DRAFT SUMMARY MINUTES
Scientific and Statistical Committee

Pacific Fishery Management Council
Doubletree by Hilton Spokane City Center
Salon III Room
322 N. Spokane Falls Ct.
Spokane, Washington 99201
Telephone: 509-455-9600

June 8-9, 2017

Members in Attendance

Dr. Aaron Berger, National Marine Fisheries Service Northwest Fisheries Science Center, Newport, OR
Dr. Evelyn Brown, Lummi Nation, Bellingham, WA
Dr. John Budrick, California Department of Fish and Wildlife, Belmont, CA
Mr. Alan Byrne, Idaho Department of Fish and Game, Boise, ID
Dr. Martin Dorn, National Marine Fisheries Service Alaska Fisheries Science Center, Seattle, WA
Dr. John Field, National Marine Fisheries Service Southwest Fisheries Science Center, Santa Cruz, CA
Dr. Owen Hamel, National Marine Fisheries Service Northwest Fisheries Science Center, Seattle, WA
Dr. Michael Harte, Oregon State University, Corvallis, OR
Dr. Dan Holland, National Marine Fisheries Service Northwest Fisheries Science Center, Seattle, WA
Dr. Galen Johnson, Northwest Indian Fisheries Commission, Olympia, WA
Dr. Kevin Piner, National Marine Fisheries Service Southwest Fisheries Science Center, La Jolla, CA
Dr. André Punt, University of Washington, Seattle, WA (Absent on day 1)
Dr. David Sampson, Oregon Department of Fish and Wildlife, Newport, OR
Dr. William Satterthwaite, SSC Chair, National Marine Fisheries Service Southwest Fisheries Science Center, Santa Cruz, CA
Dr. Cameron Speir, National Marine Fisheries Service Southwest Fisheries Science Center, Santa Cruz, CA
Dr. Tien-Shui Tsou, Washington Department of Fish and Wildlife, Olympia, WA

Members Absent

None.

SSC Recusals for the June 2017 Meeting		
SSC Member	**Issue**	**Reason**
Dr. Aaron Berger	Agenda Item F.4 – Final Stock Assessments and Catch Reports	Dr. Berger supervised staff who contributed to the arrowtooth update assessment
Dr. John Budrick	Agenda Item F.4 – Final Stock Assessments and Catch Reports	Dr. Budrick contributed to the arrowtooth update assessment
Dr. John Field	Agenda Item F.4 – Final Stock Assessments and Catch Reports	Dr. Field contributed to the blackgill and bocaccio update assessments and supervised staff who prepared the cowcod catch report
Dr. Owen Hamel	Agenda Item F.4 – Final Stock Assessments and Catch Reports	Dr. Hamel contributed to the arrowtooth update assessment and supervised staff who prepared the darkblotched update assessment
Dr. Dan Holland	Agenda Item F.2 – Trawl Catch Shares Review Draft Report and Intersector Allocation Report	Dr. Holland contributed to the analyses informing the trawl catch shares review report
Dr. André Punt	Agenda Item F.4 – Final Stock Assessments and Catch Reports	Dr. Punt supervised students who contributed to the arrowtooth update assessment
Dr. Dave Sampson	Agenda Item F.4 – Final Stock Assessments and Catch Reports	Dr. Sampson contributed to the arrowtooth update assessment
Dr. Theresa Tsou	Agenda Item F.4 – Final Stock Assessments and Catch Reports	Dr. Tsou supervised staff who contributed to the arrowtooth update assessment

A. Call to Order

Chairman Will Satterthwaite called the meeting to order at 8:00 a.m. Mr. Tracy briefed the Scientific and Statistical Committee (SSC) on the issues to be discussed this week. He noted the Council Coordination Committee agreed with the proposed agenda for the 6th national Scientific. Coordination Subcommittee (SCS) meeting. Invitations to invited speakers will go out this week. The Council received special project money to address fishery ecosystem plan (FEP) issues. The SSC will need to plan the next draft of the 5-year Research and Data Needs document. The SSC

should have a draft available for advisory body review in March. Preliminary and final action on this document is scheduled for June and September next year. The SSC needs to plan their ecosystem meeting in September and will report to the Council at this meeting under Future Workload Planning. There needs to be a workable plan for reviewing the sablefish management strategy evaluation (MSE). The SSC has been tasked with reviewing a report submitted to the Marine Stewardship Council (MSC) for the bottom trawl fishery. Tom Jagielo wrote a paper compiling information on the stocks identified. This is what the SSC will review. Any SSC questions of clarification should come under Future Workload Planning. There are proposals circulating to consider moving some salmon management lines at Horse Mt. and Heceta Bank. The Salmon Technical Team (STT) will convene a teleconference later this month to discuss these proposals. This may need to be discussed by the Salmon Subcommittee during the methodology review in October.

There should be at least two Coastal Pelagic Species (CPS) Subcommittee members in addition to André at the acoustic trawl method (ATM) methodology review.

There is a Coastal Pelagic Species Management Team (CPSMT) webinar is tentatively scheduled for August 16 that will include discussion of the ATM methodology review terms of reference (TOR).

A Center for the Advancement of Population Assessment Methodology (CAPAM) Workshop to discuss catch per unit of effort (CPUE) spatial-temporal indices has been scheduled for February 26 – March 2 in La Jolla.

Cameron Spier volunteered to serve on the Ecosystem Subcommittee

D. Coastal Pelagic Species Management

1. Final Pacific Mackerel Stock Assessment and Management Measures

The Scientific and Statistical Committee (SSC) reviewed the report "Pacific mackerel biomass projection estimate for USA management in 2017-18 and 2018-19" by Drs. Paul Crone and Kevin Hill from the Southwest Fisheries Science Center (Agenda Item D.1, Attachment 1, June 2017) along with the SSC Coastal Pelagic Species (CPS) subcommittee report (appended to this report). The Southwest Fisheries Science Center report provides a set of catch-only biomass projections for Pacific mackerel for the purpose of deriving harvest specifications for the 2017-2018 and 2018-2019 fishing years.

All of the biomass projections use the base model from the 2015 full assessment; however, alternative projections were provided to examine sensitivity to assumptions about future catch and recruitment for years beyond the end of the assessment. The SSC concludes that the baseline projection assuming removals equal to the harvest guideline (HG) and estimating recruitment directly from the stock-recruit curve should be used. Assumed recruitment during the projection period should come directly from the stock-recruit curve because recently estimated recruitments have not been consistently far above or below those expected from the stock-recruit curve. Assuming future catches equal to the HG is the default approach.

The SSC endorses the baseline biomass estimate of 143,403 metric ton (mt) of age-1+ fish at the

start of the 2017-2018 fishing year, yielding a 2017-2018 overfishing limit (OFL) of 30,115 mt. The SSC recommends carrying forward the Category 2 sigma classification (sigma = 0.72) assigned to the 2015 assessment (Agenda Item G.2.b, Supplemental SSC Report, June 2015), although uncertainty has likely increased since the 2015 full assessment due to the age of the assessment for this short-lived species. The 2017-2018 acceptable biological catch (ABC) will depend on the Council's choice of the overfishing probability (P*), as shown in Appendix B, Table B1A of the biomass projection report.

The SSC also provisionally endorses the 2018-2019 age-1+ biomass estimate of 131,724 mt, resulting in a 2018-2019 OFL of 27,662 mt, conditional on the Council's choice of 2017-2018 ABC. This projection assumes removal of the HG in 2017-2018. If the Council chooses a 2017-2018 ABC (or annual catch limit/annual catch target) lower than 26,293 mt, the 2018-2019 OFL should be recalculated assuming smaller removals in 2017-2018.

In reviewing the last full assessment of Pacific mackerel, both the SSC and the stock assessment team emphasized the value of a fishery-independent survey. The acoustic trawl method (ATM) survey was not previously approved for use in assessing Pacific mackerel. The SSC recommends that the applicability of the ATM to Pacific mackerel be reassessed during the upcoming ATM survey methodology review scheduled for January-February 2018.

SSC Notes:

Forecasts should be done in SS rather than externally in a spreadsheet.

The stock assessment TOR should be revised to give clearer guidance on catch-only projections, current guidance is vague.

A pre-assessment data meeting prior to the next mackerel assessment could be held, including consideration of potential alternative indices of abundance.

There are no established criteria for increasing sigma with age of assessment. Formal rules for updating sigma for CPS assessments should be developed in the future.

2. Final Approval of Aerial Survey Methodology Review

The SSC reviewed a proposal for a Southern California Coastal Pelagic Species (CPS) Aerial Survey (Agenda Item D.2.a, CDFW Report, June 2017) and the methodology review panel report (Agenda Item D.2, Attachment 1, June 2017) from the recent review panel meeting. Mr. Kirk Lynn, California Department of Fish and Wildlife (CDFW), was available to answer questions regarding the proposal, and Dr. André Punt presented the methodology review panel report. The survey has been operational since 2012 and includes areas in the Southern California Bight not covered by the acoustic-trawl method (ATM) survey, providing data on several coastal pelagic species. Agenda Item D.2.a, CDFW Report is a revised version of the proposal reviewed at that meeting, with responses to a number of review recommendations.

Two projects were put forward in the proposal: Project 1 involves a nearshore [minimum] estimate of absolute abundance, or index of abundance, based on density. Project 2 pertains to an inshore

correction factor for the ATM survey. Project 2 requires either A) the assumption that the proportion of the population visible to the aerial survey is identical between the nearshore and offshore areas, which is unfounded, or B) data adequate to estimate the proportion visible to the aerial survey in each area, which currently are not, nor likely soon to be, available.

Project 1 is ready to provide information for possible use in stock assessments for Pacific sardine or northern anchovy once the variance calculation captures all important areas of uncertainty. Expanding the survey north of the Southern California Bight would provide better coverage of the inshore populations, and both the variance calculation and expansion of the survey could be reviewed during a stock assessment review panel. Extrapolation of the biomass estimate outside of the surveyed area, however, would require a new methodology review.

The SSC recommends focusing sampling effort on the latitudes consistent with the distribution of the northern sub-population of sardine during the period of the survey. Previously conducted summer surveys have not met that criterion. The methodology review panel report, which the SSC endorses, provides additional recommendations.

There are additional issues that will need to be addressed in combining the ATM and aerial surveys within an assessment. The SSC encourages the survey team to work with Southwest Fisheries Science Center assessment scientists to ensure that the methods used in combining the surveys are based upon well-supported assumptions.

The SSC commends the Southern California CPS Survey team for their efforts and progress towards providing information useful for CPS assessments.

SSC Notes:

- *The aerial survey is making progress towards providing information to use in CPS assessments. In particular, moving forward with the negatively biased estimate of absolute abundance the spring survey is the most useful for sardine.*
- *The advice to the survey team will depend to some extent on the planned use of the data.*
- *Only a small number of fish have been caught in conjunction with surveys to date to determine age, length, and species composition of the fish observed in survey.*
- *The SSC recommends that additional data be collected to improve the estimation of the relationship between biomass estimates and actual biomass.*
- *The proposed aerial summer survey is problematic for sardine as it observes a portion of the southern subpopulation (and also may include some northern subpopulation sardine.)*
- *The variance estimator was problematic and alternative approaches were suggested in Appendices 2 and 3. An additional component of variance is related to the uncertainty/variation in transect width. Uncertainty in species composition should be incorporated in the variance estimate.*
- *The SSC recommends a look at sensitivity to alternative stratifications.*

F. Groundfish Management

2. Trawl Catch Shares Review Draft Report and Intersector Allocation Report

The Scientific and Statistical Committee's (SSC's) Groundfish and Economics Subcommittees met on May 24 and 25, 2017 to review the West Coast Groundfish Trawl Catch Share Program Five-Year Review - Draft (Agenda Item F.2.a, Catch Share Analysts Report, June 2017). The SSC

subcommittees produced a report (appended to this report) that contains technical comments on the Draft document and the analyses that support it. Dr. Cameron Speir (SSC Economics Subcommittee Chair) presented a summary of the subcommittee report to the full SSC.

The analysts' report (Agenda Item F.2.a, Catch Shares Analysts Report, June 2017) includes a comprehensive summary of economic, community, environmental, and program management outcomes in the groundfish trawl catch share fishery before and after the implementation of the catch share program in 2011.

The program review team is to be commended for its work on the analysts' report. The team has compiled a comprehensive and rigorous set of analyses in a short period of time. The analyses would not have been possible without the data collection efforts that began prior to implementation of the catch share program. The Economic Data Collection program and Pacific Coast Groundfish Social Survey were indispensable in documenting changes in the fishery, and staff involved in these efforts should also be commended.

The subcommittees found no major problems with the analysts' report or the included analyses. The report from the SSC's Groundfish and Economics Subcommittees' review of the analysts' report contains comments and suggestions. These comments either require minor changes or suggest editorial changes to improve the exposition of the report or identify areas for potential future research.

While the information and analyses in the analysts' report are useful for summarizing the state of the fishery and documenting changes that occurred after implementation of the catch share program, the analyses in general do not assign causality for observed changes nor can causality be inferred. This is a limitation of the analysis and is noted in the analysts' report.

The subcommittee chairs will work with the analysts to prioritize the suggested revisions. The SSC does not anticipate this causing a delay in the review process.

SSC Notes:

A causal analysis would compare observed changes to a credible counterfactual estimate of what would have occurred if the catch share program had not been implemented, or changes for particular groups would be compared to a control group (e.g., a group of similar vessels not impacted by the program). This would help to discern changes that resulted from the catch share program from those caused by other factors. However, this type of counterfactual analysis would be a difficult and lengthy task, and it is unclear whether it would be feasible to develop an accurate counterfactual given the time and resources available for this review. It is also unclear whether suitable controls groups exist to compare against impacted groups. Therefore, the SSC has not recommended that these additional analyses be undertaken for this review.

The SSC did not review the Trawl Catch Shares Intersector Allocation Report (Agenda Item F.2 attachment 2). Review of this report was not assigned to the SSC and an SSC review was not included on the Calendars for Trawl Catch Share and Intersector Allocation Reviews (Agenda Item F.2, Attachment 1).

REPORT OF THE SSC GROUNDFISH AND ECONOMICS SUBCOMMITTEES ON THE WEST COAST GROUNDFISH TRAWL CATCH SHARE PROGRAM FIVE-YEAR – DRAFT

The SSC's Groundfish and Economics Subcommittees met on May 24 and 25, 2017 to review the West Coast Groundfish Trawl Catch Share Program Five-Year Review Draft document to be presented at the June 2017 Council meeting. This report summarizes the discussion with emphasis on recommendations by the Subcommittees to the analysts.

Jim Seger (Pacific Fishery Management Council [PFMC] staff) gave a brief overview of the timeline and process for reviewing the Trawl Catch Shares Review document(s). At the June PFMC meeting, the Council is scheduled to approve the draft document for public review. Given Council approval, probably subject to responding to comments from advisory bodies, a finalized draft will be ready for general distribution and public comment in the late summer. In November 2017, the Council will consider approving the draft as final. During summer, the Community Advisory Board (CAB) will work on a range of alternatives for the Council to follow-up on.

Dr. Seger reminded the group that there is also a 5-year review of the inter-sector allocations in parallel to the 5-year review of the trawl catch shares program.

The program review team is to be commended for its work so far. The team has compiled a remarkably comprehensive set of information on the status of the fishery in a very short amount of time.

It is very difficult to identify whether many of the changes that have occurred after implementation of the catch share system were caused by the catch share program. Nearly all the analyses do not assign causality for any observed changes, but rather document the state of the fishery before and after catch share program implementation. This limitation of the analysis should be understood by stakeholders that use the program review results and clearly stated in the final document.

This analysis would not be possible without the data collection efforts that began prior to implementation of the catch share program. The Economic Data Collection (EDC) program and Pacific Coast Groundfish Social Survey (PGFSS) are indispensable in documenting changes in the fishery that have occurred.

The subcommittee has the following recommendations regarding the overall organization of the report.

- A section that documents all sources of data used in the report is required. This section can be succinct (several paragraphs per data source), but should describe each source (EDC, PCGFSS, fish tickets, logbooks, WCOP and any other data used in the analysis).
- The final report should include a discussion of the confidentiality rules associated with the data. This could be included in the data section.
- The full document will likely be used primarily for reference, so it is essential it be well organized and provide a means to quickly locate specific information. A detailed table of contents, list of tables, and list of figures is required in the final document.

Section 3.1 Economic Performance

Section 3.1 is the longest section of the draft report and summarizes economic aspects of the groundfish catch share fishery. The first major subsection, 3.1.1 Changes in Net Economic Benefits, summarizes net revenue fishery-wide and reports that net revenue to all participants in the fishery more than doubled from the pre-catch share base period (2009-2010) to the period following catch shares (2011-2015). Subsection 3.1.1 goes on to summarize several aspects that are thought to affect the level and change in net benefits in the fishery including: consolidation, efficiency and productivity, product value, and quota market performance. The second major subsection, 3.1.2 Individual Economic Outcomes, summarizes the distribution of individual financial outcomes for participants in the fishery. In addition to profitability and detailed tabulations of cost by category and fleet, this subsection reports on participation, timing and location of landings, diversification, gear-switching, and carryover provisions. The third major subsection, 3.1.3, Other Economic Goals and Objectives, reports on utilization of annual catch limits, income and employment impacts, conflicts between fishery sectors in the southern sablefish quota area, and safety outcomes.

General Comments on section 3.1

For figures and tables where there is large variation across entities (e.g. vessels or plants) and the data are a census, percentiles, rather than standard deviations, may be a better way to show the variation among individuals. An example of this is figure 3-12, but there are many similar cases.

Specific comments on Section 3.1.1 Changes in Net Economic Benefits

Table 3-1: There should be a note that the overall net benefits table (Table 3-1) does not subtract buyback fees as a cost since these a transfer to the public, not a true cost.

3.1.1(b)(1) Consolidation

There is no direct comparison of consolidation that occurred in the post-buyback period up to the catch share and then after. This comparison could provide some basis for assessing the effect of the catch share program, particularly if observed consolidation rates were compared to predicted consolidation in the Final Environmental Impact Statement (FEIS). While the FEIS does not separate whiting/non-whiting vessels in the same manner as the analysis in the draft document, it would be useful to have a comparison in the report to see if the rate of consolidation has changed relative to the rate prior to the catch share program being implemented.

Table 3-6 shows the number of processing companies. This is lower than the number of plants. This should be clarified here and there should be a cross reference if there is information in the report on the number of plants or buyers.

The draft analysis uses the number of vessel accounts that have nearly reached annual Quota Pounds (QP) limits (Tables 3-7, 3-8) and the number/percentage of entities holding Quota Share (QS) greater than 90 percent of the control limit (Table 3-9) as indicators of the degree to which consolidation limits are constraining on individual operations. The draft document simply notes that “a small percentage of vessel accounts have reached annual QP use limits since the implementation of catch shares” and “few entities are close to the QS control limits on individual species.” While the fact that not many vessels have come close to aggregation limits is suggestive

that the limits are not very constraining, it is not conclusive. We do not know, and there is nothing in the draft analysis to indicate, how many firms might have exceeded QP or QS aggregation limits, and by how much, if these constraints were not there. This is an important caveat that should be noted and may be an area where further research is needed.

- The analysts should explore and report whether there is additional information (e.g., from surveys) that might suggest that vessel QP limits are more limiting than suggested.
- Lian, Singh and Wenninger (2009) developed pre-catch share estimates of optimal operations size (i.e., how economies of scale affect vessel size and output) that could be used to investigate whether vessel QP limits are constraining.
- It may be useful review existing studies that evaluated how much consolidation of QP or QS equivalents occurred in fisheries that did not impose similar aggregation limits.

3.1.1(b)(2) Efficiency and Productivity

The draft document includes the Lowe Multifactor Productivity Index (Lowe Index) as one indicator of vessel-level productivity (the relationship between the quantity of fish produced and the amount of inputs used to harvest fish). The Lowe index can be adjusted to incorporate changing biomass levels and the biomass-adjusted version is included in the draft document (Table 3-11, non-whiting vessels; Table 3-13, shoreside whiting vessels). However, the use of the biomass-adjusted Lowe Index is problematic because it assumes that commercial catch per unit of effort (CPUE) should increase proportionately with biomass (i.e. constant catchability). This assumption is unlikely (especially so for whiting), and is contrary to assumptions made in stock assessments. The biomass-adjusted version of the Lowe index should therefore be removed from the final report and only the unadjusted version presented.

On page 3-21 the following sentence should be deleted as it is not accurate: "Projected biomass estimates in stock assessment reports are, by nature, decreasing, meaning that total non-whiting biomass is underestimated in years for which projections are used. The overall productivity change could be inflated if the biomass is lower than assumed."

The draft document tabulates the efficiency (calculated as net revenue as a percentage of total revenue) of each sector of the fishery (Table 3-14). The results show a substantial increase in efficiency for non-whiting catcher vessels and a decrease in efficiency for non-whiting processors after catch shares implementation. The draft document does not comment on reasons for this change, but there may be reasons other than changes in operational efficiency. The draft document should discuss whether this is driven by increases in ex-vessel prices and thus a transfer to rents from processor to harvest sectors.

The distribution of efficiency changes should be analyzed.

- It is unclear from information presented in the draft document whether efficiency changes have been driven by large changes in a few vessels or more broadly distributed changes.
- It would also be useful to explore whether less efficient vessels have exited over time during the catch share program and if that has increased overall efficiency.

3.1.1(b)(4) Quota Market Performance

The draft document uses cash sales of QP that include only single species transactions as the indicator of QP price. However, cash sales may not be a good representation of the value of QP because they represent only a small number of transfers and a minority of transfers of some species (Table 3-21, 3-22). There was extensive discussion of this and two points should be added to the

discussion:

- QP prices from single-species cash sales likely indicate what some additional QP put on the market would sell for (marginal value), but not the average value of all transfers including multi-species transfers.
- Several species have QP prices above ex-vessel price despite the fact that there is unused QP, which suggests the prices are part option value. That is, participants may hold QP or are willing to buy QP at a premium as insurance to avoid an overage they cannot cover and the resultant forced shut down.

Table 3-22 is useful for understanding the percentage of quota transferred in cash sales for some species. However, the table should break out single-species/multi-species cash sales and add more species, since only single-species cash sales provide usable species-level QP prices.

Specific comments on Section 3.1.2 Individual Economic Outcomes

The analysis in this section focuses on individual financial outcomes. Therefore, variation in the data is best represented by reporting percentiles, rather than medians and standard deviations. This will give a better sense of whether the distribution of individual outcomes is skewed by a few outlying individuals. EDC data represent a census of all vessels (and processors) operating in the fishery and variation in this data is due to heterogeneity of respondents. This is in contrast to some biological data and models where measures of variation include sampling variability.

The classification of a vessel as whiting or non-whiting can (and does) change from year-to-year depending on individual vessels' choice of target species. How frequently this occurs and its effect on the outcome of the analysis should be further investigated.

3.1.2(a) Individual Viability and Profitability

Figure 3-13 shows the percentage of catcher vessels with negative net revenue (both total and variable cost) in each year of the EDC data. This is a good indicator of the distribution of net revenue across vessels. There would be benefit in tracking the cumulative net revenue per vessel over time as well. A table or figure that showed the percentage of vessels with negative cumulative net revenue (from 2009 through a given year) would be useful for several reasons:

- A vessel's classification as whiting/non-whiting can (and sometimes frequently does) change from year to year.
- Total Cost Net Revenue incorporates "lumpy" fixed costs and can fluctuate from year-to-year depending on when an investment is made.
- The presence of vessels with persistent negative net revenue values would indicate either a problem in the data or an issue for future research.

The information in Tables 3-25 through 3-32 was presented to the subcommittees as plots. These were easier to interpret than the tables. These figures should be included in the written report.

Tables 3-25, 3-29, and 3-31, which summarize costs by year and category for shoreside catcher vessels, contain a pre-catch shares and catch shares period average for each cost category. For cost-recovery and observer fees, these averages are misleading because these costs have been systematically changing over time. For example, observer costs were subsidized at a declining rate from 2011 through 2015.

The ratios of the standard deviation to the mean presented in Tables 3-26, 3-28, 3-30, 3-32 are

often very large. This indicates that there high degree of variation among vessels; therefore mean/SD values could be strongly influenced by outliers. For example, in 2012 Total Cost Net Revenue (TCNR) went down substantially, while Variable Costs Net Revenue (VCNR) only declined slightly.

Plots and tables that use empirical percentiles are strongly preferred to present the values and distribution for the data in this section.

There appears to be a large decline in mean TCNR in 2012 that appears to occur across the shoreside whiting, at-sea whiting catcher vessels, and non-whiting trawlers (Tables 3-26, 3-28, 3-30). 2012 saw a large decrease in whiting total allowable catch (TAC). Also, the EDC data presented in the draft document represent activity level analyses, so large fixed costs can affect more than one fishery. This could be the result of the same vessel(s) making a large investment in fixed costs. Again, using the median minimizes the effect of outliers in the presentation of results. Further investigation into what happened in the fishery in 2012 may be warranted and the outcomes may not be due to the catch share program.

3.1.2(a)(2) Quota Leasing Activity and Distribution of Net Revenue

The tables presented in this section are very useful for getting reference information and specific values. However, the final document should also include the figures included in the presentation to the subcommittees because they are easier to interpret than tables.

Figure 3-19 presents net quota spending as a proportion of revenue, by revenue quartiles. It is unclear what question this figure addresses.

Additional minor comments on 3.1.2

Table 3-35: note here you have decimals in percentages, but not in earlier similar tables – please be consistent.

<u>Specific comments on Section 3.13 Utilization</u>

3.1.3(a)(1) Utilization of Non-whiting Species Allocations

Figure 3-38 shows landings and discards relative to Annual Catch Limits (ACLs) for eight species groups. These figures are informative, but a longer time series should be provided to illustrate that underutilization has occurred over a long period of time prior to catch shares.

Text after Figure 3-38 on page 3-139 seems out of place.

- Some or all of the paragraph beginning "There can be trade-offs" and next paragraph should be deleted. Some of this discussion in this section is unsupported by any analysis.
- This section might be best presented in the form of: "this is what we know and what we don't know about why there is underutilization."
- It may be useful to include analysis of reasons for underutilization and data necessary to answer this question in future research and data needs identification.

The discussion around Figure 3-39 seems speculative. It would be useful to have additional analysis on market limitations (to verify and support Figure 3-39). For example, it would be useful

to interview seafood buyers for retail and restaurant sector. Comments by the public at the subcommittees' meeting referenced a poll of buyers by MSC that indicated certainty and consistency of supply was a paramount concern.

3.1.3(b) Income and Employment Impacts through Associated Sectors of the Industry

The text should emphasize that the results in this section are model outputs, not data. Input output models are deterministic, but there is model error. If possible, it would be nice to have some idea of uncertainty or error of economic impact results, especially as they are presented as impacts "over time" in Figure 3-51.

3.1.3(c) Interdependencies with Other Fisheries

The guidance from National Marine Fisheries Service (NMFS) headquarters to address interdependences with other fisheries is not clear about what types of interdependencies should be evaluated. The analysts addressed interdependencies that they or stakeholders had identified as problematic. There may be others that were not identified but are important.

While the analysis addresses conflicts between the individual fishing quota (IFQ) and non-IFQ (open access or fixed gear permit) fisheries for sablefish south of 36° N. Latitude, it is not clear if the analysis here completely responds to comments submitted to the Council by stakeholders. These comments suggest that the catch share program is enabling fishing by vessels in the catch share fishery to use fixed gear in areas south of 34° 27' where the limited access trawl fishery had never been prosecuted in the past. Further analysis on this issue should be explored because it is unclear what conclusions should be drawn from the existing analysis of sablefish landings in the Morro Bay area (e.g. Figures 3-52 and 3-53).

3.1.3(d) Safety

There is uncertainty as to whether the definition of incidents in the Coast Guard data includes break-downs (Figure 3-54). It is likely that some of the break-downs are included in the incident data. Having observers on board all vessels mean could lead to higher reporting of incidents to the Coast Guard. This could lead to some bias in comparisons of the number or frequency of incidents before and after catch share implementation.

The relationship between proportion of trips starting between midnight and 2 a.m. and cost of observers could be spurious (Figures 3-59) because some of the relationship may be affected by vessel size. Specifically, the relative cost of observers is higher for smaller vessels so they are more likely to time trips this way. The analysts agreed that at least some of this relationship may be affected by vessel size, but claimed that there is consistent increase in observer cost over time due to reducing subsidies over years, so that most of what is driving the midnight to 2 a.m. start time is likely due to cost.

Additional minor comments on 3.1.3

All other roundfish in Figure 3-38 includes rockfish, but rockfish are not usually considered roundfish. This label should be changed to all other non-flatfish groundfish.

Pg. 3-171 mentions the "warm blob", but it should actually be referred to as "the Blob".

It is difficult to distinguish between pre-catch share and catch share period in Figure 3-56. Use of open circles may improve readability.

Section 3.2 Community Performance

Section 3.2 summarizes aspects of the catch share program that are believed to affect fishing communities. This section summarizes the geographic distribution of landings, the location of buyers/first receivers, infrastructure in specific ports, the location of quota owners, community level social indicators (engagement and vulnerability), employment, various aspects of community fishing associations and cooperatives, and the attitudes of fishery participants regarding various aspects of the catch share program and the fishery in general. Section 3.2 also provides information on PGFSS survey respondents statements regarding the ability of new participants to enter the fishery and perceived determinates of exit from the fishery.

General Comments on section 3.2

A preamble should be added that reminds readers that the program is not yet mature and, in particular, that trading of QS only started recently. This impacts several aspects of the program perceptions, such as whether it is harder to get loans. Also, the report should place the groundfish fishery in the broader context of the west coast fisheries because most vessels are not reliant on groundfish revenue.

Section 3.2 should focus more on regional differences in perceptions and, to the extent possible, also report the impacts/changes in perceptions within communities (as well as between communities). The latter may be challenging to assess given small sample sizes by community and it may be necessary to rely on the repeat response information.

Could the data be used to explore the quantitative effects of changes in the location of quota? For example, which vessels/operators (the least efficient?) are leaving?

The highlights need to be supported by the text. Also, be careful of highlighting statements such that they appear to represent consensus among respondents, but for which the detailed responses indicate this is not necessarily the case.

Much of the discussion of the impact of observer coverage that occurs in Sections 3.2.2 and 3.2.3 can be limited or moved. Observer coverage impacts can be better focused in Section 3.4 (Program Management Performance).

Specific comments on Section 3.2.2 Fishing Communities

The time periods in Table 3-87 are not consistent with time periods used in the analysis in section 3.1. The text should give some rationale for the time periods chosen for the analysis.

The text in section 3.2.2(c) Changes in Infrastructure makes conclusive or semi-quantitative statements (e.g. “most”). These should be supported by documenting changes in infrastructure by port where possible (e.g. number of processors).

Table 3-108 (in section 3.2.2(d)(1)), which documents trends in QS owners, should show absolute

numbers as well as percentages to aid interpretation.

The discussions of the engagement and vulnerability indices would benefit from some emphasis on the definition of indicators and their link to the fishery. Engagement is defined in 3.3.2(e) (page 3-242) as "a measure of the importance of a given community to commercial fishery resources and activities." The text would benefit from some additional emphasis that this concept is different from the importance of fishing to a community. Also, the social vulnerability indicators are constructed from census data and the link to what is happening in the fishery is not clear and direct. Changes in social vulnerability are not necessarily indicators of changes or events in the fishing industry. The review should explicitly make this caveat.

The highlights for section 3.2.2(g)(3)(c) on page 3-281 state: "respondents reported a high degree of consolidation toward processing companies and other multi-vessel entities." Can this belief by respondents be supported by analysis of existing data? This may be complicated given the nature of the available data, but an attempt should be made to explore this issue. Also, a definition of a "multi-vessel entity" should be provided.

There appears to be a conflict between Figure 3-74 and the discussion in section 3.2.2(h)(3) "Improvements in Compensation, Job Stability, and Standard of Living". However, this may be because Sec 3.2.2(f) refers to changes in jobs while Fig. 3-74 refers to roles given a job in the fishery. There should at least be cross-referencing between these sections and possibly some direct comparison of the results and interpretation.

The highlights for section 3.2.2(g) state "Newport, Oregon, appears to be adapting well to the catch share program, in part because the diversity of its fisheries and its robust infrastructure" and quotes by Newport-based participants are cited in within this section. Did the survey receive comments from communities outside Newport that Newport was adapting successfully? It appears so, and the report should be modified to reflect that.

<u>Specific comments on Section 3.2.3 Entry-Level Participants and New Entrants</u>

3.2.3(b) Are data on the cost of trawl permits available that can be included in the document?

Difficulties in obtaining loans are cited as a barrier to entry by new participants (see highlights for 3.2.3 and discussion in 3.2.3(b)(3) Entry Investment: Loans and Debt). Is there evidence to support this as a general or consensus result? If so, is this a unique aspect of the catch share fishery or an issue facing all commercial fisheries? Comment by the public at the subcommittees' meeting suggests that banks are still willing to make loans, particularly for vessel purchases.

Section 3.2.3(b)(4) states "Complicating affordability issues for crewmembers is the fact that QS transactions generally occur in large increments" (page 3-309). This may reflect the current state of the immature quota market. How likely is it that the number of small transactions increases over time as the quota market matures?

In section 3.2.3(c) Fishing Heritage, the draft document cites issues such as lack of family connections, aging of the fleet, etc. as barriers to new entry. Are these issues unique to fisheries (if so, how and why) or are they also faced by other industries and communities?

<u>Specific comments on Section 3.2.4 Small Vessels and Vessels Leaving the Fishery</u>

Section 3.2.4 makes statements that can and should be verified using existing data. This section should attempt to justify the statements (a) small vessels may be becoming more reliant on other fisheries, such as crab and shrimp, in order to offset diminished revenue in the groundfish fishery; (b) some small trawl vessels have left the fishery, either by leasing out their quota, or by selling; and (c) Astoria/Tillamook have lost the greatest number of both large and small vessels that were active in the trawl fishery during 2009 and 2010, followed by Washington, based on data collected for the economic section of the report.

Section 3.3 Environmental Performance

Section 3.3 summarizes environmental outcomes in the catch share fishery. The draft document states that a main goal of the catch share program is "to reduce the incidental catch of overfished groundfish species to assist in rebuilding these stocks." This section summarized discards and total mortality, catch limits and optimum yield, the status of stock regarding overfishing and rebuilding, bycatch of protected species, and habitat impacts. This section also contains a discussion of "localized depletion" of southern sablefish stocks (Section 3.3.4(b), see subcommittees' comments below).

Specific comments on Section 3.3.2 Discards and Total Mortality

The species composition of the grouping labeled roundfish in Figure 3-80 and 3-81 is not clear. A similar issue arose in the discussion of section 3.1.3. Providing an appendix defining the species included in roundfish would be helpful and reference to it in the figures would be useful.

Specific comments on Section 3.3.3 Catch limits and Optimum Yield

The discussion in section 3.3.3(c) Large Bycatch Events (Lightning Strikes) regarding the implications of large bycatch events for fleet behavior should be moved to the economic section. In particular, section 3.1.3(a) Utilization Information contains a discussion of the effect of perceived risk on utilization and the quota market. The total amount of removals is what is pertinent to Environmental Performance rather than the implications of large catch event "lightning strikes" which are primarily economic.

Specific comments on Section 3.3.4 Status of Stocks

The language in section 3.3.4 Status of Stocks regarding "overfishing" and "overfished", and "recovered" species is potentially confusing to stakeholders.

- Above the minimum stock size threshold (MSST), a once overfished stock is referred to as 'rebuilding' rather than 'overfished' under national parlance, but is still referred to as 'overfished' in the PFMC since it is still in a rebuilding plan and subject to much lower harvest levels until completely rebuilt. A footnote below Figure 3-97 regarding the definition of 'rebuilding' in in the MSA vs. 'overfished' in the PFMC would help readers from our Council understand the terminology being used.
- Also filling in the blanks in Figure 3-97 would clarify the status in the intervening years. Canary and Pacific ocean perch were continuously in an overfished state, and should be indicated as such in the table. Circling the status symbol when an assessment was undertaken would also help readers follow the table.

- The header for Figure 3-97 indicates the stock was overfished at that time according the most recent assessment, whereas the assessment effective at the time in question is reflective of our understanding of its status at that juncture. Thus, the table should be referencing status relative to the assessment effective in each year if it is to reflect our understanding of stock status and resulting stock status under management at the time. The annual Status of the Stocks report forming the basis for the figure may use methods that differ, reflecting a retrospective understanding of stock status per the most recent assessment. Whichever method is used, it should be referenced and explained in the Figure caption. This may also pertain to Figure 3-98 and 3-99.

In Figure 3-99, the title on the slide should not reference "overfished rockfish" since some of the species listed were never overfished. The perception of the trend in abundance appears to reflect results from the most recent assessment rather than the status as understood in each year given the assessment in effect at the time. The caption should clarify whether the Stock Information System results or the most recent assessment were referenced to clarify the source used. Cowcod also needs to be added to the graph using a B_{MSY} of 620 mt as the basis for comparison.

Specific comments on section 3.3.4(b) Localized Depletion of Sablefish South of 36°N. Latitude

The term "localized depletion" as used in this section is not clearly defined and may not reflect the nature of the issue being analyzed. The draft document fails to present a strong and relevant definition of localized depletion. Is the issue being analyzed an ecological issue? Or is it a change in fishing behavior that (possibly) negatively impacts the ability of another group of fishers to fish? The second is an economic question.

- The degree to which a stock may be subject to localized depletion depends on the distribution and intensity of fishing effort from the fleet and mobility of the species.
- Identifying localized depletion requires comparison of the rate of change in the population size at a global level and the local level. The abundance of the stock is spatially heterogeneous and depletion will not be consistent over the distribution of the stock even in the absence of fishing. It may prove difficult to determine whether the rates of change in the abundance in a given area are more severe than could be occur at random.

The data utilized to address this question are too limited to draw any conclusions regarding fishery conflicts and localized depletion.

- The current analysis utilizes only six years of data for the CPUE from only four boats in the area of the central coast in California between 34° 27' N and 36° N depicted in Figure 3-102. The amount of data is insufficient to draw any conclusions.
- Any trends in abundance or CPUE should be compared to the rates of change elsewhere.
- The Northwest Fisheries Science center Shelf/Slope Trawl survey data should be analyzed in an analogous fashion for the area of interest and compared to the results for the whole area sampled by the trawl survey or adjacent waters considered to be less heavily fished.
- In addition, statistical tests should be conducted between trends to provide greater rigor in examining whether there is a statistically significant difference in the trends in CPUE observed between the area of interest and the area outside for both the fishery dependent and fishery independent data sources.
- Alternative hypotheses regarding the potential causes should also be noted and analyzed where possible, i.e. shifts in the distribution of the stock from the area of interest as sablefish are a mobile species and water temperature regimes etc. may have effected their distribution resulting in the observed patterns.

Latitude and longitude should be indicated on the maps showing overlap in fishing effort between sectors (Figure 3-103). This figure fits better in the economic section regarding interactions between fishing sectors focusing on gear conflicts resulting from gear switching.

Specific comments on section 3.3.5 Protected Species

Section 3.3.5(a)(1) contains a detailed discussion on bycatch of salmon species, including bycatch counts through 2013 in Table 3-137. Additional, updated information was presented to the full SSC at the April 2017 meeting under agenda item F.3 regarding ESA section 7 consultation on the take of listed salmonids in the groundfish fishery and should be incorporated into the final document (www.pcouncil.org/resources/archives/briefing-books/april-2017-briefing-book/).

This section sometimes refers to pounds or tons of salmon when the reported quantities are numbers of fish, units should be checked and corrected as necessary.

Marine mammal interactions with the fishery include entanglement in fishing pot gear are described in section 3.3.5(b)(1). It is unclear whether Table 3-140 includes entanglement in crab pots (the presentation indicated that these are included), but only entanglements with fish pots should be presented. Season and depth distribution of fishing effort differs between fisheries.

The potential biological removal (PBR) limit for the marine mammals should be included in Table 3-140 for comparison to fatal interactions.

Section 3.3 Program Management Performance

The Magnuson-Stevens Fishery Conservation and Management Act (MSA) Limited Access Privilege Programs (LAPP) provisions and the Groundfish FMP Amendment 20 emphasize the importance of efficient and effective enforcement, monitoring, and management of the catch share program. This section presented indicators of management performance, and qualitative assessments informed by public comment.

Comments on section 3.4.2 Monitoring, Accountability, Catch Accounting, and Enforcement

The draft document does not include an assessment of the cost-effectiveness of maintaining 100 percent observer coverage. This issue may become more important as fewer overfished species implies lower risk from having unobserved trips.

Viability of discarded Pacific halibut on vessels with electronic monitoring is assessed by assuming a fixed mortality rate by gear type. It may be possible to refine viability estimates using observer data (Section 3.4.2(b)(6) Discards).\

Executive Summary

Given the length of the draft document, the Executive Summary is an important component of the 5-year review. It is likely the only portion of the document that many will have the opportunity to read in detail. Therefore, the subcommittees stressed that the Executive Summary must clearly and accurately convey the most important information contained in the draft document.

The Executive Summary contained in the draft document is organized according to the four

questions that the SSC suggested to the Council in November as focal points for the report. Readers may find the fact that the Executive Summary is not presented in the same order as the main text confusing and it makes it harder to know where to find specific pieces of information. The subcommittees did not reach and consensus on the best organization of the Executive Summary and the analysts should give careful consideration to this issue. Comprehensive referencing of material and conclusions in the Executive Summary is important in either case.

At the start of the Executive Summary the following two objectives should be accomplished:

- A clearer statement of what benefits were expected from the Trawl Catch Shares program. Some text to clarify the difference between "net benefits to the nation" and the economic performance of the fishing fleet and processors would also be helpful.
- A statement that not all program goals can be achieved at the same time and that the catch share program is set up to balance competing goals.

The presentation given at the subcommittees' meeting was mainly figures and graphs. This was very helpful and the revised Executive Summary should contain figures.

Section "highlights" in the main text, which provide succinct summaries of the main "results", could provide a basis for which items are included in the Executive Summary and which are left out. The Executive Summary could also include bullet-point type lists to convey information, as the analysts think is appropriate.

The Executive Summary should avoid speculation and include only statements regarding results. Each item should be supported by data and analysis contained in the main text. In the case of qualitative survey data, only statements that can be supported as a consensus of respondent views should be presented.

The document would benefit from a timeline of major events to help put some of the changes in the fishery into context. This should include major changes in management (the 2003 vessel buyback, for example), market conditions (Ukraine market for whiting?), and important environmental factors (the "Blob"). The summary slides presented at the subcommittees meeting included a short time-line of some of such events. Inclusion of this figure would provide very helpful context and provide a longer perspective (e.g., the groundfish crisis, the trawl vessel buy-back).

The summary slides presented at the subcommittees meeting included a slide illustrating consolidation from 2009 through 2016 by presenting the number of vessels participating. To understand how catch shares affected consolidation rates, especially relative to other major policy changes such as the vessel buyback, a longer time series is needed. Data exist (e.g. PacFIN fish tickets) to present this information.

- A similar slide showing the decline in the number of buyers by state starting in 1994 (title Net Benefits – Consolidation) was very helpful in showing the long term trends in the West Coast groundfish fisheries.
- A figure showing the number of trawl vessels by state starting in 1994 would be useful.
- A figure showing non-whiting trawl landings and value by state would also provide additional context.

Regarding financial outcomes:

- Figures and tables should include median and percentile values (not mean and standard deviation) because they better show the distribution of individual outcomes. Distribution is a main point of emphasis with these results.
- The analysts should consider presenting only VCNR figures in the Executive Summary This reduces clutter (by excluding TCNR) and the VCNR results may be more informative when assessing financial outcomes.

Research and Data Needs

The final report will include a "Research and Data Needs" section. That section is blank in the draft document. The analysts asked the subcommittees for recommendations regarding topics for this section. Some possible topics are listed below, but this should not be considered an exhaustive list.

- A survey that includes quota holders who do not actively participate in the fishery.
- Additional data or cost allocation studies on program administration. It is currently unclear the extent to which cost recovery fees cover program costs.
- Research on utilization rates, aggregation limits, and economies of scale/optimal size. The data and analysis presented in the draft report are insufficient to determine the effect of aggregation limits: simply put, we don't know how participants would behave if these limits were not in place. One potential option would be to update Lian, Singh and Weninger 2009. It may be useful to include analysis of reasons for underutilization and data necessary to answer this question in future research and data needs identification.
- Research on whether observed cash prices for quota pounds accurately represent value. Are there other methods for determining value?
- Research on whether observed changes are due to changes in individual behavior or a change in the make-up of the population of participants. The catch share program or other factors may induce exit by participants with certain characteristics. This will alter the mean/median/distribution of indicators, even if the behavior of the remaining vessels hasn't changed. Further, how much exit is due to pre-exiting trends versus the catch share program? This is applies to many of the analyses in the draft document.
- An assessment of the cost-effectiveness of maintaining 100 percent observer coverage. This issue may become more important as fewer overfished species implies lower risk from having unobserved trips.
- Further research on changes in sablefish fisheries south of 36° N. Latitude. The draft document attempts to address conflicts between the IFQ and non-IFQ fisheries for sablefish south of 36°, but it is not clear if the analysis here completely responds to comments submitted to the Council by stakeholders. The nature of any interactions between fisheries in this area may be economic or biological (or both), but this is unclear at this time. Further analysis on this issue should be explored because it is unclear what conclusions should be drawn from the existing analysis of sablefish landings in the Morro Bay area (e.g. Figures 3-52 and 3-53).
- Viability of discarded Pacific halibut on vessels with electronic monitoring is assessed by assuming a fixed mortality rate by gear type. It may be possible to refine viability estimates using observer data (Section 3.4.2(b)(6) Discards).

3. Scoping of Trawl Catch Shares Discard Survival Credits for Sablefish and Lingcod

The SSC reviewed the documents entitled "Scoping of trawl catch shares discard survival credits for sablefish and lingcod" (Agenda Item F.3, Attachment 1) and the "Groundfish Management Team [GMT] informational report on sablefish and lingcod discard mortality rates" (Agenda Item F.3.a, GMT Report 1). Lynn Mattes and Heather Reed (GMT) provided a summary of the GMT report and answered questions.

The information provided to the SSC on discard mortality rates did not warrant reconsideration of the rates used in the most recent stock assessments.

With respect to the question of whether it is appropriate to apply those discard survival rates as credits to the catch share fishery, the analyses planned by the GMT should be useful in evaluating any potential complications, such as changing incentives to discarding practices. The SSC previously recommended that discard mortality assumptions be consistent between assessments and management (Agenda Item F.2.b, Revised Supplemental SSC Report, March 2012). In reviewing the materials provided, the SSC finds no reason to diverge from this advice.

SSC Notes:

In future revisions to the Stock Assessment Terms of Reference there should be clarification that assessment analysts should work with the GMT to ensure that assessments reflect the best available information on discard mortality rates.

4. Final Stock Assessments and Catch Reports

The SSC was briefed by the Groundfish Subcommittee regarding the stock assessment updates for arrowtooth flounder, blackgill rockfish, bocaccio and darkblotched rockfish (Agenda Item F.4, Attachments 1, 2, 3, and 4, June 2017) as well as the catch report for cowcod (Agenda Item F.4, Attachment 5, June 2017).

Cowcod Catch Report

The cowcod catch report provides updated information on the rebuilding progress of cowcod off the U.S. Pacific coast using catch data through 2016. The 2013-2016 total catches (landings plus dead discards) were estimated to be less than the annual catch limits (ACLs) in place each year as well as the annual catch target (ACT) for 2015 and 2016. While an update to the rebuilding analysis was discussed, the stock is projected to rebuild in 2019 under all catch levels previously analyzed and an updated analysis is unlikely to result in a substantial change compared to the status quo considering low recent levels of attainment.

Update Assessments

Arrowtooth Flounder
The most recent full assessment of arrowtooth flounder was conducted in 2007 and this is the first update of that assessment. Changes from the 2007 assessment include use of updated pre-2007 landings, discards, and composition data; updated abundance indices; updated natural mortality estimates; and the addition of 10 years of catch, composition, and NWFSC slope-shelf survey data. The methods used in the update are consistent with the Terms of Reference (ToR) for updates and represent the best available science for use in management in 2019-2020 as a category 2 assessment.

Large recruitments that occurred in 2011-2013 coupled with declining fishing mortality have resulted in an upward trend in biomass. The assessment update estimates spawning biomass of almost 57,000 mt, with a depletion of 87 percent in 2017, which is much higher than the B_{MSY} proxy of $B_{25\%}$ for Council managed flatfish species. Biomass trajectories prior to 2007 were substantially different compared to the previous assessment. Therefore the SSC recommends that the next assessment of this stock be a full assessment.

The SSC would like to acknowledge the work of both the teachers and the students that went into the arrowtooth flounder update assessment, which was comprehensive and carefully prepared as part of an applied stock assessment course offered jointly at Oregon State University and the University of Washington.

Blackgill Rockfish

The most recent full assessment of blackgill rockfish was conducted in 2011 and this is the first update of that assessment. Changes to the model since the last assessment include a new fishery selectivity time block to account for changes in trawl fishery retention since implementation of catch-shares in 2011; updated and corrected maturity; updated fecundity relationships; updated indices of abundance; updated steepness value and recent length and age data. The model results were consistent with the 2011 assessment. The methods used in the update are consistent with the ToR for updates and represent the best available science for use in management in 2019-2020 as a category 2 assessment.

The assessment update estimates depletion in 2017 of 39.4 percent, which is just slightly below the B_{MSY} proxy of $B_{40\%}$. The SSC recommends the next assessment of blackgill rockfish be an update assessment.

Bocaccio

The last full assessment of bocaccio was conducted in 2015. There were only minor changes to the 2015 assessment. These include updated catches for the commercial and recreational fisheries, updated indices of abundance, new fishery and survey length composition data, and the recently updated priors on steepness and natural mortality. In addition, the method used to estimate the juvenile index was changed to correct a methodological error but there was little impact on the results. The methods used in the update are consistent with the ToR for updates and represent the best available science for use in management in 2019-2020 as a category 1 assessment.

The assessment update estimates a depletion in 2015 of 48.6 percent, which is above the B_{MSY} proxy of $B_{40\%}$, in large part due to recent strong recruitment events (1999, 2010 and 2013 year-classes). The SSC recommends that the next assessment of this stock be an update assessment.

Darkblotched Rockfish

The most recent full assessment of darkblotched rockfish was conducted in 2015 and this is the first update of that stock assessment. Changes to the model include revision of the historical catch estimates, new length and age data, and an updated prior on steepness. A model with parameter values resulting in a lower maximum likelihood values indicating improved model fit was presented to the Groundfish Subcommittee after the assessment document was submitted for inclusion in the June briefing book. The SSC recommends that this better fitting model be used for management purposes. The methods used in the update are consistent with the ToR for updates

and represent the best available science for use in management in 2019-2020 as a category 1 assessment.

The revised assessment update estimates depletion in 2017 of 40.03 percent, which is above the B_{MSY} proxy of $B_{40\%}$. The SSC recommends the next assessment of darkblotched rockfish be an update assessment.

Estimation of Sigma Values for Scientific Uncertainty

Although the SSC is recommending category assignments for the update assessments, the sigma values reflecting scientific uncertainty associated with each category are not being assigned at this time, pending the results of the planned review of default sigma values at a September 2017 groundfish subcommittee meeting (Agenda Item F.7.a, Supplemental SSC Report, June 2017). In addition, the default sigma value for darkblotched rockfish as a category 1 stock (0.36) is lower than that derived using values from the decision table (0.43). The higher value may be considered for use in place of the default value.

SSC Notes:

- *Landings for fish caught in Oregon but landed in California were not accounted for in assessments. Authors should check with the California Department of Fish and Wildlife to obtain these estimates.*
- *In the TOR it should be noted the settings for VAST should be better documented for the final model.*
- *Darkblotched is a category 1 stock. Concern was expressed that with the removal of data that the depletion levels were varying, though some the prevailing view was that the change is not extreme enough to justify changing the category. Consideration of a threshold for changes to the results relative to the previous model was discussed, though a meaningful value was not identified.*
- *A review of the stock assessments conducted using errant CalCOM downloads from this time period indicated that the only affected stock assessments were chilipepper rockfish and canary rockfish. The magnitude of the effect on the historical catch is relatively limited compared to the aggregate removals over the entire time series, which amounts to 15% of the total for chilipepper and 2% for canary rockfish. Chilipepper rockfish is a healthy stock that is underutilized since the majority of the biomass resides within the rockfish conservation area. The magnitude of the effect of the discrepancy for canary rockfish harvest limits from a 2% change in the catch history is difficult to discern though sensitivity analyses conducted in the 2015 assessment indicate that the assessment is relatively insensitive to changes in catch history.*
- *If catch based updates are to be conducted to correct these values, there is added benefit from updating the catch data to include removals for 2015 and 2016. Catch based updates for these species should be conducted to address the discrepancy and provide revised harvest limits for 2019-2020 seasons, if not 2018. Review of the catch updates could be conducted by the Groundfish Subcommittee via webinar in time for the SSC to consider the results in September. There is a question of the timing of a review for catch based updates that would be required to allow time for the West Coast Region to implement changes in time for the January 1 2018 season start date. An additional timing consideration is whether the changes can be implemented in time for issuance of initial allocations to quota accounts for 2018.*
- *Two analyses regarding uncertainty are currently underway to further evaluate the estimates of sigma and the effects of time since the last assessment on the sigma value applied. Consideration of the results of these analyses in application to 2019-2020 could either be*

reviewed prior to September to facilitate consideration by the Council in September, reviewed at the mop-up or in a meeting in October for Council review in November. Alternatively their application in the 2019-2010 could be forgone until the next biennium to prevent the analysis, review or consideration of application from being rushed and potentially affecting the timing of the remainder of the regulatory specification process.

- *If data from the Cowcod Conservation Areas becomes available or it is becomes possible to estimate recruitment deviations or more composition data from the fishery that include age and sex become available, this might justify a full assessment of blackgill rockfish.*
- *The next time the TOR is revised, the default sigma values for each category should be provided and an explanation (or appropriate citation) of how the default sigma values were derived should be included.*

7. Specifications and Management Measures Process for 2019-2020 Fisheries

Mr. John DeVore briefed the SSC on the proposed process and schedule for 2019-2020 harvest specifications for groundfish. The SSC discussed the additional analyses that will be needed for the 2019-2020 cycle, and the plans for review of these additional analyses.

Errors in historical (pre-1968) catches for California in the CalCOM database were recently discovered and corrected. After examination of all potentially affected stock assessments, the historical catch time series was found to be incorrect for two 2015 assessments, chilipepper rockfish and canary rockfish. Because the errors are too large to disregard, these assessments will need to be rerun with the corrected catch time series, and new overfishing limits (OFLs) and acceptable biological catches (ABCs) specified. The SSC recommends that these corrected assessments be reviewed at the mop-up panel in September.

New rebuilding analyses will be needed for stocks assessed in this cycle that remain overfished, unless the stock is projected to be rebuilt within two years. If the base model from the Stock Assessment Review (STAR) panel review indicates that the stock remains overfished, work on a new rebuilding analysis should begin as soon as possible, even though the SSC will not formally endorse the assessments until the September Council meeting. These rebuilding analyses will need to be reviewed at the mop-up panel.

The Groundfish Management Team (GMT) proposed a review of the yelloweye rockfish projection model. The SSC recommends that this review be scheduled as a webinar in August or September with participation by the SSC's Groundfish and Economics Subcommittees.

Due to their age, several stock assessments no longer provide useful information for management advice, and a new approach is advised for the 2019-2020 harvest specifications. Both starry flounder and gopher rockfish were last assessed in 2005, and both of these assessments are considered highly uncertain by the SSC. During the last assessment cycle, a rollover approach was used to set the OFL and the ABC, but, if possible, this approach should not be used again. The SSC recommends that these stocks be assessed using depletion-based stock reduction analysis with a depletion prior informed by stock vulnerability. These assessments should be reviewed at the mop-up panel in September.

Work is progressing on two research projects that may inform the SSC's recommendations on sigma (σ), used to establish the uncertainty buffer for the ABC. One project underway at the University of Washington is directly evaluating the uncertainty in the estimate of OFL, rather than uncertainty in ending biomass, which is how the current σ for category 1 stocks was determined. The other research project is being conducted by the Northwest Fisheries Science Center, and is

evaluating how uncertainty in abundance and OFL estimates increase in the years after the assessment is conducted, and could potentially lead to a procedure where σ gradually increases as stock assessments become older. The SSC recommends that this work be reviewed at the mop-up panel in September. It is uncertain whether these projects will be sufficiently complete for the SSC to use a new approach for the 2019-2020 harvest specifications.

Based on the SSC's review recommendations, the agenda for the mop-up review panel appears to be relatively full. Most of these tasks are straightforward, and can be dealt with quickly. Stock assessments that are referred to the mop-up should take priority over other agenda items, including review of analyses to support the choice of σ. In the event that multiple assessments are referred to the mop-up panel, it may be advisable to move some of the items currently scheduled for review at the mop-up panel meeting to a webinar meeting of the SSC groundfish subcommittee.

SSC Notes:

In the last specifications cycle, the SSC did not assign members to review parts of harvest specifications table. Close review of OFLs and ABCs is an important task, and these assignment should be made this assessment cycle.

The most recent cowcod rebuilding analysis was done in 2013. Although the rebuilding analysis includes a 10-year projection, recent catches have been much lower than were specified in the rebuilding plan. The rebuilding analysis for cowcod is a substantial analysis that uses custom-built software and integrates over uncertainty in the DBSRA stock assessment. The rebuilding analysis considered constant catch scenarios from 1.5 to 4.5 t, which allow evaluation of scenarios where catch is close to recent realized catches. All of these scenarios, in addition to a zero catch scenario, will result in the stock rebuilding by 2019 with greater than 50% probability. Given these considerations, there would be little benefit to redoing the cowcod rebuilding analysis.

There are three possible outcomes to the review of the analyses to estimate σ at the mop-up panel meeting: 1) the analysis is sufficiently complete for the SSC to recommend σ for the 2019-2020 harvest specifications cycle, 2) additional analyses are needed that can be reviewed at a groundfish subcommittee meeting in October, 3) more substantial analyses are needed and a new σ will not be recommended until the next assessment cycle.

Copied from F4 notes: A review of the stock assessments conducted using errant CalCOM downloads from this time period indicated that the only affected stock assessments were chilipepper rockfish and canary rockfish. The magnitude of the effect on the historical catch is relatively limited compared to the aggregate removals over the entire time series, which amounts to 15% of the total for chilipepper and 2 % for canary rockfish. Chilipepper rockfish is a healthy stock that is underutilized since the majority of the biomass resides within the rockfish conservation area. The magnitude of the effect of the discrepancy for canary rockfish harvest limits from a 2% change in the catch history is difficult to discern though sensitivity analyses conducted in the 2015 assessment indicate that the assessment is relatively insensitive to changes in catch history.

C. Council Administrative Matters, Continued

6. National Marine Fisheries (NMFS) White Paper on Best Scientific Information Available

Dr. Patrick Lynch (National Marine Fisheries Service, NMFS) briefed the Scientific and Statistical Committee (SSC) on a draft of the white paper "Framework for Determining that Fishery Management Decisions are Based on the Best Scientific Information Available" (Agenda Item C.6, Attachment 1, June 2017). There was little written material provided for this agenda item, so SSC discussion was based on the presentation by Dr. Lynch. The SSC understands that the framework presented is meant to document the general process for determining best scientific information available (BSIA), with the intention that each Council will document their own processes. Thus, the SSC's comments are based on this framework being non-prescriptive and adaptable to the extent allowed under the applicable laws.

The SSC notes two major differences in the Pacific Fishery Management Council (PFMC) process relative to the proposed general framework. First, in many cases the peer review process for stock assessments is not complete without SSC sign-off, and thus is not as distinct as portrayed in the proposed framework. The current review process of the SSC is well organized and provides advice to the Council about BSIA, as directed by National Standard 2 (NS2) guidelines. The SSC recommends that NMFS consider the PFMC's SSC conclusions on BSIA before making a determination of their own, as SSC review is an integral part of the peer review process. Second, in the PFMC process the SSC does not specify an ABC, except for salmon. Instead, for most species the SSC makes the determination of scientific uncertainty (sigma) and endorses an OFL, while the Council makes a policy decision on risk tolerance by selecting an overfishing probability (P^*) value. The OFL, sigma, and P^* are then used together to calculate an ABC.

The SSC suggests that the proposed framework clarify that the requirement for BSIA applies to all stock assessments used for the Council process, not just stock assessments performed by NMFS as implied in the slide presentation. The SSC is concerned that there is not an established protocol to resolve a disagreement between NMFS and the SSC on a determination of BSIA, although this issue is simply highlighted by the proposed framework and is not a new concern. The SSC also notes that for some Council-managed fisheries, such as salmon and Highly Migratory Species, the process may depart more substantially from the framework than the process for groundfish and coastal pelagic species.

SSC Notes:

The SSC is in charge of determining BSIA for the Council. NMFS is in charge of determining BSIA for the Regional Administrator. These two processes are separate, although parallel, and thought should be given to what might happen if the two groups disagree. Is there a transparent process for resolution?

8. Future Council Meeting Agenda and Workload Planning

MSC review request

The SSC discussed the request to review the document "Recent Trends in Three Selected West Coast Groundfish Species" (Agenda Item C.4.b, Supplemental Public Comment, April 2017). The SSC requires clarification on the specific questions to be addressed and the associated review standards, and recommends that Council staff coordinate with the certification team on clarifying the proper scope of the review. The SSC would then be able to identify an appropriate review process and timeline. It may be possible to review this document during the groundfish subcommittee meeting scheduled for late September (i.e., the mop-up panel), depending on the depth of review required and the number of assessments requiring follow-up review.

Ecosystem subcommittee meetings

For the last three years, the SSC Ecosystem Subcommittee (SSCES) has scheduled a meeting with members of California Current Integrated Ecosystem Assessment (CCIEA) team in the fall of the year, usually immediately before the meeting of the full SSC at the September Council meeting. The primary objective of this meeting has been to conduct technical review of selected indicators in the annual ecosystem status report. Occasionally other aspects of the CCIEA effort have been reviewed if CCIEA team considers them sufficiently developed to benefit from SSC review, and if there is potential for the topics to be useful to the Council process. The timing of the review allows the CCIEA team sufficient time to incorporate SSC recommendations in the next iteration of the ecosystem status report that is delivered to the Council in March.

The SSC has found that a regular schedule of technical review has improved the usefulness and scientific quality of the annual ecosystem report, and recommends that these reviews continue. An annual review process for ecosystem topics could be similar to the methodology review processes already in place for salmon, groundfish, and coastal pelagic species. In previous years, the SSCES and the CCIEA jointly developed the list of topics to be reviewed during the September meeting, and the SSC notified the Council of an initial list in its statement on the ecosystem report in March.

Given the strong engagement of Council advisory bodies in the Council's recently concluded ecosystem indicator initiative, a more formal approach could be considered for identifying the list of ecosystem topics to be reviewed. The SSC recommends, as one possibility, that an agenda item be scheduled for the March Council meeting that would identify the list of ecosystem-related topics to be reviewed during the September meeting. This agenda item would follow, but be separate from, the ecosystem report agenda item. This approach would allow for advisory body input, National Marine Fisheries Service input, and Council guidance on the list of review topics. The SSCES still expects to coordinate with the CCIEA team to develop an initial list of topics for Council approval, but the decision on the list of topics for review would be up to the Council.

The SSCES and CCIEA team already discussed components in the IEA that would be appropriate for technical review at this year's meeting, scheduled for September 14-15. An initial list was provided to the Council at the March meeting, but there have been some additions and deletions. The current list of topics relative to the annual ecosystem report includes:

- New habitat indicators, particularly those based on salmon life cycle stages.
- The development of a marine heatwave index, a.k.a. "blob index", that quantifies the physical conditions that we now associate with the anomalous marine heat wave of 2014-2016.
- Definition and identification of biologically meaningful thresholds in indicators for risk assessment.
- An early warning index of ecosystem changes that identifies spatio-temporal changes in different biological indicators, and evaluates their ability to predict ecosystem state shifts.

Additional topics that are not part of the annual ecosystem report, but may benefit from SSCES review, include:

- A preliminary management strategy evaluation (MSE) for sablefish based on current assessment assumptions that includes an environmental driver of recruitment.
- Models of fishery participation choices under a variable climate.

The SSC notes that given the current scheduling of the ecosystem subcommittee meeting (during the September Council meeting, after the full SSC meets), a subcommittee report on the sablefish MSE would not be available to the Council until the November meeting.

SSC Subcommittee Assignments, June 2017

Salmon	**Groundfish**	**Coastal Pelagic Species**	**Highly Migratory Species**	**Economics**	**Ecosystem-Based Management**
Galen Johnson	**David Sampson**	**André Punt**	**Kevin Piner**	**Cameron Speir**	**Martin Dorn**
John Budrick	Aaron Berger	Aaron Berger	Aaron Berger	Michael Harte	Evelyn Brown
Alan Byrne	John Budrick	Evelyn Brown	John Field	Dan Holland	John Field
Owen Hamel	Martin Dorn	John Budrick	Michael Harte	André Punt	Michael Harte
Michael Harte	John Field	Alan Byrne	Dan Holland	David Sampson	Dan Holland
Will Satterthwaite	Owen Hamel	John Field	André Punt		Galen Johnson
Cameron Speir	André Punt	Owen Hamel	David Sampson		Kevin Piner
	Tien-Shui Tsou	Will Satterthwaite			André Punt
		Tien-Shui Tsou			Will Satterthwaite
					Tien-Shui Tsou

Bold denotes Subcommittee Chairperson

Council Meeting Dates	Location	Likely SSC Mtg Dates	Major Topics
March 7-14, 2017 Advisory Bodies may begin Tue, March 7 Council Session may begin Wed, March 8	Hilton Vancouver Washington 301 W. Sixth Street Vancouver, WA 98660 USA Phone: 360-993-4500	Two-day SSC Session **Tue, March 7 – Wed, March 8**	Identify Salmon Management Objectives (possible test fishery alternatives) Salmon Review/Pre I Stock Prod., Hist. Catch Recon. WS Reports CA Current IEA Report Sablefish Ecosystem Indicators Identify New FEP Initiatives
April 6-12, 2017 Advisory Bodies may begin Thurs, April 6 Council Session may begin Fri, April 7	DoubleTree by Hilton Sacramento 2001 Point West Way Sacramento, CA 95815 Phone: 916-929-8855 or 1-800-686-3775	Two-day SSC Session **Thu, April 6 – Fri, April 7**	Pacific Sardine Assessment Salmon Methodology Topic Selection Anchovy OFL Process
June 7-14, 2017 Advisory Bodies begin Wed, June 7 Council Session begins Fri, June 9	DoubleTree by Hilton Spokane City Center 322 N. Spokane Falls Court Spokane, WA 99201 Phone: 509-455-9600	One-day SSC GF Subcm Session **Wed, June 7** Two-day SSC Session **Thu, June 8 – Fri, June 9**	Pacific Mackerel Assessment Groundfish Update Assessments & Cowcod Catch Report 5-year IFQ Program Review 2019-2020 Groundfish Spex Planning CCC Meeting Update
September 12-18, 2017 Advisory Bodies may begin Tue, Sept 11 Council Session may begin Wed, Sept 13	The Riverside Hotel 2900 Chinden Blvd Boise, ID 83714 Phone: 208-343-1871	Two-day SSC Session **Tue, Sep 12 – Wed, Sep 13** Two-day SSC Ecosystem Subcommittee Session **Mon, Sep 11 & Thu, Sep 14**	Groundfish Assessments Review 2019-2020 Groundfish Spex Groundfish Stock Assessment Methodology Review Topic Selection Groundfish EFH Analyses Off-year Science Improvements Salmon Methodology Topic Priorities

November 14-20, 2017 Advisory Bodies may begin Tue, Nov 14 Council Session may begin Wed, Nov 15	Hilton Orange County/Costa Mesa 3050 Bristol Street Costa Mesa, CA 92626 Phone: 714-540-7000	Two-day SSC Session **Tue, Nov 14 – Wed, Nov 15**	CPS Methodology Topic Selection CPS SAFE Groundfish Stock Assessments (if needed) & Rebuilding Analyses 2019-2020 Groundfish Spex Groundfish Stock Assessment Methodology Topic Priorities Salmon Methodology Review Research Planning

Proposed Workshops and SSC Subcommittee Meetings for 2017 and 2018							
Workshop/Meeting		**Potential Dates**	**Sponsor/ Tentative Location**	**SSC Reps.**	**Additional Reviewers**	**AB Reps.**	**Council Staff**
1	~~Sardine Assessment Review~~	~~Feb. 21-24~~	~~Council/ La Jolla, CA~~	~~Punt (Chair), Satterthwaite, and Brown~~	~~2 CIE~~	~~CPSMT CPSAS~~	~~Griffin~~
~~**2**~~	~~Groundfish Pre-Assessment Workshop~~	~~Mar. 21-22~~	~~Council/ Portland, OR~~	~~Hamel (Chair), GF Subcommittee~~	~~None~~	~~GMT GAP~~	~~DeVore~~
~~**3**~~	~~CPS Methodology Review~~	~~Apr. 17-18~~	~~Council/ La Jolla, CA~~	~~Punt (Chair), Hamel, + Brown~~	~~1 or 2 CIE + SWFSC Assessment Scientist~~	~~CPSMT CPSAS~~	~~Griffin~~
4	~~P. Mackerel Update Review~~	~~May 1~~	~~Webinar~~	~~CPS Subcommittee~~	~~None~~	~~CPSMT CPSAS~~	~~Griffin~~
5	~~5-year IFQ Program Review~~	~~May 24-25~~	~~Council/ Seattle, WA~~	~~GF & Economics Subcommittees~~	~~None~~	~~None~~	~~Seger~~
6	~~Groundfish Update Assessments & Cowcod Catch Report Review~~	~~June 7~~	~~Council/ Spokane, WA~~	~~GF Subcommittee~~	~~None~~	~~GMT GAP~~	~~DeVore~~
7	~~Lingcod & POP STAR Panel~~	~~June 26-30~~	~~Council/ Seattle, WA~~	~~Sampson (Chair) + Piner~~	~~2 CIE~~	~~GMT GAP~~	~~DeVore~~
8	~~Yellowtail & Yelloweye RF STAR Panel~~	~~July 10-14~~	~~Council/ Seattle, WA~~	~~Field (Chair) + Budrick~~	~~2 CIE~~	~~GMT GAP~~	~~DeVore~~
9	~~Blue/Deacon RF & CA Scorp. STAR Panel~~	~~July 24-28~~	~~Council/ Santa Cruz, CA~~	~~Dorn (Chair) + Hamel~~	~~2 CIE~~	~~GMT GAP~~	~~DeVore~~

Proposed Workshops and SSC Subcommittee Meetings for 2017 and 2018							
Workshop/Meeting		**Potential Dates**	**Sponsor/ Tentative Location**	**SSC Reps.**	**Additional Reviewers**	**AB Reps.**	**Council Staff**
10	SSC/GFSC Meeting/Webinar	Aug 28-29	PFMC/ Seattle	GF Subcommittee	None	None	DeVore
11	SSCES Meeting / CCIEA Indicator Review	Sep. 11 and 14	Council/ Boise, ID	Ecosystem Subcommittee	None	EWG (14th)	Dahl
12	Groundfish Mop-up	Sep. 25-29	Council/ Seattle, WA	GF Subcommittee	None[1]	GMT[2]	DeVore
13	Salmon Methodology Review	Oct. TBD	Council/ Portland, OR	Salmon Subcommittee	None	STT SAS MEW	Ehlke
14	SCS6 Meeting	Jan. 17-19, 2018	Council & NMFS/ So Cal TBD	Satterthwaite, Holland, Punt, Berger, Budrick, Field, Hamel, Harte, Johnson, Speir, Tsou	TBD	None	Tracy, DeVore Others? TBD
15	CPS ATM Methodology Review	Jan. 30 – Feb. 2, 2018	Council/ La Jolla, CA	Punt + 2	TBD	TBD	Griffin
16	CAPAM Workshop on Spatio-Temporal CPUE Indices	Feb. 26 – Mar. 2, 2018	CAPAM/ La Jolla, CA	TBD	TBD	TBD	TBD

PFMC
08/09/17