than 96 hours for that species of salmon. Salmon may be landed in an area that has been closed for a species of salmon more than 96 hours only if they meet the minimum size, landing/possession limit, or other special requirements for the area in which they were caught. **Alternative I:** Salmon may not be filleted prior to landing.

States may require fish landing/receiving tickets be kept on board the vessel for 90 days after landing to account for all previous salmon landings.

C.2. Gear Restrictions:

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

C.3. Gear Definitions:

Trolling defined: Fishing from a boat or floating device that is making way by means of a source of power, other than drifting by means of the prevailing water current or weather conditions.

Troll fishing gear defined: One or more lines that drag hooks behind a moving fishing vessel. In that portion of the fishery management area off Oregon and Washington, the line or lines must be affixed to the vessel and must not be intentionally disengaged from the vessel at any time during the fishing operation.

Spread defined: A single leader connected to an individual lure and/or bait.

Circle hook defined: A hook with a generally circular shape and a point which turns inward, pointing directly to the shank at a 90º angle.

C.4. Vessel Operation in Closed Areas with Salmon on Board:

a. Except as provided under C.4.b below, it is unlawful for a vessel to have troll or recreational gear in the water while in any area closed to fishing for a certain species of salmon, while possessing that species of salmon; however, fishing for species other than salmon is not prohibited if the area is open for such species, and no salmon are in possession.

TABLE 1. Commercial troll management Alternatives collated by the STT for non-Indian ocean salmon fisheries, 2014. (Page 8 of 9)	3/11/2014 4:37 PM
C. REQUIREMENTS, DEFINITIONS, RESTRICTIONS, OR EXCEPTIONS (continued)	

b. When Genetic Stock Identification (GSI) samples will be collected in an area closed to commercial salmon fishing, the scientific research permit holder shall notify NOAA OLE, USCG, CDFW and OSP at least 24 hours prior to sampling and provide the following information: the vessel name, date, location and time collection activities will be done. Any vessel collecting GSI samples in a closed area shall not possess any salmon other than those from which GSI samples are being collected. Salmon caught for collection of GSI samples must be immediately released in good condition after collection of samples.

C.5. Control Zone Definitions:

a. *Cape Flattery Control Zone* - The area from Cape Flattery (48º23'00" N. lat.) to the northern boundary of the U.S. EEZ; and the area from Cape Flattery south to Cape Alava (48º10'00" N. lat.) and east of 125º05'00" W. long.

b. *Mandatory Yelloweye Rockfish Conservation Area* – The area in Washington Marine Catch Area 3 from 48°00.00' N. lat.; 125°14.00' W. long. to 48°02.00' N. lat.; 125°14.00' W. long. to 48°02.00' N. lat.; 125°16.50' W. long. to 48°00.00' N. lat.; 125°16.50' W. long. and connecting back to 48°00.00' N. lat.; 125°14.00' W. long.

c. *Grays Harbor Control Zone* - The area defined by a line drawn from the Westport Lighthouse (46° 53'18" N. lat., 124° 07'01" W. long.) to Buoy #2 (46° 52'42" N. lat., 124°12'42" W. long.) to Buoy #3 (46° 55'00" N. lat., 124°14'48" W. long.) to the Grays Harbor north jetty (46° 55'36" N. lat., 124°10'51" W. long.).

d. *Columbia Control Zone* - An area at the Columbia River mouth, bounded on the west by a line running northeast/southwest between the red lighted Buoy #4 (46°13'35" N. lat., 124°06'50" W. long.) and the green lighted Buoy #7 (46°15'09' N. lat., 124°06'16" W. long.); on the east, by the Buoy #10 line which bears north/south at 357° true from the south jetty at 46°14'00" N. lat.,124°03'07" W. long. to its intersection with the north jetty; on the north, by a line running northeast/southwest between the green lighted Buoy #7 to the tip of the north jetty (46°15'48" N. lat., 124°05'20" W. long.), and then along the north jetty to the point of intersection with the Buoy #10 line; and, on the south, by a line running northeast/southwest between the red lighted Buoy #4 and tip of the south jetty (46°14'03" N. lat., 124°04'05" W. long.), and then along the south jetty to the point of intersection with the Buoy #10 line.

e. *Klamath Control Zone* - The ocean area at the Klamath River mouth bounded on the north by 41°38'48" N. lat. (approximately six nautical miles north of the Klamath River mouth); on the west, by 124°23'00" W. long. (approximately 12 nautical miles off shore); and on the south, by 41°26'48" N. lat. (approximately six nautical miles south of the Klamath River mouth).

C.6. Notification When Unsafe Conditions Prevent Compliance with Regulations: If prevented by unsafe weather conditions or mechanical problems from meeting special management area landing restrictions, vessels must notify the U.S. Coast Guard and receive acknowledgment of such notification prior to leaving the area. This notification shall include the name of the vessel, port where delivery will be made, approximate amount of salmon (by species) on board, the estimated time of arrival, and the specific reason the vessel is not able to meet special management area landing restrictions. In addition to contacting the U.S. Coast Guard, vessels fishing south of the Oregon/California border must notify CDFW within one hour of leaving the management area by calling 800-889-8346 and providing the same information as reported to the U.S. Coast Guard. All salmon must be offloaded within 24 hours of reaching port.

C.7. Incidental Halibut Harvest: During authorized periods, the operator of a vessel that has been issued an incidental halibut harvest license may retain Pacific halibut caught incidentally in Area 2A while trolling for salmon. Halibut retained must be no less than 32 inches in total length, measured from the tip of the lower jaw with the mouth closed to the extreme end of the middle of the tail, and must be landed with the head on. ***Alternative I***: When halibut are caught and landed incidental to commercial salmon fishing by an IPHC license holder, any person who is required to report the salmon landing by applicable state law must include on the state landing receipt for that landing both the number of halibut landed, and the total dressed, head-on weight of halibut landed, in pounds, as well as the number and species of salmon landed..

License applications for incidental harvest must be obtained from the International Pacific Halibut Commission (phone: 206-634-1838). Applicants must apply prior to mid-March 2015 for 2015 permits (*exact date to be set by the IPHC in early 2015*). Incidental harvest is authorized only during April, May, and June of the 2014 troll seasons and after June 30 in 2014 if quota remains and if announced on the NMFS hotline (phone: 800-662-9825). WDFW, ODFW, and CDFW will monitor landings. If the landings are projected to exceed the 29,671 pound preseason IPHC allocation or the total Area 2A non-Indian commercial halibut allocation, NMFS will take inseason action to prohibit retention of halibut in the non-Indian salmon troll fishery.

Alternative I - May 1, 2014 through December 31, 2014 and April 1-30, 2015, license holders may land or possess no more than one Pacific halibut per each three Chinook, except one Pacific halibut may be possessed or landed without meeting the ratio requirement, and no more than 15 halibut may be possessed or landed per trip. Pacific halibut retained must be no less than 32 inches in total length (with head on).
Alternative II - May 1, 2014 through December 31, 2014 and April 1-30, 2015, license holders may land or possess no more than one Pacific halibut per each four Chinook, except one Pacific halibut may be possessed or landed without meeting the ratio requirement, and no more than 12 halibut may be possessed or landed per trip. Pacific halibut retained must be no less than 32 inches in total length (with head on).
Alternative III - May 1, 2014 through December 31, 2014 and April 1-30, 2015, license holders may land or possess no more than one Pacific halibut per each five Chinook, except one Pacific halibut may be possessed or landed without meeting the ratio requirement, and no more than 10 halibut may be possessed or landed per trip. Pacific halibut retained must be no less than 32 inches in total length (with head on).

TABLE 1. Commercial troll management Alternatives collated by the STT for non-Indian ocean salmon fisheries, 2014. (Page 9 of 9)	3/11/2014 4:37 PM
C. REQUIREMENTS, DEFINITIONS, RESTRICTIONS, OR EXCEPTIONS (continued)	

Incidental Pacific halibut catch regulations in the commercial salmon troll fishery adopted for 2014, prior to any 2014 inseason action, will be in effect when incidental Pacific halibut retention opens on April 1, 2015 unless otherwise modified by inseason action at the March 2015 Council meeting.

a. "C-shaped" yelloweye rockfish conservation area is an area to be voluntarily avoided for salmon trolling. NMFS and the Council request salmon trollers voluntarily avoid this area in order to protect yelloweye rockfish. The area is defined in the Pacific Council Halibut Catch Sharing Plan in the North Coast subarea (Washington marine area 3), with the following coordinates in the order listed:
48°18' N. lat.; 125°18' W. long.;
48°18' N. lat.; 124°59' W. long.;
48°11' N. lat.; 124°59' W. long.;
48°11' N. lat.; 125°11' W. long.;
48°04' N. lat.; 125°11' W. long.;
48°04' N. lat.; 124°59' W. long.;
48°00' N. lat.; 124°59' W. long.;
48°00' N. lat.; 125°18' W. long.;
and connecting back to 48°18' N. lat.; 125°18' W. long.

C.8. Inseason Management: In addition to standard inseason actions or modifications already noted under the season description, the following inseason guidance is provided to NMFS:

a. Chinook remaining from the May through June non-Indian commercial troll harvest guideline north of Cape Falcon may be transferred to the July through September harvest guideline if the transfer would not result in exceeding preseason impact expectations on any stocks.

b. **Alternative I:** If at least 35,000 coho are available for the recreational non-selective coho salmon season quota between Cape Falcon and Humbug Mt. (combined initial quota and impact neutral rollover from the recreational selective coho between Cape Falcon and the Oregon-California Border) consideration will be made to transfer a portion of the remaining coho that are in excess of those needed to meet the recreational objectives to the commercial troll season between Cape Falcon and Humbug Mt. Landing week limits and coho per Chinook ratios may be adjusted inseason.

c. Chinook remaining from the June and/or July non-Indian commercial troll quotas in the Oregon KMZ may be transferred to the Chinook quota for the next open period if the transfer would not result in exceeding preseason impact expectations on any stocks.

d. NMFS may transfer fish between the recreational and commercial fisheries north of Cape Falcon if there is agreement among the areas' representatives on the Salmon Advisory Subpanel (SAS), and if the transfer would not result in exceeding preseason impact expectations on any stocks.

e. At the March 2015 meeting, the Council will consider inseason recommendations for special regulations for any experimental fisheries (proposals must meet Council protocol and be received in November 2014).

f. If retention of unmarked coho is permitted by inseason action, the allowable coho quota will be adjusted to ensure preseason projected impacts on all stocks is not exceeded.

g. Landing limits may be modified inseason to sustain season length and keep harvest within overall quotas.

C.9. State Waters Fisheries: Consistent with Council management objectives:

a. The State of Oregon may establish additional late-season fisheries in state waters.

b. The State of California may establish limited fisheries in selected state waters.

Check state regulations for details.

C.10. For the purposes of California Fish and Game Code, Section 8232.5, the definition of the Klamath Management Zone (KMZ) for the ocean salmon season shall be that area from Humbug Mountain, Oregon, to Horse Mountain, California.

TABLE 2. Recreational management Alternatives collated by the STT for non-Indian ocean salmon fisheries, 2014. (Page 1 of 9) 3/11/2014 4:37 PM

A. SEASON ALTERNATIVE DESCRIPTIONS		
ALTERNATIVE I	ALTERNATIVE II	ALTERNATIVE III
North of Cape Falcon	**North of Cape Falcon**	**North of Cape Falcon**
Supplemental Management Information	**Supplemental Management Information**	**Supplemental Management Information**
1. Overall non-Indian TAC: 125,000 (non-mark-selective equivalent of 120,000) Chinook and 230,000 coho marked with a healed adipose fin clip (marked). 2. Recreational TAC: 63,000 (non-mark selective equivalent of 58,000) Chinook and 193,200 marked coho; all retained coho must be marked. 4. No Area 4B add-on fishery. 5. Buoy 10 fishery opens August 1 with an expected landed catch of 50,000 marked coho in August and September. 6. Overall Chinook and/or coho TACs may need to be reduced or fisheries adjusted to meet NMFS ESA guidance, FMP requirements, upon conclusion of negotiations in the North of Falcon forum, or upon receipt of preseason catch and abundance expectations for Canadian and Alaskan fisheries.	1. Overall non-Indian TAC: 114,000 (non-mark-selective equivalent of 110,000) Chinook and 210,000 coho marked with a healed adipose fin clip (marked). 2. Recreational TAC: 58,000 (non-mark selective equivalent of 54,000) Chinook and 176,400 marked coho; all retained coho must be marked. 4. No Area 4B add-on fishery. 5. Buoy 10 fishery opens August 1 with an expected landed catch of 60,000 marked coho in August and September. 6. Overall Chinook and/or coho TACs may need to be reduced or fisheries adjusted to meet NMFS ESA guidance, FMP requirements, upon conclusion of negotiations in the North of Falcon forum, or upon receipt of preseason catch and abundance expectations for Canadian and Alaskan fisheries.	1.Overall non-Indian TAC: 95,000 Chinook and 190,000 coho marked with a healed adipose fin clip (marked). 2. Recreational TAC: 47,500 Chinook and 159,600 marked coho; all retained coho must be marked. 4. No Area 4B add-on fishery. 5. Buoy 10 fishery opens August 1 with an expected landed catch of 70,000 marked coho in August and September. 6. Overall Chinook and/or coho TACs may need to be reduced or fisheries adjusted to meet NMFS ESA guidance, FMP requirements, upon conclusion of negotiations in the North of Falcon forum, or upon receipt of preseason catch and abundance expectations for Canadian and Alaskan fisheries.
U.S./Canada Border to Queets River • May 16-17, May 23-24, and May 31-June 20 or a coastwide **marked Chinook quota of 10,000** (C.5). Seven days per week. Two fish per day, all salmon except coho, **all Chinook must be marked with a healed adipose fin clip (C.1).** Chinook 24-inch total length minimum size limit (B). See gear restrictions (C.2). Inseason management may be used to sustain season length and keep harvest within the overall Chinook recreational TAC for north of Cape Falcon (C.5).	**U.S./Canada Border to Queets River** • May 23-24 and June 7-20 or a coastwide **marked Chinook quota of 8,000** (C.5). Seven days per week. Two fish per day, all salmon except coho, **all Chinook must be marked with a healed adipose fin clip (C.1).** Chinook 24-inch total length minimum size limit (B). See gear restrictions (C.2). Inseason management may be used to sustain season length and keep harvest within the overall Chinook recreational TAC for north of Cape Falcon (C.5).	**U.S./Canada Border to Queets River**
Queets River to Leadbetter Point • May 31 through earlier of June 20 or a coastwide **marked Chinook quota of 10,000** (C.5). Seven days per week. Two fish per day, all salmon except coho, **all Chinook must be marked with a healed adipose fin clip (C.1)**. Chinook 24-inch total length minimum size limit (B). See gear restrictions (C.2). Inseason management may be used to sustain season length and keep harvest within the overall Chinook recreational TAC for north of Cape Falcon (C.5).	**Queets River to Leadbetter Point** • June 7 through earlier of June 20 or a coastwide **marked Chinook quota of 8,000** (C.5). Seven days per week. Two fish per day, all salmon except coho, **all Chinook must be marked with a healed adipose fin clip (C.1)**. Chinook 24-inch total length minimum size limit (B). See gear restrictions (C.2). Inseason management may be used to sustain season length and keep harvest within the overall Chinook recreational TAC for north of Cape Falcon (C.5).	**Queets River to Leadbetter Point**

TABLE 2. Recreational management Alternatives collated by the STT for non-Indian ocean salmon fisheries, 2014. (Page 2 of 9) 3/11/2014 4:37 PM

A. SEASON ALTERNATIVE DESCRIPTIONS		
ALTERNATIVE I	ALTERNATIVE II	ALTERNATIVE III
Leadbetter Point to Cape Falcon • May 31 through earlier of June 20 or a coastwide **marked Chinook quota of 10,000** (C.5). Seven days per week. Two fish per day, all salmon except coho, **all Chinook must be marked with a healed adipose fin clip (C.1)**. Chinook 24-inch total length minimum size limit (B). See gear restrictions (C.2). Inseason management may be used to sustain season length and keep harvest within the overall Chinook recreational TAC for north of Cape Falcon (C.5).	**Leadbetter Point to Cape Falcon** • June 7 through earlier of June 20 or a coastwide **marked Chinook quota of 8,000** (C.5). Seven days per week. Two fish per day, all salmon except coho, **all Chinook must be marked with a healed adipose fin clip (C.1)**. Chinook 24-inch total length minimum size limit (B). See gear restrictions (C.2). Inseason management may be used to sustain season length and keep harvest within the overall Chinook recreational TAC for north of Cape Falcon (C.5).	**Leadbetter Point to Cape Falcon**
U.S./Canada Border to Cape Alava (Neah Bay) • June 21 through earlier of September 21 or 20,090 marked coho subarea quota with a subarea guideline of 7,300 Chinook (C.5). Seven days per week. All salmon except no chum beginning August 1; two fish per day. All coho must be marked (C.1). Beginning August 1, Chinook non-retention east of the Bonilla-Tatoosh line (C.4.a) during Council managed ocean fishery. See gear restrictions and definitions (C.2, C.3). Inseason management may be used to sustain season length and keep harvest within the overall Chinook and coho recreational TACs for north of Cape Falcon (C.5).	**U.S./Canada Border to Cape Alava (Neah Bay**) • June 21 through earlier of September 21 or 18,350 marked coho subarea quota with a subarea guideline of 6,900 Chinook (C.5). Seven days per week. All salmon except no chum beginning August 1; two fish per day. All coho must be marked (C.1). Beginning August 1, Chinook non-retention east of the Bonilla-Tatoosh line (C.4.a) during Council managed ocean fishery. See gear restrictions and definitions (C.2, C.3). Inseason management may be used to sustain season length and keep harvest within the overall Chinook and coho recreational TACs for north of Cape Falcon (C.5).	**U.S./Canada Border to Cape Alava (Neah Bay**) • June 14 through earlier of September 21 or 16,600 marked coho subarea quota with a subarea guideline of 6,600 Chinook (C.5). Seven days per week. All salmon except no chum beginning August 1; two fish per day. All coho must be marked (C.1). Beginning August 1, Chinook non-retention east of the Bonilla-Tatoosh line (C.4.a) during Council managed ocean fishery. See gear restrictions and definitions (C.2, C.3). Inseason management may be used to sustain season length and keep harvest within the overall Chinook and coho recreational TACs for north of Cape Falcon (C.5).
Cape Alava to Queets River (La Push Subarea) • June 21 through earlier of September 21 or 4,980 marked coho subarea quota with a subarea guideline of 2,550 Chinook (C.5). • September 27 through earlier of October 12 or 50 marked coho quota or 50 Chinook quota (C.5) in the area north of 47°50'00 N. lat. and south of 48°00'00" N. lat. Seven days per week. All salmon, two fish per day. All coho must be marked (see *Ocean Boat Limits*, C.1). See gear restrictions and definitions (C.2, C.3). Inseason management may be used to sustain season length and keep harvest within the overall Chinook and coho recreational TACs for north of Cape Falcon (C.5).	**Cape Alava to Queets River (La Push Subarea)** • June 21 through earlier of September 21 or 4,540 marked coho subarea quota with a subarea guideline of 2,350 Chinook (C.5). • September 27 through earlier of October 12 or 50 marked coho quota or 50 Chinook quota (C.5) in the area north of 47°50'00 N. lat. and south of 48°00'00" N. lat. Seven days per week. All salmon, two fish per day. All coho must be marked (see *Ocean Boat Limits*, C.1). See gear restrictions and definitions (C.2, C.3). Inseason management may be used to sustain season length and keep harvest within the overall Chinook and coho recreational TACs for north of Cape Falcon (C.5).	**Cape Alava to Queets River (La Push Subarea)** • June 14 through earlier of September 21 or 4,100 marked coho subarea quota with a subarea guideline of 2,250 Chinook (C.5). • September 27 through earlier of October 12 or 50 marked coho quota or 50 Chinook quota (C.5) in the area north of 47°50'00 N. lat. and south of 48°00'00" N. lat. Seven days per week. All salmon, two fish per day. All coho must be marked (see *Ocean Boat Limits*, C.1). See gear restrictions and definitions (C.2, C.3). Inseason management may be used to sustain season length and keep harvest within the overall Chinook and coho recreational TACs for north of Cape Falcon (C.5).

TABLE 2. Recreational management Alternatives collated by the STT for non-Indian ocean salmon fisheries, 2014. (Page 3 of 9) 3/11/2014 4:37 PM

A. SEASON ALTERNATIVE DESCRIPTIONS

ALTERNATIVE I	ALTERNATIVE II	ALTERNATIVE III
Queets River to Leadbetter Point (Westport Subarea) • June 21 through earlier of September 30 or 71,480 marked coho subarea quota with a subarea guideline of 29,200 Chinook (C.5). Seven days per week. All salmon; two fish per day. All coho must be marked (C.1). See gear restrictions and definitions (C.2, C.3). Grays Harbor Control Zone closed beginning August 11 (C.4). Inseason management may be used to sustain season length and keep harvest within the overall Chinook and coho recreational TACs for north of Cape Falcon (C.5).	**Queets River to Leadbetter Point (Westport Subarea)** • June 21 through earlier of September 21 or 65,260 marked coho subarea quota with a subarea guideline of 27,600 Chinook (C.5). Seven days per week. All salmon; two fish per day, no more than one of which can be a Chinook. All coho must be marked (C.1). See gear restrictions and definitions (C.2, C.3). Grays Harbor Control Zone closed beginning August 11 (C.4). Inseason management may be used to sustain season length and keep harvest within the overall Chinook and coho recreational TACs for north of Cape Falcon (C.5).	**Queets River to Leadbetter Point (Westport Subarea)** • June 15 through earlier of September 30 or 59,050 marked coho subarea quota with a subarea guideline of 26,200 Chinook (C.5). Five days per week, Sunday through Thursday. All salmon; two fish per day, no more than one of which can be a Chinook. All coho must be marked (C.1). See gear restrictions and definitions (C.2, C.3). Grays Harbor Control Zone closed beginning August 11 (C.4). Inseason management may be used to sustain season length and keep harvest within the overall Chinook and coho recreational TACs for north of Cape Falcon (C.5).
Leadbetter Point to Cape Falcon (Columbia River Subarea) • June 21.through earlier of September 30 or 96,600 marked coho subarea quota with a subarea guideline of 13,900 Chinook (C.5). Seven days per week. All salmon, two fish per day. All coho must be marked (C.1). See gear restrictions and definitions (C.2, C.3). Columbia Control Zone closed (C.4). Inseason management may be used to sustain season length and keep harvest within the overall Chinook and coho recreational TACs for north of Cape Falcon (C.5).	**Leadbetter Point to Cape Falcon (Columbia River Subarea)** • June 21 through earlier of September 30 or 88,200 marked coho subarea quota with a subarea guideline of 13,100 Chinook (C.5). Seven days per week. All salmon, two fish per day, only one of which can be a Chinook. All coho must be marked (C.1). See gear restrictions and definitions (C.2, C.3). Columbia Control Zone closed (C.4). Inseason management may be used to sustain season length and keep harvest within the overall Chinook and coho recreational TACs for north of Cape Falcon (C.5).	**Leadbetter Point to Cape Falcon (Columbia River Subarea)** • June 14 through earlier of September 30 or 79,800 marked coho subarea quota with a subarea guideline of 12,400 Chinook (C.5). Seven days per week. All salmon, two fish per day, only one of which can be a Chinook. All coho must be marked (C.1). See gear restrictions and definitions (C.2, C.3). Columbia Control Zone closed (C.4). Inseason management may be used to sustain season length and keep harvest within the overall Chinook and coho recreational TACs for north of Cape Falcon (C.5).

TABLE 2. Recreational management Alternatives collated by the STT for non-Indian ocean salmon fisheries, 2014. (Page 4 of 9)		3/11/2014 4:37 PM
A. SEASON ALTERNATIVE DESCRIPTIONS		
South of Cape Falcon	**South of Cape Falcon**	**South of Cape Falcon**
ALTERNATIVE I	ALTERNATIVE II	ALTERNATIVE III
Supplemental Management Information	**Supplemental Management Information**	**Supplemental Management Information**
1. Sacramento River Basin recreational fishery catch assumption: __,___ adult Sacramento River fall Chinook (__._ % of the total allowable harvest). 2. Sacramento River fall Chinook spawning escapement of ___,___ adults. 3. Klamath River recreational fishery allocation: __,___ adult Klamath River fall Chinook. 4. Klamath tribal allocation: ___,___ adult Klamath River fall Chinook. 5. Overall recreational coho TAC: __,___ mark-selective coho fishery and __,___ in the non-mark-selective coho fishery. 6. Fisheries may need to be adjusted to meet NMFS ESA consultation standards, FMP requirements, other management objectives, or upon receipt of new allocation recommendations from the CFGC.	1. Sacramento River Basin recreational fishery catch assumption: __,___ adult Sacramento River fall Chinook (__._ % of the total allowable harvest). 2. Sacramento River fall Chinook spawning escapement of ___,___ adults. 3. Klamath River recreational fishery allocation: __,___ adult Klamath River fall Chinook. 4. Klamath tribal allocation: ___,___ adult Klamath River fall Chinook. 5. Overall recreational coho TAC: __,___ mark-selective coho fishery and __,___ in the non-mark-selective coho fishery. 6. Fisheries may need to be adjusted to meet NMFS ESA consultation standards, FMP requirements, other management objectives, or upon receipt of new allocation recommendations from the CFGC.	1. Sacramento River Basin recreational fishery catch assumption: __,___ adult Sacramento River fall Chinook (__._ % of the total allowable harvest). 2. Sacramento River fall Chinook spawning escapement of ___,___ adults. 3. Klamath River recreational fishery allocation: __,___ adult Klamath River fall Chinook. 4. Klamath tribal allocation: ___,___ adult Klamath River fall Chinook. 5. Overall recreational coho TAC: __,___ mark-selective coho fishery and __,___ in the non-mark-selective coho fishery. 6. Fisheries may need to be adjusted to meet NMFS ESA consultation standards, FMP requirements, other management objectives, or upon receipt of new allocation recommendations from the CFGC.
Cape Falcon to Humbug Mt. • March **15** through October **31** (C.6), except as provided below during the summer all-salmon mark-selective and September non-mark-selective coho fisheries. Seven days per week. All salmon except coho; two fish per day (C.1). Chinook minimum size limit of 24 inches total length (B). See gear restrictions and definitions (C.2, C.3). • **Non-mark-selective coho fishery**: **August 30 through the earlier of September 30 or a landed catch of 20,000 non-mark-selective coho quota** (C.5). **All salmon**, two fish per day (C.5); The all salmon except coho season reopens the earlier of October 1 or attainment of the coho quota (C.5). In 2015, the season between Cape Falcon and Humbug Mountain will open March 15 for all salmon except coho, two fish per day (B, C.1, C.2, C.3).	**Cape Falcon to Humbug Mt.** • March **15** through October **31** (C.6), except as provided below during the summer all-salmon mark-selective and September non-mark-selective coho fisheries. Seven days per week. All salmon except coho; two fish per day (C.1). Chinook minimum size limit of 24 inches total length (B). See gear restrictions and definitions (C.2, C.3). • **Non-mark-selective coho fishery**: **September 1 through the earlier of September 30 or a landed catch of 20,000 non-mark-selective coho quota** (C.5). **All salmon**, two fish per day (C.5); The all salmon except coho season reopens the earlier of October 1 or attainment of the coho quota (C.5). In 2015, same as Alternative I	**Cape Falcon to Humbug Mt.** • March **15** through October **31** (C.6), except as provided below during the summer all-salmon mark-selective and September non-mark-selective coho fisheries. Seven days per week. All salmon except coho; two fish per day (C.1). Chinook minimum size limit of 24 inches total length (B). See gear restrictions and definitions (C.2, C.3). • **Non-mark-selective coho fishery**: **September 1 through the earlier of September 30 or a landed catch of 20,000 non-mark-selective coho quota** (C.5). **All salmon**, two fish per day (C.5); The all salmon except coho season reopens the earlier of October 1 or attainment of the coho quota (C.5). In 2015, same as Alternative I
Fishing in the Stonewall Bank yelloweye rockfish conservation area restricted to trolling only on days the all depth recreational halibut fishery is open (call the halibut fishing hotline 1-800-662-9825 for specific dates) (C.3.b, C.4.d).		

TABLE 2. Recreational management Alternatives collated by the STT for non-Indian ocean salmon fisheries, 2014. (Page 5 of 9) 3/11/2014 4:37 PM

A. SEASON ALTERNATIVE DESCRIPTIONS

ALTERNATIVE I	ALTERNATIVE II	ALTERNATIVE III
Cape Falcon to OR/CA Border • All-**salmon mark-selective coho fishery**: **June 21** through earlier of **August 10** or a landed catch of **80,000** marked coho. Seven days per week. All salmon, two fish per day. All retained coho must be marked (C.1). Chinook minimum size limit of 24 inches total length (B). Any remainder of the mark selective coho quota will be transferred on an impact neutral basis to the September non-selective coho quota from Cape Falcon to Humbug Mountain. The all salmon except coho season reopens the earlier of August 11 or attainment of the coho quota. Fishing in the Stonewall Bank yelloweye rockfish conservation area restricted to trolling only on days the all depth recreational halibut fishery is open (call the halibut fishing hotline 1-800-662-9825 for specific dates) (C.3.b, C.4.d).	**Cape Falcon to OR/CA Border** • All-**salmon mark-selective coho fishery**: **June 28** through earlier of **August 3** or a landed catch of **65,000** marked coho. Seven days per week. All salmon, two fish per day. All retained coho must be marked (C.1). Chinook minimum size limit of 24 inches total length (B). Any remainder of the mark selective coho quota will be transferred on an impact neutral basis to the September non-selective coho quota from Cape Falcon to Humbug Mountain. The all salmon except coho season reopens the earlier of August 4 or attainment of the coho quota. Fishing in the Stonewall Bank yelloweye rockfish conservation area restricted to trolling only on days the all depth recreational halibut fishery is open (call the halibut fishing hotline 1-800-662-9825 for specific dates) (C.3.b, C.4.d).	**Cape Falcon to OR/CA Border** • All-**salmon mark-selective coho fishery**: **July 1** through earlier of **July 31** or a landed catch of **50,000** marked coho. Seven days per week. All salmon, two fish per day. All retained coho must be marked (C.1). Chinook minimum size limit of 24 inches total length (B). Any remainder of the mark selective coho quota will be transferred on an impact neutral basis to the September non-selective coho quota from Cape Falcon to Humbug Mountain. The all salmon except coho season reopens the earlier of August 1 or attainment of the coho quota. Fishing in the Stonewall Bank yelloweye rockfish conservation area restricted to trolling only on days the all depth recreational halibut fishery is open (call the halibut fishing hotline 1-800-662-9825 for specific dates) (C.3.b, C.4.d).
Humbug Mt. to OR/CA Border (Oregon KMZ) • May 1 through September 7 except as provided above during the all-salmon mark-selective coho fishery (C.6). All salmon except coho, except as noted above in the all-salmon mark-selective coho fishery. Seven days per week, two fish per day (C.1). Chinook minimum size limit of 24 inches total length (B). See gear restrictions and definitions (C.2, C.3).	**Humbug Mt. to OR/CA Border (Oregon KMZ)** • May 17 through September 7 except as provided above during the all-salmon mark-selective coho fishery (C.6). All salmon except coho, except as noted above in the all-salmon mark-selective coho fishery. Seven days per week, two fish per day (C.1). Chinook minimum size limit of 24 inches total length (B). See gear restrictions and definitions (C.2, C.3).	**Humbug Mt. to OR/CA Border (Oregon KMZ)** • May 24 through September 1 except as provided above during the all-salmon mark-selective coho fishery (C.6). All salmon except coho, except as noted above in the all-salmon mark-selective coho fishery. Seven days per week, two fish per day (C.1). Chinook minimum size limit of 20 inches total length (B). See gear restrictions and definitions (C.2, C.3).
OR/CA Border to Horse Mt. (California KMZ) • May 1 through September 7 (C.6). Seven days per week. All salmon except coho, two fish per day (C.1). Chinook minimum size limit of 24 inches total length (B). See gear restrictions and definitions (C.2, C.3). Klamath Control Zone closed in August (C.4.e). See California State regulations for additional closures adjacent to the Smith, Eel, and Klamath rivers.	**OR/CA Border to Horse Mt. (California KMZ)** • May 17 through September 7 (C.6). Seven days per week. All salmon except coho, two fish per day (C.1). Chinook minimum size limit of 24 inches total length (B). See gear restrictions and definitions (C.2, C.3). Klamath Control Zone closed in August (C.4.e). See California State regulations for additional closures adjacent to the Smith, Eel, and Klamath rivers.	**OR/CA Border to Horse Mt. (California KMZ)** • May 24 through September 1 (C.6). Seven days per week. All salmon except coho, two fish per day (C.1). Chinook minimum size limit of 20 inches total length (B). See gear restrictions and definitions (C.2, C.3). Klamath Control Zone closed in August (C.4.e). See California State regulations for additional closures adjacent to the Smith, Eel, and Klamath rivers.

TABLE 2. Recreational management Alternatives collated by the STT for non-Indian ocean salmon fisheries, 2014. (Page 6 of 9) 3/11/2014 4:37 PM		
A. SEASON ALTERNATIVE DESCRIPTIONS		
ALTERNATIVE I	ALTERNATIVE II	ALTERNATIVE III
Horse Mt. to Point Arena (Fort Bragg) • April 5 through November 9. Seven days per week. All salmon except coho, two fish per day (C.1). Chinook minimum size limit of 20 inches total length (B). See gear restrictions and definitions (C.2, C.3). In 2015, season opens April 4 for all salmon except coho, two fish per day (C.1). Chinook minimum size limit of 20 inches total length (B); and the same gear restrictions as in 2014 (C.2, C.3).	**Horse Mt. to Point Arena (Fort Bragg)** • April 5 through November 2. Seven days per week. All salmon except coho, two fish per day (C.1). Chinook minimum size limit of 20 inches total length (B). See gear restrictions and definitions (C.2, C.3). In 2015, same as Alternative I.	**Horse Mt. to Point Arena (Fort Bragg)** • April 5 through November 2. Seven days per week. All salmon except coho, two fish per day (C.1). Chinook minimum size limit of 24 inches total length (B). See gear restrictions and definitions (C.2, C.3). In 2015, same as Alternative I.
Point Arena to Pigeon Point (San Francisco) • April 5 through November 9. Seven days per week. All salmon except coho, two fish per day (C.1). Chinook minimum size limit of 24 inches total length through May 31; 20 inches thereafter (B). See gear restrictions and definitions (C.2, C.3). In 2015, season opens April 4 for all salmon except coho, two fish per day (C.1). Chinook minimum size limit of 24 inches total length (B); and the same gear restrictions as in 2014 (C.2, C.3).	**Point Arena to Pigeon Point (San Francisco)** • April 5 through November 9. Seven days per week. All salmon except coho, two fish per day (C.1). Chinook minimum size limit of 24 inches total length through June 30; 20 inches thereafter (B). See gear restrictions and definitions (C.2, C.3). In 2015, same as Alternative I.	**Point Arena to Pigeon Point (San Francisco)** • April 5 through November 9 Seven days per week. All salmon except coho, two fish per day (C.1). Chinook minimum size limit of 24 inches total length through July 3; 20 inches thereafter (B). See gear restrictions and definitions (C.2, C.3). In 2015, same as Alternative I.
Pigeon Point to U.S./Mexico Border (Monterey) • April 5 through October 5. Seven days per week. All salmon except coho, two fish per day (C.1). Chinook minimum size limit of 24 inches total length (B). See gear restrictions and definitions (C.2, C.3). In 2015, season opens April 4 for all salmon except coho, two fish per day (C.1). Chinook minimum size limit of 24 inches total length (B); and the same gear restrictions as in 2014 (C.2, C.3).	**Pigeon Point to U.S./Mexico Border (Monterey)** • April 5 through October 5. Seven days per week. All salmon except coho, two fish per day (C.1). Chinook minimum size limit of 24 inches total length (B). See gear restrictions and definitions (C.2, C.3). In 2015, same as Alternative I.	**Pigeon Point to U.S./Mexico Border (Monterey)** • April 5 through October 5. Seven days per week. All salmon except coho, two fish per day (C.1). Chinook minimum size limit of 24 inches total length (B). See gear restrictions and definitions (C.2, C.3). In 2015, same as Alternative I.
California State regulations require all salmon be made available to a CDFW representative for sampling immediately at port of landing. Any person in possession of a salmon with a missing adipose fin, upon request by an authorized agent or employee of the CDFW, shall immediately relinquish the head of the salmon to the state. (California Fish and Game Code §8226)		

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

Area (when open)		Chinook	Coho	Pink
North of Cape Falcon		24.0	16.0	None
Cape Falcon to Humbug Mt.		24.0	16.0	None
Humbug Mt. to OR/CA Border	Alt. I & II	24.0	16.0	None
	Alt.III	20.0	16.0	None
OR/CA Border to Horse Mountain	Alt. I & II	24.0	-	20.0
	Alt. III	20.0		
Horse Mt. to Pt. Arena	Alt. I & II	20.0	-	20.0
	Alt. III	24.0		
Pt. Arena. to Pigeon Pt.:	Alt. I ≤ May 31	24.0	-	24.0
	Alt. I ≥ June 1	20.0	-	24.0
	Alt II ≤ June 30	24.0		20.0
	Alt II ≥ July 1	20.0		26.0
	Alt III ≤ July 3	24.0		20.0
	Alt III ≥ July 4	20.0	-	24.0
Pigeon Pt.. to U.S./Mexico Border:		24.0	-	24.0

C. REQUIREMENTS, DEFINITIONS, RESTRICTIONS, OR EXCEPTIONS

C.1. Compliance with Minimum Size and Other Special Restrictions: All salmon on board a vessel must meet the minimum size or other special requirements for the area being fished and the area in which they are landed if that area is open. Salmon may be landed in an area that is closed only if they meet the minimum size or other special requirements for the area in which they were caught. **Alternative I:** Salmon may not be filleted prior to landing.

Ocean Boat Limits: Off the coast of Washington, Oregon, and California, each fisher aboard a vessel may continue to use angling gear until the combined daily limits of Chinook and coho salmon for all licensed and juvenile anglers aboard have been attained (additional state restrictions may apply).

C. REQUIREMENTS, DEFINITIONS, RESTRICTIONS, OR EXCEPTIONS

C.2. Gear Restrictions: Salmon may be taken only by hook and line using barbless hooks. All persons fishing for salmon, and all persons fishing from a boat with salmon on board, must meet the gear restrictions listed below for specific areas or seasons.

a. *U.S./Canada Border to Point Conception, California*: No more than one rod may be used per angler; and no more than two single point, single shank barbless hooks are required for all fishing gear. [Note: ODFW regulations in the state-water fishery off Tillamook Bay may allow the use of barbed hooks to be consistent with inside regulations.]

b. *Horse Mountain, California, to Point Conception, California*: Single point, single shank, barbless circle hooks (see gear definitions below) are required when fishing with bait by any means other than trolling, and no more than two such hooks shall be used. When angling with two hooks, the distance between the hooks must not exceed five inches when measured from the top of the eye of the top hook to the inner base of the curve of the lower hook, and both hooks must be permanently tied in place (hard tied). Circle hooks are not required when artificial lures are used without bait.

C.3. Gear Definitions:

a. *Recreational fishing gear defined*: Off Oregon and Washington, angling tackle consists of a single line that must be attached to a rod and reel held by hand or closely attended; the rod and reel must be held by hand while playing a hooked fish. No person may use more than one rod and line while fishing off Oregon or Washington. Off California, the line must be attached to a rod and reel held by hand or closely attended; weights directly attached to a line may not exceed four pounds (1.8 kg). While fishing off California north of Point Conception, no person fishing for salmon, and no person fishing from a boat with salmon on board, may use more than one rod and line. Fishing includes any activity which can reasonably be expected to result in the catching, taking, or harvesting of fish.

b. *Trolling defined*: Angling from a boat or floating device that is making way by means of a source of power, other than drifting by means of the prevailing water current or weather conditions.

c. *Circle hook defined*: A hook with a generally circular shape and a point which turns inward, pointing directly to the shank at a 90° angle.

C.4. Control Zone Definitions:

a. *The Bonilla-Tatoosh Line*: A line running from the western end of Cape Flattery to Tatoosh Island Lighthouse (48°23'30" N. lat., 124°44'12" W. long.) to the buoy adjacent to Duntze Rock (48°24'37" N. lat., 124°44'37" W. long.), then in a straight line to Bonilla Point (48°35'39" N. lat., 124°42'58" W. long.) on Vancouver Island, British Columbia.

b. *Grays Harbor Control Zone* - The area defined by a line drawn from the Westport Lighthouse (46° 53'18" N. lat., 124° 07'01" W. long.) to Buoy #2 (46° 52'42" N. lat., 124°12'42" W. long.) to Buoy #3 (46° 55'00" N. lat., 124°14'48" W. long.) to the Grays Harbor north jetty (46° 55'36" N. lat., 124°10'51" W. long.).

c. *Columbia Control Zone*: An area at the Columbia River mouth, bounded on the west by a line running northeast/southwest between the red lighted Buoy #4 (46°13'35" N. lat., 124°06'50" W. long.) and the green lighted Buoy #7 (46°15'09' N. lat., 124°06'16" W. long.); on the east, by the Buoy #10 line which bears north/south at 357° true from the south jetty at 46°14'00" N. lat., 124°03'07" W. long. to its intersection with the north jetty; on the north, by a line running northeast/southwest between the green lighted Buoy #7 to the tip of the north jetty (46°15'48" N. lat., 124°05'20" W. long. and then along the north jetty to the point of intersection with the Buoy #10 line; and on the south, by a line running northeast/southwest between the red lighted Buoy #4 and tip of the south jetty (46°14'03" N. lat., 124°04'05" W. long.), and then along the south jetty to the point of intersection with the Buoy #10 line.

d. *Stonewall Bank Yelloweye Rockfish Conservation Area*: The area defined by the following coordinates in the order listed:

44°37.46' N. lat.; 124°24.92' W. long.;
44°37.46' N. lat.; 124°23.63' W. long.;
44°28.71' N. lat.; 124°21.80' W. long.;
44°28.71' N. lat.; 124°24.10' W. long.;
44°31.42' N. lat.; 124°25.47' W. long.;
and connecting back to 44°37.46' N. lat.; 124°24.92' W. long.

e. *Klamath Control Zone*: The ocean area at the Klamath River mouth bounded on the north by 41°38'48" N. lat. (approximately six nautical miles north of the Klamath River mouth); on the west, by 124°23'00" W. long. (approximately 12 nautical miles off shore); and, on the south, by 41°26'48" N. lat. (approximately 6 nautical miles south of the Klamath River mouth).

TABLE 2. Recreational management measures adopted by the Council for non-Indian ocean salmon fisheries, 2014. (Page 9 of 9)
C. REQUIREMENTS, DEFINITIONS, RESTRICTIONS, OR EXCEPTIONS

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

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

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

TABLE 3. Treaty Indian troll management Alternatives collated by the STT for ocean salmon fisheries, 2014. (Page 1 of 2) 3/11/2014 4:50 PM

A. SEASON ALTERNATIVE DESCRIPTIONS

ALTERNATIVE I	ALTERNATIVE II	ALTERNATIVE III
Supplemental Management Information	**Supplemental Management Information**	**Supplemental Management Information**
,1.Overall Treaty-Indian TAC: 70,000 Chinook and 60,000 coho. 2. Overall Chinook and/or coho TACs may need to be reduced or fisheries adjusted to meet NMFS ESA guidance, FMP requirements, upon conclusion of negotiations in the North of Falcon forum, or upon receipt of preseason catch and abundance expectations for Canadian and Alaskan fisheries	1. Overall Treaty-Indian TAC: 62,500 Chinook and 55,000 coho. 2. Overall Chinook and/or coho TACs may need to be reduced or fisheries adjusted to meet NMFS ESA guidance, FMP requirements, upon conclusion of negotiations in the North of Falcon forum, or upon receipt of preseason catch and abundance expectations for Canadian and Alaskan fisheries	1. Overall Treaty-Indian TAC: 55,000 Chinook and 47,500 coho. 2. Overall Chinook and/or coho TACs may need to be reduced or fisheries adjusted to meet NMFS ESA guidance, FMP requirements, upon conclusion of negotiations in the North of Falcon forum, or upon receipt of preseason catch and abundance expectations for Canadian and Alaskan fisheries
• May 1 through the earlier of June 30 or 42,000 Chinook quota. All salmon except coho. If the Chinook quota is exceeded, the excess will be deducted from the later all-salmon season (C.5). See size limit (B) and other restrictions (C). • July 1 through the earlier of September 15, or 28,000 Chinook quota, or 60,000 coho quota. All Salmon. See size limit (B) and other restrictions (C).	• May 1 through the earlier of June 30 or 36,250 Chinook quota. All salmon except coho. If the Chinook quota is exceeded, the excess will be deducted from the later all-salmon season. See size limit (B) and other restrictions (C). • July 1 through the earlier of September 15, or 26,250 Chinook quota, or 55,000 coho quota. All salmon. See size limit (B) and other restrictions (C).	• May 1 through the earlier of June 30 or 27,500 Chinook quota. All salmon except coho. If the Chinook quota is exceeded, the excess will be deducted from the later all-salmon season. See size limit (B) and other restrictions (C). • July 1 through the earlier of September 15, or 27,500 Chinook quota, or 47,500 coho quota. All salmon. See size limit (B) and other restrictions (C)

TABLE 3. Treaty Indian troll management Alternatives collated by the STT for ocean salmon fisheries, 2014. (Page 2 of 2) 3/11/2014 4:50 PM

B. MINIMUM SIZE (Inches)

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

C. REQUIREMENTS, DEFINITIONS, RESTRICTIONS, OR EXCEPTIONS

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

S'KLALLAM - Washington State Statistical Area 4B (All).

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

QUILEUTE - That portion of the FMA between 48°07'36" N. lat. (Sand Pt.) and 47°31'42" N. lat. (Queets River) and east of 125°44'00" W. long.

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

QUINAULT - That portion of the FMA between 47°40'06" N. lat. (Destruction Island) and 46°53'18"N. lat. (Point Chehalis) and east of 125°44'00" W. long.

C.2. Gear restrictions

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

C.3. Quotas

a. The quotas include troll catches by the S'Klallam and Makah tribes in Washington State Statistical Area 4B from May 1 through September 15.
b. The Quileute Tribe will continue a ceremonial and subsistence fishery during the time frame of September 15 through October 15 in the same manner as in 2004-2013. Fish taken during this fishery are to be counted against treaty troll quotas established for the 2014 season (estimated harvest during the October ceremonial and subsistence fishery: 100 Chinook; 200 coho).

C.4. Area Closures

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

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

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

TABLE 5. Projected key stock escapements (thousands of fish) or management criteria for 2014 ocean fishery Alternatives analyzed by the STT.[a/] (Page 1 of 3)

	Projected Ocean Escapement[b/] or Other Criteria (Council Area Impacts in Parens)				
Key Stock/Criteria	Alternative I	Alternative II	Alternative III		Spawner Objective or Other Comparative Standard as Noted
			CHINOOK		
Columbia Upriver Brights	917.3	918.4	919.4	74.0	Minimum ocean escapement to attain 60.0 adults over McNary Dam, with normal distribution and no mainstem harvest.
Mid-Columbia Brights	339.4	339.8	340.2	14.9	Minimum ocean escapement to attain 0.9 adults for Umatilla and 4.5 for Little White Salmon and Bonneville Hatchery egg-takes, assuming average conversion and no mainstem harvest.
Columbia Lower River Hatchery Tules	98.7	100.3	102.7	25.0	Minimum ocean escapement to attain 14.5 adults for hatchery egg-take, with average conversion and no lower river mainstem or tributary harvest.
Columbia Lower River Natural Tules (threatened)	**42.9%**	**41.5%**	39.7%	≤ 41.0%	Total adult equivalent fishery exploitation rate (2014 NMFS ESA guidance).
Columbia Lower River Wild[c/] (threatened)	33.3	33.3	33.4	6.9	Minimum ocean escapement to attain MSY spawner goal of 5.7 for N. Lewis River fall Chinook (NMFS ESA consultation standard).
Spring Creek Hatchery Tules	99.5	103.0	108.2	8.2	Minimum ocean escapement to attain 7.0 adults for Spring Creek Hatchery egg-take, assuming average conversion and no mainstem harvest.
Snake River Fall (threatened) SRFI	50.9%	47.0%	47.0%	≤ 70.0%	Of 1988-1993 base period exploitation rate for all ocean fisheries (NMFS ESA consultation standard).
Klamath River Fall	**36,701**	**39,121**	**40,083**	40,700	MSY natural area adult spawners
Federally recognized tribal harvest	50.0%	50.0%	50.0%	50.0%	Equals 30.3, 28.5, and 27.7 (thousand) adult fish for Yurok and Hoopa Valley tribal fisheries.
Spawner Reduction Rate	**52.3%**	**49.2%**	**47.9%**	≤ 47.1%	FMP; equals 40.3, 37.8, and 36.9 (thousand) fewer natural area adult spawners due to fishing.
Adult river mouth return	91.0	92.1	92.5	NA	Total adults.
Age 4 ocean harvest rate	**17.7%**	**16.7%**	**16.3%**	≤ 16.0%	NMFS ESA consultation standard for threatened California Coastal Chinook.
KMZ sport fishery share	8.3%	8.3%	8.5%		No Council guidance for 2014.
River recreational fishery share	15.0%	15.0%	15.0%	NA	Equals 4.6, 4.3, and 4.2 (thousand) adult fish for recreational inriver fisheries.
Sacramento River Winter (endangered)	**16.3%**	**16.0%**	15.4%	≤ 15.4%	Age-3 ocean impact rate in fisheries south of Pt. Arena. In addition, the following season restrictions apply: Recreational- Pt. Arena to Pigeon Pt. between the first Saturday in April and the second Sunday in November; Pigeon Pt. to the U.S./Mexico Border between the first Saturday in April and the first Sunday in October. Minimum size limit ≥ 20 inches total length. Commercial- Pt. Arena to the U.S./Mexico border between May 1 and September 30, except Pt. Reyes to Pt. San Pedro between October 1 and 15. Minimum size limit ≥ 26 inches total length (NMFS 2014 ESA Guidance).

TABLE 5. Projected key stock escapements (thousands of fish) or management criteria for 2014 ocean fishery Alternatives adopted by the Council.[a/] (Page 2 of 3)

	Projected Ocean Escapement[b/] or Other Criteria (Council Area Impacts in Parens)				
Key Stock/Criteria	Alternative I	Alternative II	Alternative III		Spawner Objective or Other Comparative Standard as Noted
Sacramento River Fall	310.8	312.0	321.5	≥ 190.4	2014 preseason ACL.
Sacramento Index exploitation rate	51.0%	50.8%	49.3%	≤ 70.0%	FMP.
Ocean commercial impacts	195.2	195.2	184.8		All Alternatives include fall (Sept-Dec) 2013 impacts (35.3 thousand SRFC).
Ocean recreational impacts	78.0	76.6	76.1		All Alternatives include fall 2013 impacts (3.8 thousand SRFC).
River recreational impacts	50.6	50.8	52.3		No guidance in 2014.
Hatchery spawner goal	Met	Met	Met	22.0	Aggregate number of adults to achieve egg take goals at Coleman, Feather River, and Nimbus hatcheries.
				COHO	
Interior Fraser (Thompson River)	**12.4% (5.5%)**	**11.9% (5.02%)**	**11.4% (4.4%)**	≤ 10.0%	2014 Southern U.S. exploitation rate ceiling; 2009 PSC coho agreement.
Skagit	39.3% (5.3%)	38.9% (4.8%)	38.6% (4.3%)	≤ 60.0%	2014 total exploitation rate ceiling; FMP matrix[d/]
Stillaguamish	32.9% (3.6%)	32.6% (3.2%)	32.3% (2.9%)	≤ 50.0%	2014 total exploitation rate ceiling; FMP matrix[d/]
Snohomish	31.3% (3.6%)	31.0% (3.2%)	30.8% (2.9%)	≤ 60.0%	2014 total exploitation rate ceiling; FMP matrix[d/]
Hood Canal	56.1% (5.7%)	55.8% (5.2%)	55.5% (4.6%)	≤ 65.0%	2014 total exploitation rate ceiling; FMP matrix[d/]
Strait of Juan de Fuca	14.8% (4.6%)	14.4% (4.2%)	14.0% (3.8%)	≤ 40.0%	2014 total exploitation rate ceiling; FMP matrix[d/]
Quillayute Fall	16.9	17.0	17.1	6.3	FMP MSY adult spawner estimate[d/]. Value depicted is ocean escapement.
Hoh	7.4	7.5	7.6	2.5	FMP MSY adult spawner estimate[d/]. Value depicted is ocean escapement.
Queets Wild	7.8	8.0	8.1	5.8	FMP MSY adult spawner estimate[d/]. Value depicted is ocean escapement.
Grays Harbor	95.9	96.6	97.3	24.4	FMP MSY adult spawner estimate[d/]. Value depicted is ocean escapement.
Lower Columbia River Natural (threatened)	14.9%	13.4%	11.9%	≤ 22.5%	Total marine and mainstem Columbia River fishery exploitation rate (2014 NMFS ESA guidance). Value depicted is ocean fishery exploitation rate only. Bolded values identify ocean exploitation rates that, when combined with 2013 freshwater harvest rates, will exceed the total allowable exploitation rate of 22.5 percent.
Upper Columbia[e/]	>50%	>50%	>50%	≥ 50%	Minimum percentage of the run to Bonneville Dam.
Columbia River Hatchery Early	316.6	326.0	335.4	41.2	Minimum ocean escapement to attain hatchery egg-take goal of 21.8 early adult coho, with average conversion and no mainstem or tributary fisheries.
Columbia River Hatchery Late	355.3	268.7	282.6	8.8	Minimum ocean escapement to attain hatchery egg-take goal of 6.3 late adult coho, with average conversion and no mainstem or tributary fisheries.
Oregon Coastal Natural	23.0%	21.6%	20.4%	≤ 30.0%	Marine and freshwater fishery exploitation rate (NMFS ESA consultation standard).
Southern Oregon/Northern California Coast (threatened)	7.4%	6.8%	6.3%	≤ 13.0%	Marine fishery exploitation rate for R/K hatchery coho (NMFS ESA consultation standard).

TABLE 5. Projected key stock escapements (thousands of fish) or management criteria for 2014 ocean fishery Alternatives analyzed by the STT.[a/] (Page 3 of 3)

a/ Projections in the table assume a WCVI mortality for coho of the 2013 preseason level. Chinook fisheries in Southeast Alaska, North Coast BC, and WCVI troll and outside sport fisheries were assumed to have the same exploitation rates as expected preseason in 2013, as modified by the 2008 PST agreement. Assumptions for these Chinook fisheries will be changed prior to the April meeting when allowable catch levels for 2014 under the PST are known.

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

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

d/ Annual management objectives may be different than FMP goals, and are subject to agreement between WDFW and the treaty tribes under U.S. District Court orders. Total exploitation rate includes Alaskan, Canadian, Council area, Puget Sound, and freshwater fisheries and is calculated as total fishing mortality divided by total fishing mortality plus spawning escapement. These total exploitation rates reflect the initial base package for inside fisheries developed by state and tribal comanagers. It is anticipated that total exploitation rates will be adjusted by state and tribal comanagers during the preseason planning process to comply with stock specific exploitation rate constraints.

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

TABLE 7. Expected coastwide lower Columbia Natural (LCN) Oregon coastal natural (OCN) and Rogue/Klamath (RK) coho, and Lower Columbia River (LCR) tule Chinook exploitation rates by fishery for 2014 ocean fisheries management Alternatives adopted by the Council.

	Exploitation Rate (Percent)											
	LCN Coho			OCN Coho			RK Coho			LCR Tule Chinook		
Fishery	I	II	III	I	II	III	I	II	III	I	II	III
SOUTHEAST ALASKA	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.0%	2.0%	2.0%
BRITISH COLUMBIA	0.1%	0.1%	0.1%	0.3%	0.3%	0.3%	0.0%	0.0%	0.0%	12.7%	12.8%	13.0%
PUGET SOUND/STRAIT	0.2%	0.2%	0.2%	0.1%	0.1%	0.1%	0.0%	0.0%	0.0%	0.4%	0.4%	0.4%
NORTH OF CAPE FALCON												
Treaty Indian Ocean Troll	2.4%	2.2%	2.0%	0.5%	0.5%	0.4%	0.0%	0.0%	0.0%	6.7%	6.0%	5.2%
Recreational	5.8%	5.2%	4.6%	1.0%	0.9%	0.8%	0.0%	0.0%	0.0%	3.6%	3.3%	2.9%
Non-Indian Troll	2.0%	1.8%	1.6%	0.5%	0.4%	0.4%	0.0%	0.0%	0.0%	8.0%	7.2%	6.1%
SOUTH OF CAPE FALCON												
Recreational:										0.1%	0.1%	0.1%
Cape Falcon to Humbug Mt.	3.3%	2.9%	2.5%	8.4%	7.3%	6.5%	0.7%	0.5%	0.3%			
Humbug Mt. to OR/CA border (KMZ)	0.1%	0.1%	0.1%	0.4%	0.4%	0.3%	1.0%	0.9%	0.7%			
OR/CA border to Horse Mt. (KMZ)	0.1%	0.0%	0.0%	0.4%	0.4%	0.4%	1.9%	1.9%	1.7%			
Fort Bragg	0.0%	0.0%	0.0%	0.3%	0.3%	0.3%	1.1%	1.1%	1.1%			
South of Pt. Arena	0.0%	0.0%	0.0%	0.3%	0.3%	0.3%	0.7%	0.7%	0.7%			
Troll:										1.8%	1.8%	1.8%
Cape Falcon to Humbug Mt.	0.7%	0.7%	0.7%	0.9%	0.9%	0.9%	0.2%	0.1%	0.1%			
Humbug Mt. to OR/CA border (KMZ)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	0.0%			
OR/CA border to Horse Mt. (KMZ)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	0.1%			
Fort Bragg	0.0%	0.0%	0.0%	0.5%	0.4%	0.4%	1.1%	1.0%	1.0%			
South of Pt. Arena	0.0%	0.0%	0.0%	0.3%	0.3%	0.3%	0.2%	0.2%	0.2%			
BUOY 10	1.7%	2.0%	2.3%	0.1%	0.1%	0.2%	0.0%	0.0%	0.0%	7.8%	8.0%	8.2%
ESTUARY/FRESHWATER	N/A	N/A	N/A	8.9%	8.9%	8.9%	0.2%	0.2%	0.2%			
TOTAL[a/]	14.9%	13.4%	11.9%	23.0%	21.6%	20.4%	7.4%	6.8%	6.3%	**42.9%**	**41.5%**	39.7%

a/ Totals do not include estuary/freshwater for LCN coho.

TABLE A-1. Sacramento River Winter run Chinook age-3 ocean impact rate south of Pt. Arena by fishery and alternative. The age-3 SRWC impact rate was projected for each of the proposed 2014 fishing season alternatives. The impacts are displayed as a percent for each alternative by fishery, port area, and month. Max rate: 15.4

Commercial

Alternative I **16.3 Total**

Port Area	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year Total
	2014								
SF	0.21	0.90	0.41	0.16	0.01	0.00			1.68
MO	0.45	1.15	0.35	0.71	0.15				2.82
Total	0.66	2.05	0.76	0.87	0.16	0.00	0.00	0.00	**4.50**

Alternative II **16.0 Total**

Port Area	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year Total
	2014								
SF	0.21	1.02	0.36	0.16	0.01	0.00			1.75
MO	0.45	1.43	0.31	0.72	0.15				3.05
Total	0.66	2.44	0.66	0.87	0.16	0.00	0.00	0.00	**4.80**

Alternative III **15.4 Total**

Port Area	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year Total
	2014								
SF	0.21	0.84	0.32	0.16	0.01	0.00			1.54
MO	0.45	1.00	0.28	0.72	0.16				2.60
Total	0.66	1.84	0.60	0.88	0.16	0.00	0.00	0.00	**4.14**

Recreational

Alternative I

Port Area	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year Total
	2014									
SF	0.17	0.39	1.57	2.05	0.63	0.06	0.17	0.03		5.05
MO	1.00	0.56	1.46	2.73	0.95	0.09	0.00			6.79
Total	1.17	0.95	3.03	4.77	1.58	0.15	0.17	0.03	0.00	**11.85**

Alternative II

Port Area	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year Total
	2014									
SF	0.17	0.39	0.95	2.05	0.63	0.06	0.17	0.03		4.44
MO	1.00	0.56	1.46	2.74	0.95	0.09	0.00			6.80
Total	1.17	0.95	2.41	4.79	1.58	0.15	0.17	0.03	0.00	**11.25**

Alternative III

Port Area	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year Total
	2014									
SF	0.17	0.39	0.95	2.02	0.63	0.06	0.18	0.03		4.42
MO	1.00	0.56	1.46	2.75	0.96	0.09	0.00			6.83
Total	1.17	0.95	2.41	4.77	1.59	0.15	0.18	0.03	0.00	**11.25**

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

10-Mar-14

TABLE A-2. Klamath River fall Chinook **age-4 ocean HARVEST** by fishery and alternative. In 2014, a harvest of 10,779 age-4 KRFC equals a 16% ocean harvest rate. March 10 2014

Commercial

Alternative I 17.7% Total

Port	Fall 2013			Summer 2014						Summer	Year
Area	Sept	Oct	Nov-Dec	Mar	Apr	May	Jun	Jul	Aug	Total	Total
NO					92	191	65	61	208	617	617
CO	1,164	488			237	305	222	333	684	1,782	3,434
KO						24	192	179	126	521	521
KC											
FB							1,190	2,257	616	4,063	4,063
SF						329	685	706	80	1,800	1,800
MO						87	84	65	1	236	236
Total	1,164	488			329	937	2,438	3,602	1,714	9,019	10,671
											15.8%

Alternative II 16.7% Total

Port	Fall 2013			Summer 2014						Summer	Year
Area	Sep	Oct	Nov-Dec	Mar	Apr	May	Jun	Jul	Aug	Total	Total
NO					92	191	65	61	189	599	599
CO	1,164	488			237	305	222	335	622	1,721	3,373
KO						24	192	179	127	522	522
KC											
FB							936	1,957	624	3,517	3,517
SF						329	774	612	81	1,797	1,797
MO						87	104	56	1	248	248
Total	1,164	488			329	937	2,294	3,201	1,643	8,403	10,055
											14.9%

Alternative III 16.3% Total

Port	Fall 2013			Summer 2014						Summer	Year
Area	Sep	Oct	Nov-Dec	Mar	Apr	May	Jun	Jul	Aug	Total	Total
NO					92	191	66	61	175	584	584
CO	1,164	488			237	305	222	334	576	1,674	3,326
KO						24	128	134	85	371	371
KC											
FB							1,362	1,745	626	3,733	3,733
SF						329	643	546	81	1,600	1,600
MO						87	73	50	1	211	211
Total	1,164	488			329	937	2,493	2,869	1,544	8,172	9,824
											14.6%

Recreational

Alternative I

Port	Fall 2013			Summer 2014						Summer	Year
Area	Sep	Oct	Nov-Dec	Mar	Apr	May	Jun	Jul	Aug	Total	Total
NO								8	4	12	12
CO	155					1	10	19	12	43	198
KO	28					2	19	44	146	210	238
KC						83	117	106	192	497	497
FB					2	19	45	57	14	137	137
SF					20	13	47	44	2	126	126
MO					15	3	5	10	1	35	35
Total	183				37	121	244	288	369	1,059	1,242
											1.8%

Alternative II

Port	Fall 2013			Summer 2014						Summer	Year
Area	Sep	Oct	Nov-Dec	Mar	Apr	May	Jun	Jul	Aug	Total	Total
NO								8	2	10	10
CO	155					1	6	19	10	37	192
KO	28					1	19	44	148	212	240
KC						40	117	106	194	458	458
FB					2	19	45	58	14	137	137
SF					20	13	47	45	2	126	126
MO					15	3	5	10	1	35	35
Total	183				37	77	240	289	371	1,014	1,197
											1.8%

Alternative III

Port	Fall 2013			Summer 2014						Summer	Year
Area	Sep	Oct	Nov-Dec	Mar	Apr	May	Jun	Jul	Aug	Total	Total
NO								8	2	9	9
CO	155					1	4	19	10	34	189
KO	28					1	19	44	148	211	239
KC						21	117	106	195	439	439
FB					2	19	45	57	14	137	137
SF					20	13	47	44	2	126	126
MO					15	3	5	10	1	35	35
Total	183				37	58	238	288	371	992	1,175
											1.7%

ADOPTION OF 2014 MANAGEMENT ALTERNATIVES FOR PUBLIC REVIEW

The Council will review the Salmon Technical Team (STT) impact analysis (Agenda Item F.6.b, Supplemental STT Report) and comments from advisory bodies, agencies, tribes, and the public before adopting proposed ocean salmon fishery management alternatives for public review. The adopted alternatives should meet fishery management plan objectives (spawner escapement goals, allocations, annual catch limits, etc.) and encompass a realistic range of alternatives from which the final management measures will emerge. Any need for implementation by emergency rule must be clearly noted and consistent with the Council's and National Marine Fisheries Service's emergency criteria (see Agenda Item F.2.a, Attachment 2 and Attachment 3).

Council Action:

1. **Adopt proposed 2014 ocean salmon fishery management alternatives for public review.**
2. **If necessary, identify and justify any alternative(s) that would require implementation by emergency rule.**

Reference Materials:

1. Agenda Item F.6.b, Supplemental STT Report: Analysis of Preliminary Salmon Management Alternatives for 2014 Ocean Fisheries.

Agenda Order:

a. Agenda Item Overview — Mike Burner
b. Reports and Comments of Advisory Bodies and Management Entities
c. Public Comment
d. **Council Action:** Adopt Management Alternatives for Public Review

PFMC
02/11/14

OREGON DEPARTMENT OF FISH AND WILDLIFE REPORT ON ADOPTION OF 2014 MANAGEMENT ALTERNATIVES FOR PUBLIC REVIEW

In guidance provided to the Salmon Technical Team (STT) on March 12, 2014, Oregon Department of Fish and Wildlife (ODFW) staff had expected that a Lower Columbia Natural (LCN) coho impact neutral rollover of 29,000 mark selective coho from the summer to the September non-mark selective coho season would result in an additional 20,000 coho in the non-mark selective coho season. This was based on preliminary model runs on March 11, 2014. However, model runs on March 12, 2014 resulted in an LCN coho impact neutral transfer and Oregon Coastal Natural (OCN) coho impacts that were less than expected.

ODFW worked with the STT to recalculate the modeled impacts using an LCN coho impact neutral transfer of 35,000 coho from the summer mark-selective coho season to the September non-mark selective season. This proposed change to Alternative I in Agenda Item F.6.b, Supplemental STT Report would result in a net transfer of 20,300 coho to September, an increase to OCN coho impacts of 2.5 percent, a revised overall OCN coho impact rate of 25.3 percent, and no increase in LCN coho impacts.

Oregon requests that these model results, including the increased quota transfer and revised OCN coho impacts, be included in the alternatives for public review.

Agenda Item F.6.b
Supplemental STT Report
March 2014

SALMON TECHNICAL TEAM

ANALYSIS OF PRELIMINARY SALMON MANAGEMENT ALTERNATIVES FOR 2014 OCEAN FISHERIES

March 13, 2014

<table>
<tr><td colspan="3">TABLE 1. Commercial troll management Alternatives collated by the STT for non-Indian ocean salmon fisheries, 2014 (Page 1 of 9) 3/12/2014 7:49 PM</td></tr>
<tr><td colspan="3">A. SEASON ALTERNATIVE DESCRIPTIONS</td></tr>
<tr><td>ALTERNATIVE I</td><td>ALTERNATIVE II</td><td>ALTERNATIVE III</td></tr>
<tr><td>North of Cape Falcon</td><td>North of Cape Falcon</td><td>North of Cape Falcon</td></tr>
<tr><td>Supplemental Management Information</td><td>Supplemental Management Information</td><td>Supplemental Management Information</td></tr>
<tr><td>1. Overall non-Indian TAC: 117,500 (non-mark-selective equivalent of 112,500) Chinook and 230,000 coho marked with a healed adipose fin clip (marked).
2. Non-Indian commercial troll TAC: 57,500 Chinook and 36,800 marked coho.
3. Trade: May be considered at the April Council meeting
4. Overall Chinook and/or coho TACs may need to be reduced or fisheries adjusted to meet NMFS ESA guidance, FMP requirements, upon conclusion of negotiations in the North of Falcon forum, or upon receipt of preseason catch and abundance expectations for Canadian and Alaskan fisheries.</td><td>1. Overall non-Indian TAC: 114,000 (non-mark-selective equivalent of 110,000) Chinook and 210,000 coho marked with a healed adipose fin clip (marked).
2. Non-Indian commercial troll TAC: 56,000 Chinook and 33,600 marked coho.
3. Trade: May be considered at the April Council meeting
4. Overall Chinook and/or coho TACs may need to be reduced or fisheries adjusted to meet NMFS ESA guidance, FMP requirements, upon conclusion of negotiations in the North of Falcon forum, or upon receipt of preseason catch and abundance expectations for Canadian and Alaskan fisheries.</td><td>1. Overall non-Indian TAC: 95,000 Chinook and 190,000 coho marked with a healed adipose fin clip (marked).
2. Non-Indian commercial troll TAC: 47,500 Chinook and 30,400 marked coho.
3. Trade: May be considered at the April Council meeting
4. Overall Chinook and/or coho TACs may need to be reduced or fisheries adjusted to meet NMFS ESA guidance, FMP requirements, upon conclusion of negotiations in the North of Falcon forum, or upon receipt of preseason catch and abundance expectations for Canadian and Alaskan fisheries.</td></tr>
<tr><td>U.S./Canada Border to Cape Falcon
• May 1 through earlier of June 30 or 38,300 Chinook, no more than 12,300 of which may be caught in the area between the U.S./Canada border and the Queets River.
Seven days per week (C.1). All salmon except coho (C.4, C.7). Chinook minimum size limit of 28 inches total length (B, C.1). Vessels in possession of salmon north of the Queets River may not cross the Queets River line without first notifying WDFW at 360-902-2739 with area fished, total Chinook and halibut catch aboard, and destination. Vessels in possession of salmon south of the Queets River may not cross the Queets River line without first notifying WDFW at 360-902-2739 with area fished, total Chinook and halibut catch aboard, and destination. See compliance requirements (C.1) and gear restrictions and definitions (C.2, C.3). When it is projected that 28,725 Chinook have been landed overall, or 9,675 Chinook have been landed in the area between the U.S/Canada border and the Queets River, inseason action modifying the open period to five days per week and adding landing and possession limits will be considered to ensure the guideline is not exceeded.</td><td>U.S./Canada Border to Cape Falcon
• May 1 through earlier of June 30 or 37,300 Chinook, no more than 12,000 of which may be caught in the area between the U.S./Canada border and the Queets River.
Seven days per week (C.1). All salmon except coho (C.4, C.7). Chinook minimum size limit of 28 inches total length (B, C.1). Vessels in possession of salmon north of the Queets River may not cross the Queets River line without first notifying WDFW at 360-902-2739 with area fished, total Chinook and halibut catch aboard, and destination. Vessels in possession of salmon south of the Queets River may not cross the Queets River line without first notifying WDFW at 360-902-2739 with area fished, total Chinook and halibut catch aboard, and destination. See compliance requirements (C.1) and gear restrictions and definitions (C.2, C.3). When it is projected that 27,975 Chinook have been landed overall, or 9,000 Chinook have been landed in the area between the U.S/Canada border and the Queets River, inseason action modifying the open period to five days per week and adding landing and possession limits will be considered to ensure the guideline is not exceeded.</td><td>U.S./Canada Border to Cape Falcon
• May 1 through earlier of June 30 or 31,700 Chinook.
Seven days per week (C.1). All salmon except coho (C.4, C.7). Chinook minimum size limit of 28 inches total length (B, C.1). See compliance requirements (C.1) and gear restrictions and definitions (C.2, C.3). When it is projected that 23,775 Chinook have been landed inseason action modifying the open period to five days per week and adding landing and possession limits will be considered to ensure the guideline is not exceeded.</td></tr>
<tr><td colspan="3">Cape Flattery, Mandatory Yelloweye Rockfish Conservation Area, and Columbia Control Zones closed (C.5). Vessels must land and deliver their fish within 24 hours of any closure of this fishery. Under state law, vessels must report their catch on a state fish receiving ticket. Vessels fishing or in possession of salmon while fishing north of Leadbetter Point must land and deliver their fish within the area and north of Leadbetter Point. Vessels fishing or in possession of salmon while fishing south of Leadbetter Point must land and deliver their fish within the area and south of Leadbetter Point, except that Oregon permitted vessels may also land their fish in Garibaldi, Oregon. Oregon State regulations require all fishers landing salmon into Oregon from any fishery between Leadbetter Point, Washington and Cape Falcon, Oregon must notify ODFW within one hour of delivery or prior to transport away from the port of landing by either calling 541-867-0300 Ext. 271 or sending notification via e-mail to nfalcon.trollreport@state.or.us. Notification shall include vessel name and number, number of salmon by species, port of landing and location of delivery, and estimated time of delivery. Inseason actions may modify harvest guidelines in later fisheries to achieve or prevent exceeding the overall allowable troll harvest impacts.</td></tr>
</table>

<table>
<tr><td colspan="2">TABLE 1. Commercial troll management Alternatives collated by the STT for non-Indian ocean salmon fisheries, 2014. (Page 2 of 9)</td><td>3/12/2014 7:49 PM</td></tr>
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<tr>
<td>U.S./Canada Border to Cape Falcon
• July 1 through earlier of September 16 or attainment of the quota of 19,200 Chinook, no more than 8,800 of which may be caught in the area between the U.S./Canada border and the Queets River, or 36,800 marked coho (C.8.d).
July 1-8 then Friday through Tuesday July 11-August 19 with a landing and possession limit of 75 Chinook and 60 coho per vessel per open period; Friday through Tuesday August 22-September 16 with a landing and possession limit of 20 Chinook and 50 coho per vessel per open period (C.1). Vessels in possession of salmon north of the Queets River may not cross the Queets River line without first notifying WDFW at 360-902-2739 with area fished, total Chinook, coho, and halibut catch aboard, and destination. Vessels in possession of salmon south of the Queets River may not cross the Queets River line without first notifying WDFW at 360-902-2739 with area fished, total Chinook, coho, and halibut catch aboard, and destination. When it is projected that 14,400 Chinook have been landed overall, or 6,975 Chinook have been landed in the area between the U.S/Canada border and the Queets River, inseason action modifying the open period to five days per week and adding landing and possession limits will be considered to ensure the guideline is not exceeded.. No earlier than September 1, if at least 5,000 marked coho remain on the quota, inseason action may be considered to allow non-selective coho retention (C.8). All salmon except no chum retention north of Cape Alava, Washington in August and September (C.7). Chinook minimum size limit of 28 inches total length (B, C.1). All coho must be marked except as noted above (C.8.d). See compliance requirements (C.1) and gear restrictions and definitions (C.2, C.3).</td>
<td>U.S./Canada Border to Cape Falcon
• July 1 through earlier of September 16 or attainment of the quota of 18,700 Chinook, no more than 8,600 of which may be caught in the area between the U.S./Canada border and the Queets River, or 33,600 marked coho (C.8.d)
July 1-2, July 4-8, then Friday through Tuesday July 11-August 19 with a landing and possession limit of 65 Chinook and 45 coho per vessel per open period; Friday through Tuesday August 22-September 16 with a landing and possession limit of 15 Chinook and 50 coho per vessel per open period (C.1). Vessels in possession of salmon north of the Queets River may not cross the Queets River line without first notifying WDFW at 360-902-2739 with area fished, total Chinook, coho, and halibut catch aboard, and destination. Vessels in possession of salmon south of the Queets River may not cross the Queets River line without first notifying WDFW at 360-902-2739 with area fished, total Chinook, coho, and halibut catch aboard, and destination. All salmon except no chum retention north of Cape Alava, Washington in August and September (C.7). Chinook minimum size limit of 28 inches total length (B, C.1). All coho must be marked except as noted above (C.8.d). See compliance requirements (C.1) and gear restrictions and definitions (C.2, C.3).</td>
<td>U.S./Canada Border to Cape Falcon
• July 1 through earlier of September 16 or 15,800 Chinook (C.8) or a 30,400 marked coho quota (C.8.d)
July 1-4, July 6-8, then Friday through Tuesday July 11-August 26 with a landing and possession limit of 50 Chinook and 45 coho per vessel per open period; Friday through Tuesday August 29-September 16 with a landing and possession limit of 15 Chinook and 50 coho per vessel per open period (C.1). All salmon except no chum retention north of Cape Alava, Washington in August and September (C.7). Chinook minimum size limit of 28 inches total length (B, C.1). All coho must be marked except as noted above (C.8.d). See compliance requirements (C.1) and gear restrictions and definitions (C.2, C.3).</td>
</tr>
<tr><td colspan="3">Mandatory Yelloweye Rockfish Conservation Area, Cape Flattery and Columbia Control Zones, and beginning August 9, Grays Harbor Control Zone closed (C.5). Vessels must land and deliver their fish within 24 hours of any closure of this fishery. Vessels fishing or in possession of salmon while fishing north of Leadbetter Point must land and deliver their fish within the area and north of Leadbetter Point. Vessels fishing or in possession of salmon while fishing south of Leadbetter Point must land and deliver their fish within the area and south of Leadbetter Point, except that Oregon permitted vessels may also land their fish in Garibaldi, Oregon. Under state law, vessels must report their catch on a state fish receiving ticket. Oregon State regulations require all fishers landing salmon into Oregon from any fishery between Leadbetter Point, Washington and Cape Falcon, Oregon must notify ODFW within one hour of delivery or prior to transport away from the port of landing by either calling 541-867-0300 Ext. 271 or sending notification via e-mail to nfalcon.trollreport@state.or.us. Notification shall include vessel name and number, number of salmon by species, port of landing and location of delivery, and estimated time of delivery. Inseason actions may modify harvest guidelines in later fisheries to achieve or prevent exceeding the overall allowable troll harvest impacts.</td></tr>
</table>

TABLE 1. Commercial troll management Alternatives collated by the STT for non-Indian ocean salmon fisheries, 2014. (Page 3 of 9)		3/12/2014 7:49 PM
A. SEASON ALTERNATIVE DESCRIPTIONS		
ALTERNATIVE I	ALTERNATIVE II	ALTERNATIVE III
South of Cape Falcon	**South of Cape Falcon**	**South of Cape Falcon**
Supplemental Management Information	**Supplemental Management Information**	**Supplemental Management Information**
1. Sacramento River Basin recreational fishery catch assumption: 52,866 adult Sacramento River fall Chinook. 2. Sacramento River fall Chinook spawning escapement of 324.748 adults. 3. Klamath River recreational fishery allocation: 4,145 adult Klamath River fall Chinook. 4. Klamath tribal allocation: 27,288 adult Klamath River fall Chinook. 5. Fisheries may need to be adjusted to meet NMFS ESA consultation standards, FMP requirements, other management objectives, or upon receipt of new allocation recommendations from the California Fish and Game Commission.	1. Sacramento River Basin recreational fishery catch assumption: 51,348 adult Sacramento River fall Chinook. 2. Sacramento River fall Chinook spawning escapement of 315,423 adults. 3. Klamath River recreational fishery allocation: 4,109 adult Klamath River fall Chinook. 4. Klamath tribal allocation: 27,296 adult Klamath River fall Chinook. 5. Fisheries may need to be adjusted to meet NMFS ESA consultation standards, FMP requirements, other management objectives, or upon receipt of new allocation recommendations from the California Fish and Game Commission.	1..Sacramento River Basin recreational fishery catch assumption: 52,520 adult Sacramento River fall Chinook. 2. Sacramento River fall Chinook spawning escapement of 322,620 adults. 3. Klamath River recreational fishery allocation: 4,204 adult Klamath River fall Chinook. 4. Klamath tribal allocation: 27,274 adult Klamath River fall Chinook. 5. Fisheries may need to be adjusted to meet NMFS ESA consultation standards, FMP requirements, other management objectives, or upon receipt of new allocation recommendations from the California Fish and Game Commission.
Cape Falcon to Humbug Mt. • April 1-July 31, August 6-29; • September 3-October 31 (C.9.a). Seven days per week. All salmon except coho except as listed below for September non-selective coho incidental retention (C.4, C.7). Chinook minimum size limit of 28 inches total length (B, C.1). All vessels fishing in the area must land their fish in the State of Oregon. See gear restrictions and definitions (C.2, C.3) and Oregon State regulations for a description of special regulations at the mouth of Tillamook Bay. Beginning September 3, closed between Florence South Jetty and Humbug Mt. Open Cape Falcon to Florence South Jetty with no more than 100 Chinook per vessel per landing week (Wed.-Tues.). **Non-selective incidental coho retention:** • September 3 through the earlier of the quota or September 30, retention of coho will be limited to no more than one coho for each landed Chinook with a landing week limit of no more than 20 coho per vessel if sufficient quota is available for transfer from the Cape Falcon to Humbug Mt. non-selective recreational fishery (C.8.b). • Oregon State regulations require all fishers landing coho salmon from this season to notify ODFW within one hour of delivery or prior to transport away from the port of landing by calling 541-867-0300 Ext. 252. Notification shall include vessel name and number, number of salmon by species, port of landing and location of delivery, and estimated time of delivery. In 2015, the season will open March 15, all salmon except coho. Chinook minimum size limit of 28 inches total length. Gear restrictions same as in 2014. This opening may be modified following Council review at its March 2015 meeting.	**Cape Falcon to Humbug Mt.** • April 1-June 30; • July 6-31; • August 6-29; • September 3-October 31 (C.9). Seven day per week. All salmon except coho (C.7). Chinook minimum size limit of 28 inches total length (B). All vessels fishing in the area must land their fish in the State of Oregon. See gear restrictions and definitions (C.2, C.3) and Oregon State regulations for a description of special regulations at the mouth of Tillamook Bay. Beginning September 3, closed between Cape Arago and Humbug Mt. Open Cape Falcon to Cape Arago with no more than 75 Chinook per vessel per landing week (Wed.-Tues.). In 2015, same as Alternative I	**Cape Falcon to Humbug Mt.** • April 1-June 30; • July6-31; • August 6-29; • September **3**-October **31** (C.9). Seven day per week. All salmon except coho (C.7). Chinook minimum size limit of 28 inches total length (B). All vessels fishing in the area must land their fish in the State of Oregon. See gear restrictions and definitions (C.2, C.3) and Oregon State regulations for a description of special regulations at the mouth of Tillamook Bay. Beginning September **3**, no more than 50 Chinook per vessel per landing week (Wed.-Tues.). In 2015, same as Alternative I

TABLE 1. Commercial troll management Alternatives collated by the STT for non-Indian ocean salmon fisheries, 2014. (Page 4 of 9) 3/12/2014 7:49 PM

A. SEASON ALTERNATIVE DESCRIPTIONS

ALTERNATIVE I	ALTERNATIVE II	ALTERNATIVE III
Humbug Mt. to OR/CA Border (Oregon KMZ) • April 1-May 31; • June 1 through earlier of June 30, or a 1,500 Chinook quota; • July 1 through earlier of July 31, or a 1,000 Chinook quota; • August 6 through earlier of August 29, or a 500 Chinook quota; • September 15 through earlier of September 27 or a 500 Chinook quota (C.9.a). Seven days per week. All salmon except coho (C.4, C.7). Chinook minimum size limit of 28 inches total length (B, C.1). Prior to June 1, all fish caught in this area must be landed and delivered in the State of Oregon. June 1 – August 29 landing and possession limit of 30 Chinook per vessel per day. September 16-27 landing and possession limit of 20 Chinook per vessel per day. Any remaining portion of the June and/or July Chinook quotas may be transferred inseason on an impact neutral basis to the next open quota period (C.8). All vessels fishing in this area must land and deliver all fish within this area or Port Orford, within 24 hours of any closure of this fishery, and prior to fishing outside of this area. State regulations require fishers intending to transport and deliver their catch to other locations after first landing in one of these ports notify ODFW prior to transport away from the port of landing by calling 541-867-0300 Ext. 252, with vessel name and number, number of salmon by species, location of delivery, and estimated time of delivery. See compliance requirements (C.1) and gear restrictions and definitions (C.2, C.3). In 2015, the season will open March 15 for all salmon except coho, with a 28 inch Chinook minimum size limit. This opening could be modified following Council review at its March 2015 meeting.	**Humbug Mt. to OR/CA Border (Oregon KMZ)** • April 1-May 31; • June 1 through earlier of June 30, or a 1,500 Chinook quota; • July 6 through earlier of July 31, or a 500 Chinook quota; • August 6 through earlier of August 29, or a 500 Chinook quota; • September 15 through earlier of September 27 or a 500 Chinook quota (C.9.a). Seven days per week. All salmon except coho (C.4, C.7). Chinook minimum size limit of 28 inches total length (B, C.1). Prior to June 1, all fish caught in this area must be landed and delivered in the State of Oregon. June 1 – August 29 landing and possession limit of 25 Chinook per vessel per day. September 15-27 landing and possession limit of 20 Chinook per vessel per day. Any remaining portion of the June and/or July Chinook quotas may be transferred inseason on an impact neutral basis to the next open quota period (C.8). All vessels fishing in this area must land and deliver all fish within this area or Port Orford, within 24 hours of any closure of this fishery, and prior to fishing outside of this area. State regulations require fishers intending to transport and deliver their catch to other locations after first landing in one of these ports notify ODFW prior to transport away from the port of landing by calling 541-867-0300 Ext. 252, with vessel name and number, number of salmon by species, location of delivery, and estimated time of delivery. See compliance requirements (C.1) and gear restrictions and definitions (C.2, C.3). In 2015, same as Alternative I.	**Humbug Mt. to OR/CA Border (Oregon KMZ)** • April 1-May 31; • June 1 through earlier of June 30, or a 1,000 Chinook quota; • July 1 through earlier of July 31, or a 500 Chinook quota; • August 6 through earlier of August 29, or a 500 Chinook quota; (C.9.a). Seven days per week. All salmon except coho (C.4, C.7). Chinook minimum size limit of 28 inches total length (B, C.1). Prior to June 1, all fish caught in this area must be landed and delivered in the State of Oregon. June 1 – August 29 landing and possession limit of 20 Chinook per vessel per day. Any remaining portion of the June and/or July Chinook quotas may be transferred inseason on an impact neutral basis to the next open quota period (C.8). All vessels fishing in this area must land and deliver all fish within this area or Port Orford, within 24 hours of any closure of this fishery, and prior to fishing outside of this area. State regulations require fishers intending to transport and deliver their catch to other locations after first landing in one of these ports notify ODFW prior to transport away from the port of landing by calling 541-867-0300 Ext. 252, with vessel name and number, number of salmon by species, location of delivery, and estimated time of delivery. See compliance requirements (C.1) and gear restrictions and definitions (C.2, C.3). In 2015, same as Alternative I.

<table>
<tr><td colspan="2">TABLE 1. Commercial troll management Alternatives collated by the STT for non-Indian ocean salmon fisheries, 2014. (Page 5 of 9)</td><td>3/12/2014 7:49 PM</td></tr>
<tr><td colspan="3">A. SEASON ALTERNATIVE DESCRIPTIONS</td></tr>
<tr><td>ALTERNATIVE I</td><td>ALTERNATIVE II</td><td>ALTERNATIVE III</td></tr>
<tr><td>OR/CA Border to Humboldt South Jetty (California KMZ)
• September 5 through earlier of September 30, or 10,000 Chinook quota (C.9.b).
Five days per week, Friday through Tuesday. All salmon except coho (C.4, C.7). Chinook minimum size limit of 27 inches total length (B, C.1). Landing and possession limit of 30 Chinook per vessel per day (C.8.g).</td><td>OR/CA Border to Humboldt South Jetty (California KMZ)
• September 12 through earlier of September 30, or 6,000 Chinook quota (C.9.b).
Five days per week, Friday through Tuesday. All salmon except coho (C.4, C.7). Chinook minimum size limit of 27 inches total length (B, C.1). Landing and possession limit of 20 Chinook per vessel per day (C.8.g).</td><td>OR/CA Border to Humboldt South Jetty (California KMZ)
• September 12 through earlier of September 30, or 3,000 Chinook quota (C.9.b).
Five days per week, Friday through Tuesday. All salmon except coho (C.4, C.7). Chinook minimum size limit of 27 inches total length (B, C.1). Landing and possession limit of 20 Chinook per vessel per day (C.8.g).</td></tr>
<tr><td colspan="3">All fish caught in this area must be landed within the area and within 24 hours of any closure of the fishery and prior to fishing outside the area (C.10). See compliance requirements (C.1) and gear restrictions and definitions (C.2, C.3). Klamath Control Zone closed (C.5.e). See California State regulations for additional closures adjacent to the Smith and Klamath rivers. When the fishery is closed between the OR/CA border and Humbug Mountain and open to the south, vessels with fish on board caught in the open area off California may seek temporary mooring in Brookings, Oregon prior to landing in California only if such vessels first notify the Chetco River Coast Guard Station via VHF channel 22A between the hours of 0500 and 2200 and provide the vessel name, number of fish on board, and estimated time of arrival (C.6.).</td></tr>
<tr><td>Humboldt South Jetty to Horse Mt.
Closed.</td><td>Humboldt South Jetty to Horse Mt.
Closed.</td><td>Humboldt South Jetty to Horse Mt.
Closed.</td></tr>
<tr><td>Horse Mt. to Point Arena (Fort Bragg)
• June 16-30;
• July 15-31;
• August 1-29;
• September 1-30 (C.9.b).
Seven days per week. All salmon except coho (C.4, C.7). Chinook minimum size limit of 27 inches total length (B, C.1). All fish must be landed in California and offloaded within 24 hours of the August 29 closure (C.6). When the CA KMZ fishery is open, all fish caught in the area must be landed south of Horse Mountain (C.6). During September, all fish must be landed north of Point Arena (C.6). See compliance requirements (C.1) and gear restrictions and definitions (C.2, C.3).

In 2015, the season will open April 16-30 for all salmon except coho, with a 27 inch Chinook minimum size limit and the same gear restrictions as in 2014. All fish caught in the area must be landed in the area. This opening could be modified following Council review at its March 2015 meeting.</td><td>Horse Mt. to Point Arena (Fort Bragg)
• June 18-30;
• July 15-31;
• August 1-29;
• September 1-30 (C.9.b).
Seven days per week. All salmon except coho (C.4, C.7). Chinook minimum size limit of 27 inches total length (B, C.1). All fish must be landed in California and offloaded within 24 hours of the August 29 closure (C.6). When the CA KMZ fishery is open, all fish caught in the area must be landed south of Horse Mountain (C.6). During September, all fish must be landed north of Point Arena (C.6). See compliance requirements (C.1) and gear restrictions and definitions (C.2, C.3).

In 2015, same as Alternative I.</td><td>Horse Mt. to Point Arena (Fort Bragg)
• June 15-30;
• July 15-31;
• August 1-29;
• September 1-30 (C.9.b).
Seven days per week. All salmon except coho (C.4, C.7). Chinook minimum size limit of 27 inches total length (B, C.1). All fish must be landed in California and offloaded within 24 hours of the August 29 closure (C.6). When the CA KMZ fishery is open, all fish caught in the area must be landed south of Horse Mountain (C.6). During September, all fish must be landed north of Point Arena (C.6). See compliance requirements (C.1) and gear restrictions and definitions (C.2, C.3).

In 2015, same as Alternative I.</td></tr>
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TABLE 1. Commercial troll management Alternatives collated by the STT for non-Indian ocean salmon fisheries, 2014. (Page 6 of 9) 3/12/2014 7:49 PM		
A. SEASON ALTERNATIVE DESCRIPTIONS		
ALTERNATIVE I	ALTERNATIVE II	ALTERNATIVE III
Pt. Arena to Pigeon Pt. (San Francisco) • May 1-31; • June 11-30; • July 15-31; • August 1-29; • September 1-30 (C.9.b). Seven days per week. All salmon except coho (C.4, C.7). Chinook minimum size limit of 27 inches total length prior to September 1, 26 inches thereafter (B, C.1). All fish must be landed in California and offloaded within 24 hours of the August 29 closure (C.6). During September, all fish must be landed south of Point Arena (C.6). See compliance requirements (C.1) and gear restrictions and definitions (C.2, C.3). **Point Reyes to Point San Pedro (Fall Area Target Zone)** • October 1-3, 6-10, and 13-15. All salmon except coho (C.4, C.7). Chinook minimum size limit of 26 inches total length (B, C.1). All fish caught in this area must be landed between Point Arena and Pigeon Point (C.6). See compliance requirements (C.1) and gear restrictions and definitions (C.2, C.3).	**Pt. Arena to Pigeon Pt. (San Francisco)** • May 1-31; • June 1-30; • July 15-31; • August 1-29; • September 1-30 (C.9.b). Seven days per week. All salmon except coho (C.4, C.7). Chinook minimum size limit of 27 inches total length prior to September 1, 26 inches thereafter (B, C.1). All fish must be landed in California and offloaded within 24 hours of the August 29 closure (C.6). During September, all fish must be landed south of Point Arena (C.6). See compliance requirements (C.1) and gear restrictions and definitions (C.2, C.3). **Point Reyes to Point San Pedro (Fall Area Target Zone)** • October 1-3, 6-10, and 13-15. All salmon except coho (C.4, C.7). Chinook minimum size limit of 26 inches total length (B, C.1). All fish caught in this area must be landed between Point Arena and Pigeon Point (C.6). See compliance requirements (C.1) and gear restrictions and definitions (C.2, C.3).	**Pt. Arena to Pigeon Pt. (San Francisco)** • May 1-31; • June 7-30; • July 15-31; • August 1-29; • September 1-30 (C.9.b). Seven days per week. All salmon except coho (C.4, C.7). Chinook minimum size limit of 27 inches total length prior to September 1, 26 inches thereafter (B, C.1). All fish must be landed in California and offloaded within 24 hours of the August 29 closure (C.6). During September, all fish must be landed south of Point Arena (C.6). See compliance requirements (C.1) and gear restrictions and definitions (C.2, C.3). **Point Reyes to Point San Pedro (Fall Area Target Zone)** • October 1-3, 6-10, and 13-15. All salmon except coho (C.4, C.7). Chinook minimum size limit of 26 inches total length (B, C.1). All fish caught in this area must be landed between Point Arena and Pigeon Point (C.6). See compliance requirements (C.1) and gear restrictions and definitions (C.2, C.3).
Pigeon Point to U.S./Mexico Border (Monterey) • May 1-31; • June 11-30; • July 15-31; • August 1-29; • September 1-30 (C.9.b). Seven days per week. All salmon except coho (C.4, C.7). Chinook minimum size limit of 27 inches total length prior to September 1, 26 inches thereafter (B, C.1). All fish must be landed in California and offloaded within 24 hours of the August 29 closure (C.6). During September, all fish must be landed south of Point Arena (C.6). See compliance requirements (C.1) and gear restrictions and definitions (C.2, C.3).	**Pigeon Point to U.S./Mexico Border (Monterey))** • May 1-31; • June 1-30; • July 15-31; • August 1-13; Seven days per week. All salmon except coho (C.4, C.7). Chinook minimum size limit of 27 inches total length prior to September 1, 26 inches thereafter (B, C.1). All fish must be landed in California and offloaded within 24 hours of the August 29 closure (C.6). See compliance requirements (C.1) and gear restrictions and definitions (C.2, C.3).	**Pigeon Point to U.S./Mexico Border (Monterey)** • May 1-31; • June 7-30; • July 15-31; • August 1-29; • September 1-30 (C.9.b). Seven days per week. All salmon except coho (C.4, C.7). Chinook minimum size limit of 27 inches total length prior to September 1, 26 inches thereafter (B, C.1). All fish must be landed in California and offloaded within 24 hours of the August 29 closure (C.6). During September, all fish must be landed south of Point Arena (C.6). See compliance requirements (C.1) and gear restrictions and definitions (C.2, C.3).
California State regulations require all salmon be made available to a California Department of Fish and Wildlife (CDFW) representative for sampling immediately at port of landing. Any person in possession of a salmon with a missing adipose fin, upon request by an authorized agent or employee of the CDFW, shall immediately relinquish the head of the salmon to the state. (California Fish and Game Code §8226)		

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

Area (when open)		Chinook Total Length	Chinook Head-off	Coho Total Length	Coho Head-off	Pink
North of Cape Falcon		28.0	21.5	16.0	12.0	None
Cape Falcon to OR/CA Border		28.0	21.5	-	-	None
OR/CA Border to Humboldt South Jetty		27.0	20.5	-	-	None
Horse Mt. to Pt. Arena		27.0	20.5	-	-	None
Pt. Arena to U.S./Mexico Border	≤ Aug. 29	27.0	20.5	-	-	None
	≥ Sept. 1	26.0	19.5	-	-	None

C. REQUIREMENTS, DEFINITIONS, RESTRICTIONS, OR EXCEPTIONS

C.1. Compliance with Minimum Size or Other Special Restrictions: All salmon on board a vessel must meet the minimum size, landing/possession limit, or other special requirements for the area being fished and the area in which they are landed if the area is open or has been closed less than 96 hours for that species of salmon. Salmon may be landed in an area that has been closed for a species of salmon more than 96 hours only if they meet the minimum size, landing/possession limit, or other special requirements for the area in which they were caught. **Alternative I:** Salmon may not be filleted prior to landing.

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

C.2. Gear Restrictions:

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

C.3. Gear Definitions:

Trolling defined: Fishing from a boat or floating device that is making way by means of a source of power, other than drifting by means of the prevailing water current or weather conditions.

Troll fishing gear defined: One or more lines that drag hooks behind a moving fishing vessel. In that portion of the fishery management area off Oregon and Washington, the line or lines must be affixed to the vessel and must not be intentionally disengaged from the vessel at any time during the fishing operation.

Spread defined: A single leader connected to an individual lure and/or bait.

Circle hook defined: A hook with a generally circular shape and a point which turns inward, pointing directly to the shank at a 90º angle.

C.4. Vessel Operation in Closed Areas with Salmon on Board:

a. Except as provided under C.4.b below, it is unlawful for a vessel to have troll or recreational gear in the water while in any area closed to fishing for a certain species of salmon, while possessing that species of salmon; however, fishing for species other than salmon is not prohibited if the area is open for such species, and no salmon are in possession.

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

b. When Genetic Stock Identification (GSI) samples will be collected in an area closed to commercial salmon fishing, the scientific research permit holder shall notify NOAA OLE, USCG, CDFW and OSP at least 24 hours prior to sampling and provide the following information: the vessel name, date, location and time collection activities will be done. Any vessel collecting GSI samples in a closed area shall not possess any salmon other than those from which GSI samples are being collected. Salmon caught for collection of GSI samples must be immediately released in good condition after collection of samples.

C.5. Control Zone Definitions:

a. *Cape Flattery Control Zone* - The area from Cape Flattery (48º23'00" N. lat.) to the northern boundary of the U.S. EEZ; and the area from Cape Flattery south to Cape Alava (48º10'00" N. lat.) and east of 125º05'00" W. long.

b. *Mandatory Yelloweye Rockfish Conservation Area* – The area in Washington Marine Catch Area 3 from 48°00.00' N. lat.; 125°14.00' W. long. to 48°02.00' N. lat.; 125°14.00' W. long. to 48°02.00' N. lat.; 125°16.50' W. long. to 48°00.00' N. lat.; 125°16.50' W. long. and connecting back to 48°00.00' N. lat.; 125°14.00' W. long.

c. *Grays Harbor Control Zone* - The area defined by a line drawn from the Westport Lighthouse (46° 53'18" N. lat., 124° 07'01" W. long.) to Buoy #2 (46° 52'42" N. lat., 124°12'42" W. long.) to Buoy #3 (46° 55'00" N. lat., 124°14'48" W. long.) to the Grays Harbor north jetty (46° 55'36" N. lat., 124°10'51" W. long.).

d. *Columbia Control Zone* - An area at the Columbia River mouth, bounded on the west by a line running northeast/southwest between the red lighted Buoy #4 (46°13'35" N. lat., 124°06'50" W. long.) and the green lighted Buoy #7 (46°15'09' N. lat., 124°06'16" W. long.); on the east, by the Buoy #10 line which bears north/south at 357° true from the south jetty at 46°14'00" N. lat.,124°03'07" W. long. to its intersection with the north jetty; on the north, by a line running northeast/southwest between the green lighted Buoy #7 to the tip of the north jetty (46°15'48" N. lat., 124°05'20" W. long.), and then along the north jetty to the point of intersection with the Buoy #10 line; and, on the south, by a line running northeast/southwest between the red lighted Buoy #4 and tip of the south jetty (46°14'03" N. lat., 124°04'05" W. long.), and then along the south jetty to the point of intersection with the Buoy #10 line.

e. *Klamath Control Zone* - The ocean area at the Klamath River mouth bounded on the north by 41°38'48" N. lat. (approximately six nautical miles north of the Klamath River mouth); on the west, by 124°23'00" W. long. (approximately 12 nautical miles off shore); and on the south, by 41°26'48" N. lat. (approximately six nautical miles south of the Klamath River mouth).

C.6. Notification When Unsafe Conditions Prevent Compliance with Regulations: If prevented by unsafe weather conditions or mechanical problems from meeting special management area landing restrictions, vessels must notify the U.S. Coast Guard and receive acknowledgment of such notification prior to leaving the area. This notification shall include the name of the vessel, port where delivery will be made, approximate amount of salmon (by species) on board, the estimated time of arrival, and the specific reason the vessel is not able to meet special management area landing restrictions. In addition to contacting the U.S. Coast Guard, vessels fishing south of the Oregon/California border must notify CDFW within one hour of leaving the management area by calling 800-889-8346 and providing the same information as reported to the U.S. Coast Guard. All salmon must be offloaded within 24 hours of reaching port.

C.7. Incidental Halibut Harvest: During authorized periods, the operator of a vessel that has been issued an incidental halibut harvest license may retain Pacific halibut caught incidentally in Area 2A while trolling for salmon. Halibut retained must be no less than 32 inches in total length, measured from the tip of the lower jaw with the mouth closed to the extreme end of the middle of the tail, and must be landed with the head on. ***Alternative I***: When halibut are caught and landed incidental to commercial salmon fishing by an IPHC license holder, any person who is required to report the salmon landing by applicable state law must include on the state landing receipt for that landing both the number of halibut landed, and the total dressed, head-on weight of halibut landed, in pounds, as well as the number and species of salmon landed..

License applications for incidental harvest must be obtained from the International Pacific Halibut Commission (phone: 206-634-1838). Applicants must apply prior to mid-March 2015 for 2015 permits (*exact date to be set by the IPHC in early 2015*). Incidental harvest is authorized only during April, May, and June of the 2014 troll seasons and after June 30 in 2014 if quota remains and if announced on the NMFS hotline (phone: 800-662-9825). WDFW, ODFW, and CDFW will monitor landings. If the landings are projected to exceed the 29,671 pound preseason IPHC allocation or the total Area 2A non-Indian commercial halibut allocation, NMFS will take inseason action to prohibit retention of halibut in the non-Indian salmon troll fishery.

Alternative I - May 1, 2014 through December 31, 2014 and April 1-30, 2015, license holders may land or possess no more than one Pacific halibut per each three Chinook, except one Pacific halibut may be possessed or landed without meeting the ratio requirement, and no more than 15 halibut may be possessed or landed per trip. Pacific halibut retained must be no less than 32 inches in total length (with head on).
Alternative II - May 1, 2014 through December 31, 2014 and April 1-30, 2015, license holders may land or possess no more than one Pacific halibut per each four Chinook, except one Pacific halibut may be possessed or landed without meeting the ratio requirement, and no more than 12 halibut may be possessed or landed per trip. Pacific halibut retained must be no less than 32 inches in total length (with head on).
Alternative III - May 1, 2014 through December 31, 2014 and April 1-30, 2015, license holders may land or possess no more than one Pacific halibut per each five Chinook, except one Pacific halibut may be possessed or landed without meeting the ratio requirement, and no more than 10 halibut may be possessed or landed per trip. Pacific halibut retained must be no less than 32 inches in total length (with head on).

TABLE 1. Commercial troll management Alternatives collated by the STT for non-Indian ocean salmon fisheries, 2014. (Page 9 of 9)	3/12/2014 7:49 PM
C. REQUIREMENTS, DEFINITIONS, RESTRICTIONS, OR EXCEPTIONS (continued)	

Incidental Pacific halibut catch regulations in the commercial salmon troll fishery adopted for 2014, prior to any 2014 inseason action, will be in effect when incidental Pacific halibut retention opens on April 1, 2015 unless otherwise modified by inseason action at the March 2015 Council meeting.

a. "C-shaped" yelloweye rockfish conservation area is an area to be voluntarily avoided for salmon trolling. NMFS and the Council request salmon trollers voluntarily avoid this area in order to protect yelloweye rockfish. The area is defined in the Pacific Council Halibut Catch Sharing Plan in the North Coast subarea (Washington marine area 3), with the following coordinates in the order listed:
48°18' N. lat.; 125°18' W. long.;
48°18' N. lat.; 124°59' W. long.;
48°11' N. lat.; 124°59' W. long.;
48°11' N. lat.; 125°11' W. long.;
48°04' N. lat.; 125°11' W. long.;
48°04' N. lat.; 124°59' W. long.;
48°00' N. lat.; 124°59' W. long.;
48°00' N. lat.; 125°18' W. long.;
and connecting back to 48°18' N. lat.; 125°18' W. long.

C.8. Inseason Management: In addition to standard inseason actions or modifications already noted under the season description, the following inseason guidance is provided to NMFS:

a. Chinook remaining from the May through June non-Indian commercial troll harvest guideline north of Cape Falcon may be transferred to the July through September harvest guideline if the transfer would not result in exceeding preseason impact expectations on any stocks.

b. **Alternative I:** If at least 35,000 coho are available for the recreational non-selective coho salmon season quota between Cape Falcon and Humbug Mt. (combined initial quota and impact neutral rollover from the recreational selective coho between Cape Falcon and the Oregon-California Border) consideration will be made to transfer a portion of the remaining coho that are in excess of those needed to meet the recreational objectives to the commercial troll season between Cape Falcon and Humbug Mt. Landing week limits and coho per Chinook ratios may be adjusted inseason.

c. Chinook remaining from the June and/or July non-Indian commercial troll quotas in the Oregon KMZ may be transferred to the Chinook quota for the next open period if the transfer would not result in exceeding preseason impact expectations on any stocks.

d. NMFS may transfer fish between the recreational and commercial fisheries north of Cape Falcon if there is agreement among the areas' representatives on the Salmon Advisory Subpanel (SAS), and if the transfer would not result in exceeding preseason impact expectations on any stocks.

e. At the March 2015 meeting, the Council will consider inseason recommendations for special regulations for any experimental fisheries (proposals must meet Council protocol and be received in November 2014).

f. If retention of unmarked coho is permitted by inseason action, the allowable coho quota will be adjusted to ensure preseason projected impacts on all stocks is not exceeded.

g. Landing limits may be modified inseason to sustain season length and keep harvest within overall quotas.

C.9. State Waters Fisheries: Consistent with Council management objectives:

a. The State of Oregon may establish additional late-season fisheries in state waters.

b. The State of California may establish limited fisheries in selected state waters.

Check state regulations for details.

C.10. For the purposes of California Fish and Game Code, Section 8232.5, the definition of the Klamath Management Zone (KMZ) for the ocean salmon season shall be that area from Humbug Mountain, Oregon, to Horse Mountain, California.

TABLE 2. Recreational management Alternatives collated by the STT for non-Indian ocean salmon fisheries, 2014. (Page 1 of 9) 3/12/2014 7:51 PM

A. SEASON ALTERNATIVE DESCRIPTIONS

ALTERNATIVE I	ALTERNATIVE II	ALTERNATIVE III
North of Cape Falcon	**North of Cape Falcon**	**North of Cape Falcon**
Supplemental Management Information	**Supplemental Management Information**	**Supplemental Management Information**
1. Overall non-Indian TAC: 117,500 (non-mark-selective equivalent of 112,500) Chinook and 230,000 coho marked with a healed adipose fin clip (marked). 2. Recreational TAC: 60,000 (non-mark selective equivalent of 55,000) Chinook and 193,200 marked coho; all retained coho must be marked. 4. No Area 4B add-on fishery. 5. Buoy 10 fishery opens August 1 with an expected landed catch of 50,000 marked coho in August and September. 6. Overall Chinook and/or coho TACs may need to be reduced or fisheries adjusted to meet NMFS ESA guidance, FMP requirements, upon conclusion of negotiations in the North of Falcon forum, or upon receipt of preseason catch and abundance expectations for Canadian and Alaskan fisheries.	1. Overall non-Indian TAC: 114,000 (non-mark-selective equivalent of 110,000) Chinook and 210,000 coho marked with a healed adipose fin clip (marked). 2. Recreational TAC: 58,000 (non-mark selective equivalent of 54,000) Chinook and 176,400 marked coho; all retained coho must be marked. 4. No Area 4B add-on fishery. 5. Buoy 10 fishery opens August 1 with an expected landed catch of 60,000 marked coho in August and September. 6. Overall Chinook and/or coho TACs may need to be reduced or fisheries adjusted to meet NMFS ESA guidance, FMP requirements, upon conclusion of negotiations in the North of Falcon forum, or upon receipt of preseason catch and abundance expectations for Canadian and Alaskan fisheries.	1.Overall non-Indian TAC: 95,000 Chinook and 190,000 coho marked with a healed adipose fin clip (marked). 2. Recreational TAC: 47,500 Chinook and 159,600 marked coho; all retained coho must be marked. 4. No Area 4B add-on fishery. 5. Buoy 10 fishery opens August 1 with an expected landed catch of 70,000 marked coho in August and September. 6. Overall Chinook and/or coho TACs may need to be reduced or fisheries adjusted to meet NMFS ESA guidance, FMP requirements, upon conclusion of negotiations in the North of Falcon forum, or upon receipt of preseason catch and abundance expectations for Canadian and Alaskan fisheries.
U.S./Canada Border to Queets River • May 16-17, May 23-24, and May 31-June 20 or a coastwide **marked Chinook quota of 10,000** (C.5). Seven days per week. Two fish per day, all salmon except coho, **all Chinook must be marked with a healed adipose fin clip (C.1).** Chinook 24-inch total length minimum size limit (B). See gear restrictions (C.2). Inseason management may be used to sustain season length and keep harvest within the overall Chinook recreational TAC for north of Cape Falcon (C.5).	**U.S./Canada Border to Queets River** • May 23-24 and June 7-20 or a coastwide **marked Chinook quota of 8,000** (C.5). Seven days per week. Two fish per day, all salmon except coho, **all Chinook must be marked with a healed adipose fin clip (C.1).** Chinook 24-inch total length minimum size limit (B). See gear restrictions (C.2). Inseason management may be used to sustain season length and keep harvest within the overall Chinook recreational TAC for north of Cape Falcon (C.5).	**U.S./Canada Border to Queets River**
Queets River to Leadbetter Point • May 31 through earlier of June 20 or a coastwide **marked Chinook quota of 10,000** (C.5). Seven days per week. Two fish per day, all salmon except coho, **all Chinook must be marked with a healed adipose fin clip (C.1)**. Chinook 24-inch total length minimum size limit (B). See gear restrictions (C.2). Inseason management may be used to sustain season length and keep harvest within the overall Chinook recreational TAC for north of Cape Falcon (C.5).	**Queets River to Leadbetter Point** • June 7 through earlier of June 20 or a coastwide **marked Chinook quota of 8,000** (C.5). Seven days per week. Two fish per day, all salmon except coho, **all Chinook must be marked with a healed adipose fin clip (C.1)**. Chinook 24-inch total length minimum size limit (B). See gear restrictions (C.2). Inseason management may be used to sustain season length and keep harvest within the overall Chinook recreational TAC for north of Cape Falcon (C.5).	**Queets River to Leadbetter Point**

TABLE 2. Recreational management Alternatives collated by the STT for non-Indian ocean salmon fisheries, 2014. (Page 2 of 9) 3/12/2014 7:51 PM

A. SEASON ALTERNATIVE DESCRIPTIONS

ALTERNATIVE I	ALTERNATIVE II	ALTERNATIVE III
Leadbetter Point to Cape Falcon • May 31 through earlier of June 20 or a coastwide **marked Chinook quota of 10,000** (C.5). Seven days per week. Two fish per day, all salmon except coho, **all Chinook must be marked with a healed adipose fin clip (C.1)**. Chinook 24-inch total length minimum size limit (B). See gear restrictions (C.2). Inseason management may be used to sustain season length and keep harvest within the overall Chinook recreational TAC for north of Cape Falcon (C.5).	**Leadbetter Point to Cape Falcon** • June 7 through earlier of June 20 or a coastwide **marked Chinook quota of 8,000** (C.5). Seven days per week. Two fish per day, all salmon except coho, **all Chinook must be marked with a healed adipose fin clip (C.1)**. Chinook 24-inch total length minimum size limit (B). See gear restrictions (C.2). Inseason management may be used to sustain season length and keep harvest within the overall Chinook recreational TAC for north of Cape Falcon (C.5).	**Leadbetter Point to Cape Falcon**
U.S./Canada Border to Cape Alava (Neah Bay) • June 21 through earlier of September 21 or 20,090 marked coho subarea quota with a subarea guideline of 6,900 Chinook (C.5). Seven days per week. All salmon except no chum beginning August 1; two fish per day. All coho must be marked (C.1). Beginning August 1, Chinook non-retention east of the Bonilla-Tatoosh line (C.4.a) during Council managed ocean fishery. See gear restrictions and definitions (C.2, C.3). Inseason management may be used to sustain season length and keep harvest within the overall Chinook and coho recreational TACs for north of Cape Falcon (C.5).	**U.S./Canada Border to Cape Alava (Neah Bay**) • June 21 through earlier of September 21 or 18,350 marked coho subarea quota with a subarea guideline of 6,900 Chinook (C.5). Seven days per week. All salmon except no chum beginning August 1; two fish per day. All coho must be marked (C.1). Beginning August 1, Chinook non-retention east of the Bonilla-Tatoosh line (C.4.a) during Council managed ocean fishery. See gear restrictions and definitions (C.2, C.3). Inseason management may be used to sustain season length and keep harvest within the overall Chinook and coho recreational TACs for north of Cape Falcon (C.5).	**U.S./Canada Border to Cape Alava (Neah Bay**) • June 14 through earlier of September 21 or 16,600 marked coho subarea quota with a subarea guideline of 6,600 Chinook (C.5). Seven days per week. All salmon except no chum beginning August 1; two fish per day. All coho must be marked (C.1). Beginning August 1, Chinook non-retention east of the Bonilla-Tatoosh line (C.4.a) during Council managed ocean fishery. See gear restrictions and definitions (C.2, C.3). Inseason management may be used to sustain season length and keep harvest within the overall Chinook and coho recreational TACs for north of Cape Falcon (C.5).
Cape Alava to Queets River (La Push Subarea) • June 21 through earlier of September 21 or 4,980 marked coho subarea quota with a subarea guideline of 2,350 Chinook (C.5). • September 27 through earlier of October 12 or 50 marked coho quota or 50 Chinook quota (C.5) in the area north of 47°50'00 N. lat. and south of 48°00'00" N. lat. Seven days per week. All salmon, two fish per day. All coho must be marked (see *Ocean Boat Limits*, C.1). See gear restrictions and definitions (C.2, C.3). Inseason management may be used to sustain season length and keep harvest within the overall Chinook and coho recreational TACs for north of Cape Falcon (C.5).	**Cape Alava to Queets River (La Push Subarea)** • June 21 through earlier of September 21 or 4,540 marked coho subarea quota with a subarea guideline of 2,350 Chinook (C.5). • September 27 through earlier of October 12 or 50 marked coho quota or 50 Chinook quota (C.5) in the area north of 47°50'00 N. lat. and south of 48°00'00" N. lat. Seven days per week. All salmon, two fish per day. All coho must be marked (see *Ocean Boat Limits*, C.1). See gear restrictions and definitions (C.2, C.3). Inseason management may be used to sustain season length and keep harvest within the overall Chinook and coho recreational TACs for north of Cape Falcon (C.5).	**Cape Alava to Queets River (La Push Subarea)** • June 14 through earlier of September 21 or 4,100 marked coho subarea quota with a subarea guideline of 2,250 Chinook (C.5). • September 27 through earlier of October 12 or 50 marked coho quota or 50 Chinook quota (C.5) in the area north of 47°50'00 N. lat. and south of 48°00'00" N. lat. Seven days per week. All salmon, two fish per day. All coho must be marked (see *Ocean Boat Limits*, C.1). See gear restrictions and definitions (C.2, C.3). Inseason management may be used to sustain season length and keep harvest within the overall Chinook and coho recreational TACs for north of Cape Falcon (C.5).

TABLE 2. Recreational management Alternatives collated by the STT for non-Indian ocean salmon fisheries, 2014. (Page 3 of 9)		3/12/2014 7:51 PM
	A. SEASON ALTERNATIVE DESCRIPTIONS	
ALTERNATIVE I	ALTERNATIVE II	ALTERNATIVE III
Queets River to Leadbetter Point (Westport Subarea) • June 21 through earlier of September 30 or 71,480 marked coho subarea quota with a subarea guideline of 27,600 Chinook (C.5). Seven days per week. All salmon; two fish per day. All coho must be marked (C.1). See gear restrictions and definitions (C.2, C.3). Grays Harbor Control Zone closed beginning August 11 (C.4). Inseason management may be used to sustain season length and keep harvest within the overall Chinook and coho recreational TACs for north of Cape Falcon (C.5).	**Queets River to Leadbetter Point (Westport Subarea)** • June 21 through earlier of September 21 or 65,260 marked coho subarea quota with a subarea guideline of 27,600 Chinook (C.5). Seven days per week. All salmon; two fish per day, no more than one of which can be a Chinook. All coho must be marked (C.1). See gear restrictions and definitions (C.2, C.3). Grays Harbor Control Zone closed beginning August 11 (C.4). Inseason management may be used to sustain season length and keep harvest within the overall Chinook and coho recreational TACs for north of Cape Falcon (C.5).	**Queets River to Leadbetter Point (Westport Subarea)** • June 15 through earlier of September 30 or 59,050 marked coho subarea quota with a subarea guideline of 26,200 Chinook (C.5). Five days per week, Sunday through Thursday. All salmon; two fish per day, no more than one of which can be a Chinook. All coho must be marked (C.1). See gear restrictions and definitions (C.2, C.3). Grays Harbor Control Zone closed beginning August 11 (C.4). Inseason management may be used to sustain season length and keep harvest within the overall Chinook and coho recreational TACs for north of Cape Falcon (C.5).
Leadbetter Point to Cape Falcon (Columbia River Subarea) • June 21.through earlier of September 30 or 96,600 marked coho subarea quota with a subarea guideline of 13,100 Chinook (C.5). Seven days per week. All salmon, two fish per day. All coho must be marked (C.1). See gear restrictions and definitions (C.2, C.3). Columbia Control Zone closed (C.4). Inseason management may be used to sustain season length and keep harvest within the overall Chinook and coho recreational TACs for north of Cape Falcon (C.5).	**Leadbetter Point to Cape Falcon (Columbia River Subarea)** • June 21 through earlier of September 30 or 88,200 marked coho subarea quota with a subarea guideline of 13,100 Chinook (C.5). Seven days per week. All salmon, two fish per day, only one of which can be a Chinook. All coho must be marked (C.1). See gear restrictions and definitions (C.2, C.3). Columbia Control Zone closed (C.4). Inseason management may be used to sustain season length and keep harvest within the overall Chinook and coho recreational TACs for north of Cape Falcon (C.5).	**Leadbetter Point to Cape Falcon (Columbia River Subarea)** • June 14 through earlier of September 30 or 79,800 marked coho subarea quota with a subarea guideline of 12,400 Chinook (C.5). Seven days per week. All salmon, two fish per day, only one of which can be a Chinook. All coho must be marked (C.1). See gear restrictions and definitions (C.2, C.3). Columbia Control Zone closed (C.4). Inseason management may be used to sustain season length and keep harvest within the overall Chinook and coho recreational TACs for north of Cape Falcon (C.5).

TABLE 2. Recreational management Alternatives collated by the STT for non-Indian ocean salmon fisheries, 2014. (Page 4 of 9) 3/12/2014 7:51 PM

A. SEASON ALTERNATIVE DESCRIPTIONS

South of Cape Falcon	**South of Cape Falcon**	**South of Cape Falcon**
ALTERNATIVE I	ALTERNATIVE II	ALTERNATIVE III
Supplemental Management Information	**Supplemental Management Information**	**Supplemental Management Information**
1. Sacramento River Basin recreational fishery catch assumption: 52,866 adult Sacramento River fall Chinook. 2. Sacramento River fall Chinook spawning escapement of 324.748 adults. 3. Klamath River recreational fishery allocation: 4,145 adult Klamath River fall Chinook. 4. Klamath tribal allocation: 27,288 adult Klamath River fall Chinook. 5. Overall recreational coho TAC: 80,000 mark-selective coho fishery and 20,000 in the non-mark-selective coho fishery. 6. Fisheries may need to be adjusted to meet NMFS ESA consultation standards, FMP requirements, other management objectives, or upon receipt of new allocation recommendations from the CFGC.	1. Sacramento River Basin recreational fishery catch assumption: 51,348 adult Sacramento River fall Chinook. 2. Sacramento River fall Chinook spawning escapement of 315,423 adults. 3. Klamath River recreational fishery allocation: 4,109 adult Klamath River fall Chinook. 4. Klamath tribal allocation: 27,296 adult Klamath River fall Chinook. 5. Overall recreational coho TAC: 65,000 mark-selective coho fishery and 20,000 in the non-mark-selective coho fishery. 6. Fisheries may need to be adjusted to meet NMFS ESA consultation standards, FMP requirements, other management objectives, or upon receipt of new allocation recommendations from the CFGC.	1..Sacramento River Basin recreational fishery catch assumption: 52,520 adult Sacramento River fall Chinook. 2. Sacramento River fall Chinook spawning escapement of 322,620 adults. 3. Klamath River recreational fishery allocation: 4,204 adult Klamath River fall Chinook. 4. Klamath tribal allocation: 27,274 adult Klamath River fall Chinook. 5. Overall recreational coho TAC: 50,000 mark-selective coho fishery and 20,000 in the non-mark-selective coho fishery. 6. Fisheries may need to be adjusted to meet NMFS ESA consultation standards, FMP requirements, other management objectives, or upon receipt of new allocation recommendations from the CFGC.
Cape Falcon to Humbug Mt. • March **15** through October **31** (C.6), except as provided below during the summer all-salmon mark-selective and September non-mark-selective coho fisheries. Seven days per week. All salmon except coho; two fish per day (C.1). Chinook minimum size limit of 24 inches total length (B). See gear restrictions and definitions (C.2, C.3). • **Non-mark-selective coho fishery**: **August 30 through the earlier of September 30 or a landed catch of 20,000 non-mark-selective coho quota** (C.5). **All salmon**, two fish per day (C.5); The all salmon except coho season reopens the earlier of October 1 or attainment of the coho quota (C.5). In 2015, the season between Cape Falcon and Humbug Mountain will open March 15 for all salmon except coho, two fish per day (B, C.1, C.2, C.3).	**Cape Falcon to Humbug Mt.** • March **15** through October **31** (C.6), except as provided below during the summer all-salmon mark-selective and September non-mark-selective coho fisheries. Seven days per week. All salmon except coho; two fish per day (C.1). Chinook minimum size limit of 24 inches total length (B). See gear restrictions and definitions (C.2, C.3). • **Non-mark-selective coho fishery**: **September 1 through the earlier of September 30 or a landed catch of 20,000 non-mark-selective coho quota** (C.5). **All salmon**, two fish per day (C.5); The all salmon except coho season reopens the earlier of October 1 or attainment of the coho quota (C.5). In 2015, same as Alternative I	**Cape Falcon to Humbug Mt.** • March **15** through October **31** (C.6), except as provided below during the summer all-salmon mark-selective and September non-mark-selective coho fisheries. Seven days per week. All salmon except coho; two fish per day (C.1). Chinook minimum size limit of 24 inches total length (B). See gear restrictions and definitions (C.2, C.3). • **Non-mark-selective coho fishery**: **September 1 through the earlier of September 30 or a landed catch of 20,000 non-mark-selective coho quota** (C.5). **All salmon**, two fish per day (C.5); The all salmon except coho season reopens the earlier of October 1 or attainment of the coho quota (C.5). In 2015, same as Alternative I

Fishing in the Stonewall Bank yelloweye rockfish conservation area restricted to trolling only on days the all depth recreational halibut fishery is open (call the halibut fishing hotline 1-800-662-9825 for specific dates) (C.3.b, C.4.d).

TABLE 2. Recreational management Alternatives collated by the STT for non-Indian ocean salmon fisheries, 2014. (Page 5 of 9) 3/12/2014 7:51 PM

A. SEASON ALTERNATIVE DESCRIPTIONS

ALTERNATIVE I	ALTERNATIVE II	ALTERNATIVE III
Cape Falcon to OR/CA Border • All-**salmon mark-selective coho fishery**: **June 21** through earlier of **August 10** or a landed catch of **80,000** marked coho. Seven days per week. All salmon, two fish per day. All retained coho must be marked (C.1). Chinook minimum size limit of 24 inches total length (B). Any remainder of the mark selective coho quota will be transferred on an impact neutral basis to the September non-selective coho quota from Cape Falcon to Humbug Mountain. The all salmon except coho season reopens the earlier of August 11 or attainment of the coho quota. Fishing in the Stonewall Bank yelloweye rockfish conservation area restricted to trolling only on days the all depth recreational halibut fishery is open (call the halibut fishing hotline 1-800-662-9825 for specific dates) (C.3.b, C.4.d).	**Cape Falcon to OR/CA Border** • All-**salmon mark-selective coho fishery**: **June 28** through earlier of **August 3** or a landed catch of **65,000** marked coho. Seven days per week. All salmon, two fish per day. All retained coho must be marked (C.1). Chinook minimum size limit of 24 inches total length (B). Any remainder of the mark selective coho quota will be transferred on an impact neutral basis to the September non-selective coho quota from Cape Falcon to Humbug Mountain. The all salmon except coho season reopens the earlier of August 4 or attainment of the coho quota. Fishing in the Stonewall Bank yelloweye rockfish conservation area restricted to trolling only on days the all depth recreational halibut fishery is open (call the halibut fishing hotline 1-800-662-9825 for specific dates) (C.3.b, C.4.d).	**Cape Falcon to OR/CA Border** • All-**salmon mark-selective coho fishery**: **July 1** through earlier of **July 31** or a landed catch of **50,000** marked coho. Seven days per week. All salmon, two fish per day. All retained coho must be marked (C.1). Chinook minimum size limit of 24 inches total length (B). Any remainder of the mark selective coho quota will be transferred on an impact neutral basis to the September non-selective coho quota from Cape Falcon to Humbug Mountain. The all salmon except coho season reopens the earlier of August 1 or attainment of the coho quota. Fishing in the Stonewall Bank yelloweye rockfish conservation area restricted to trolling only on days the all depth recreational halibut fishery is open (call the halibut fishing hotline 1-800-662-9825 for specific dates) (C.3.b, C.4.d).
Humbug Mt. to OR/CA Border (Oregon KMZ) • May 1 through September 7 except as provided above during the all-salmon mark-selective coho fishery (C.6). All salmon except coho, except as noted above in the all-salmon mark-selective coho fishery. Seven days per week, two fish per day (C.1). Chinook minimum size limit of 24 inches total length (B). See gear restrictions and definitions (C.2, C.3).	**Humbug Mt. to OR/CA Border (Oregon KMZ)** • May 17 through September 7 except as provided above during the all-salmon mark-selective coho fishery (C.6). All salmon except coho, except as noted above in the all-salmon mark-selective coho fishery. Seven days per week, two fish per day (C.1). Chinook minimum size limit of 24 inches total length (B). See gear restrictions and definitions (C.2, C.3).	**Humbug Mt. to OR/CA Border (Oregon KMZ)** • May 24 through September 1 except as provided above during the all-salmon mark-selective coho fishery (C.6). All salmon except coho, except as noted above in the all-salmon mark-selective coho fishery. Seven days per week, two fish per day (C.1). Chinook minimum size limit of 20 inches total length (B). See gear restrictions and definitions (C.2, C.3).
OR/CA Border to Horse Mt. (California KMZ) • May 1 through September 7 (C.6). Seven days per week. All salmon except coho, two fish per day (C.1). Chinook minimum size limit of 24 inches total length (B). See gear restrictions and definitions (C.2, C.3). Klamath Control Zone closed in August (C.4.e). See California State regulations for additional closures adjacent to the Smith, Eel, and Klamath rivers.	**OR/CA Border to Horse Mt. (California KMZ)** • May 17 through September 7 (C.6). Seven days per week. All salmon except coho, two fish per day (C.1). Chinook minimum size limit of 24 inches total length (B). See gear restrictions and definitions (C.2, C.3). Klamath Control Zone closed in August (C.4.e). See California State regulations for additional closures adjacent to the Smith, Eel, and Klamath rivers.	**OR/CA Border to Horse Mt. (California KMZ)** • May 24 through September 1 (C.6). Seven days per week. All salmon except coho, two fish per day (C.1). Chinook minimum size limit of 20 inches total length (B). See gear restrictions and definitions (C.2, C.3). Klamath Control Zone closed in August (C.4.e). See California State regulations for additional closures adjacent to the Smith, Eel, and Klamath rivers.

TABLE 2. Recreational management Alternatives collated by the STT for non-Indian ocean salmon fisheries, 2014. (Page 6 of 9) 3/12/2014 7:51 PM

A. SEASON ALTERNATIVE DESCRIPTIONS

ALTERNATIVE I	ALTERNATIVE II	ALTERNATIVE III
Horse Mt. to Point Arena (Fort Bragg) • April 5 through November 9. Seven days per week. All salmon except coho, two fish per day (C.1). Chinook minimum size limit of 20 inches total length (B). See gear restrictions and definitions (C.2, C.3). In 2015, season opens April 4 for all salmon except coho, two fish per day (C.1). Chinook minimum size limit of 20 inches total length (B); and the same gear restrictions as in 2014 (C.2, C.3).	**Horse Mt. to Point Arena (Fort Bragg)** • April 5 through November 2. Seven days per week. All salmon except coho, two fish per day (C.1). Chinook minimum size limit of 20 inches total length (B). See gear restrictions and definitions (C.2, C.3). In 2015, same as Alternative I.	**Horse Mt. to Point Arena (Fort Bragg)** • April 5 through November 2. Seven days per week. All salmon except coho, two fish per day (C.1). Chinook minimum size limit of 24 inches total length (B). See gear restrictions and definitions (C.2, C.3). In 2015, same as Alternative I.
Point Arena to Pigeon Point (San Francisco) • April 5 through November 9. Seven days per week. All salmon except coho, two fish per day (C.1). Chinook minimum size limit of 24 inches total length through June 13; 20 inches thereafter (B). See gear restrictions and definitions (C.2, C.3). In 2015, season opens April 4 for all salmon except coho, two fish per day (C.1). Chinook minimum size limit of 24 inches total length (B); and the same gear restrictions as in 2014 (C.2, C.3).	**Point Arena to Pigeon Point (San Francisco)** • April 5 through November 9. Seven days per week. All salmon except coho, two fish per day (C.1). Chinook minimum size limit of 24 inches total length through June 30; 20 inches thereafter (B). See gear restrictions and definitions (C.2, C.3). In 2015, same as Alternative I.	**Point Arena to Pigeon Point (San Francisco)** • April 5 through November 9 Seven days per week. All salmon except coho, two fish per day (C.1). Chinook minimum size limit of 24 inches total length through July 3; 20 inches thereafter (B). See gear restrictions and definitions (C.2, C.3). In 2015, same as Alternative I.
Pigeon Point to U.S./Mexico Border (Monterey) • April 5 through October 5. Seven days per week. All salmon except coho, two fish per day (C.1). Chinook minimum size limit of 24 inches total length (B). See gear restrictions and definitions (C.2, C.3). In 2015, season opens April 4 for all salmon except coho, two fish per day (C.1). Chinook minimum size limit of 24 inches total length (B); and the same gear restrictions as in 2014 (C.2, C.3).	**Pigeon Point to U.S./Mexico Border (Monterey)** • April 5 through October 5. Seven days per week. All salmon except coho, two fish per day (C.1). Chinook minimum size limit of 24 inches total length (B). See gear restrictions and definitions (C.2, C.3). In 2015, same as Alternative I.	**Pigeon Point to U.S./Mexico Border (Monterey)** • April 5 through October 5. Seven days per week. All salmon except coho, two fish per day (C.1). Chinook minimum size limit of 24 inches total length (B). See gear restrictions and definitions (C.2, C.3). In 2015, same as Alternative I.

California State regulations require all salmon be made available to a CDFW representative for sampling immediately at port of landing. Any person in possession of a salmon with a missing adipose fin, upon request by an authorized agent or employee of the CDFW, shall immediately relinquish the head of the salmon to the state. (California Fish and Game Code §8226)

TABLE 2. Recreational management Alternatives collated by the STT for non-Indian ocean salmon fisheries, 2014. (Page 7 of 9) 3/12/2014 7:51 PM

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

Area (when open)		Chinook	Coho	Pink
North of Cape Falcon		24.0	16.0	None
Cape Falcon to Humbug Mt.		24.0	16.0	None
Humbug Mt. to OR/CA Border	Alt. I & II	24.0	16.0	None
	Alt.III	20.0	16.0	None
OR/CA Border to Horse Mountain	Alt. I & II	24.0	-	20.0
	Alt. III	20.0		
Horse Mt. to Pt. Arena	Alt. I & II	20.0	-	20.0
	Alt. III	24.0		
Pt. Arena. to Pigeon Pt.:	Alt. I ≤ June 13	24.0	-	24.0
	Alt. I ≥ June 14	20.0	-	24.0
	Alt II ≤ June 30	24.0		20.0
	Alt II ≥ July 1	20.0		26.0
	Alt III ≤ July 3	24.0		20.0
	Alt III ≥ July 4	20.0	-	24.0
Pigeon Pt.. to U.S./Mexico Border:		24.0	-	24.0

C. REQUIREMENTS, DEFINITIONS, RESTRICTIONS, OR EXCEPTIONS

C.1. Compliance with Minimum Size and Other Special Restrictions: All salmon on board a vessel must meet the minimum size or other special requirements for the area being fished and the area in which they are landed if that area is open. Salmon may be landed in an area that is closed only if they meet the minimum size or other special requirements for the area in which they were caught. **Alternative I:** Salmon may not be filleted prior to landing.

Ocean Boat Limits: Off the coast of Washington, Oregon, and California, each fisher aboard a vessel may continue to use angling gear until the combined daily limits of Chinook and coho salmon for all licensed and juvenile anglers aboard have been attained (additional state restrictions may apply).

TABLE 2. Recreational management Alternatives collated by the STT for non-Indian ocean salmon fisheries, 2014. (Page 8 of 9)	3/12/2014 7:51 PM
C. REQUIREMENTS, DEFINITIONS, RESTRICTIONS, OR EXCEPTIONS	

C.2. Gear Restrictions: Salmon may be taken only by hook and line using barbless hooks. All persons fishing for salmon, and all persons fishing from a boat with salmon on board, must meet the gear restrictions listed below for specific areas or seasons.

a. *U.S./Canada Border to Point Conception, California*: No more than one rod may be used per angler; and no more than two single point, single shank barbless hooks are required for all fishing gear. [Note: ODFW regulations in the state-water fishery off Tillamook Bay may allow the use of barbed hooks to be consistent with inside regulations.]

b. *Horse Mountain, California, to Point Conception, California*: Single point, single shank, barbless circle hooks (see gear definitions below) are required when fishing with bait by any means other than trolling, and no more than two such hooks shall be used. When angling with two hooks, the distance between the hooks must not exceed five inches when measured from the top of the eye of the top hook to the inner base of the curve of the lower hook, and both hooks must be permanently tied in place (hard tied). Circle hooks are not required when artificial lures are used without bait.

C.3. Gear Definitions:

a. *Recreational fishing gear defined*: Off Oregon and Washington, angling tackle consists of a single line that must be attached to a rod and reel held by hand or closely attended; the rod and reel must be held by hand while playing a hooked fish. No person may use more than one rod and line while fishing off Oregon or Washington. Off California, the line must be attached to a rod and reel held by hand or closely attended; weights directly attached to a line may not exceed four pounds (1.8 kg). While fishing off California north of Point Conception, no person fishing for salmon, and no person fishing from a boat with salmon on board, may use more than one rod and line. Fishing includes any activity which can reasonably be expected to result in the catching, taking, or harvesting of fish.

b. *Trolling defined*: Angling from a boat or floating device that is making way by means of a source of power, other than drifting by means of the prevailing water current or weather conditions.

c. *Circle hook defined*: A hook with a generally circular shape and a point which turns inward, pointing directly to the shank at a 90° angle.

C.4. Control Zone Definitions:

a. *The Bonilla-Tatoosh Line*: A line running from the western end of Cape Flattery to Tatoosh Island Lighthouse (48°23'30" N. lat., 124°44'12" W. long.) to the buoy adjacent to Duntze Rock (48°24'37" N. lat., 124°44'37" W. long.), then in a straight line to Bonilla Point (48°35'39" N. lat., 124°42'58" W. long.) on Vancouver Island, British Columbia.

b. *Grays Harbor Control Zone* - The area defined by a line drawn from the Westport Lighthouse (46° 53'18" N. lat., 124° 07'01" W. long.) to Buoy #2 (46° 52'42" N. lat., 124°12'42" W. long.) to Buoy #3 (46° 55'00" N. lat., 124°14'48" W. long.) to the Grays Harbor north jetty (46° 55'36" N. lat., 124°10'51" W. long.).

c. *Columbia Control Zone*: An area at the Columbia River mouth, bounded on the west by a line running northeast/southwest between the red lighted Buoy #4 (46°13'35" N. lat., 124°06'50" W. long.) and the green lighted Buoy #7 (46°15'09' N. lat., 124°06'16" W. long.); on the east, by the Buoy #10 line which bears north/south at 357° true from the south jetty at 46°14'00" N. lat., 124°03'07" W. long. to its intersection with the north jetty; on the north, by a line running northeast/southwest between the green lighted Buoy #7 to the tip of the north jetty (46°15'48" N. lat., 124°05'20" W. long. and then along the north jetty to the point of intersection with the Buoy #10 line; and on the south, by a line running northeast/southwest between the red lighted Buoy #4 and tip of the south jetty (46°14'03" N. lat., 124°04'05" W. long.), and then along the south jetty to the point of intersection with the Buoy #10 line.

d. *Stonewall Bank Yelloweye Rockfish Conservation Area*: The area defined by the following coordinates in the order listed:

44°37.46' N. lat.; 124°24.92' W. long.;
44°37.46' N. lat.; 124°23.63' W. long.;
44°28.71' N. lat.; 124°21.80' W. long.;
44°28.71' N. lat.; 124°24.10' W. long.;
44°31.42' N. lat.; 124°25.47' W. long.;
and connecting back to 44°37.46' N. lat.; 124°24.92' W. long.

e. *Klamath Control Zone*: The ocean area at the Klamath River mouth bounded on the north by 41°38'48" N. lat. (approximately six nautical miles north of the Klamath River mouth); on the west, by 124°23'00" W. long. (approximately 12 nautical miles off shore); and, on the south, by 41°26'48" N. lat. (approximately 6 nautical miles south of the Klamath River mouth).

TABLE 2. Recreational management measures adopted by the Council for non-Indian ocean salmon fisheries, 2014. (Page 9 of 9)
C. REQUIREMENTS, DEFINITIONS, RESTRICTIONS, OR EXCEPTIONS

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

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

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

TABLE 3. Treaty Indian troll management Alternatives collated by the STT for ocean salmon fisheries, 2014. (Page 1 of 2) 3/12/2014 7:51 PM

A. SEASON ALTERNATIVE DESCRIPTIONS

ALTERNATIVE I	ALTERNATIVE II	ALTERNATIVE III
Supplemental Management Information	**Supplemental Management Information**	**Supplemental Management Information**
,1.Overall Treaty-Indian TAC: 67,500 Chinook and 60,000 coho. 2. Overall Chinook and/or coho TACs may need to be reduced or fisheries adjusted to meet NMFS ESA guidance, FMP requirements, upon conclusion of negotiations in the North of Falcon forum, or upon receipt of preseason catch and abundance expectations for Canadian and Alaskan fisheries	1. Overall Treaty-Indian TAC: 62,500 Chinook and 55,000 coho. 2. Overall Chinook and/or coho TACs may need to be reduced or fisheries adjusted to meet NMFS ESA guidance, FMP requirements, upon conclusion of negotiations in the North of Falcon forum, or upon receipt of preseason catch and abundance expectations for Canadian and Alaskan fisheries	1. Overall Treaty-Indian TAC: 55,000 Chinook and 47,500 coho. 2. Overall Chinook and/or coho TACs may need to be reduced or fisheries adjusted to meet NMFS ESA guidance, FMP requirements, upon conclusion of negotiations in the North of Falcon forum, or upon receipt of preseason catch and abundance expectations for Canadian and Alaskan fisheries
• May 1 through the earlier of June 30 or 40,500 Chinook quota. All salmon except coho. If the Chinook quota is exceeded, the excess will be deducted from the later all-salmon season (C.5). See size limit (B) and other restrictions (C). • July 1 through the earlier of September 15, or 27,000 Chinook quota, or 60,000 coho quota. All Salmon. See size limit (B) and other restrictions (C).	• May 1 through the earlier of June 30 or 36,250 Chinook quota. All salmon except coho. If the Chinook quota is exceeded, the excess will be deducted from the later all-salmon season. See size limit (B) and other restrictions (C). • July 1 through the earlier of September 15, or 26,250 Chinook quota, or 55,000 coho quota. All salmon. See size limit (B) and other restrictions (C).	• May 1 through the earlier of June 30 or 27,500 Chinook quota. All salmon except coho. If the Chinook quota is exceeded, the excess will be deducted from the later all-salmon season. See size limit (B) and other restrictions (C). • July 1 through the earlier of September 15, or 27,500 Chinook quota, or 47,500 coho quota. All salmon. See size limit (B) and other restrictions (C)

TABLE 3. Treaty Indian troll management Alternatives collated by the STT for ocean salmon fisheries, 2014. (Page 2 of 2)	3/12/2014 7:51 PM

B. MINIMUM SIZE (Inches)

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

C. REQUIREMENTS, DEFINITIONS, RESTRICTIONS, OR EXCEPTIONS

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

S'KLALLAM - Washington State Statistical Area 4B (All).

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

QUILEUTE - That portion of the FMA between 48°07'36" N. lat. (Sand Pt.) and 47°31'42" N. lat. (Queets River) and east of 125°44'00" W. long.

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

QUINAULT - That portion of the FMA between 47°40'06" N. lat. (Destruction Island) and 46°53'18"N. lat. (Point Chehalis) and east of 125°44'00" W. long.

C.2. Gear restrictions

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

C.3. Quotas

a. The quotas include troll catches by the S'Klallam and Makah tribes in Washington State Statistical Area 4B from May 1 through September 15.
b. The Quileute Tribe will continue a ceremonial and subsistence fishery during the time frame of September 15 through October 15 in the same manner as in 2004-2013. Fish taken during this fishery are to be counted against treaty troll quotas established for the 2014 season (estimated harvest during the October ceremonial and subsistence fishery: 100 Chinook; 200 coho).

C.4. Area Closures

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

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

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

TABLE 5. Projected key stock escapements (thousands of fish) or management criteria for 2014 ocean fishery Alternatives analyzed by the STT.[a/] (Page 1 of 3)

Key Stock/Criteria	Projected Ocean Escapement[b/] or Other Criteria (Council Area Impacts in Parens) Alternative I	Alternative II	Alternative III	Spawner Objective or Other Comparative Standard as Noted	
			CHINOOK		
Columbia Upriver Brights	918.0	918.4	919.4	74.0	Minimum ocean escapement to attain 60.0 adults over McNary Dam, with normal distribution and no mainstem harvest.
Mid-Columbia Brights	339.4	339.8	340.2	14.9	Minimum ocean escapement to attain 0.9 adults for Umatilla and 4.5 for Little White Salmon and Bonneville Hatchery egg-takes, assuming average conversion and no mainstem harvest.
Columbia Lower River Hatchery Tules	99.8	100.3	102.7	25.0	Minimum ocean escapement to attain 14.5 adults for hatchery egg-take, with average conversion and no lower river mainstem or tributary harvest.
Columbia Lower River Natural Tules (threatened)	**42.0%**	**41.5%**	39.7%	≤ 41.0%	Total adult equivalent fishery exploitation rate (2014 NMFS ESA guidance).
Columbia Lower River Wild[c/] (threatened)	33.3	33.3	33.4	6.9	Minimum ocean escapement to attain MSY spawner goal of 5.7 for N. Lewis River fall Chinook (NMFS ESA consultation standard).
Spring Creek Hatchery Tules	101.3	103.0	108.2	8.2	Minimum ocean escapement to attain 7.0 adults for Spring Creek Hatchery egg-take, assuming average conversion and no mainstem harvest.
Snake River Fall (threatened) SRFI	48.5%	41.5%	39.7%	≤ 70.0%	Of 1988-1993 base period exploitation rate for all ocean fisheries (NMFS ESA consultation standard).
Klamath River Fall	40,700	40,700	40,700	40,700	MSY natural area adult spawners
Federally recognized tribal harvest	50.0%	50.0%	50.0%	50.0%	Equals 27.3, 27.3, and 27.3 (thousand) adult fish for Yurok and Hoopa Valley tribal fisheries.
Spawner Reduction Rate	47.1%	47.1%	47.1%	≤ 47.1%	FMP; equals 36.3, 36.3, and 36.3 (thousand) fewer natural area adult spawners due to fishing.
Adult river mouth return	92.8	92.8	92.9	NA	Total adults.
Age 4 ocean harvest rate	16.0%	16.0%	16.0%	≤ 16.0%	NMFS ESA consultation standard for threatened California Coastal Chinook.
KMZ sport fishery share	9.3%	8.7%	8.7%		No Council guidance for 2014.
River recreational fishery share	15.2%	15.1%	15.4%	NA	Equals 4.1, 4.1, and 4.2 (thousand) adult fish for recreational inriver fisheries.
Sacramento River Winter (endangered)	15.4%	15.4%	15.4%	≤ 15.4%	Age-3 ocean impact rate in fisheries south of Pt. Arena. In addition, the following season restrictions apply: Recreational- Pt. Arena to Pigeon Pt. between the first Saturday in April and the second Sunday in November; Pigeon Pt. to the U.S./Mexico Border between the first Saturday in April and the first Sunday in October. Minimum size limit ≥ 20 inches total length. Commercial- Pt. Arena to the U.S./Mexico border between May 1 and September 30, except Pt. Reyes to Pt. San Pedro between October 1 and 15. Minimum size limit ≥ 26 inches total length (NMFS 2014 ESA Guidance).

TABLE 5. Projected key stock escapements (thousands of fish) or management criteria for 2014 ocean fishery Alternatives adopted by the Council.[a/] (Page 2 of 3)

Key Stock/Criteria	Projected Ocean Escapement[b/] or Other Criteria (Council Area Impacts in Parens) Alternative I	Alternative II	Alternative III		Spawner Objective or Other Comparative Standard as Noted
Sacramento River Fall	324.7	315.4	322.6	≥ 190.4	2014 preseason ACL.
Sacramento Index exploitation rate	48.8%	50.3%	49.2%	≤ 70.0%	FMP.
Ocean commercial impacts	179.0	191.2	183.5		All Alternatives include fall (Sept-Dec) 2013 impacts (35.3 thousand SRFC).
Ocean recreational impacts	78.0	76.6	76.1		All Alternatives include fall 2013 impacts (3.8 thousand SRFC).
River recreational impacts	52.9	51.3	52.5		No guidance in 2014.
Hatchery spawner goal	Met	Met	Met	22.0	Aggregate number of adults to achieve egg take goals at Coleman, Feather River, and Nimbus hatcheries.
COHO					
Interior Fraser (Thompson River)	**12.2% (5.4%)**	**11.7% (5.0%)**	**11.1% (4.4%)**	≤ 10.0%	2014 Southern U.S. exploitation rate ceiling; 2009 PSC coho agreement.
Skagit	39.1% (5.3%)	38.0% (4.8%)	38.4% (4.3%)	≤ 60.0%	2014 total exploitation rate ceiling; FMP matrix[d/]
Stillaguamish	32.8% (3.5%)	32.1% (3.2%)	32.3% (2.9%)	≤ 50.0%	2014 total exploitation rate ceiling; FMP matrix[d/]
Snohomish	31.2% (3.6%)	30.6% (3.2%)	30.7% (2.9%)	≤ 60.0%	2014 total exploitation rate ceiling; FMP matrix[d/]
Hood Canal	56.0% (5.7%)	54.6% (5.2%)	55.4% (4.6%)	≤ 65.0%	2014 total exploitation rate ceiling; FMP matrix[d/]
Strait of Juan de Fuca	14.6% (4.6%)	13.1% (4.2%)	13.8% (3.8%)	≤ 40.0%	2014 total exploitation rate ceiling; FMP matrix[d/]
Quillayute Fall	16.9	17.0	17.1	6.3	FMP MSY adult spawner estimate[d/]. Value depicted is ocean escapement.
Hoh	7.4	7.5	7.6	2.5	FMP MSY adult spawner estimate[d/]. Value depicted is ocean escapement.
Queets Wild	7.8	8.0	8.1	5.8	FMP MSY adult spawner estimate[d/]. Value depicted is ocean escapement.
Grays Harbor	95.9	96.6	97.4	24.4	FMP MSY adult spawner estimate[d/]. Value depicted is ocean escapement.
Lower Columbia River Natural (threatened)	14.9%	13.4%	11.9%	≤ 22.5%	Total marine and mainstem Columbia River fishery exploitation rate (2014 NMFS ESA guidance). Value depicted is ocean fishery exploitation rate only. Bolded values identify ocean exploitation rates that, when combined with 2013 freshwater harvest rates, will exceed the total allowable exploitation rate of 22.5 percent.
Upper Columbia[e/]	>50%	>50%	>50%	≥ 50%	Minimum percentage of the run to Bonneville Dam.
Columbia River Hatchery Early	316.9	326.3	335.6	41.2	Minimum ocean escapement to attain hatchery egg-take goal of 21.8 early adult coho, with average conversion and no mainstem or tributary fisheries.
Columbia River Hatchery Late	255.6	268.9	282.7	8.8	Minimum ocean escapement to attain hatchery egg-take goal of 6.3 late adult coho, with average conversion and no mainstem or tributary fisheries.
Oregon Coastal Natural [b/]	24.7%	21.5%	20.4%	≤ 30.0%	Marine and freshwater fishery exploitation rate (NMFS ESA consultation standard).
Southern Oregon/Northern California Coast (threatened)	7.1%	6.7%	6.3%	≤ 13.0%	Marine fishery exploitation rate for R/K hatchery coho (NMFS ESA consultation standard).

TABLE 5. Projected key stock escapements (thousands of fish) or management criteria for 2014 ocean fishery Alternatives analyzed by the STT.[a/] (Page 3 of 3)

a/ Projections in the table assume a WCVI mortality for coho of the 2013 preseason level. Chinook fisheries in Southeast Alaska, North Coast BC, and WCVI troll and outside sport fisheries were assumed to have the same exploitation rates as expected preseason in 2013, as modified by the 2008 PST agreement. Assumptions for these Chinook fisheries will be changed prior to the April meeting when allowable catch levels for 2014 under the PST are known.

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

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

d/ Annual management objectives may be different than FMP goals, and are subject to agreement between WDFW and the treaty tribes under U.S. District Court orders. Total exploitation rate includes Alaskan, Canadian, Council area, Puget Sound, and freshwater fisheries and is calculated as total fishing mortality divided by total fishing mortality plus spawning escapement. These total exploitation rates reflect the initial base package for inside fisheries developed by state and tribal comanagers. It is anticipated that total exploitation rates will be adjusted by state and tribal comanagers during the preseason planning process to comply with stock specific exploitation rate constraints.

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

f/ Alternative I modeled as if 29,000 of the marked coho quota was rolled into the 20,000 non-mark-selective coho quota. The resulting 35,600 non-mark-selective coho quota in this simulation did not result in an increase to the projected impacts for LCN coho, but impacts for OCN coho increased by 1.9 percent for a total exploitation rate of 24.7 percent.

TABLE 7. Expected coastwide lower Columbia Natural (LCN) Oregon coastal natural (OCN) and Rogue/Klamath (RK) coho, and Lower Columbia River (LCR) tule Chinook exploitation rates by fishery for 2014 ocean fisheries management Alternatives adopted by the Council.

	Exploitation Rate (Percent)											
	LCN Coho			OCN Coho			RK Coho			LCR Tule Chinook		
Fishery	I	II	III	I	II	III	I	II	III	I	II	III
SOUTHEAST ALASKA	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.0%	2.0%	2.0%
BRITISH COLUMBIA	0.1%	0.1%	0.1%	0.3%	0.3%	0.3%	0.0%	0.0%	0.0%	12.8%	12.8%	13.0%
PUGET SOUND/STRAIT	0.2%	0.2%	0.2%	0.1%	0.1%	0.1%	0.0%	0.0%	0.0%	0.4%	0.4%	0.4%
NORTH OF CAPE FALCON												
Treaty Indian Ocean Troll	2.4%	2.2%	2.0%	0.5%	0.5%	0.4%	0.0%	0.0%	0.0%	6.5%	6.0%	5.2%
Recreational	5.8%	5.2%	4.6%	1.0%	0.9%	0.8%	0.0%	0.0%	0.0%	3.4%	3.3%	2.9%
Non-Indian Troll	2.0%	1.8%	1.6%	0.5%	0.4%	0.4%	0.0%	0.0%	0.0%	7.4%	7.2%	6.1%
SOUTH OF CAPE FALCON												
Recreational:										0.1%	0.1%	0.1%
Cape Falcon to Humbug Mt.	3.3%	2.9%	2.5%	10.3%	7.3%	6.5%	0.7%	0.5%	0.3%			
Humbug Mt. to OR/CA border (KMZ)	0.1%	0.1%	0.1%	0.4%	0.4%	0.3%	1.0%	0.9%	0.7%			
OR/CA border to Horse Mt. (KMZ)	0.1%	0.0%	0.0%	0.4%	0.4%	0.4%	1.9%	1.9%	1.7%			
Fort Bragg	0.0%	0.0%	0.0%	0.3%	0.3%	0.3%	1.1%	1.1%	1.1%			
South of Pt. Arena	0.0%	0.0%	0.0%	0.3%	0.3%	0.3%	0.7%	0.7%	0.7%			
Troll:										1.6%	1.7%	1.7%
Cape Falcon to Humbug Mt.	0.7%	0.7%	0.7%	0.9%	0.8%	0.8%	0.1%	0.1%	0.1%			
Humbug Mt. to OR/CA border (KMZ)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
OR/CA border to Horse Mt. (KMZ)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	0.1%	0.1%			
Fort Bragg	0.0%	0.0%	0.0%	0.4%	0.4%	0.4%	1.0%	0.9%	1.0%			
South of Pt. Arena	0.0%	0.0%	0.0%	0.3%	0.3%	0.3%	0.2%	0.2%	0.2%			
BUOY 10	1.7%	2.0%	2.3%	0.1%	0.1%	0.2%	0.0%	0.0%	0.0%	7.9%	8.0%	8.2%
ESTUARY/FRESHWATER	N/A	N/A	N/A	8.9%	8.9%	8.9%	0.2%	0.2%	0.2%			
TOTAL[a/]	14.9%	13.4%	11.9%	24.7% [b/]	21.5%	20.4%	7.1%	6.7%	6.3%	**42.0%**	**41.5%**	39.7%

a/ Totals do not include estuary/freshwater for LCN coho.

b/ Modeled as if 29,000 of the marked coho quota was rolled into the 20,000 non-mark-selective coho quota. The resulting 35,600 non-mark-selective coho quota in this simulation did not result in an increase to the projected impacts for LCN coho, but impacts for OCN coho increased by 1.9 percent for a total exploitation rate of 24.7 percent.

TABLE A-1. Sacramento River Winter run Chinook age-3 ocean impact rate south of Pt. Arena by fishery and alternative. The age-3 SRWC impact rate was projected for each of the proposed 2014 fishing season alternatives. The impacts are displayed as a percent for each alternative by fishery, port area, and month. Max rate: 15.4

Commercial

Alternative I **15.4 Total**

Port Area	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year Total
SF	0.21	0.71	0.32	0.16	0.01	0.00			1.41
MO	0.45	0.80	0.28	0.72	0.16				2.40
Total	0.66	1.51	0.60	0.88	0.16	0.00	0.00	0.00	**3.81**

Alternative II **15.4 Total**

Port Area	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year Total
SF	0.21	1.03	0.32	0.17	0.01	0.00			1.73
MO	0.45	1.39	0.27	0.32	0.00				2.43
Total	0.66	2.41	0.59	0.49	0.01	0.00	0.00	0.00	**4.16**

Alternative III **15.4 Total**

Port Area	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year Total
SF	0.21	0.84	0.32	0.16	0.01	0.00			1.54
MO	0.45	1.00	0.28	0.72	0.16				2.60
Total	0.66	1.84	0.60	0.88	0.16	0.00	0.00	0.00	**4.14**

Recreational

Alternative I

Port Area	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year Total
SF	0.17	0.39	1.30	2.07	0.63	0.06	0.18	0.03		4.82
MO	1.00	0.56	1.46	2.75	0.96	0.09	0.00			6.83
Total	1.17	0.95	2.76	4.82	1.59	0.15	0.18	0.03	0.00	**11.64**

Alternative II

Port Area	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year Total
SF	0.17	0.39	0.95	2.05	0.63	0.06	0.18	0.03		4.45
MO	1.00	0.56	1.46	2.74	0.95	0.09	0.00			6.81
Total	1.17	0.95	2.41	4.79	1.58	0.15	0.18	0.03	0.00	**11.25**

Alternative III

Port Area	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year Total
SF	0.17	0.39	0.95	2.02	0.63	0.06	0.18	0.03		4.42
MO	1.00	0.56	1.46	2.75	0.96	0.09	0.00			6.83
Total	1.17	0.95	2.41	4.77	1.59	0.15	0.18	0.03	0.00	**11.25**

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

12-Mar-14

TABLE A-2. Klamath River fall Chinook **age-4 ocean HARVEST** by fishery and alternative. In 2014, a harvest of 10,779 age-4 KRFC equals a 16% ocean harvest rate.

Commercial

Alternative I 16.0% Total

Port	Fall 2013			Summer 2014						Summer	Year
Area	Sept	Oct	Nov-Dec	Mar	Apr	May	Jun	Jul	Aug	Total	Total
NO					92	191	65	61	176	585	585
CO	1,164	488			237	305	222	335	579	1,678	3,330
KO						24	96	90	42	252	252
KC											
FB							1,275	1,751	629	3,655	3,655
SF						329	541	548	82	1,500	1,500
MO						87	58	50	1	196	196
Total	1,164	488			329	937	2,257	2,835	1,508	7,866	9,518
											14.1%

Alternative II 16.0% Total

Port	Fall 2013			Summer 2014						Summer	Year
Area	Sep	Oct	Nov-Dec	Mar	Apr	May	Jun	Jul	Aug	Total	Total
NO					92	191	65	51	176	576	576
CO	1,164	488			237	305	222	280	579	1,624	3,276
KO						24	96	45	42	207	207
KC											
FB							1,106	1,748	681	3,535	3,535
SF						329	781	547	86	1,743	1,743
MO						87	101	50		239	239
Total	1,164	488			329	937	2,371	2,722	1,565	7,924	9,576
											14.2%

Alternative III 16.0% Total

Port	Fall 2013			Summer 2014						Summer	Year
Area	Sep	Oct	Nov-Dec	Mar	Apr	May	Jun	Jul	Aug	Total	Total
NO					92	191	66	51	176	575	575
CO	1,164	488			237	305	222	280	579	1,624	3,276
KO						24	64	45	42	175	175
KC											
FB							1,362	1,747	629	3,738	3,738
SF						329	643	547	82	1,601	1,601
MO						87	73	50	1	211	211
Total	1,164	488			329	937	2,429	2,720	1,509	7,924	9,576
											14.2%

Recreational

Alternative I

Port	Fall 2013			Summer 2014						Summer	Year
Area	Sep	Oct	Nov-Dec	Mar	Apr	May	Jun	Jul	Aug	Total	Total
NO								8	4	12	12
CO	155					1	10	19	12	43	198
KO	28					2	19	44	149	214	242
KC						83	117	106	196	502	502
FB					2	19	45	58	14	137	137
SF					20	13	47	45	2	126	126
MO					15	3	5	10	1	35	35
Total	183				37	121	244	289	377	1,069	1,252
											1.9%

Alternative II

Port	Fall 2013			Summer 2014						Summer	Year
Area	Sep	Oct	Nov-Dec	Mar	Apr	May	Jun	Jul	Aug	Total	Total
NO								8	2	10	10
CO	155					1	6	19	10	37	192
KO	28					1	19	44	149	213	241
KC						40	117	106	196	460	460
FB					2	19	45	58	14	137	137
SF					20	13	47	44	2	126	126
MO					15	3	5	10	1	35	35
Total	183				37	77	240	289	375	1,017	1,200
											1.8%

Alternative III

Port	Fall 2013			Summer 2014						Summer	Year
Area	Sep	Oct	Nov-Dec	Mar	Apr	May	Jun	Jul	Aug	Total	Total
NO								8	2	9	9
CO	155					1	4	19	10	34	189
KO	28					1	19	44	149	212	240
KC						21	117	106	196	441	441
FB					2	19	45	57	14	137	137
SF					20	13	47	44	2	126	126
MO					15	3	5	10	1	35	35
Total	183				37	58	238	289	373	995	1,178
											1.7%

12-Mar-14

TESTIMONY OF THE COLUMBIA RIVER TREATY TRIBES
BEFORE PACIFIC FISHERIES MANAGEMENT COUNCIL
March 13, 2014, Sacramento, CA

Good day members of the Council. My name is Wilbur Slockish. I am Commissioner with the Columbia River Inter-Tribal Fish Commission and a treaty fisherman on the Columbia River. I am here with Chris Williams, and Herb Jackson and to provide testimony on behalf of the four Columbia River treaty tribes: the Yakama, Warm Springs, Umatilla and Nez Perce tribes.

During the 1850's, Issac Stevens promised that the tribes and our rights to hunt, fish, and gather our sacred foods would be protected. But it was this week back in 1957, that the gates were closed at The Dalles Dam flooding Celilo Falls, our last great mainstem fishing site on the Columbia River. This was done over the objections of the tribes. As one of our elders said at a 1947 Hearing on a proposed moratorium to dam construction, "Other people come to Celilo [and] got the fish to eat, white people and English. They live on the truth [treaty] we got. He [Issac Stevens] says, 'I will protect you from the white people.' Where is it? Where is the buffalo? Where is the deer? Where is the Elk? Where is the moose? Conservation took it all away and today we are left with the last truth we got, fish." Over and over, promises have not been upheld. This has created distrust. Distrust regarding things like promise that mark selective fisheries will not adversely impact our fish and our fishers.

As we have told the Council before, we do not support ocean mark selective fisheries. We have received a copy of the WDFW 2013 Ocean Mark Selective Fishery Sampling Report. We appreciate this report and support this type of evaluation of mark selective fisheries. We would like to see this kind of evaluation done for in-river mark selective fisheries.

There are a couple of things from this report we would like to bring to the Council's attention. The FRAM modeled mark rate in the May-June chinook mark selective fishery was higher than the mark rate actually observed in the fishery. Even though the fishery did not catch as many fish as expected, this indicates that FRAM is under-estimating impacts to wild fish per fish landed in this fishery. This is a serious concern to the tribes and should be a concern to NMFS as well. The on-board observer data indicated a lower proportion of clipped fish than the voluntary trip reports did. This supports our contention that anglers either cannot recall or choose not to report all the unclipped fish they release and that on-board observer programs are needed to accurately gage mark rates.

The tribes continue our opposition to mark selective recreational fisheries, especially the chinook fishery in Ocean Areas 1 through 4. We felt the ocean mark selective fishery proposals were not appropriate in the past four years and continue to believe that they are very in-appropriate. There is too much uncertainty in the impacts of these fisheries. The observed mark rates in this fishery are not very high. A full retention fishery would make more sense. The full retention coho fisheries planned south of cape falcon are a better approach.

Because the ocean and in-river fisheries share impacts on lower river coho and lower river tules, we would like to comment on the in-river fisheries affecting these stocks.

Again we are here to tell you that we do not support and have never supported having a mark selective chinook or coho fishery at Buoy 10. Even though the states use a 19% release mortality rate, we believe the fish may be highly susceptible to handling mortality in the estuary. August temperatures peak at just over 70 degrees in August in the Buoy 10 area.

The in-river recreational mark selective fall season chinook fisheries all have relatively low mark rates, so they are inefficient at harvesting hatchery fish. Many recreational fishers claim they do not even want to catch the clipped hatchery tules in the river. These fisheries complicate the in-river fishery modeling and are difficult to monitor and evaluate. In 2013, the mainstem mark selective chinook sport fishery occurred in a stretch of river where the water temperatures peaked at over 72 degrees in early September. We would like to note that the National Marine Fisheries Service restricts sampling fish for research purposes at Bonneville Dam at 70 degrees and sampling ceases when the temperatures are over 72 degrees because of the associated handling mortality. We wonder why they continue to allow mark selective fisheries to handle and release fish at these high temperatures.

Last fall, the states implemented a mark selective coho tanglenet fishery. We do not agree with the release mortality rate the states chose to use in this fishery. This rate is based on little more than guess work. We also remain concerned that the timing and area of this fishery will have too much impact on the mass marked coho returning to the Klickitat River. The Klickitat River is a very important late season fishery for the Yakama Nation.

This fall, there have been discussions of starting a commercial mark selective fishery as part of the implementation of the Kitzhaber commercial/sport re-allocation plan. WDFW has engaged in a research study to estimate the release mortality for purse and beach seine gear which is something we have asked for. However, the *U.S. v. Oregon* Technical Advisory Committee (TAC) has reviewed the preliminary results of this research, but has not reached consensus on appropriate release mortality rate for chinook and coho. The results are complex, but the core problem is that in order to accept the stock composition estimates from some radio tag work associated with this study, it suggests that our long set of CWT data for fisheries in the study area are not correct. The release mortality rates suggested by WDFW, imply that our CWT data are wrong. We ask that the states not consider implementation of commercial mark selective seine fisheries until the TAC can further consider the results of these studies and try to resolve these apparent inconsistencies in the data.

Mark selective fisheries have direct adverse effects on tribal fisheries such and they adversely affect tribal efforts to appropriately use hatchery fish in our rebuilding efforts. Managing simply for mark selective fisheries just manages for harvest opportunity and does nothing for rebuilding. Since the advent of mark selective fisheries, none of them have ever provided support for rebuilding fish runs.

This concludes our statement. Thank You.

Tribal Motion for the 2014 Treaty Ocean Troll Salmon Season

For the 2014 Treaty Ocean Troll Salmon Season, I move for the establishment of three alternatives for public review as they are presented in table 3 of the supplemental STT report (F.6.b) on pages 19-20.

Alternative I quota levels of 67,500 Chinook, and 60,000 coho

Alternative II quota levels of 62,500 Chinook, and 55,000 coho

Alternative III quota levels of 55,000 Chinook, and 47,500 coho

The salmon season will consist of a May/June chinook directed fishery and a July/August/September all-species fishery. The Chinook harvest will be split between the two periods with the following sub-quotes: **Alternative I**: 40,500; **Alternative II**: 36,250; **Alternative III**: 27,500 for the May/June Chinook directed fishery and the remainder Chinook in each alternative for the July/August/September all species fishery.

The Tribes would like to request model runs be done on each of the three alternatives with what the Tribes are proposing for Mid-Puget Sound age 2 Chinook recruit scalar and with what WDFW is calling the "old" version, this would be a total of 6 model runs.

I would also like to state for the record, that the Tribes and State are just <u>beginning</u> the North of Falcon planning process in which we will evaluate the total impacts of all proposed fisheries on Puget Sound and Columbia River stocks.

SALMON HEARINGS OFFICERS

Agenda Item F.7.a, Attachment 1 provides a schedule of public hearings for the Council management alternatives. Three hearings are scheduled as follows: March 24 in Westport, Washington and Coos Bay, Oregon; and March 25 in Santa Rosa, California. The public will also be able to provide their comments and recommendations on the alternatives in Vancouver, Washington during the April Council meeting.

The California Department of Fish and Wildlife, the Oregon Department of Fish and Wildlife, and the Washington Department of Fish and Wildlife also may announce additional state-sponsored hearings.

Council Action:

Confirm hearings officers and other official hearings attendees.

Reference Materials:

1. Agenda Item F.7.a, Attachment 1: Schedule of Salmon Fishery Management Alternative Hearings.

Agenda Order:

a. Agenda Item Overview — Mike Burner
b. **Council Action:** Appoint Hearings Officers — Dorothy Lowman

PFMC
02/11/14

SCHEDULE OF SALMON FISHERY MANAGEMENT ALTERNATIVE HEARINGS
Pacific Fishery Management Council
March 24-25, 2014[a/]

Date Day/Time	Location	Council	NMFS	USCG	Staff	Salmon Team	Meeting Facility Contact
March 24 Monday 7 p.m.	Chateau Westport Beach Room 710 West Hancock Westport, WA 98595						Rhonda or Linda (360) 268-9101 Phone (360) 268-1646 Fax
March 24 Monday 7 p.m.	Red Lion Hotel South Umpqua Room 1313 North Bayshore Drive Coos Bay, OR 97420						Kristin McDonald (541) 269-4099 Phone (541) 269-4060 Fax
March 25 Tuesday 7 p.m.	Hilton Sonoma Wine Country Golden Gate CD Room 3555 Round Barn Blvd. Santa Rosa, CA 95403						Lindsay Darrimon (707) 523-5505 Phone (707) 569-5555 Fax

a/ The Council will also receive public comment at the Vancouver, Washington meeting during the week of April 4-10, 2014.

PFMC
02/11/14

SACRAMENTO WINTER CHINOOK HARVEST CONTROL RULE

Sacramento River winter Chinook (SRWC) were listed as endangered under the Endangered Species Act (ESA) in 1989 and have been a limiting factor in the management of salmon fisheries. At the March 2012 meeting of the Pacific Fishery Management Council (Council), the National Marine Fisheries Service (NMFS) announced a new regulatory framework for SRWC that was based on findings of the 2010 Biological Opinion and included a control rule with a no-take threshold; NMFS also offered further involvement with the Council towards understanding the scientific and policy basis of the new approach.

At its April 2013 meeting, the Council held a workshop with the primary purpose of reviewing fishery management alternatives of two stocks listed under the Endangered Species Act, California Coastal Chinook (CCC) and SRWC, and approved a list of preliminary topics for the 2013 Salmon Methodology Review. Based on the results of the workshop and comments and reports at the April Council meeting, the Council did not include these two stocks in the 2013 methodology review. However, the Council remains interested in advancing the understanding and fishery management options for both stocks; Agenda Item F.9 at this meeting deals with CCC.

In an August 1, 2013 letter from Council Executive Director Donald McIsaac (Agenda Item F.8.a, Attachment 1), the Council requested a NMFS presentation at the September 2013 Council meeting on the policy basis of the NMFS Biological Opinion jeopardy determination for ocean salmon fisheries, the technical substance of the management strategy evaluation (Agenda Item F.8.a, Attachment 2), and the reasonable and prudent alternatives reviewed by NMFS as part of the current consultation standard. Specifically, the Council requested briefing on the control rule that limits the maximum age-3 impact rate for fisheries south of Point Arena, California based on the most recent 3-year geometric mean spawner escapement, relative to its extinction risk in comparison to other alternatives examined in the management strategy evaluation. The Council has expressed concern that the existing control rule may be unnecessarily restrictive in years of low abundance, particularly in situations where the 3-year mean escapement falls below a 500 fish threshold that results in zero impacts, as opposed to the *de minimis* impacts allowed on other ESA-listed salmonids (Agenda Item F.8.a, Supplemental Attachment 3). The Council has expressed interest in examining alternative control rules that can provide incidental *de minimis* management flexibility, capable of preserving some level of opportunity for the harvest of healthy targeted stocks without significantly increasing the risk of extinction of SRWC.

There was no presentation on these matters at the September 2013 Council meeting. However, on January 23, 2014, NMFS published in the *Federal Register* a notice of availability of the management strategy evaluation and a broad request for comments on alternative SRWC harvest control rules (Agenda Item F.8.a, Attachment 4). The Council and its advisory bodies are scheduled to review the management strategy evaluation and SRWC harvest policy and consider submitting comments on the matter by the April 23, 2014 deadline.

Council Action:

Provide Guidance for Submitting Comments on the Sacramento Winter Chinook Harvest Control Rule.

Reference Materials:

1. Agenda Item F.8.a, Attachment 1: August 1, 2013 letter from Dr. McIsaac to Mr. Will Stelle, NMFS West Coast Regional Administrator regarding SRWC.
2. Agenda Item F.8.a, Attachment 2: *Management Strategy Evaluation for Sacramento River winter Chinook salmon.*
3. Agenda Item F.8.a, Supplemental Attachment 3: Allowable or *de minimis* Fishery Impact Rates on Salmonid Stocks Listed under the Endangered Species List.
4. Agenda Item F.8.a, Attachment 4: January 23, 2014 *Federal Register* Notice of Availability of a Management Strategy Evaluation, Request for Comments.

Agenda Order:

a. a. Agenda Item Overview Mike Burner
b. Reports and Comments of Advisory Bodies and Management Entities
c. Public Comment
d. **Council Action**: Provide Guidance for Submitting Comments on the Sacramento Winter Chinook Harvest Control Rule

PFMC
02/14/14

Pacific Fishery Management Council

7700 NE Ambassador Place, Suite 101, Portland, OR 97220-1384
Phone 503-820-2280 | Toll free 866-806-7204 | Fax 503-820-2299 | www.pcouncil.org
Dan Wolford, Chairman | Donald O. McIsaac, Executive Director

August 01, 2013

Mr. Will Stelle, Regional Administrator
National Marine Fisheries Service
7600 Sand Point Way, NE, BIN C15700
Seattle, WA 98115-0070

RE Pacific Fishery Management Council Request for Information on the Sacramento River Winter Chinook Biological Opinion Methodology and Control Rule Components

Dear ~~Mr.~~ Will Stelle:

At the March 2012 meeting of the Pacific Fishery Management Council (Council), the National Marine Fisheries Service (NMFS) announced a new regulatory framework for Sacramento River Winter-run Chinook (SRWC) that was based on findings of the 2010 Biological Opinion and included a control rule with a no-take threshold; NMFS also offered further involvement with the Council towards understanding the scientific and policy basis of the new approach. At its April 2012 meeting, the Council assigned the Salmon Technical Team the task of looking into the scientific basis for the change in the control rule as part of the 2012 Salmon Methodology Review. At its April 2013 meeting, the Council held a workshop with the primary purpose of reviewing fishery management alternatives of two stocks listed under the Endangered Species Act, California Coastal Chinook (CCC) and SRWC, and approved a list of preliminary topics for the 2013 Salmon Methodology Review. Based on the results of the workshop and comments and reports at the April Council meeting, the Council did not include these two stocks in the 2013 methodology review. However, the Council remains interested in advancing the understanding and fishery management options for both stocks.

Regarding CCC, the Council is encouraged by ongoing research efforts by the California Department of Fish and Wildlife and NMFS. The Council anticipates holding a workshop in the spring of 2014 to review progress towards improved science and the potential of an abundance-based management approach.

Regarding SRWC, the Council requests a NMFS presentation on the basis of the NMFS Biological Opinion jeopardy determination for ocean salmon fisheries, the subsequent management strategy evaluation, and the reasonable and prudent alternative selected by NMFS as part of the current consultation standard. While the April 2013 workshop presentations were helpful for those in attendance, the Council has yet to see the highlights of NMFS presentations at that workshop. Specifically, the Council requests a briefing on the control rule that limits the maximum age-3 impact rate for fisheries south of Point Arena, California based on the most recent 3-year geometric mean spawner escapement, relative to its extinction risk in comparison to other alternatives examined in the management strategy evaluation. The Council is concerned that the existing control rule may be unnecessarily restrictive in years of low abundance, particularly in situations where the 3-year mean escapement falls below a 500 fish threshold that results in zero rather than *de minimis* impacts as is the case on other ESA-listed salmonids. The Council would like to have a discussion about alternative control rules that can provide incidental *de minimis* management flexibility, capable of preserving some level of opportunity for the harvest of healthy targeted stocks without significantly increasing the risk of extinction of SRWC.

Although not formally part of the 2013 Salmon Methodology Review process, the Council scheduled a NMFS report on these SRWC matters under the Salmon Methodology Review agenda item at the September 2013 Council meeting in Boise, Idaho. Ideally, a NMFS report provided for the advance Briefing Book for the September Council meeting on the basis of the current and alternative control rules would result in meaningful discussion about relevant issues. The Council could consider additional analyses or public notice for Council action at the November 2013 Council meeting in Costa Mesa, California, towards a potential Council decision to recommend NMFS consider changes in the management approach for the 2014 salmon preseason management cycle and fisheries.

Thank you for your advancement of transparency on this important issue. Should your staff have any questions on this matter, please contact Mr. Mike Burner at the Council office.

Sincerely,

D.O. McIsaac, Ph.D.
Executive Director

MDB: kam

c: Council Members
SSC Members
STT Members
SAS Members
Dr. Cisco Werner
Dr. Steve Lindley
Mr. Mike Burner
Ms. Heidi Taylor
Mr. Chuck Tracy

Management Strategy Evaluation for Sacramento River winter Chinook salmon

Arliss J. Winship[1,2] Michael R. O'Farrell[2]
Michael S. Mohr[2]

[1] Institute of Marine Sciences, University of California, Santa Cruz
Tel: +1-831-420-3963, E-mail: awinship@ucsc.edu

[2] Fisheries Ecology Division, Southwest Fisheries Science Center
National Marine Fisheries Service, 110 Shaffer Road, Santa Cruz, CA 95060, USA

February 28, 2012

Introduction

Sacramento River winter Chinook salmon (SRWC) is an endangered stock that is harvested incidentally in ocean fisheries. This stock was first listed as threatened under the Endangered Species Act (ESA) in 1989, and then downgraded to endangered in 1994. Most recently, in the 2010 Biological Opinion for ocean fisheries (NMFS (National Marine Fisheries Service), 2010), the National Marine Fisheries Service (NMFS) found that ocean fisheries are likely to jeopardize the continued existence of SRWC owing to a lack of measures and tools to constrain or reduce fishery impacts when this population's status is poor. NMFS offered a reasonable and prudent alternative (RPA) to comply with the ESA, which included (1) establishing thresholds related to the status of SRWC, (2) establishing fishery management objectives, and (3) development of analytical tools and assessment models that can implement the fishery objectives in the salmon fishery management process. This report documents a management strategy evaluation (MSE) used to develop a new management framework in the form of a harvest control rule. This work is relevant to component 2 of the RPA.

MSE is a computer simulation approach to evaluating the performance of alternative harvest management strategies with respect to management objectives (Hilborn, 1979; Butterworth & Punt, 1999; Cooke, 1999; Milner-Gulland *et al.*, 2001; Punt & Donovan, 2007). At the core of a MSE is an operating model. The operating model has several components including the dynamics of the impacted population, measurement of that population, and the dynamics of harvest (Kell *et al.*, 1999; Rademeyer *et al.*, 2007). A set of candidate control rules are chosen that relate the target harvesting effort, impact rate, or harvest to the estimated status of the impacted population. Simulations are then conducted using the operating model to evaluate the performance of the different control rules in terms of conservation and fishery objectives. By modelling the entire system, including errors in the assessment of the impacted population and errors in the implementation of harvest control measures, MSE aims to replicate how a harvest strategy would perform in practice.

This report describes the development of an operating model and the evaluation of several different control rules for specifying annual ocean fishery impact rates. The performance of the different control rules were evaluated relative to previously defined conservation criteria for Central Valley salmonids (Lindley *et al.*, 2007) and the implications for ocean fisheries. The addendum to this report presents the performance results for an additional control rule proposed by the NMFS Southwest Region.

Methods

Operating model

An important feature of our operating model was stochasticity. Maturation and death are discrete events that occur with some expected probability within a given time frame for each individual. However, the occurrences of these events also involve an element of randomness whereby the actual maturation and survival rates in a finite population will vary from the expected probabilities. This randomness is referred to as demographic stochasticity and can be modelled using standard probability distributions for discrete events (e.g., binomial and multinomial). The variance in maturation and survival rates induced by demographic stochasticity is highest for small populations. It is also the case in nature that expected maturation and survival probabilities are rarely constant over time. For example, variation in environmental conditions results in variation in expected maturation and survival rates (environmental stochasticity). Variation in expected maturation and survival probabilities over time results in greater variation in the numbers of maturations and deaths than that specified by the binomial and multinomial distributions. Human processes are also subject to stochasticity. Measurements of natural systems are subject to random errors (e.g., estimated numbers of spawners from carcass surveys). The implementation of a management decision such as a fishery impact rate is a complex process involving the design of fishery control measures and subsequent fishing effort, which will never perfectly achieve the chosen rate in practice. It was vital that these sources of stochasticity were included in our operating model. Demographic and environmental stochasticity can affect the probability that a population will go extinct (Lande, 1993). Data that feed into a control rule will be uncertain so in order for the MSE to mimic reality the impact control rule can not have knowledge of the true state of the population. Deviations of realized impact rates from those specified by the control rule have obvious implications for the success of any management strategy.

At the core of our operating model was a model of the SRWC population. The population model was structured by origin (natural and hatchery), sex and age and had a time step of one year (Figs 1 and 2). The model tracked the number of fish on 1 March. We assumed that spawning adults, symbolized by S, entered the river on the last day of February. Their offspring (fry), J, along with hatchery-produced juveniles (pre-smolts), P, migrated back down the river during the following fall and winter and were assumed to enter the ocean on the last day of February one year later. Fish in the ocean were symbolized by O with fish being referred to as age-2 during their first year in the ocean and their age advancing 1 year every 1 March. Fish of age a that returned to the river to spawn were referred to as age-a even though spawning occurred during the summer following river entry. Aspects of our model and some of our notation follow several previous models for SRWC (Botsford & Brittnacher, 1998; Newman *et al.*, 2006; Newman & Lindley, 2006; O'Farrell *et al.*, 2011b).

For fish in the ocean on 1 March, the first modelled event each biological year was fishery impacts:

$$I_{osat} \sim \text{Binomial}\left(O_{osat}, i_{at}\right) \qquad \text{for} \quad 2 < a \leq A \tag{1}$$

where I_{osat} is the number of fish of origin o, sex s and age a that died during the fishing season following time t due to interactions with fisheries (harvest, release and drop-off mortality), O_{osat} is the number of fish of origin o, sex s and age a in the ocean at time t, i_{at} is the fishery impact rate on fish of age a during the fishing season following time t, and A is maximum age. The notation $x = \text{Binomial}\left(n, p\right)$ indicates that x is binomially distributed with sample size n and probability p. x represents the number of successes in n Bernoulli trials (two possible outcomes) with a probability of success of p. The number of successes will vary among sets of trials of size n by chance. The binomial distribution describes the distribution of the numbers of successes across sets of trials. In the case of Eq. 1, the number of fishery impacts I_{osat} represents the number of 'successes', the number of fish in the ocean O_{osat} represents the sample size, and the fishery impact rate i_{at} represents the probability of success.

Natural mortality was assumed to occur over winter after fishery impacts followed by sexual maturity completing the biological year:

$$\left[O_{os(a+1)(t+1)}, S_{osa(t+1)}\right] \sim \text{Multinomial}\left[O_{osat} - I_{osat}, n_a\left(1 - m_{sa}\right), n_a m_{sa}\right] \quad \text{for} \quad 2 < a < A \tag{2}$$

$$S_{osa(t+1)} \sim \text{Binomial}\left(O_{osat} - I_{osat}, n_a\right) \quad \text{for} \quad a = A \tag{3}$$

where S_{osat} is the number of fish of origin o, sex s and age a returning to the river at time t, n_a is the overwinter natural survival rate of fish of age a, and m_{sa} is the probability that a fish of sex s and age a will mature into a spawner. The model assumed that the earliest age at which a fish could spawn was 2 years and that all fish matured by the maximum age. Fisheries were assumed to impact only fish of age 3 or older. We also assumed that fishery impact rates, natural survival rates and maturation rates were identical between natural-origin and hatchery-origin fish. This assumption is discussed further in the 'Parameterization' section. The notation $[x_1, x_2] = \text{Multinomial}\,(n, p_1, p_2)$ or $\mathbf{x} = \text{Multinomial}\,(n, \mathbf{p})$ indicates that the vector $\mathbf{x}$ is multinomially distributed with sample size n and probability vector $\mathbf{p}$. The multinomial distribution is analogous to the binomial distribution, but it is used for situations when there is more than two possible outcomes in each trial. p_1 represents the probability of the first outcome, p_2 represents the probability of the second outcome, etc. In the case of Eq. 2, there were three possible outcomes for a fish that survived fishery impacts: survived natural mortality and did not spawn, survived natural mortality and spawned, or succumbed to natural mortality. In our model we only kept track of the first two of these outcomes.

The numbers of natural-origin and hatchery-origin fish returning to spawn at age 2 and remaining in the ocean at age 3 were assumed to be functions of natural and hatchery production:

$$\left[O_{(\text{natural})(\text{male})3(t+1)}, O_{(\text{natural})(\text{female})3(t+1)}, S_{(\text{natural})(\text{male})2(t+1)}, S_{(\text{natural})(\text{female})2(t+1)}\right] \sim \\ \text{Multinomial}\left[J_t, 0.5n_{2t}\left(1-m_{(\text{male})2}\right), 0.5n_{2t}\left(1-m_{(\text{female})2}\right), 0.5n_{2t}m_{(\text{male})2}, 0.5n_{2t}m_{(\text{female})2}\right] \tag{4}$$

$$\left[O_{(\text{hatchery})(\text{male})3(t+1)}, O_{(\text{hatchery})(\text{female})3(t+1)}, S_{(\text{hatchery})(\text{male})2(t+1)}, S_{(\text{hatchery})(\text{female})2(t+1)}\right] \sim \\ \text{Multinomial}\left[P_t, 0.5hn_{2t}\left(1-m_{(\text{male})2}\right), 0.5hn_{2t}\left(1-m_{(\text{female})2}\right), 0.5hn_{2t}m_{(\text{male})2}, 0.5hn_{2t}m_{(\text{female})2}\right] \tag{5}$$

where J_t is the number of fry produced in natural spawning areas by spawners who entered the river at time $t-1$, n_{2t} is the juvenile survival rate of natural-origin fry from time t to time $t+1$ (freshwater outmigration and their first year in the ocean), P_t is the number of pre-smolts released into the river by the hatchery, and h is the juvenile survival rate of hatchery-origin pre-smolts as a multiple of the survival rate of natural-origin fry. We assumed a juvenile sex ratio of 1:1. Eqs 4-5 incorporated demographic stochasticity in the sex ratio, maturation rate and survival rate of juveniles.

Freshwater rearing, outmigration and the first year in the ocean are critical life stages for young salmon, and it has been hypothesized that variation in the environmental conditions experienced during these stages may cause substantial variation in natural juvenile growth and survival rates and ultimately the number of fish that return to the river to spawn (Friedland, 1998; Beamish & Mahnken, 2001; Wells *et al.*, 2007; Lindley *et al.*, 2009). We modelled the effect of variation in environmental conditions on juvenile survival by allowing the juvenile survival rate to vary over time according to a first-order autoregressive process whose marginal distribution was a beta distribution (McKenzie, 1985):

$$n_{2t} = 1 - U_t \left[1 - W_t n_{2(t-1)}\right] \tag{6}$$

where

$$U_t \sim \text{Beta}\left(\beta_{n_2}, \alpha_{n_2} - p_{n_2}\right) \tag{7}$$
$$W_t \sim \text{Beta}\left(p_{n_2}, \alpha_{n_2} - p_{n_2}\right) \tag{8}$$

for $0 < p_{n_2} < \alpha_{n_2}$. Note that U_t and W_t were independent of each other and $n_{2(t-1)}$. Eqs 6-8 allow for positive autocorrelation in n_{2t} over time. The parameters of these beta distributions (α_{n_2}, β_{n_2}, p_{n_2}) were determined by specifying the mean, CV and autocorrelation of n_{2t} (μ_{n_2}, CV_{n_2}, ρ_{n_2}) and using the following relationships:

$$\alpha_{n_2} = \frac{1 - \mu_{n_2}\left(1 + CV_{n_2}^2\right)}{CV_{n_2}^2} \tag{9}$$

$$\beta_{n_2} = \frac{\frac{1}{\mu_{n_2}} - 2 + \mu_{n_2} + \left(\mu_{n_2} - 1\right) CV_{n_2}^2}{CV_{n_2}^2} \tag{10}$$

$$p = \frac{\alpha_{n_2} + \beta_{n_2}}{1 + \frac{\beta_{n_2}}{\rho_{n_2}\alpha_{n_2}}} \tag{11}$$

where $0 < \rho_{n_2} < 1$. Eq. 11 was derived based on McKenzie (1985). The sequence of juvenile survival rates was initialized by setting $n_{21} = \mu_{n_2}$. Autocorrelation in juvenile survival rates over time was intended to reflect autocorrelation in environmental conditions over time (e.g., sequences of consecutive good or bad years). Demographic stochasticity in juvenile survival rates was modelled (Eqs 4-5) in addition to the stochasticity described here (Eqs 6-8). The value used for CV_{n_2} was estimated from data at escapement levels of hundreds or thousands of spawners so we allowed for additional variance in realized juvenile survival rates at very small population sizes.

Livingston Stone National Fish Hatchery obtains new broodstock each year by capturing returning natural-origin spawners (in very few cases, hatchery-origin SRWC have been used for broodstock) in the Keswick Dam fish trap. Thus, not all natural-origin fish returning to the river contribute to natural production. The numbers of fish that spawned in the river were calculated as follows:

$$R_{osat} = \begin{cases} S_{osat} & \text{for} \quad o = \text{hatchery} \\ S_{osat} - B_{sat} & \text{for} \quad o = \text{natural} \end{cases} \tag{12}$$

where R_{osat} is the number of fish of origin o, sex s and age a that returned to the river at time t and subsequently spawned in the river and B_{sat} is the number of natural-origin fish of sex s and age a that returned to the river at time t and were subsequently removed from the river for broodstock.

We assumed that there was a targeted total broodstock for each sex, B^{target}, but that the total broodstock for each sex actually taken in a given year, B_t^{sex}, was constrained by the number of returning natural-origin spawners. We assumed that at most 20% of returning natural-origin spawners were taken as broodstock:

$$B_t^{\text{sex}} = \min\left\{B^{\text{target}}, \text{round}\left[0.2\sum_{a=2}^{A} S_{(\text{natural})(\text{female})at}\right], \text{round}\left[0.2\sum_{a=2}^{A} S_{(\text{natural})(\text{male})at}\right]\right\} \tag{13}$$

Eq. 13 assumed that the numbers of broodstock taken were determined by the sex with the fewest returning spawners. It is possible that the hatchery would be unable to obtain 20% of returning natural-origin spawners if abundance was low and < 20% of spawners entered the trap. If this was the case, the number of broodstock taken (and subsequent hatchery production) would be lower than specified by Eq 13.

The total male broodstock was assumed to be equal to the female broodstock, and broodstock was partitioned stochastically among ages according the age composition of returning fish:

$$[B_{s2t}, \ldots, B_{sAt}] \sim \text{Multinomial}\left[B_t^{\text{sex}}, \frac{S_{(\text{natural})s2t}}{\sum_{a=2}^{A} S_{(\text{natural})sat}}, \ldots, \frac{S_{(\text{natural})sAt}}{\sum_{a=2}^{A} S_{(\text{natural})sat}}\right] \tag{14}$$

Between 2003 and 2010 the annual numbers of male and female spawners taken as broodstock were usually similar, although 9% more females were taken overall (D. Killam, pers. comm.).

The expected number of fry produced in the wild was assumed to be a density-dependent function of the number of eggs produced following the Beverton-Holt stock-recruitment relationship (Beverton & Holt, 1957). Furthermore, it was assumed that the number of fry produced per female spawner would vary over time due to variation in fecundity and the rate of survival of eggs to the fry stage driven by variation in environmental conditions. This stochasticity in production was assumed to be greater than that dicatated by demographic stochasticity alone. We modelled stochasticity in the number of fry produced in the wild using a bias-corrected lognormal distribution. The following equations described the production of natural-origin fry in our model:

$$J_{t+1} \sim \text{round}\left\{\text{Lognormal}\left[\log\left(r_t F_t\right) - 0.5\sigma^2_{\log J}, \sigma^2_{\log J}\right]\right\} \tag{15}$$

$$r_t = \frac{\theta_1 g}{1 + \theta_2 g F_t} \tag{16}$$

$$F_t = \sum_o \sum_{a=2}^{A} R_{o(\text{female})at} \tag{17}$$

where $\text{Lognormal}\left(\mu, \sigma^2\right)$ is a lognormal distribution with mean μ and variance σ^2 on the log-scale, F_t is the total number of natural-origin and hatchery-origin females who entered the river at time t and subsequently spawned in the river, r_t is the number of fry produced per female spawner, g is the number of eggs produced per female spawner, θ_1 is the maximum rate of successful egg deposition, incubation, hatching and survival to the fry stage, and θ_2 is a parameter specifying the strength of density dependence. Eq. 16 follows the parameterization of Newman & Lindley (2006) where θ_1 is equal to $\frac{1}{\beta}$ in the original parameterization presented by Beverton & Holt (1957) and θ_2 is equal to $\frac{\alpha}{\beta}$ in the original parameterization. We assumed that the number of male spawners did not limit the number of fry produced. We specified the CV of natural production (CV_J) and then calculated the variance on the log scale as:

$$\sigma^2_{\log J} = \log\left(1 + CV_J^2\right) \tag{18}$$

Hatchery production was modelled by assuming that all females taken for broodstock were spawned and that each of these females ultimately produced 3000 hatchery-origin pre-smolts for release into the river:

$$P_{t+1} = \text{round}\left[3000 B_t^{\text{sex}}\right] \tag{19}$$

We estimated the number of pre-smolts released per broodstock female from the numbers of female spawners taken as broodstock between 2006-2009 and the corresponding numbers of hatchery-origin pre-smolts released from those brood years (K. Niemela, pers. comm.).

Fishery impact rates were modelled as follows:

$$i_{at} = 1 - e^{\log\left[1-(c_t+\delta)\right]v_a} \tag{20}$$

where c_t is the realized impact rate south of Point Arena following time t, δ is the additional fishery impact rate north of Point Arena, and v_a is the relative instantaneous impact rate on age a. The realized impact rate was assumed to be distributed according to a beta distribution whose mean was the impact rate specified by the impact control rule (the maximum allowable impact rate):

$$c_t \sim \text{Beta}\left(\alpha_{c_t}, \beta_{c_t}\right) \tag{21}$$

where

$$\alpha_{c_t} = \frac{1 - \mu_{c_t}\left(1 + CV_c^2\right)}{CV_c^2} \tag{22}$$

$$\beta_{c_t} = \frac{\frac{1}{\mu_{c_t}} - 2 + \mu_{c_t} + \left(\mu_{c_t} - 1\right) CV_c^2}{CV_c^2}, \tag{23}$$

μ_{c_t} was the impact rate specified by the control rule at time t and CV_c was the coefficient of variation of the realized impact rate relative to the maximum allowable impact rate. The deviations of the realized impact rate from that specified by the control rule were intended to capture the unpredictable complexities of the real process of trying to design fishery controls to achieve a specific maximum allowable impact rate. For some simulation scenarios (see below), c_t was restricted to be

≤ 0.35 to prevent unrealistic realized impact rates. This constraint was implemented by truncating the beta distribution in Eq. 21 (i.e., discarding values higher than 0.35 and resampling until a permissible value was obtained). Demographic stochasticity in the realized impact rate was modelled (Eq. 1) in addition to the stochasticity described here (Eq. 21). As with CV_{n_2}, the value used for CV_c was estimated from data at escapement levels of hundreds or thousands of fish so we allowed for additional variance in realized impact rates at very small population sizes.

Six different impact control rules were considered (Fig. 3). The first three of these had a constant maximum allowable impact rate (i.e., μ_{c_t} did not change over time). The other three control rules specified the maximum allowable impact rate as a function of the mean estimated number of spawners over the past T years:

$$\mu_{c_t} = \min \left\{ \phi_1 + \frac{\phi_2 - \phi_1}{\phi_4 - \phi_3} \max \left[\bar{N}_{tT}^{\text{spawn}} - \phi_3, 0 \right], \phi_2 \right\} \tag{24}$$

where $\bar{N}_{tT}^{\text{spawn}}$ is the mean estimated number of spawners per year during the T years preceding t, ϕ_1 was the minimum value that the maximum allowable impact rate could be, ϕ_2 was the maximum value that the maximum allowable impact rate could be, ϕ_3 was the threshold mean estimated number of spawners below which the maximum allowable impact rate was set to its minimum value, and ϕ_4 was the mean estimated number of spawners above which the maximum allowable impact rate was set to its maximum value. We used the geometric mean estimated number of spawners:

$$\bar{N}_{tT}^{\text{spawn}} = \left(\prod_{u=t-T}^{t-1} \hat{N}_u^{\text{spawn}} \right)^{\frac{1}{T}} \tag{25}$$

where $\hat{N}_t^{\text{spawn}}$ were simulated estimates of the numbers of spawners over time. These simulated estimates had two components: 1) the total numbers of spawners that were removed as broodstock ($2B_t^{\text{sex}}$), which were assumed to be known, and 2) estimates of the number of fish spawning in the river as though actual carcass surveys were being conducted. Errors in the estimates of the number of fish spawning in the river were assumed to conform to a bias-corrected lognormal distribution so that:

$$\hat{N}_t^{\text{spawn}} \sim \text{round} \left\{ \text{Lognormal} \left[\log \left(\sum_o \sum_s \sum_{a=2}^{A} R_{osat} \right) - 0.5\sigma^2_{\log \hat{N}^{\text{spawn}}}, \sigma^2_{\log \hat{N}^{\text{spawn}}} \right] \right\} + 2B_t^{\text{sex}} \tag{26}$$

We specified the CV of these spawner estimates ($CV_{\hat{N}^{\text{spawn}}}$) and then calculated the variance on the log scale as in Eq. 18. Eq. 26 assumed that the true number of fish spawning in the river was the mean of the lognormal distribution. It is important to note that the impact rate specified by the control rule was a function of the simulated data not the true number of spawners.

Initialization

The natural population was initialized at the beginning of the simulation by specifying the initial number of females spawning in the river, $F_{(\text{natural})1}$. The vector of initial numbers of natural-origin fish of each sex, age and maturity status, $\mathbf{N}_1$, was then calculated from $F_{(\text{natural})1}$ and the stable age distribution specified by a pre-simulation deterministic transition matrix, $\left(\mathbf{X}_{\text{natural}} + \mathbf{Z}_{(\text{natural})0}\right)\mathbf{Y}_0$ (Appendix A). The stable age distribution was proportional to the eigenvector corresponding to the dominant eigenvalue of this matrix. The pre-simulation matrix was intended to approximate the dynamics of the population just prior to the start of the simulation. For consistency we assumed that these dynamics conformed to the assumed density-dependent dynamics in the simulation. Thus, the number of juveniles produced per female spawner just prior to the simulation, r_0, was set equal to r_1, which was calculated from $F_{(\text{natural})1}$ and Eq. 16. We also allowed for pre-simulation fishery impacts specified by the impact rates i_{a0}. It is important to note that if the initial population was below the equilibrium population size, the stable age distribution defined by the pre-simulation matrix would never be realized even theoretically because r_t would change over time according to its assumed density dependence. Furthermore, the removal of natural-origin spawners for broodstock and the contribution of hatchery-origin spawners to natural production were not represented in the natural stable age distribution. Despite these inconsistencies, we felt that this stable age distribution provided a reasonably realistic approximate natural age distribution with which to start the simulations with.

The hatchery-origin population was initialized at the beginning of the simulation in the same way as the natural population but using the initial number of hatchery-origin pre-smolts, P_1, and the pre-simulation deterministic transition matrix, $\left(\mathbf{X}_{\text{hatchery}} + \mathbf{Z}_{(\text{hatchery})0}\right)\mathbf{Y}_0$.

Parameterization

Model parameter values are presented in Table 1. We assumed a maximum age of 4 years. The initial number of natural-origin females spawning in the river was set to 1475, the average estimated number of natural-origin females spawning in the river from 2008-2010. The initial and future target broodstock (B_0^{sex} and B^{target}, respectively) were set to 50 females and 50 males. This broodstock was assumed to produce 150000 pre-smolts following our assumption of 3000 pre-smolts per female. This assumed hatchery production reflected the average hatchery production in recent years (2006-2009).

We obtained several of the parameter values that we used in the simulations from a statistical model that we developed for SRWC (Winship *et al.*, 2011). The structure of the population model in that analysis was similar to the population component of our operating model, thus, the parameters were transferable between models. The parameter values that we took from the statistical analysis included the stock-recruitment parameters (g, θ_1, θ_2, CV_J), sexual maturation probabilities (m_{sa}), juvenile survival probabilities (μ_{n_2}, CV_{n_2}, h) and the CV of estimates of the number of fish spawning in the river ($CV_{\hat{N}^{\text{spawn}}}$). We used median posterior estimates from the statistical model because the posterior probability distributions were sometimes heavily skewed and medians are less affected by parameter transformations. The value of $CV_{\hat{N}^{\text{spawn}}}$ was set to the mean of our annual estimates from the statistical model (total number of fish spawning in the river). There were no available estimates of the autocorrelation in juvenile survival probabilities over time. Furthermore, we did not feel that the lengths of the data time-series (Winship *et al.*, 2011) were sufficient to reliably estimate this parameter. Instead, we explored two different scenarios with respect to temporal autocorrelation in juvenile survival rates. In the first of these scenarios we assumed no autocorrelation, and in the second we assumed an autocorrelation of 0.5. The values that we chose for ρ_{n_2} were somewhat arbitrary because of the lack of information about what a realistic level of autocorrelation might be. Nevertheless, we felt that the values 0 and 0.5 bracketed a range that likely contained a realistic value. We explored two other preliminary autocorrelation scenarios ($\rho_{n_2} = 0.3$ and 0.6) and found that increasing or decreasing ρ_{n_2} generally increased or decreased the autocorrelation effects described in the 'Results' section.

We assumed a constant natural annual survival probability of 80% for ages $\geq$ 3 following assumptions in models by CDFG (California Department of Fish and Game) (1989) and O'Farrell *et al.* (2011b). Our model assumed that the survival rates of hatchery-origin and natural-origin fish older than age 2 were identical. The average age distributions of hatchery-origin and natural-origin spawners were similar between 2001-2009 (USFWS (United States Fish and Wildlife Service), 2010), which is consistent with similar survival rates conditional on similar maturation rates.

The impact rate specified by the control rule was assumed to be the age-3 impact rate ($v_3 = 1$). Fish were assumed to be invulnerable to fishery-related mortality during their first year in the ocean (i.e., $v_2 = 0$). Estimated age-4 impact rates were variable between 2001-2007 and based on small sample sizes (O'Farrell *et al.*, 2011b) so we made the simplifying assumption that the instantaneous age-4 impact rate was twice that of the age-3 impact rate ($v_4 = 2$). The contributions of fishery impacts north of Point Arena to the overall impact rate were also variable between 2000-2007, but we assumed that $\delta = 0.006$, the average value. The pre-simulation age-3 impact rate, $i_{3\,0}$, was assumed to be 0.2 (O'Farrell *et al.*, 2011b). The CV of the realized impact rate relative to that specified by the control rule, CV_c, was calculated from an analysis of estimated impact rates for SRWC (O'Farrell *et al.*, 2011b) and hindcast impact rates from a preliminary version of the SRWC harvest model (O'Farrell *et al.*, 2011a).

Performance-testing simulations

To illustrate our MSE framework we conducted a series of preliminary performance-testing simulations.

We evaluated the performance of six different control rules that specified a wide range of maximum allowable fishery impact rates. The set of control rules represented no fishing, historical fishing levels, current fishing levels and three control rules where the maximum allowable impact rate was reduced as stock status declined. The control rule parameter values used for these performance-testing simulations were: rule 0 – $c_t = 0$; rule 1 – $c_t = 0.25$; rule 2 – $c_t = 0.2$; rule 3 – $\phi_1 = 0.1$, $\phi_2 = 0.2$, $\phi_3 = 833\frac{1}{3}$ and $\phi_4 = 1041\frac{2}{3}$; rule 4 – $\phi_1 = 0$, $\phi_2 = 0.2$, $\phi_3 = 0$ and $\phi_4 = 1041\frac{2}{3}$; rule 5 – $\phi_1 = 0$, $\phi_2 = 0.2$, $\phi_3 = 833\frac{1}{3}$ and $\phi_4 = 1041\frac{2}{3}$ (Fig. 3).

Control rule 1 was intended to represent a situation where fishing opportunity and effort were similar to historical levels. It is not possible to directly estimate fishery impact rates prior to the implementation of SRWC-focused protective measures, first instituted in 1994, because of data limitations. The largest difference in ocean fisheries between the pre-1994 "baseline" period and current fisheries was the presence of February and March recreational fisheries in areas south of Point Arena. Available data from the late 1960s suggest that recreational fisheries in these months likely harvested substantial numbers of SRWC (O'Farrell *et al.*, 2011b). Using historical fishing effort estimates and estimates of the impact rate per unit effort, we inferred the age-3 impact rate south of Point Arena for the baseline era prior to the protective measures. A general description of the method follows.

For the south of Point Arena area, the monthly (March–November), recreational age-3 impact rate per unit effort was estimated from cohort reconstructions for the current era, defined as 2000-2009 (O'Farrell *et al.*, 2011b). The recreational age-3 impact rate in the baseline era was then inferred by (1) assuming that the February impact rate per unit effort was equivalent to the March impact rate per unit effort, (2) multiplying the month-specific, recreational impact rate per unit effort by the month-specific average recreational effort for years 1976–1993, (3) summing the resulting impact rates over months February–November, and (4) multiplying the baseline age-3 recreational fishery impact rate by a factor of 1/0.69. The denominator of the fraction in (4) represents the proportion of the age-3 impact rate attributed to the recreational fishery, estimated for the current era. This procedure results in a mean age-3 impact rate for the baseline period of 0.25.

Control rule 2, a constant age-3 impact rate, was intended to represent current era ocean fisheries, which have been reduced relative to the historic level owing to the SRWC consultation standard. Control rule 2 is therefore defined as a constant age-3 impact rate of 0.20, which was the mean age-3 impact rate estimated from cohort reconstructions for years 2000-2007 (O'Farrell *et al.*, 2011b).

Control rules 3-5 incorporated increasingly conservative features to control rule 2, in the form of lower age-3 impact rates at reduced levels of stock status (Fig. 3). The mean spawner levels at which reductions in impact rate occurred were chosen based on thresholds of the population size risk criterion defined by Lindley *et al.* (2007).

Control rule 3 specifies an age-3 impact rate of 0.20 (ϕ_2) at mean spawner levels greater than $1041\frac{2}{3}$ (ϕ_4). Between mean spawner levels of $1041\frac{2}{3}$ and $833\frac{1}{3}$ (ϕ_3), the impact rate declines linearly from 0.20 to 0.10 (ϕ_1). At mean spawner levels less than or equal to $833\frac{1}{3}$, the impact rate is 0.10. The threshold value of $833\frac{1}{3}$ was chosen to represent the situation where the total population size was 2500 spawners, the threshold for a low risk of extinction for the population size criterion defined by Lindley *et al.* (2007). The threshold value of $1041\frac{2}{3}$ was chosen to represent the situation where the number of spawners in a given year would be reduced to $833\frac{1}{3}$ by an impact rate of 0.20. Control rule 3 therefore allows the mean impact rate experienced in recent years under the current SRWC consultation standard, unless the mean number of spawners reaches a defined threshold, at which time the impact rate is reduced to a *de minimis* level. The *de minimis* impact rate of 0.10 is representative of other *de minimis* exploitation rates for ESA listed salmon stocks.

Control rule 5 specifies an age-3 impact rate of 0.20 (ϕ_2) at mean spawner levels greater than $1041\frac{2}{3}$ (ϕ_4). Between mean spawner levels of $1041\frac{2}{3}$ and $833\frac{1}{3}$ (ϕ_3), the impact rate declines linearly from 0.20 to zero (ϕ_1). Justification for threshold values of mean spawner levels is the same as described for control rule 3. Control rule 5 contains the most conservative features of all control rules considered (with exception to the no fishing control rule), as it results in the closure of all fisheries when the average spawner level is less than or equal to the low risk threshold for the population size risk criterion (Lindley *et al.*, 2007).

Control rule 4 was designed to represent an intermediate level of conservatism between control rules 3 and 5. This control rule specifies an age-3 impact rate of 0.20 (ϕ_2) at mean spawner levels greater than $1041\frac{2}{3}$ (ϕ_4). Between mean spawner levels of $1041\frac{2}{3}$ and zero (ϕ_3), the impact rate declines linearly from 0.20 to zero (ϕ_1).

For control rules 2-5 we assumed that the maximum realized impact rate was 0.35 (the realized impact rate was a stochastic realization of the impact rate specified by the control rule; Eq. 21).

For comparison we also present the results of simulations with no fishery impacts south of Point Arena (i.e., $c_t = 0$), referred to as control rule 0.

The six control rules were tested under all combinations of two sets of scenarios. The first set of three simulation scenarios explored different values of T, the number of years of data input to the control rule (Eqs 24-25). In Scenario 'a' only the most recent escapement was input to the control rule ($T = 1$). In Scenario 'b' the geometric mean of the previous three escapements was input ($T = 3$). In Scenario 'c' $T = 5$.

The second set of two simulation scenarios considered different levels of autocorrelation in juvenile survival rates over time, ρ_{n_2} (Eq. 11). In the first of these scenarios we assumed no autocorrelation in juvenile survival rate, and in the second we assumed an autocorrelation of 0.5. All other parameters were set at the values presented in Table 1.

For each combination of control rule and scenario 20000 stochastic simulations were conducted for a time period of 100 years. We evaluated five performance metrics primarily related to the extinction risk criteria presented by Lindley *et al.* (2007) for Sacramento River Chinook salmon. The first performance metric was annual escapement, which equalled the total number of male and female natural- and hatchery-origin spawners each year ($\sum_o \sum_s \sum_{a=2}^{A} S_{osat}$). The second performance metric was 'population size' as defined by Lindley *et al.* (2007): the sum of three years (one generation) of escapement ($\sum_o \sum_s \sum_{a=2}^{A} \sum_{u=t}^{t-2} S_{osau}$). The distinction between escapement and population size is important with respect to performance criteria. For example, Lindley *et al.* (2007) present criteria for assessing extinction risk based on population size, but there may also be interest in escapement criteria. The third performance metric was the 10-year log trend in escapements, which is related to the extinction risk criteria based on 'population decline' presented by Lindley *et al.* (2007). The fourth performance metric was generational changes in population size, which was related to the extinction risk criteria based on 'catastrophe' presented by Lindley *et al.* (2007). While our model did not incorporate catastrophic events as defined by Lindley *et al.* (2007), we were interested in how the environmental variability that was incorporated in our model would affect the classification of population changes in terms of the catastrophe criteria. The catastrophe performance metric was calculated over 12 years of escapement, which equalled 10 years of population sizes. Note that these population sizes were not independent as there was temporal overlap in the escapements used to calculate sequential population sizes. Each generational change was calculated from the ratio of each pair of these 10 population sizes that were 3 years apart. Thus, the catastrophe performance metric was based on 7 generational changes in population size. The fifth performance metric was the proportion of years in which hatchery-origin fish composed 10% or more of the escapement. This last metric is relevant to the 'hatchery influence' extinction risk criteria presented by (Lindley *et al.*, 2007).

In addition to the extinction risk criteria, we evaluated several performance metrics relevant to the fishery. First we examined the proportion of time that the conservative features of control rules 3-5 were activated. We also examined how frequently the maximum allowable impact rate changed under these control rules, and the durations of continuous periods of time when the maximum allowable impact rate was less than its maximum value. Finally, we examined the realized impact rates under all of the control rules.

Results

Performance-testing simulations

Time-series of escapements simulated by the model seemed plausible in the context of the observed dynamics of SRWC during the past 40 years (Figs 4-5). The majority of simulated escapements were within the range of estimated historical escapements, although much higher escapements occurred in the simulations ($>$ 50000 spawners). Large declines were observed in some of the simulations as were extended periods of low escapement. It is important to keep in mind that the historical time series of escapement data represents only one replicate of 40 years while the simulation results represent what might have happened in 20000 different realizations of a 100-year time series. As expected, allowing for autocorrelation in juvenile survival rates resulted in relatively smoother changes in escapement over time and more frequent protracted periods of low or high escapement (Fig. 5). The long-term mean annual escapement in simulations without fishery impacts south of Point Arena was about 23000-24000 spawners, but when fishery impacts were allowed under control rule 1 the mean escapement dropped to about 10000 spawners. Mean escapement was a bit higher under the more conservative control rules 2-5, about 13000 spawners. Differences among the long-term mean escapements under control rules 2-5 were small ($<$ 1000 spawners).

The distributions of final population sizes in the simulations reflected similar patterns as those observed in annual escapements (Figs 6-7). The mean final population sizes were about three times the long-term mean annual escapements for corresponding control rules and scenarios. This result was expected because population size was calculated as the sum of three years of escapement. The distributions of population sizes were highly positively skewed with modes and medians less than the means. Thus, $>$ 50% of final population sizes were less than the mean final population size. Allowing for fishery impacts under control rule 1 resulted in a $>$ 50% reduction in final population size. This reduction was less under control rules 2-5, and differences in final population size among control rules 2-5 were relatively small. Differences in final population size among the three T scenarios (a, b and c) were also small. Allowing for autocorrelation in juvenile survival rates increased the variance in final population size (Fig. 7).

With respect to the 'population size' extinction risk criteria of Lindley *et al.* (2007), the vast majority of simulations resulted in low extinction risk (Figs 8-9). Fishery impacts under control rules 1-5 resulted in higher probabilities of moderate and high risk (Figs 8-11). The risk was highest when juvenile survival rates were autocorrelated over time, although the proportions of runs with high risk were small (1%) and only 9% of these simulations resulted in moderate risk (Figs 9, 11). It is also worth noting that there were small probabilities of moderate and high risk even in the absence of fishery impacts south of Point Arena, when juvenile survival rates were autocorrelated over time (Fig. 9). Performance with respect to these extinction risk criteria tended to improve from control rule 1 through control rule 5 especially in the presence of autocorrelated juvenile survival rates (Figs 9, 11). However, differences in performance among control rules 3-5 were small ($\leq 1\%$).

With respect to the 'population decline' extinction risk criteria of Lindley *et al.* (2007), there was substantial probability of moderate and high risk even in the absence of fishery impacts south of Point Arena (Figs 12-13). The dynamics of our operating model were such that the population fluctuated around an equilibrium size, sometimes increasing and sometimes decreasing. Thus, about 50% of the time the population was expected to be declining, sometimes at a rate greater than 10% per year. As a result, the population often met the decline-based criteria for moderate or high extinction risk. Fishery impacts under control rules 2-5 increased the probability of moderate and high extinction risk by decreasing the equilibrium mean escapement and increasing the probability that escapement was ≤ 500 spawners at least once in the last 6 years. Autocorrelation in juvenile survival rates also increased the probability of escapements ≤ 500 resulting in higher risk attributable to this metric.

With respect to the 'catastrophe' extinction risk criteria of Lindley *et al.* (2007), the environmental variability inherent to our model resulted in small probabilities of a catastrophic decline in population size during the last 10 years of the simulations (Figs 14-15). The probability of high risk ($\geq 90\%$) was at most 2% (scenario with autocorrelation in juvenile survival rates; Fig. 15). The probabilities of at least one lesser but substantial decline ($\geq 50\%$; our definition of moderate risk) were much higher (up to 50%). Performance with respect to these criteria varied little among control rules. It is important to note that our model did not incorporate catastrophic events, however, the environmental variability that was incorporated resulted in generational changes in population size that could have been classified as moderate or high risk according to the 'catastrophe' criteria of Lindley *et al.* (2007).

The mean frequency of years when $> 10\%$ of spawners were of hatchery origin was about 1 in 10 in the absence of fishery impacts south of Point Arena and autocorrelation in juvenile survival rates (Fig. 16). This mean frequency increased to about 4 in 10 with fishery impacts under control rule 1 and about 3 in 10 under control rules 2-5. The frequency increased with increasing fishery impacts because the impacts reduced the size of the natural-origin population and thus natural production while hatchery production remained constant. Autocorrelation in juvenile survival rates increased the mean frequency of years with $> 10\%$ of spawners of hatchery-origin to as much as 1 in 2 under control rule 1 (Fig. 17). Differences in this performance metric were small among T scenarios and among control rules 2-5, although there was some indication that the frequency decreased from rule 2 through rule 5 when juvenile survival rates were autocorrelated (Fig. 17).

The probability of escapement being > 20000 spawners was 38-42% in the absence of fishery impacts south of Point Arena across all simulation scenarios (Figs

18-21). This probability dropped to 13-15% when there were fishery impacts south of Point Arena under control rule 1, and was between 18-21% under control rules 2-5. Differences in this probability among control rules 2-5 were small. Allowing for autocorrelation in juvenile survival rates tended to result in slightly higher probabilities of escapement > 20000 under control rules 1-5 (Figs 19, 21). Differences in T did not have large effects on the probability of escapement > 20000. For historical context, estimates of SRWC escapement from counts at Red Bluff Diversion Dam on the Sacramento River exceeded 20000 in 9 of 39 years between 1970-2008. However, the years with escapement > 20000 occurred at the beginning of the time series, and the dynamics during that time period might have been different from the more recent dynamics that we estimated using our statistical model and applied to our forward projections.

For the majority of years in the simulations the maximum allowable impact rate specified by control rules 3-5 was equal to its maximum value, 0.2 (Figs 22-23). Population size was usually greater than the thresholds inherent to these control rules at which a lower impact rate would have been specified. Nevertheless, there were substantial proportions of time during which control rules 3-5 dictated a scaling back of the impact rate and thus fishing opportunity. Maximum allowable impact rates < 0.1 occurred under control rules 4 and 5, and maximum allowable impact rates of 0 (i.e., no fishing effort) occurred under control rule 5. The proportion of years with a maximum allowable impact rate less than its maximum value was greatest under Scenario a where only the most recent estimate of escapement was input to the control rule (Fig. 22). The 3-year and 5-year means that were input to the control rules under Scenarios b and c fluctuated less than the most recent escapement value so there were fewer years when the input to the control rule was low enough to trigger a lower impact rate. As discussed above, autocorrelation in juvenile survival rates resulted in a higher probability of lower population sizes, thus autocorrelation resulted in control rules 3-5 more frequently specifying an impact rate less than the maximum (Fig. 23).

Because the impact rate specified by control rules 3-5 was usually its maximum value, the maximum allowable impact rate was mostly stable over time (Fig. 24). The proportions of years when the maximum allowable impact rate decreased or increased were approximately equal. The impact rate changed more frequently when only the most recent estimate of escapement was input to the control rule than when 3-year or 5-year means were input. Autocorrelation in juvenile survival rates resulted in higher proportions of years when the impact rate changed because of the higher frequency of escapements below the control rules' upper escapement thresholds (Fig. 25). The specified impact rate changed most frequently under control rule 4, which had the largest range of escapements over which the impact rate was specified to change (Fig. 3).

The periods of time for which control rules 3-5 specified a scaling back of the maximum allowable impact rate varied depending on the number of years of escapement data input to the control rule and the level of autocorrelation in juvenile survival rates (Figs 26 and 27). When we assumed no autocorrelation in juvenile survival rates and the specified impact rate was a function of only the most recent estimate of escapement (Scenario a) the impact rate was usually scaled back for only a single year at a time ($> 80\%$ of occurrences of scaling back; Fig. 26). Over 99% of occurrences of the impact rate being scaled back lasted for 5 years or less. When 3-year or 5-year means were input to the control rule scaling back of the specified impact rate lasted for ≥ 2 years more than half of the time and lasted longer than 5 years 9-17% of the time. When we assumed that there was autocorrelation in juvenile survival rates, the average time that the specified impact rate was scaled back lengthened (Fig. 27). When the control rule operated on the most recent estimate of escapement the impact rate was scaled back for longer than a year 38-39% of time. When 3-year or 5-year means were input to the control rule scaling back of the specified impact rate lasted for ≥ 2 years 75-82% of the time and lasted longer than 5 years 30-38% of the time.

Although the maximum allowable impact rate was usually 0.25 (control rule 1) or 0.2 (control rules 2-5), the assumed stochastic errors in achieving the maximum allowable impact rate resulted in a wide range of realized age-3 impact rates south of Point Arena. The bulk of the distributions were between 0.1-0.4 under control rule 1, but we assumed a maximum realized impact rate of 0.35 under control rules 2-5 (Figs 28-29). Within T scenarios, the lower tails of these distributions tended to be longer as the control rule became more conservative and specified an increasing frequency of impact rates < 0.2. In the case of control rule 5, realized impact rates were as low as zero. The lower tails of the distributions of realized impact rates were also longer and heavier when the juvenile survival rate was assumed to be autocorrelated over time.

Discussion

We constructed a MSE to inform the choice of a new management framework for SRWC in the form of a fishery impact rate control rule. The operating model used in the MSE was parameterized based on a statistical model, a cohort reconstruction, and auxiliary analyses. We examined several simulation scenarios including a scenario with reduced precision of spawner abundance estimates and two scenarios with respect to autocorrelation in juvenile survival rates over time. We feel that the two autocorrelation scenarios bracketed the range of realistic levels of autocorrelation. The simulation scenario with an autocorrelation of 0.5 represented the worst case scenario, in terms of conservation risk, among the scenarios that we examined.

The MSE was used to evaluate the performance, in terms of conservation benefit and fishery cost, of several control rules with a wide range of conservative features. The set of control rules represented no fishing, historical fishing levels, current fishing levels and three control rules where the impact rate was reduced as stock status declined.

While we evaluated the performance of these control rules with respect to a variety of criteria, the most pertinent criterion with regard to developing a management framework was the population size risk criterion. Other performance metrics were much less informative for a variety of reasons. With respect to the population decline risk criterion, our model structure (density dependence) resulted in the population fluctuating around an equilibrium level with relatively equal frequencies of increase and decrease. In addition, the population decline risk criterion is of most relevance at low population size, which is represented more directly by the population size risk criterion. With respect to the hatchery risk criterion, Livingston Stone National Fish Hatchery is a best-practices fish hatchery and there is little basis for quantitative guidelines regarding hatchery straying from best-practices hatcheries (Lindley *et al.*, 2007). With respect to a recovery criterion, we examined the probability of annual escapement exceeding 20000 (NMFS, 1997; Botsford & Brittnacher, 1998). However, 20000 spawners is not a well-established recovery target and the ocean fishery is not solely responsible for recovery. Finally, with respect to the catastrophe risk criterion, Lindley *et al.* (2007) developed this criterion to capture large, rapid declines in population size that were not a result of "normal environmental variation". It is difficult to predict the probability of occurrence and magnitude of catastrophes that might befall SRWC so we did not incorporate catastrophes in our model. Nevertheless, the environmental variability that was incorporated sometimes resulted in very large, rapid declines in population size. Presumably the catastrophe risk criterion would be considered in the event of an identifiable catastrophe. We therefore focus here on results pertaining to the population size risk criterion for making inference about conservation benefits provided by alternative control rules.

The three-year geometric mean number of spawners is an appropriate metric for use in determining the maximum allowable age-3 impact rate through a control rule. Escapement in salmon populations can be highly variable, and single years of low or high escapement may not accurately reflect stock status. On the other hand, use of the five-year geometric mean could result in a control rule that is too slow to respond to changes in stock status, with relatively distant escapement values affecting current management. We focus here on results when the three-year geometric mean number of spawners was input to the control rules.

Control rules 3-5 reduce the maximum allowable age-3 impact rate as stock status declines, and the breakpoints in these control rules correspond to published thresholds for the population size risk criterion (Lindley *et al.*, 2007). There was little to no difference in risk among control rules 3-5 in terms of the population size risk criterion. Under our worst-case scenario (autocorrelation in juvenile survival rate $= 0.5$), there was moderate risk 4-5% of the time and high risk $< 1\%$ of the time. When we assumed no autocorrelation in juvenile survival rate, there was moderate or high risk $< 1\%$ of the time. Control rules 3-5 reduced the probability of moderate or high risk by $> 50\%$ relative to historical levels of fishing (control rule 1), and resulted in noticeable risk reduction relative to current levels of fishing (control rule 2). Furthermore, there is relatively little to be gained in terms of risk reduction by more conservative control rules than those developed here, as the elimination of all fisheries still resulted in moderate or high risk in 1% of the simulations for the worst-case scenario.

While there was little difference in terms of the conservation benefits resulting from control rules 3-5, there would have been large differences in the costs to the fishery. The conservative features of these control rules (i.e., reductions in the maximum allowable impact rate below its maximum value) were invoked 7-9% of the time under our worst-case scenario. Control rule 3 allows for a *de minimis* age-3 impact rate of 0.1 when stock status is poor, and the specified impact rate was equal to this value 1% of the time when there was no autocorrelation in juvenile survival rate and 9% of the time when there was autocorrelation in juvenile survival rate. Control rules 4-5 allowed for impact rates < 0.1 and complete closure of the recreational and commercial fisheries. Control rule 5 specified a zero impact rate $< 1\%$ of the time and 5% of the time without and with autocorrelation, respectively. An impact rate of 0.1 would require heavy reductions in both commercial and recreational fishing opportunity south of Point Arena, but would permit some *de minimis* fishery impacts, allowing some access to abundant target stocks. Impact rates below 0.1 would dramatically reduce fishing opportunity relative to what has been typical levels under the current consultation standard.

In conclusion, among the range of control rules considered, control rule 3 provided conservation benefits relative to the control rules that approximated historical and current rates of fishery impacts and resulted in similar levels of conservation benefits as control rules 4-5. However, control rule 3 would have resulted in the lowest fishery cost among the set of control rules 3-5, primarily because it allowed for some *de minimis* fishery impacts to occur. Our results suggested that the population size risk incurred by the *de minimis* fishery impact rate under control rule 3 was negligible, but the reduction in fishery cost relative to control rules 4-5 was substantial.

Table 1. Model parameters and values.

Parameter	Description	Dimensions	Value
A	max. age		4
$F_{(\text{natural})1}$	initial number of natural-origin females spawning in the river		1475
g	number of eggs per female spawner		4900
θ_1	max. egg-to-fry survival rate		0.301
θ_2	strength of density dependence		1.38e-08
CV_J	CV of recruitment stochasticity		0.105
n_a, μ_{n_2}	natural survival rate	$a \in \{2, \ldots, A\}$	$n_2 = \mu_{n_2} = 0.00370$ $n_{3+} = 0.8$
CV_{n_2}	CV of juvenile survival rate		0.836
ρ_{n_2}	autocorrelation in juvenile survival rate		0, 0.5
h	hatchery-origin juvenile survival rate		2.06
m_{sa}	maturation rate	$s \in \{\text{male}, \text{female}\}$ $a \in \{2, \ldots, A-1\}$	$m_{(\text{male})2} = 0.139$ $m_{(\text{male})3} = 0.903$ $m_{(\text{female})2} = 0.000628$ $m_{(\text{female})3} = 0.960$
B_0^{sex}, B^{target}	broodstock	$t \in \{1, 2, \ldots, T-1\}$	50
λ^{P}	pre-simulation rate of change in hatchery production		1
v_a	relative impact rate	$a \in \{3, \ldots, A\}$	$v_3 = 1$ $v_4 = 2$
CV_c	CV of realized impact rate		0.315
$i_{3\,0}$	pre-simulation age-3 impact rate		0.2
$CV_{\hat{N}^{\text{spawn}}}$	CV of observation error		0.08

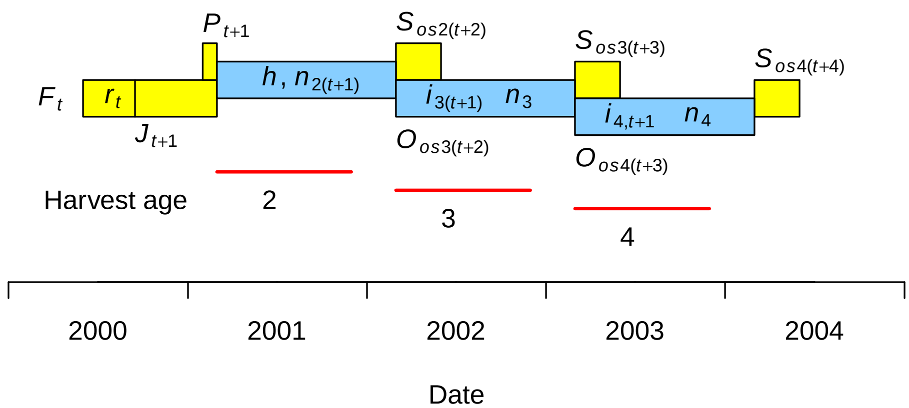

Figure 1. Model life history of Sacramento River winter Chinook salmon. This example timeline is for fish whose brood year is 2000 (offspring of female spawners in 2000, F_t). Yellow represents freshwater phases and blue represents marine phases. Model ages correspond to 1 March. Spawners are assumed to enter the river on the last day of February and to spawn on 1 June. Numbers of fish are symbolized with capital letters (J_t = natural-origin fry, P_t = hatchery-origin pre-smolts, O_{osat} = fish in the ocean, and S_{osat} = spawners). Natural survival rates (r_t = egg to fry, h = hatchery-origin pre-smolt outmigration and first year in ocean, n_{2t} = natural-origin fry outmigration and first year in ocean, n_a = ages 3 and older) and fishery impact rates (i_{at}) are symbolized with lower case letters. Red lines indicate the time period of the marine fisheries (1 March - 30 November). Note that harvest age is equivalent to the age at which the fish could spawn next. The removal of natural-origin spawners for hatchery broodstock is not represented in this figure.

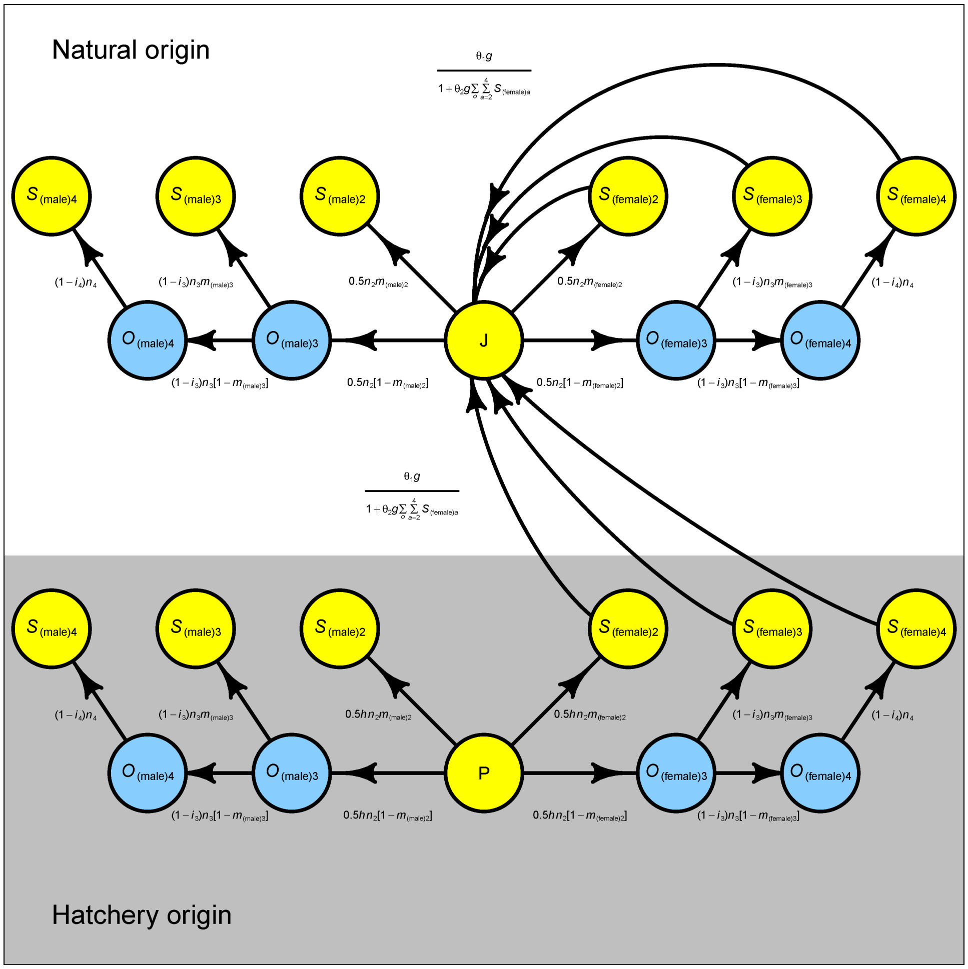

Figure 2. Model life cycle of Sacramento River winter Chinook salmon. Yellow represents freshwater phases and blue represents marine phases. The grey shaded box indicates hatchery-origin fish as distinct from natural-origin fish. Circles represent the numbers of fish in each state (J = natural-origin fry, P = hatchery-origin pre-smolts, O_{sa} = fish in the ocean, and S_{sa} = spawners). The indexing of states by origin, o, has been suppressed in this figure. Transitions between states include fishery impact rates (i_a) and natural survival (n_a, h), maturation (m_{sa}) and reproductive rates. The removal of natural-origin spawners for hatchery broodstock and subsequent hatchery production is not represented in this figure.

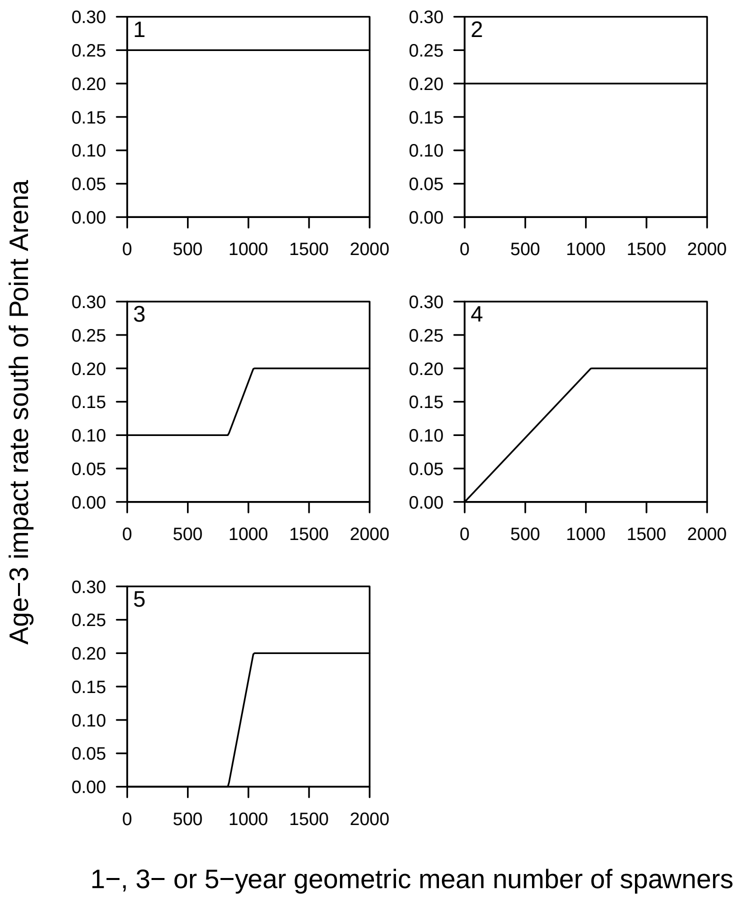

Figure 3. Impact control rules 1-5. The x-axis is the mean estimated total male and female natural- and hatchery-origin spawner escapement ($\bar{N}_{tT}^{\mathrm{spawn}}$).

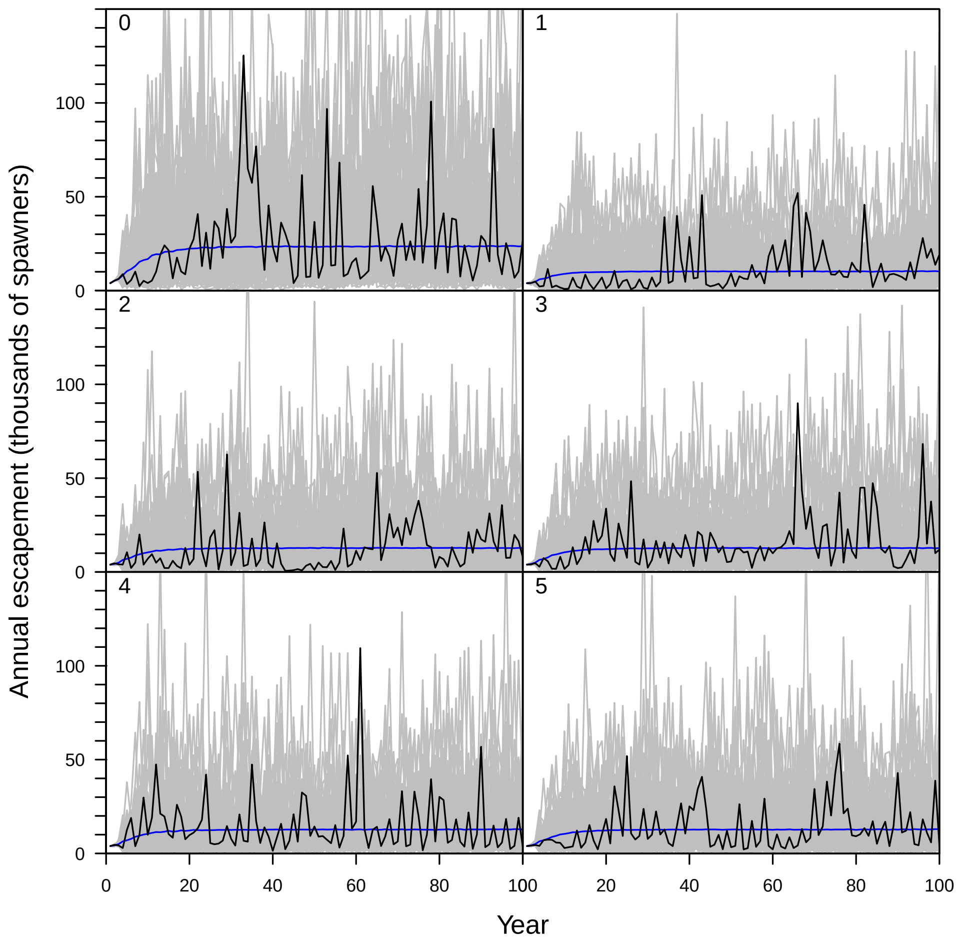

Figure 4. Simulated time-series of escapement over a 100-year period. The 3-year geometric mean estimated escapement was input to the control rule in any given year (Scenario b) and there was no temporal autocorrelation in juvenile survival rates. Panels 0-5 represent control rules 0-5 as described in the text. The grey lines represent 100 simulations for each control rule. The blue lines represent the mean escapement in each year across 20000 simulations. The black lines represent a single, randomly chosen simulation.

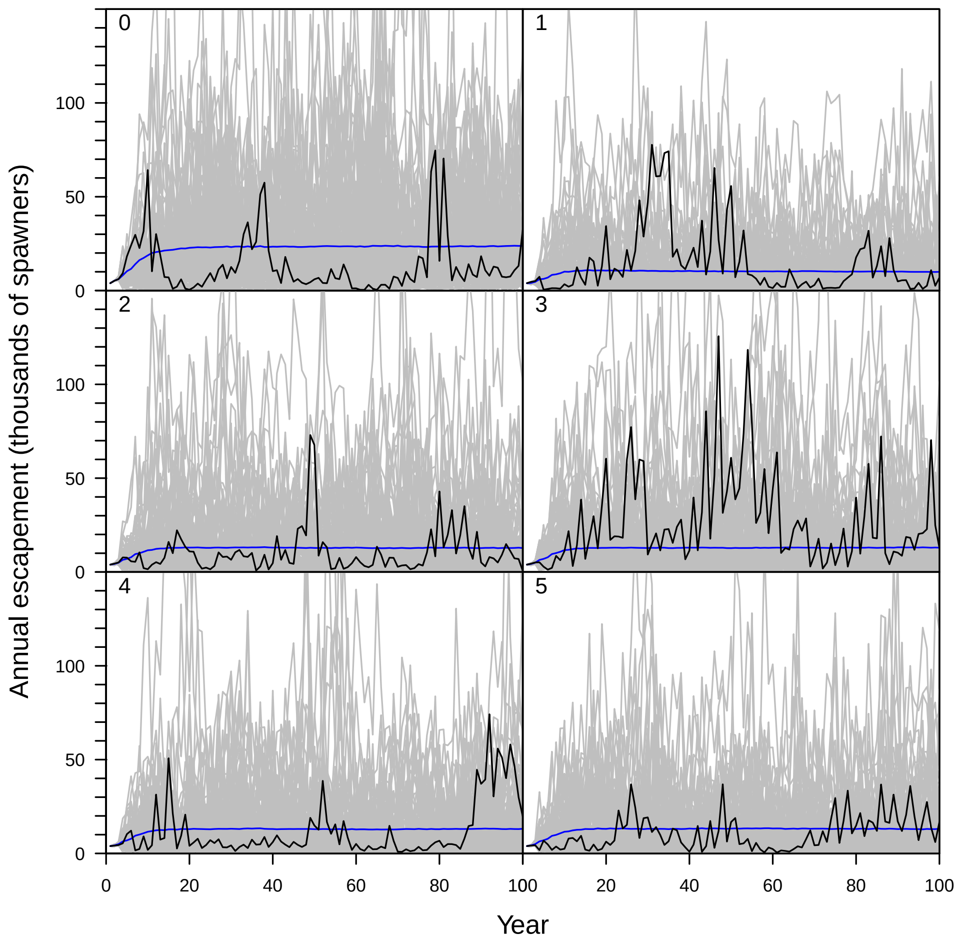

Figure 5. Simulated time-series of escapement over a 100-year period. The 3-year geometric mean estimated escapement was input to the control rule in any given year (Scenario b) and we assumed a temporal autocorrelation of 0.5 in juvenile survival rates. Panels 0-5 represent control rules 0-5 as described in the text. The grey lines represent 100 simulations for each control rule. The blue lines represent the mean escapement in each year across 20000 simulations. The black lines represent a single, randomly chosen simulation.

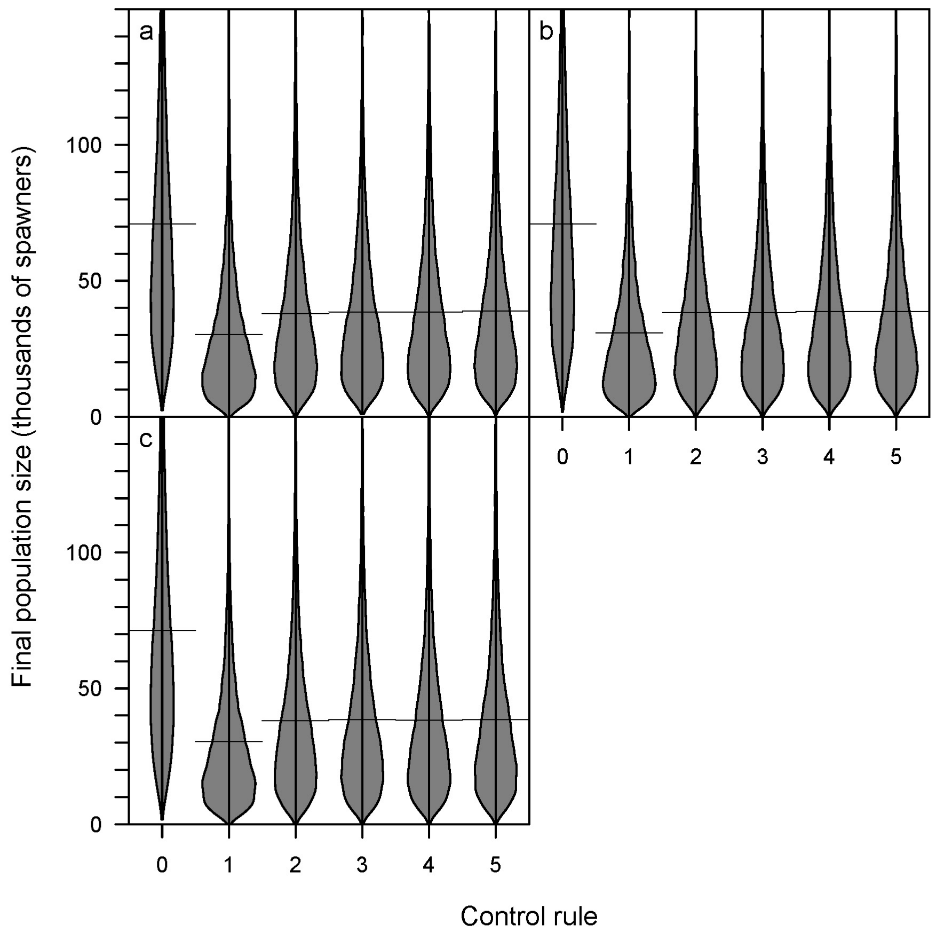

Figure 6. Distribution of final population size in 20000 100-year simulations for each of three T scenarios (a-c) and 6 control rules (0-5) assuming no temporal autocorrelation in juvenile survival rates. Final population size was calculated as the sum of escapements during the last three years of a simulation. Scenarios and control rules are described in the text. The horizontal lines represent the means of the distributions.

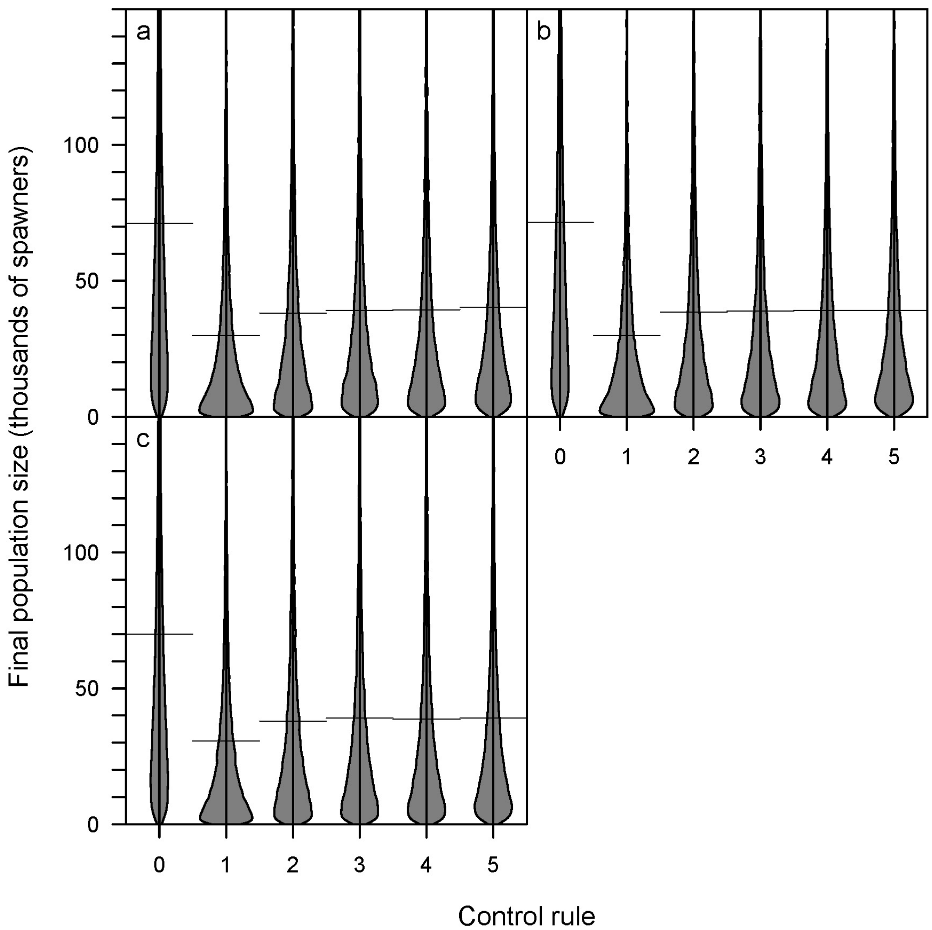

Figure 7. Distribution of final population size in 20000 100-year simulations for each of three T scenarios (a-c) and 6 control rules (0-5) assuming a temporal autocorrelation of 0.5 in juvenile survival rates. Final population size was calculated as the sum of escapements during the last three years of a simulation. Scenarios and control rules are described in the text. The horizontal lines represent the means of the distributions.

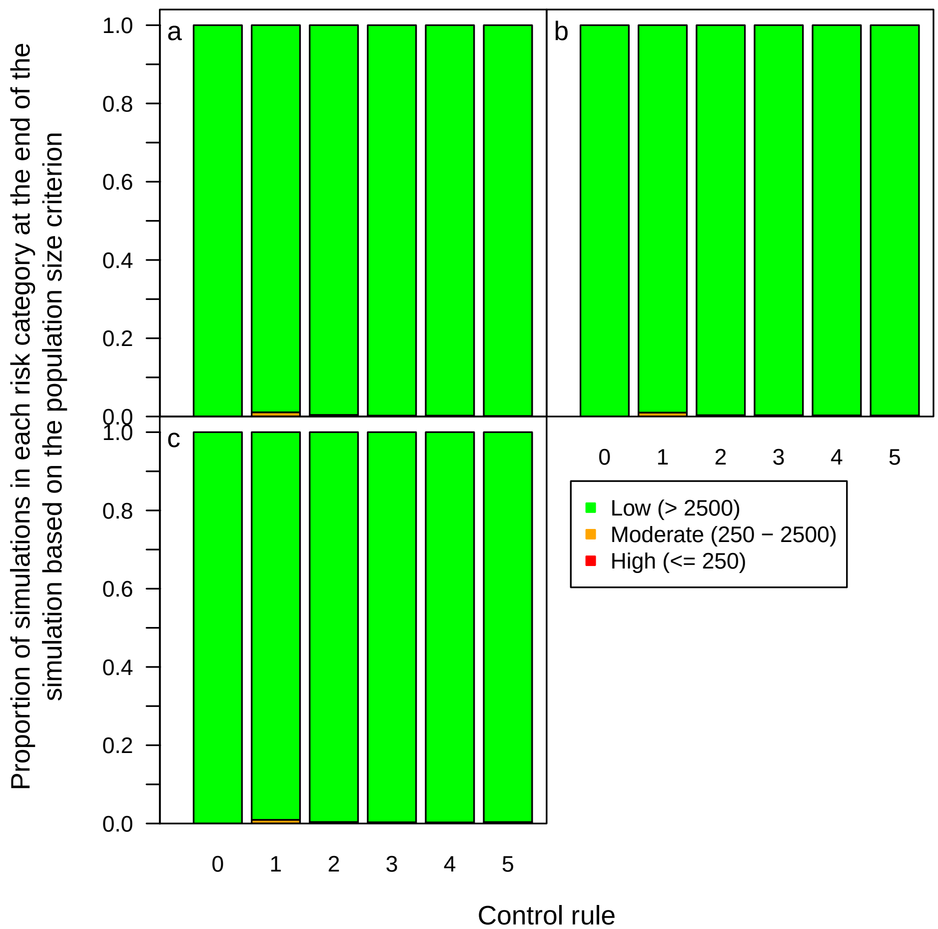

Figure 8. Proportions of 20000 100-year simulations whose final population sizes met each of three extinction risk categories based on 'population size' defined by Lindley *et al.* (2007). We assumed no temporal autocorrelation in juvenile survival rates. Final population size was calculated as the sum of escapements during the last three years of a simulation. Results are shown for each of three T scenarios (a-c) and 6 control rules (0-5), which are described in the text.

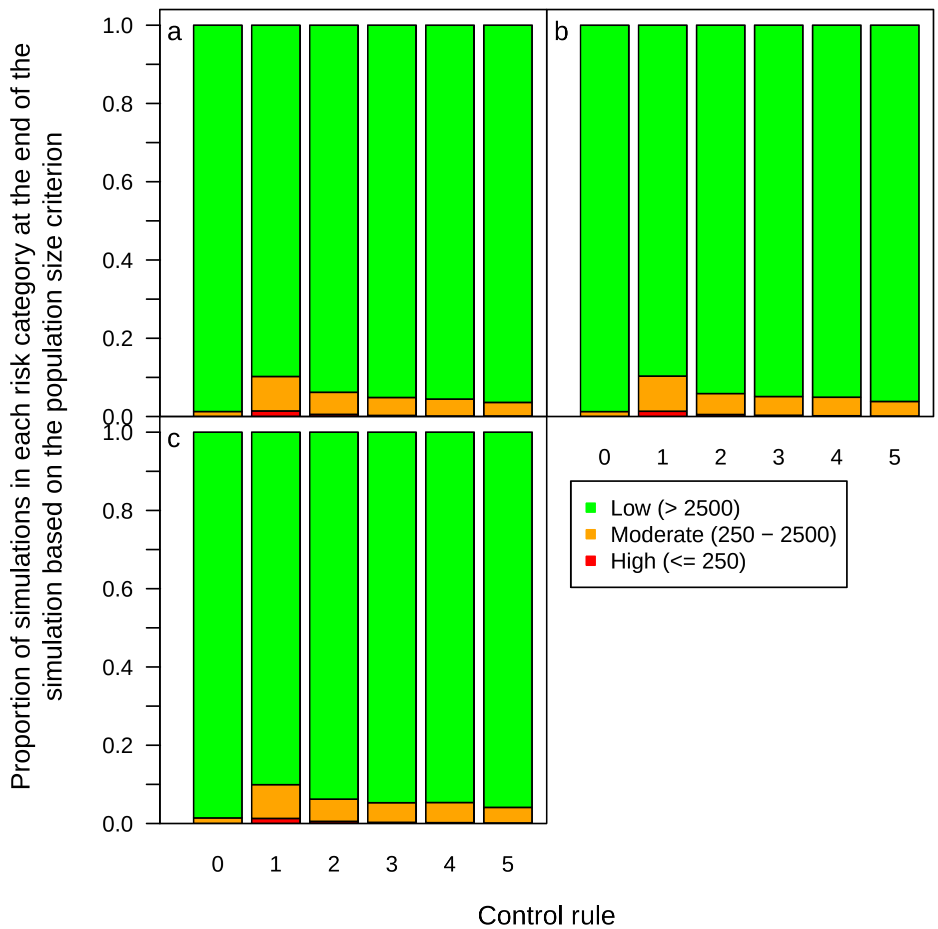

Figure 9. Proportions of 20000 100-year simulations whose final population sizes met each of three extinction risk categories based on 'population size' defined by Lindley *et al.* (2007). We assumed a temporal autocorrelation of 0.5 in juvenile survival rates. Final population size was calculated as the sum of escapements during the last three years of a simulation. Results are shown for each of three T scenarios (a-c) and 6 control rules (0-5), which are described in the text.

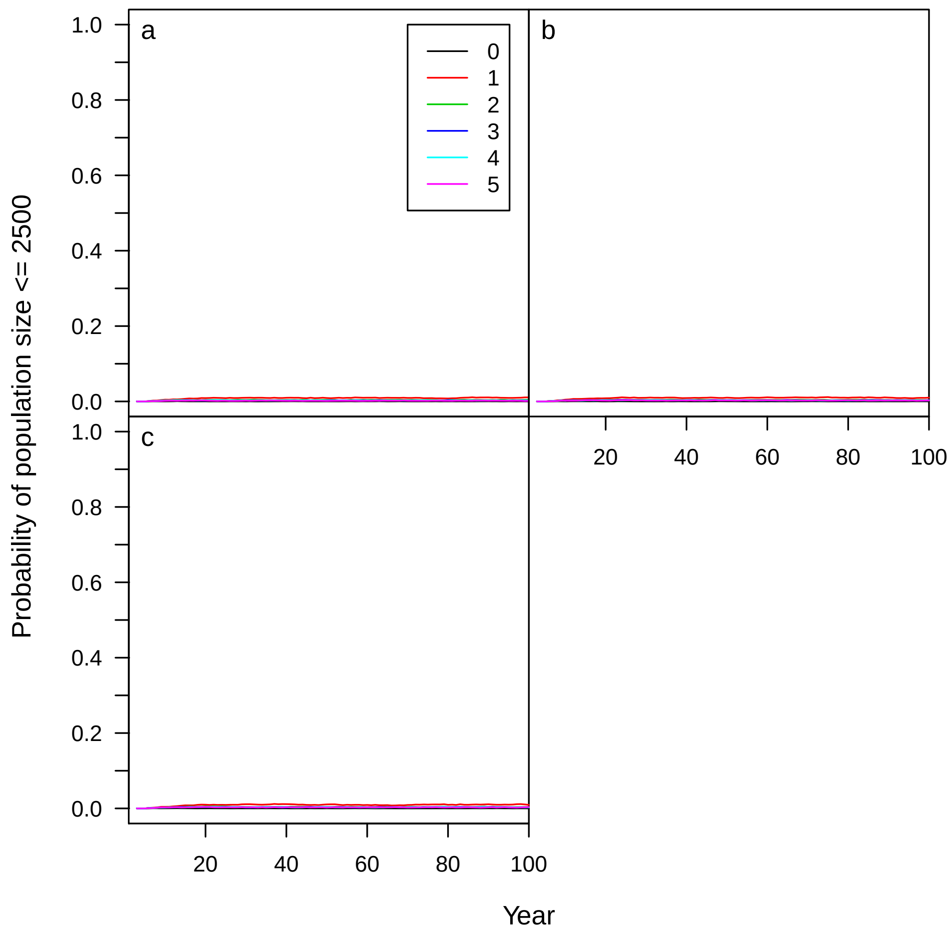

Figure 10. Proportion of 20000 simulations in which population size was $\leq$ 2500 spawners over the course of a 100-year simulation period. We assumed no temporal autocorrelation in juvenile survival rates. Population size was calculated as the sum of the escapements in the previous 3 years. Results are shown for each of three T scenarios (a-c) and 6 control rules (0-5), which are described in the text.

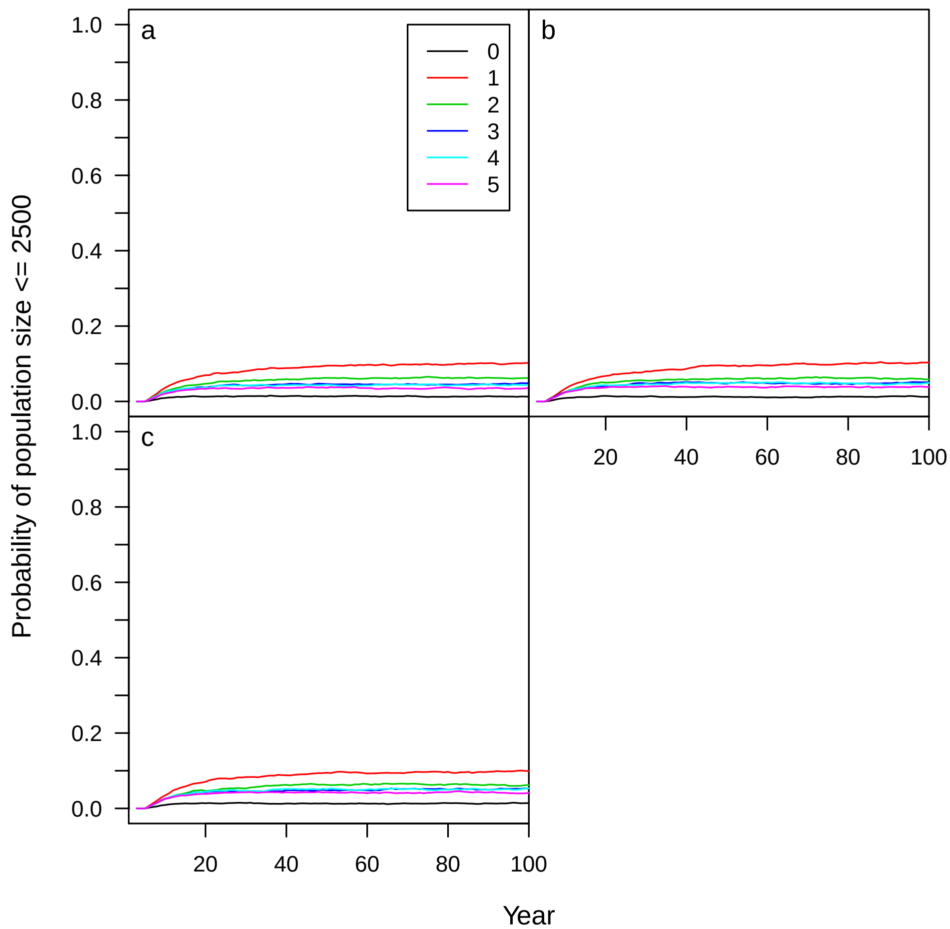

Figure 11. Proportion of 20000 simulations in which population size was $\leq$ 2500 spawners over the course of a 100-year simulation period. We assumed a temporal autocorrelation of 0.5 in juvenile survival rates. Population size was calculated as the sum of the escapements in the previous 3 years. Results are shown for each of three T scenarios (a-c) and 6 control rules (0-5), which are described in the text.

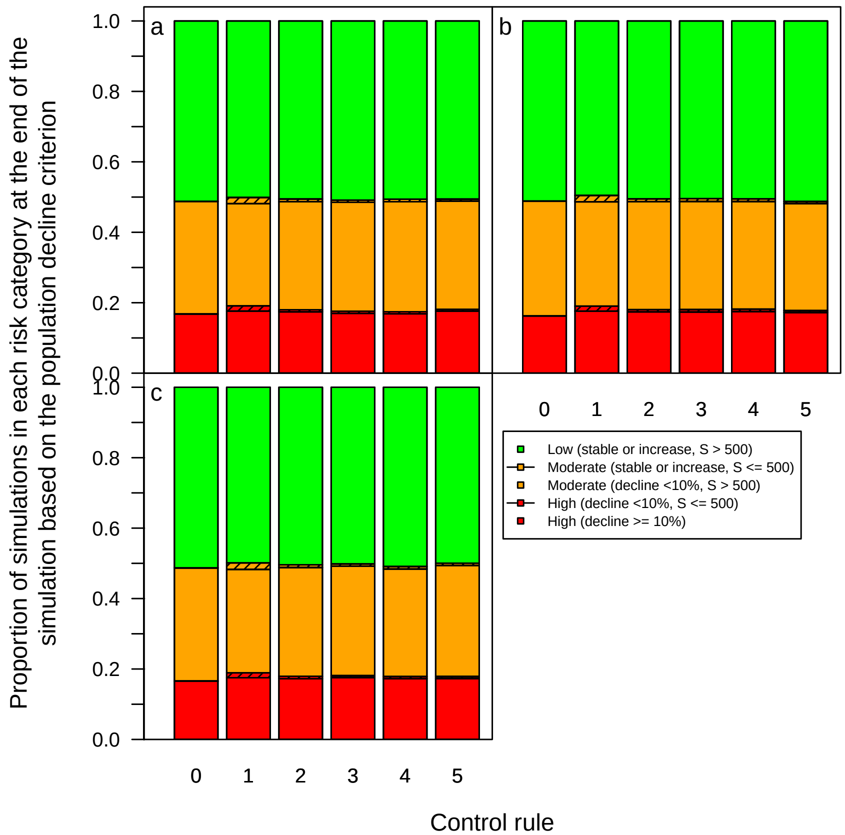

Figure 12. Proportions of 20000 100-year simulations whose final six escapements (S) and population trends met each of three extinction risk categories based on 'population decline' defined by Lindley *et al.* (2007). We assumed no temporal autocorrelation in juvenile survival rates. S$\leq$ 500 indicates that there was at least one escapement during the final six years (two generations) of the simulation that was $\leq$ 500 spawners, while S$>$ 500 indicates that all of the last six escapements were more than 500 spawners. Population trend was calculated as the slope of the linear regression of the log of the final 10 escapements on year (Lindley *et al.*, 2007). We assumed that a slope $<= \log(0.9)$ indicated a decline $\geq$ 10% and that a slope $> \log(0.999)$ indicated a stable or increasing trend. Trend was not calculated if there was one or more zero escapements during the final 10 years so in some cases the total proportions do not sum to 1. However, zero escapements were rare in the simulations shown here so the sum of the proportions was always very close to one. Results are shown for each of three T scenarios (a-c) and 6 control rules (0-5), which are described in the text.

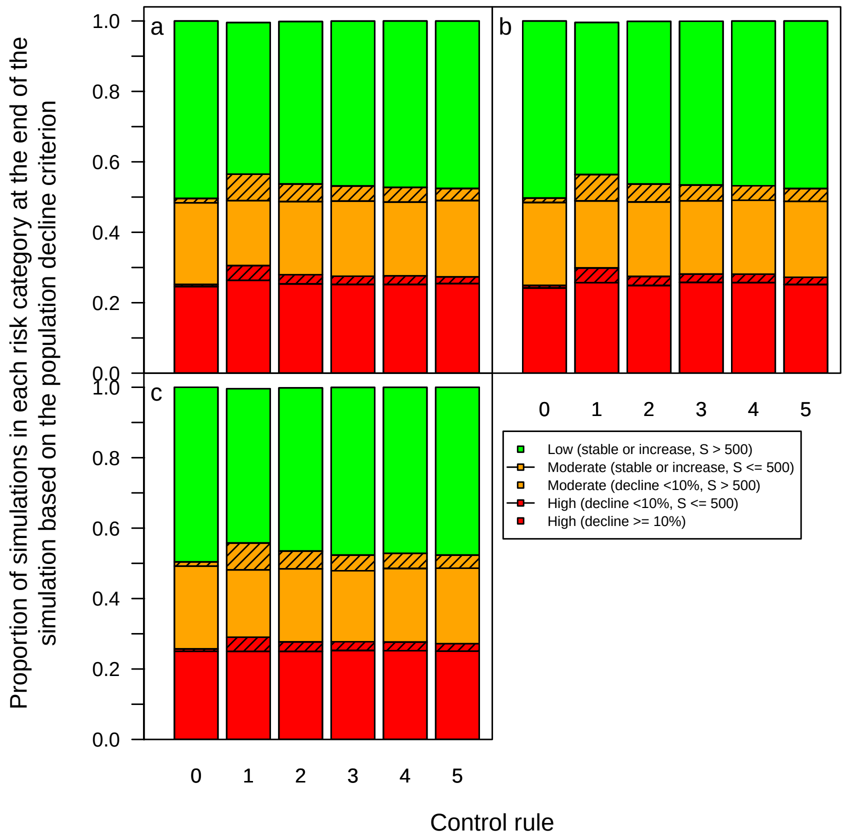

Figure 13. Proportions of 20000 100-year simulations whose final six escapements (S) and population trends met each of three extinction risk categories based on 'population decline' defined by Lindley *et al.* (2007). We assumed a temporal autocorrelation of 0.5 in juvenile survival rates. S$\leq$ 500 indicates that there was at least one escapement during the final six years (two generations) of the simulation that was $\leq$ 500 spawners, while S$>$ 500 indicates that all of the last six escapements were more than 500 spawners. Population trend was calculated as the slope of the linear regression of the log of the final 10 escapements on year (Lindley *et al.*, 2007). We assumed that a slope $<= \log(0.9)$ indicated a decline $\geq$ 10% and that a slope $> \log(0.999)$ indicated a stable or increasing trend. Trend was not calculated if there was one or more zero escapements during the final 10 years so in some cases the total proportions do not sum to 1. However, zero escapements were rare in the simulations shown here so the sum of the proportions was always very close to one. Results are shown for each of three T scenarios (a-c) and 6 control rules (0-5), which are described in the text.

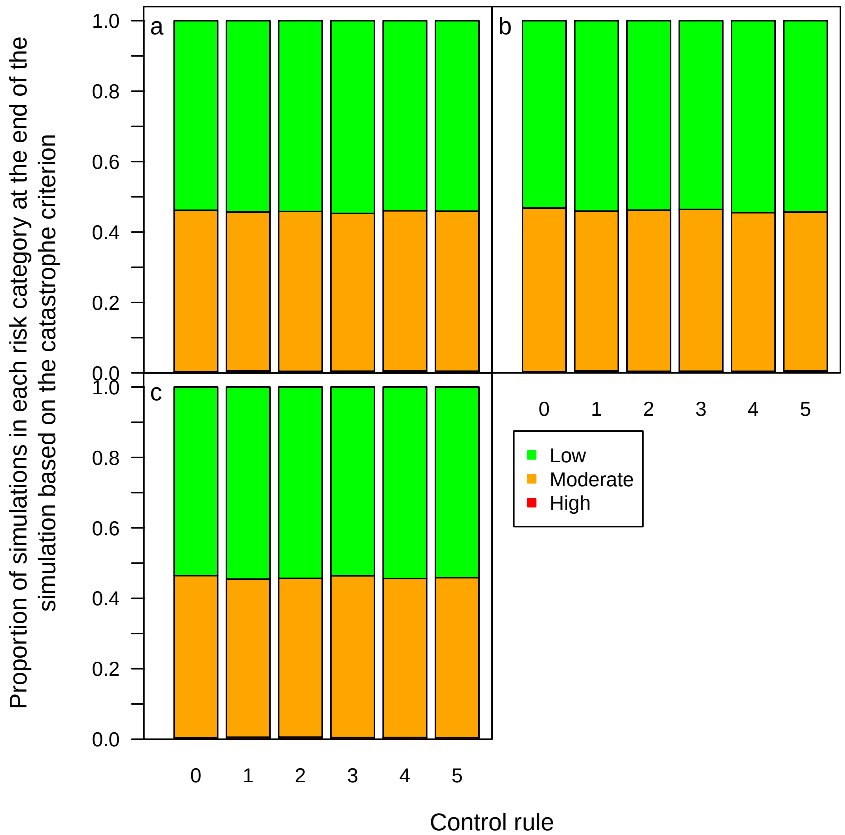

Figure 14. Proportions of 20000 100-year simulations whose population changes during the last 10 years met each of three extinction risk categories based on 'catastrophe' defined by Lindley *et al.* (2007). We assumed no temporal autocorrelation in juvenile survival rates. Population changes were calculated as proportional differences between pairs of population sizes three years (one generation) apart (Lindley *et al.*, 2007). Thus, during the last 10 years of each simulation there were 7 population changes. High risk was assigned to simulations in which there was at least one population decline $\geq 90\%$. Moderate risk was assigned to simulations in which there was at least one population decline $\geq 50\%$, but none $\geq 90\%$. Simulations that did not meet the conditions for high or moderate risk were assigned low risk. Population changes were ignored if the population went extinct. Results are shown for each of three T scenarios (a-c) and 6 control rules (0-5), which are described in the text.

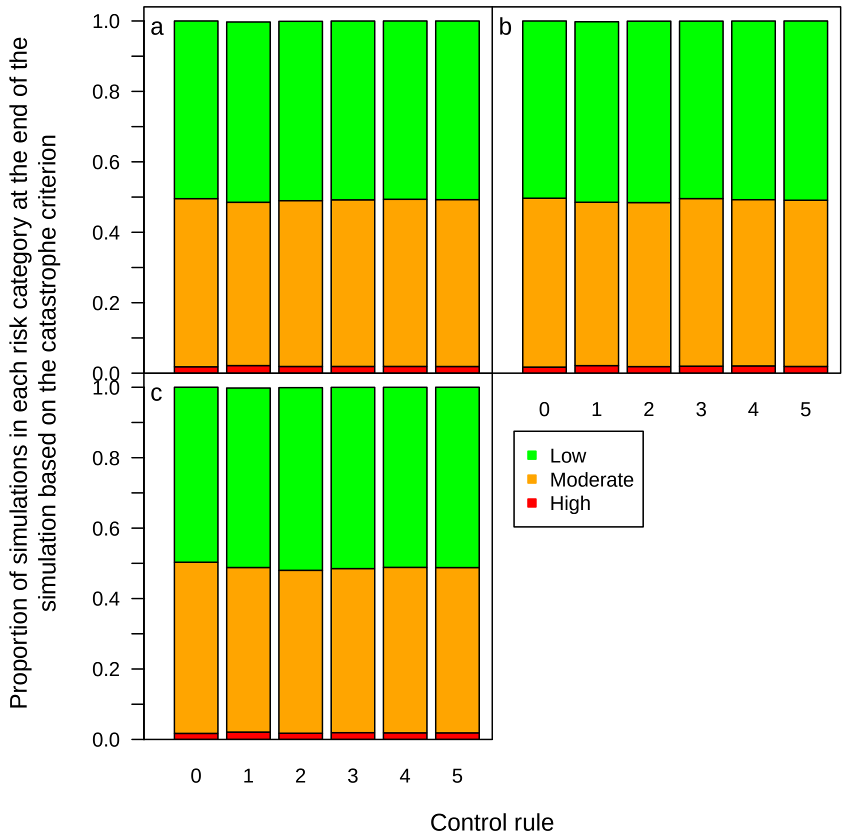

Figure 15. Proportions of 20000 100-year simulations whose population changes during the last 10 years met each of three extinction risk categories based on 'catastrophe' defined by Lindley *et al.* (2007). We assumed a temporal autocorrelation of 0.5 in juvenile survival rates. Population changes were calculated as proportional differences between pairs of population sizes three years (one generation) apart (Lindley *et al.*, 2007). Thus, during the last 10 years of each simulation there were 7 population changes. High risk was assigned to simulations in which there was at least one population decline $\geq 90\%$. Moderate risk was assigned to simulations in which there was at least one population decline $\geq 50\%$, but none $\geq 90\%$. Simulations that did not meet the conditions for high or moderate risk were assigned low risk. Population changes were ignored if the population went extinct. Results are shown for each of three T scenarios (a-c) and 6 control rules (0-5), which are described in the text.

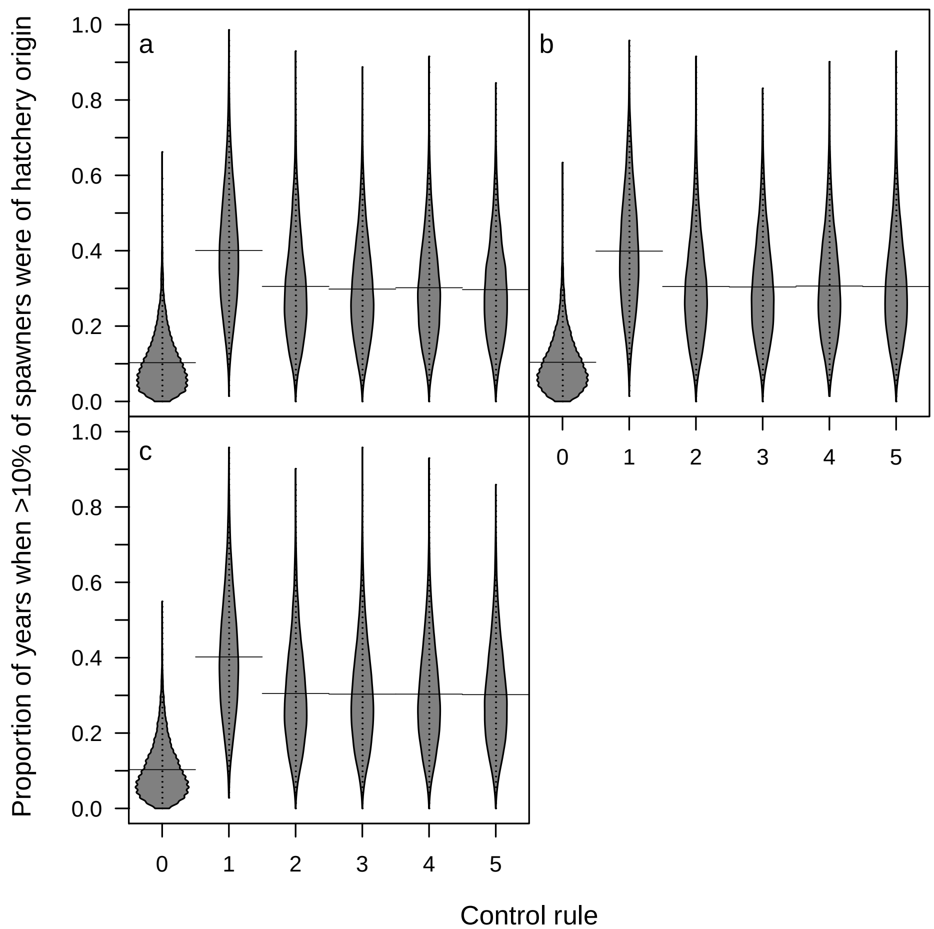

Figure 16. Distribution of the proportion of years during which $> 10\%$ of spawners were of hatchery origin across 20000 simulations. Proportions were calculated based on years 30-100 of 100-year simulations; the first 29 years were not included to ignore transient changes in spawner composition early in the simulation as a result of initial conditions. We assumed no temporal autocorrelation in juvenile survival rates. Results are shown for each of three T scenarios (a-c) and 6 control rules (0-5), which are described in the text. The horizontal lines represent the means of the distributions.

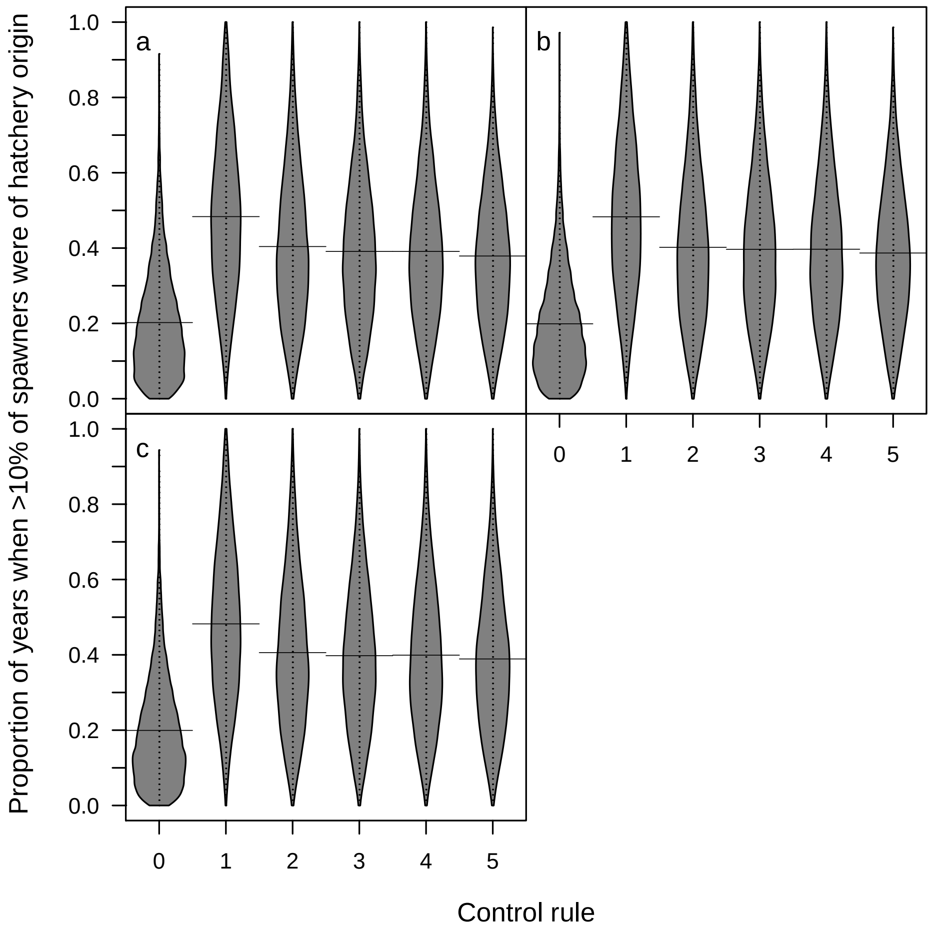

Figure 17. Distribution of the proportion of years during which > 10% of spawners were of hatchery origin across 20000 simulations. Proportions were calculated based on years 30-100 of 100-year simulations; the first 29 years were not included to ignore transient changes in spawner composition early in the simulation as a result of initial conditions. We assumed a temporal autocorrelation of 0.5 in juvenile survival rates. Results are shown for each of three T scenarios (a-c) and 6 control rules (0-5), which are described in the text. The horizontal lines represent the means of the distributions.

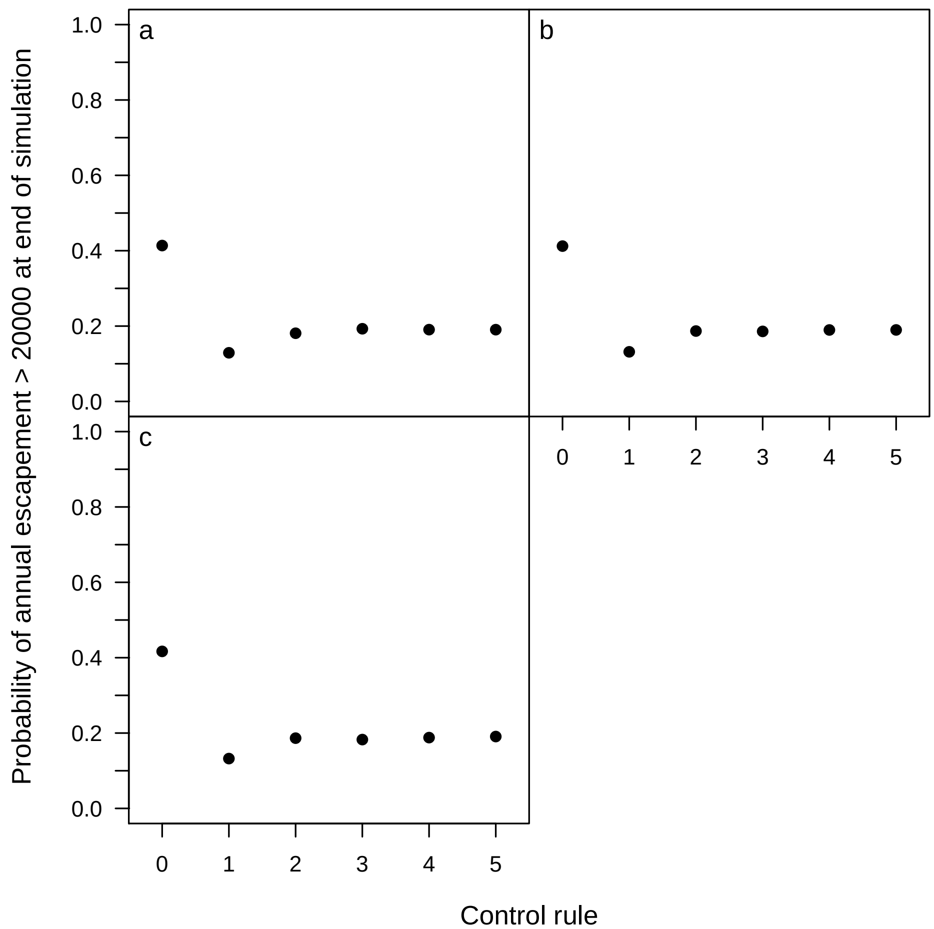

Figure 18. Proportion of 20000 100-year simulations whose final annual escapement was > 20000 spawners. We assumed no temporal autocorrelation in juvenile survival rates. Results are shown for each of three T scenarios (a-c) and 6 control rules (0-5), which are described in the text.

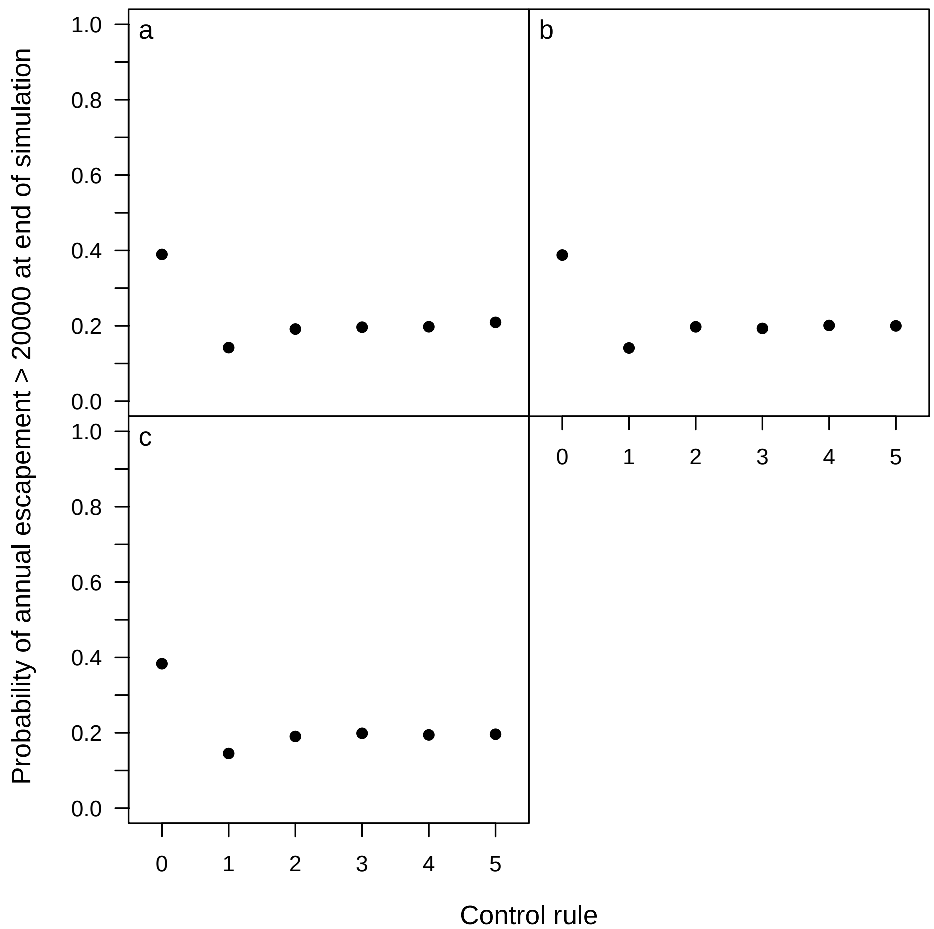

Figure 19. Proportion of 20000 100-year simulations whose final annual escapement was > 20000 spawners. We assumed a temporal autocorrelation of 0.5 in juvenile survival rates. Results are shown for each of three T scenarios (a-c) and 6 control rules (0-5), which are described in the text.

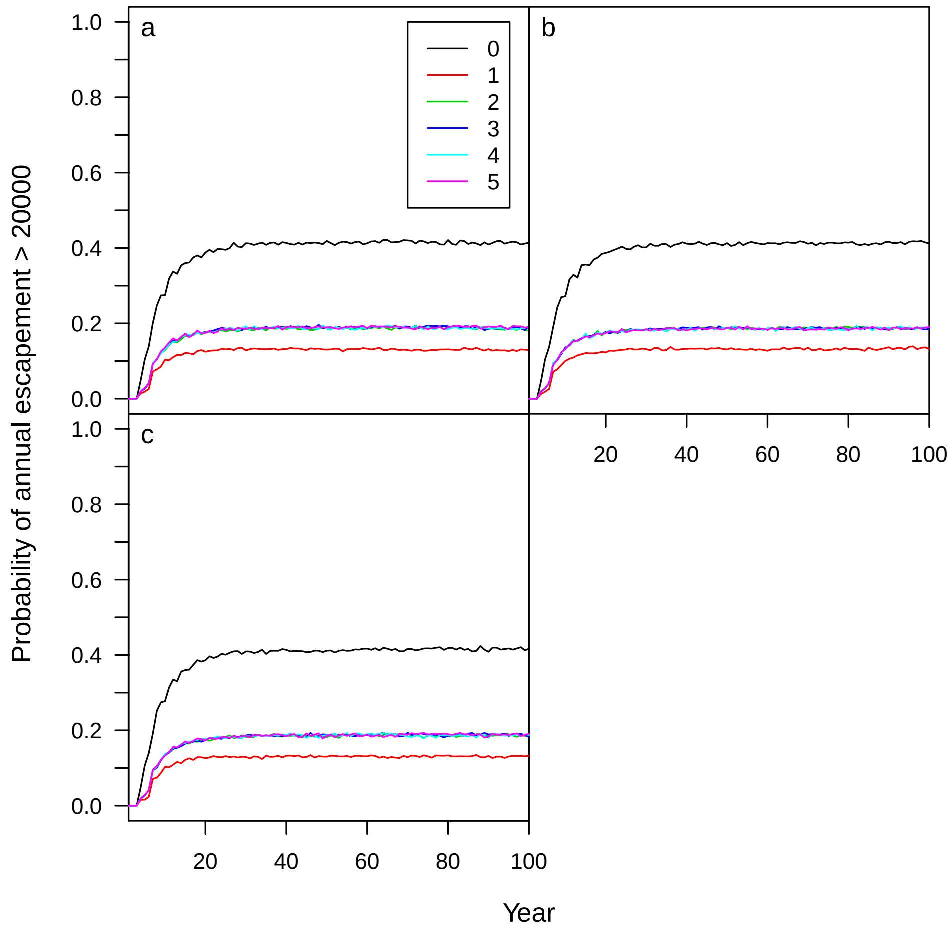

Figure 20. Proportion of 20000 simulations in which annual escapement was > 20000 spawners over the course of a 100-year simulation period. We assumed no temporal autocorrelation in juvenile survival rates. Results are shown for each of three T scenarios (a-c) and 6 control rules (0-5), which are described in the text.

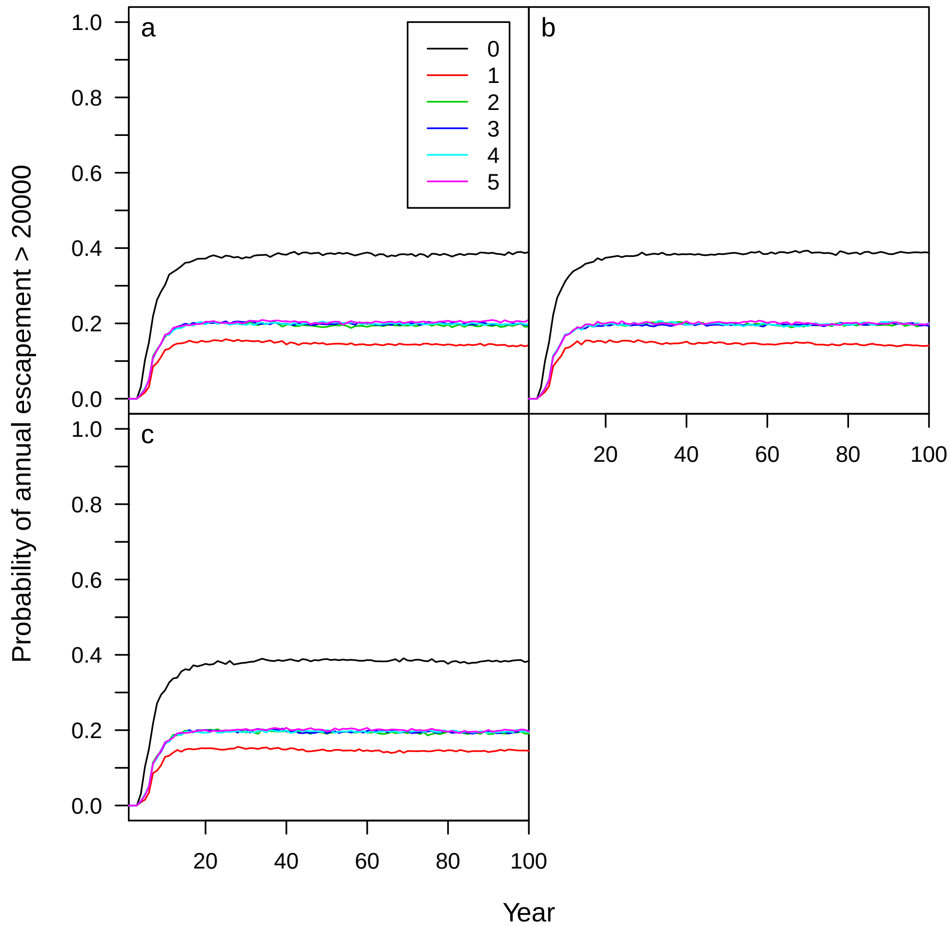

Figure 21. Proportion of 20000 simulations in which annual escapement was > 20000 spawners over the course of a 100-year simulation period. We assumed a temporal autocorrelation of 0.5 in juvenile survival rates. Results are shown for each of three T scenarios (a-c) and 6 control rules (0-5), which are described in the text.

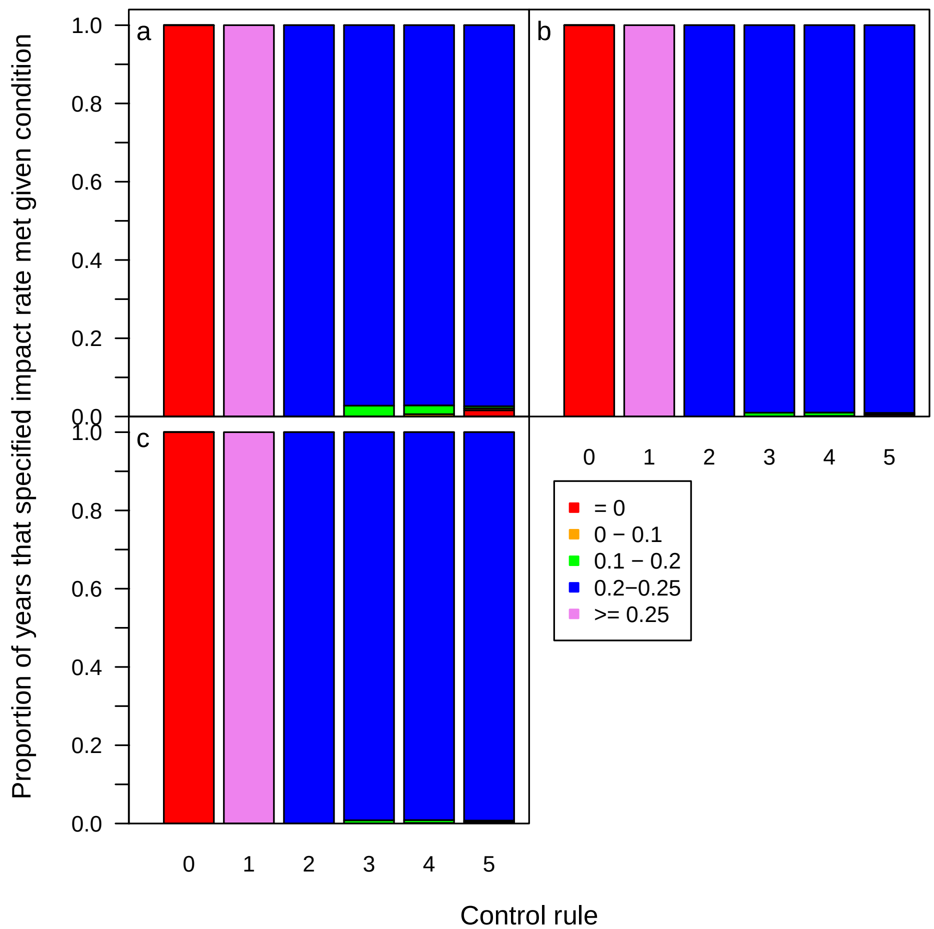

Figure 22. Proportions of annual impact rates specified by the control rule that met each of four categories across 20000 100-year simulations. Impact rates were only calculated for years 30-99 (i.e., 1400000 impact rates are represented by each vertical bar). The first 29 years were not included to ignore transient changes in population size early in the simulation as a result of initial conditions. We assumed no temporal autocorrelation in juvenile survival rates. Results are shown for each of three T scenarios (a-c) and 6 control rules (0-5), which are described in the text.

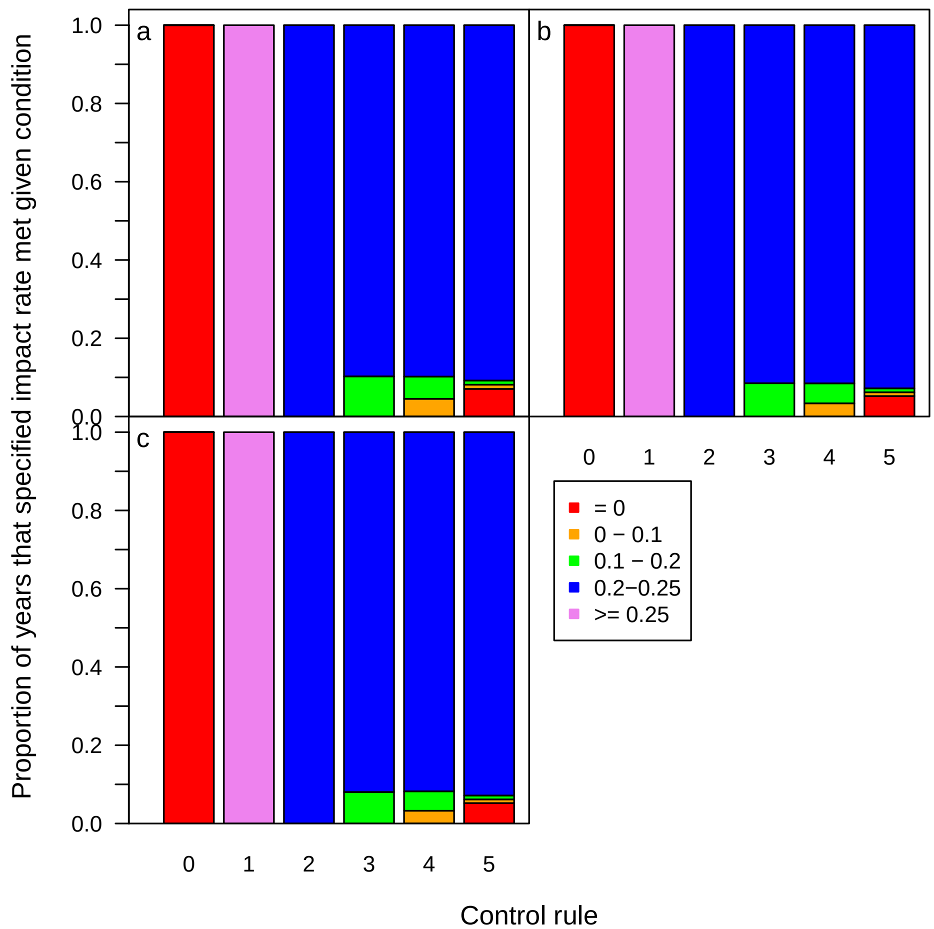

Figure 23. Proportions of annual impact rates specified by the control rule that met each of four categories across 20000 100-year simulations. Impact rates were only calculated for years 30-99 (i.e., 1400000 impact rates are represented by each vertical bar). The first 29 years were not included to ignore transient changes in population size early in the simulation as a result of initial conditions. We assumed a temporal autocorrelation of 0.5 in juvenile survival rates. Results are shown for each of three T scenarios (a-c) and 6 control rules (0-5), which are described in the text.

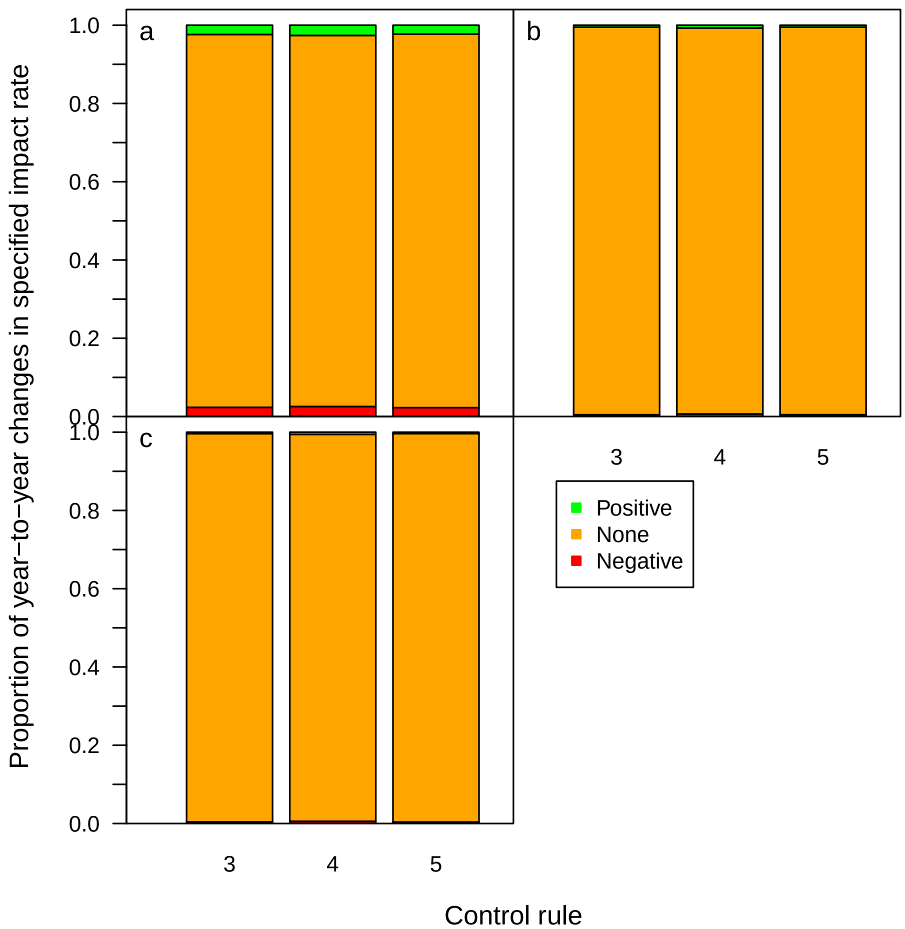

Figure 24. Proportions of year-to-year changes in the impact rate specified by the control rule that fell into each of three categories: negative, no change, and positive. Results are shown for years 30-99 of 20000 100-year simulations. The first 29 years of each simulation were not included to ignore transient changes in dynamics early in the simulation as a result of initial conditions. We assumed no temporal autocorrelation in juvenile survival rates. Results are shown for each of three T scenarios (a-c) and 3 control rules (3-5), which are described in the text.

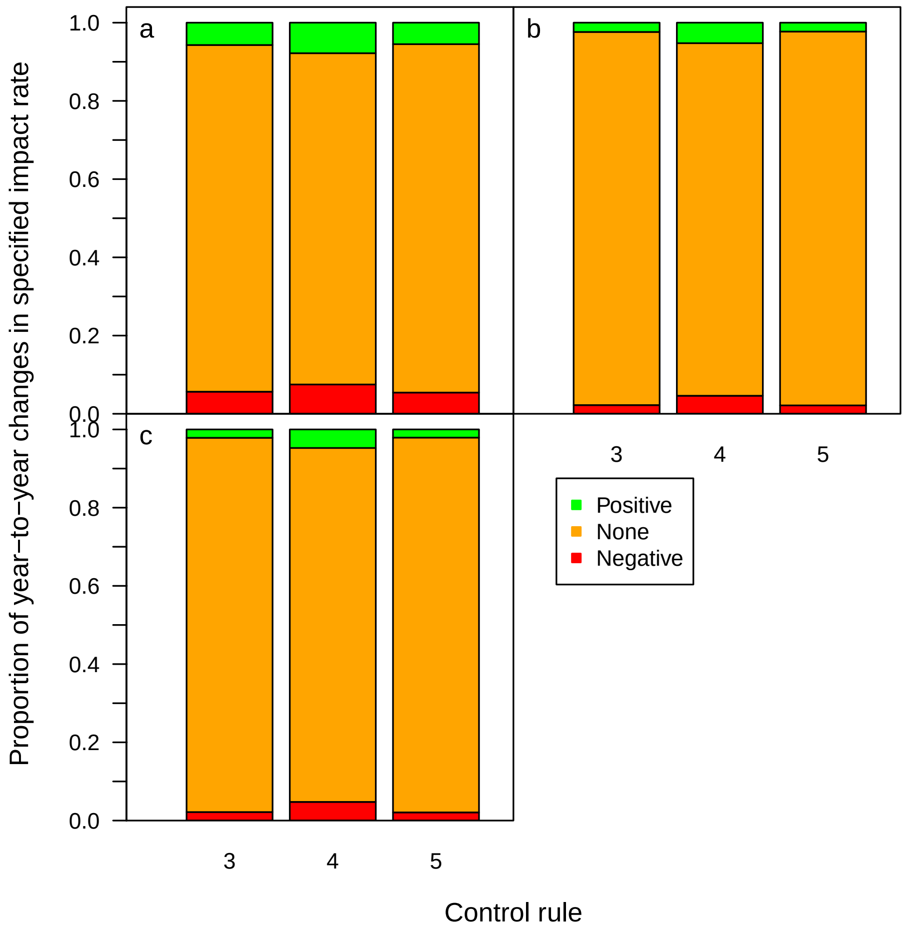

Figure 25. Proportions of year-to-year changes in the impact rate specified by the control rule that fell into each of three categories: negative, no change, and positive. Results are shown for years 30-99 of 20000 100-year simulations. The first 29 years of each simulation were not included to ignore transient changes in dynamics early in the simulation as a result of initial conditions. We assumed a temporal autocorrelation of 0.5 in juvenile survival rates. Results are shown for each of three T scenarios (a-c) and 3 control rules (3-5), which are described in the text.

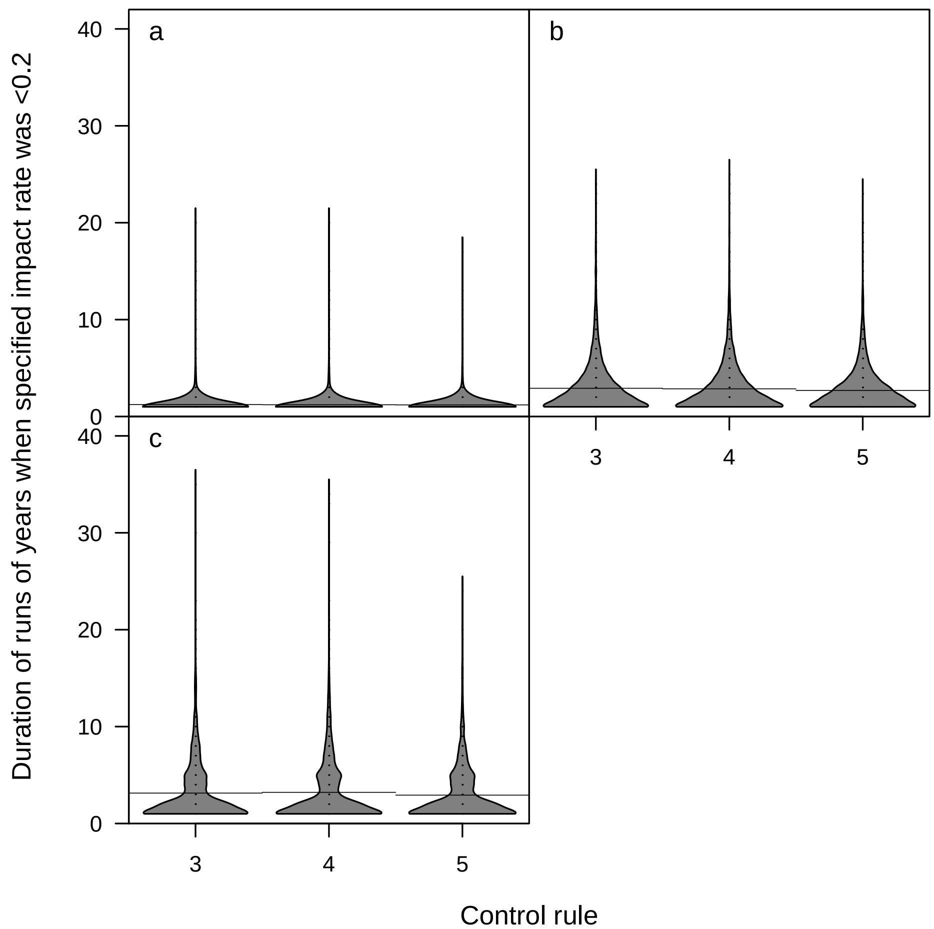

Figure 26. Distribution of lengths of runs of years when the impact rate specified by the control rule was < 0.2. Results are shown for years 30-99 of 20000 100-year simulations. The first 29 years of each simulation were not included to ignore transient changes in dynamics early in the simulation as a result of initial conditions. We assumed no temporal autocorrelation in juvenile survival rates. Results are shown for each of three T scenarios (a-c) and 3 control rules (3-5), which are described in the text. The horizontal lines represent the means of the distributions.

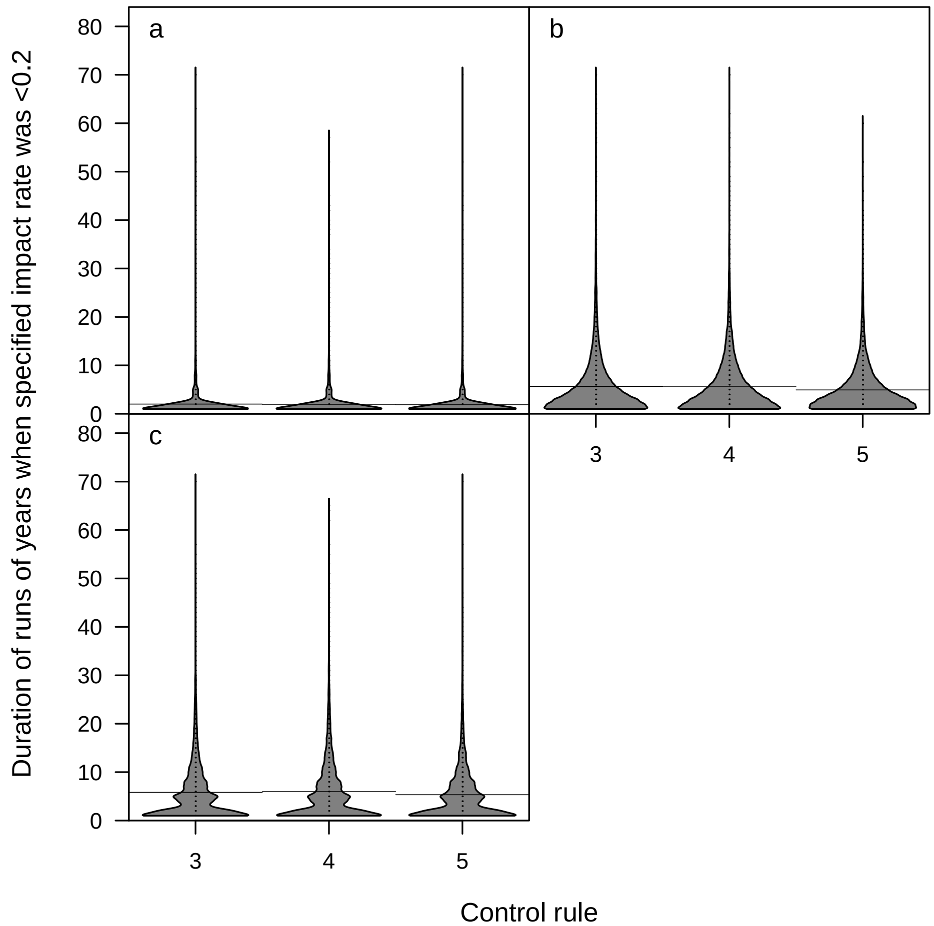

Figure 27. Distribution of lengths of runs of years when the impact rate specified by the control rule was < 0.2. Results are shown for years 30-99 of 20000 100-year simulations. The first 29 years of each simulation were not included to ignore transient changes in dynamics early in the simulation as a result of initial conditions. We assumed a temporal autocorrelation of 0.5 in juvenile survival rates. Results are shown for each of three T scenarios (a-c) and 3 control rules (3-5), which are described in the text. The horizontal lines represent the means of the distributions.

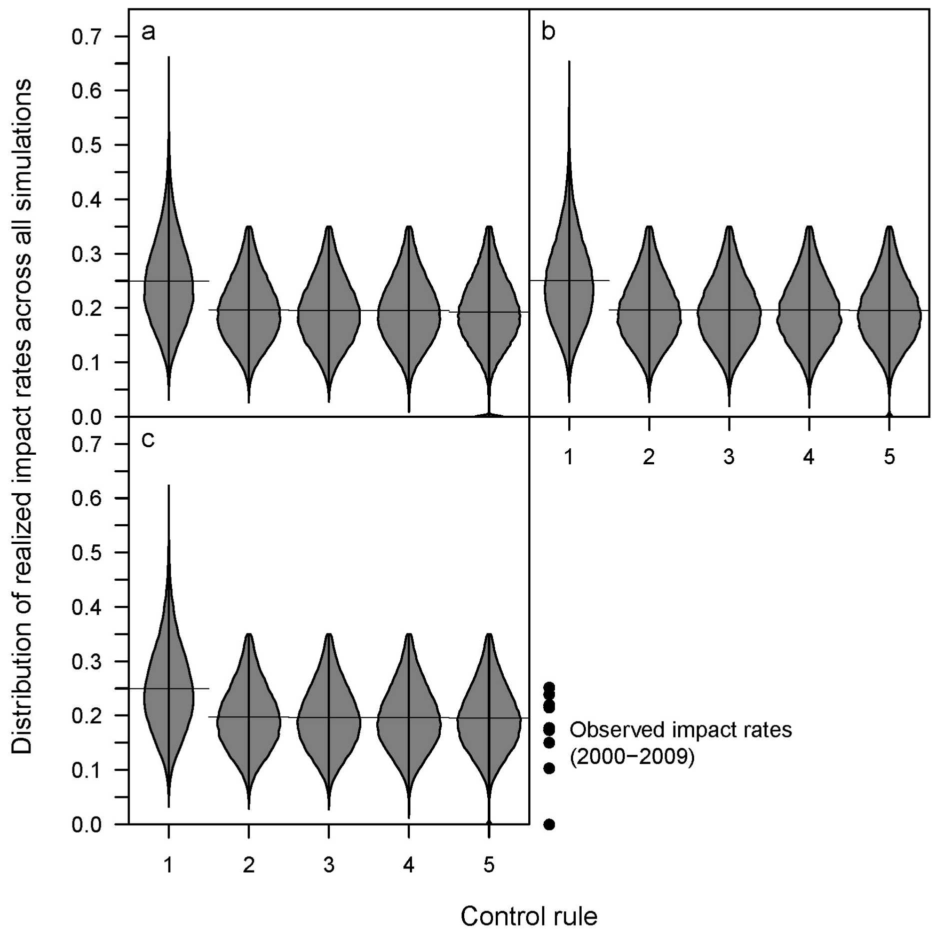

Figure 28. Distribution of realized annual age-3 impact rates south of Point Arena. Each distribution represents 100000 annual realized impact rates sampled from 20000 100-year simulations. The assumed impact rate north of point Arena ($\delta = 0.006$) was a constant addition to the realized impact rates shown here. Only impact rates from years 30-99 were plotted to exclude transient changes early in the simulation as a result of initial conditions. We assumed no temporal autocorrelation in juvenile survival rates. Results are shown for each of three T scenarios (a-c) and 5 control rules (1-5), which are described in the text. The horizontal lines represent the means of the distributions. Actual estimated impact rates for years 2000-2009 are shown as points to the right of the lower panel.

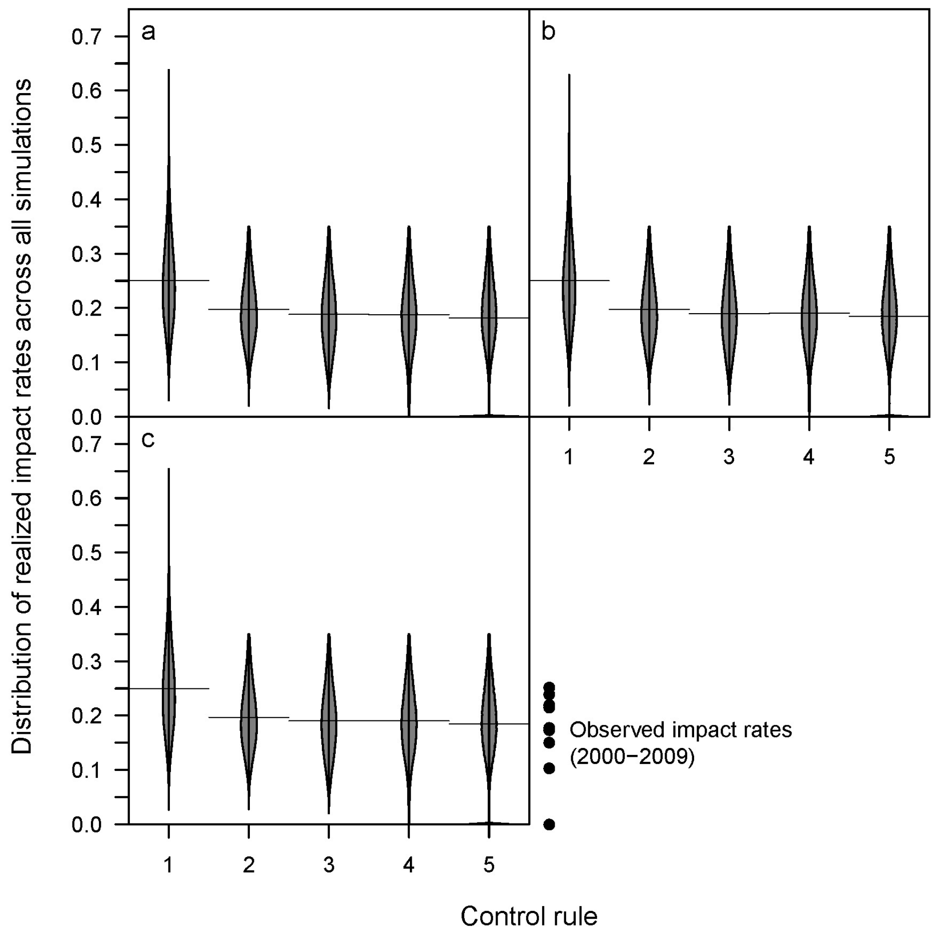

Figure 29. Distribution of realized annual age-3 impact rates south of Point Arena. Each distribution represents 100000 annual realized impact rates sampled from 20000 100-year simulations. The assumed impact rate north of point Arena ($\delta = 0.006$) was a constant addition to the realized impact rates shown here. Only impact rates from years 30-99 were plotted to exclude transient changes early in the simulation as a result of initial conditions. We assumed a temporal autocorrelation of 0.5 in juvenile survival rates. Results are shown for each of three T scenarios (a-c) and 5 control rules (1-5), which are described in the text. The horizontal lines represent the means of the distributions. Actual estimated impact rates for years 2000-2009 are shown as points to the right of the lower panel.

Appendix A Matrix equations

For the purpose of initializing our full stochastic population model we used a simplified deterministic population model represented by the following matrix equations (Leslie, 1945; Caswell, 2000). This simplified model ignored the removal of natural-origin spawners for broodstock and the contribution of hatchery-origin spawners to natural production.

$$\mathbf{N}_{t+1} = \left(\mathbf{X}_{\text{natural}} + \mathbf{Z}_{(\text{natural})t}\right) \mathbf{Y}_t \mathbf{N}_t \tag{A.1}$$

$$\mathbf{H}_{t+1} = \left(\mathbf{X}_{\text{hatchery}} + \mathbf{Z}_{(\text{hatchery})t}\right) \mathbf{Y}_t \mathbf{H}_t \tag{A.2}$$

$$\mathbf{X}_{\text{natural}} =$$

$$\begin{Bmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0.5n_2\left[1 - m_{(\text{male})2}\right] & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & n_3\left[1 - m_{(\text{male})3}\right] & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0.5n_2 m_{(\text{male})2} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & n_3 m_{(\text{male})3} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & n_4 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0.5n_2\left[1 - m_{(\text{female})2}\right] & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & n_3\left[1 - m_{(\text{female})3}\right] & 0 & 0 & 0 & 0 \\
0.5n_2 m_{(\text{female})2} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & n_3 m_{(\text{female})3} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & n_4 & 0 & 0 & 0
\end{Bmatrix} \tag{A.3}$$

$$\mathbf{X}_{\text{hatchery}} =$$

$$\begin{Bmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0.5hn_2\left[1 - m_{(\text{male})2}\right] & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & n_3\left[1 - m_{(\text{male})3}\right] & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0.5hn_2 m_{(\text{male})2} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & n_3 m_{(\text{male})3} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & n_4 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0.5hn_2\left[1 - m_{(\text{female})2}\right] & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & n_3\left[1 - m_{(\text{female})3}\right] & 0 & 0 & 0 & 0 \\
0.5hn_2 m_{(\text{female})2} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & n_3 m_{(\text{female})3} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & n_4 & 0 & 0 & 0
\end{Bmatrix} \tag{A.4}$$

$$\mathbf{Y}_t = \begin{Bmatrix} 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 1-i_{3t} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 1-i_{4t} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 1-i_{3t} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1-i_{4t} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 \end{Bmatrix} \tag{A.5}$$

$$\mathbf{Z}_{(\text{natural})t} = \begin{Bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & r_t & r_t & r_t \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{Bmatrix} \tag{A.6}$$

$$\mathbf{Z}_{(\text{hatchery})t} = \begin{Bmatrix} \lambda_t^{\text{P}} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{Bmatrix} \tag{A.7}$$

$$\mathbf{N}_t = \begin{bmatrix} J_t \\ O_{(\text{natural})(\text{male})3t} \\ O_{(\text{natural})(\text{male})4t} \\ S_{(\text{natural})(\text{male})2t} \\ S_{(\text{natural})(\text{male})3t} \\ S_{(\text{natural})(\text{male})4t} \\ O_{(\text{natural})(\text{female})3t} \\ O_{(\text{natural})(\text{female})4t} \\ S_{(\text{natural})(\text{female})2t} \\ S_{(\text{natural})(\text{female})3t} \\ S_{(\text{natural})(\text{female})4t} \end{bmatrix} \tag{A.8}$$

$$\mathbf{H}_t = \begin{bmatrix} P_t \\ O_{(\text{hatchery})(\text{male})3t} \\ O_{(\text{hatchery})(\text{male})4t} \\ S_{(\text{hatchery})(\text{male})2t} \\ S_{(\text{hatchery})(\text{male})3t} \\ S_{(\text{hatchery})(\text{male})4t} \\ O_{(\text{hatchery})(\text{female})3t} \\ O_{(\text{hatchery})(\text{female})4t} \\ S_{(\text{hatchery})(\text{female})2t} \\ S_{(\text{hatchery})(\text{female})3t} \\ S_{(\text{hatchery})(\text{female})4t} \end{bmatrix} \tag{A.9}$$

where λ_t^{P} is the rate of change in the number of hatchery-origin pre-smolts released into the river from time t to time $t+1$.

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Addendum

Following completion of this report, the NMFS Southwest Region requested that the Southwest Fisheries Science Center (SWFSC) evaluate a new SRWC management framework for ocean salmon fisheries. Upon receiving this request, the SWFSC performed a MSE on this framework and the other management frameworks evaluated in the original report. This addendum reports the results from this new MSE.

The new Southwest Region management framework consists of two components. The first component specifies that the yearly season and size-limit minimum restrictions first specified in the NMFS 2004 Biological Opinion (NMFS, 2004) remain in place, regardless of population status:

> *The recreational season between Point Arena and Pigeon Point shall open no earlier than the first Saturday in April and close no later than the second Sunday in November; the recreational season between Pigeon Point and the U.S./Mexico Border shall open no earlier than the first Saturday in April and close no later than the first Sunday in October. The minimum size limit shall be at least 20 inches total length.*
>
> *The commercial season between Point Arena and the U.S./Mexico border shall open no earlier than May 1 and close no later than September 30, with the exception of an October season conducted Monday through Friday between Point Reyes and Point San Pedro, which shall end no later than October 15. The minimum size limit shall be at least 26 inches total length.*

The second component of the framework specifies that in addition, during periods of low abundance, the allowable age-3 impact rate on SRWC south of Point Arena is limited according to a control rule (Fig. A.3a) that is a function of the most recent 3-year geometric mean number of spawners ($T = 3$ scenario). If the 3-year geometric mean number of spawners is less than 500, the maximum allowable age-3 impact rate is zero. For a geometric mean number of spawners between 500 and 4000, the maximum allowable age-3 impact rate is a linearly increasing function from 0.10 to 0.20. For a geometric mean number of spawners between 4000 and 5000, the maximum allowable age-3 impact rate is 0.20. At mean spawner levels greater than 5000, the age-3 impact rate is not specifically limited.

For purposes of performing a MSE on the Southwest Region management framework, we combined the two framework components into a single control rule "SWR" as shown in Fig. A.3b by setting the maximum allowable age-3 impact rate to 0.20 for mean spawner levels greater than 5000. The control rule SWR is a reasonable approximation of this management framework given that estimates of the age-3 impact rate derived from SRWC cohort reconstructions (O'Farrell *et al.*, 2011b) under the season and size-limit restrictions of the first component have averaged 0.20. As with all other simulations in this report, the realized impact rate (which would be estimated postseason) was not necessarily equal to the maximum allowable impact rate, but was specified by a distribution informed by expected deviations between the maximum allowable and realized impact rates.

The results of the MSE are presented in Figs A.4-A.29. The numbering sequence used for these figures is the same as that used in the main report; e.g., Fig. 5 in the main report corresponds with Fig. A.5 in this addendum. While the SWR framework results are only presented for the $T = 3$ scenario, the results from all other management frameworks and T scenarios are presented in these figures for comparison.

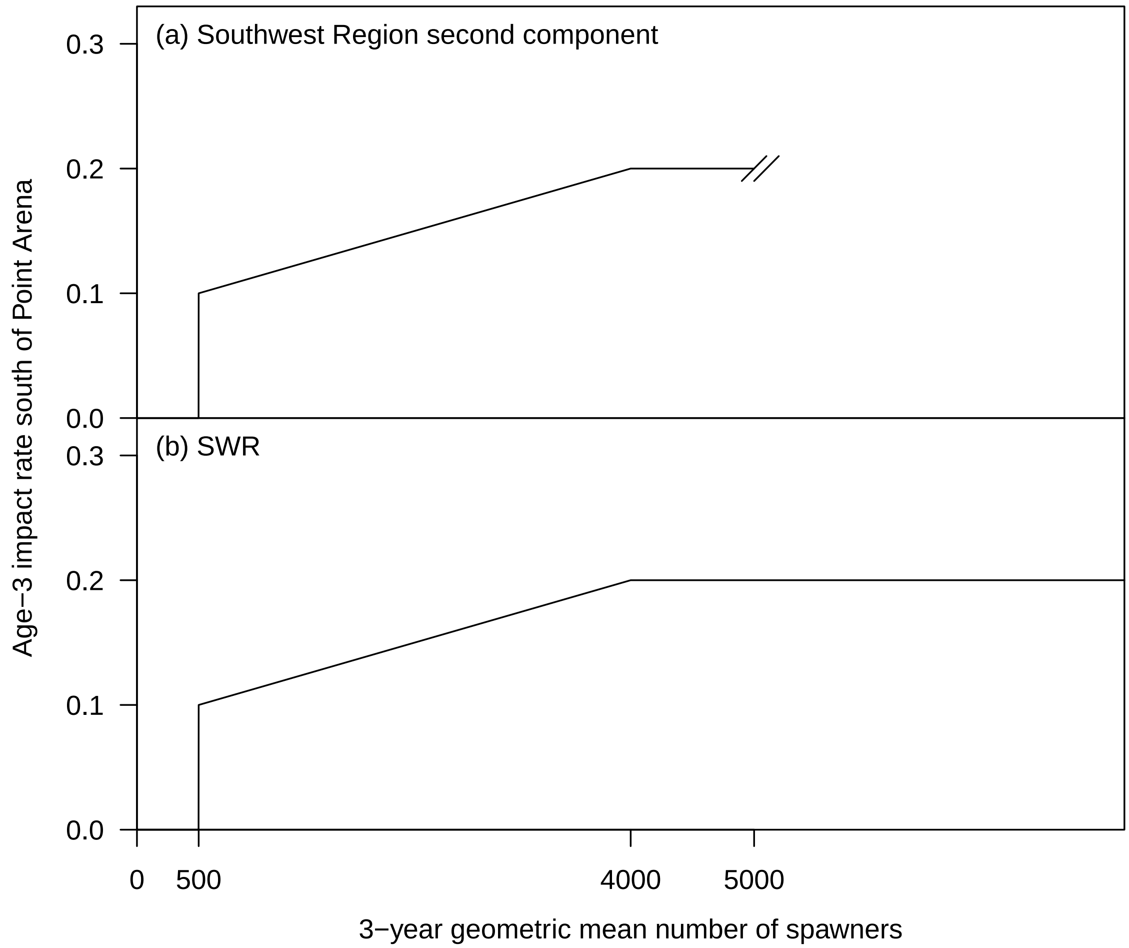

Figure A.3. Age-3 impact rate control rules. The number of spawners refers to the total male and female, natural- and hatchery-origin, spawner escapement as estimated through the carcass survey ($\bar{N}_{tT}^{\text{spawn}}$). Southwest Region management framework second component (a): above 5,000 spawners the impact rate is not specifically limited. The MSE was performed using the "SWR" control rule shown in panel (b), in which the maximum allowable impact rate above 5,000 spawners was 0.2 (see text).

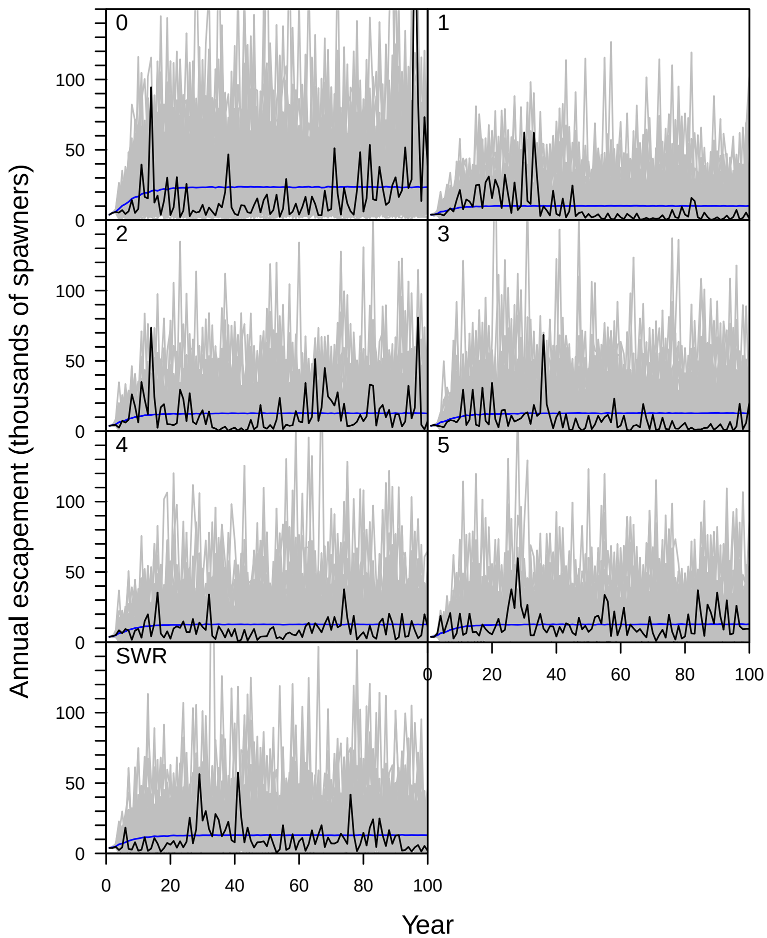

Figure A.4. Simulated time-series of escapement over a 100-year period. The 3-year geometric mean estimated escapement was input to the control rule in any given year (Scenario b) and there was no temporal autocorrelation in juvenile survival rates. Panels 0-5 and 'SWR' represent control rules 0-5 and 'SWR' as described in the text. The grey lines represent 100 simulations for each control rule. The blue lines represent the mean escapement in each year across 20000 simulations. The black lines represent a single, randomly chosen simulation.

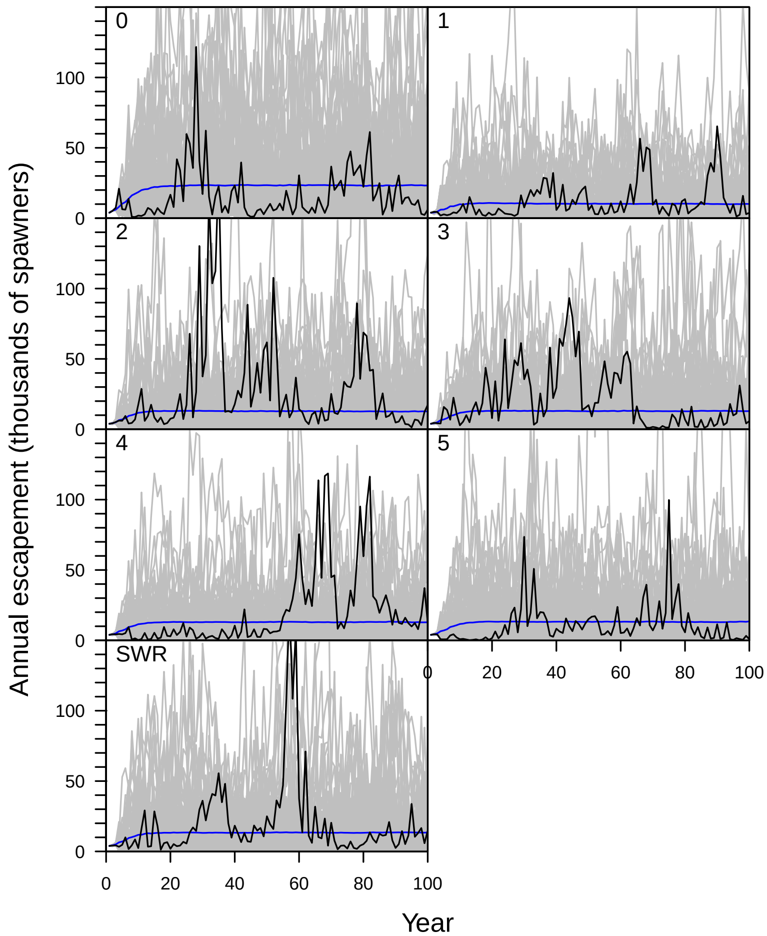

Figure A.5. Simulated time-series of escapement over a 100-year period. The 3-year geometric mean estimated escapement was input to the control rule in any given year (Scenario b) and we assumed a temporal autocorrelation of 0.5 in juvenile survival rates. Panels 0-5 and 'SWR' represent control rules 0-5 and 'SWR' as described in the text. The grey lines represent 100 simulations for each control rule. The blue lines represent the mean escapement in each year across 20000 simulations. The black lines represent a single, randomly chosen simulation.

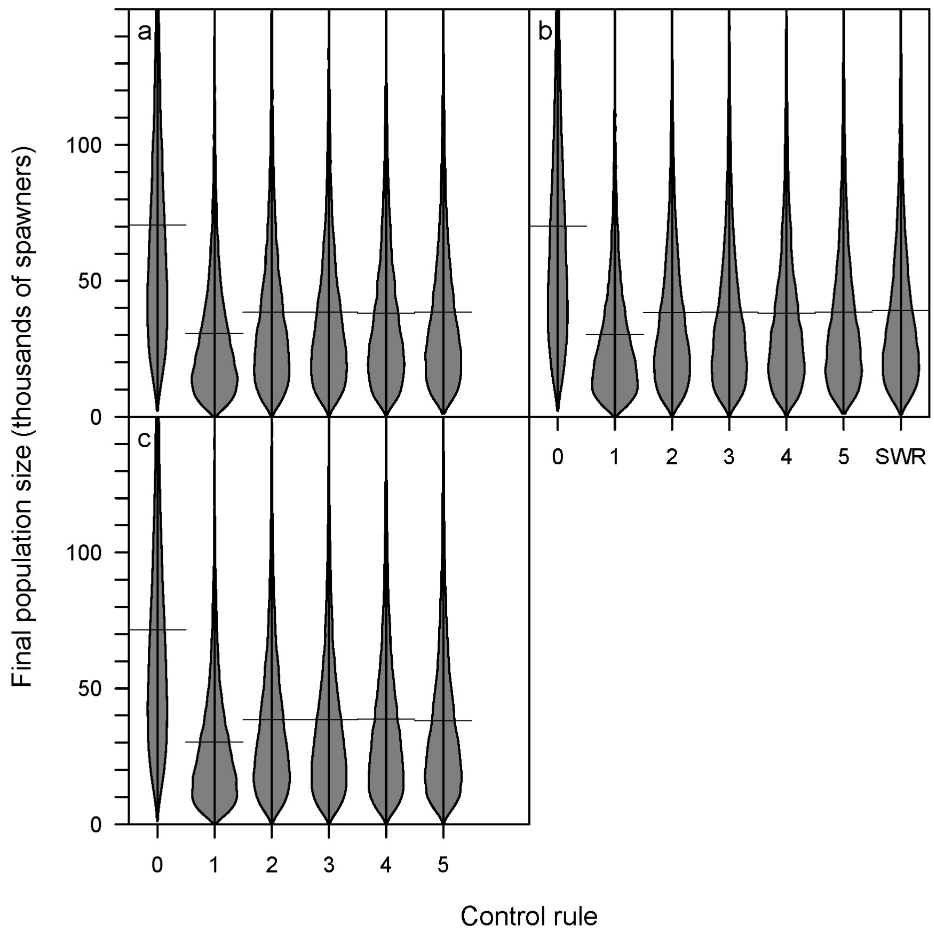

Figure A.6. Distribution of final population size in 20000 100-year simulations for each of three T scenarios (a-c) and 7 control rules (0-5 and 'SWR') assuming no temporal autocorrelation in juvenile survival rates. Final population size was calculated as the sum of escapements during the last three years of a simulation. Scenarios and control rules are described in the text. The horizontal lines represent the means of the distributions.

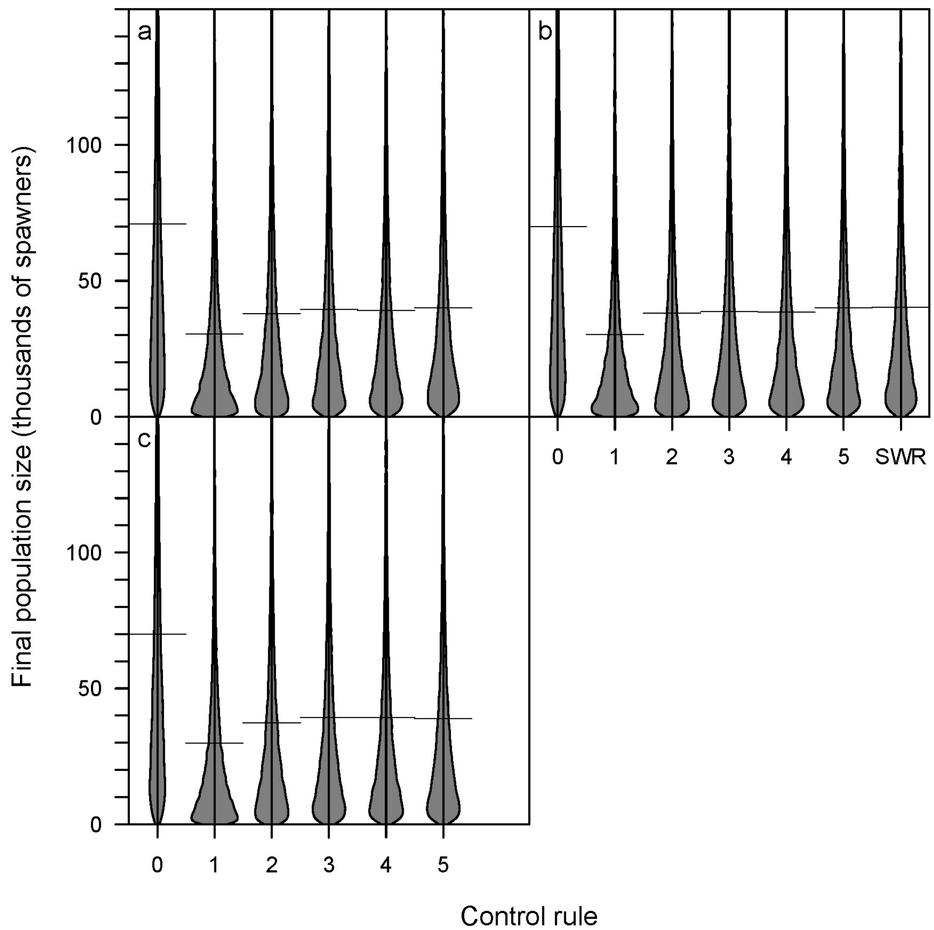

Figure A.7. Distribution of final population size in 20000 100-year simulations for each of three T scenarios (a-c) and 7 control rules (0-5 and 'SWR') assuming a temporal autocorrelation of 0.5 in juvenile survival rates. Final population size was calculated as the sum of escapements during the last three years of a simulation. Scenarios and control rules are described in the text. The horizontal lines represent the means of the distributions.

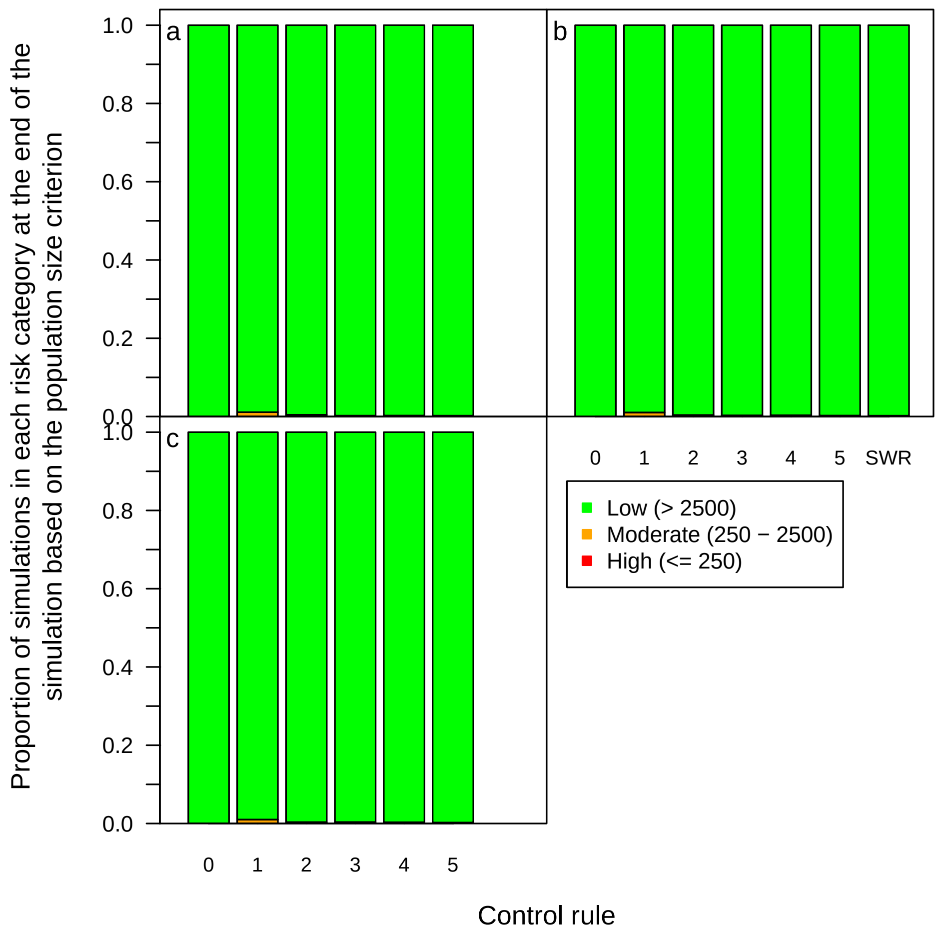

Figure A.8. Proportions of 20000 100-year simulations whose final population sizes met each of three extinction risk categories based on 'population size' defined by Lindley *et al.* (2007). We assumed no temporal autocorrelation in juvenile survival rates. Final population size was calculated as the sum of escapements during the last three years of a simulation. Results are shown for each of three T scenarios (a-c) and 7 control rules (0-5 and 'SWR'), which are described in the text.

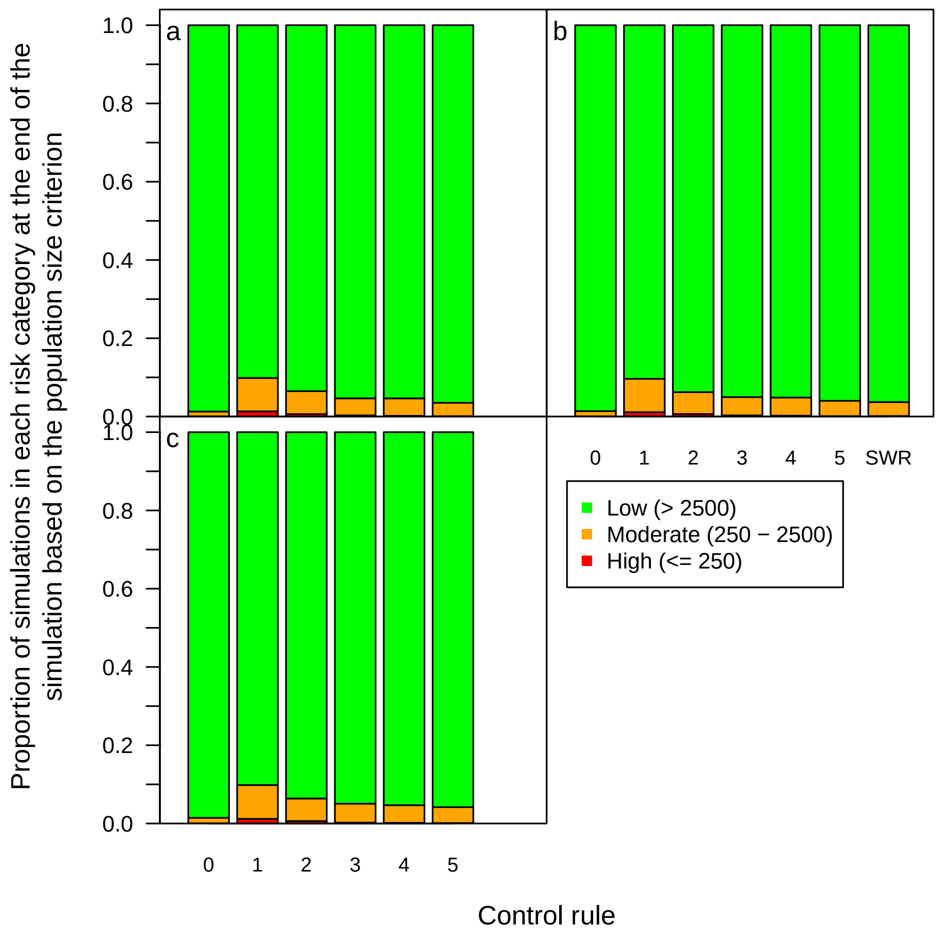

Figure A.9. Proportions of 20000 100-year simulations whose final population sizes met each of three extinction risk categories based on 'population size' defined by Lindley *et al.* (2007). We assumed a temporal autocorrelation of 0.5 in juvenile survival rates. Final population size was calculated as the sum of escapements during the last three years of a simulation. Results are shown for each of three T scenarios (a-c) and 7 control rules (0-5 and 'SWR'), which are described in the text.

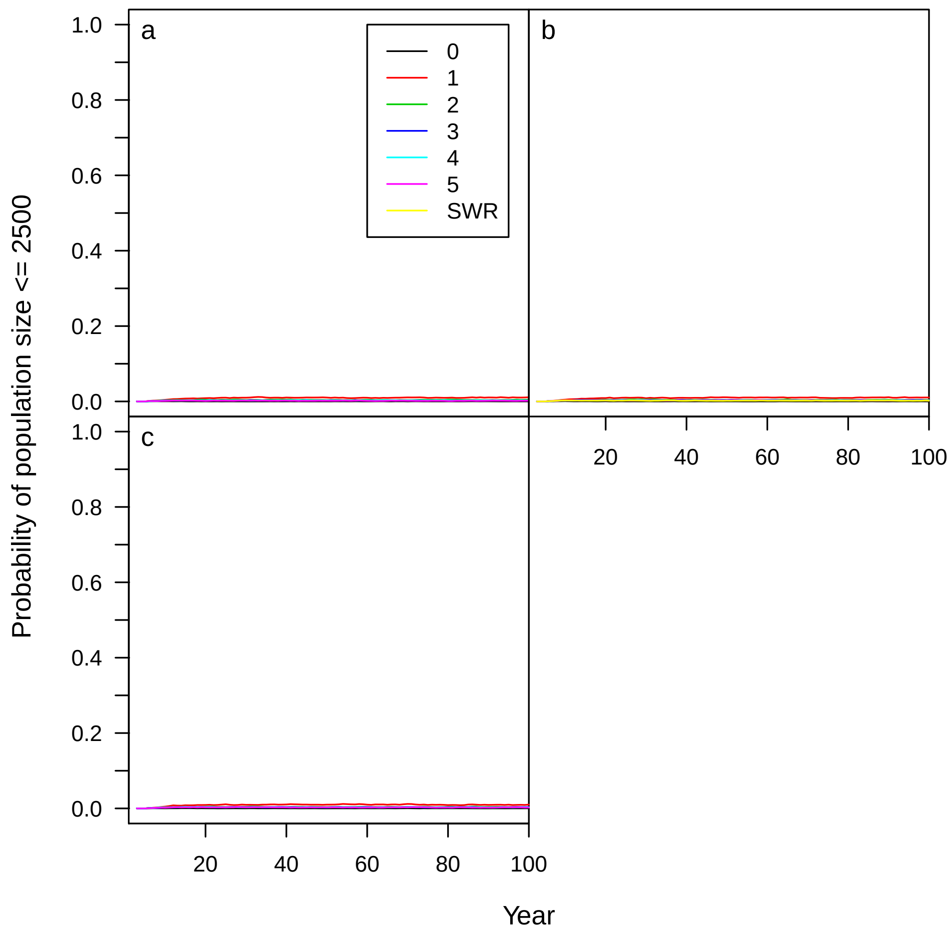

Figure A.10. Proportion of 20000 simulations in which population size was ≤ 2500 spawners over the course of a 100-year simulation period. We assumed no temporal autocorrelation in juvenile survival rates. Population size was calculated as the sum of the escapements in the previous 3 years. Results are shown for each of three T scenarios (a-c) and 7 control rules (0-5 and 'SWR'), which are described in the text.

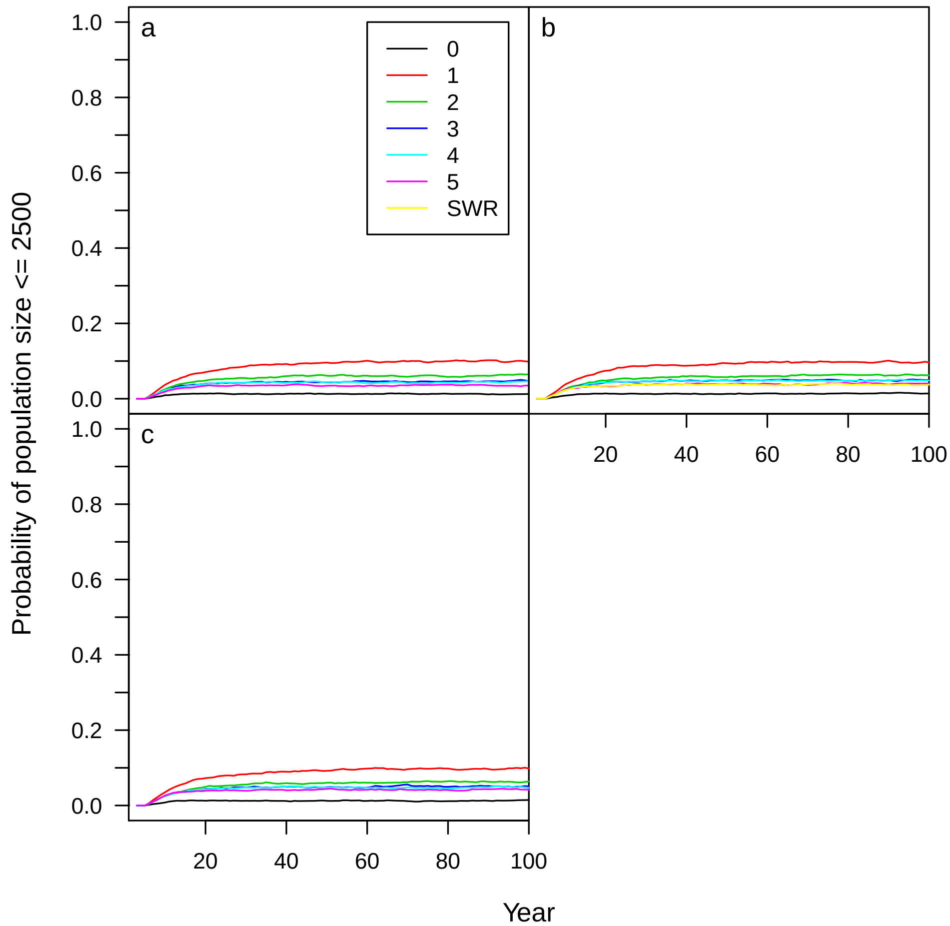

Figure A.11. Proportion of 20000 simulations in which population size was ≤ 2500 spawners over the course of a 100-year simulation period. We assumed a temporal autocorrelation of 0.5 in juvenile survival rates. Population size was calculated as the sum of the escapements in the previous 3 years. Results are shown for each of three T scenarios (a-c) and 7 control rules (0-5 and 'SWR'), which are described in the text.

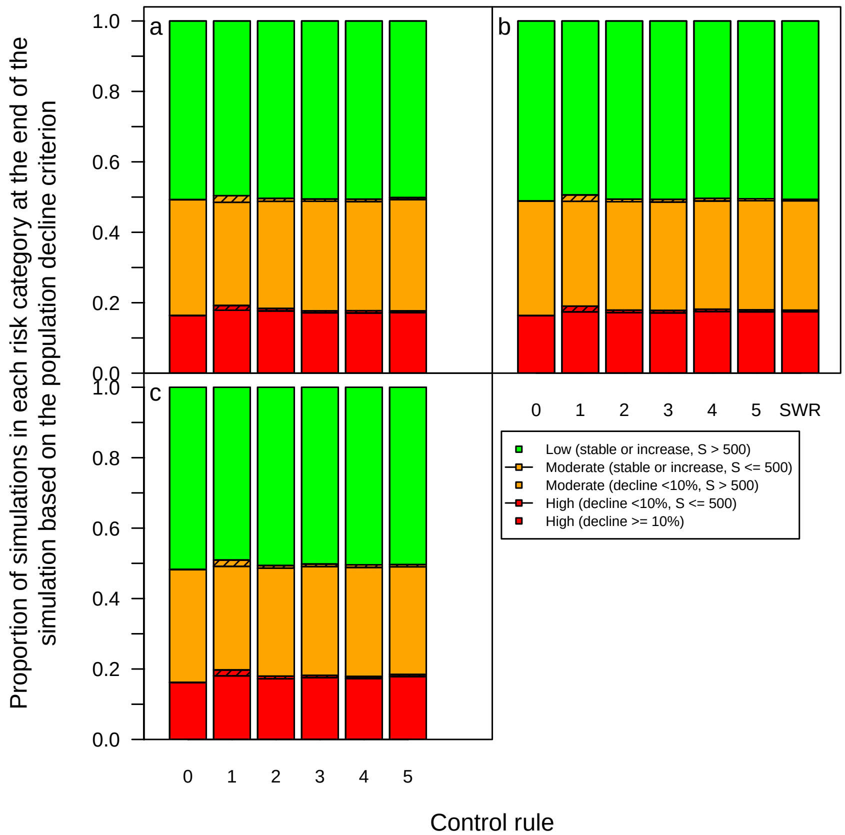

Figure A.12. Proportions of 20000 100-year simulations whose final six escapements (S) and population trends met each of three extinction risk categories based on 'population decline' defined by Lindley *et al.* (2007). We assumed no temporal autocorrelation in juvenile survival rates. S$\leq$ 500 indicates that there was at least one escapement during the final six years (two generations) of the simulation that was $\leq$ 500 spawners, while S$>$ 500 indicates that all of the last six escapements were more than 500 spawners. Population trend was calculated as the slope of the linear regression of the log of the final 10 escapements on year (Lindley *et al.*, 2007). We assumed that a slope $<= \log(0.9)$ indicated a decline $\geq$ 10% and that a slope $> \log(0.999)$ indicated a stable or increasing trend. Trend was not calculated if there was one or more zero escapements during the final 10 years so in some cases the total proportions do not sum to 1. However, zero escapements were rare in the simulations shown here so the sum of the proportions was always very close to one. Results are shown for each of three T scenarios (a-c) and 7 control rules (0-5 and 'SWR'), which are described in the text.

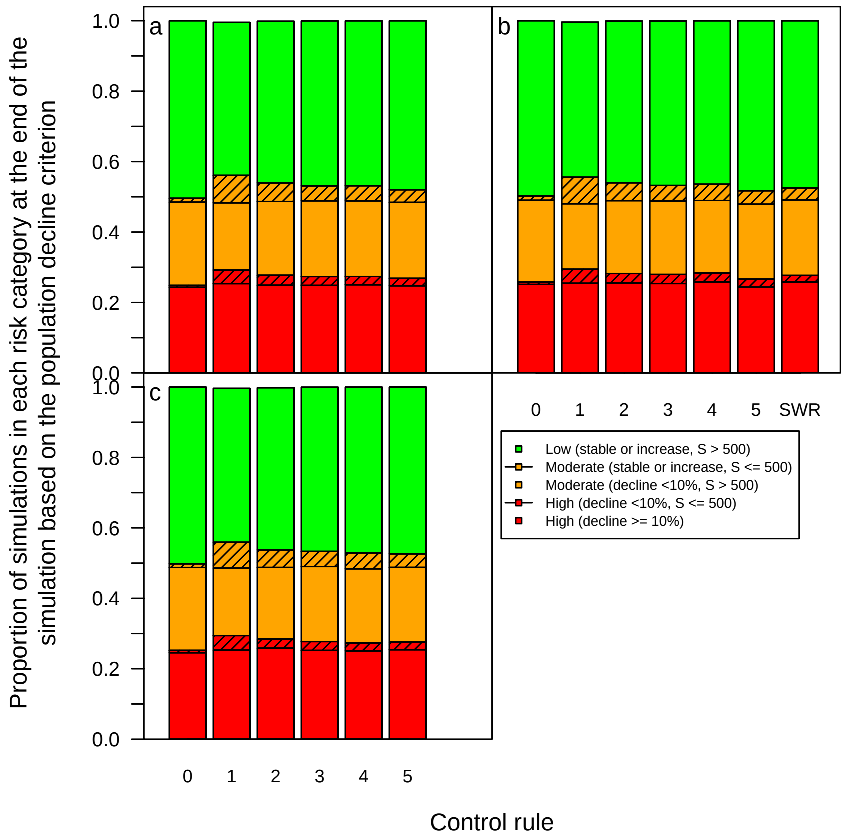

Figure A.13. Proportions of 20000 100-year simulations whose final six escapements (S) and population trends met each of three extinction risk categories based on 'population decline' defined by Lindley *et al.* (2007). We assumed a temporal autocorrelation of 0.5 in juvenile survival rates. S$\leq$ 500 indicates that there was at least one escapement during the final six years (two generations) of the simulation that was $\leq$ 500 spawners, while S$>$ 500 indicates that all of the last six escapements were more than 500 spawners. Population trend was calculated as the slope of the linear regression of the log of the final 10 escapements on year (Lindley *et al.*, 2007). We assumed that a slope $<=\log(0.9)$ indicated a decline $\geq$ 10% and that a slope $>\log(0.999)$ indicated a stable or increasing trend. Trend was not calculated if there was one or more zero escapements during the final 10 years so in some cases the total proportions do not sum to 1. However, zero escapements were rare in the simulations shown here so the sum of the proportions was always very close to one. Results are shown for each of three T scenarios (a-c) and 7 control rules (0-5 and 'SWR'), which are described in the text.

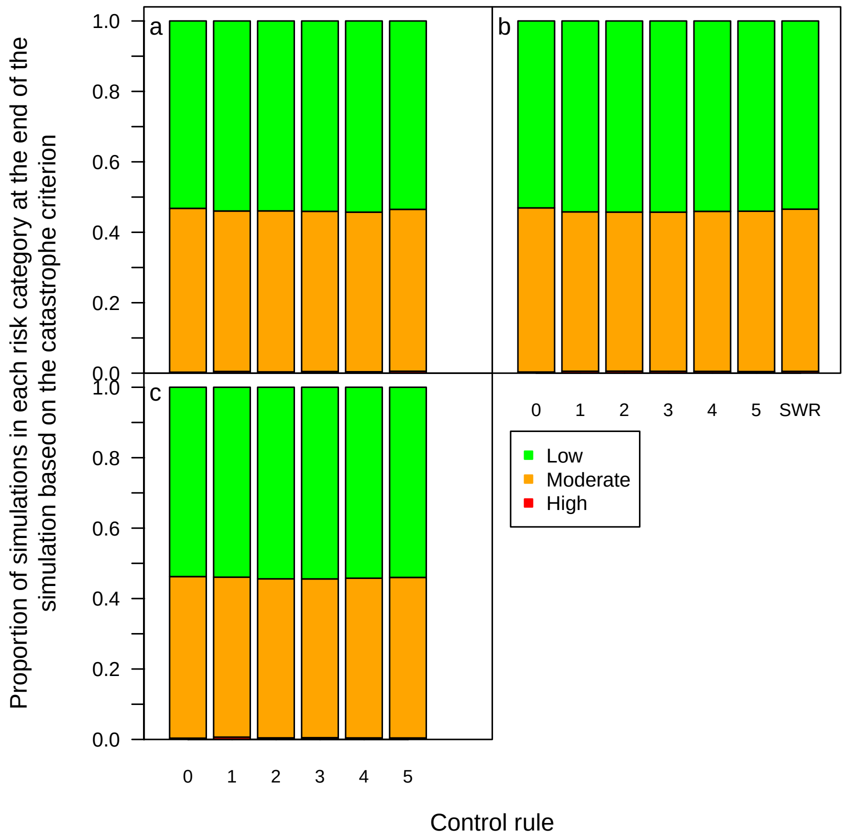

Figure A.14. Proportions of 20000 100-year simulations whose population changes during the last 10 years met each of three extinction risk categories based on 'catastrophe' defined by Lindley *et al.* (2007). We assumed no temporal autocorrelation in juvenile survival rates. Population changes were calculated as proportional differences between pairs of population sizes three years (one generation) apart (Lindley *et al.*, 2007). Thus, during the last 10 years of each simulation there were 7 population changes. High risk was assigned to simulations in which there was at least one population decline $\geq 90\%$. Moderate risk was assigned to simulations in which there was at least one population decline $\geq 50\%$, but none $\geq 90\%$. Simulations that did not meet the conditions for high or moderate risk were assigned low risk. Population changes were ignored if the population went extinct. Results are shown for each of three T scenarios (a-c) and 7 control rules (0-5 and 'SWR'), which are described in the text.

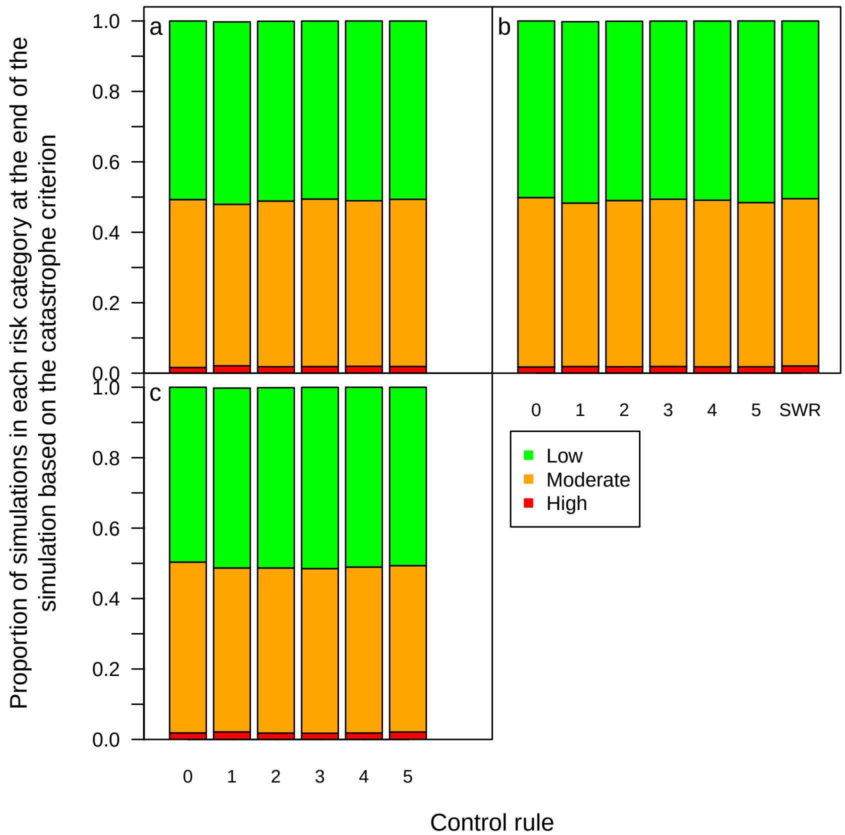

Figure A.15. Proportions of 20000 100-year simulations whose population changes during the last 10 years met each of three extinction risk categories based on 'catastrophe' defined by Lindley *et al.* (2007). We assumed a temporal autocorrelation of 0.5 in juvenile survival rates. Population changes were calculated as proportional differences between pairs of population sizes three years (one generation) apart (Lindley *et al.*, 2007). Thus, during the last 10 years of each simulation there were 7 population changes. High risk was assigned to simulations in which there was at least one population decline $\geq 90\%$. Moderate risk was assigned to simulations in which there was at least one population decline $\geq 50\%$, but none $\geq 90\%$. Simulations that did not meet the conditions for high or moderate risk were assigned low risk. Population changes were ignored if the population went extinct. Results are shown for each of three T scenarios (a-c) and 7 control rules (0-5 and 'SWR'), which are described in the text.

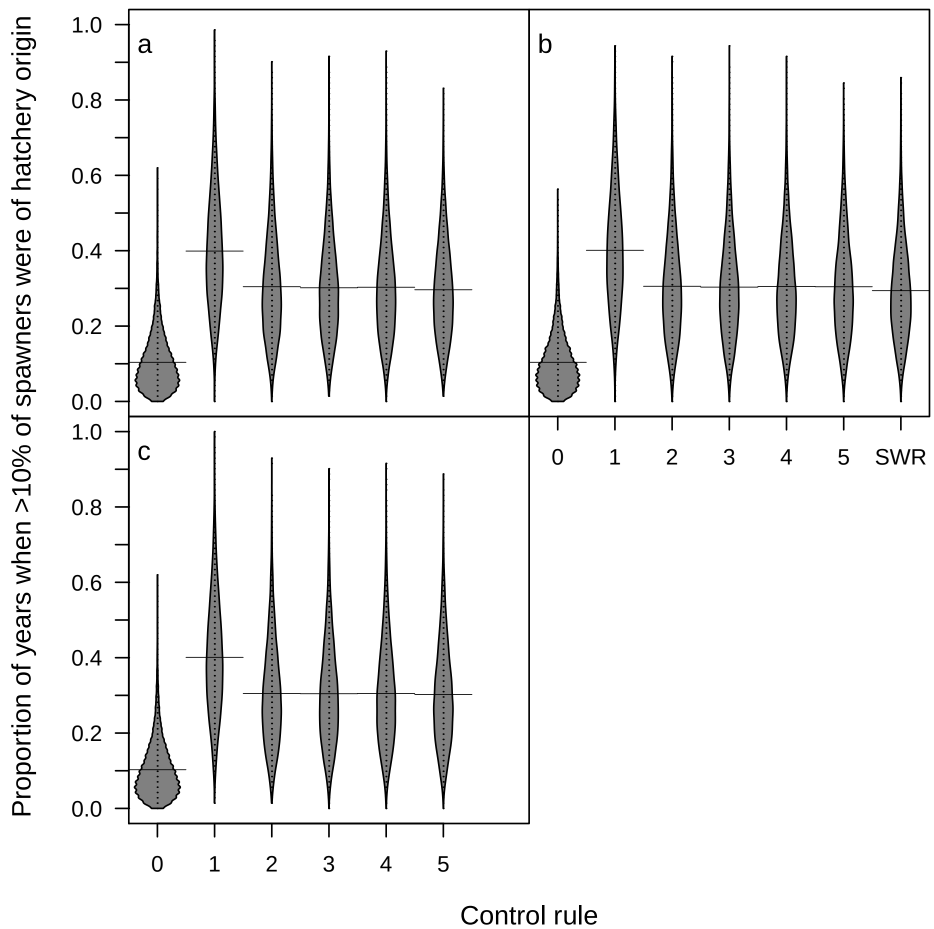

Figure A.16. Distribution of the proportion of years during which $>$ 10% of spawners were of hatchery origin across 20000 simulations. Proportions were calculated based on years 30-100 of 100-year simulations; the first 29 years were not included to ignore transient changes in spawner composition early in the simulation as a result of initial conditions. We assumed no temporal autocorrelation in juvenile survival rates. Results are shown for each of three T scenarios (a-c) and 7 control rules (0-5 and 'SWR'), which are described in the text. The horizontal lines represent the means of the distributions.

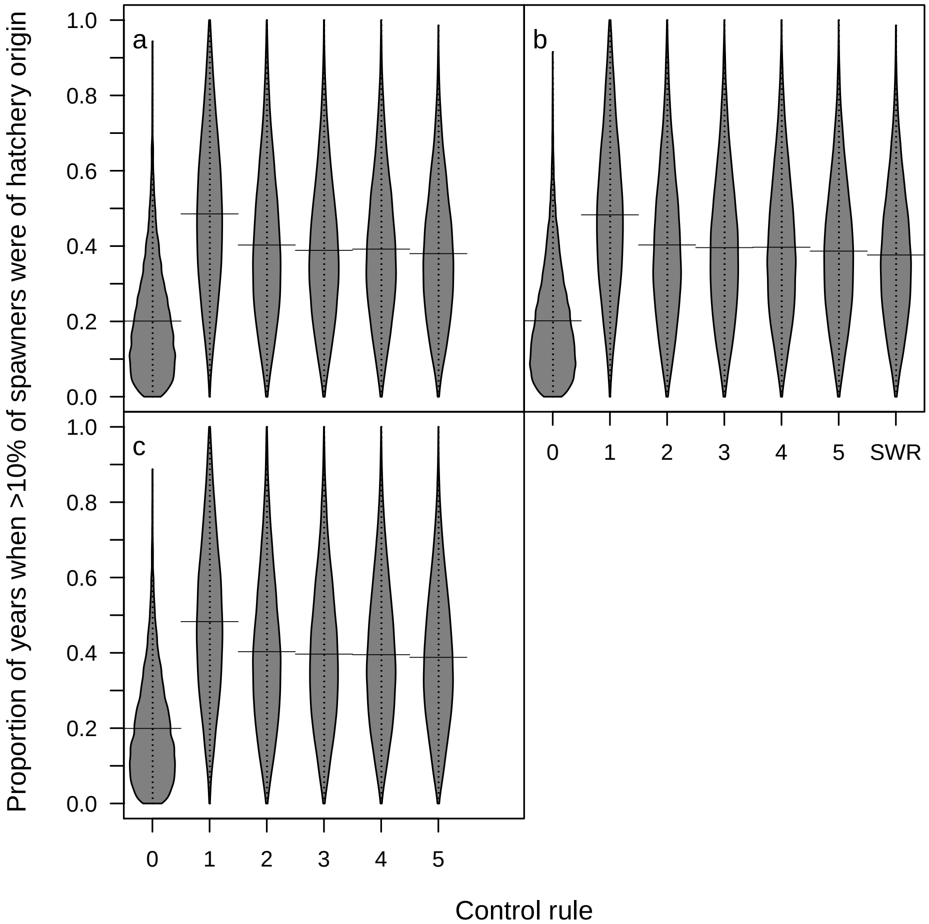

Figure A.17. Distribution of the proportion of years during which $> 10\%$ of spawners were of hatchery origin across 20000 simulations. Proportions were calculated based on years 30-100 of 100-year simulations; the first 29 years were not included to ignore transient changes in spawner composition early in the simulation as a result of initial conditions. We assumed a temporal autocorrelation of 0.5 in juvenile survival rates. Results are shown for each of three T scenarios (a-c) and 7 control rules (0-5 and 'SWR'), which are described in the text. The horizontal lines represent the means of the distributions.

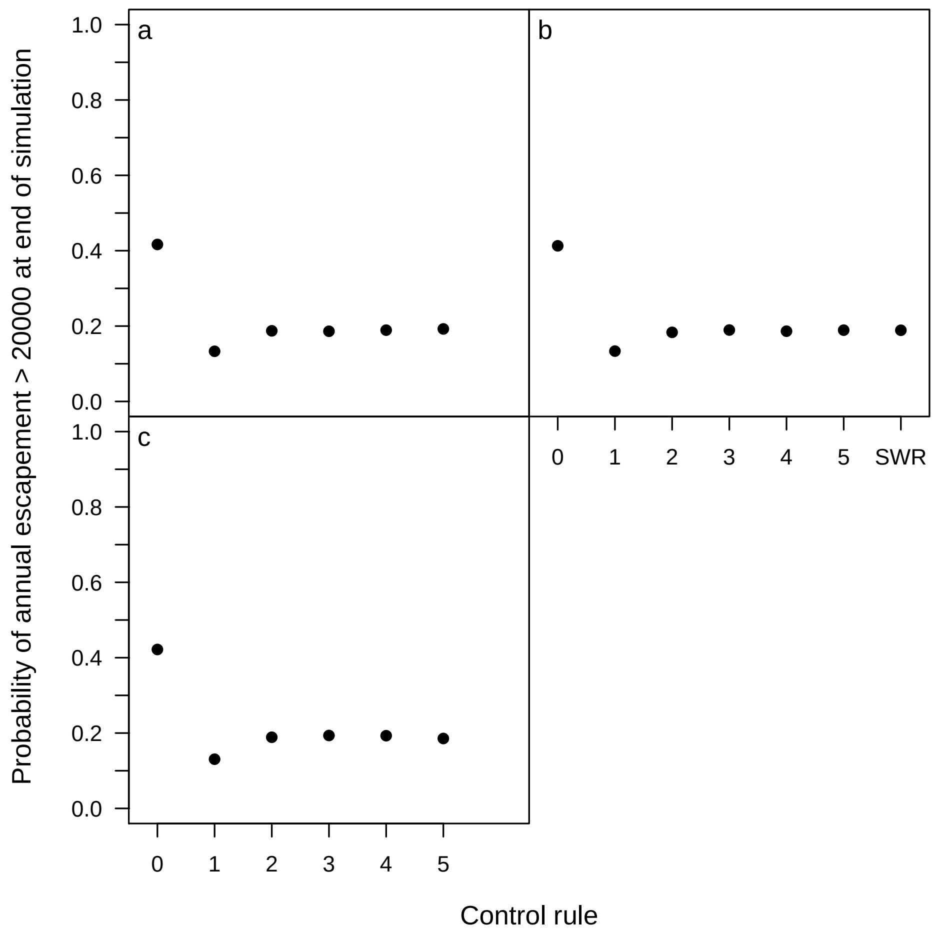

Figure A.18. Proportion of 20000 100-year simulations whose final annual escapement was > 20000 spawners. We assumed no temporal autocorrelation in juvenile survival rates. Results are shown for each of three T scenarios (a-c) and 7 control rules (0-5 and 'SWR'), which are described in the text.

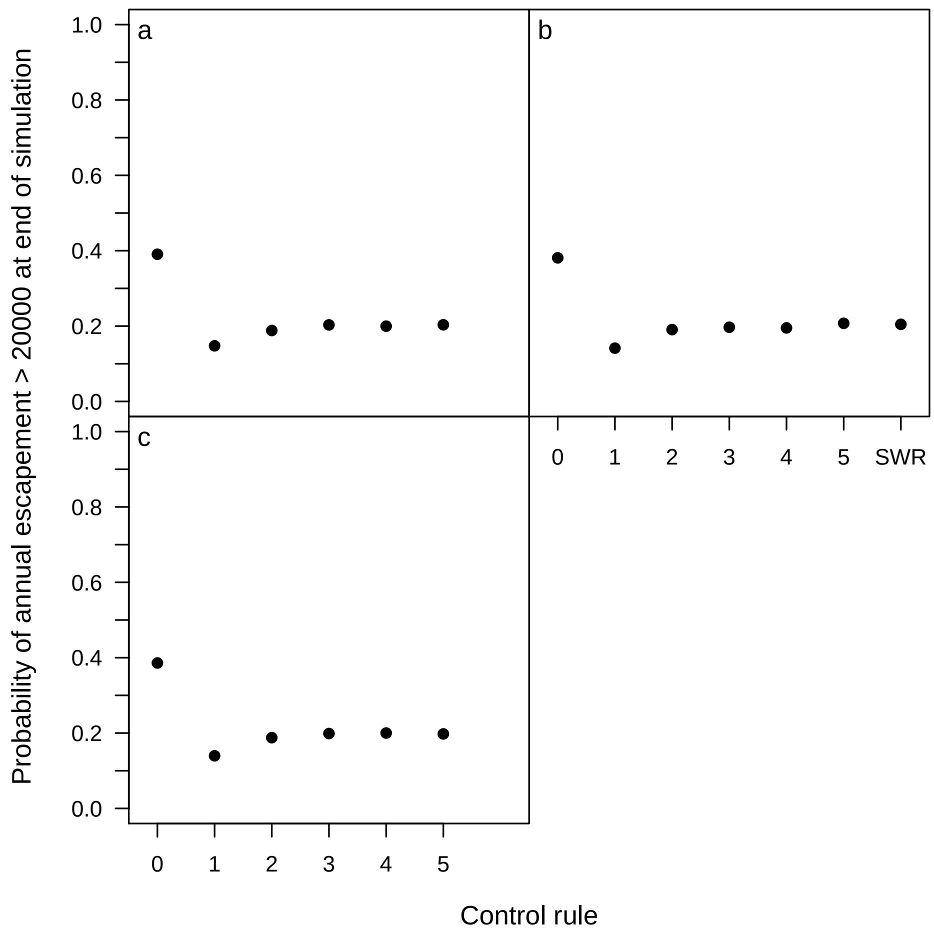

Figure A.19. Proportion of 20000 100-year simulations whose final annual escapement was > 20000 spawners. We assumed a temporal autocorrelation of 0.5 in juvenile survival rates. Results are shown for each of three T scenarios (a-c) and 7 control rules (0-5 and 'SWR'), which are described in the text.

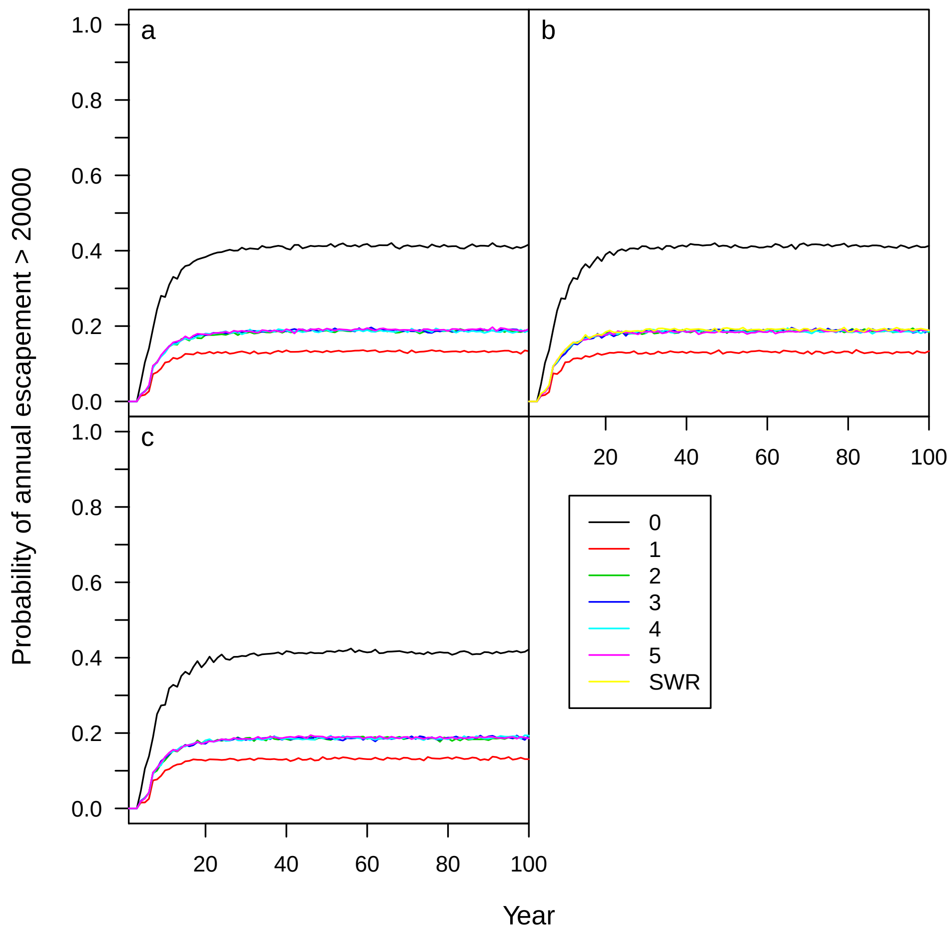

Figure A.20. Proportion of 20000 simulations in which annual escapement was > 20000 spawners over the course of a 100-year simulation period. We assumed no temporal autocorrelation in juvenile survival rates. Results are shown for each of three T scenarios (a-c) and 7 control rules (0-5 and 'SWR'), which are described in the text.

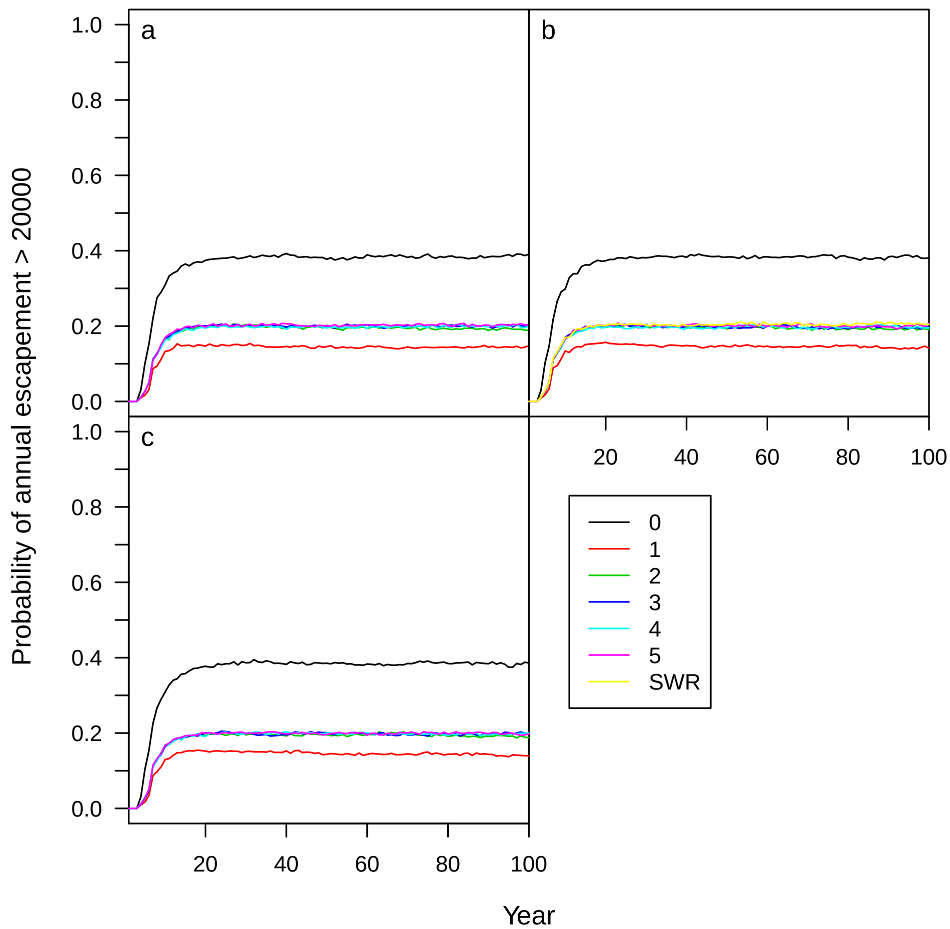

Figure A.21. Proportion of 20000 simulations in which annual escapement was > 20000 spawners over the course of a 100-year simulation period. We assumed a temporal autocorrelation of 0.5 in juvenile survival rates. Results are shown for each of three T scenarios (a-c) and 7 control rules (0-5 and 'SWR'), which are described in the text.

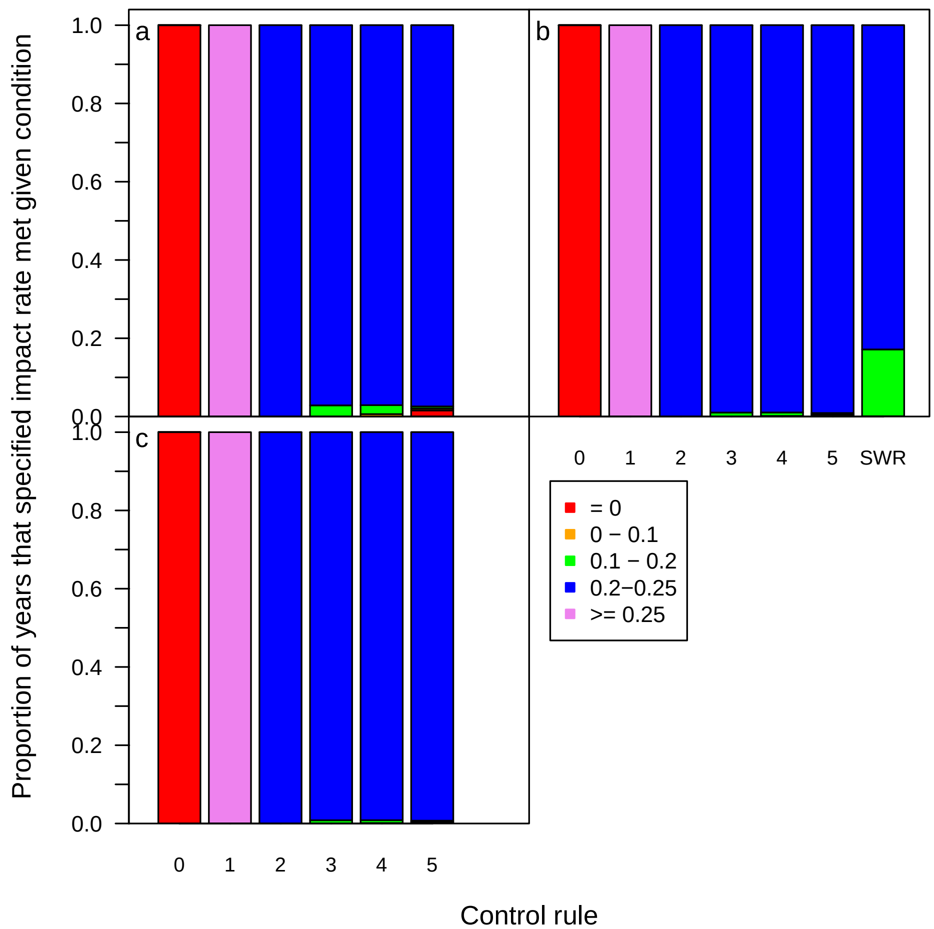

Figure A.22. Proportions of annual impact rates specified by the control rule that met each of four categories across 20000 100-year simulations. Impact rates were only calculated for years 30-99 (i.e., 1400000 impact rates are represented by each vertical bar). The first 29 years were not included to ignore transient changes in population size early in the simulation as a result of initial conditions. We assumed no temporal autocorrelation in juvenile survival rates. Results are shown for each of three T scenarios (a-c) and 7 control rules (0-5 and 'SWR'), which are described in the text.

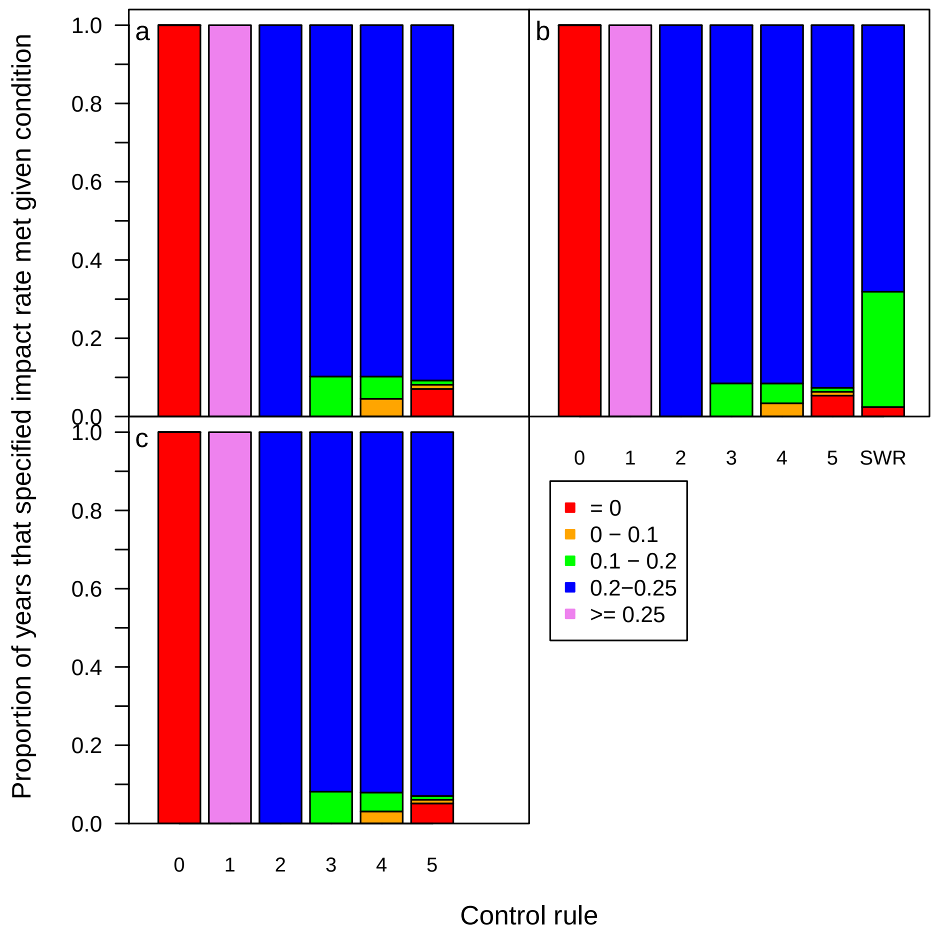

Figure A.23. Proportions of annual impact rates specified by the control rule that met each of four categories across 20000 100-year simulations. Impact rates were only calculated for years 30-99 (i.e., 1400000 impact rates are represented by each vertical bar). The first 29 years were not included to ignore transient changes in population size early in the simulation as a result of initial conditions. We assumed a temporal autocorrelation of 0.5 in juvenile survival rates. Results are shown for each of three T scenarios (a-c) and 7 control rules (0-5 and 'SWR'), which are described in the text.

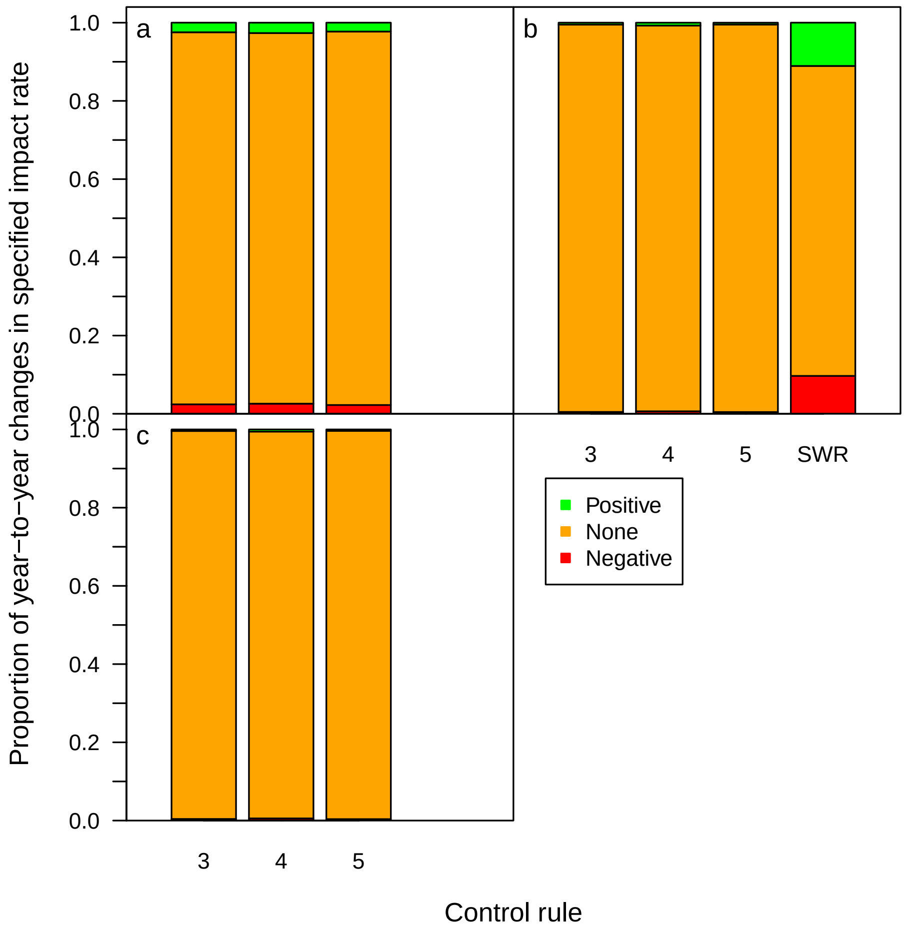

Figure A.24. Proportions of year-to-year changes in the impact rate specified by the control rule that fell into each of three categories: negative, no change, and positive. Results are shown for years 30-99 of 20000 100-year simulations. The first 29 years of each simulation were not included to ignore transient changes in dynamics early in the simulation as a result of initial conditions. We assumed no temporal autocorrelation in juvenile survival rates. Results are shown for each of three T scenarios (a-c) and 4 control rules (3-5 and 'SWR'), which are described in the text.

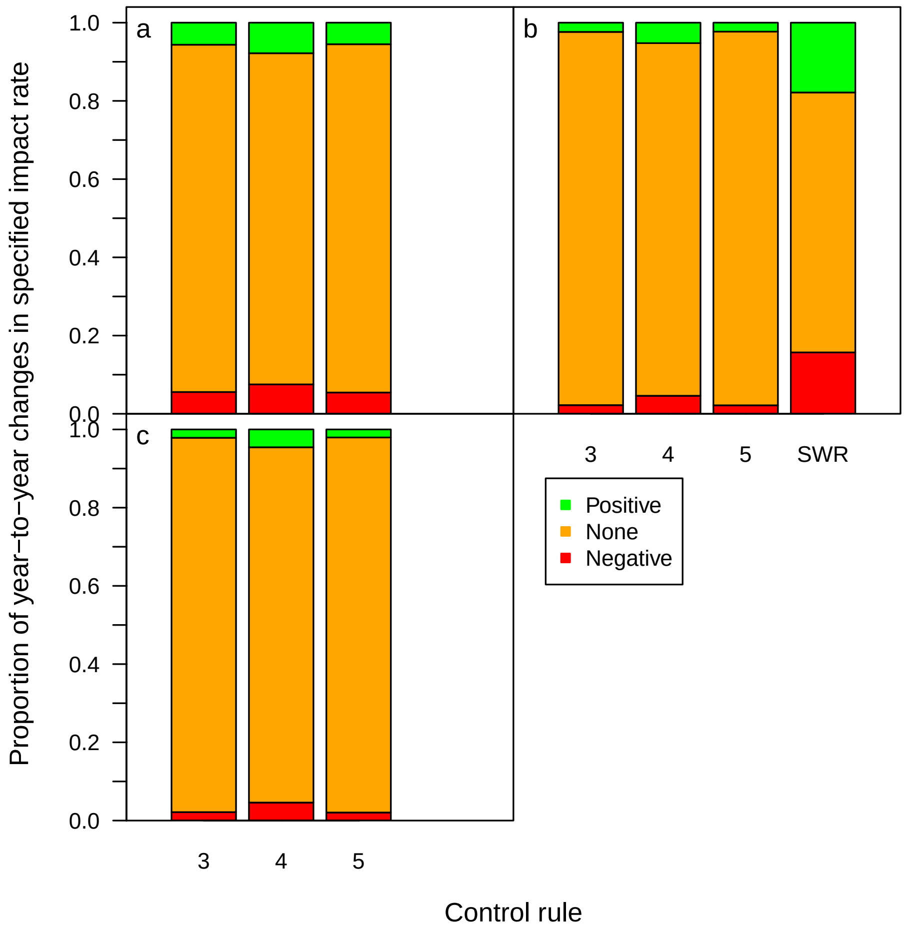

Figure A.25. Proportions of year-to-year changes in the impact rate specified by the control rule that fell into each of three categories: negative, no change, and positive. Results are shown for years 30-99 of 20000 100-year simulations. The first 29 years of each simulation were not included to ignore transient changes in dynamics early in the simulation as a result of initial conditions. We assumed a temporal autocorrelation of 0.5 in juvenile survival rates. Results are shown for each of three T scenarios (a-c) and 4 control rules (3-5 and 'SWR'), which are described in the text.

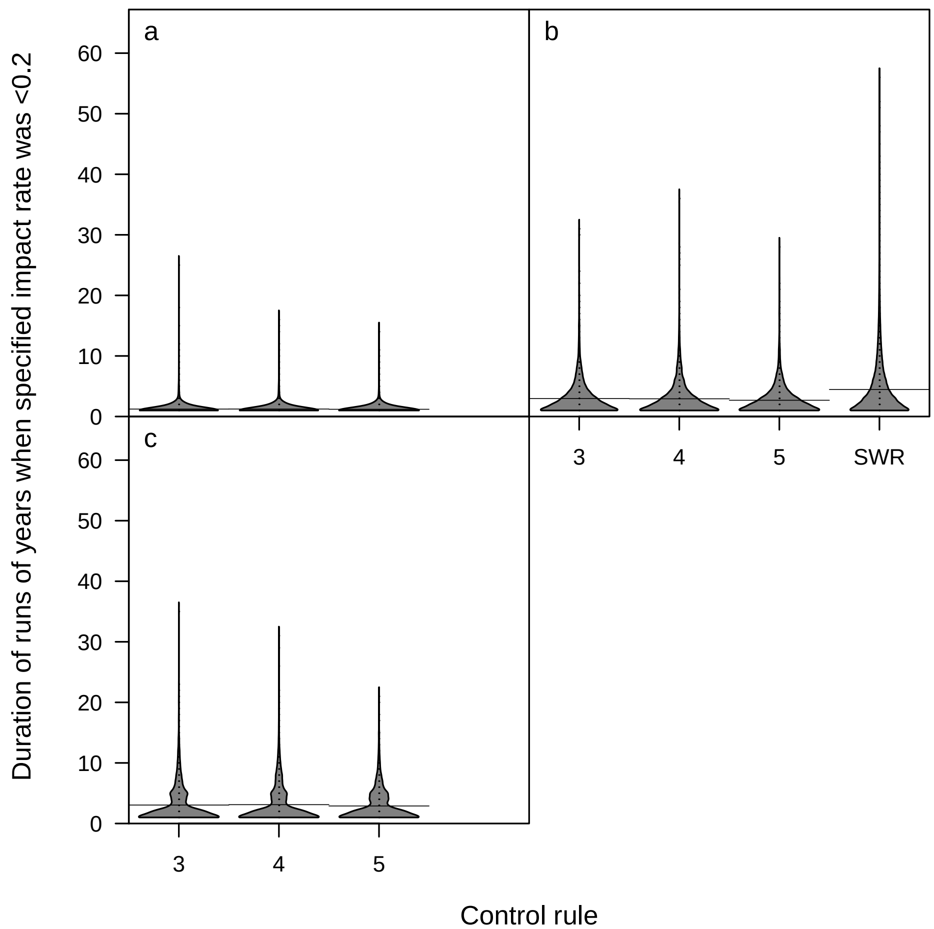

Figure A.26. Distribution of lengths of runs of years when the impact rate specified by the control rule was < 0.2. Results are shown for years 30-99 of 20000 100-year simulations. The first 29 years of each simulation were not included to ignore transient changes in dynamics early in the simulation as a result of initial conditions. We assumed no temporal autocorrelation in juvenile survival rates. Results are shown for each of three T scenarios (a-c) and 4 control rules (3-5 and 'SWR'), which are described in the text. The horizontal lines represent the means of the distributions.

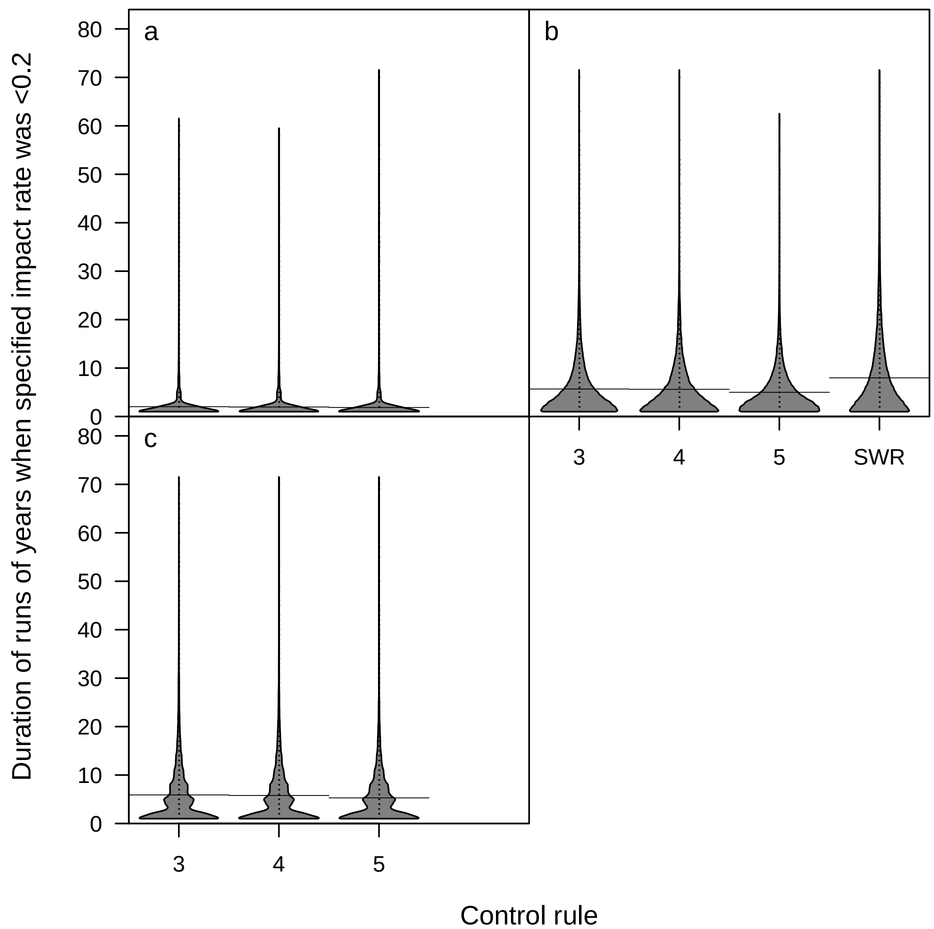

Figure A.27. Distribution of lengths of runs of years when the impact rate specified by the control rule was < 0.2. Results are shown for years 30-99 of 20000 100-year simulations. The first 29 years of each simulation were not included to ignore transient changes in dynamics early in the simulation as a result of initial conditions. We assumed a temporal autocorrelation of 0.5 in juvenile survival rates. Results are shown for each of three T scenarios (a-c) and 4 control rules (3-5 and 'SWR'), which are described in the text. The horizontal lines represent the means of the distributions.

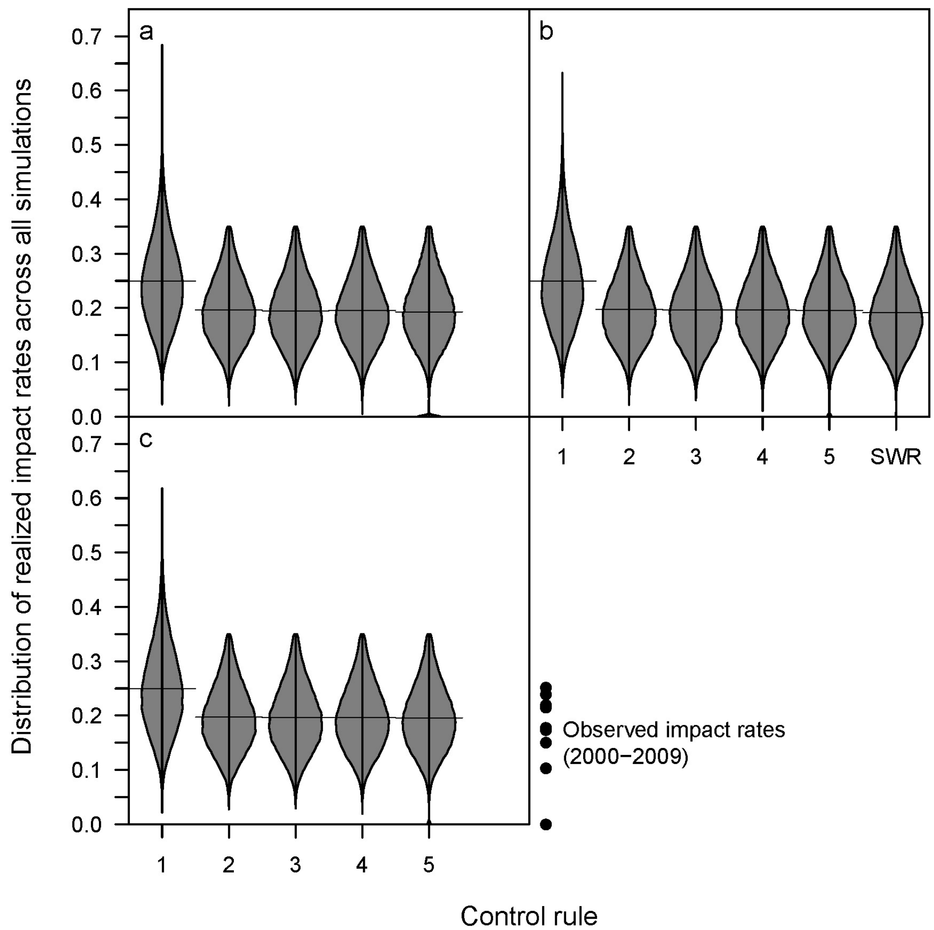

Figure A.28. Distribution of realized annual age-3 impact rates south of Point Arena. Each distribution represents 100000 annual realized impact rates sampled from 20000 100-year simulations. The assumed impact rate north of point Arena ($\delta = 0.006$) was a constant addition to the realized impact rates shown here. Only impact rates from years 30-99 were plotted to exclude transient changes early in the simulation as a result of initial conditions. We assumed no temporal autocorrelation in juvenile survival rates. Results are shown for each of three T scenarios (a-c) and 6 control rules (1-5 and 'SWR'), which are described in the text. The horizontal lines represent the means of the distributions. Actual estimated impact rates for years 2000-2009 are shown as points to the right of the lower panel.

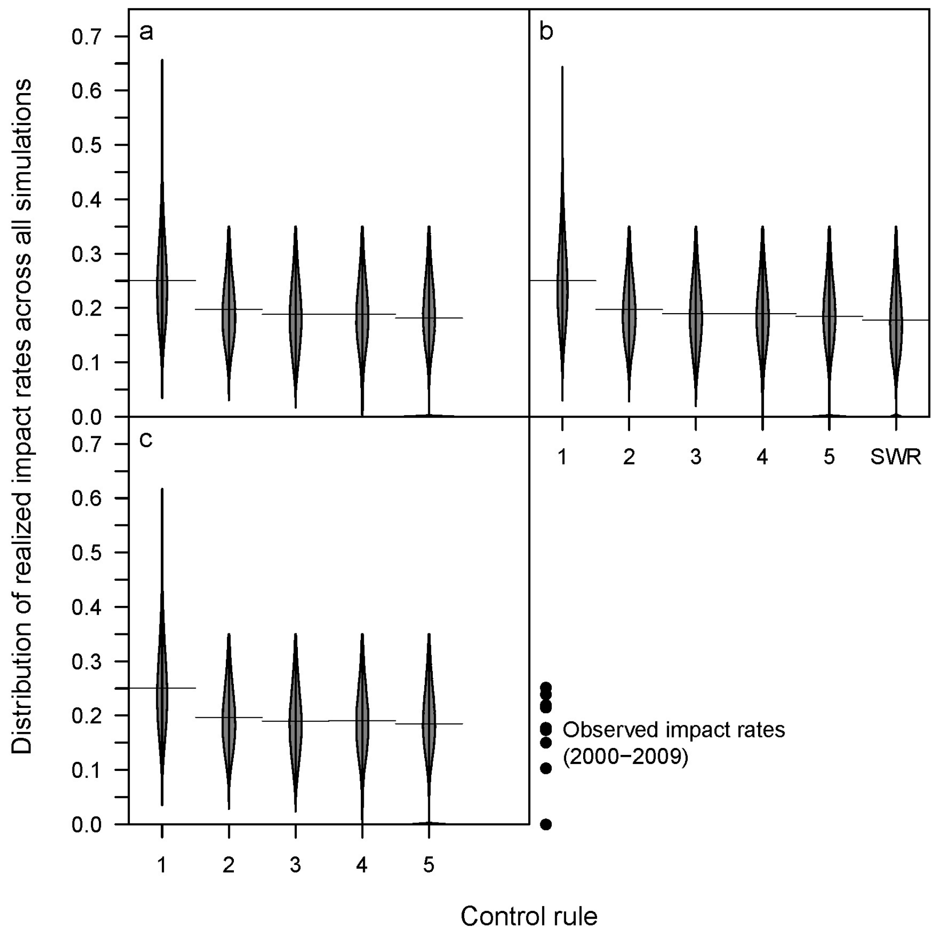

Figure A.29. Distribution of realized annual age-3 impact rates south of Point Arena. Each distribution represents 100000 annual realized impact rates sampled from 20000 100-year simulations. The assumed impact rate north of point Arena ($\delta = 0.006$) was a constant addition to the realized impact rates shown here. Only impact rates from years 30-99 were plotted to exclude transient changes early in the simulation as a result of initial conditions. We assumed a temporal autocorrelation of 0.5 in juvenile survival rates. Results are shown for each of three T scenarios (a-c) and 6 control rules (1-5 and 'SWR'), which are described in the text. The horizontal lines represent the means of the distributions. Actual estimated impact rates for years 2000-2009 are shown as points to the right of the lower panel.

Agenda Item F.8.a
Attachment 4
March 2014

Country	Program(s)	Gross[1] Subsidy ($/lb)	Net[2] Subsidy ($/lb)
	Consumer Subsidy	0.00	0.00
Total		0.00	0.00
Switzerland	Deficiency Payments	0.00	0.00

[FR Doc. 2014–01302 Filed 1–22–14; 8:45 am]

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DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

RIN 0648–XC958

Domestic Fisheries; Management Strategy Evaluation for Sacramento River Winter Chinook Salmon

AGENCY: National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

ACTION: Notice of availability of a Management Strategy Evaluation; request for comments.

SUMMARY: The Pacific Fishery Management Council (Council) has requested that the National Marine Fisheries Service (NMFS) take into consideration alternative harvest control rules for Sacramento River winter Chinook salmon (winter-run), a species listed as endangered under the Endangered Species Act (ESA) and impacted by ocean salmon fisheries that the Council and NMFS manage. The Council is concerned that the existing control rule may be unnecessarily restrictive in years of low winter-run abundance, particularly when the 3-year average escapement drops below 500 fish. The current control rule specifies zero fishery impacts at this level of abundance rather than the *de minimis* impacts that are allowed under fishery control rules that limit impacts on other ESA listed species. The Council has expressed interest in exploring alternatives that would provide some limited harvest opportunity on other Chinook salmon stocks when winter-run abundance is low, without significantly increasing the risk to winter-run. To help facilitate consideration of such alternatives, NMFS is requesting public comment on alternative harvest control rules analyzed in a Management Strategy Evaluation (MSE) for winter-run. These alternative harvest control rules include the current control rule implemented by NMFS on May 1, 2012, as part of the ESA consultation standard on the ocean salmon fishery and additional control rules that reduce the impact rate at low abundance.

DATES: Information and comments on the alternative control rules described in this notice must be received at the appropriate address (see **ADDRESSES**), no later than 5:00 p.m., on April 23, 2014. We encourage the public's involvement in selecting and providing rationale for a preferred control rule that may be taken into consideration during the annual salmon management process.

ADDRESSES: You may submit comments on this document, identified by NOAA–NMFS–2013–0154, by any of the following methods:

- *Electronic Submissions:* Submit all electronic public comments via the Federal e-Rulemaking Portal. Go to *www.regulations.gov/#!docketDetail;D=NOAA–NMFS–2013–0154,* click the ''Comment Now!'' icon, complete the required fields, and enter or attach your comments.
- *Mail:* Submit written comments to Heidi Taylor, NMFS, 501 W. Ocean Blvd., Suite 4200, Long Beach, CA 90802. Include the identifier ''NOAA–NMFS–2013–0154'' in the comments.

Instructions: Comments sent by any other method, to any other address or individual, or received after the end of the comment period, may not be considered by NMFS. All comments received are a part of the public record and will generally be posted for public viewing on *http://www.regulations.gov* without change. All personal identifying information (e.g., name, address, etc.), confidential business information, or otherwise sensitive information submitted voluntarily by the sender will be publicly accessible. NMFS will accept anonymous comments (enter ''N/A'' in the required fields if you wish to remain anonymous). Attachments to electronic comments will be accepted in Microsoft Word, Excel, or Adobe PDF file formats only.

FOR FURTHER INFORMATION CONTACT: Heidi Taylor, NMFS WCR, 562–980–4039.

SUPPLEMENTARY INFORMATION:

Background

Sacramento River winter Chinook salmon were first listed as threatened under the Endangered Species Act in 1989 (54 FR 32085) and their status was changed to endangered in 1994 (59 FR 440). Under section 7 of the Endangered Species Act, NMFS consulted with itself on the effects of the federally-managed ocean salmon fishery on the winter-run stock and, in April 2010, completed the Biological Opinion on the Authorization of Ocean Salmon Fisheries Pursuant to the Pacific Coast Salmon Fishery Management Plan (Salmon FMP) and Additional Protective Measures as it affects the Sacramento River Winter Chinook Salmon (winter-run) Evolutionary Significant Unit (ESU) (NMFS 2010) (2010 Opinion). In the 2010 Opinion, NMFS found that, given the current management structure of the fishery and the measures in place to protect winter-run, it was expected that adult spawning returns of winter-run cohorts would be reduced 10 to 25 percent as a result of impacts associated with incidental harvest in the ocean salmon fishery. These impacts occur primarily as a result of removal of age-3 winter-run, almost exclusively south of Point Arena, CA, when fishing activity is permitted in those areas, and in conjunction with the seasonal and size restrictions previously adopted to minimize impacts to winter-run consistent with the proposed action for ocean salmon fisheries management under the salmon FMP (NMFS 2010). The results from the O'Farrell *et al.* (2012a) cohort reconstruction indicate that the majority of these impacts were associated with the recreational salmon fishery in this area. The analysis also indicates that the ocean fishery spawner reduction rate [1] has averaged 20 percent in years when ocean salmon fisheries south of point Arena occur (O'Farrell *et al.,* 2012a), regardless of the spawning abundance of winter-run.

Over the last decade, this winter-run population (and consequently the entire ESU) has had years of positive growth (cohort replacement rates greater than 1.0) while sustaining ocean fishery impacts. The population increased to as many as 17,000 spawners in 2006. Therefore, NMFS concluded that the anticipated impacts of the fishery, based on past performance of both the fishery

[1] The spawner reduction rate is defined as the reduction in a cohort's ''potential adult spawning escapement owing to ocean fisheries, relative to its escapement potential in the absence of ocean fishing'' (O'Farrell *et al.* 2012).

and the winter-run population, were not expected to reduce the likelihood of survival and recovery of the species during periods when the winter-run population is stable or increasing. To a large degree, the consultation standards and management measures described in the 2010 Opinion, which were designed to protect winter-run specifically as well as address other stocks of Chinook salmon, have served to reduce fishery impacts on the winter-run Chinook salmon population to a level that is consistent with an expectation of survival and recovery for the species.

However, NMFS identified that the proposed action analyzed in the 2010 Opinion did not include measures that would avoid or constrain the fishery's impacts on winter-run during periods of decline or increased extinction risk. Without any explicit means to further constrain impacts after consideration of winter-run abundance in the fishery management process, the potential exists for total spawner reduction rates associated with the ocean salmon fishery to approach, or exceed, 25 percent during periods of time when risks of extinction are significantly increased. Therefore, NMFS concluded that the proposed operation of the fishery without consideration of additional protective measures that would be implemented when winter-run are at low abundance was not sufficient to ensure that the fishery was not likely to appreciably reduce the likelihood of survival and recovery of winter-run.

Reasonable and Prudent Alternative (RPA)

The ESA requires that, where NMFS concludes through consultation that a proposed action is likely to jeopardize the continued existence of a listed species, NMFS identify one or more RPAs to such action. By regulation, an RPA is defined as ''alternative actions identified during formal consultation that can be implemented in a manner consistent with the intended purpose of the action, that can be implemented consistent with the scope of the Federal agency's legal authority and jurisdiction, that is economically and technologically feasible, and that the Director [NMFS] believes would avoid the likelihood of jeopardizing the continued existence of listed species or resulting in the destruction or adverse modification of critical habitat'' (50 CFR 402.02).

NMFS' approach when developing the RPA in the 2010 Opinion was to address the foundation of the jeopardy conclusion, which is the lack of explicit controls in the ocean salmon fishery management process to constrain and reduce impacts when the abundance of winter-run is depressed and the extinction risk is increased. Specifically, the purpose of the RPA was to establish a long-term management framework that accounts each year for the abundance of winter-run and specifies a level of fishery impact that is responsive to that abundance and consistent with the requirement to avoid jeopardy. However, at the time of the 2010 Opinion, the information and analyses required to establish specific management objectives or acceptable impact targets given various conditions, and the tools needed to incorporate those criteria into the fishery management process were not available. Additional analytical effort was required before this framework could be developed and implemented. Therefore, the RPA required NMFS to develop a winter-run management framework that (1) meets the objective of the RPA, (2) is practical given the ocean salmon fishery management process as described in the Salmon FMP, and (3) that the framework be available for consideration in time for implementation as the consultation standard for the ocean salmon fishery for winter-run for the 2012 fishing season.

For the interim between issuance of the 2010 Opinion and implementation of the new framework, NMFS determined that the winter-run population had been in significant decline since 2006, and concluded that conservative management measures should be taken and fishery impacts reduced pending completion of the new management framework. The 2010 Opinion provided options to the Council and NMFS to either increase size limits or reduce fishing effort (seasonal closures) in the recreational fishery in 2010 and 2011 to produce a qualitative constraint and reduction in winter-run impacts (see NMFS 2010 for explanation of interim RPA rationale).

Management Strategy Evaluation (MSE)

In order to develop the management framework required by the 2010 RPA, the NMFS Southwest Fisheries Science Center Salmon Assessment Team (Team) engaged in an effort to develop the analytical tools required to evaluate various fishery exploitation control rule alternatives in a formal Management Strategy Evaluation (MSE) process. The term ''Management Strategy Evaluation'' is being used to represent all aspects of the analytical work developed to support the decision-making process. The purpose of the MSE was to simulate winter-run population dynamics as well as monitoring, assessment, and implementation of the fishery management system under a variety of prospective fishery management control rules. The control rules specify the allowable level of incidental take of winter-run (age-3 impact rate south of Point Arena, CA) for ocean fisheries in a given year. For example, a control rule which allows a fixed annual fishing impact rate could be simulated and compared to other control rules that specify reduced allowable impact rates when population abundance is low. The goal of this simulation work was to evaluate the relative performance of various control rules in terms of conservation and fishery criteria.

In order to perform the simulations, the Team developed a model for winter-run such that the prescribed fishing impact rate under a control rule could be directly input as a source of mortality (with its attendant uncertainty). This mortality affected spawning abundance, leading directly to the generation of the next cohort, and on throughout the population simulation (Winship *et al.* 2012). The MSE evaluated three control rules with constant age-3 fishery impact rate target scenarios representing: no impact (0 percent), estimated historical fishery impact rate (25 percent), and current era fishery impact rate (20 percent). The MSE also considered other variations of control rules with decreasing age-3 fishery impact rates at decreasing population abundance levels (Winship *et al.,* 2012). These are described in the paragraph titled ''Public Comment and Availability of the winter-run Management Strategy Evaluation'' below. The performance of alternative control rules was compared in terms of established population performance criteria and the implications for ocean fisheries. A paper consistent with the Winship *et al.* (2012) report describing the winter-run MSE was subsequently published (Winship *et al.,* 2013).

Public Comment and Availability of the Winter-Run Management Strategy Evaluation

NMFS seeks input from the public on the control rules analyzed in the MSE as described in Winship et al. 2012 (''the MSE report''), particularly on whether commenters prefer one of those control rules over the others, and the reasons for such preference. The comment period will conclude at 5:00 p.m. on April 23, 2014, NMFS will consider all comments received by the end of the comment period as we move forward to consider potential changes to the management approach. The MSE report (Winship *et al.,* 2012) is available at the following

Web site *http://www.pcouncil.org/wp-content/uploads/SRWC_MSE_2012_02_28.pdf* and by mail upon request. NMFS is specifically interested in comments and information regarding a preferred control rule analyzed in the MSE for ocean salmon fisheries south of Point Arena that is responsive to the abundance of the species. The control rules are described in the MSE report as ''management strategies'' and are as follows: management strategy 1 allowed for a zero age-3 impact rate, management strategy 2 used a historical impact rate of 25 percent, management strategy 3 used the current era impact rate of 20 percent, and management strategies 4 through 6 required a reduction in impact rates at certain abundance thresholds. The control rule included in the current RPA (referred to as ''management strategy SWR'' in the Winship *et al.* 2012 addendum, beginning on page 57 of the document at *http://www.pcouncil.org/wp-content/uploads/SRWC_MSE_2012_02_28.pdf* was also analyzed with results presented in Winship *et al.* 2012 (addendum); we welcome comments on this control rule as well.

References

Lindley, S.T., R.S. Schick, E. Mora, P.B. Adams, J.J. Anderson, S. Greene, C. Hanson, B.P. May, D.R. McEwan, R.B. MacFarlane, C. Swanson, and J.G. Williams. 2007. Framework for assessing viability of threatened and endangered Chinook salmon and steelhead in the Sacramento-San Joaquin Basin. San Francisco Estuary and Watershed Science 5(1), Article 4: 26 pages. Available at: *http://repositories.cdlib.org/jmie/sfews/vol5/iss1/art4.*

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Dated: January 16, 2014.

Sean F. Corson,

Acting Deputy Director, Office of Sustainable Fisheries, National Marine Fisheries Service.

[FR Doc. 2014–01239 Filed 1–22–14; 8:45 am]

BILLING CODE 3510–22–P

DEPARTMENT OF DEFENSE

Department of the Navy

Meeting of the Board of Advisors to the Presidents of the Naval Postgraduate School and the Naval War College

AGENCY: Department of the Navy, DoD.

ACTION: Notice of Open Meeting.

SUMMARY: Pursuant to the provisions of the Federal Advisory Committee Act (Pub. L. 92–463, as amended), notice is hereby given that the following meeting of the Board of Advisors (BOA) to the Presidents of the Naval Postgraduate School (NPS) and the Naval War College (NWC) and its two subcommittees will be held. This meeting will be open to the public.

DATES: The meeting will be held on Wednesday, February 19, 2014, from 8:00 a.m. to 4:00 p.m. and on Thursday, February 20, from 8:00 a.m. to 4:00 p.m. Eastern Time Zone.

ADDRESSES: The meeting will be held at 900 N. Glebe Road, Arlington, VA.

FOR FURTHER INFORMATION CONTACT: Ms. Jaye Panza, Naval Postgraduate School, Monterey, CA, 93943–5001, telephone number 831–656–2514.

SUPPLEMENTARY INFORMATION: The Committee examines the effectiveness with which the NPS and the NWC are accomplishing its missions. The agenda is as follows:

(1) February 19, 2014: General deliberations and inquiry by the NWC BOA Subcommittee and its parent committee NPS/NWC BOA into its programs and mission priorities; re-accreditation preparedness; administration; state of morale of the student body, faculty, and staff; fiscal affairs; and any other matters relating to the operations of the NWC as the board considers pertinent.

(2) February 20, 2014: The purpose of the meeting is to elicit the advice of the NPS BOA subcommittee on the Naval Service's Postgraduate Education Program and the collaborative exchange and partnership between the NPS and the Air Force Institute of Technology. With its parent committee NPS/NWC BOA, the board will inquire into programs and curricula; instruction; administration; state of morale of the student body, faculty, and staff; fiscal affairs; as well as reviewing the updates on recommendations cited in the 2012 Navy Inspector General's report. The committee will review any other matters relating to the operations of the NPS as the board considers pertinent.

Individuals without a DoD Government Common Access Card require an escort at the meeting location. For access, information, or to send written statements for consideration at the committee meeting must contact Ms. Jaye Panza, Naval Postgraduate School, 1 University Circle, Monterey, CA 93943–5001 or by fax 831–656–3145 by February 7, 2014.

Dated: January 15, 2014.

N. A. Hagerty-Ford,

Commander, Office of the Judge Advocate General, U.S. Navy, Federal Register Liaison Officer.

[FR Doc. 2014–01265 Filed 1–22–14; 8:45 am]

BILLING CODE 3810–FF–P

DEPARTMENT OF ENERGY

Office of Energy Efficiency and Renewable Energy

[Case No. CD–009]

Energy Conservation Program for Consumer Products: Decision and Order Granting a Waiver to Indesit Company from the Department of Energy Residential Clothes Dryer Test Procedure

AGENCY: Office of Energy Efficiency and Renewable Energy, Department of Energy.

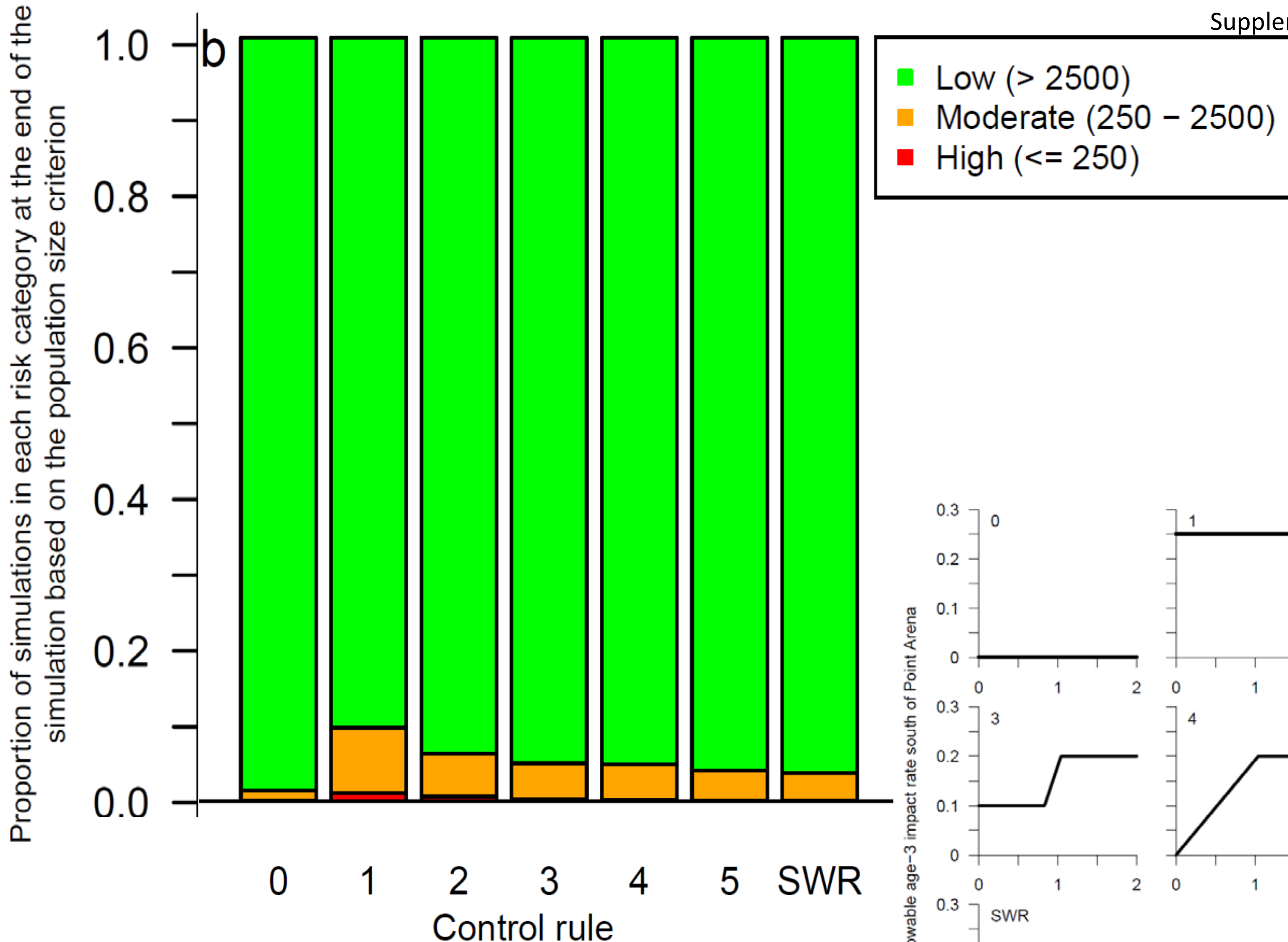
ACTION: Decision and order.

SUMMARY: The U.S. Department of Energy (DOE) gives notice of the

Table 1. Allowable or *de minimis* Fishery Impact Rates on Salmonid Stocks Listed under the Endangered Species List

Evolutionarily Significant Unit	Status	Exploitation Rate (ER)	Other Provisions
Chinook			
Sacramento River Winter	**Endangered**	0%	Includes additional time and area restrictions south of Point Arena CA. Discountable impacts north of Point Arena, CA.
Snake River Spring/Summer	Threatened	<5.5%	No specific guidance, protective measures for Upper Columbia River Spring-run as a surrogate.
Puget Sound	Threatened		Resource Management Plan under 4(d) rule. Stock specific Recovery ERs that do not go to zero.
Lower Columbia River Tule Fall	Threatened	≤ 30.0%	
Upper Willamette River	Threatened	≤ 15.0%	Harvest rate in freshwater fisheries. Additional 10-15% in Alaskan and Canadian ocean fisheries.
Upper Columbia River Spring	**Endangered**	<5.5%	
Central Valley Spring	Threatened		No specific guidance.
California Coastal	Threatened	≤ 16.0%	Klamath fall Chinook ocean age-4 f harvest rate.
Snake River Fall	Threatened	≤~40%	≤ 70.0% of 1988-1993 base period exploitation rate for all ocean fisheries.
Coho			
Central California Coastal	**Endangered**	No limit specified.	No directed fisheries or retention of coho in all commercial and recreational fisheries off California.
S. Oregon/ N. California Coastal	Threatened	≤ 13.0%	No retention in California.
Oregon Coastal	Threatened	≤ 8.0%	
Lower Columbia River	Threatened	≤ 8.0%	
Sockeye			
Snake River	**Endangered**	5.0%	
Chum			
Hood Canal Summer	Threatened	2.5-4.6%	Southern U.S. Waters. Population specific.

PFMC
03/13/14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Low (> 2500)
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High (<= 250)
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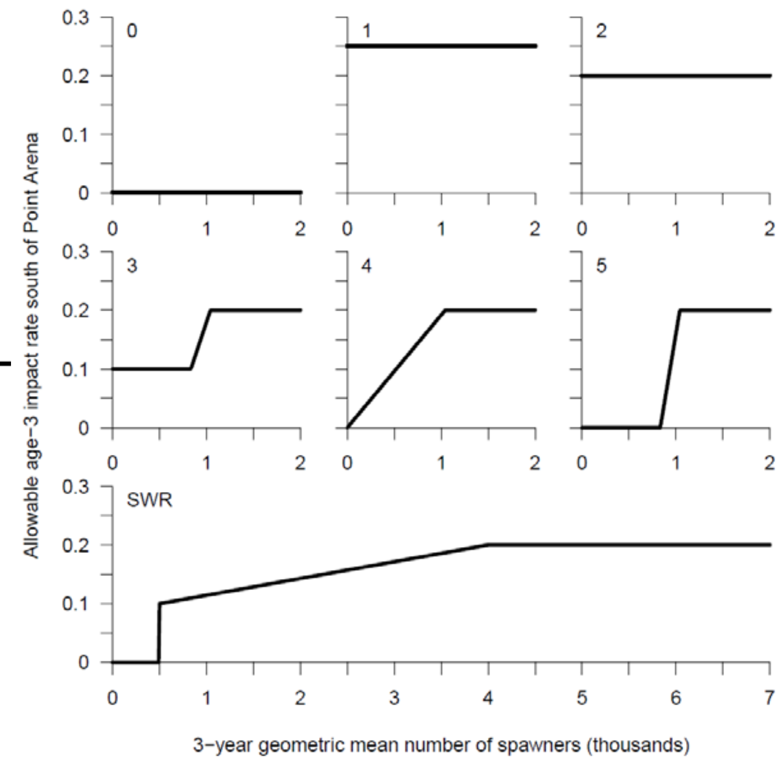
Control rule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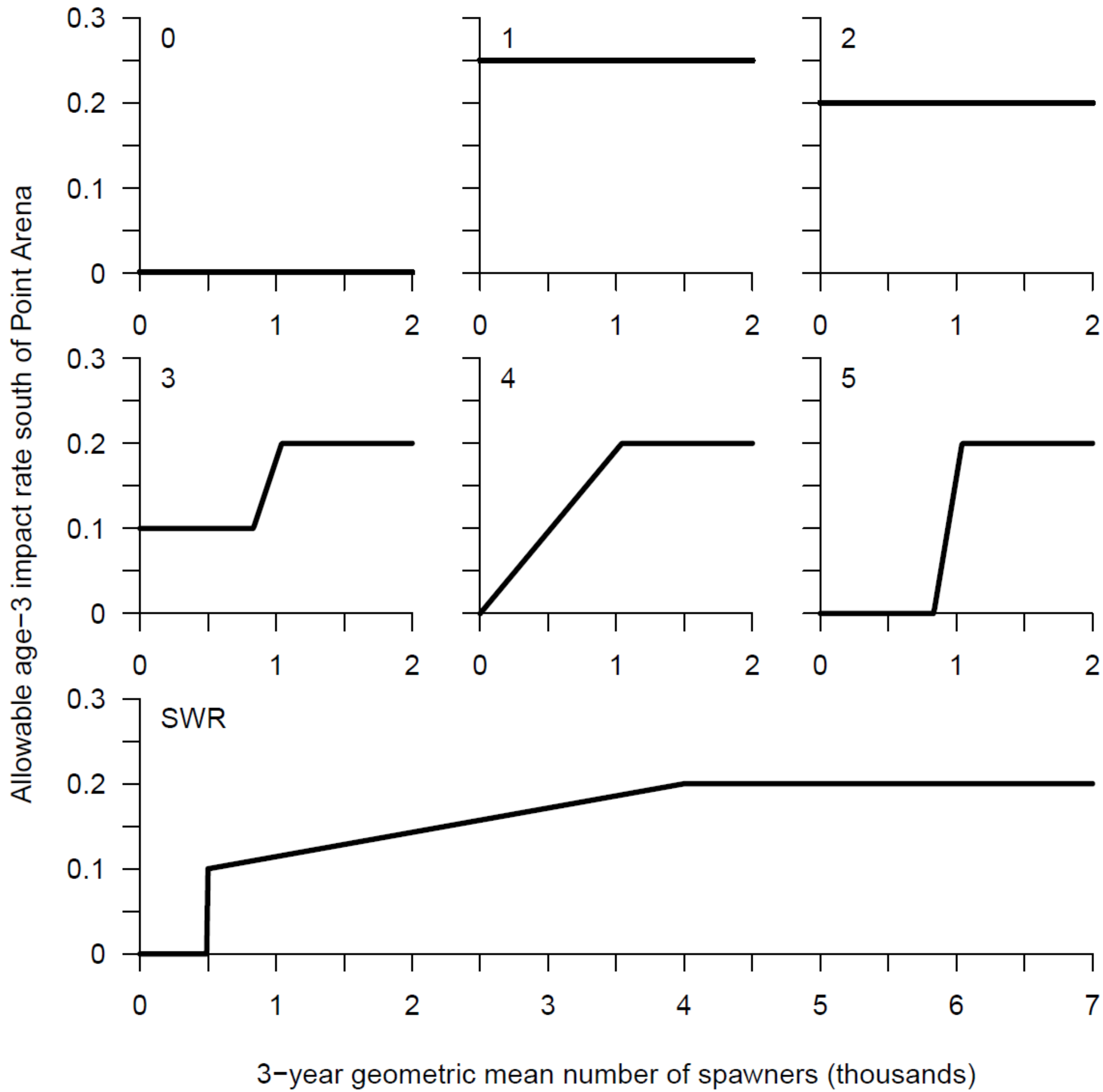
SWR
Allowable age−3 impact rate south of Point Arena
3−year geometric mean number of spawners (thousands)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7
Allowable age−3 impact rate south of Point Arena
3−year geometric mean number of spawners (thousands)

Winter Run Documents on the Council's Web Site

- Final Implementation of the 2010 Reasonable and Prudent Alternative Sacramento River Winter-Run Chinook Management Framework for the Pacific Coast Salmon FMP (April 30, 2012)

- Management Strategy Evaluation for Sacramento River Winter Chinook Salmon (February 28, 2012)

- Final Harvest Biological Opinion, Sacramento River Winter Run Chinook Salmon (April 30, 2010)

- NMFS White Paper: Abundance-based Ocean Salmon Fisheries Management Framework for Sacramento River Winter-run Chinook (March, 2012 Briefing Book)

- Federal Register Notice (March, 2014 Briefing Book) *Comment Period Closes April 23, 2014.*

Additional Link cited in the Fed. Register Notice

- The Winter-run Chinook Harvest Model (May, 2012)

SALMON ADVISORY SUBPANEL REPORT ON SACRAMENTO RIVER WINTER CHINOOK HARVEST CONTROL RULE

The Salmon Advisory Subpanel (SAS) has reviewed the Federal Register notice and received the benefit of a presentation from Dr. Michael O'Farrell about the history of the current Sacramento River winter Chinook control rule and the relative protections and fishing opportunities provided under the alternative control rules that have been proposed. The SAS notes that greater restrictions on fishing opportunities do not translate into proportional reductions in the extinction risk of Sacramento River winter Chinook.

The SAS appreciates that any control rule must necessarily reduce fishing impacts in response to lower Sacramento River winter Chinook abundances. Alternative control rules 3, 4 and 5 meet this criterion. Among these alternatives, the SAS prefers control rule 4 because it provides for a linear response as Sacramento River winter Chinook abundances fall. While the computer models suggest that control rules 3 and 5 offer comparable protection for the Sacramento River winter Chinook, the abrupt changes may result in under- or over-compensation in particular instances.

PFMC
03/12/14

SCIENTIFIC AND STATISTICAL COMMITTEE REPORT ON SACRAMENTO WINTER CHINOOK HARVEST CONTROL RULE

Dr. Mike O'Farrell (Southwest Fisheries Science Center) gave a presentation to the Scientific and Statistical Committee (SSC) on the management strategy evaluation (MSE) that formed the basis for determining a harvest control rule for Sacramento Winter Run Chinook. The MSE and its results had been examined previously during a workshop associated with the April 2013 Council meeting in which members of the SSC, Salmon Technical Team, and Salmon Advisory Subpanel participated. The current Sacramento Winter Run Chinook jeopardy standard includes a harvest control rule adopted by National Marine Fisheries Service Southwest Region (SWR) in 2012 that was based on the MSE analyses. The current SWR rule, along with a variety of alternative harvest control rules, were evaluated at the workshop. The operational model for the MSE and components of the model used to evaluate the harvest control rule alternatives have been peer reviewed and published. The SSC notes that results from MSE analyses are best used as a means to compare proposed harvest control rules on a relative basis but the empirical results from model runs (such as the frequency of occurrence of no fishing periods) should not be viewed as accurate predictions of future events.

The SSC endorses the MSE as the best available science for evaluating the harvest control rules for Sacramento Winter Run Chinook.

PFMC
03/11/14

SALMON TECHNICAL TEAM REPORT ON SACRAMENTO WINTER CHINOOK HARVEST CONTROL RULE

The management strategy evaluation analysis used to inform the current National Marine Fisheries Service consultation standard for Sacramento River winter Chinook considered a wide range of alternative control rules including no fishing, historical fishery impact rates, recent fishery impact rates, and control rules that included *de minimis* fishing with control rules that go to zero at zero abundance and at abundance levels greater than zero. The range of control rules were evaluated both in terms of extinction risk and effects on fishing opportunity. The results were consistent, predictable, and can be used to reasonably infer the effects of the range of control rules considered. The analyses were subsequently peer reviewed and published in a scientific journal. The Salmon Technical Team believes that consideration of alternative control rules is a policy issue rather than a technical one.

PFMC
03/12/14

CALIFORNIA COASTAL CHINOOK UPDATE

Northern California Chinook stocks include fall and spring stocks north of the entrance to San Francisco Bay. Primary river systems in this area are (from north to south) the Smith, Klamath, Mad, Eel, Mattole, and Russian rivers. Coastal Chinook stocks south of the Klamath River were listed as threatened under the Endangered Species Act (ESA) in September 1999. The ESA consultation standard for California Coastal Chinook relies on Klamath River fall Chinook (KRFC) as a surrogate and requires a forecast KRFC age-4 ocean harvest rate of no greater than 16.0 percent when developing salmon fishery management measures. This consultation standard has been a limiting factor in the management of salmon fisheries in California and Oregon in recent years.

The Council has expressed an interest in evaluating the feasibility of alternative management approaches for California Coastal Chinook primarily through the annual salmon methodology review process. A workshop was held at the 2013 April Council meeting in Portland, Oregon to review the status, monitoring, and management of these stocks. The workshop was primarily attended by Council advisory body members, as it occurred during a Council session. Participants were encouraged by the monitoring and assessment work being done by the California Department of Fish and Wildlife (CDFW) and National Marine Fisheries Service, but most agreed that the existing data on these stocks is a limiting factor when considering alternative management approaches. Additionally, many felt that the Council would benefit from a review of the current monitoring effort, and thus this agenda item.

Mr. Michael Lacy with the CDFW Fisheries Branch in Sacramento will present an overview of the CDFW monitoring program for California Coastal Chinook (Agenda Item F.9, Attachment 1). Dr. Michael O’Farrell of the National Marine Fisheries Service (NMFS),Southwest Fisheries Science Center will provide an overview of California Coastal Chinook status, data, and management strategy (for supporting materials refer to the March 2013 Briefing Book, Agenda Item C.3.b, Supplemental NMFS Report).

Council Action:

Discuss the CDFW presentation and consider California Coastal Chinook management issues.

Reference Materials:

1. Agenda Item F.9.a, Attachment 1: California Coastal Salmonid Population Monitoring Strategy, Design, and Methods. CDFW, 2011.

Agenda Order:

a. Agenda Item Overview — Mike Burner
b. Reports and Comments of Advisory Bodies and Management Entities
c. Public Comment
d. **Council Action**: Consider California Coastal Chinook Management Issues

PFMC
02/13/14

Agenda Item F.9.a
Attachment 1
March 2014

State of California
The Natural Resources Agency
Department of Fish and Game

Fish Bulletin 180

CALIFORNIA COASTAL SALMONID POPULATION MONITORING: STRATEGY, DESIGN, AND METHODS

By

Peter B. Adams [1]

L.B. Boydstun [2]

Sean P. Gallagher [3]

Michael K. Lacy [4]

Trent McDonald [5]

and

Kevin E. Shaffer [4]

2011

[1] National Marine Fisheries Service, Southwest Fisheries Science Center, Santa Cruz, CA 95060
[2] Fisheries Consultant, Fair Oaks, CA 95628
[3] California Department of Fish and Game, Northern Region, Fort Bragg, CA 95437
[4] California Department of Fish and Game, Fisheries Branch, Sacramento, CA 95814
[5] West, Inc, Cheyenne, WY, 82001

ACKNOWLEDGEMENTS

There are far too many people that have contributed to this plan to acknowledge all of them individually. Large numbers of people participated in the two initial workshops. Many people participated in writing groups that contributed to the documents that preceded this plan. Both of these efforts provided operational and biological expertise that is the underlying structure of this plan. Neil Manji, CDFG, Larry Week, CDFG, David Boughton, NOAA Fisheries, Scott Hill, NOAA Fisheries, and Churchill Grimes, NOAA Fisheries were substantially involved in the project in its early stages. Over thirty individuals from both CDFG and NOAA Fisheries contributed agency reviews of the document. Scientific reviews were provided by David Hankin, Humboldt State University, Ken Newman, United States Fish and Wildlife Service, Anthony Olsen, Environmental Protection Agency, Jeff Rogers, Oregon Department of Fish and Wildlife, and Carl Schwartz, University of British Columbia. All of these reviews substantially improved the Plan. Russ Bellmer and Terry Foreman provided final edit review that significantly improved this paper. We would like to thank Meredith Fleener of CDFG for formatting the paper into the bulletin template and assisting in the final editing of the manuscript. Funding provided by CDFG Fishery Restoration Grant Program grant # P0210567 supported earlier versions of this document.

EXECUTIVE SUMMARY

California's salmon and steelhead populations have experienced marked declines leading to listing of almost all of California's anadromous salmonids under the California Endangered Species Act (CESA) and Federal Endangered Species Act (ESA). Both CESA and ESA listings require recovery plans that call for monitoring to provide some measure of progress toward recovery. In addition, there are related monitoring needs for other management activities such as hatchery operations and fisheries management.

This California Coastal Salmonid Monitoring Plan (CMP) has been developed to meet these monitoring needs, describing the overall strategy, design, and methods used in monitoring salmonid populations. Implementation details of the plan are described in Shaffer (in prep.). The CMP uses the Viable Salmonid Population (VSP; McElhany et. al. 2000) concept as the framework for plan development. The VSP conceptual framework assesses salmonid viability in terms of four key population characteristics: abundance, productivity, spatial structure, and diversity. High abundance buffers a population against both 'normal' and catastrophic variation due to environmental conditions and loss due to anthropogenic factors. High productivity will lead to more certain replacement when populations are placed under either natural or anthropogenic stress. Wide spatial structure reduces extinction risk due to catastrophic events and provides pathways for recolonization. Diversity in life history traits (e.g., time of spawning, juvenile life history, adult fish size, age structure, degree of anadromy, etc.) provides resilience against extinction risk from changing conditions.

The CMP divides California into Northern and Southern areas with a boundary south of Aptos Creek and north of the Pajaro River, based on differences in species composition, levels of abundance, distribution patterns, and habitat differences that necessitate different monitoring approaches.

Both the larger Evolutionarily Significant Units-level scale and the population viability criteria are based on the four VSP parameters. The assessment of viability, however, will be based upon adult population size, and the distribution and connectivity of these populations (Boughton et al. 2007, Spence et al. 2008, and Williams et al. 2008). The CMP provides a sampling framework to collect information at the appropriate life stages and spatial scales to evaluate adult salmonid abundance both at larger regional scales and at the population level. Productivity is calculated as the trend in abundance over

time. CMP design also allows basic assessments of connectivity through the collection of juvenile distribution and relative abundance data. Measurement of diversity will be based on local evaluation of essential life history variants and both broad and focused assessments of genetic diversity patterns.

Adult abundance monitoring will be approached differently between the Northern and Southern areas due to differences in species composition, abundances, and habitat conditions. In the Northern Area, adult numbers will be estimated mostly through expanded redd surveys and in the Southern Area adults will be counted at fixed stations. In the Northern Area, adult abundance estimates will be needed for multiple species over large areas. Surveys will be selected in a random, spatially balanced manner. Spatial balance is important because salmonid numbers from samples near each other tend to be similar, so that more information relevant to a regional scale evaluation is obtained from samples that are spaced out. Redd surveys have generally been shown to be the most reliable means of estimating multi-species populations in California, but will require redd-to-adult corrections to estimate numbers of adults by species from them. Other methods (e.g., live fish counts for Chinook salmon) will be used where necessary.

In the Southern Area, steelhead are the only salmonid present and populations are very small, making abundance difficult to assess. Steelhead arrival is associated with storm events that raise water levels drastically. These species characteristics and environmental features therefore make steelhead in the Southern Area difficult to monitor, and due to the low abundance and difficult sampling conditions, fixed stations will be used to count adult Southern Area steelhead.

Spatial structure refers to the geographical and ecological distribution of salmonids across the landscape. Broad spatial distribution and connectivity among populations are important traits that protect against the effects of catastrophic events and buffer extinction risk, particularly at low abundance. Spatial structure will be monitored using summer and fall juvenile snorkel surveys over reaches selected in a random, spatially balanced manner. A larger number of juvenile surveys can be accomplished in less time and expense than adult surveys because it is simpler and can occur at a more operationally favorable time of the year.

In the Northern Area, spatial structure monitoring will be conducted only for coho salmon since steelhead occur over a wider area. This monitoring will provide estimates of coho salmon spatial structure. Since steelhead occur over a wide area, they will be counted as well as a relative measure of spatial structure. Chinook salmon spawn in only a few well-defined areas and outmigrate in the spring before the juvenile surveys take place, and information on their spatial structure will come from adult monitoring. In the Southern Area, juvenile spatial structure monitoring will be conducted for steelhead, the only salmonid present.

Diversity traits are strongly adaptive for local areas and populations, and these traits allow salmonids to survive in the face of unique local natural and anthropogenic challenges. Higher level diversity traits have been considered in the creation of the listing and stratification units; however, population level diversity traits may be very different from one geographical or population unit to another. Therefore, local diversity traits will need to be surveyed, eventually leading to local diversity monitoring plans. Specific projects targeting both broad and focused levels and patterns of genetic diversity will be developed. Tissue collections for these projects will be coordinated with other CMP activities.

Life Cycle Monitoring (LCM) stations will provide estimates of freshwater and ocean survival, essential to understanding whether changes in salmonid numbers are due to recovery from improvements in freshwater habitat conditions or changes in ocean conditions. An LCM station will include an absolute measure of adult abundance from a counting facility, a spawning survey estimate of adult abundance, and an estimate of outmigrating smolts. The adult counts and outmigrant smolt counts will provide estimates of fish in and fish out, that can be used to provide relative estimates of freshwater and marine survival. The counting station data and adult survey estimates will be used to develop an estimation factor between redds and adults for calibration of adult surveys conducted in other watersheds. The LCM sites are also expected to be magnets for other kinds of recovery-oriented research, particularly studies of fish habitat-productivity relationships and evaluations of habitat restoration effectiveness.

Finally, a data management structure will be created to provide general access to the CMP data. Monitoring is necessary to provide data that will be analyzed to inform management decisions, and those data must be made available in a timely manner to managers in a usable form. The data management structure is one of the most important parts of the CMP, ensuring that consistent data standards and protocols are applied across and within monitoring areas and that data flow is coordinated from the field to a central data collection center. It will also ensure that data reporting necessary for common analytical activities occurs in a timely manner and will provide a data source for other analytical needs.

CONTENTS

INTRODUCTION

Background

Drastic declines in salmon and steelhead populations have led to California Endangered Species Act (CESA) and/or Federal Endangered Species Act (ESA) listings covering all of California's anadromous salmonid waters (CDFG 2002, Good et al. 2005). Both CESA and ESA allow listing of subgroups of vertebrate species called Evolutionarily Significant Units (ESUs) for salmon and Distinct Population Segments (DPSs) for steelhead. These units are collections of populations used for species status assessments. In this document, the term ESU may also include reference to DPS. In California, all coho salmon (*Oncorhynchus kisutch*) are listed under both the CESA and ESA (Figure 1). All steelhead (*O. mykiss*) south of the Klamath River and coastal Chinook salmon (*O. tshawytscha*) south of the Klamath River to the Russian River are federally-listed under the ESA. Although not addressed in this plan, Central Valley winter-run and spring-run Chinook salmon are listed under both CESA and ESA and Central Valley steelhead are listed under the ESA. These listings require that both the California Department of Fish and Game (CDFG) and the National Marine Fisheries Service (NMFS) develop recovery strategies that will conserve, protect, restore, and enhance listed species. The Federal government requires that recovery planning include objective, measurable criteria that, when met, would result in a determination that the species be removed from listing (16 USC 1531, Endangered Species Act 1973). California further requires that listed salmonids be recovered to a level of abundance that would permit commercial use (California Fish and Game Code Sections 2050 to 2097).

Development of recovery goals that would result in delisting and achieving those goals through effective implementation of State and Federal recovery plans are at the core of the two agencies' responsibilities, and the ability to measure progress toward recovery at the ESU and population levels is fundamental to the process. Currently, monitoring of California's adult coastal anadromous salmonid populations is limited to a few adult counting stations, localized carcass surveys of fall Chinook salmon in various reaches (e.g., the Klamath, Mad, and Eel rivers), snorkel surveys of the major spring Chinook salmon and summer-run steelhead populations, and production and harvest monitoring of Klamath-Trinity Basin fall Chinook salmon (Boydstun and McDonald 2005). Limited monitoring of winter-run steelhead and more recently, salmonid moni-

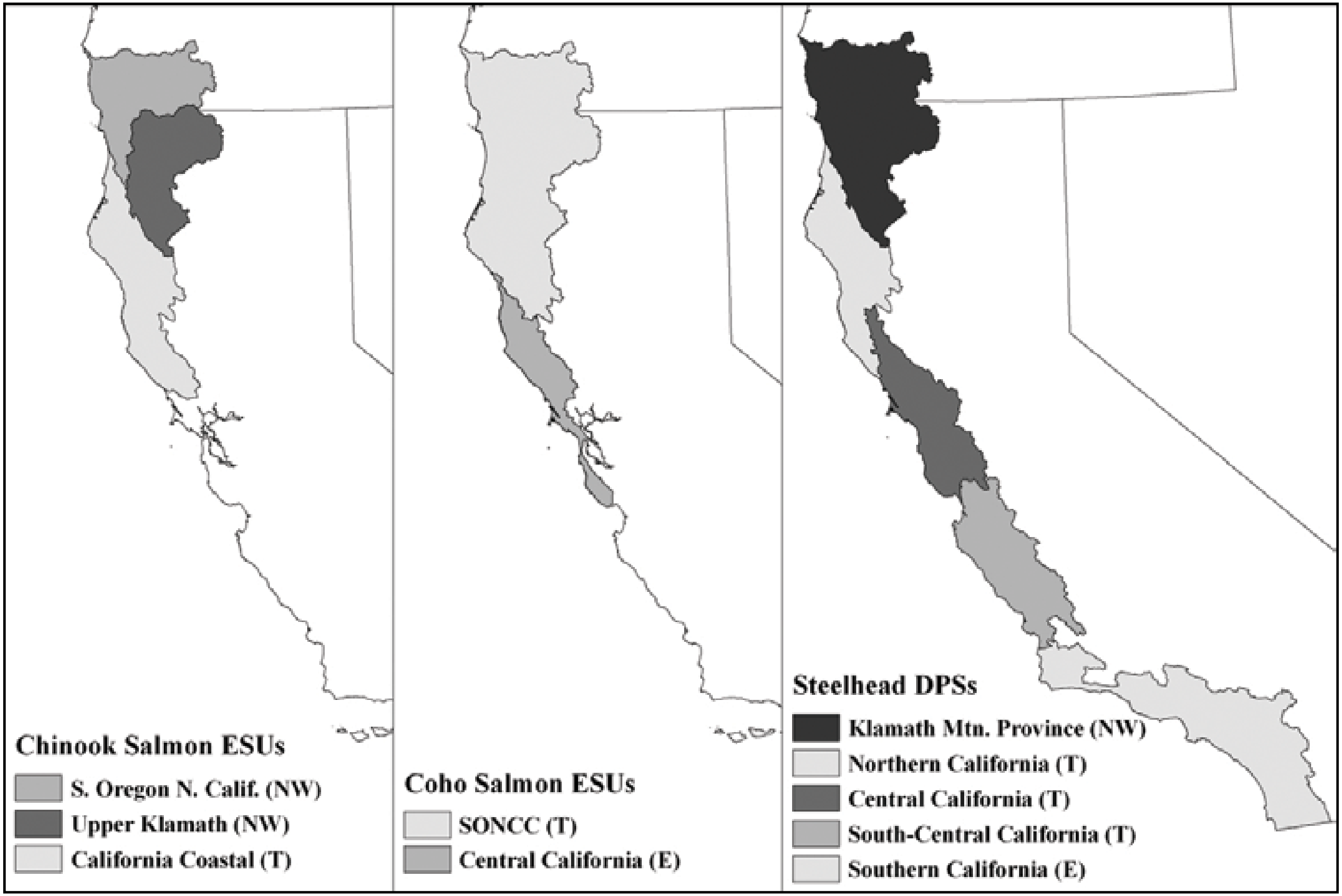

Figure 1. Evolutionarily Significant Units (ESUs) and Distinct Populations Segments (DPSs) for California Coastal Chinook and coho salmon ESUs, and steelhead DPSs. ESU and DPS designations: E for Endangered; T for Threatened; NW for not warranted. Designations by National Marine Fisheries Service, NOAA Fisheries.

toring associated with the development of the California Coastal Salmonid Monitoring Program (CMP) has begun in the Mendocino County coastal area; Freshwater Creek, Humboldt County; Lagunitas Creek, Marin County; and Scott Creek, Santa Cruz County (ibid). Broader and more intensive monitoring efforts are necessary to fulfill the responsibilities to measure progress toward recovery.

There is, of course, an even wider variety of other needs for salmonid monitoring, both to obtain specific information associated with recovery (e.g., hatchery impacts, restoration effectiveness) and for fishery management. Coastal salmonid monitoring has been considered in detail before, and this document summarizes and updates earlier efforts (Boydstun and McDonald 2005, Shaffer, in prep), and was prepared for use in developing a CMP. It should be considered a living document, as it will be modified as new information becomes available. The document has been peer-reviewed to ensure completeness, appropriateness, and use of current approaches to monitor California coastal salmonids.

California Coho Salmon Recovery Strategy

The primary purpose of the Recovery Strategy for California Coho Salmon (CDFG 2004) is to outline actions that will return coho salmon populations to a level of sustained viability and that will allow delisting under CESA. The strategy lists five goals to achieve this purpose: 1) maintain and improve numbers of key populations and cohorts, 2) maintain and increase the number of spawning adults, 3) maintain and enhance the range and maintain and increase the distribution of coho salmon in the State, 4) maintain existing habitat, and 5) enhance and restore habitat within the species' range. The State's recovery strategy identifies an additional objective to reach and maintain coho salmon population levels sufficient to allow resumption of tribal, recreational, and commercial fisheries in California.

Monitoring is essential to assess progress toward (or attainment of) specific regional recovery goals for key populations, such as numbers of spawning adults, range and distribution of fish, brood-year structure (presence), and number of stream kilometers restored or enhanced. The recovery strategy proposes monitoring focused on two essential elements: 1) the status and trends of coho salmon populations, their range and distribution attributes and habitat condition, and 2) the performance of coho salmon recovery efforts. The CMP as described in this document is incorporated into the recovery strategy as the foundation for determining coho salmon status and monitoring of trends. Additional efforts to expand CMP are underway to develop implementation, effectiveness, and validation monitoring of restoration projects to address monitoring the effectiveness of restoring estuarine and freshwater habitat for coastal salmon and steelhead.

Need for Coastal Monitoring Program

Evaluation of species viability

The Viable Salmonid Population (VSP) concept (McElhany et al. 2000, see Boydstun and McDonald 2005, Appendix B) is a conceptual framework for use in assessing salmonid population viability, and by extension, ESU viability. The VSP framework identifies four key characteristics central to attaining and maintaining long-term population viability: abundance, productivity, spatial structure, and diversity. NMFS Technical Recovery Teams (TRTs) have provided localized and detailed strategies for establishing and meeting VSP criteria and the combinations of viable populations that will be necessary to achieve a viable ESU. The CMP is designed to collect data that will allow evaluation of ESU and population viability through assessing VSP parameters. It also provides methods to assess viability at varying spatial scales, from the ESU to the individual population level, and at smaller spatial scales such as individual watercourses.

Evaluation of the effect of ocean conditions on recovery

Work over the last two decades has demonstrated the effects of ocean conditions on salmonid abundance (Ware and Thomson 1991, Francis and Hare 1994, Loggerwell et al. 2003, Botsford et al. 2005, Mueter et al. 2007 and others). Salmonids experience wide variation in marine survival that results from cyclic and non-cyclic changes in ocean conditions. These wide changes in ocean survival can mask both species recovery and declines (Lawson 1993). Effective monitoring should provide an independent measure of ocean survival so that recovery can be accurately assessed. The CMP proposes long-term, intensive monitoring at fixed Life Cycle Monitoring (LCM) stations to evaluate the effects of changing ocean conditions on salmonid populations.

Evaluation of freshwater habitat conditions

Although many factors have contributed to the decline of Pacific salmon (NRC 1995, 1996), the primary cause of imperilment of ESA-listed species overall is degradation and loss of habitat (Wilcove et al. 1998, Gregory and Bisson 1997). An understanding of the relationships among salmonid production, population health, and freshwater habitat condition is essential to developing effective recovery strategies (Holtby and Scrivener 1989, Jones and Moore 1999), for evaluation of progress toward recovery, and to inform listing and delisting decisions under both the CESA and ESA (ESA, 1973, Sec. 4, and CCR Title 14, Sec. 670.1, respectively). Without an understanding of freshwater habitat conditions, meeting State and Federal delisting requirements cannot be accomplished. In addition, State recovery criteria specify that habitat protection and improvement objectives must be met (CDFG 2004).

Specific links between fish production and freshwater habitat condition are difficult to determine, and have not been well established (Smokorowski et al. 1998, Roni et al. 2002, Feist et al. 2003). Current thinking tends toward the view that population viability is more dependent on a complicated collection of spatial features and processes at the landscape level (Dunning et al. 1992, Bond and Lake 2003, Williams and Reeves 2003). Habitat monitoring is not included as part of this plan, but will be dealt with in a separate document.

Plan Goals and Objectives

The goals and objectives of the CMP are to develop broad and intensive monitoring strategies and techniques that:

1) Create a monitoring framework that includes all coho salmon, Chinook salmon and steelhead in coastal California;
2) Provide regional (ESU-level) and population abundance estimates for both status and trend of salmonid populations;
3) Estimate productivity trends from status abundance data;
4) Provide estimates of regional and population level spatial structure of coastal salmonids;
5) Consider the diversity of life history and ecological differences in the three species of interest; and
6) Create permanent LCM stations that will allow deeper evaluation of both freshwater and marine fish-habitat relationships and provide long-term index monitoring.

This document is intended to provide a concise technical description of the overall strategy, design, and methods of the CMP elements for the purpose of technical peer review. Larger, more detailed description of the CMP is presented by Boydstun and McDonald (2005) and the implementation strategy can be found in Shaffer (in prep.).

Finally, it should be pointed out that the CMP does not provide for collecting all salmonid information necessary for a comprehensive evaluation of fisheries, hatchery impacts, and habitat condition. Nor does the CMP contain implementation logistics necessary to execute field operations. These aspects of monitoring are in some cases already available (Johnson et al. 2007) or will be detailed in separate documents.

Plan Development Approach

The CMP is the result of a Salmon Restoration Grant to CDFG and NMFS. The first task of the grant was to hire knowledgeable individuals to write the CMP and develop the proposed statistical methods. The second task was to conduct two workshops to gain scientific consensus on the CMP goals and monitoring priorities by species and life history form. The first workshop provided the general outline for the CMP and the second workshop provided more specific recommendations for geographical areas and for habitat monitoring. The attendees were experts on salmon ecology, sampling, and fisheries and habitat management from NMFS, CDFG, other State and Federal agencies, and various academic institutions. The participants provided input on: 1) technical feasibility of implementing the recommendations in the field, and 2) technical suitability of the resulting data sets for assessing extinction risk under the CESA and the ESA. Scientists involved in developing State and Federal extinction risk criteria and policy standards, as well as in conducting State and Federal status assessments, were centrally involved in the workshop and CMP writing processes. The CMP development process is covered in more detail in the two companion documents by Boydstun and McDonald (2005) and Shaffer (in prep.).

Geographical Areas

The CMP divides California geographically into Northern and Southern monitoring areas due to differences in species composition, abundances, and habitat conditions. Adult abundance monitoring will be approached differently in the Northern and Southern areas so that similar types of sampling are grouped together for operational efficiency. The boundary between the

Northern and Southern monitoring areas is between Aptos Creek, Santa Cruz County and the Pajaro River, Monterey County. Creation of separate Northern and Southern monitoring areas will group areas that have similar monitoring conditions and needs. The sampling efficiencies will be to some extent financial, but to a larger extent, these efficiencies will be due to the ability to apply region-specific operational knowledge of sampling procedures and gear. Also, the Northern and Southern division follows CESA and ESA listing boundaries, CDFG Regional boundaries, and the southern boundary of the Environmental Protection Agency's (EPA) Marine West Coast Forest Ecoregion (EPA 2008). Of course, the differences in these operational efficiencies are not absolute and some amount of knowledge and gear will be transferable across both areas.

The three target species in the Northern Area (Chinook salmon, coho salmon and steelhead) complicates the monitoring design. Species-specific differences in distribution, age at maturity, run-timing, and other life history features will preclude selection of sampling locations that fulfill the monitoring requirements of all three species simultaneously. Chinook salmon from south of the Klamath River to the Russian River are ESA listed (Good et al. 2005). Coho salmon from the Oregon border to Aptos Creek, the end of their range, are both CESA and ESA listed. Steelhead are listed throughout the entire coastal area except the Klamath River Basin and north to the Oregon border. Because species-specific needs require some prioritization, sampling will have to be geographically weighted to focus on species with greater risk of extinction. Very sophisticated sample draws will be necessary to obtain the most appropriate distribution of monitoring effort. In contrast, in the Southern Area, only steelhead are present, greatly simplifying the sampling design and the elements of drawing an appropriate sample.

In the Northern Area, the available information suggests that standard adult surveys can be successful (Ricker 2005, Gallagher and Gallagher 2005, Gallagher et al. 2010a). However due to very low steelhead abundance in the Southern Area, monitoring there will need to be very different. Low and patchy steelhead abundance adds considerable difficulty and therefore expense to monitoring in the south. The two Southern Area steelhead DPSs, South-Central California Coastal and Southern California, have severely reduced abundance, although how severely reduced is unknown due to lack of data for almost all populations (Good et al. 2005). In addition to the need for monitoring low or even rare abundances, there are concerns about the timing of the adult runs. Steelhead in the Southern Area are thought to migrate into rivers associated with one or a few large hydrologic or storm events, but this is unproven. The question of whether steelhead migrate in large groups or spread throughout the season raises concerns on how they should be monitored. In addition, there are also concerns about spatial distribution once steelhead are in the watershed. If grouped in only a few locations, how would those locations be targeted for sampling? Due to these concerns about monitoring Southern Area steelhead, counting the entire population (i.e., a census), usually at a counting station at a passage point in the lower portion of these watersheds should be used rather than dispersed and randomized adult surveys (Boydstun and McDonald 2005).

Finally, the division between the Northern and Southern areas occurs at the major change in hydrological and ecologic conditions, corresponding to the transition from the Coast Range Ecoregion to the Southern and Central California Chaparral and Oak Woodlands Ecoregion (EPA 2008). Ecoregions denote areas of general similarity in ecosystems and in the type, quality, and quantity of environmental resources, and are designed to serve as a spatial framework for the research, assessment, management, and monitoring of ecosystems and ecosystem components. The Coast Range Ecoregion extends from the U.S-Canadian border to just south of Aptos Creek and is characterized by low mountains covered by highly productive, rain-drenched coniferous forests. Coastal redwood (*Sequoia sempervirens*) forests originally dominated the fog-shrouded coast, while a mosaic of western red cedar (*Thuja plicata*), western hemlock (*Tsuga heterophylla*), and Douglas-fir (*Pseudotsuga menziesii*) blanketed inland areas. The primary distinguishing characteristic of the Southern and Central California Chaparral and Oak Woodlands Ecoregion is the Mediterranean climate of hot dry summers and cool moist winters, and associated vegetative cover comprised mainly of chaparral, oak woodlands, and annual grasslands. Salmonid distribution mirrors these changes in habitat and hydrology, creating a logical boundary for the two monitoring areas.

MONITORING PLAN ORGANIZATION

The CMP (Figure 2) is designed to provide information to assess viability of CESA- and ESA-listed salmonids relevant to the four VSP parameters: abundance, productivity, spatial structure, and diversity, and to monitor trends in freshwater and ocean survival. Management decisions are routinely made by both State and Federal agencies based on understanding of these concepts and there is pressing need for improved information on salmonid abundance and distribution to better inform decision-makers. The CMP will also allow recovery partners to monitor salmonid populations in a consistent manner and to provide the essential data for other management purposes. Sampling will occur in a spatially explicit and balanced way, with flexibility in the analyses of larger or smaller spatial groupings of the data, a critical first step for this type of monitoring. The biological information from the CMP will be regularly organized by Northern and Southern areas, ESUs, and individual populations; although analyses can also be conducted at other scales. The CMP also provides organizational structure so data flows efficiently, effectively, and in a timely manner from the collection phase to central databases for editing and analysis.

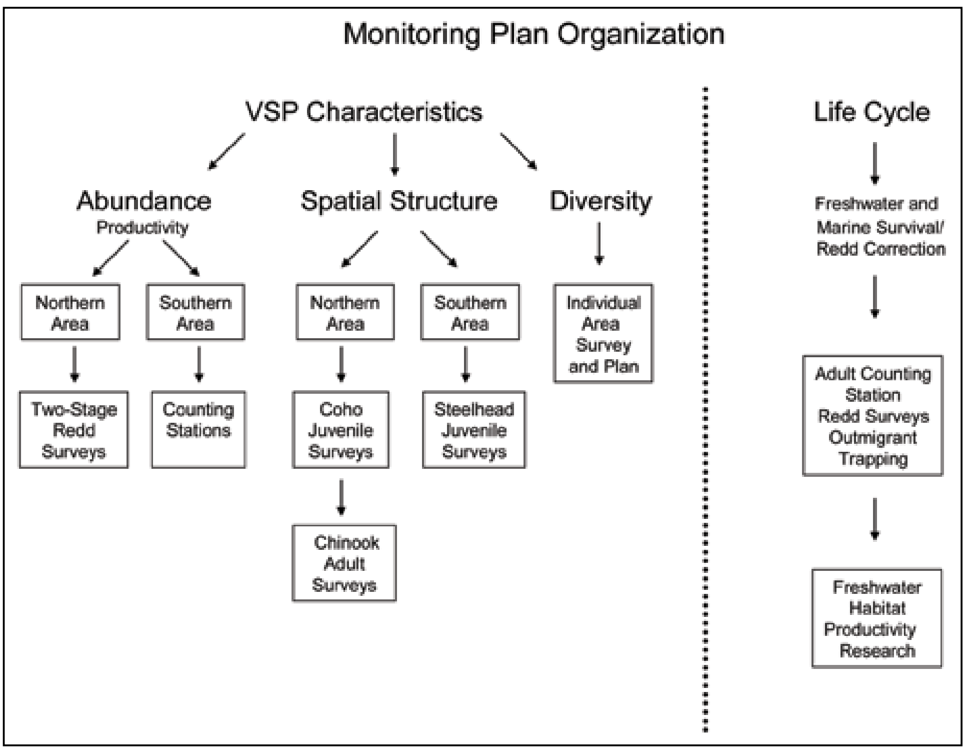

Figure 2. Overall California Coastal Salmonid Monitoring Plan organization based on VSP parameters and Life-Cycle Monitoring.

Adult abundance monitoring will be approached differently in the Northern and Southern areas due to differences in species composition, abundances, and habitat conditions. In the Northern Area, abundance monitoring is needed for Chinook salmon, coho salmon, and steelhead, and will occur through live fish, carcass, and redd surveys for Chinook salmon, and redd surveys for coho salmon and steelhead. These estimates will be expanded to compare to the various species and area goals in the State and Federal recovery plans. Random sampling of stream sample units will be spatially balanced (i.e., evenly distributed) because samples next to each other tend to be similar. Generalized Random Tessellation Stratified (GRTS) sampling is a commonly used method of selecting these types of spatially balanced random samples and is the best compromise between the need for randomization and the need for spatial balance. The proportion of hatchery fish will be estimated over various spatial scales, but these estimates will be contingent on the establishment of a consistent coast wide hatchery marking protocol and programs to conduct the marking, retrieval, and data analysis. In the Southern Area, steelhead is the only salmonid present, and monitoring is complicated because southern steelhead may spawn over an extended period, from January to June (Busby et al. 1996), but may enter rivers and streams in discrete pulses associated with freshets. This protracted spawning period with sporadic entry, coupled with the low abundance and highly patchy distribution once steelhead enter a watershed, pose extreme problems for accurately estimating population size. Therefore, population censuses taken at fish counting facilities are more likely to produce reliable estimates of abundance than adult surveys (Boydstun and McDonald 2005).

Spatial structure monitoring provides data to assess the extent to which populations can maintain connectivity to each other and whether the species distribution is expanding or contracting. Populations will be monitored by juvenile snorkel surveys that are spatially explicit and balanced in the same way as the Northern Area abundance surveys. Snorkel surveys will be adjusted to account for observer efficiency using a revisit technique, allowing the assessment of the data at flexible spatial scales from ESU to population. This approach of targeting juvenile fish in the summer or early fall is operationally simpler and less expensive than adult sampling, allowing for more sample reaches to be surveyed at a lower cost. In the Northern Area, juvenile surveys will be conducted only in sample units identified with coho salmon. Steelhead are widespread in the Northern Area. Chinook salmon spawn in only a few well-defined areas and outmigrate in the spring before the juvenile surveys take place. Some information on their spatial structure will come from adult surveys. In the Southern Area, juvenile surveys will be conducted for steelhead (and resident rainbow trout), since spatial structure is a particularly important characteristic for small populations.

Diversity monitoring is unique to each ESU, population, or individual area, since diversity characteristics are a response, in part, to the habitats where they occur and are strongly adaptive to those conditions. Primary diversity strata (e.g., ESUs) are defined genetically and so extensive genetic baseline surveys are necessary to determine whether subunit genetic diversity strata exist. In addition, each geographical unit requires a survey of phenotypic and other diversity characteristics and a plan for monitoring these characteristics.

Freshwater and ocean survival will be monitored using LCM stations, to assess whether population trends reflect changes in freshwater productivity or a response to changing ocean conditions. Each would have three essential components: an upstream adult counting station, adult surveys above the station, and outmigrant smolt trapping. LCM stations will provide an absolute measure of adult abundance, a survey estimate of adult abundance, and an estimate of outmigrating smolts. The adult counting station and outmigrant smolt counts will provide measures of "fish in and fish out" that will be used to evaluate freshwater and marine survival (Prager et al. 1999). The data from counting stations and adult survey estimates will be used to develop a correction factor between redd counts and adult numbers to calibrate adult surveys conducted in other watersheds. It is expected the LCM stations will be magnets for other kinds of recovery-oriented research, particularly fish habitat-productivity relationships and habitat restoration effectiveness.

SAMPLE DESIGN

The spatial extent of salmonid populations and certainly ESUs are too large to be measured completely. Therefore the biological and physical attributes of a population have to be inferred from a sample of measurements from the population of interest, the basic tenet of statistical inference. The plan develops a coast-wide sampling design based on the random selection of sample stream segments from a sample frame consisting of all possible reaches within a population of interest. This design allows for statistical inference to be made about the entire area within the sample frame, and the uncertainty of these inferences to be evaluated on the basis of probability theory. The unit utilized in the design is the collection of stream segments, and the attributes of this population are species abundance and distribution. This design is the structure within which species abundance and distribution monitoring occurs. Due to the biogeographic differences between the two areas explained earlier in this document (See Geographic Areas section), abundance of adult steelhead in key populations within the Southern Area will be censused, without the use of design-based abundance estimation, but design-based sampling will be used to estimate juvenile steelhead abundance.

<u>Sample Frame Development</u>

Field data cannot possibly be collected from all portions of all streams in either of the monitoring areas; consequently, a properly constructed and ordered sample frame is essential to the overall success of the CMP. As used here, the term sample frame refers to a list of all possible sample units that could potentially be selected as data collection sites in an area of interest. Sample units comprise the sample frame and are the basic stream entities over which sample measurements are made (e.g., approximately 1.6 – 3.2 km stream segment). The area of interest covered by the sample frame is dictated by overall project goals. Sample frames will be constructed with the goal of ensuring all units listed potentially contain one or more fish species of interest. Sample frame construction will target inclusion of units below impassable barriers that have been identified as potential habitat (Agrawal et al. 2005) and that do not have an obvious reason to exclude them. As of 2010, only work on the Northern Area sample frame has been started, but methods for the Southern Area sample frame are identical.

Despite careful thought during construction, some units in the sample frame may be excluded following the sample draw. Post-draw exclusion may be due to 1) failure to meet target population definitions after on-the-ground examination (e.g., inaccurate barrier or gradient measurements that render actual reaches unsuitable for salmonids) or 2) logistical inability to access the site (e.g., inability to secure landowner permission). These are distinct in that the former do not affect inference but the latter do, representing a non-response error. Removal of units completely at random from the post-sample draw reduces analysis efficiency slightly, but otherwise does not cause any ill effects on inferences or the ability of the study to meet monitoring objectives. However, removal of units due to logistical inability to gain landowner permission may introduce bias into the estimates. The segments that are excluded need to be examined carefully at the end each sampling year to determine their effects on data analyses.

Sample units proposed here are lengths of stream segments that will be sampled using the appropriate protocol. For both adult abundance and juvenile distribution sampling, the sample units will be stream segments of 1.6 - 3.2 km (1 - 2 mi) in length, chosen because it is the average distance that adult abundance monitoring crews can survey in one day. Crews measuring juvenile distribution will only be able to sample every other pool. Sample units are allowed to vary in length so that unit boundaries can be defined by easily observed landmarks in the watershed (e.g., bridges, confluences, cliffs, etc.). With boundaries at easily discerned landmarks, field crews readily know where to start and stop for the day's sampling.

Construction of the sample frame starts with all possible sample units; that is all possible 1.6 – 3.2 km stream segments. This will be done for both the Northern and Southern areas. The exact process has not been finalized, but will generally follow these methods. The sampling frame will be drawn from an Arcview GIS layer of the 1:24,000 routed hydrography containing the latitude-longitude (LLID) identifiers, stream and tributary names, and stream lengths. These stream lengths will then be reduced to include only those reaches below the upstream limits of anadromous habitat using historical occurrence and Intrinsic Potential salmonid habitat modeling (Agrawal et al. 2005; McCanne and Brown 2005). Both the Southern Oregon-Northern California Coast (SONCC) and North-Central California Coast (NCCC) TRTs used Intrinsic Potential habitat modeling for coho salmon and steelhead and current maps exist for all areas to be monitored. The sample frame is then reduced further by removing stream segments above barriers and areas known not to be used by fish (e.g., downstream extent of spawning) or areas that are unavailable for sampling for other reasons (e.g., access). Next, expert opinion will be used to define the up- and downstream limits of salmon spawning and rearing habitat including all tributaries in each stream. Consensus (Delphi-like) techniques will be used to rectify situations with differing expert opinions. Once established, each reach will be associated with the species and life stage assumed to be present. The reasons for all exclusions, especially those due to non-biological factors, will be documented.

Following initial sample frame construction, sampling units will be ordered using a one-dimensional method that starts by ordering units based on the geographic location of the watershed and the unit's location within that watershed. All watersheds in the CMP area will first be ordered from north to south along the coast. Sample units within each watershed will then be ordered starting at the lowest sampling unit in the drainage and moving upstream. All units in the main-stem of the system will appear first in the list, followed by units in tributaries. Tributaries will be ordered based on the stream distance of their confluence with the mainstem. That is, units in lower (farthest downstream) tributaries will appear before units in upper tributaries. In this way, ordering of the frame will continue from main-stem to tributaries until all units are placed in the frame. The location of a unit in the ordered frame defines its "spatial" location, where "space" here is a one-dimensional measure that generally represents river kilometer from the ocean, except that larger (main-stem) streams are inherently closer to the ocean in this "space" than tributaries. An example of a sample frame from the Mendocino Coast is shown in Figure 3.

The proposed frame ordering and its induced measure of "space" in the river system more closely mimics what salmonids experience than two-dimensional Euclidian space wherein distances are measured as straight lines between sample units. The difference between "spatial" locations of two units in the sample frame reflects both differences in distance from the ocean and stream order. This ordering, coupled with the sample drawing mechanism (McDonald 2003), ensures that sampled units will be spread out in this one-dimensional "space", and will represent all areas of the plan in proportion to size (number of river kilometers).

Completion of the sample frame for coastal California is currently underway. The sampling frame starts with stream segments predicted to be historical habitat by modeling (Agrawal et al. 2005). Stream segments are equivalent to sampling units as defined above. The historical predicted habitat will be further delimited using existing habitat data sets and local scientific expert opinion. The Eel River Basin, portions of the Eureka Plain in Humboldt County, Mendocino County, San Mateo County, and Santa Cruz County

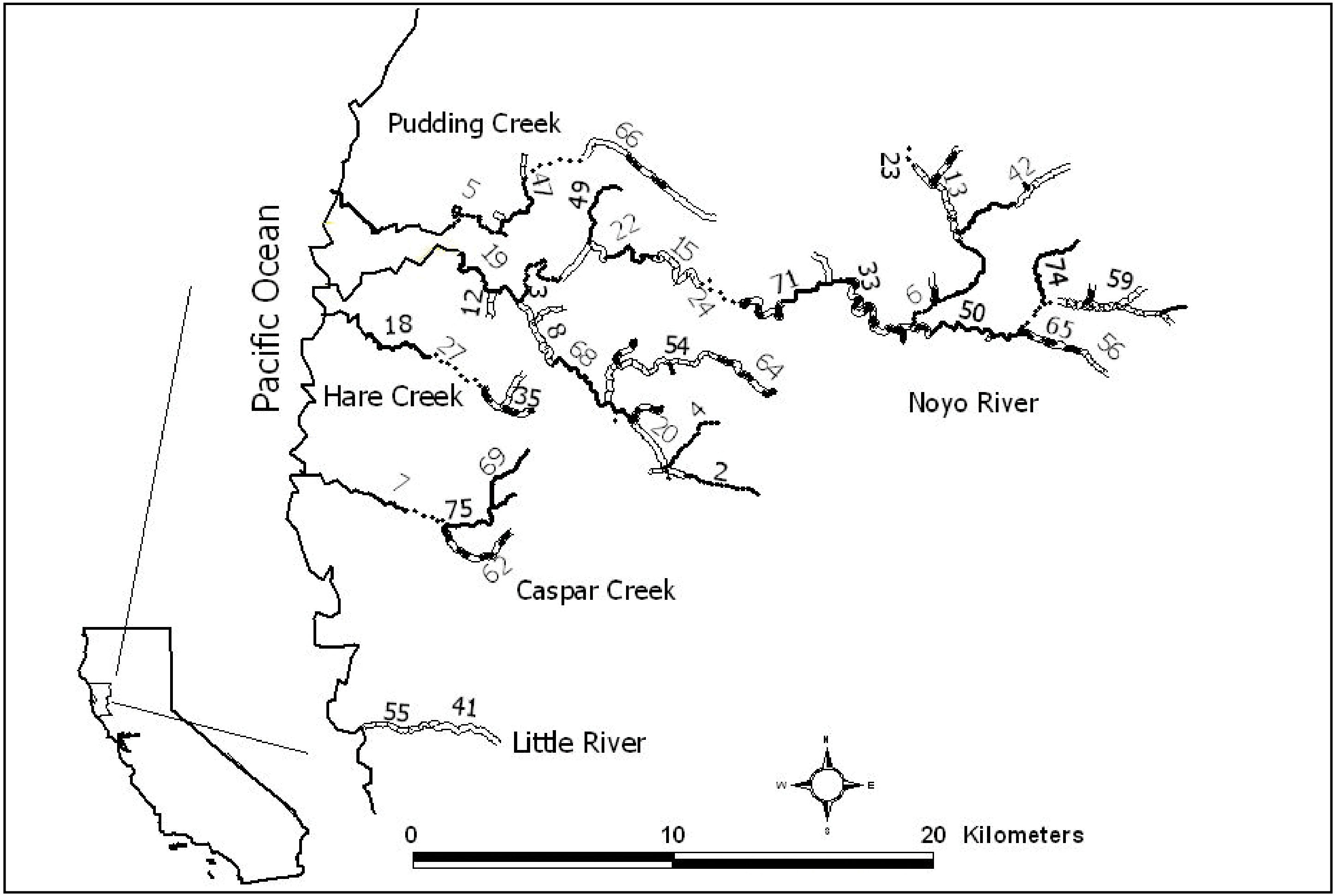

Figure 3. Mendocino Coast sampling frame example (McCanne, D. and A. Brown. 2005).

sampling frames have been completed. Sampling frames for other areas are in progress or have not been started (ibid, Figure 4).

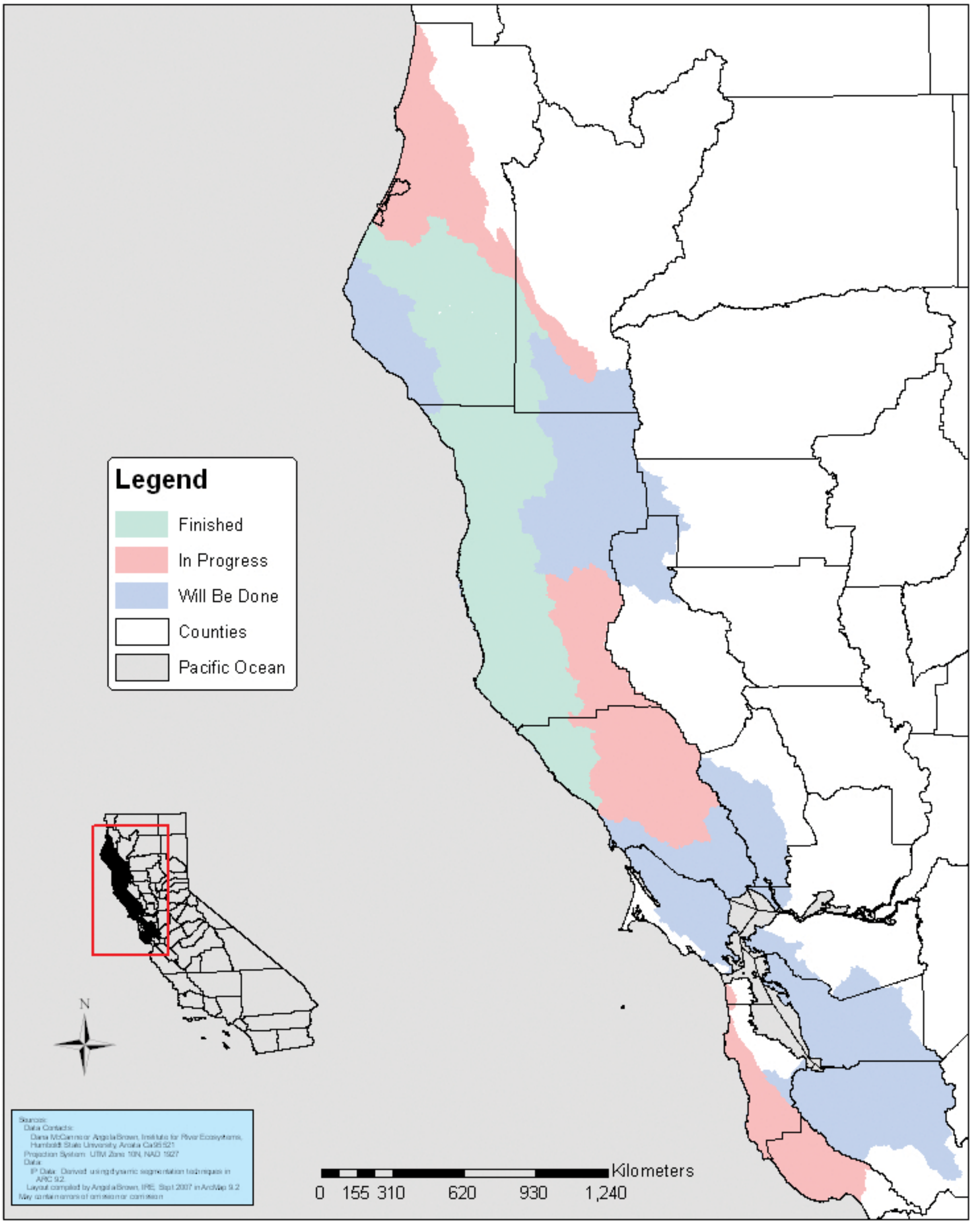

Figure 4. Status of small scale (1:24,000 routed hydrograph) sample frame development in the Northern Area.

An important refinement of the sampling frame will be dealing with species-specific estimates (Boydstun and McDonald 2005). Habitat modeling (Agrawal et al. 2005) suggests that adult steelhead occur in most of the stream segments in the Northern Area, but adult coho salmon only occur in about one half of the stream segments; half of the segments were estimated to contain steelhead only and half the segments were estimated to contain steelhead and coho salmon. The number of segments estimated to contain Chinook salmon is much smaller. If the Chinook salmon and coho salmon species estimates are derived from a sample selected without regard to hypothesized species composition, the Chinook and coho salmon estimates will have higher variances because they do not occur in many segments, increasing the number of zero counts.

One method to reduce variance in the adult estimates would be to attribute each segment in the frame with the species hypothesized to be present (i.e., Chinook salmon, coho salmon, steelhead) and draw a so-called "soft-stratified" sample (Larson et al. 2008). Assuming *n*-coho salmon segments are required from waters likely to contain, or likely historically did contain coho salmon, "soft-stratification" skips segments in the sample without the "coho" attribute until *n*-coho salmon segments with the "coho" attribute are obtained. Separate samples for each species result in separate samples from de facto populations of units containing each species. Alternatively, three separate samples could be drawn, one for each species. The primary advantage of "soft-stratification" over drawing three separate samples from three separate species-specific frames is that "soft-stratification" assures as much co-location of field sampling efforts as possible. Separate samples from separate species-specific soft stratification would reduce variance due to the elimination of zero counts from segments that never contained those species. However, costs, staffing, field time, and complexity of sampling would be greater using this strategy and would need to be organized and implemented carefully.

Juvenile habitat for coho salmon and steelhead is larger than adult spawning habitat due to dispersal of juveniles seeking food and space during their stream residency period (one year for coho salmon and, generally, two or three years for steelhead). Spatially balanced sampling is not proposed for Chinook salmon juveniles because of their short stream residency period and typical ocean-oriented downstream migration pattern. As described above, species distribution assessment for Chinook salmon will be based on adult spawning distribution sampling, although rotary-screw trapping could be used to assess timing and magnitude of Chinook salmon emigrations.

A similar "soft-stratification" scheme will be needed for the spatial structure juvenile surveys in the Northern Area. A "juveniles" attribute will be attached to all segments in the frame and will be invoked when drawing the juvenile survey samples. Using this attribute to delimit sampling will allow elimination of large areas uninhabited by juveniles, which should result in more accurate averages and reduced variances. High accuracy of the "soft-stratification" segment attributes assignments (i.e., Chinook salmon, coho salmon, and steelhead) will improve precision. In the Southern Area, there is no need for the species-based "soft-stratification" since only steelhead occur there.

Initially, a sampling frame workgroup will be formed to assign the segment attributes using available data and expert opinion. Since more information will arise as the sampling progresses, the workgroup will update these attributes annually or as better data become available. This is an important process and careful attention to detail and documentation is necessary to ensure that additions and removals of sample units are defensible. This process may influence estimates, but is unlikely to have a large effect as only a few smaller stream segments are expected to be changed out of a large area of known stream habitat. In general, it is expected that the sampling frame will be refined for several years after sampling has been initiated.

Utility of Generalized Random Tessellation Stratified (GRTS) Sample Selection

Generalized Random Tessellation Stratified (GRTS) is a compromise between systematic and simple random sampling that resolves problems with sampling patchy distributions and has several significant advantages useful for salmonid surveys. Because the GRTS procedure orders samples so that any consecutively numbered sample set is a randomly chosen, spatially-balanced sample, it has the ability to substitute consecutive samples when needed. This offers several major advantages. First, if any segment is unusable, the next segment in the GRTS draw can be substituted and the sample design will remain spatially balanced and randomized. Second, the GRTS sample can be decomposed to subregion sample sets that are still spatially balanced and randomized. Finally, if there is additional interest in a particular subregion, say a watershed, an additional number of successive samples from that subregion can be added to the survey and all of the samples can be used in the subregion estimates. These characteristics are of vast utility in regional-scale salmonid surveys.

Perhaps the most valuable characteristic of the GRTS sample selection scheme is the ease with which unusable samples can be replaced and yet still maintain a randomized, spatially balanced sample design. The number of unusable samples is expected to be large, particularly in the early years of monitoring. There are several reasons why samples will be unusable, including landowners denying access to the site, the samples being above or below the limits of anadromy, dewatered reaches, sampler safety or health issues, or difficult access. Using GRTS, the next sample in the sample draw can simply be added to replace the unusable sample. GRTS sampling contrasts with systematic sampling, the other commonly used sampling scheme that assures spatial balance, in which it is difficult to replace unusable samples and still maintain spatial balance. For example, Oregon coho salmon surveys had 12% unusable samples between 1998-2006 (Jepsen and Leader 2007), even though coho salmon surveys have been conducted in these watersheds for over 50 years and many of these unusable samples had already been identified. A pilot effort in the Mendocino Coast had 22% unusable samples, primarily from denied access.

The second advantage of GRTS is that estimates can be made for subunits ("domain estimation," Lohr 1999) that remain spatially balanced and randomized. This means that population level estimates can be made from larger area estimates and additional samples can easily be added to the population estimate if greater precision is needed. Estimates of status and trend will frequently be needed for smaller parts of the study area for a variety of purposes, primarily recovery planning. Both CESA and ESA recovery plans are based on recovering a targeted set of designated populations within an ESU. These targeted populations are not currently identified, but their population abundances will be a critical part of recovery. Another need of domain estimation will be for Hatchery and Genetic Management Plans (HGMP). HGMPs will require monitoring survival and mingling of natural and hatchery fish at a number of spatial scales. Other needs for domain estimation include evaluating timber practices, habitat restoration activities, and evaluation of the effects of flow regimes.

A third advantage of using the GRTS sample selection scheme is flexibility in augmented sampling for domain or population estimates (Stevens 2002). Often, greater precision for particular domain estimates is necessary. To accommodate these additional needs, additional samples can be added as necessary to the existing sampling in the domain of interest. The need for domain estimates is expected to be common, since there will always be concerns about hatchery impacts, habitat restoration actions, and local watershed interests. The ability to include both the large scale samples and the additional domain samples in one estimate will greatly reduce the cost.

Stevens and Olson (2004) discuss the theory and details of spatially balanced sampling, and a detailed example of GRTS specific to CMP is described in

Boydstun and McDonald (2005, Appendix H). A GRTS sampling scheme is based on the concept of selecting a probability sample from a sampling frame arranged in a linear fashion. To do this, place all the stream segments in the sample frame on a linear line (see Sample Frame Development, above). Then create hierarchical addressing by splitting the sampling universe into quadrants and number the quadrants. Repeat this step by dividing the quadrants into subquadrants and number those until down to a single sample. This creates hierarchical addressing with the first digit being the first quadrant, the second digit being the first subquadrant and so on. Then randomize the hierarchical addresses and construct the sampling line. Select a systematic sample with a random start from sampling line and place the samples in reverse hierarchical address order. This procedure creates sampling schemes that emphasize spatial balance along with substantial flexibility to replace samples. Software is available to simplify this complex procedure (McDonald 2003, Kincaid and Olson 2009)

ADULT MONITORING

Northern Area

Goal and Methods

In the Northern Area, adult abundance monitoring will be used to measure progress toward adult abundance viability goals set in recovery plans (Spence et al. 2008, Williams et al. 2008). A time series of adult abundance estimates, adjusted for harvest mortality when appropriate, can then be used to estimate productivity. Abundance goals vary by species and area in the State and Federal recovery plans. The adult monitoring in the Northern Area will estimate coho and Chinook salmon and steelhead abundance from the Oregon-California border to Aptos Creek (Santa Cruz County) (See CDFG 2004 and Good et al. 2005). The Recovery Strategy for California Coho Salmon (CDFG 2004) has targets for downlisting Central California Coho Salmon from Endangered to Threatened status ranging from 1,350 spawning adults for the San Mateo County to 15,000 for the Mendocino Coast. State delisting targets will be determined in the future. For the Federal Southern Oregon-Northern California (SONC) and North-Central California Coast (NCCC) recovery domains, the low-risk coho salmon targets based on estimated habitat potential range from 1,400 for Little River (Humboldt County) to 18,000 for the Upper Rogue River (Williams et al. 2008). The Federal low-risk steelhead targets range from 600 for Casper Creek (Mendocino County) to 23,600 for the South Fork of the Eel River and low-risk Chinook salmon population targets range from 700 natural spawners for Little River (Humboldt County) to 11,900 for the Lower Eel River.

In the Northern Area, adult monitoring will consist of dispersed redd surveys (see Gallagher and Gallagher 2005, Gallagher et al. 2010b), augmented with adult to redd ratios estimated from LCM stations. The augmented redd surveys will be conducted over the appropriate areas in a probabilistic, spatially-dispersed fashion. The design will allow for increasing sample size in areas where there is interest in more precise estimates. Initially, live fish and carcass counts will also be recorded to insure that redd surveys are the most efficient estimation method since there is little cost associated with this extra data collection.

Adult Surveys

Differences in run timing among species and locations will require operational differences in the timing of the adult spawning surveys. Coho salmon and steelhead will be monitored throughout the entire Northern Area. Chinook salmon will be monitored in selected watersheds from Redwood Creek to the Russian River. The different species will require different beginning and ending survey dates with Chinook salmon being the earliest and steelhead the latest. Even within a species, there are major run-timing differences depending on latitude, distance from the ocean, and whether the river mouth bars over with sand. Northern California fall-run Chinook salmon enter larger rivers in August and September and spawn in late October and early November (Myers et al. 1998). Populations in smaller coastal watersheds may enter somewhat later. Chinook salmon surveys would need to begin in October but the ending date is less important since the surveys will need to extend beyond these dates for coho salmon and steelhead. Coho salmon run timing also varies by latitude. In California, coho salmon runs generally extend from September to February, with peak spawning in November to January (Weitkamp et al. 1995). Coho salmon surveys may need to start as early as October and run through February, with local adjustments. Steelhead run timing is even more variable and extended than Chinook or coho salmon. Steelhead in California typically spawn from December through April or even May, with peak spawning in January, February, and March (Busby et al. 1996). Steelhead surveys would need to be conducted the entire period from December through April, with some local adjustment.

Adult abundance estimates will be made from walking surveys that will record live fish, carcasses, and redds. Chinook salmon will be monitored using combinations of the three. Redd counts have been shown to be better estimates of coho salmon and steelhead in Mendocino watersheds (Gallagher et al. 2010a). Redd counts converted to adult numbers of fish using adult to redd ratios were similar to live fish capture-recapture estimates, but were operationally similar, cheaper, and less invasive to ESA listed fish (Gallagher et al. 2010a). Adult redd surveys can be conducted over widely distributed areas for ESU coverage and over smaller local areas (i.e. areas impacted by local watershed projects or hatcheries) with specialized needs for higher precision. Counting live fish and carcasses require no more effort and can be used as rough quality control measures for redd-based abundance estimates. Adult redd surveys will be conducted at sites from the GRTS sample draws made for multiple spatial scales. Again, the advantage of the GRTS sampling scheme is that it is flexible enough to draw samples for both of these purposes. Adult to redd conversions will be based on data obtained at the LCM stations (see LCM section below). Preliminary results from Mendocino County (Gallagher et al. 2010a) have found no differences in adult to redd conversions over a regional area.

At very high abundance, redds become difficult to count. Lestelle and Weller (2002) found that redd counts were better at low spawner abundance, but that area under the curve (AUC) escapement estimates were more reliable than redd count estimates at high spawner abundance. Our experience in Mendocino coast streams has found no superimposition, and hence, little difficulty in counting redds. This would be expected where fish are ESA listed for low abundance. Training and marking of redds can help reduce this potential difficulty. A study to measure observer error during coho salmon and steelhead redd surveys should be initiated (see Future Directions and Plan Refinement section). Previous studies (Durham et al. 2001, Muhlfled et al. 2006) found this to be insignificant when conducted on bull trout.

Abundance estimates can then be calculated for ESUs, for individual populations, and for even smaller units with management needs. As mentioned above, the advantage of the GRTS sampling scheme is that if higher precision is desired for a subunit (population or even smaller), then additional samples can be drawn for a subunit and all the samples can be used in the subunit estimators. Increasing sample size, and therefore precision, cannot be done efficiently using systematic sampling. For spawner surveys, sample sizes of 10% per year of the total sample universe for a given species are recommended based on precision levels estimated in Oregon for adult coho salmon spawners (Jacobs 2002). Recent work on the Mendocino Coast (Gallagher et al. 2010b) found that escapement estimated from sample sizes of 10% to 35% overlapped each other, and variation in the 95% confidence limits did not change after 15%. Censuses of every population within the ESU, or even intensive sampling, are not possible because of cost; thus a lower intensity probabilistic sampling with a precision of ± 30% may be acceptable.

Rotating Panels

Dividing sample units into rotating panels balances the dual goals of status estimation and trend detection. These goals conflict because sampling randomly drawn previously unvisited sites improves status estimates, while repeated sampling of the same sites improves trend detection. Rotating panel designs therefore provide the best compromise for achieving both goals. Sample units selected by the GRTS sampling scheme will be allocated to four panels that are in turn assigned different visitation schedules. The four different visitation schedules for panels are as follows: one panel that will be visited every year (Panel 1), three panels that will be visited once every three years (Panels 2 through 4), 12 panels that will be visited once every 12 years (Panels 5 through 16), and 30 panels that will be visited once every 30 years (Panels 17 through 46), the entire life of the project (Figure 5). Each panel will contain multiple sample units. The panel sampled every year is proposed to contain ~40% of the total number of reaches visited every year. The panels sampled every 3, 12, and 30 years are each proposed to contain ~20% of the total annual number of sampled reaches. In this way, one year of sampling will have both randomization for status estimation and retain consistency for trend detection. In the future, there will undoubtedly be some need for frame refreshment to account for sample change and attrition. This will be most serious if samples from every panel need to be replaced.

The one-year, three-year, twelve-year, and thirty-year rotational visitation scheme proposed here is slightly different than the rotation scheme used by the Oregon coho salmon monitoring plan. The Oregon Plan uses a 1, 3 and 9 year rotational visitation scheme with equal numbers of reaches in each panel. The Oregon Plan rotation scheme is based on the 3-year life history cycle of coho salmon. A series of visitation cycles (1, 3, 12, and 30-year) are proposed, based on the life histories of coho salmon, and also Chinook salmon and steelhead, both of which mature predominately at ages 3 or 4. We also propose to re-sample a higher proportion of sites every year given the importance of detecting population trends to the CMP. This scheme will need to be revisited iteratively to confirm the best allocation of sampling effort.

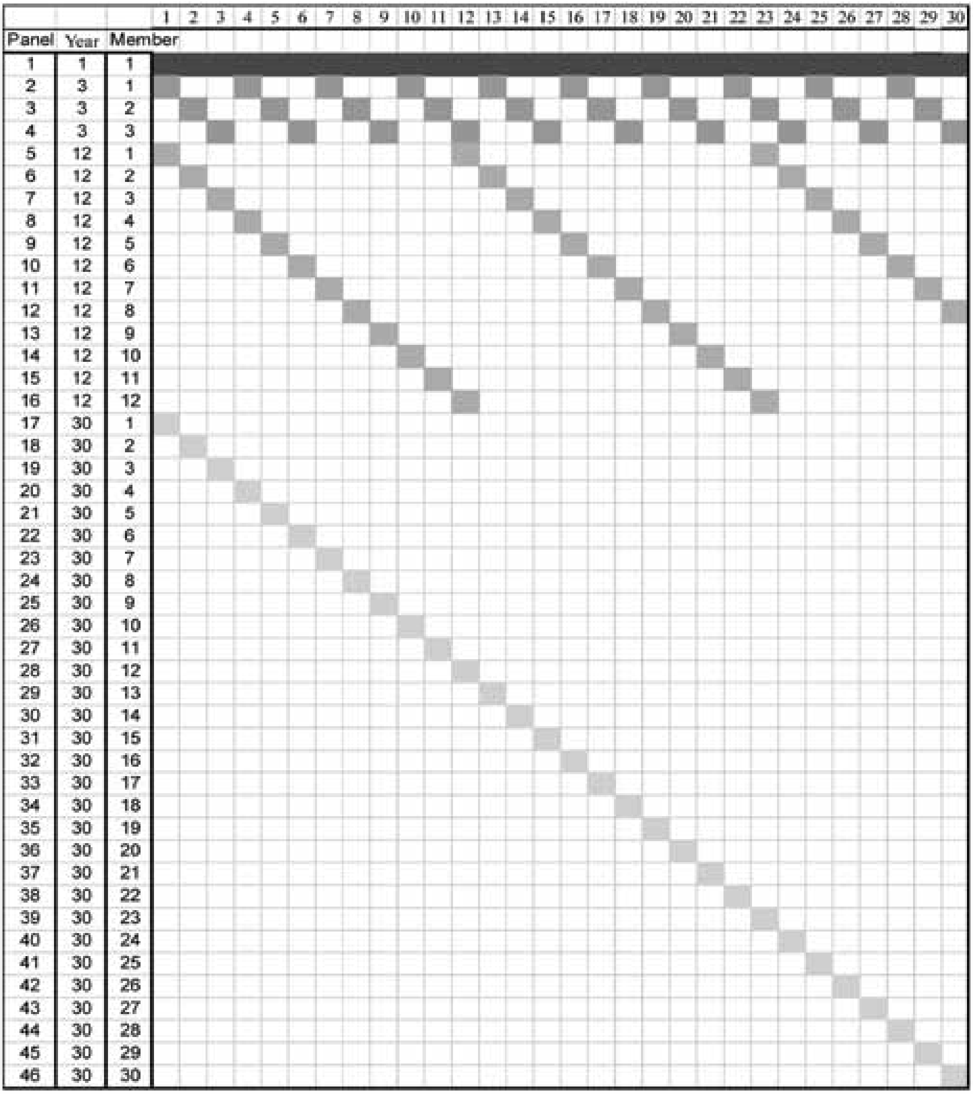

Figure 5. Rotating panel design for the California Salmonid Monitoring Plan by sampling year with 1, 3, 12, and 30 year panels with individual panel member rotation shown by the shading.

Adult spawning surveys have been the primary tool for assessing the status and trend of naturally reproducing salmonid populations since at least the 1930's (Ricker 1958), but have been conducted in different ways. This is particularly true for surveys targeting the three species of interest. Chinook salmon escapement is indexed using redd counts in Washington (Crawford and Volkhardt 2004) and peak counts of live fish and carcasses in Oregon (Jacobs et al. 2002). In the Klamath River in California, Chinook salmon escapement is indexed using a variety of methods including redd counts and peak counts (PMFC 2007).

Coho salmon survey escapement in Washington is indexed using redd counts, although live fish counts are also used in Puget Sound (Crawford and Volkhardt 2004). Oregon coho salmon escapement has a long history of using live fish counts (Jacobs et al. 2002). In California, preliminary results from coho salmon surveys (Gallagher and Gallagher 2005, Gallagher et al. 2010a) suggest that redd surveys provide estimates with higher precision than live fish counts and have greater consistency across streams at a lower cost.

Steelhead escapement is monitored using redd counts in Washington (Crawford and Volkhardt 2004) and Oregon (ODFW 2009). Gallagher et al. (2010a) found that steelhead redd counts were positively correlated with trap escapement counts and suggest that they should be considered as reliable indicators for steelhead in California.

Detailed redd survey methods are described in Gallagher and Gallagher (2005); Crawford et al. (2007); Gallagher et al. (2007); Gallagher et al. (2010a); and ODFW (2009). Selected sample units will be surveyed biweekly throughout the season. Two-person crews will walk or kayak the sample unit, searching for redds and noting live fish, carcasses, stream flow and visibility. All redds will be uniquely marked with flags to avoid double counting. Redds will be identified as to type and measured per Gallagher et al. (2007). Live fish and carcasses will be identified, tallied, sexed, and measured, and carcasses will be marked with tags. Obtaining this information from steelhead will be difficult due to unreliability of estimation on live fish and lack of carcasses, so information may be taken from LCM stations. Additional sampling may include otolith or scales for aging or microchemical analyses and tissue samples for genetic analyses.

Estimation of Hatchery and Natural Fish

In several coastal watersheds, hatcheries release salmonids in an attempt to supplement natural production. The returning adults typically return to the stream of origin, but some stray to neighboring streams. It is important to know how many returning fish are of hatchery origin and how many result from natural spawning. For recovery plans, the fraction of hatchery fish in a population needs to be below a specific proportion for the population to be considered viable (Spence et al. 2008, Williams et al. 2008). The proportion of hatchery fish must be less than 5% of the total population to avoid a significant negative effect (Good et. al. 2005).

For salmon, a fraction of each hatchery salmon brood-year is marked with a Coded Wire Tag (CWT) and the adipose fin is removed. The adipose clip is easily observed during adult surveys. When a salmon carcass with an adipose clip is observed, the head of the salmon will be removed for later CWT processing. Live salmon with adipose clips will also be noted. Unfortunately, several of the hatcheries have not yet begun implementing a constant fractional marking (CFM) program that would allow estimation of hatchery and natural proportions. Estimation of the fraction of hatchery fish will not be possible without coast-wide CFM programs. All hatchery steelhead receive an adipose clip, but do not receive a CWT. Therefore the hatchery fraction can be estimated directly from the combined live fish and carcass counts. Live or dead steelhead with an adipose clip observed by survey crews will also be noted.

Several procedures are available for estimating hatchery and natural proportions in watersheds where hatcheries are conducting CFM (Newman et al. 2004). The method proposed here assumes a constant fraction of hatchery fish have been marked for an extended period (e.g., three to four years) prior to the survey so that the same fraction of all age classes currently spawning are marked. This process essentially treats hatchery-marked fish as a separate species for estimation purposes, and applies the species-specific estimation methods outlined below to arrive at an estimate of total number of hatchery marked fish in a segment or system. This estimate of total number of hatchery marked fish will then be expanded by the constant proportion of hatchery fish that were marked prior to the survey. For example, redd counts will be converted into number of fish with hatchery marks in a particular segment using the methods outlined in the next Section. This estimate of fish with hatchery marks will then be divided by the proportion of marked fish. The estimated number of unmarked hatchery fish in a segment will have to be subtracted from the estimated number of non-hatchery fish. Total number of fish with hatchery marks in a larger system will be estimated using either the simple or regression estimators listed below, then divided by the proportion of marked fish. Because the proportion of marked fish is constant and assumed to be known, all variance estimates in the next section can simply be multiplied by the square of the proportion of marked fish.

Estimates of hatchery fish may be biased low due to the use of redd surveys as the principal sampling method because some marked fish will have been washed downstream after they completed redds, but before they have been counted. The question is whether marked or unmarked fish are washed down at different rates. Although this may not prove to be a concern, the question of bias associated with this problem can be evaluated if a LCM station is nearby. The number of marked fish found at the counting stations can be compared with the number of marked fish found in the surveys to assess whether bias associated with washed-down marked fish exists.

In watersheds where hatcheries are not yet conducting constant fractional marking, survey crews will count the hatchery marked fish encountered during sampling. Marked hatchery fish counts summarized over time and stream segments will provide a rough assessment of the proportion of hatchery and natural fish.

Estimation of Abundance

Redd survey estimates of the number of spawners in surveyed reaches will be expanded to regional or ESU scales. The use of reach specific redd surveys to estimate spawner abundance is conceptually simple and abundance estimates obtained are comparable to estimates obtained using other survey methods. These methods are flexible enough to allow abundance estimation over large regions or variously sized subunits within larger regions. Expansion of abundance estimates contains two steps: 1) estimation of the numbers of adults for each sample unit from redd surveys, and 2) scaling those reach-specific estimates to larger-scale abundance estimates. Redd-survey based estimation of number of spawners in a particular sample unit follows Gallagher and Gallagher (2005) and Gallagher et al. (2007, 2010b). Reducing over- and under-counting errors in redd counts (bias corrected) was accomplished using techniques outlined in Gallagher and Gallagher (2005). Methods to estimate larger-scale abundance are taken directly from Appendix H of Boydstun and McDonald (2005), and are included here for completeness. We assume that individual stream sample segments were selected in accordance with the proposed sampling design, and that unbiased estimates of the number of fish per sampled unit were obtained using calibrated redd counts. This method also assumes that the basins (or sub-basins) and time periods where expansion factors are established are representative of the sample frame in general. There is a significant relationship between escapements and redd counts in California coastal streams where these data are available (Gallagher et. al. 2010a). The large-scale estimators can be further applied to any unbiased estimate of a quantity associated with an individual segment, such as number of carcasses or live fish, fry to parr ratio, and habitat parameters like percent cover, temperature, large woody debris, etc.

Even though the redd count method had the best relationship to escapement of the survey methods considered in Gallagher et al. (2010a), they still have biases associated with their use to estimate abundance. In particular, redd detection probabilities may vary considerably depending on viewing conditions. Also, over the full temporal span of a spawning season, a "population" of redds must be treated as an "open" population with new recruits (i.e., new redds being constructed as fish enter the stream and spawn over the survey period) and mortalities (older redds becoming obscured (lost) due to gravel substrate migration during periodic high flow events) even with appropriate monitoring protocols.

Numbers of Adults per Sample Unit from Redds

Estimated number of adult fish in a particular sample unit will be computed by first classifying redds to species, then applying a species-specific fish to redd ratio. When the species that built a redd is unknown, estimated logistic regression equations computed from known Chinook salmon, coho salmon and steelhead redds will be used to attribute redds to species. This method follows Gallagher and Gallagher (2005) who developed a series of logistic equations for Mendocino County that were used to classify total redds into redds by species using day of year, redd area, and redd substrate data. The apparent error rate of redd misidentification of all species was 3.9% from a set of redd data where species was known, which compares favorably to field classification uncertainty ranging from 11% to 22%. The apparent error rate for discrimination of Chinook salmon and coho salmon was higher (5.9%), but this was probably due to a very low number of known Chinook salmon redds. The rate of redd misidentification was 6.8% when these equations were used to classify an independent set of steelhead redds. Gough (2010) developed logistic regressions to classify Chinook and coho salmon redds using just day number, and then day numbers, redd area, and redd substrate from Prairie Creek, Humboldt County. For unmeasured redds using only day number, Chinook salmon and coho salmon were classified correctly at a rate of 93.3% using a known redd data set. Adding measured redds and redd substrate to the regressions lead to a 97.7% correct identification rate. The two sets of regressions have different forms and the results were not completely compatible. The CMP will use the Gallagher and Gallagher (2005) regression to separate coho salmon and steelhead redds, and where necessary, use Gough (2010), to separate coho and Chinook salmon redds

Spawner to redd ratios are an active area of research. For Oregon steelhead, Susac (2005) suggest using a female to redd ratio of 1.04, but found ratios that ranged from 0.5 to 4.45. Washington assumes 2.5 fish for each redd for Chinook salmon, coho salmon and steelhead (Crawford et al. 2007). California does not have a standardized approach to spawner to redd ratios. Klamath-Trinity Basin Chinook salmon redd surveys use a ratio of two fish per redd (PFMC 2007). In some of the California Central Valley (CV) streams, Chinook salmon redd surveys are used as to assess escapement, as an index variable or to map distribution (Low 2007). On Mill Creek (CV) Chinook salmon redd surveys assume a female to redd ratio of 1:1 and a female to male ratio also of 1:1, for an overall redd to adult ratio of 2:1.

Another approach is to use a ratio of females per redd based on redd area (Gallagher and Gallagher 2005). This redd area method assumes that the number of females to redds is related to size of the redd. Coho salmon and steelhead redd sizes are scaled so that smaller redds represent fewer females. Female coho and female steelhead estimates from redd size measurements are then multiplied by the observed male-to-female ratios. Gough (2010) estimated population sizes for both Chinook and coho salmon using the one female per redd method and the redd area method. The estimates from the redd area method were consistently lower than estimates under the assumption of one female per redd.

Gallagher et al. (2010a) converted redds to fish using a three stream annual average of capture-recapture adult estimates divided by the number of redds. This method is conceptually simpler and estimates are similar to other methods. Redd to fish ratios will be calculated in different locales at LCM stations.

Finally, it should be noted that redd surveys in themselves without adjustment for adult to redd ratios would provide the same trend analysis as the adult numbers. However, much of the need for salmonid monitoring is to provide information for ESA and harvest management decisions. For these purposes, a measure of fish number carries more authority in these difficult decision-making processes.

Total Abundance Estimation over Large Geographic Regions (Status)

Status is estimated as total abundance (or escapement) over different geographic areas. Because the GRTS sample was selected with equal probabilities, estimation of current abundance in a study area is reasonably straight forward. Assume that $\tau_{p(i),t}$ is an unbiased estimate of the total number of fish present (abundance) in segment i of panel p when it was sampled during occasion t, and that $s_{p(i),t}$ is an estimate of the standard error of $\tau_{p(i),t}$. An estimate of total fish abundance in the entire study area during year t is,

$$T_t = N \sum_{p=1}^{P} \sum_{i=1}^{n_p} I_{p,t} \tau_{p(i),t} \Big/ \sum_{p=1}^{P} I_{p,t} n_p$$

where P is the total number of panels, n_p is the number of segments in panel p, $N = \sum_{p=1}^{P} n_p$ is total number of segments in the sample frame, and $I_{p,t}$ is an *indicator* function that takes on the value of 1 if panel p was sampled during occasion t and 0 otherwise (for the purposes of "soft stratification", Larsen et al. 2008). This "soft stratification" scheme will be expanded to include juvenile and habitat surveys. The scheme will result in vastly improved cost and efficiency from logistics such as landowner permissions, travel, and site set-up. Despite the complicated looking formula, this equation is simply the arithmetic average of fish abundance measured on all segments visited during occasion t [i.e., $\sum_{p=1}^{P} \sum_{i=1}^{n_p} I_{p,t} \tau_{p(i),t} \Big/ \sum_{p=1}^{P} I_{p,t} n_p$ = (sum of abundance on all segments sampled year t) / (number of segments sampled)] multiplied by frame size N.

Note that T_t does not contain terms that depend upon either GIS-estimated or actual segment length. This lack of dependence on unit length is intentional by design and avoids several potential pitfalls. First, segment lengths estimated from GIS data are notoriously inaccurate and errors in the GIS lengths compound if fish abundance is estimated as fish density times total stream length from the GIS. Second, field implementation of the CMP is unperturbed by stream channel mapping errors. For example, if a previously unmapped small stream, channel, or slough is discovered while field crews are collecting measurements on a particular segment, the additional habitat can be measured immediately and its data can be included in $\tau_{p(i),t}$ for that segment. This causes T_t to be "self-correcting" in the sense that it accurately estimates total abundance regardless of map inaccuracies in the GIS. Third, field workers do not absolutely need to measure real length of a segment, thus potentially simplifying field protocols. Contrary to intuition, empirical evidence suggests that the relationship between fish abundance and segment length is weak (unpublished data, North Cascade National Park). That said, stream length should be measured for use with the regression estimator with external variables described below. Finally, T_t remains unbiased for true total abundance regardless of true or measured variation in segment length.

Assuming $n_{t\bullet} = \sum_{p=1}^{P} I_{p,t} n_p$ is the number of segments actually sampled in year t, the estimated standard error of T_t is,

$$se(T_t) = N\sqrt{\left(1-\frac{n_{t\bullet}}{N}\right)\frac{sd^2\left(\tau_{p(i),t}\right)}{n_{t\bullet}} + \frac{1}{Nn_{t\bullet}}\left(\sum_{p=1}^{P}\sum_{i=1}^{n_p} I_{p,t} s^2_{p(i),t}\right)} \;,$$

where

$$\begin{aligned} sd\left(\tau_{p(i),t}\right) &= \sqrt{\sum_{p=1}^{P}\sum_{i=1}^{n_p} I_{p,t}\left(\tau_{p(i),t}-\bar{\tau}_t\right)^2 \Big/ \left(n_{t\bullet}-1\right)} \\ &= \sqrt{\left(n_{t\bullet}-1\right)^{-1}\left[\sum_{p=1}^{P}\sum_{i=1}^{n_p} I_{p,t}\tau^2_{p(i),t} - n_{t\bullet}^{-1}\left(\sum_{p=1}^{P}\sum_{i=1}^{n_p} I_{p,t}\tau_{p(i),t}\right)^2\right]} \end{aligned}$$

(Thompson 1992, p. 129). This formula is the variance estimator of a total under two-stage sampling, assuming equi-probable sampling at stage one (whole segments), and unbiased sampling at stage two (sampling within segments). The finite population correction factor, 1 - $n_{t\bullet}/N$, for stage-one segments has been included, but a similar correction for sample size at the second stage has not, due to the varied nature of field measurements called for under the CMP. Certain analyses may wish to include a finite population correction factor in the last term of $se(T_t)$ if, for example, a large fraction of all pools in the segment were measured to obtain $\tau_{p(i),t}$ for the segment. The segment (first stage) correction factor will usually be negligible, and it can generally be dropped.

The above standard error estimators, and all other standard error estimators in this section, ignore the fact that the original sample of segments was selected using the GRTS algorithm. Ignoring the fact that the original sample was a GRTS sample, effectively treats it as if it were a simple random sample and results in an overestimate of variance. That is, standard errors calculated using these formulas are larger than the true standard errors of the associated estimator. This is unfortunate because a spatially balanced sample should result in estimates with lower standard error than simple random samples, and this lower standard error will not be realized because these standard error estimators assume simple random sampling. In other words, we know that GRTS sampling improves accuracy, but we don't know how much is due to the use of the simple random estimators. We used the simple random sampling estimators here because they are easy to calculate, and because the improvement in precision estimates afforded by more complicated estimators is slight for parameters with high residual variation. Nonetheless, analyses of data collected under this CMP should consider both the simple random variance and the local neighborhood variance estimators. The local neighborhood variance estimator $se(T_t)$ was proposed by Stevens and Olsen (2003) and software is available. The local neighborhood variance estimator averages variances estimated on local neighborhoods (on nearby segments) surrounding each segment.

Provided $n_{t\bullet}$ is large enough (generally > 30) a 95% confidence interval for

the true average fish abundance is,

$$T_t \pm 1.96 se\left(T_t\right)$$

regardless of the distribution of fish density in an individual segment. If sample size at occasion t is small, a confidence interval for mean fish density should be constructed using a nonparametric bootstrap method (Manly 2007, Ch. 3).

However, combinations of stream systems and fish species may exist where density is relatively constant throughout the system and correlation between fish abundance and segment length is strong. In addition, there may exist exogenous covariates such as average gradient or latitude that could potentially explain a significant fraction of the variation in T_t. Because of these potential advantages, regression estimators for T_t should be considered. Besides total abundance, regression estimation should yield excellent estimates of the true total kilometers of stream in a system that will in turn be used to estimate average fish density.

Assume that an auxiliary variable, say $x_{p(i),t}$, is known for all segments in the population, both sampled and unsampled. In most cases, $x_{p(i),t}$ will be derived from the GIS system. Examples of potentially useful $x_{p(i),t}$ include segment length as measured in the GIS, gradient of the segment as derived from Digital Elevation Model's, latitude (or longitude) of the segment's midpoint, average flow as predicted by a flow model, etc. Provided the true correlation between $x_{p(i),t}$ and $\tau_{p(i),t}$ is strong, we can use variation in $x_{p(i),t}$ to explain variation in $\tau_{p(i),t}$ and thereby improve the precision of T_t. We assume only one auxiliary variable is involved in estimation, even though it is possible to use more than one in a multiple regression estimator. Extension of the simple linear regression estimator to a multiple regression estimation is straightforward and is given in Thompson (1992, p. 86). Non-linear or scatter-plot smoother regression estimators are also possible.

The simple linear regression estimate of total abundance at a particular occasion is,

$$T_{R,t} = T_t + \hat{\beta}_1 \left(T_{x,t} - N\overline{x}_t \right)$$

where

$$T_{x,t} = \sum_{p=1}^{P} \sum_{i=1}^{n_p} x_{p(i),t},$$

$$\overline{x}_t = \sum_{p=1}^{P} \sum_{i=1}^{n_p} I_{p,t} x_{p(i),t} \Bigg/ \sum_{p=1}^{P} I_{p,t} n_p$$

are the known total of x in the population and the mean of x in the sample at time t, respectively. $\hat{\beta}_0$is the slope of a least-squares-estimated line through the scatter plot of $\tau_{p(i),t}$ on $x_{p(i),t}$ (Thompson, 1992, p. 80). Some care will be needed to avoid using the same segments multiple times. The estimated slope, $\hat{\beta}_0$, should be as accurate as possible and can be based on multiple years of data. An estimate of the standard error of $T_{R,t}$ is,

$$se\left(T_{R,t}\right) = N\sqrt{\left(1 - \frac{n_{t\bullet}}{N}\right) \frac{\sum_{p=1}^{P} \sum_{i=1}^{n_p} I_{p,t} \left(\tau_{p(i),t} - \left[\hat{\beta}_0 + \hat{\beta}_1 x_{p(i),t} \right] \right)^2}{n_{t\bullet}\left(n_{t\bullet} - 2\right)} + \left(\frac{1}{Nn_{t\bullet}}\right) \sum_{p=1}^{P} \sum_{i=1}^{n_p} I_{p,t} s^2_{p(i),t}} \quad , (1)$$

where $\hat{\beta}_0$ is the estimated intercept of the least squares regression fit (Thompson, 1992, p. 80 and 131). Note the first term under the square root is a function of the mean squared residual from the regression of $\tau_{(i),t}$ on $x_{p(i),t}$, thus affording a reduction in variance if $x_{p(i),t}$ indeed explains a large proportion of the variation in $\tau_{p(i),t}$.

To estimate total stream length in the population, we rely on correlation between segment length in the GIS and actual segment length measured in the field. If maps in the GIS are useful for locating stream segments, the correlation between map and actual length should be high. Assuming $l_{p(i),t}$ is the actual measured length of segment i in panel p at time t, and that $\lambda_{p(i),t}$ is length of the same segment reported by the GIS, we can apply the regression estimator above to estimate total length as,

$$L_{R,t} = N\bar{l}_t + \hat{\beta}_1\left(T_{\lambda,t} - N\bar{\lambda}_t\right)$$

where,

$$\bar{l}_t = \sum_{p=1}^{P}\sum_{i=1}^{n_p} I_{p,t} l_{p(i),t} \Big/ \sum_{p=1}^{P} I_{p,t} n_p \,,$$

$$T_{\lambda,t} = \sum_{p=1}^{P}\sum_{i=1}^{n_p} \lambda_{p(i),t} \,,$$

$$\bar{\lambda}_t = \sum_{p=1}^{P}\sum_{i=1}^{n_p} I_{p,t}\lambda_{p(i),t} \Big/ \sum_{p=1}^{P} I_{p,t} n_p \,.$$

The standard error of $L_{R,t}$ can be estimated using Equation (1), substituting l for τ and λ for x.

Average fish density in the population of stream segments can now be estimated by dividing estimated total stream length into estimated fish abundance. This is an instance of a ratio-of-totals estimator, and should yield highly accurate estimates. Prior to estimation, the best estimate of abundance, either T_t or $T_{R,t}$, should be determined. If estimates of fish per kilometer (or mile) are desired, the regression estimator $L_{R,t}$ should be used. If estimates of fish per hectare (or square meter or acre) are desired, measured values of segment area should be substituted for l in the regression estimator equations to obtain a regression estimator for total hectares in the system. Unless area of a segment can be estimated from GIS data, segment length should remain as the explanatory variable for estimating total area.

The ratio of totals estimate of average fish density at time t is either,

$$\bar{d}_t = \frac{T_t}{L_{R,t}} \text{ or } \bar{d}_t = \frac{T_{R,t}}{L_{R,t}}$$

Assuming T_t is used, the estimated standard error of $\bar{d}_t$ is,

$$se(\bar{d}_t) = \sqrt{\frac{se^2(T_t) + \bar{d}_t^2 se^2(L_{R,t}) - 2\bar{d}_t \operatorname{cov}(T_t, L_{R,t})}{L_{R,t}^2}}$$

where $\operatorname{cov}(T_t, L_{R,t})$ is the estimated covariance between fish abundance and total length (Särndal et al., 1992, p. 179, eqn. 5.6.10). If $T_{R,t}$ is used to estimate density, $T_{R,t}$ should be substituted for T_t in this equation. Estimation of the covariance can be difficult in some surveys, and it is standard practice to drop this term during estimation. If the covariance term is dropped and if it can be assumed > 0, the resulting standard error is conservative in the sense that it is too large. However, after multiple years of sampling, covariance between fish abundance and total stream length can be estimated directly from data collected by the CMP. Furthermore, strong positive covariance between total number of fish and total stream kilometers in an entire system is expected, and the estimated standard error of $\bar{d}_t$ could be substantially reduced in this case. After m years of sampling under the CMP, the covariance between fish abundance and total steam length can be estimated as,

$$\operatorname{cov}(T_t, L_{R,t}) = \operatorname{cov}(T, L_R) = \frac{1}{m-1}\sum_{t=1}^{m}(T_t - \bar{T})(L_{R,t} - \bar{L}_R)$$

where

$$\bar{T} = \frac{1}{m}\sum_{t=1}^{m} T_t,$$

$$\bar{L}_R = \frac{1}{m}\sum_{t=1}^{m} L_{R,t}.$$

Again, $T_{R,t}$ should be substituted in place of T_t if $T_{R,t}$ is used to compute density.

Other estimates of average fish abundance and density at a particular point in time are available. The so-called MVLUE estimator reviewed by Binder and Hidiroglou (1988) is an alternate estimator of status that makes use of temporal correlation in fish abundance on individual segments (i.e., between $\tau_{p(i),t}$ and $\tau_{p(i),t-1}$) to improve estimates. The strength of correlation in fish abundances through time determines the magnitude of precision improvement, with higher correlation yielding higher improvement in precision. The MVLUE estimator is complicated and the improvement in precision afforded by it is unknown at present. The MVLUE estimator will therefore not be given here, but it should not be disregarded.

As described earlier, species estimation in subregions will be an important need in the CMP. Estimation of status in a subregion of the study area such as a watershed is called domain estimation (Lohr 1999) and is relatively straightforward. Samples that fall within the specified subregion are treated as if they were the sampling universe. If additional precision within the subregion is desired, then the next consecutive samples on the GRTS list that fall within the subregion can be added to the sample universe. If sample size for the subregion is sufficiently large (>30), then the simple random sampling formulas from above can be used for inference about the subregion total and variance. For smaller sample sizes, see Lohr (1999).

Southern Area

Goals and Methods

In the Southern Area, steelhead are the only salmonid present and, since abundances are known to be extremely low, monitoring is critical to assess recovery goals. These low abundances are difficult to monitor due to patchy spawner distribution and large stretches of uninhabited water. In addition, the Southern Area is very different from the northern area in terms of species composition, abundance, distribution, and run-timing, and dictate different adult monitoring approaches in the two regions. The major distinctive features of the Southern Area are: 1) only steelhead occur there; 2) steelhead population sizes are small and occur at widely spaced locations within watersheds, 3) stream flows in this area are generally very low, but in the winter can be episodic and short-lived, leading to erratic run-timing of steelhead that live there; and 4) the Southern Area has experienced greater habitat degradation than the northern area, particularly in the form of dams. Thus, our ability to sample adult steelhead in the Southern Area is confounded by small numbers of spawners coupled with the unpredictable shifting of steelhead run-timing and spawning locations. These conditions, particularly the small numbers of patchily distributed spawners, mean that the random spatially balanced surveys that will be used in the Northern Area would result in sampling an unacceptably large number of units containing no fish. This would lead to very small abundance estimates with large variances and little statistical power to detect change. These features argue for a complete census of steelhead in the Southern Area that would be accomplished by a fish counting station at the lower end of a number of watersheds. As in the Northern Area, decisions concerning adult abundance monitoring locations will be undertaken in other venues such as recovery plans, or for other specific needs. However unlike the spatially-balanced, random adult surveys used in the Northern Area, there will be no provision for subregion estimation. Abundance estimates will only be applicable to the specific streams surveyed and will have no variance estimates. While these individual population censuses cannot be expanded, this condition is being accepted due the lack of preliminary knowledge and the expectation that steelhead populations will be extremely sparse and highly clumped. As the level of background information is expanded, the Southern area monitoring plan may require modification.

Adult Monitoring

For the Southern Area, adult abundance monitoring goals will be to obtain complete adult censuses at existing or proposed fishways where possible and to conduct evaluations of new technologies for obtaining adult counts. Portable weirs may have limited usefulness in the Southern Area censuses because the few steelhead that inhabit these streams are known to move upstream and spawn on high flows when portable weirs usually have to be removed or cannot operate. This behavioral feature of steelhead in the region requires fixed location total census monitoring in the Southern Area rather than the random spatially balanced surveys proposed for the Northern Area. Counts at fixed stations lack the statistical rigor to assess regional status and trends in the same way as the methods used in the Northern Area (i.e., estimates cannot be statistically inferred to apply to non-sampled streams); however, over time this approach will create time series that will allow trend estimation on the set of monitored watersheds. The counting stations monitoring scheme is not as geographically flexible as the GRTS and greater care in selection of watersheds and locations of counting stations will be needed to insure that the collection will supply the needed data. Provided that the set of monitored watersheds include the major steelhead-bearing watersheds, this approach will provide the information necessary to guide management. Finally, in the past many attempts to establish fish counting stations have failed due to operational conditions. Operating a station that will provide reliable counts is not a simple undertaking and will need to be well thought out.

The proposal for monitoring Southern Area steelhead focuses on conducting complete censuses of the major watersheds considered the keystones for viability in recent recovery planning efforts (Boughton et al. 2007). This approach will increase reliance on spatial structure sampling over the entire Southern Area to provide information on other watersheds. As more funding becomes available, adult census monitoring can be expanded to more watersheds. In the South-Central California Coast Steelhead DPS, only the Carmel River is currently being monitored. In the Southern California Steelhead DPS, there are monitoring sites on the Ventura and Santa Clara rivers.

Traps and weirs associated with passage facilities can quantify the escapement of adult salmonids in streams and rivers. In addition to providing absolute counts of fishes migrating beyond a fixed point in the system, they can be used to determine species composition, determine sex ratio, place and recover tags, and collect tissue or scale samples. Passive integrated transponder (PIT) tagging can be used at the trap site to gather data on travel time, passage timing, and survival. The trap site and other appropriate locations should be equipped with PIT antenna arrays to detect tagged fish passage. Additional PIT monitoring stations can be added to collect data to answer specific questions at relatively low cost. As noted above, portable weirs may have limited usefulness in the Southern Area censuses because the few steelhead that inhabit these streams are known to move upstream and spawn on high flows when portable weirs usually have to be removed or cannot operate. Detailed procedures for these types of sampling operations are described in Zimmerman and Zabkar (2007).

Video systems have been used to count many salmonid species in a wide range of circumstances; however they are only likely to be successful when placed in a passage facility (O'Neal 2007a). For video systems to work, fish need to be crowded into a narrow area to be counted due to the limited imaging range of video recording systems. They provide a time-saving, cost effective method for obtaining weir counts and avoid actually handling the fish, which is an important consideration in dealing with a listed species. In addition, video systems provide the opportunity to record fish behavior. Video systems can provide all of the data from a passage facility including species composition, numbers, direction of passage, body size, and hatchery marking. However, video systems lose resolution with even limited turbidity.

A video counting system is currently being operated at San Clemente Dam on the Carmel River. The system is operated on a fish ladder where as fish jump up from one ladder step to another, they break an electronic beam that turns on the video camera, and the fish's image is recorded. Commercially available video systems have become very sophisticated and many specialized needs can be met, including automatic processing of the video and long distance real-time viewing. Detailed procedures and advice for constructing, installing, and operating video fish counting systems is given in O'Neal (2007a).

For smaller systems where larger, more permanent systems are not feasible, Dual-Frequency Identification Sonar (DIDSON) can be used to provide adult abundance numbers. DIDSON is an acoustic "camera" that has been recently adapted to fisheries monitoring by the Alaska Department of Fish and Game (Maxwell and Gove 2004). The device is a high-frequency sonar system with a lens capable of focusing sound waves onto a high-resolution sensor array. It is self-contained and operates much like a video camera except that it processes reflected sound rather than reflected light. The resulting acoustic image is grainy compared to light-based images, but is a considerable improvement over older-style sonar units. This unit is not much more difficult to operate than a video camera and requires little training to use. Its advantage over video systems derives from the fact that it is a sonar device, and is therefore not limited by turbidity, and does not require a fish crowding structure.

Like a video image, the DIDSON sonar image is detailed enough to identify, count, and measure the size of fish swimming through the beam, but unlike a video camera the unit can detect images when video cannot (e.g., in opaque water during high-flow events when steelhead are known to move in this region). The unit can view up to 20 m of stream width thereby making the installation of a weir unnecessary. Thus, DIDSON has the potential to provide complete steelhead counts even during peak Southern California flow events in small (< 20 m wide) streams. Steelhead are the only anadromous salmonid found in streams from the Pajaro River southward, so species identification is not an issue. Fish counts can be automated or the view sequence can be shortened to periods when the DIDSON software detects movement.

The Alaska Department of Fish and Game has conducted a series of pilot studies using DIDSON to assess its use in monitoring salmon runs (Maxwell and Gove 2004, D. Burwen, ADFG, pers. comm.). They found that DIDSON produces precise estimates of fish passage over a wide range of abundances, including at high passage rates (Figure 6).

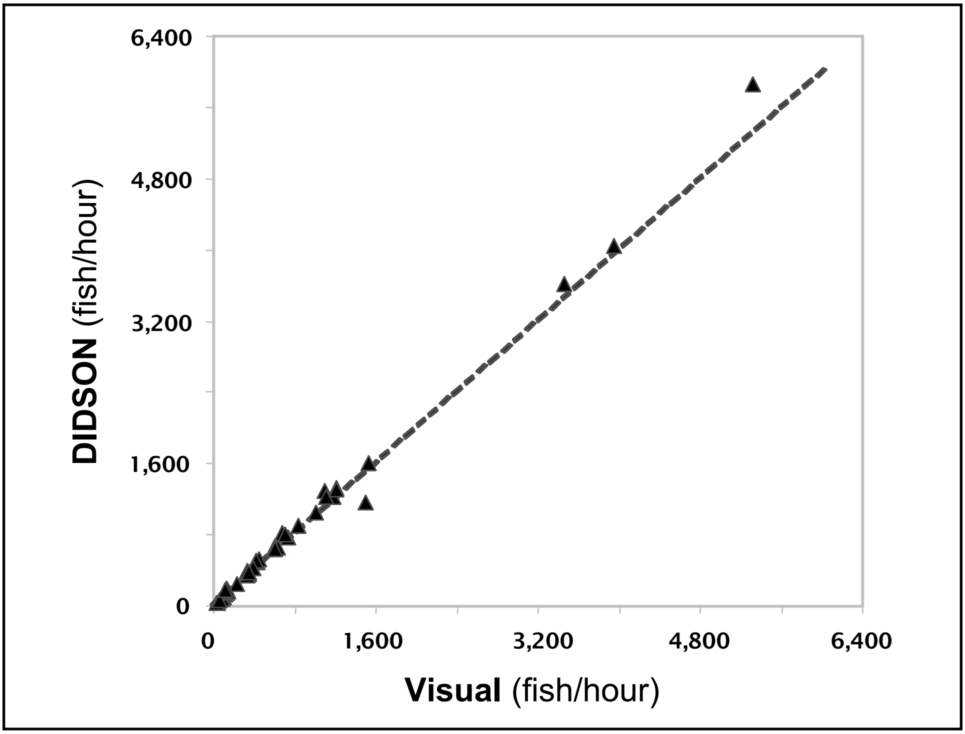

Figure 6. Comparison of salmon counts from the DIDSON camera vs. visual tower counts (made by an observer sitting in a streamside tower, currently considered the benchmark data type by Alaska Dept of Fish and Game).

To specifically test the DIDSON acoustic camera as a tool to monitor Southern California steelhead, a DIDSON unit was deployed in the San Lorenzo River, Santa Cruz County for limited periods during 2006 (Pipal et al. 2010). The DIDSON unit was installed approximately 200 m downstream of a diversion dam with a fish counting trap. The DIDSON unit and trap counts were compared over the same time period (March 17, 2006 to March 24, 2006) when both the DIDSON and the fish trap were operating.

Counts made with the DIDSON unit and the traps were very similar. The DIDSON unit counted 41 net upstream migrants (46 upstream migrants minus 5 downstream migrants Table 1). The trap collected 46 fish (Table 2). Evidence to date supports the potential for using DIDSON units for salmonid assessments in low abundance Southern California rivers and streams (Pipal et al. 2010).

DIDSON's greatest strengths—that it does not require handling of fish and it does not impede passage of low-abundance, high extinction risk salmonids—

are also it's greatest weakness in that certain types of biological information (e.g. sex ratio, scale samples) cannot be taken. DIDSON use for monitoring does have some of the same potential problems as video, such as providing power and security. The most difficult problem comes from the fact that its image spans the entire stream bed. The DIDSON records much more natural fish behavior than a situation where the fish has to move through a fish trap or narrow viewing channel. This behavior can, at times, be difficult to interpret as simply either upstream or downstream migration. Detailed operational guidance for using DIDSON as a salmonid counting method can be found in Pipal et al. (2010).

Table 1. Summary of DIDSON footage from the San Lorenzo River between March 17 and March 24, 2006.

DIDSON File Review				
DIDSON FILE DATE	**File Type**	**Fish Up**	**Fish Down**	**Net Fish Up**
3/17/2006	Sonar	1	0	1
3/21/2006	Sonar	4	0	4
3/22/2006	Sonar	15	4	11
3/23/2006	Sonar	22	0	22
3/24/2006	Sonar	4	1	3
Totals		**46**	**5**	**41**

Table 2. Totals from the fish trap on the San Lorenzo River approximately ~200m upstream from the DIDSON location.

Trap Totals				
Trap Operation	**File Type**	**Male STH**	**Female STH**	**Total Trapped**
3/17/2006		7	4	11
3/21/2006	Trap not operated	N/A	N/A	N/A
3/22/2006		5	5	10
3/23/2006		4	6	10
3/24/2006		9	6	15
Totals		**25**	**21**	**46**

SPATIAL STRUCTURE

Goals

Effective spatial population structure can provide protection from local catastrophic extinction risks that are separate from those due to abundance and productivity (McElhany et al. 2000). Salmonids have high fidelity to their spawning locations (Groot and Margolis 1991) and therefore have a naturally patchy distribution because of their spawning conditions and/or the nature of their habitat dynamics. At the same time, some individuals move from one natal spawning area to another (straying; Quinn 1997). Therefore, a population's spatial structure is the result of these population characteristics; fidelity to spawning location, straying, and the nature and dynamics of their habitats. Spatially structured populations are often generically referred to as "metapopulations" (Levins 1969). Though the term metapopulation has taken on a number of different meanings, the general meaning is a group of spatially separated populations of the same species that interact at some level through dispersion. Since the dynamics of a metapopulation can include individual population extinction and recolonization, understanding the population spatial structure can have important consequences to salmonid population viability (Hanski and Gilpin 1997). Metapopulation theory has shown that spatial structure can have both within-population and within-ESU aspects.

Population-level spatial structure is a function of the population's habitat dynamics and the rate at which individuals move from one location to another. Spatial structure is important to viability because extinction risk occurs at longer time scales and may not be apparent from short-term observations of abundance and productivity (McElhany et al. 2000). If habitat is being destroyed faster than it is being created, then population viability will decrease. Also, where straying among subpopulations decreases due to increasing distance among occupied habitat patches, population viability will again decrease. Often under anthropogenic stress, both mechanisms are occurring at the same time. In these situations of decreasing population viability, strong source subpopulations should be indentified and maintained as an essential element of recovery. As population decline becomes more pronounced, monitoring of these spatial structure characteristics is increasingly important since isolated groups of fish are much more vulnerable to rapid extinction.

Within-ESU spatial structure is important to salmonid viability due to risks of catastrophic events (Bisson et al. 1997). Catastrophic events affect entire populations and occur rarely over a 100-year time scale. They can be natural or anthropogenic events; and often natural catastrophes will increase in magnitude or frequency due to anthropogenic disturbances. Catastrophes can profoundly affect extinction risk. In fact, models predict that the rate and severity of catastrophes can be the most important factor in determining a population's extinction risk (Lande 1993, Mangel and Tier 1993). The Sacramento winter-run Chinook salmon ESU is an example of the risks associated with poor spatial structure characteristics—the entire run is composed of a single bottlenecked population that spawns in one location below Shasta Dam. In a nearby area above Shasta Dam, the Cantara herbicide spill caused a wide-spread fish kill. The spill wiped out the downstream fish and invertebrate populations, including native rainbow trout, but since the spill was confined above Shasta Dam, impacts to anadromous salmonids did not occur. Within-population spatial structure can also have serious extinction risks and these risks will often coincide with low abundance.

Due to the potential for catastrophic events, there should be multiple populations within ESUs that do not share common catastrophic risks. At the same time, some populations within ESUs should be geographically close to each other so that metapopulation interactions can occur. The TRTs built this concept into their approach with the use of diversity strata and requirements for strata viability throughout the ESU and requirements for population viability within a stratum (Spence et al. 2008, Williams et al. 2008). Anthropogenic impacts have often reduced habitat in ways that further concentrate salmonids into any remaining higher quality habitat. Therefore, assessing current spatial structure is an important measure of viability. Measured improvements in spatial structure are also a strong indication of progress toward recovery.

Spatial structure monitoring is important in both the Northern and Southern areas. In the Northern Area, some information for Chinook salmon, coho salmon, and steelhead will come from adult monitoring, although that information will not be comprehensive. These data will be used to assess the spatial patterns that indicate sufficient immigration is occurring to ensure connectivity and to assess whether distribution is expanding or contracting using simple binomial probability of segments occupied. Different species have different levels of extinction risk associated with loss of spatial structure, so that different sampling frames may be used in the sample draw, perhaps sampling one species more intensively than another. This assessment of occupancy patterns will be used to record that connectivity is maintained between populations and to monitor whether the species distribution is expanding or contracting. In the Northern Area, spatial structure monitoring will be conducted for juvenile coho salmon using snorkel sampling throughout the entire area. Spatial monitoring for steelhead is a lower priority because they are more widely distributed than coho and Chinook salmon. However, we realize that, even for this resilient species, spatial patterns may change rapidly. This is especially a concern in the face of climate change. The CMP will revisit prioritization of steelhead spatial structure surveys, incorporating them as soon as possible after project implementation begins. Juvenile Chinook salmon leave the watershed and enter the ocean too early in the year to be surveyed with snorkel methods. For Chinook, adult surveys will provide the primary information about spatial distribution of spawners, and outmigrant monitoring (e.g., using rotary screw traps) could be used to obtain opportunistic watershed-level information on spatial structure. If Chinook salmon spatial structure information is considered sufficiently important, adult surveys in Chinook salmon habitat could be expanded to provide that information. In the Southern Area, steelhead will be monitored for spatial structure. Due to the very small populations in Southern California, spatial structure monitoring may need to be more localized and focused than in the north. In the Southern Area, rainbow trout, the nonanadromous forms of *O. mykiss*, occurs more commonly than the anadromous form even in anadromous waters. Snorkel surveys for steelhead are difficult and their results are inconsistent because it is difficult to visually distinguish steelhead from rainbow trout while snorkeling. The only reliable way to distinguish between the two forms is an evaluation of otolith microchemistry—a lethal and time consuming procedure. Discrimination of steelhead from resident rainbow trout, and ways to evaluate the relationship between these two life history forms is an active area of research. However, presently there is no simple way to distinguish between them for routine population monitoring.

<u>Sample Design and Methods</u>

Although spatial structure could be monitored using adult spawner distributions, the approach of targeting the distribution of juvenile fish in summer or early fall is operationally simpler and less expensive and is more comprehensive as it takes into account species dispersal following hatching. Therefore, the CMP proposes using juvenile salmonid surveys as the most efficient means to monitor spatial structure. Sites will be selected using the protocol described in the Adult Sampling section. In the future, a modified sampling frame to represent summer rearing areas will be developed using a "soft-stratification." The procedure would include selection of a GRTS sample, and allocation of that sample into panels that receive rotating effort over the years. This will allow for estimating spatial structure of fish and habitat condition at both the population and ESU levels.

The sample draw process starts with establishing a desired sampling intensity. More intense sampling would be required as the species becomes rarer to maintain the same coefficients of variation. Sampling rare species usually leads to greater uncertainty in the estimate even with higher sampling intensity. As in the adult sampling, a random spatially balanced sample is desired due to the patchy distribution of the fish. A GRTS-based sample draw at the desired intensity will be selected. Additional samples will need to be drawn since some of the samples will not be useable due to inaccessibility, unsuitable habitat, poor water quality, or other reasons. Increased subsampling will be accomplished by drawing additional samples in the same manner as for the adult sampling.

Snorkel surveys for juveniles are effective, cost efficient, and cause the least impact on ESA/CESA-listed species. Juvenile surveys during the summer and fall will allow the widest measurement of species distribution for a fixed cost. Sampling and access is far easier and less expensive at that time of the year. Snorkel surveys are both cheaper and faster than the next most common juvenile sampling method: electrofishing. Snorkel surveys and electrofishing have different levels of precision depending on conditions like water clarity, habitat structure/complexity, and fish density. Also, snorkel surveys can give inaccurate counts if moving fish are recounted. However, more samples can be obtained for the same cost using snorkel surveys. Snorkel surveys can also be conducted in conditions where other survey techniques are not feasible, such as low water or when sampling sites are far from roads. Finally, snorkel surveys can provide qualitative information on fish behavior such as habitat associations, feeding, and resting activities that may help us to evaluate the reasons underlying observed distributions.

Comparative studies of snorkel and electrofishing for coho salmon and steelhead have shown that snorkel-survey abundance estimates are higher than electrofishing estimates (coho salmon 1.6 times and steelhead 2.0 times, Jepsen 2005). Other research evaluating population estimation methods for juvenile coho salmon in small Oregon streams found that mark-recapture, electrofishing, and snorkel techniques accounted for 85%, 67%, and 40%, respectively, of the known summer populations in pools (Rodgers et al. 1992). But this range of densities may not have been great enough to show an influence (J. Rogers pers. comm.). High fish density influences snorkel counts more than other methods, as accurate visual counting is more difficult with larger numbers of fish (Heggenes et al. 1990). However, Rodgers et al. (1992) found no effect of fish density on the accuracy of snorkel or removal techniques. So while snorkel surveys may be biased toward lower abundance estimates than two stage sample designs (Hankin and Mohr 2009), this is less important in evaluating spatial structure than the increase in the number of samples that can be obtained at fixed cost. Finally, snorkel surveys do not require handling fish and in general cause much less stress for the fish than methods that require handling. This is an important advantage of this method for sampling listed species.

The CMP proposes using standard snorkel survey procedures as described in detail in Peck et al. (2003), and O'Neal (2007b), which we will only briefly review here. Teams of two snorkelers will be trained prior to the sampling season. Inter-observer reliability will be assessed and calibrated during training. The snorkelers will alternate counting and recording on smaller sections within the reach. In those few instances where the tributary is too wide for one snorkeler to survey, teams will snorkel side-to-side. Sampling will count all individuals of whatever species encountered in the sample unit through the entire length. Data will be entered in handheld electronic recording devices to be downloaded after return from the field. The accuracy of the snorkel counts will be assessed by revisiting between 10-20% of sites that were occupied by the species of interest. This will allow evaluation of initial count precision and provide the basis for variance estimates using the methods of Stevens (2002). More detailed field protocols can be obtained from O'Neil (2007b).

Spatial structure from juvenile snorkel surveys will be measured as the proportion of sample units occupied by at least one fish, the average number of pools per sampling unit occupied by at least one fish, and the average number of fish per sampling unit. Spatial structure might be compromised even if a relatively high proportion of sites are occupied but they are geographically concentrated. The proportion of sampling units occupied by at least one fish will be reported as a simple percentage. Since the sampling units were drawn using the GRTS procedure, this may be considered a random sample and representative of the entire population of sample units. The average number of pools per sampling unit with at least one fish is a simple mean of a binomial distribution and means and confidence intervals can be calculated by the standard methods. Then again, the degree of occupancy of any sampling unit is the number of segments containing at least one fish and is also estimated as a simple mean of a binomial distribution and its variance. We expect that, because of their relative rarity, data for coho salmon will include a large number of sample units without any fish. Because of that, for coho salmon, the median may be a more useful measure of central tendency and should be considered along with the mean. The average number of fish per sample unit can then be estimated over larger sampling units of interest. A composite variance estimator using the revisit data is provided by Stevens (2002). ODFW uses the SVB metric (Stevens 2006) to assess whether the occupied sites are dispersed or clumped, and this can be considered in the future.

DIVERSITY MONITORING

Goals

Salmonids in coastal California possess and exhibit a wide range of physical and behavioral characteristics that affect population and ESU-level viability (McElhany et al. 2000; Table 3). Expression of diverse life history, behavioral, and physiological traits allow salmonid populations to tolerate irregular or cyclical environmental variation, and provide a buffer against habitat change, food web shifts, and varying predation pressure. Diversity is frequently assessed by analyzing allele frequencies of neutral genetic markers (e.g., microsatellite DNA). Although the genetic underpinnings of most life history traits cannot currently be directly assigned and quantified, the expressed traits themselves (e.g., run timing, outmigration timing, and age structure) can be assessed. Diversity traits are expressed on different spatial scales. Major diversity traits, which have the strongest genetic signal, are observable at the species- and ESU-level. Species and ESU-level diversity, and diversity patterns over large geographic areas (e.g., California coast-wide), are incorporated into listings and recovery plans. Population-level diversity traits, which are more difficult to track, will have to be identified on a case-by-case basis. Due to these ESU level and even local differences in diversity traits, it will be almost impossible to compare diversity over larger areas and diversity monitoring will be used largely for trend monitoring within an area of sampling interest.

The CMP goals for diversity monitoring are to: 1) establish and maintain genetic baselines for all salmonid runs and ESUs, and 2) identify important and variable life history characteristics of specific populations within each ESU that can be measured as part of existing field surveys, at LCM stations, and at hatcheries, or for other Diversity traits for which specific data collection still needs to be designed.

Methods

Relevant diversity characteristics vary with species, population, and ESU. This makes it very difficult to provide specific advice about sample design and methods for monitoring diversity across all of coastal California. Also, we expect that substantial research will be necessary to understand the way in which many of the most important diversity traits operate before we can understand how to monitor them.

The CMP proposes a stepwise process to identify relevant diversity characteristics and incorporate appropriate monitoring into adult and juvenile field surveys and LCM station data collections. In some cases, additional surveys may be required to address diversity monitoring.

Step 1: CDFG and NOAA Fisheries will jointly convene meetings of local expert teams that will indentify diversity characteristics relevant to each species at the population- and ESU-level. ESU-level diversity characters will include those identified in federal and State status reviews and recovery plans.

Step 2: Local expert teams will develop ESU-wide programs to monitor identified diversity traits. Whenever possible, diversity monitoring will be incorporated into established population monitoring protocols at hatcheries, established LCM stations, and regional spawning and juvenile sampling surveys. Otherwise, new surveys will be added to the CMP to collect and evaluate specific diversity information.

General Diversity Characteristics

Evaluation of genetic diversity at population and ESU scales is essential. Therefore, the CMP proposes collecting tissues for genetic analysis from all fish handled in surveys and at LCM stations. Tissue collection and archiving will follow protocols established by NOAA Fisheries SWFSC's Coastal Salmonid Tissue Archive in association with CDFG's Central Valley Anadromous Salmonid Tissue Archive. Genetic baselines will be periodically revisited.

Tissue samples will also be collected from hatchery broodstock and, when appropriate, juveniles. In places with significant hatchery influence, tissue samples will be sought from natural-origin and hatchery-origin fish that spawn naturally. Hatchery and spawning ground genetic data will be used to evaluate and improve hatchery operations and to assess interactions of hatchery fish with naturally spawning stocks.

A program will be developed to collect, read, and archive scales (and/or otoliths) from adult fish collected at LCM stations, hatcheries, and those encountered in limited carcass surveys. These data will be used to assess age structure. In some cases (e.g., steelhead, and to some extent perhaps coho salmon), carcasses may not be available or accessible in large enough numbers to allow age structure estimation. In these cases we will use either hatchery fish data as a surrogate, or rely solely on data gathered at LCM stations. Age structure estimation for the small numbers of steelhead in the southern area will likely rely on data collected at LCM stations.

The CMP will also collect seasonal abundance data at LCM stations to evaluate adult run timing and juvenile outmigration at these selected sites.

Table 3. Diversity Characteristics of Salmonids Ranging from Strongest level of Genetic Separation to Weakest.

I. Strongest levels of genetic separation
   A. Species

II. Significant levels of genetic separation
   A. Major geographic divisions: Distinct Populations Segments (DPSs) and Evolutionarily Significant Units ESUs)
   B. Within geographic division traits (Generally labeled as run timing, but includes a wide variety of genetically inherit traits that enable these reproductive strategies)
      1. Strong genetic signal – Separate Central Valley Chinook salmon ESUs, Columbia River Chinook salmon ESUs
      2. Weak genetic signal – Klamath Mountain Province summer steelhead, Klamath spring run Chinook salmon

III. Major life history traits (Small to no genetic signal)
   A. Anadromy/resident
   B. Sex ratio
   C. Fecundity (Includes egg size)
   D. Age and size structure
   E. Habitat utilization patterns (Freshwater and marine)
   F. Emigration age and timing
   G. Maturity patterns (Includes winters at sea)
   H. Adult spawning timing
   I. Physiological tolerances

LIFE CYCLE MONITORING STATIONS

Goals

Work within the past few years has demonstrated the effects of ocean conditions on salmonid abundance (Loggerwell et al. 2003, Botsford et al. 2005, Mueter et al. 2007). Salmonids experience wide variation in marine survival due to cyclic and non-cyclic changes in ocean conditions which can mask both species recovery and declines. Effective recovery monitoring should provide an independent measure of ocean survival so that recovery can be accurately assessed. The CMP proposes long-term, intensive monitoring at fixed Life Cycle Monitoring (LCM) stations to evaluate the effects of changing ocean conditions on salmonid populations by providing measures of freshwater and ocean survival. Salmonid population abundances are known to change dramatically from year to year (PMFC 2007) due to changes in ocean survival. This variation has long been considered in harvest management. For coho salmon, abundance has been shown to have decadal scale variability due to ocean survival (Botsford et al. 2005). For example, coho salmon experienced a decadal scale decline in ocean survival from near 10% in the early 1970's to values less than 1% in the 1990's. Similar patterns of variability in ocean survival are thought to occur with other salmonid species, but are not as well documented. Therefore, the measures of freshwater and ocean survival that will be obtained from LCM stations are essential for effective interpretation of observed variation in adult abundance. Also, secondary questions such as geographical patterns in survival rates can be used to help explain differences in effectiveness of recovery and restoration actions.

LCM stations will include an adult counting station, spawner surveys upstream from the counting station, and outmigrant juvenile trapping. The adult station is necessary to adjust the results of the larger-scale redd surveys for estimating adult abundance and to link variation in survival at different life cycle stages to adult abundance. Redd to adult bias corrections will be estimated from the LCM data (see Adult Escapement per Sample Unit from Redds Estimation Section, above). These corrections are essential components of the larger-scale adult abundance estimates and can best be gained from data collected at LCM stations. Currently, it is not clear how much geographical or annual variation these redd to adult bias corrections have, and results over a number of locations and years will be necessary to establish these relationships. This means that the LCM stations need to be established as soon as possible. The outmigrant juvenile trapping along with the adult counting station will provide estimates of freshwater and marine survival.

It is expected that the LCM stations will attract a wide range of salmonid research projects. The most obvious research focus will be salmonid habitat productivity studies. In particular, specific links between fish production and freshwater habitat condition are difficult to determine, and have not been well established (Smokorowski et al. 1998, Roni et al. 2002, Feist et al. 2003). Current thinking tends toward the view that population viability is more dependent on a complicated collection of spatial features and processes at the landscape level (Dunning et al. 1992, Bond and Lake 2003, Williams and Reeves 2003). It is hoped that CMP habitat assessments and population monitoring will further our understanding of these habitat-productivity relationships.

Locations

LCM stations will need to be distributed in a way that captures regional marine and freshwater dynamics and at least two LCM stations per recovery domain will be necessary. Oregon Department of Fish and Wildlife (ODFW 2008) and Washington Department of Fish and Wildlife (WMOC 2002) have prepared a list of considerations for location of the LCM stations and this information has been updated and modified specifically for California (Boydstun and McDonald 2005). Specific consideration criteria are presented in these documents and will not be repeated here except for the following general comments. The LCM stations will not be located randomly, due to accessibility requirements and the need to restrict locations to watersheds of manageable size. LCM stations will probably be placed on smaller systems that are in single ownership with good access or where there are existing counting weirs. This will probably lead to the stations being placed in systems that are smaller and perhaps in places with better habitat condition than average. Also, locations where there would be substantial or erratic mortality between the outmigrant trapping and ocean entry locations should be avoided, since this would bias the ocean survival estimates. However, LCM stations will still provide important information for understanding salmonid recovery, even with these unavoidable limitations. We will not provide specific location recommendations in this document. But, Boydstun and McDonald (2005) provide a list of existing counting weirs and some general guidance. ODFW (2008) suggests pairing geographically close stations, since one person can operate two locations in one day. Currently, Oregon operates eight LCM stations (ODFW 2008) while Washington has nineteen LCM stations (Crawford et al. 2002). The numbers of LCM stations that will be needed are unclear at the present, but should reflect major biotic areas along the California coast. At a minimum, there should be at least two LCM stations per recovery domain in the Northern Area. In the Southern Area, there are liable to be a large number of LCM stations due to the reliance on counting stations to estimate abundance.

Methods

The essential components of the LCM stations are an adult counting station (e.g., a weir), adult escapement surveys above the counting station, and outmigrant juvenile trapping. The standard adult surveys can be conducted following the procedures presented in the Adult Monitoring section. The adult counting station and trapping of outmigrant juveniles will be described briefly below.

Counting Stations

Zimmerman and Zabkar (2007) describe detailed sampling methods for operating fixed station and weir counting stations. A few major points are outline here. Gallagher et al. (2010a) operated both fixed counting stations and the more-common PVC resistance weirs in Mendocino County and found that the fixed counting station performed better. The fixed counting station performs at much higher flows than the resistance weir. However, new fixed counting stations are unlikely to be built except in association with new or renovated water storage or hydroelectric projects. Therefore, resistance weirs are much more likely to be used as adult counting stations. Procedures at weirs are straightforward where fish will be counted, measured and biological samples (scales, tissue samples, etc.) will be taken. Fish will be marked as they pass through the weir to estimate double counting and uncounted passage in the watershed.

In circumstances where high flow events allow significant numbers of salmonids to pass counting stations unmonitored, mark and recapture experiments will be needed. The fish will be marked at the counting station and recovered in the adult spawning ground surveys either as live re-sightings or carcass recoveries. The fish should be marked with tags that are individually numbered and/or have a color scheme that indicates the week in which they were marked. In addition, an operculum punching system that is stream-specific should be used to evaluate tag loss. Mark and recapture data can be analyzed for either live fish (re-sight) recoveries that assume replacement or closed population models using carcasses that are recaptured only once (see Seber 1982 and Gallagher et al. 2010a).

DIDSON methods for counting adult abundance (see Adult Monitoring, Southern Area) appear to provide reliable estimates where species identification is not an issue (see data presented here and Maxwell and Grove 2004). DIDSON equipment can be operated at higher flows than resistance weirs and provides salmonid estimates unconstrained by fixed counting stations. However, where two or more similar salmonid species inhabit a stream, reliable species identification can be problematic. Adult Chinook salmon can be separated from coho salmon and steelhead by size and date, but identifications of coho salmon and steelhead need to be validated before species specific estimates can be accepted.

Outmigrant Juvenile Trapping

The CMP proposes using outmigrant juvenile trapping to assess freshwater habitat quality both through estimators of freshwater survival and through outmigration characteristics (e.g., numbers of fish, fish size, and timing). Trap type and design (fyke net, inclined plane, or rotary screw traps) will be dictated by local conditions, species present, stream size, and flow conditions. Extensive advice is available about trap site selection, operations, and data management (Volkhardt et al. 2007, O'Neill 2007a, ODFW 2008) and will only be dealt with briefly here. Traps for coho salmon and steelhead are generally fished near the head of a pool, just below a section of fast flowing water. Stream flow should be moving in a straight line as it enters the trap. Juvenile Chinook salmon trapping will generally occur in the main stem using rotary screw traps, which require several feet of water to use. Trapping usually begins by the first week in March and continues until the catch decreases to low levels, usually ending by the first of June except for Chinook salmon which may continue migration through July. However, juveniles are out-migrating both earlier and later than these dates and there is some level of juvenile outmigration throughout the year (S. Harris, pers. comm.; S. Hayes, pers. comm.). Traps generally are operated 24 hours per day 7 days per week and are at a minimum monitored daily. All fish should be counted each day and a subset of at least twenty should be measured per species and size class. `Generally all fish handled for length measurements or marking for trap efficiency experiments should be anesthetized and care should be taken to reduce fish stress due to water temperature and fish density. Holding water should be cool and well-oxygenated.

Measures of trap efficiency, or the probability that an individual will be captured in a trap, are necessary to properly assess juvenile outmigrant data. Volkharht et al. (2007) gives examples of trap efficiencies ranging from 63% to 13% so that the estimates would be expanded by 1.6 to 7.7 times actual catch. Flow is often the dominant factor affecting trap efficiency since downstream migration is often prompted by high flow events. Turbidity, visibility, fish species and size, noise, and location are also factors that may affect efficiency. The varying influence of these factors indicates that trap efficiency measures are needed throughout the migration period and particularly to cover a wide range of flow events. Detailed instructions for measuring trap efficiency are given in Bjorkstedt (2005), Volkhardt et al. (2007) and ODFW (2008).

The basic trap efficiency procedure is to release marked juvenile outmigrants above the trap, estimate the proportion of released fish captured, and expand the total trap numbers by that proportion. Fish previously captured in the trap or in a secondary upstream trap are marked using fin clips, dying, pit tags, or panjet marking. Care should be taken in the selection of the marked fish so that they are representative of the entire population. In some circumstances, hatchery fish may be used as the marked component, but because hatchery fish can behave differently than natural fish, using them in this way introduces unknown biases to the efficiency estimates. The marked fish should be released far enough upstream that they redistribute in a natural pattern, but not so far that other factors such as predation become issues. Volkhardt et al. (2007) suggest a release point at least two pool/riffle sequences above the trap. Trapping efficiencies over discrete experiments and time periods described here are estimated using the Petersen method (See Seber 1982, Volkhardt et al. 2007). Confidence intervals are commonly estimated using bootstrap procedures (Manly 2007).

Mark and recapture experiments have a number of assumptions: populations are closed, marked and unmarked individuals are well-mixed, and marks are not lost (Ricker 1958). Also there is the assumption that these factors do not vary over time that is often unlikely given the influence of flow on smolt outmigration. Stratified mark and recapture estimates provide a means to incorporate variability in trapping operations and for improving the precision of the abundance estimate (See Schwarz and Dempson 1994 and Bjorkstedt 2005). Fish are marked in a different unique manner over discrete time periods, often one week. Mark and recapture experiments then can be decomposed into a series of time periods when recaptured individuals can be traced back to the period in which it was marked. Stratified mark and recapture experiments can use two traps (either partial or complete) or a single trap, where fish are captured, marked, moved upstream and released. Stratified mark and recapture estimates can be modeled against other variables, most often flow, to greatly improve total abundance estimates. The methods of calculation are well developed and will not be covered here, but are available from Seber (1982), Schwarz and Dempson (1994), Arnason et al. (1996), and Bjorkstedt (2005). Software for analyzing stratified mark and recapture experiments is available from Arnason et al. (1996) and Bjorkstedt (2005).

Survival Indices

Three survival indices will be calculated: total survival, freshwater survival, and marine survival. Together, these indices will be used to assess links between life-stage specific mortality and adult abundance. Total survival will be calculated as the number of adults returning in a year (recruits) divided by the number of spawning adults that contributed to the recruits. This is the same quantity as Productivity or the cohort replacement rate. Freshwater survival will be calculated as the number of smolts divided by the estimated number of eggs deposited by the spawning adults in that season. Whether an overall or an annual egg per female body weight estimator will be needed is yet to be determined. Marine survival is calculated as the returning adults (recruits) divided by the number of smolts from the corresponding brood year. While this is relatively straightforward for coho salmon due to their more rigid three-year cycle, both Chinook salmon and steelhead have less rigid life cycles and will require knowledge of their age structure. These marine survival indices should be calculated as geometric means to reduce the influence of extreme values and to be consistent with other ESA analyses (Good et al. 2005). Precision estimates for these survival indices will be computed by bootstrapping the underlying data (Manly 2007). Knowledge of life stage specific mortality features will allow us to assess which recovery actions or scenarios will be most likely to lead to improvements in adult numbers. Marine survival can also be estimated from CWT hatchery Chinook salmon data. These estimates are not routinely made, but have been calculated for specific situations (M. Mohr, pers. comm,) The nature of survival indices of hatchery salmonids may be very different than those of natural spawned fish (Lindley et al. 2009) and may vary among species.

DATA MANAGEMENT

Need for a Centralized Database

Data management is a very important part of the CMP. These data are required for analyses intended to inform decision makers, and if these data are not easily and clearly available, then they have no value. Data management is often neglected as an integral element of biological sampling programs and it is therefore essential that data management be addressed at the beginning of the monitoring program and become central to its development.

Planning for a central data management scheme needs to begin immediately. The data management system should be a distributed one, accessible through a web-based platform. Data will be entered directly from the field, range checked, and held for data review and editing. After the data review and editing, the data will be entered into the central database. These data will then be accessed through a web-based platform for analyses. There will also be a regularly updated web-based interface for the general access. The following tasks will need to be completed for the creation of the centralized database:

1. Development of a common set of spatial and user identification data fields to allow queries and relationships between data sets;
2. Software programming for a fully relational database and interface;
3. Metadata standards to facilitate use of a metadata catalog for keyword and thematic searches across data sets;
4. Guidelines for standardizing data structures and management; and
5. Identification of lookup tables and data definition standards.

More detailed descriptions of these tasks can be found in Toshach et al. (2007). In addition, there are a number of preexisting data sets that will need to be incorporated into the database and standards for their conversion will need to be developed.

Data Flow

Data flow for the monitoring would include: 1) the capture of data collected by field operations including geolocation, 2) transfer of raw data to the database, 3) data editing and range checking, and 4) making these data available to agencies and the public. Each of these steps will contribute to improved data collection, organization, management, estimation, interpretation and display to the user audiences.

Actual data collection activities will occur over a wide range of locations and conditions, including wet winter sampling. Data recording in the field can be accomplished by using direct data recorders. Field electronic devices programmed for data entry are currently widely used for this purpose. These data entry systems have the advantage that some data checking can occur at the time of data collection (Johnson et al. 2009). Most importantly, this will minimize the time required for data entry and the errors introduced during data entry. The direct data recorders can then be downloaded into laptops each day and backed-up onto external media or if possible to the central database via a web-based platform. These direct data recorders are not expected to be a major program expense and are preferred to the traditional method of having support personnel enter field data, usually at a remote location, without oversight. Their disadvantage is if they fail, the crew could potentially lose all of the raw data collected on any given day's field survey because there is no paper backup. Timely archiving of daily field data in both electronic and hard-copy formats will mitigate or eliminate this disadvantage of the direct data recorders. These data logging methods are now widely used and data losses have not been significant. Some of the authors have used these methods for over seven years and have not experienced this sort of data loss.

Data can be uploaded over the web to a central database upon the field crew's return to field offices. This will offer an additional chance for data editing and range checking and also allows a rapid transfer to the central data management center. The close to real time data transfer allows almost immediate data summary and examination and will result in much better operational control for monitoring sampling activities.

Raw data from field activities will be managed by a central data management system. This central data management system will be part of the operational control of the sampling as well as charged with basic data management of the raw field collection data. The data center will be responsible for regional data management, including final data editing and storage of data and development of data expansion factors and variance calculations. This central data management also will be responsible for annual data reports and summaries that will be necessary to insure that the year's sampling is being completed in a timely fashion. This type of in-season sampling information is invaluable for operational control of sampling activities.

FUTURE DIRECTIONS AND PLAN REFINEMENT

The strategy, design and methods outlined here, as well as data collection methods and analytical tools will be continuously reviewed in an effort to improve accuracy, implementability, usefulness, and cost effectiveness. CDFG and NOAA Fisheries have convened joint agency committees to oversee the initial development and implementation of a coastal monitoring program. Joint working groups will be established to address the technical field and scientific analysis responsibilities and data management (e.g., database structure, storage, retrieval, distribution). Once these groups are established and operating, a multi-agency advisory committee will be established, to provide a forum for State, federal, county, academic, and private partners to collaborate with CDFG and NOAA in implementing and maintaining a statewide monitoring program. The objectives of this organizational strategy are to ensure consistent permanent membership to oversee the program, analyze alternative methods, implement program improvements, apply consistent methodologies across the State, maintain a single, comprehensive data set, promote collaboration with other organizations and agencies, and advance widespread availability of monitoring data, analyses, and reports.

The following list contains important initial tasks and investigations that will be taken up by the joint CDFG-NOAA committees. Many of these issues were either identified by the authors in the process of writing this technical summary or brought to our attention by reviewers. However, in the interest of beginning program implementation as soon as possible, and because many monitoring elements are subject to multiagency approval, these issues could not be resolved in this paper. These issues, and others, will be taken up and resolved by the appropriate CMP committees or working groups as program implementation progresses.

1. Finalize the habitat monitoring plan to be integrated with CMP population monitoring;
2. Improve analytic techniques to provide answers from sampling data (Inference Design);
3. Add steelhead in the Northern area to spatial structure monitoring, with a minimum goal of establishing baseline distribution over their range in California;
4. Explore the potential value of incorporating additional or different analytical methods and tools (e.g., local neighborhood variance estimator);

5. Identify and implement research components that would improve CMP data collection, sampling strategy, and data analysis;
6. Further develop the relationship of redd counts to true abundances for all species and locations across the northern monitoring area. Explore the alternative use of local polynomial regression estimates (Breidt and Opsomer 2000) to evaluate these relationships;
7. Use initial years' data to evaluate and improve allocation of sample size to each panel type. Revisit sample size required to obtain sufficient power to detect trends and sufficient precision to accurately estimate status;
8. Investigate PIT tag-based methods for estimating separate winter and summer juvenile survival rates at LCM stations, specifically when methods would allow for evaluating habitat restoration activities;
9. Initiate studies to measure redd detection and inter-observer reliability of redd surveys in a variety of locations across the northern monitoring area. Studies have shown that redd detection was not a significant issue. These studies were conducted on bull trout, a non-anadromous salmonid with a much shorter spawning season than CMP's target species. Investigations based on coho salmon and steelhead in California would provide corroboration and support for this methodology under CMP;
10. Consider using the SVB metric to assess whether spatial structure occupied sites are dispersed or clumped;
11. Add coastal cutthroat trout as a target species;
12. Finalize the Shaffer document; and
13. Establish a website portal to provide organizations and the public with information and guidance on a) status and trend monitoring for anadromous salmonids and b) the State's coastal monitoring program.

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Agenda Item F.9.b
Supplemental CDFW PowerPoint
March 2014

CDFW Priorities for Monitoring California Coastal Chinook Salmon

Michael K. Lacy
California Department of Fish and Wildlife
Fisheries Branch

March 13, 2014

Thanks to the following contributors to this talk

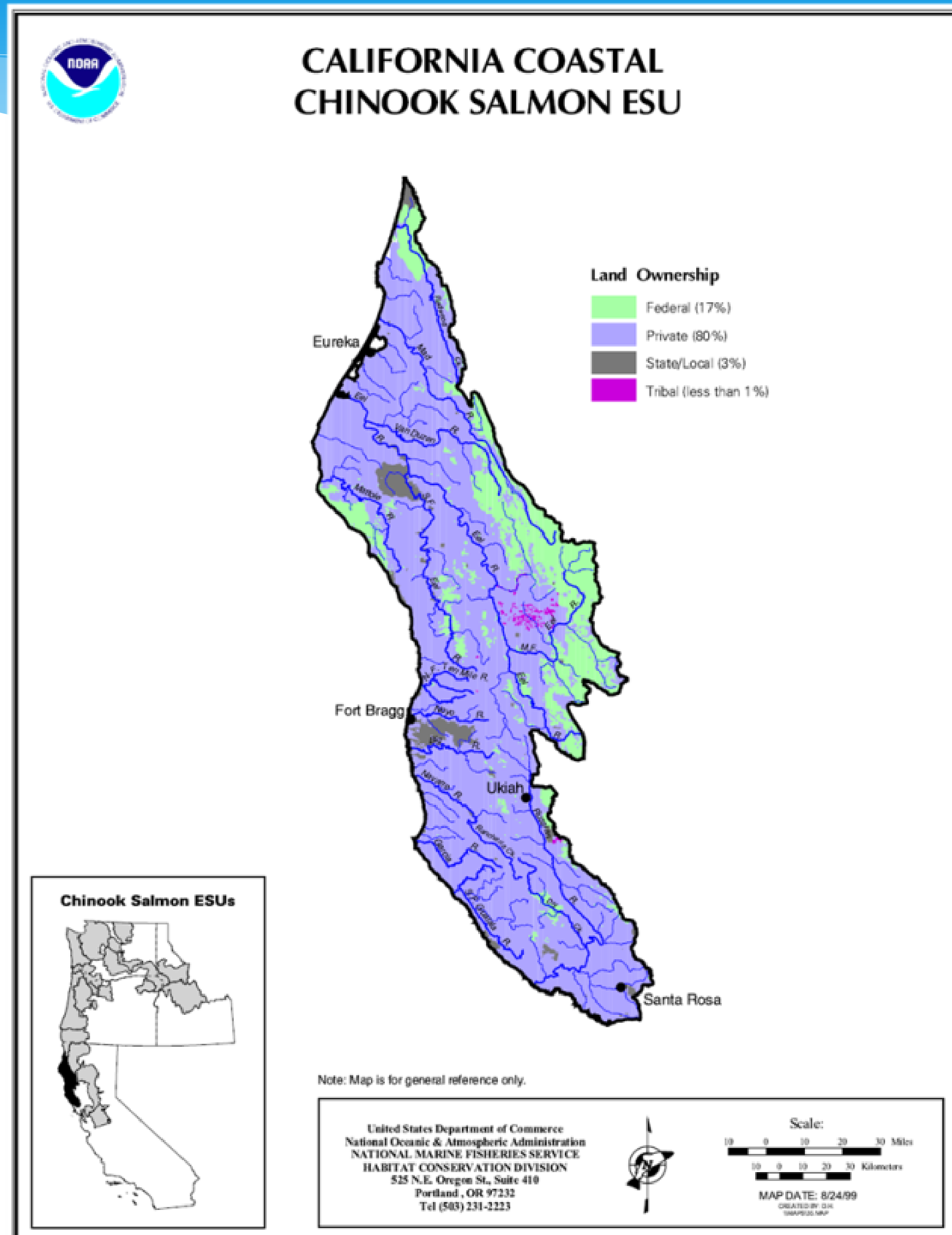
* Pete Adams, NOAA Fisheries (retired)
* Kristine Atkinson, CDFW
* Sean Gallagher, CDFW
* Greg Horton, SCWA
* Brett Kormos, CDFW
* Eric Larson, CDFW
* George Neillands, CDFW
* Seth Ricker, CDFW
* California Coastal Monitoring Plan Technical Team

Today's talk on CC Chinook

* Complexities of monitoring California Coastal Chinook salmon
* Relevant features of the California Coastal Monitoring Plan (Adams et al. 2011, AKA FB 180)
* CDFW prioritization– stepwise approach to addressing monitoring needs
* Example data

California Coastal Chinook Salmon ESU

- Wide latitudinal distribution
- Many watersheds with different characteristics
- No hatchery stocks in ESU=no marked fish to monitor
- No broad-scale monitoring program prior to CMP (Adams et al. 2011)



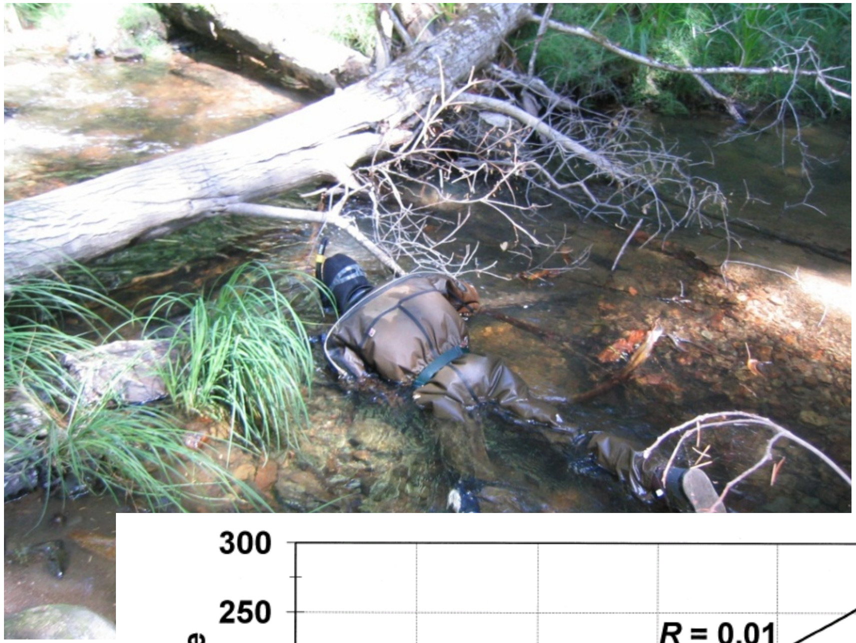
Two Monitoring problems

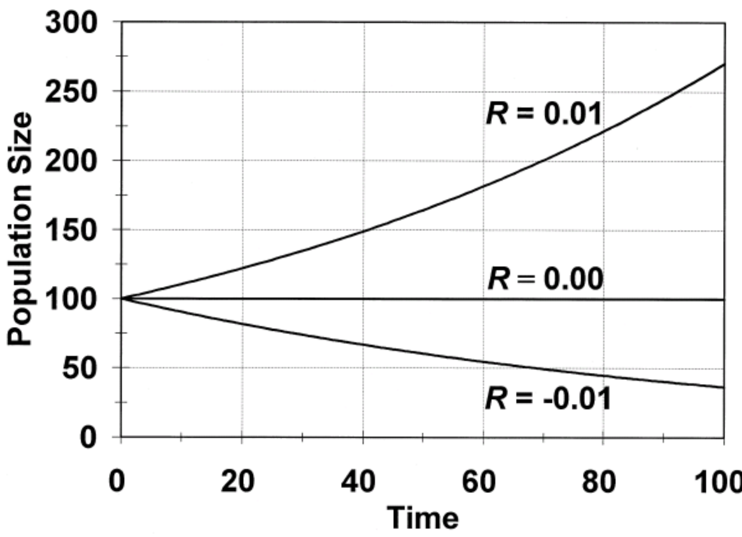
1. Develop monitoring plan to establish CC Chinook status and trend at ESU and other relevant (smaller) scales

   Fully implement CMP (Adams et al. 2011), upgrade priority of CC Chinook Monitoring

2. Develop monitoring sufficient to obtain information to effectively manage ocean fisheries

   Work w/ NOAA Fisheries to design and implement additional monitoring to better manage ocean fisheries





Goals and objectives of the CMP

(Adams et al. 2011)

1. Create a monitoring framework that includes all coho salmon, Chinook salmon and steelhead in coastal California

- ✓ ESU and population *abundance estimates* for both status and trend
- ✓ Estimate *productivity trends* from status abundance data
- ✓ Estimate regional and population-level *spatial structure*
- ✓ Document and monitor changes in the *diversity* of life history and ecology

2. Create permanent Life Cycle Monitoring (LCM) stations that will allow deeper evaluation of both freshwater and marine fish-habitat relationships and provide long-term index monitoring.

CMP design elements

General Randomized Tessellation-Stratified (GRTS) Design

* Generates a spatially balanced random sample of stream reaches
* Allows substitution of reaches if some are unusable while retaining spatial balance
* Allows addition of samples to increase intensity at smaller scales (e.g., diversity stratum)

Rotating panel visitation schedule

* Provides appropriate data for both status and trend evaluation

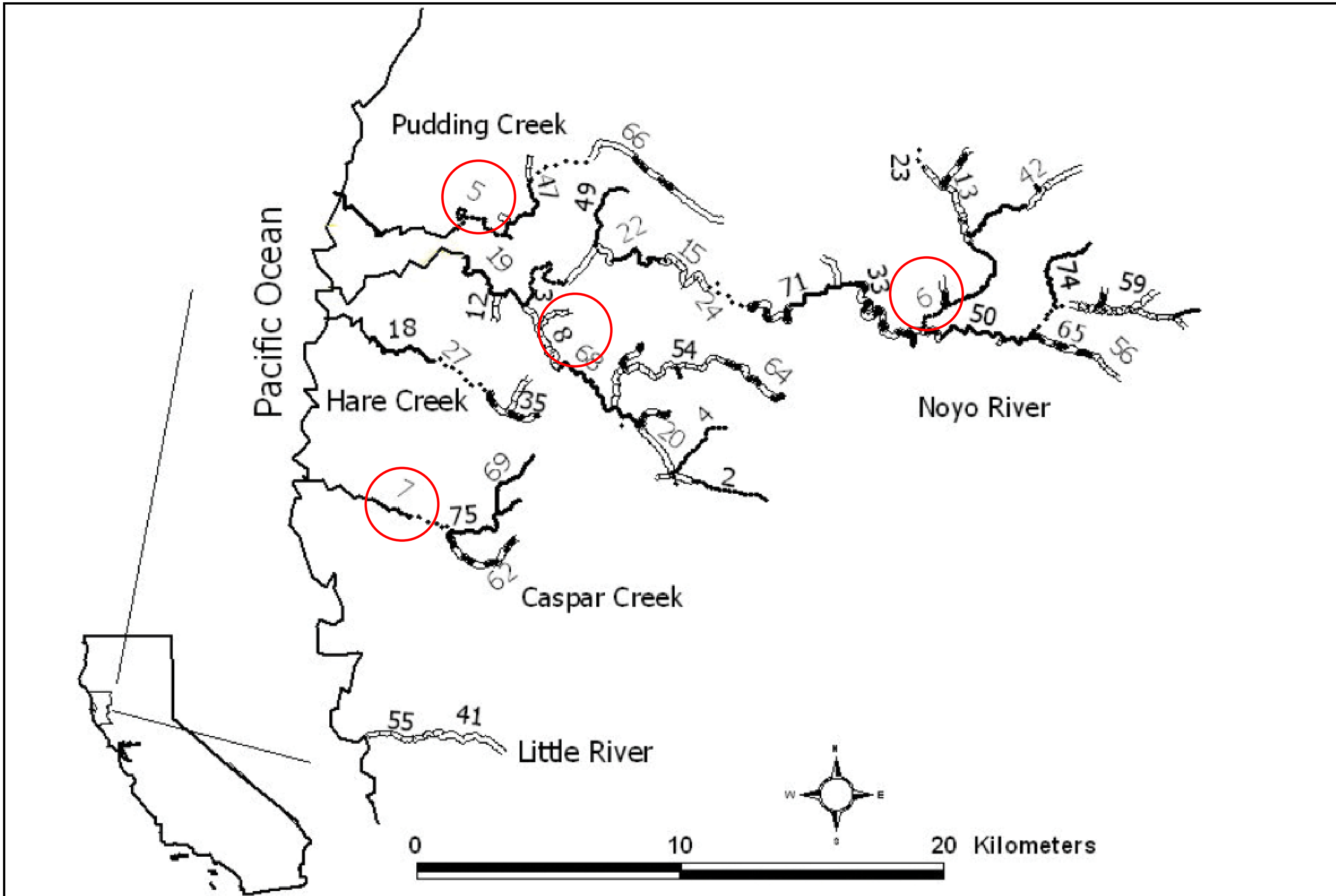
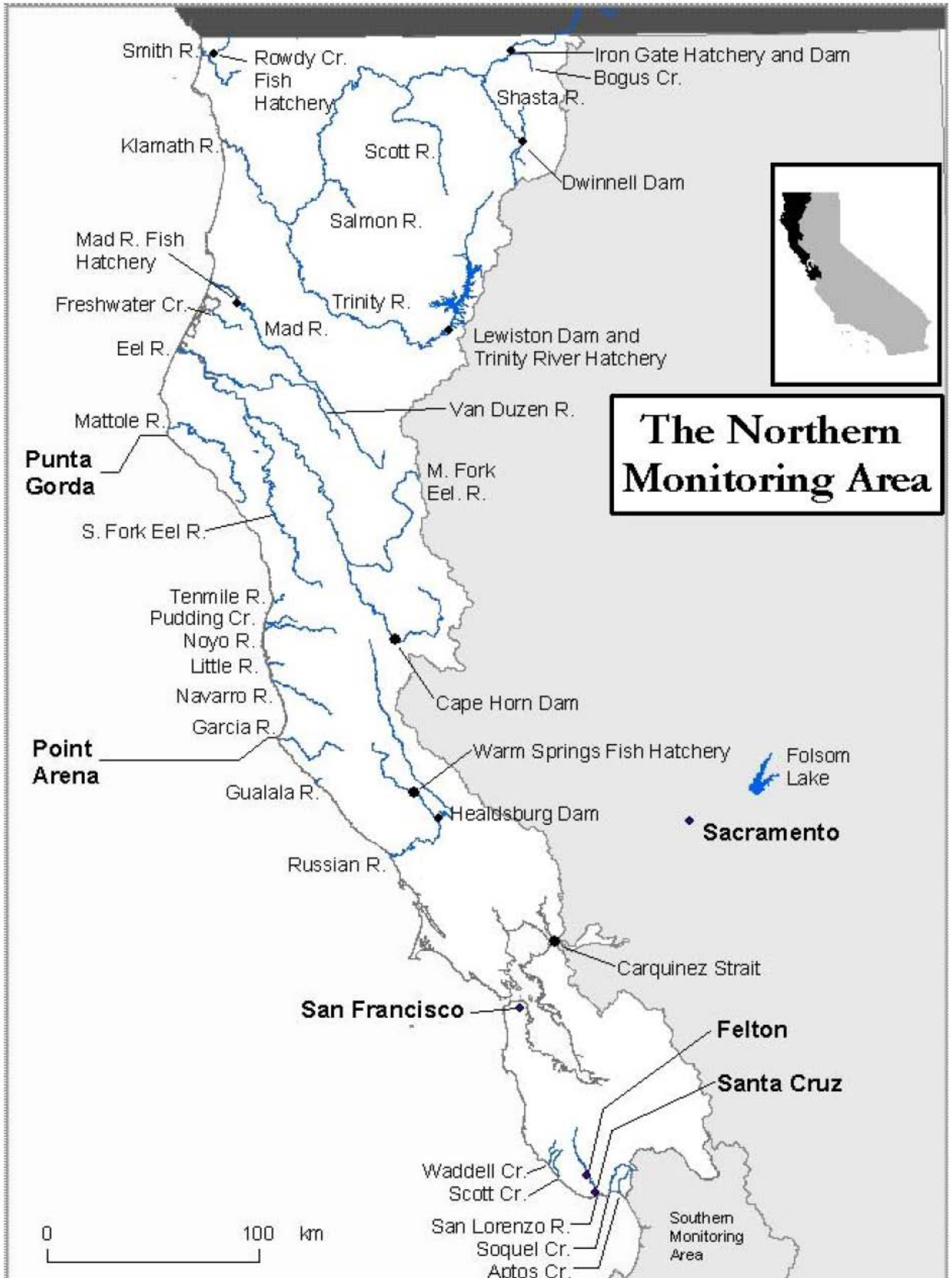


Figure 3. Mendocino Coast sampling frame example (McCanne, D. and A. Brown. 2005).

The CMP Northern Area

- CMP monitoring split into Northern and Southern areas
  - Species
  - Abundance and distribution
  - Environmental conditions

- Northern Area is North of Pajaro River
- Contains entire CC Chinook ESU



Status and Trend in the Northern Area

Adult abundance

- Sampling frame by species
- Estimate annual abundance using redd surveys (GRTS)
- Status is geometric mean over 4 generations
- Trend is slope of regression of abundance over 4 generations
- Productivity: CRR (N_{t+3}/N_t)

Life Cycle Stations

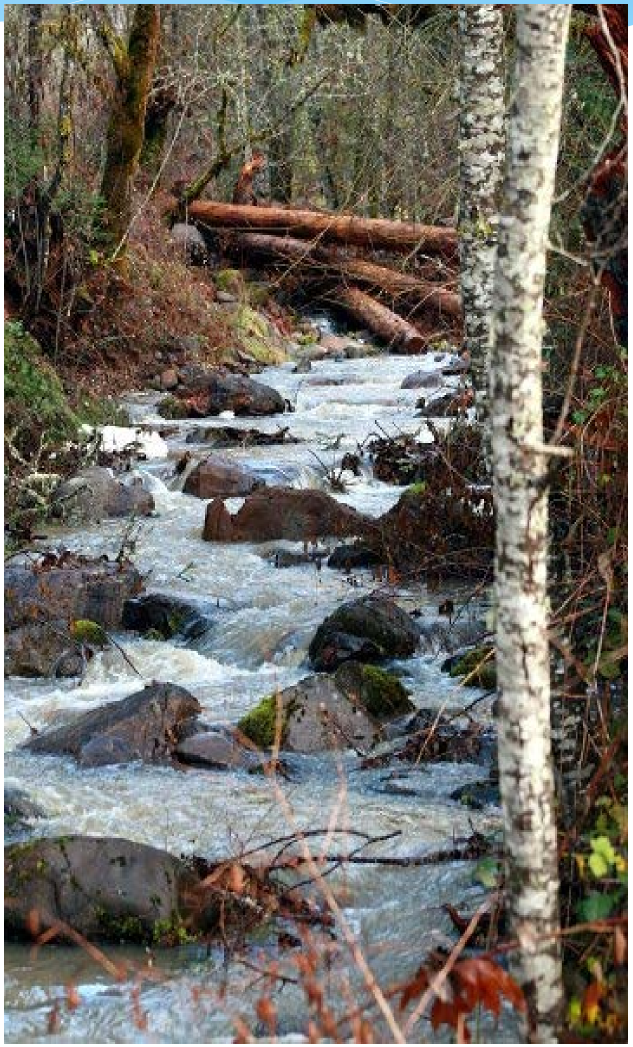
- Adjustment of redd estimates to number of fish using LCS data
- Marine survival
- Productivity-habitat relationships

Spatial distribution of juveniles

- Snorkel surveys (GRTS)

Complexities of implementation of the CMP for CC Chinook (and others)

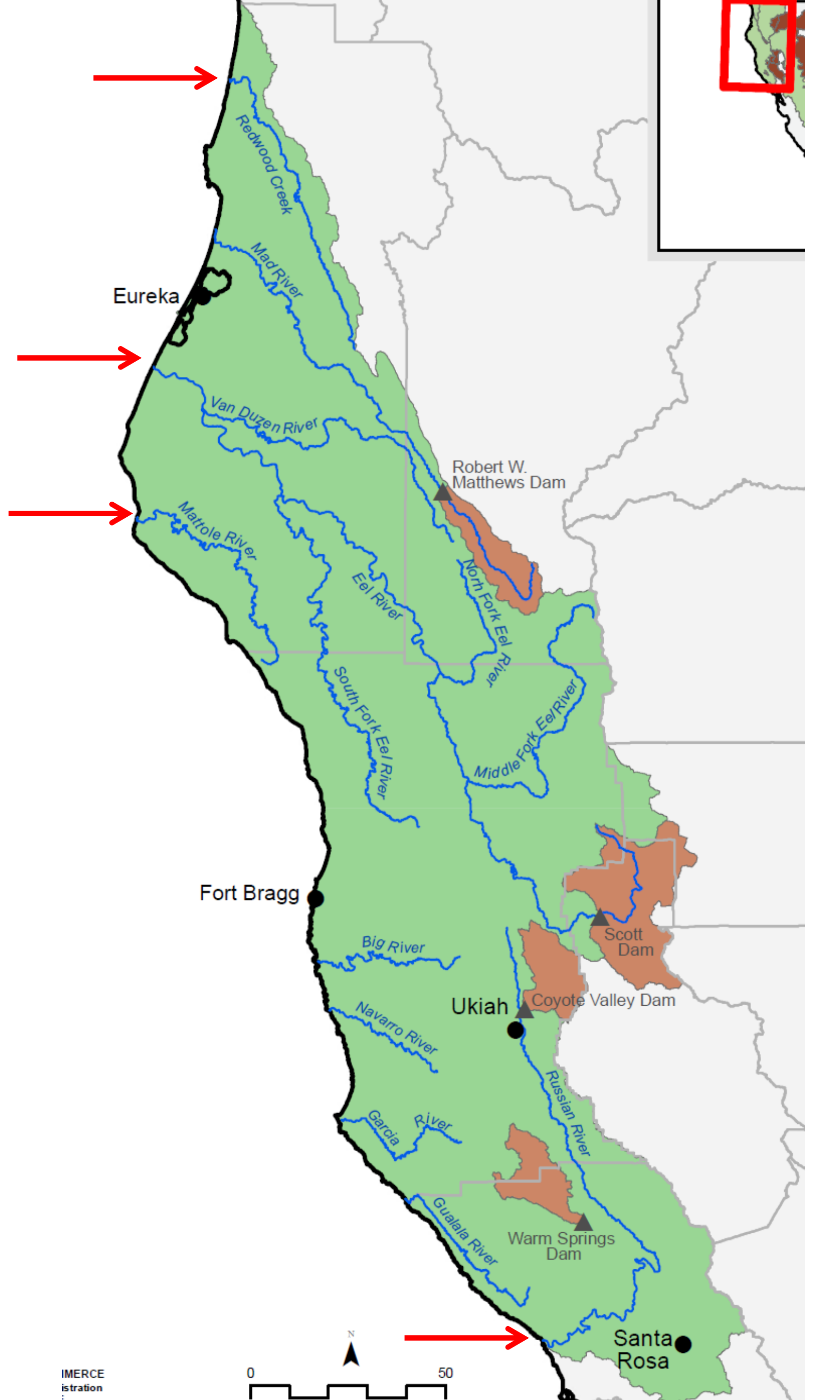
- Difficulties accessing large areas repeatedly over spawning season
- Application of LCM redd-to-fish relationships at larger scales
- Large scale application– all salmon streams along CA coast
    - Incremental implementation
- Access to private land
- Logistics and funding
- Unknowns and uncertainty



Improving status and trend monitoring for CC Chinook

Increase CMP effort (especially adult abundance estimation) focused on major producers of CC Chinook:

- Redwood Creek
- Eel River (expand SF Eel to "Chinook space," then expand surveys to rest of basin)
- Mattole River, and
- Russian River



Example data: CC Chinook 2012-13 Season

River/Creek	Estimates or Counts of Chinook Adults			Method
	Low 95% CI	Point Estimate	High 95% CI	
Redwood Creek (Humboldt Co)	476	766	1056	Redd count only, not adjusted to no. fish. Chinook redds within coho sampling frame
Humboldt Bay Creeks	--	11	--	Uncalibrated weir count
Eel River	776	1445	2221	Redd counts only, not adjusted to no. fish. Chinook redds within coho sampling frame
Mattole River	No surveys			
Ten Mile River	--	0	--	Redd counts adjusted to no. fish. Chinook redds within coho sampling frame
Noyo River	0	5	16	Redd counts adjusted to no. fish. Chinook redds within coho sampling frame
Big River	0	20	60	Redd counts adjusted to no. fish. Chinook redds within coho sampling frame
Albion River	--	0	--	Redd counts adjusted to no. fish. Chinook redds within coho sampling frame
Navarro River	--	0	--	Redd counts adjusted to no. fish. Chinook redds within coho sampling frame
Garcia River	0	18	41	Redd counts adjusted to no. fish. Chinook redds within coho sampling frame
Russian River	--	6713	--	Video Count

What the CMP *will* and *will not* do

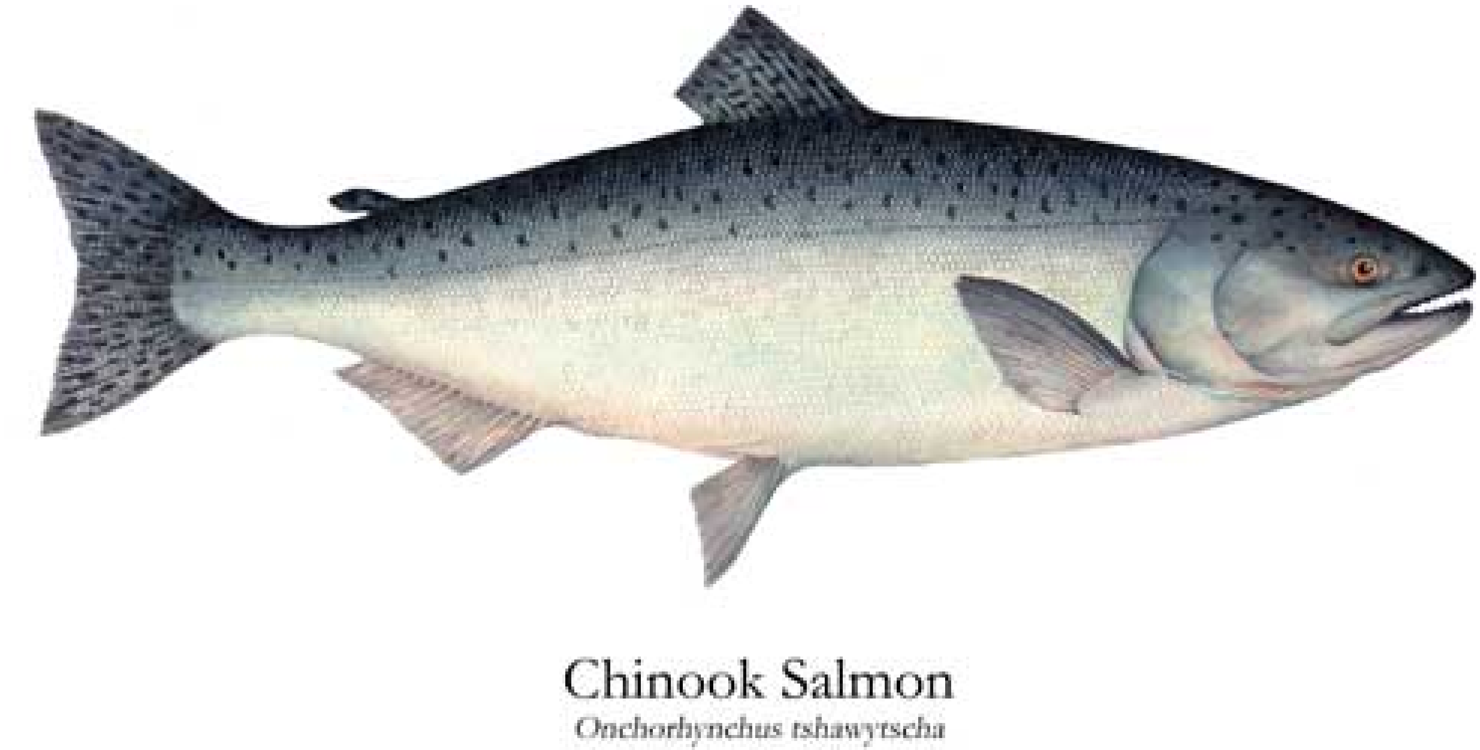
CMP WILL

- Provide direct estimates of regional status and trend– abundance, spatial structure, productivity, and diversity
- Estimates for smaller areas (e.g., diversity strata) when needed

CMP WILL NOT

- Provide age-specific abundance and/or survival estimates suitable for development of explicit fishery targets
- Provide sufficient detail to manage fisheries directly

Questions?



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Agenda Item F.9.b
Supplemental NMFS Report
March 2014

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
West Coast Region
7600 Sand Point Way N.E.
Seattle, Washington 98115

March 5, 2014

Mr. Chuck Bonham
Director, California Department of Fish and Wildlife
1416 Ninth Street
Sacramento, California 95814

Dear Mr. Bonham: Chuck

NOAA's National Marine Fisheries Service (NOAA Fisheries) is interested in pursuing with the California Department of Fish and Wildlife (CDFW) steps that could lead to more advanced management and recovery of California Coastal Chinook (CC Chinook). Current management of CC Chinook under the Endangered Species Act relies on constraining ocean fisheries off California and Oregon so that the predicted Klamath River fall Chinook age-4 ocean harvest rate does not exceed 16 percent. This restriction applies in all years regardless of the abundance of CC Chinook. Recently, there have been calls to move toward an abundance-based management approach for CC Chinook, which would advance conservation while providing flexibility in the fishery – potentially similar to the fishery control rules recently adopted for threatened Lower Columbia River (LCR) natural tule fall Chinook and endangered Sacramento River winter Chinook (SRWC).

Data available for CC Chinook are far more limited than those for LCR natural tule Chinook and SRWC. At this time, we lack reliable estimates of total CC Chinook harvest in ocean fisheries; and escapement data are geographically limited, suffer from short time series, and are likely unreliable in some areas. A NOAA Fisheries study in 2012 concluded that development of an abundance-based management approach is not currently feasible.

NOAA Fisheries appreciates the efforts by CDFW to collect more comprehensive and reliable CC Chinook spawner escapement data. As beneficial as this effort is, we are of the understanding that these new data alone will not be sufficient for conducting a stock assessment, the development of an abundance-based management approach, or tracking the viability of this threatened species. I hope you share the view that conservation and management of CC Chinook could well be advanced with an abundance-based approach – and that an important first step toward that objective is for coordination between CDFW and NOAA Fisheries so that all necessary and appropriate data can be identified and developed for stock assessment and management.

In order to further this objective, NOAA Fisheries proposes to fund and hold a two-day joint CDFW/NOAA Fisheries workshop with a dual focus[1]. The first emphasis would be on current

[1] Funds include travel for 14 meeting participants (seven CDFW and seven NOAA Fisheries) and one month of salary for a junior scientist aiding in meeting facilitation and preparation of the Technical Memorandum.

and planned monitoring projects, with presentations on these efforts given by CDFW scientists. Key gaps in data, sampling limitations and challenges, and the spatial scale of sampling will be discussed. The second emphasis would be on the data needed for stock assessment and development of abundance-based management approaches with presentations initiated by NOAA Fisheries scientists. NOAA Fisheries would anticipate that the group would discuss and prioritize data needs for assessment and management given the practical constraints on data collection in the region. NOAA Fisheries anticipates that these discussions would need to be robust, and include focus on spawner escapement surveys, the feasibility of outmigrant sampling, marking and tagging of outmigrants, recovery of marked adult spawners, and estimation of age-structure.

We are prepared to publish the proceedings of the workshop as a NOAA Technical Memorandum so that the documentation can lead to priority research areas and identify the highest priority projects for future financial support.

Our staff have already begun discussions with their CDFW colleagues about this proposal, and we are encouraged by the level of engagement and dialogue so far. We hope the proposal for a workshop is well received. Please let us know of any questions that you or your staff may have so we can move forward together.

Sincerely,

William W. Stelle, Jr.
Regional Administrator
West Coast Region

Francisco Werner, Ph.D.
Science and Research Director
Southwest Fisheries Science Center

SCIENTIFIC AND STATISTICAL COMMITTEE REPORT ON CALIFORNIA COASTAL CHINOOK UPDATE

The Scientific and Statistical Committee (SSC) reviewed the document "California Coastal Salmonid Population Monitoring: Strategy, Design, and Methods" (Agenda item F.9.a, Attachment 1) submitted by the California Department of Fish and Wildlife (CDFW). The monitoring plan had been examined previously during a workshop associated with the April Council meeting in which members of the SSC, Salmon Technical Team, and Salmon Advisory Subpanel participated.

The document provides a broad overview of possible methods, concepts, and considerations that could be used in development of a monitoring plan but is not focused specifically on California Coastal Chinook or on data needs for potential abundance-based management of this stock. The SSC notes generally that these data needs include estimation of both stock-specific escapement and harvest. One challenge is the lack of coded-wire-tagged fish for this stock, which necessitates using alternative methods of estimating stock-specific harvest (e.g., genetic stock identification).

The SSC concludes that while this document could be used as a general guide to develop a more specific monitoring plan for California Coastal Chinook, it lacks detail to determine whether the data collected would be adequate for Council decision-making regarding abundance-based management. Establishing a monitoring program for this stock would require an intensive, long-term investment, with uncertain fishery benefits. If CDFW and the Council decide to pursue development of a monitoring plan for this stock, the proposed methods should undergo thorough SSC review to ensure the monitoring will meet management needs.

PFMC
03/11/14