GROUNDFISH MANAGEMENT TEAM REPORT ON SALMON ENDANGERED SPECIES ACT (ESA) CONSULTATION: RECOMMENDATIONS

Since the March Council meeting, the Groundfish Management Team (GMT) has compiled additional information and analysis to help inform the Council's final recommendations on Chinook salmon bycatch management in the Pacific coast groundfish fisheries. Below, the GMT provides a description of the future groundfish fisheries, details on supplemental analysis for both the whiting and non-whiting trawl fisheries, and a clarification on Scenario 3 (reserve approach) presented in the analytical document (Agenda Item I.1, NMFS Report 1, March 2017).

As a reminder, in March 2017, the Council recommended that the National Marine Fisheries Service (NMFS) incorporate the GMT's proposed analysis examining bycatch rates between selective flatfish trawls (SFFT) and hooded bottom trawls for use in estimating bottom trawl impacts. The removal of the SFFT requirement is part of the future gear change regulations (passed by the Council in June 2016) and therefore bycatch rates that reflect more similar gear configurations (i.e. hooded nets) should be used instead of assuming the bycatch rates of SFFT. A full detailed description of the methods and results of this analysis can be seen in Agenda Item F.3.a, Supplemental NMFS Report. The GMT will provide our comments and recommendations on this analysis in Supplemental GMT Report 2.

Description of the Future Groundfish Fisheries

During Council discussion in March, Council members expressed a desire to have a description of each fishery included in the main analytical document, as well as an update of the management measures and regulations applicable to each sector that were listed in Agenda Item I.1, NMFS Report 2, March 2017. **The GMT provides an updated description below of each fishery based on the text in that document and recommends these be incorporated into the final Biological Opinion (BiOp).**

Whiting

At-Sea

During the primary whiting season (May 15-December 31), midwater trawl gear[1] is used to target Pacific whiting in the at-sea sectors (mothership and catcher/processor cooperatives). Catcher/processors (CP) both harvest and process catch while mothership (MS) vessels process catch received from catcher vessels (CV). In 2017, there are 10 permitted CPs (nine of which are registered to vessels), six permitted MS vessels, and 34 limited entry (LE) catcher permits with mothership endorsements (MS/CV permits, 31 of which are registered to vessels).[2] Since 1992, the at-sea fleet has been restricted from harvesting south of 42° N. lat. (57 FR 14663). CPs are large vessels that have the capacity to target Pacific whiting at deeper depths than some of the

[1] Midwater trawl gear is defined in regulation at 50 CFR 660.11 as (ii) Midwater (pelagic or off-bottom) trawl means a trawl in which the otter boards and footrope of the net remain above the seabed. It includes pair trawls if fished in midwater. A midwater trawl has no rollers or bobbins on any part of the net or its component wires, ropes, and chains. For additional midwater trawl gear requirements and restrictions, see §660.130(b), subpart D.

[2] When the trawl individual quota program was initiated, there were 10 CP permits, 6 MS permits, and 37 MS/CV endorsements with assigned catch histories. Currently, 3 of the 34 vessels have 2 endorsements and catch histories assigned to them. NMFS West Coast Region Pacific Coast Fisheries Permit System queried March 20, 2017.

smaller catcher vessels that harvest in the MS or shoreside sectors. At times, the at-sea fleet has fished at depths greater than 200 fathoms which may limit salmon bycatch (Agenda Item I.1, NMFS Report 1, March 2017, Figure 10, page 49).

Prior to 2009, the sectors (including shoreside) operated without bycatch caps (1990-2006), or a whiting sector combined cap (2007-2008). This led to a race for whiting until the allocation was reached, or a bycatch cap for an overfished species shut down the sectors from fishing. In 2009, sector-specific bycatch caps for overfished species were established leading to sectors being able to manage their fishing activity individually. In 1997, the CP fleet started voluntary co-op management through the Pacific Whiting Conservation Cooperative (PWCC). In 2011, the MS sector started to operate under voluntary co-op style management through Amendment 20[3] to the Pacific Coast Groundfish Fishery Management Plan (FMP).

With the implementation of Amendment 20, there were few changes to the management of PWCC. Amendment 20 secured the position of the PWCC by continuing the closed class of processor permits established as an interim measure through Amendment 15 and regulations were enacted so that if the co-op dissolves, the quota would be apportioned equally among the vessels who are current members. For the MS sector, Amendment 20 provided the opportunity for the owners of MS/CV permits to form co-ops. Each year, owners of such permits must choose whether to participate in a catcher vessel co-op and, if so, identify the MS to which they are committing their deliveries. Thus far in the program, MS/CV permit owners have chosen to form a single co-op, and all have chosen to join that co-op. If the catcher vessels do not choose a co-op, they can participate in a non co-op fishery, and receive their respective allocations. However, a vessel with an MS/CV endorsement may not fish in both the co-op and non co-op fisheries in the same year.

Under the typical co-op agreements, the primary goal is to minimize bycatch with each fleet using real time monitoring to track location and catch amounts. For the MS co-op, there are specific criteria for avoiding high bycatch, including area restrictions and moving protocols when specific base rates are exceeded. There are two stages of Chinook salmon base rates for the MS sector:

a) 0.04 Chinook/mt is the base rate for fleets that have taken more than their pro-rata share of Chinook salmon relative to whiting harvested, and,
b) 0.06 Chinook/mt is the base rate for fleets that have taken less than their pro-rata share of Chinook salmon relative to whiting harvested. (2015 WMC Bycatch Rules).

Once a seasonal pool has taken 50 percent of its pro-rata share of Chinook salmon, then vessels may be forced to move fishing effort based on varying levels of bycatch. Note that vessels may move earlier due to other constraining species base rates.

For the CP sector, there are fewer vessels and companies participating within the co-op and therefore no pools or specific base rates are stated explicitly within the agreement. However, vessel reports are looked at frequently (hourly to daily) and if bycatch rates are above acceptable levels, PWCC discusses what actions should be taken with the vessels.

[3] http://www.pcouncil.org/wp-content/uploads/PCGFFMP_A20_AsApproved.pdf

Shoreside

The shoreside whiting fleet is a component of the individual fishing quota (IFQ) fishery, which is comprised of quota shareholders who are issued quota pounds for most groundfish species and complexes, vessels registered to limited entry (LE) trawl permits, and shorebased individual fishing quota (IFQ) first receivers. Vessels participating in the shoreside whiting fishery use midwater trawl gear during the primary whiting season. These vessels may also deliver, as catcher vessels, to the MS sector if they have a MS/CV endorsement (as described above). Pacific whiting IFQ vessels tend to fish in waters closer to the ports where first receivers are located, as compared to the at-sea fleet, since whiting needs to be processed quickly. Figure 1 below shows the distribution of hauls by depth for all three whiting sectors from 2011-2015, with average depth of haul in fathoms on the x-axis, and the quantile on the right axis. Fifty percent of all shoreside hauls happen within 120 fathoms or shallower, compared to 140 fathoms in the mothership sector and 175 fathoms in the catcher processor sector.

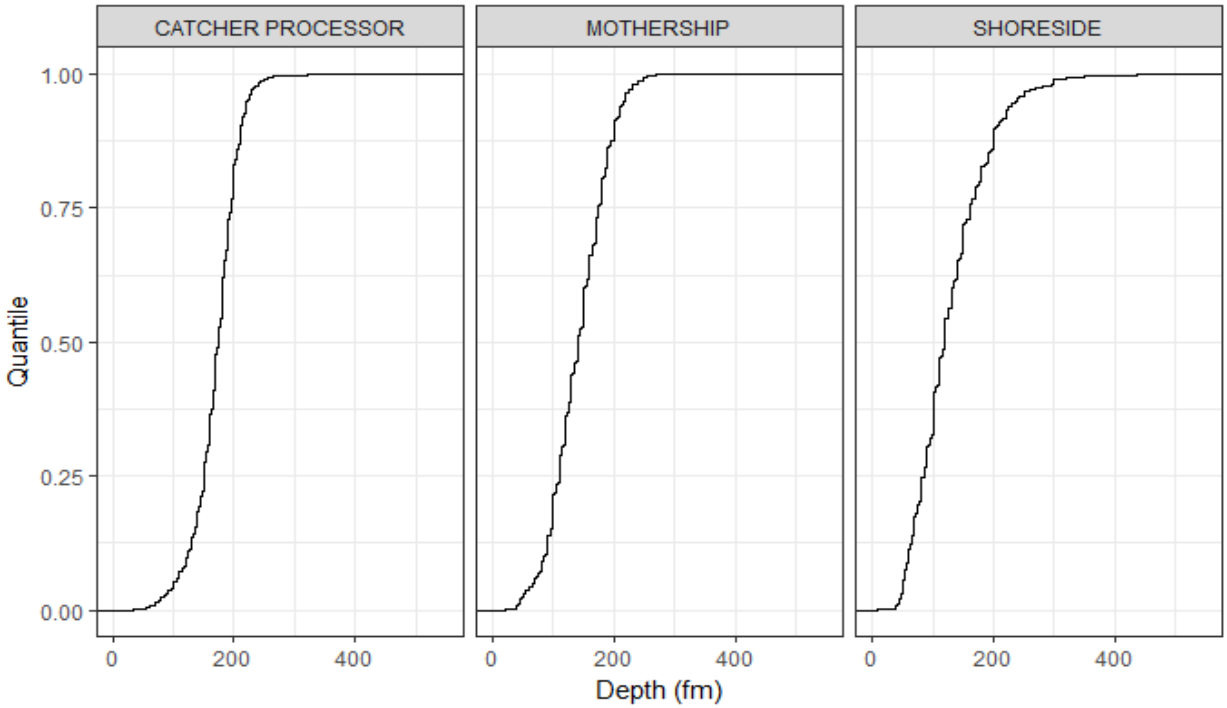

Figure 1: Distribution of hauls by depth (fm) by whiting sector, 2011-2015

Non-Whiting

Individual Fishing Quota- Bottom Trawl and Midwater Rockfish Trawl

For the non-whiting IFQ sectors, the GMT believes that the description from Agenda Item I.1.a, NMFS Report 2, March 2017 is fitting of the fishery through 2013, and also characterizes expectations for reemergence of the historical midwater rockfish fishery. **However, the GMT recommends that information be added in regards to recent regulatory updates that have been adopted (e.g., gear regulations package) or may be expected in the future (e.g., omnibus priority items such as year-round mid-water trawl).** These items are described in further detail below.

It is important to characterize current and future changes since the non-whiting IFQ sector is still in the midst of major transitions that pertain to both management regimes (i.e., trip limits to IFQ) and also in terms of revitalization of opportunity due to the recovery of overfished rockfish, and potential access to areas of the current Rockfish Conservation Area (RCA).

Fixed Gear

The GMT believes that the description in Agenda Item I.1.a, NMFS Report 2, March 2017 is accurate, and provides some additions/edits below to help the Council with their decision making. In NMFS Report 2, it states that the LE fixed gear sector primarily targets high-value sablefish with the majority of landings occurring in Oregon and Washington. However, landings of sablefish vary depending on environmental conditions, and have recently shown a southerly trend. California tends to see the greatest amount of LE daily-trip-limit landings of sablefish in recent years, while Oregon has seen the most primary landings.

In 2017, there were 234 fixed gear permits including 168 sablefish-endorsed and 66 non-sablefish-endorsed permits. In addition, all LE fixed gear permits have gear endorsements (longline, pot/trap, or both). Of the sablefish endorsed permits, 135 were associated with longline gear, 29 were associated with pot/trap gear, and four were associated with both longline and pot/trap gear. The remaining 66 non sablefish-endorsed permits were associated with longline gear.[4]

Recreational Fisheries

Recreational fisheries in Washington and California have shifted from year round fisheries to seasonal fisheries with different open periods depending on the target species. Recreational fishing in Oregon is open year round not including inseason closures when needed. Coastwide, the number of marine angler trips peaks in the July–August period, but seasonal concentrations are more pronounced in Oregon and Washington where weather is more variable. Table 4Table 5, Table 6, and Table 7 in the Appendix: Updated recreational fisheries regulation tables (from tables 3-5 in NMFS Report 2) are updates of Tables 3-5 from Agenda Item I.1.a, NMFS Report 2, March 2017 showing the recreational fishing season and bag limit restrictions by state for recent years. These tables are not a comprehensive summary of all management measures in place for each state; for example, seasonal depth restrictions and inseason adjustments may not be captured in these tables. **While there wasn't sufficient time to completely update the tables, the GMT thinks that doing so would be valuable and recommends that NMFS work with the states to do that in time for the final BiOp.**

Washington

Changes to the Washington recreational fishery beginning in 2017 will close the recreational bottomfish fishery from mid-October to mid-March. In addition, the recreational rockfish bag limit will be reduced from t10 to seven fish per day and the aggregate daily bottomfish bag limit will be reduced from 12 to nine fish per day. Also beginning in 2017, the minimum size limit of 22 inches for lingcod will be removed. The daily-bag-limit changes are intended to keep mortality of black rockfish within allowable limits. The removal of the lingcod minimum size limit is intended to allow anglers to keep the first two lingcod encountered and may reduce

[4] NMFS West Coast Region Pacific Coast Fisheries Permit System queried March 27, 2017.

bycatch of rockfish, including yelloweye rockfish, if time on the water is reduced. These changes should not result in additional impacts on Endangered Species Act (ESA) listed salmon species.

Oregon

The Oregon recreational fishery will operate much the same as described in Agenda Item I.1.a, NMFS Report 2, March 2017. The primary difference is that in 2017, there will be a longleader gear opportunity which targets midwater rockfish species.[5] The gear used is standard recreational fishing gear for bottomfish, but with a requirement of a minimum of 30 feet between the weight and the lowest hook. This new opportunity should not have any additional impacts on ESA listed salmon species, based on analysis of the results of the EFP (Agenda Item G.5, Attachment 1, March 2015).

California

The California recreational seasons and depth constraints for 2017-2018 are found in Table 1. Starting in 2017, the bag limit for lingcod will be two fish and within the 10 fish aggregate Rockfish, Cabezon, Greenling (RCG) complex bag limit, a sub-bag limit of three black and one canary rockfish will be in place; the sub-bag limit for bocaccio has been removed. Detailed information about the California recreational fishery can be found in the 2017-2018 Analytical Document.

Table 1. California recreational seasons and depth constraints for 2017-2018, by management area.

Management Area	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Northern	Closed				May 1 – Oct 31 <30fm						All Depth	
Mendocino	Closed				May 1 – Oct 31 <20fm						All Depth	
San Francisco	Closed				April 15 – Dec 31 <40fm							
Central	Closed				April 1 – Dec 31 <50fm							
Southern	Closed			Mar 1 – Dec 31 <60 fm								

Current and Future Rulemakings

There are several proposed regulatory changes in various stages of completion that may affect how the groundfish trawl fishery may operate in the future. Below, the GMT describes those actions that have been completed by the Council and those that are ongoing. While some of these are mentioned and included in the analysis (based on when the consultation began), there are others that are not discussed explicitly and may impact where and how the groundfish fisheries operate in the near future.

Rulemakings in Progress

As detailed in Agenda Item F.1.a, NMFS Report 2, March 2017, there are currently eight groundfish actions that are at various stages of development within the rulemaking process, in addition to several other non-rulemaking major activities. These actions include:

1. Trawl gear modifications

[5] Proposed rule expected in April 2017, with final rule in May or June. (Agenda Item F.1.a, NMFS Report 2, March 2017)

2. Electronic monitoring
3. At-sea set asides for darkblotched rockfish and Pacific ocean perch (POP)
4. Vessel movement and monitoring
5. Widow reallocation
6. Oregon midwater recreational fishery
7. Pacific halibut rulemaking for 2017
8. Pacific whiting rulemaking for 2017

Future Items for Council Consideration

In addition, there are several action items that may affect the future of the groundfish fishery, specifically the trawl sectors, that are still being considered by the Council. All of the items are described in Agenda Item C.4, Attachment 3, April 2017 under Active Groundfish Priorities, but some are scheduled for Council action within the next year (Agenda Item C.4, Attachment 1, April 2017).

As an example, the year-round midwater trawl exempted fishing permit (EFP) is currently slated to be scoped in June 2017 under the omnibus agenda item. Currently, non-whiting midwater trawl is only allowed during the primary whiting season (May 15-December 31) N. of 40'10 N. lat. and can occur within the RCA. South of 40° 10' N. lat., midwater trawling is only allowed seaward of the RCA.

The recently approved gear regulation EFP is expected to provide some data on the potential bycatch of Chinook salmon by the midwater rockfish fishery in the time period between March 15 and May 15. However, there is currently no salmon compositional data from midwater trawl bycatch targeting rockfish prior to the whiting season, which increases the uncertainty in which stocks, particularly evolutionary significant unit (ESU) listed stocks, may be affected. **When writing the final BiOp, the GMT recommends that information from the EFP be incorporated in order to better capture the future of the fishery and potential regulatory changes.**

Analysis

Whiting

In NMFS Report 1 (Agenda Item I.1.a, NMFS Report, March 2017, pg. 22), it states that the whiting sector is expected to stay within the 11,000 Chinook salmon threshold, but may "periodically exceed it when the whiting Total Allowable Catch (TAC) is at historic highs or under anomalous environmental conditions." However, the value of the TAC appears to have little correlation to the bycatch of Chinook salmon in any of the whiting sectors. Figure 2 shows the United States Pacific Whiting TAC (mt) on the left axis and the total Chinook salmon (in numbers of fish) caught in the combined whiting sectors on the right axis from 2009 to 2016. [6] Even at the recent historical high TAC in 2016, the Chinook salmon bycatch was at one of its lowest values in the recent era.[7]

[6] Prior to 2012, the TAC was termed Optimum Yield.
[7] Recent era refers to 2009-2016, when management of the whiting sectors has included sector specific bycatch caps.

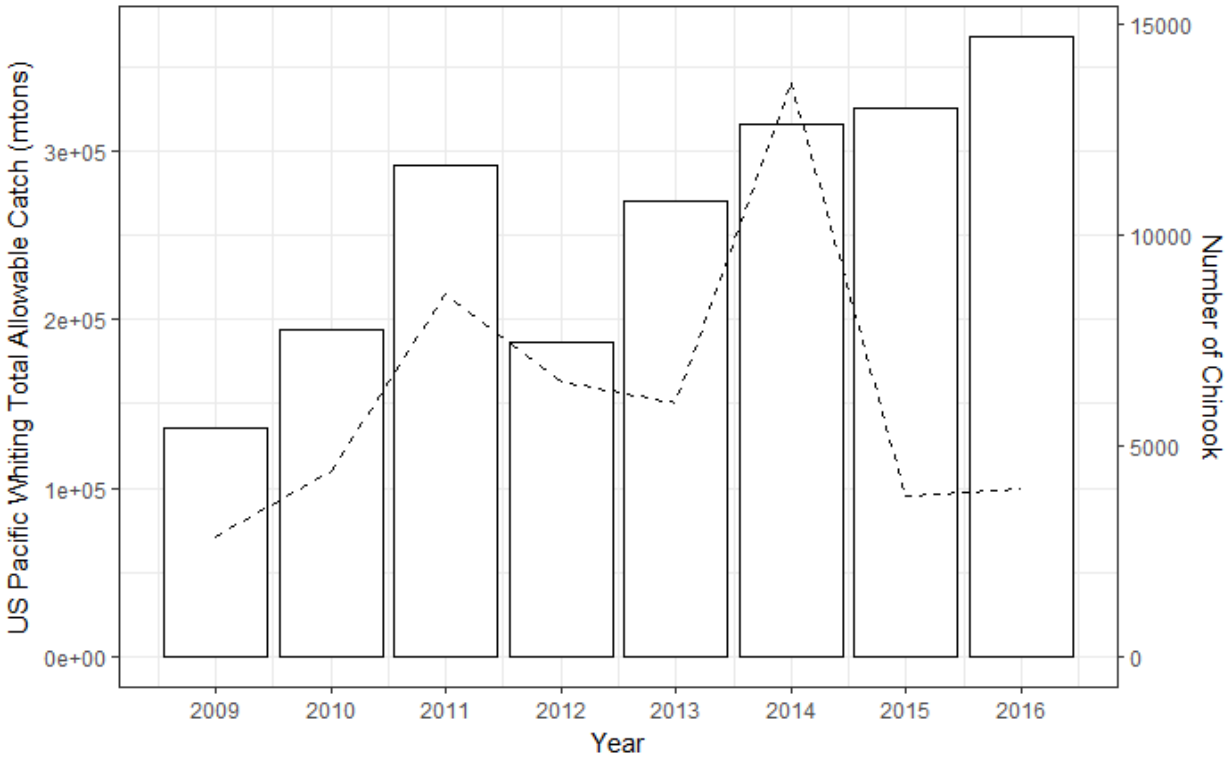

Figure 2: Pacific whiting annual TAC (mt) vs. number of Chinook salmon caught in the whiting sectors

Instead, bycatch of Chinook salmon appears to be more random, and can accumulate at a fast rate without time to react. On page 47, the NMFS document describes the potential for extreme catch events (ECEs) for salmon and "suggests that a small number of hauls can account for a disproportionate amount of Chinook salmon bycatch." To provide further context, Figure 3, Figure 4, and Figure 5 show the cumulative catch of numbers of Chinook salmon by haul for each sector in the recent era. Haul level data was queried from the Pacific Fisheries Information Network (PacFIN) North Pacific fisheries database 4900 comprehensive table (NORPac) for the at-sea sectors, and from the Pacific States Marine Fisheries Commission Etix system for the shoreside whiting sectors. Fish tickets were assumed to be a single haul/trip for the shoreside sector. Shoreside sector haul level data is only shown from 2011 on due to the availability of electronic fish tickets. Paper tickets tend to record Chinook salmon bycatch on separate overage tickets that have a different fish ticket number than a whiting trip. While the "official" record of catch from a paper ticket can overwrite the electronic fish ticket estimate in PacFIN, the Etix system recorded all species on a single entry due to the sector operating under maximized retention.

Depending on the year, catch can see a slow but steady increase, or can see sharp increases in the total bycatch. In 2014, all three sectors saw rapid inclines in the cumulative catch of salmon; this was the same year that the 11,000 threshold was exceeded. For example, approximately one-third of the total CP bycatch in 2014 was landed within the span of one day, with three of the highest hauls occurring within approximately a one hour time span.

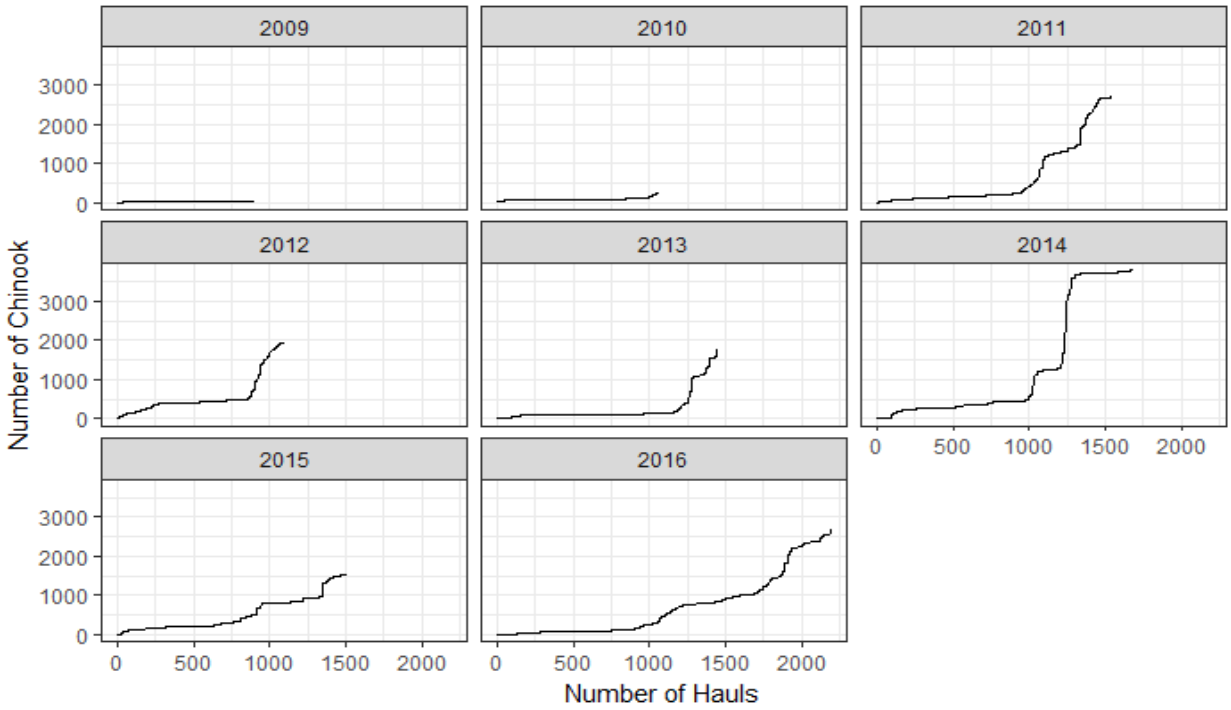

Figure 3: CP Cumulative Catch by Haul of Chinook salmon 2009-2016

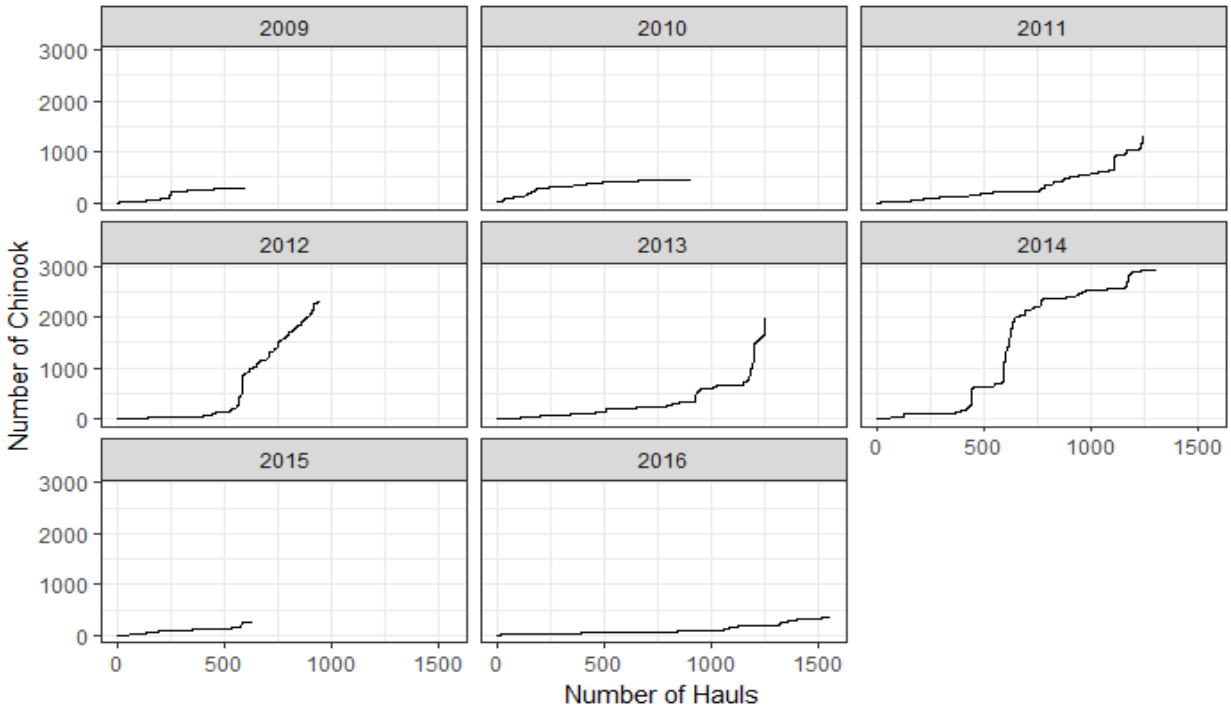

Figure 4: MS Cumulative Catch of Chinook salmon, 2009-2016

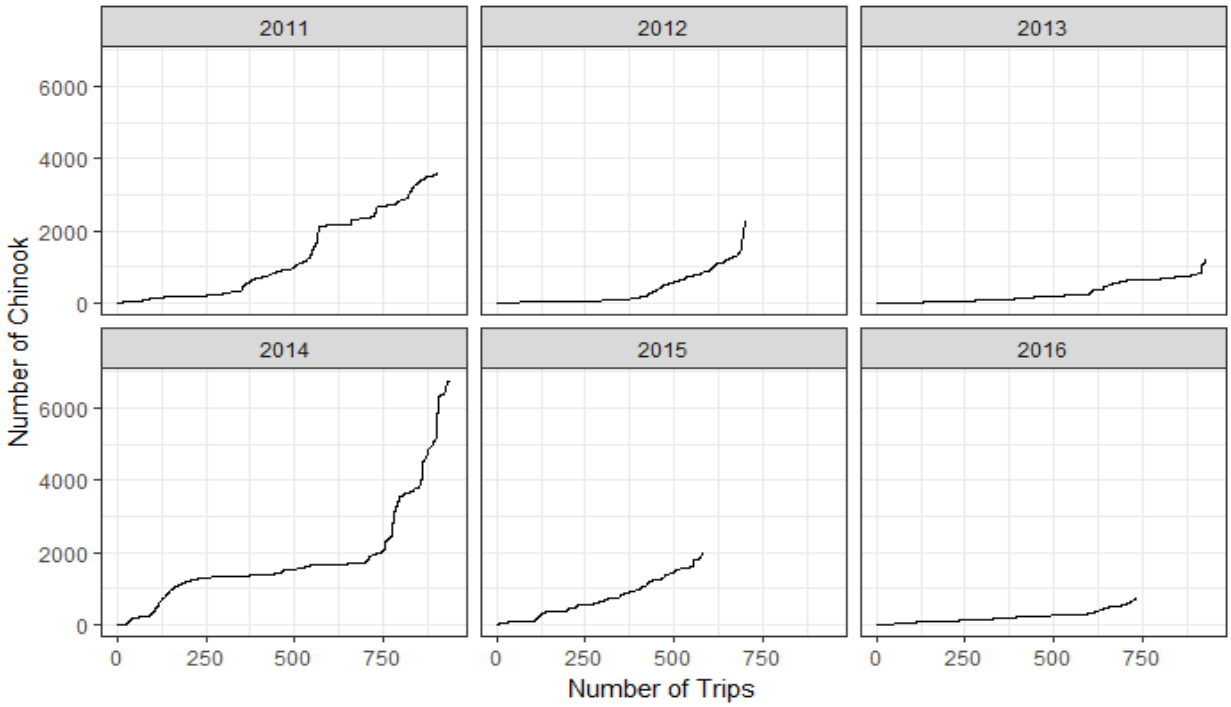

Figure 5: Shoreside Cumulative Catch of Chinook salmon by Trip, 2011-2016

With an increased whiting TAC, it would seem as though the number of hauls would increase in order to land the greater amount of available fish thereby increasing the bycatch of Chinook. However, as shown in Agenda Item F.7.a, Supplemental WDFW Report, September 2016, the number of hauls does not necessarily vary in relation to the catch. Instead, environmental conditions and other species constraints may be the primary factors driving the catch per unit effort. For example, in 2015, whiting were difficult to find in large schools, and vessels were constantly moving to avoid overfished species such as darkblotched rockfish, POP, and canary rockfish. All three sectors stopped fishing earlier in the season than in other years, leading to fewer numbers of hauls. 2014 and 2016 had similar levels of haul numbers, with 2016 having a higher TAC, yet 2014 had record Chinook salmon bycatch levels and 2016 having one of the lowest in recent history.

The Joint Management Committee (JMC) for the US-Canada Pacific Whiting treaty recently recommended their highest US TAC in recent history for 2017 of 441,433 mt (Agenda Item I.4.a, Supplemental JMC Report, April 2017). With the set-aside for incidental catch (1,500 mt) and the tribal allocation of 17.5 percent (77,251 mt), this results in the sector allocations shown in Table 2.

Table 2: 2017 Allocations for Pacific Whiting

Sector	Allocation (mt)
Shoreside	152,327
Catcher Processor	123,312
Mothership	87,044

In NMFS Report 1 (Agenda Item, I.1.a, NMFS Report 1, March 2017), the projected maximum whiting landings are based on data through 2015 for the at-sea sectors and 2014 for the shorebased sector. The 2017 TAC is 20 percent higher than the 2016 TAC, and the 2017 whiting assessment reports that we may see continued growth in the whiting biomass due to strong year classes, particularly 2014 (Agenda Item I.4., Supplemental Attachment 1, March 2017). Therefore, the values for projected catch in Tables 4a through 4c (Agenda Item, I.1.a, NMFS Report 1, March 2017) may be lower than what may actually occur in the whiting fisheries in future years. For example, the maximum projected whiting catch from all sectors is 267,036 mt based on 2009-2015 data. If they caught that much in 2017, that would only be 73.6 percent attainment of the non-tribal allocation, without any reapportionment. In 2016, the sectors attained 77.2 percent of the allocations, with reapportionment. **Therefore, the GMT recommends that NMFS consider expanding the range of whiting catch analyzed as it may increase in future years.**

In March, the Scientific and Statistical Committee (SSC) noted that using the bycatch rate approach may be a "noisy predictor of salmon bycatch because the ratio will depend on temporal and spatial variation in the relative densities of salmon and groundfish, as well as fishing effort." (Agenda Item I.1.a, Supplemental SSC Report, March 2017) Instead, they proposed considering a resampling approach. Using the at-sea bootstrap analysis updated with 2016 data and 2017 allocations[8], Table 3 shows the risk-neutral projection (i.e. 0.5 quantile) of both at-sea sectors under different sampling universes (2000-2016, 2009-2016). While the 2000-2016 projection uses all the haul level data (with consistent sampling approach) available, the latter period was intended to align with the years used in NMFS analysis. As shown, depending on the years used, the sector with the higher bycatch amount varies and both project higher than the mean bycatch rate projection from Agenda Item, I.1.a, NMFS Report 1, March 2017. However, the maximum projected whiting catch used in that estimate for the at-sea sectors combined was almost 10,000 metric tons less than what was caught in 2016. This further supports expanding the range of potential catch values for the BiOp. Note that currently, a shoreside whiting bootstrap or resampling approach does not exist and due to timing, was not developed.

Table 3: At-Sea Projection of Chinook Salmon Bycatch

Methodology	Years	CP	MS	Total
Bootstrap	2000-2016	2,362	2,878	5,240
Bootstrap	2009-2016	3,054	2,516	5,570
Mean Bycatch Rate Projection from NMFS Report 1, Table 4a	2009-2015	*No sector specific estimates provided*		2,026-4,627

[8] Methods described Appendix A of the 2017-2018 Harvest Specifications and Management Measures Analytical Document

While the proposed 11,000 Chinook threshold is expected to be sufficient to cover all three whiting fleets, bycatch of Chinook catch is uncertain and can be quite volatile. Using the at-sea bootstrap with data from 2009-2016, Table 4 shows the projected catch of chinook at various quantiles by the at-sea sectors under the 2017 whiting TAC. The quantiles represent the likelihood, or risk, of the sectors taking the corresponding amount of Chinook salmon. For example, half of the time (quantile= 0.5), the sectors will take 5,570 Chinook combined based on recent year patterns, the 2017 whiting allocations, and constraining species allocations. One-in-100 times (quantile = 0.99), the sectors could theoretically catch the 11,000 proposed threshold alone (without the shoreside sector's bycatch included). However, it is important to consider that the co-op style management, incentive to avoid bycatch, and management measures in place to reduce salmon impacts (e.g. salmon conservation zone) would further reduce the chances of the higher bycatch numbers salmon occurring. As detailed in Agenda Item F.7.a, Supplemental WDFW Report, September 2016, "the co-ops have an interest in maintaining the [co-op] approach because of the flexibility it offers them around planning their seasons".

Table 4: At-Sea Bootstrap Results for Chinook Salmon Bycatch using 2009-2016 data

Quantile	0.1	0.25	0.5	0.75	0.9	0.95	0.99	0.9999
CP	540	2,415	3,054	4,094	4,669	4,955	5,510	6,563
MS	453	734	2,516	3,419	4,639	5,210	5,850	6,817
Grand Total	993	3,149	5,570	7,513	9,308	10,165	11,360	13,380

Effort for South of 42° N. lat.

In March, the Council eliminated the scenario that assumes whiting processing at-sea is extended south of 42° N. lat. (i.e. Scenario 1B; Draft Council Motions, Agenda Item I.1). The GMT would like to point out that, under Scenario 1A, which assumes that *processing* at sea continues to be prohibited, there is still the potential for *catch* to occur or increase beyond current levels south of 42° N. lat. analyzed within Scenario 1A. **Therefore, the GMT sees merit in incorporating further analysis within the BiOp on potential impacts to Chinook stocks due to varying harvest levels in this area under the current management.**

Scenario 1A analyzes the current geographic footprint of the whiting fishery from 2009-2015. As described in Agenda Item, I.1.a, NMFS Report 1, March 2017, there has been a steady southward trend since 2011 in the at-sea fisheries. Due to the combining of at-sea bycatch rates and projected whiting catches, the stock specific impacts seen in Figure 12a (NMFS Report 1) may not fully capture the potential bycatch of the fleet in future years.

While neither CP nor MS vessels can process south of 42° N. lat., both CP and catcher vessels that deliver to MS may fish south of the line and then return north of the line for processing although is not as economically viable. The amount of whiting harvest occurring south can vary by year. Within the recent year period (2009-2016), there were no whiting effort recorded for the CP sector but an average of 4.66 percent of the whiting catch in the MS sector has occurred south of 42° N. lat. This amount has ranged from zero hauls with an average latitude south of 42° N. lat. in 2011 and 2013 to a high of almost 20 percent of the whiting catch being taken in the southern area in 2010.

While economic feasibility will continue to limit either sector's fishing activity in the area, it does suggest that if more effort were to occur south of 42° N. lat. than the recent average, then impacts to Chinook salmon (particularly to ESA listed stocks in the south) may be greater than those analyzed under 1A.

Non-Whiting

For non-whiting, NMFS reached the following conclusions in regards to total Chinook salmon bycatch Agenda Item, I.1.a, NMFS Report 1, March 2017 (pg. 87): (1) bycatch is unlikely to breach the 9,000 upper threshold that was analyzed and that bycatches in the tens of thousands (e.g., West Coast Groundfish Observer Program (WCGOP) 2002-2003 estimates and Scenario 2B-2 projections) are possible, but highly unlikely given fleet consolidation, greater impetus on bycatch reduction, etc. (2) bycatch is likely to breach the lower baseline 1,000 threshold that was analyzed; (3) bycatch could also approach or exceed the 4,500 middle-ground threshold that was analyzed more frequently than suggested by the analysis given uncertainty with bycatch rates and future fishery regrowth.

The GMT concurs with all of the NMFS conclusions listed above. However, the GMT believes that the probability that non-whiting sector will approach or exceed the 4,500 threshold is greater than originally suspected by NMFS for two reasons.

First, the Scenario 2B-1 projections (historical landings combined with recent bycatch rates) that were generally less than 4,500 Chinook were based in part due to low bycatch rates from SFFTs. If the SFFT requirement is eliminated with the implementation of the gear regulations package rulemaking, then a shift in gear from lower bycatch rate SFFTs to higher bycatch rate "hooded" nets is expected. At the March 2017 meeting, the Council specifically requested that the influence of removal of the SFFT rule be evaluated in regards to Scenario 2B-1 non-whiting projections. The resulting Chinook salmon projections that were updated to account for removal of SFFTs in Supplemental NMFS Report are 5-10 times greater than the original 2B-1 projections and are well above the 4,500 threshold (i.e., 10,994 assuming recent shelf activity and 22,397 assuming historical shelf activity when paired with mean 1990's landings).

Second, projections from the GMT in regards to potential Chinook salmon bycatch from the midwater rockfish fishery alone are consistently in the 3,500-5,000 range (Figure 4-6 from the Final Environmental Assessment for Amendment 27 to the Groundfish FMP and 2017-2018 Harvest Specifications and Management Measures as seen in Appendix B; Table 2 from Agenda Item F.5.a, Supplemental GMT Report, November 2016). These impacts would be in addition to the approximately 200-725 Chinook salmon taken annually from status quo non-whiting activities (including non-trawl) since 2006 (Table 3 from Agenda Item, I.1.a, NMFS Report 1, March 2017) plus any other additional impacts that may result due to expanded shelf bottom trawling, which is expected to occur now that canary rockfish constraints have been lessened.

However, it should be noted that non-whiting projections are very uncertain because they are based on a very limited patchwork of bycatch rate data dating back to the 1990s and are based on the assumption that current landing levels increase to the historically higher levels (e.g., full attainments of midwater rockfish IFQ allocations). Bycatch rate data is lacking since there has been minimal shelf bottom or midwater rockfish activity due to overfished rockfish constraints

during the WCGOP era (2002-present). Attainments are also uncertain because, despite higher allocations of midwater rockfish, processors have indicated that market constraints could result in under-attainment.

In addition, the GMT notes that the tables presented in Agenda Item I.1.a, NMFS Report 2, March 2017 characterizing the location and bycatch of Chinook salmon in the bottom trawl fishery may lead to inaccurate conclusions and/or management thresholds. For example, in March 2017, NMFS and the GMT demonstrated that using regional bycatch rates from Table 24 as adaptive management triggers for the Trawl Gear Modifications EFP would have been too low to provide for a functional EFP because the rates were not reflective of the types of fishing that would be occurring in the EFP for a variety of reasons (Agenda Item I.3.a, Supplemental NMFS PowerPoint, March 2017). As such, new regional bycatch rate were recommended to better reflect the expected conditions of EFP in order to better provide opportunity.

Similarly, when developing the BiOp, and especially if NMFS were to consider broader regional bycatch rates for the whole non-whiting sector (as with whiting), the same approach should be given to characterization and establishment of rates as done with the EFP. For example, Table 24 in NMFS Report 2 shows a summary of retained catch, trawl hours, and Chinook bycatch by area and depth bin for 2011-2014. The spatial areas used are North of Cape Falcon, Cape Falcon to Cape Blanco, Cape Blanco to 40° 10' N. lat. and South of 40° 10' N. lat. However, the area north of Cape Alava (48° 10' N. lat.) was re-opened in 2017 to bottom trawling shoreward of 100 fm.[9] Therefore, the area North of Cape Falcon from 2011-2014 automatically would not be applicable to the estimates shown in the area north of Cape Alava as it has been closed since 2007. **Management measure changes impacting area summaries should be noted in the BiOp**.

Furthermore, RCAs and fishing activity can vary by year and by latitude. Using the depth strata of 0-100, 100-150, 150-200, and >200 could lead to mischaracterization of the data. For example, Table 24 shows 29 Chinook were caught as bycatch between 100-150 fm for the bottom trawl sector. While this is most likely a function of RCA lines not aligning to depth contours exactly, such as cutouts for canyons, it does not accurately represent where the fishery is and has been occurring (i.e., depth-based and not by coordinates). In addition, the depths were derived from logbooks which record the average depth of where a majority of catch was caught, not necessarily were the Chinook were caught. **It may therefore be more appropriate to have depth bins described in relation to the RCA, such as shoreward, within, and seaward (and be based on haul coordinates and not depth).** However, finer scale breakdowns may be needed when considering management measures similar to the bycatch reduction area for non-whiting.

Reserve Approach

As stated in Agenda Item I.1.a, Supplemental GMT Report, March 2017, the GMT questioned whether the 5,500 reserve was supposed to be 4,500 to align with an overall total threshold of 20,000 Chinook salmon for the groundfish fisheries (11,000 for whiting + 4,500 for non-whiting + 4,500 reserve = 20,000). It has come to the GMT's understanding that the initial intent was to

[9] 50 CFR 660, Subpart D, Table 1

divide the 9,000 threshold for the non-whiting sectors in half and hold 4,500 in reserve. **Therefore, should the Council recommend the reserve approach under final action, they should consider the impacts relative to the 20,000 total Chinook salmon as opposed to the 21,000.**

Recommendations

1. **Update descriptions of each fishery through 2017**
2. **Include information in regards to recent regulatory updates that have been adopted (e.g., gear regulations package) or may be expected in the future (e.g., omnibus priority items such as year-round mid-water trawl).**
3. **Work with state representatives to update recreational management tables to include inseason changes and seasonal depth restrictions**
4. **Incorporate additional analysis provided by the GMT, including (but not limited to)**
    a. **Expanding whiting catch projections**
    b. **Exploring potential impacts to stocks south of 42° N. lat. under status quo management**
    c. **Providing clarifications on area bycatch estimates**
    d. **Adjusting breakdowns to seaward, within, and shoreward of RCA**
5. **Consider the reserve approach in relation to 20,000 total Chinook as opposed to 21,000.**

Appendix: Updated recreational fisheries regulation tables (from tables 3-5 in **NMFS Report 2**)

Table 5: Updated Washington recreational fishery regulations

Year	Season	Bag Limit	Sub-Bag Limits		
		Groundfish	Lingcod	Cabezon/	Rockfish
2005	Year round, except lingcod. Lingcod Mar 12- Oct 15	15 a/	2 (≥ 24")	--	10 b/
2006	Year round, except lingcod. Lingcod Mar 18- Oct 14	15 c/	2 (≥ 24")	--	10 b/
2007	Year round, except lingcod. Lingcod N of 48° 10' N lat. - Apr 15 - Oct 13; 48° 10' N lat. To 46° 16' N lat. - Mar 17 - Oct 13	15 c/	2 (≥ 22")	--	10 b/
2008	Year round, except lingcod. Lingcod N of 48° 10' N lat. - Apr 15 - Oct 15; 48° 10' N lat. To 46° 16' N lat. - Mar 15 - Oct 18	15 c/	2 (≥ 22")	--	10 b/
2009 & 2010	Year round, except lingcod. Lingcod N of 48° 10' N lat. - Apr 16 - Oct 15; 48° 10' N lat. To 46° 16' N lat. - Mar 19 - Oct 15	15 c/	2 (≥ 22")	--	10 b/
2011	Year round, except lingcod. Lingcod N of 48° 10' N lat. - Apr 16 - Oct 15; 48° 10' N lat. To 46° 16' N lat. - Mar 12 - Oct 15	Jan 1-Feb 28-15 /c; Mar 1 - Dc 31 - 12 c/	2 (≥ 22")	2	10 b/
2012	Year round, except lingcod. Lingcod N of 48° 10' N lat. - Apr 15 - Oct 13; 48° 10' N lat. To 46° 16' N lat. - Mar 17 - Oct 13	12 c/	2 (≥ 22")	2	10 b/
2013	Year round, except lingcod. Lingcod N of 48° 10' N lat. - Apr 15 - Oct 13; 48° 10' N lat. To 46° 16' N lat. - Mar 17 - Oct 13	12 c/	2 (≥ 22")	2	10 b/
2014	Year round, except lingcod. Lingcod N of 48° 10' N lat. - Apr 15 - Oct 13; 48° 10' N lat. To 46° 16' N lat. - Mar 17 - Oct 13	12 c/	2 (≥ 22")	2 / 1 (≥18") e/	10 b/
2015	Year round, except lingcod. Lingcod N of 48° 10' N lat. - Apr 15 - Oct 13; 48° 10' N lat. To 46° 16' N lat. - Mar 17 - Oct 13	12 c/	2 (≥ 22")	2 / 1 (≥18") e/	10 b/
2016	Year round, except lingcod. Lingcod N of 48° 10' N lat. - Apr 15 - Oct 13; 48° 10' N lat. To 46° 16' N lat. - Mar 17 - Oct 13	12 c/	2 (≥ 22")	2 / 1 (≥18") e/	10 b/
2017	Open second Saturday in March through third Saturday in October. Lingcod N of 48° 10' N lat. - Apr 16 - Oct 15; 48° 10' N lat. To 46° 16' N lat. Mar 11- 22 (same as groundfish)	9 f/	2 (no min)	2 / 1 (≥18") e/	7 d/
2018	Open second Saturday in March through third Saturday in October. Lingcod N of 48° 10' N lat. - Apr 16 - Oct 15; 48° 10' N lat. To 46° 16' N lat. Mar 11- 22 (same as groundfish)	9 f/	2 (no min)	2 / 1 (≥18") e/	7 d/

a/ South of 46° 38.17' N lat. Groundfish retention is prohibited except that when Pacific halibut are onboard sablefish may be retained.
b/ Canary and yelloweye rockfish retention prohibited
c/ South of 46° 38.17' N lat. Groundfish retention is prohibited except when Pacific halibut are onboard sablefish and Pacific cod may be retained
d/ Yelloweye retention prohibited in all areas, up to one canary allowed in Marine Areas 1-3
e/ Cabezon sublimit is 2 in Marine Areas 1-2 /Marine Area 4 sublimit of one with a minimum size limit of 18 inches
f/ South of 46° 38.17' N lat. Groundfish retention is prohibited except when Pacific halibut are onboard sablefish and Pacific cod may be retained. Lingcod can be retained with halibut on board north of 46° 16' N lat. during the month of May

Table 6: Updated Oregon Recreational Fishery Regulations

Year	Season	Bag Limits			Marine Fish Sub-bag & size Limits			Inseason Adjustments
		Marine Fish	Lingcod	Flatfish/ Sanddab	Cabezon	Kelp Greenling	Rockfish	
2005	Year round	10 a/	2 (≥24')	--	(≥ 16")	(≥ 10")	--	8/11 cabezon closed, 10/18 black rockfish closed
2006	Year round b/	6 a/	2 (≥24')	--	(≥ 16")	(≥ 10")	--	7/24 vermilion rockfish closed, 9/23 cabezon closed
2007	Year round b/	8 a/	2 (≥22')	25	(≥ 16")	(≥ 10")	--	8/11 cabezon closed
2008	Year round b/	8 a/	2 (≥22')	25	(≥ 16")	(≥ 10")	--	8/21 cabezon closed
2009	Year round	10 a/ c/	2 (≥22')	25	(≥ 16")	(≥ 10")	--	9/14 cabezon closed
2010	Year round	10 a/ c/	2 (≥22')	25	(≥ 16")	(≥ 10")	--	7/24 cabezon closed
2011	Year round	10 a/ c/	2 (≥22')	25	(≥16") limit 1; Apr 1 - Sept 30	(≥ 10")	--	7/21 cabezon closed
2012	Year round	10 a/ c/	2 (≥22')	25	(≥16") limit 1; Apr 1 - Sept 30	(≥ 10")	--	7/21 cabezon closed
2013	Year round	10 a/ c/	2 (≥22')	25	(≥16") limit 1; Apr 1 - Sept 30	(≥ 10")	--	
2014	Year round	10 a/ c/	2 (≥22')	25	(≥16") limit 1; July 1 - Dec 31	(≥ 10")	--	
2015	Year round	10 c/ d/	2 (≥22')	25	(≥16") limit 1; July 1 - Dec 31	(≥ 10")	1 canary; 3 blue; 0 China, copper, or quillback e/	
2016	Year round	10 c/ d/	2 (≥22')	25	(≥16") limit 1; July 1 - Dec 31	(≥ 10")	1 canary; 3 blue; 0 China, copper, or quillback e/	
2017	Year round	10 c/ d/	2 (≥22')	25	(≥16") limit 1; July 1 - Dec 31	--	4 blue, copper, quillback, or China combined e/	longleader gear to target midwater rockfish will be allowed in May or June
2018	Year round	10 c/ d/	2 (≥22')	25	(≥16") limit 1; July 1 - Dec 31	--	4 blue, copper, quillback, or China combined e/	

a/ Canary and yelloweye rockfish prohibited

b/ From the WA/OR border to Cape Falcon groundfish retention is prohibited when Pacific halibut are onboard except sablefish and Pacific cod may be retained. Cape Falcon to Humbug Mt groundfish retention is prohibited when Pacific halibut are onboard except sablefish

c/ From the WA/OR border to Cape Falcon groundfish retention is prohibited when Pacific halibut are onboard except sablefish and Pacific cod may be retained. Cape Falcon to Humbug Mountain, during days open to the all-depth sport halibut season, groundfish retention is prohibited when Pacific halibut are onboard except sablefish and Pacific cod.

d/ Yelloweye rockfish prohibited

e/ Nearshore rockfish sub-bag limits in state regulations only, not in federal regulations

Table 7: Updated California Recreational Fishery Regulations

Year	Management Areas	Overall Finfish Bag Limit	RCG Season c/	RCG Bag and Sub-Bag Limits				Lingcod Season		Other Flatfish		CA Scorpionfish	
				Overall	Bocaccio	Greenling	Cabe-zon	Season	Bag Limit	Seas on	Bag Limit	Season	Bag Limit
2005	North of 40° 10' N. lat.	20 a/ b/d/	May 1 - Dec 31	10	2 ≥ 10"	1 ≥ 12"	1 ≥ 15"	May 1 - Nov 30	2 ≥ 24"	Year round	20 a/	--	--
	40° 10' -37° 11' N lat.		Jul 1 - Dec 31					Jul 1 - Nov 30				Jul 1 - Dec 31	5 ≥ 10"
	37° 11' - 36° N lat.		Jul 1 - Dec 31					Jul 1 - Nov 30				Jul 1 - Dec 31	
	36° - 34° 27' N lat.		May 1 - Sep 30					May 1 - Sep 30				May 1 - Sep 30	
	South of 34° 27' N lat.		Mar 1- Dec 31					Mar 1- Sep 30				Oct 1 - Dec 31	
2006	North of 40° 10' N. lat.	20 a/ b/d/	May 1 - Dec 31	10	2 ≥ 10"	1 ≥ 12"	1 ≥ 15"	May 1 - Nov 30	2 ≥ 24"	Year round	20 a/	--	--
	40° 10' -37° 11' N lat.		Jul 1 - Dec 31					Jul 1 - Nov 30				Jul 1 - Dec 31	5 ≥ 10"
	37° 11' - 36° N lat.		Jul 1 - Dec 31					Jul 1 - Nov 30				Jul 1 - Dec 31	
	36° - 34° 27' N lat.		May 1 - Oct 30					May 1 - Oct 30				May 1 - Oct 30	
	South of 34° 27' N lat.		Mar 1- Dec 31					Apr 1 - Nov 30				Mar 1- Dec 31	
2007	North of 40° 10' N. lat.	20 a/ b/d/	May 1 - Nov 30	10	2 ≥ 10"	2 ≥ 12"	1 ≥ 15"	May 1 - Nov 30	2 ≥ 24"	Year round	20 a/	--	--
	40° 10' -37° 11' N lat.		Jun 1- Nov 30		2 ≥ 10"			Jun 1- Nov 30				Jun 1- Nov 30	5 ≥ 10"
	37° 11' - 36° N lat.		May 1 - Nov 30					May 1 - Nov 30				May 1 - Nov 30	
	36° - 34° 27' N lat.		May 1 - Nov 30					May 1 - Nov 30				May 1 - Nov 30	
	South of 34° 27' N lat.		Mar 1 - Dec 31					Apr 1 - Nov 31				Jan 1 - Dec 31	
2008	North of 40° 10' N. lat.	20 a/ b/d/	May 1 - Dec 31	10	2 ≥ 10"	2 ≥ 12"	1 ≥ 15"	May 1 - Nov 30	2 ≥ 24"	Year round	20 a/	--	--
	40° 10' -37° 11' N lat.		Jun 1 - Dec 31		1 ≥ 10"			Jun 1 - Nov 30				Jun 1 - Dec 31	5 ≥ 10"
	37° 11' - 36° N lat.		Jun 1 - Nov 30					Jun 1 - Nov 30				Jun 1 - Nov 30	
	36° - 34° 27' N lat.		May 1 - Nov 30					May 1 - Nov 30				May 1 - Sep 30	
	South of 34° 27' N lat.		Mar 1 - Dec 31					Apr 1- Nov 30				Jan 1 - Dec 31	
2009	North of 40° 10' N. lat.	20 a/ b/ d/	May 15 - Sep 15	10	2 ≥ 10"	2 ≥ 12"	1 ≥ 15"	May 15 - Sep 15	2 ≥ 24"	Year round	20 a/	--	--
	40° 10' - 38° 57.50' N lat.		May 15 - Aug 15					May 15 - Aug 15				May 15 - Aug 15	5 ≥ 10"
	38° 57.50' - 37° 11' N lat.		June 15- Nov 15					June 15- Nov 15				June 15- Nov 15	

	37° 11' - 36° N lat.		May 1 - Nov 15					May 1 - Nov 15				May 1 - Nov 15	
	36° - 34° 27' N lat.		May 1 - Nov 15					May 1 - Nov 15				May 1 - Nov 15	
	South of 34° 27' N lat.		Mar 1 - Dec 31					Apr 1 - Nov 30				Jan 1 - Dec 31	
2010	North of 40° 10' N. lat.	20 a/ b/ d/	May 15 - Sep 15	10	2 ≥ 10"	2 ≥ 12"	2 ≥ 15"	May 15 - Sep 15	2 ≥ 24"	Year round	20 a/	--	--
	40° 10' - 38° 57.50' N lat.		May 15 - Aug 15					May 15 - Aug 15				May 15 - Aug 15	5 ≥ 10"
	38° 57.50' - 37° 11' N lat.		June 15- Oct 31					June 15- Oct 31				June 15- Oct 31	
	37° 11' - 36° N lat.		May 1 - Nov 15					May 1 - Nov 15				May 1 - Nov 15	
	36° - 34° 27' N lat.		May 1 - Nov 15					May 1 - Nov 15				May 1 - Nov 15	
	South of 34° 27' N lat.		Mar 1 - Dec 31					Apr 1 - Nov 30				Jan 1 - Dec 31	
2011	North of 40° 10' N. lat.	20 a/ b/ d/	May 15 - Oct 31	10	2 ≥ 10"	2 ≥ 12"	3 ≥ 15"	May 15 - Oct 31	2 ≥ 22"	Year round	20 a/	--	--
	40° 10' - 38° 57.50' N lat.		May 15 - Aug 15					May 15 - Aug 15				May 15 - Aug 15	5 ≥ 10"
	38° 57.50' - 37° 11' N lat.		Jun 1 - Dec 31					Jun 1 - Dec 31				Jun 1 - Dec 31	
	37° 11' - 34° 27' N lat.		May 1 - Dec 31					May 1 - Dec 31				May 1 - Dec 31	
	South of 34° 27' N lat.		Mar 1 - Dec 31					Mar 1 - Dec 31				Jan 1 - Dec 31	
2012	North of 40° 10' N. lat.	20 a/ b/ d/	May 15 - Oct 31	10	2 ≥ 10"	10 ≥ 12"	3 ≥ 15"	May 14 - Oct 31	2 ≥ 22"	Year round	20 a/	--	--
	40° 10' - 38° 57.50' N lat.		May 15 - Aug 15					May 14 - Aug 15				May 15 - Aug 15	5 ≥ 10"
	38° 57.50' - 37° 11' N lat.		Jun 1 - Dec 31					Jun 1 - Dec 31				Jun 1 - Dec 31	
	37°11 ' - 34° 27' N lat.		May 1 - Dec 31					May 1 - Dec 31				May 1 - Dec 31	
	South of 34° 27' N lat.		Mar 1 - Dec 31					Mar 1 - Dec 31				Jan 1 - Dec 31	
2013	North of 40° 10' N. lat.	20 a/ b/ d/	May 15 - Oct 31	10	3	10 ≥ 12"	3 ≥ 15"	May 15 - Oct 31	2 ≥ 22"	Year round	20 a/	--	--
	40° 10' - 38° 57.50' N lat.		May 15 - Sept 2					May 15 - Sept 2				May 15 - Sept 2	5 ≥ 10"
	38° 57.50' - 37° 11' N lat.		Jun 1 - Dec 31					Jun 1 - Dec 31				Jun 1 - Dec 31	
	37° 11' - 34° 27' N lat.		May 1 - Dec 31					May 1 - Dec 31				May 1 - Dec 31	
	South of 34° 27' N lat.		Mar 1 - Dec 31					Mar 1 - Dec 31				Jan 1 - Dec 31	
2014	North of 40° 10' N. lat.	20 a/ b/ d/	May 15 - Oct 31	10	3	10 ≥ 12"	3 ≥ 15"	May 15 - Oct 31	2 ≥ 22"	Year round	20 a/	--	--

	40° 10' - 38° 57.50' N lat.		May 15 - Sept 1					May 15 - Sept 1				May 15 - Sept 1	5 ≥ 10"
	38° 57.50' - 37° 11' N lat.		Jun 1 - Dec 31					Jun 1 - Dec 31				Jun 1 - Dec 31	
	37° 11' - 34° 27' N lat.		May 1 - Dec 31					May 1 - Dec 31				May 1 - Dec 31	
	South of 34° 27' N lat.		Mar 1 - Dec 31					Mar 1 - Dec 31				Jan 1 - Dec 31	
2015	North of 40° 10' N. lat.	20 a/ b/ d/	May 15 - Oct 31	10	3	10 ≥ 12"	3 ≥ 15"	May 15 - Oct 31	2 ≥ 22"	Year round	20 a/	--	--
	40° 10' - 38° 57.50' N lat.		May 15 - Oct 31					May 15 - Sep 2				May 15 - Sep 2	5 ≥ 10"
	38° 57.50' - 37° 11' N lat.		Apr 15 - Dec 31					Jun 1 - Dec 31				Jun 1 - Dec 31	
	37° 11' - 34° 27' N lat.		Apl1 - Dec 31					May 1 - Dec 31				May 1 - Dec 31	
	South of 34° 27' N lat.		Mar 1 - Dec 31					Mar 1 - Dec 31				Jan 1 - Aug 31	
2016	North of 40° 10' N. lat.	20 a/ b/ d/	May 15 - Oct 31	10	3	10 ≥ 12"	3 ≥ 15"	May 15 - Oct 31	2 ≥ 22"	Year round	20 a/	--	--
	40° 10' - 38° 57.50' N lat.		May 15 - Oct 31					May 15 - Sep 2				May 15 - Sep 2	5 ≥ 10"
	38° 57.50' - 37° 11' N lat.		Apr 15 - Dec 31					Jun 1 - Dec 31				Jun 1 - Dec 31	
	37° 11' - 34° 27' N lat.		Apl1 - Dec 31					May 1 - Dec 31				May 1 - Dec 31	
	South of 34° 27' N lat.		Mar 1 - Dec 31					Mar 1 - Dec 31				Jan 1 - Aug 31	
2017	North of 40° 10' N. lat.	20 a/ d/ e/	May 1 - Dec 31	10	10	10 ≥ 12"	3 ≥ 15"	May 1 - Dec 31	2 ≥ 22"	Year round	20 a/	--	--
	40° 10' - 38° 57.50' N lat.		May 1 - Dec 31					May 1 - Dec 31				May 1 - Dec 31	5 ≥ 10"
	38° 57.50' - 37° 11' N lat.		Apr 15 - Dec 31					Apr 15 - Dec 31				Apr 15 - Dec 31	
	37° 11' - 34° 27' N lat.		Apl1 - Dec 31					Apl1 - Dec 31				Apl1 - Dec 31	
	South of 34° 27' N lat.		Mar 1 - Dec 31					Mar 1 - Dec 31				Jan 1 - Aug 31	
2018	North of 40° 10' N. lat.	20 a/ d/ e/	May 1 - Dec 31	10	10	10 ≥ 12"	3 ≥ 15"	May 1 - Dec 31	2 ≥ 22"	Year round	20 a/	--	--
	40° 10' - 38° 57.50' N lat.		May 1 - Dec 31					May 1 - Dec 31				May 1 - Dec 31	5 ≥ 10"
	38° 57.50' - 37° 11' N lat.		Apr 15 - Dec 31					Apr 15 - Dec 31				Apr 15 - Dec 31	

	37° 11' - 34° 27' N lat.		Apl1 - Dec 31					Apl1 - Dec 31				Apl1 - Dec 31	
	South of 34° 27' N lat.		Mar 1 - Dec 31					Mar 1 - Dec 31				Jan 1 - Aug 31	

a/ subject to the overall 20 fish limit for all fin fish, of which no more than 10 fish of any one species except for petrale sole, Pacific sanddab, and starry flounder
b/ retention of bronzespotted, cowcod, canary and yelloweye rockfishes prohibited
c/ Rockfish/cabezon/greenling complex
d/ Recreational spearfishing and fishing from shore for all federally managed groundfish is exempt from closed seasons.
e/ Retention of bronzespotted rockfish, cowcod and yelloweye rockfish is
prohibited.

Appendix B

Excerpt from the Final Environmental Assessment for Amendment 27 of the Groundfish FMP and 2017-2018 Harvest Specifications and Management Measures

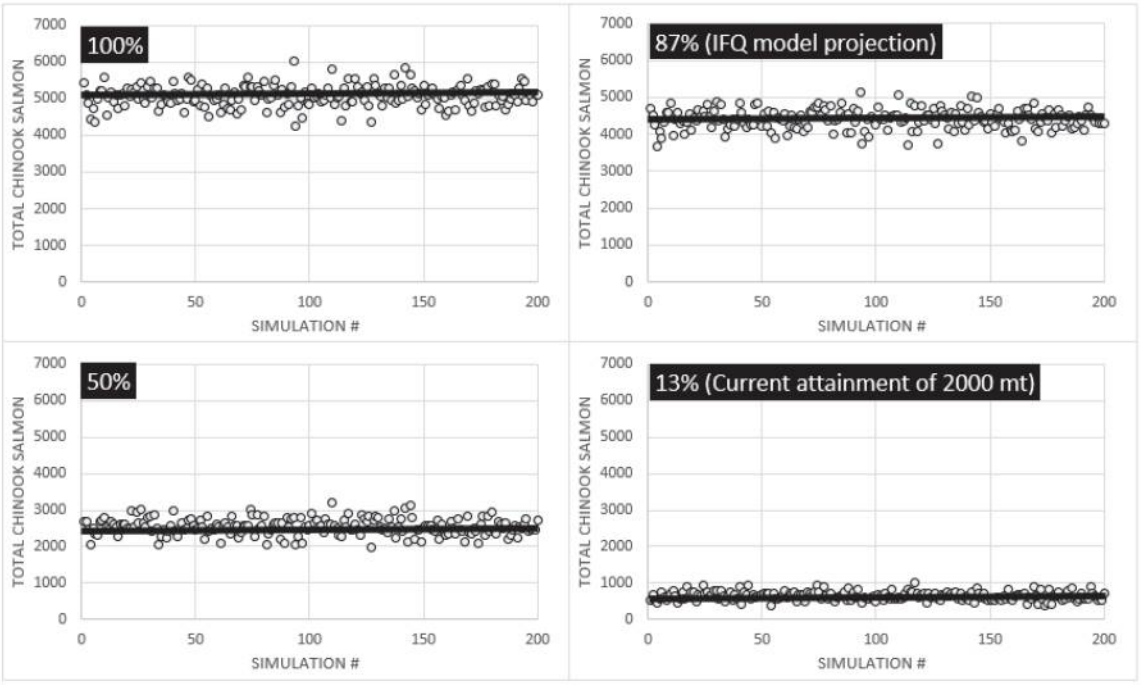

Figure 4-6. Projected Chinook salmon bycatch in the IFQ fisheries for alternative attainment rates of widow and yellowtail rockfishes from a bycatch rate model (solid black line) and a bootstrap model (each dot is the total for a simulated season; there are 200 simulated seasons). All predictions are within the 9,000 Chinook salmon threshold for the non-whiting fisheries from the current Salmon BiOp.

PFMC
03/31/17