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DRAFT SUMMARY MINUTES
Scientific and Statistical Committee
Pacific Fishery Management Council
Hyatt Regency Orange County
Terrace ABC Room
11999 Harbor Blvd.
Garden Grove, CA 92840
Telephone: 714-750-1234
November 15-16, 2016

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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
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.

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SSC Recusals for the November 2016 Meeting		
SSC Member	**Issue**	**Reason**
Dr. John Field	G. 4. Northern Anchovy Stock Assessment and Management Measures	Dr. Field was in charge of the juvenile rockfish survey which was used in the anchovy analysis
Dr. Will Satterthwaite	D.2 Salmon Methodology Review	Dr. Satterthwaite's supervisor contributed to the Sacramento Winter Chinook analysis
Dr. Cameron Speir	D.2 Salmon Methodology Review	Dr. Speir's supervisor contributed to the Sacramento Winter Chinook analysis

A. Call to Order

Chairman, Will Satterthwaite, called the meeting to order at 8 a.m. Mr. Tracy commended the Scientific and Statistical Committee (SSC) on the workload planning tables. They are very useful in tracking the workload and planning the Council agenda. He briefed the SSC on planning the National SSC meeting next year. Dr. Satterthwaite has been active polling other SSC chairs regarding topics of discussion. Mr. Tracy commended Dr. Dave Sampson on the Historical Catch Reconstruction workshop held a couple of weeks ago. He also commended Dr. Martin Dorn on planning next month's Productivity workshop scheduled for December 6-8 in Seattle, WA. Mr. Chuck Tracy then provided the agenda overview.

Dr. Evelyn Brown removed herself from the Groundfish Subcommittee. STAR Panel assignments were decided (see 2017 workload planning tables at the end of these minutes).

The SSC discussed workload planning and made some changes in 2017 workload tasks (see tables at end of these minutes). Dr. Dorn provided an overview of plans for the upcoming Productivity workshop. Dr. Punt said he could develop a special edition of Fisheries Research with papers produced for the workshop. Dr. Sampson provided an overview of the Historical Catch Reconstruction workshop, and some interest in pursuing this option was expressed. Reports from both workshops will be provided in the advance March 2017 briefing book.

D. Salmon Management

2. Salmon Methodology Review

The SSC Salmon Subcommittee (SSCSS) and Salmon Technical Team (STT) held a joint methodology review meeting in Portland, Oregon on October 18, 2016 to review models that predict the preseason abundance of Sacramento River Winter run Chinook salmon (Agenda Item D.2, Attachment 1). Dr. Michael O'Farrell (SWFSC) briefed the SSC on work that was completed after the methodology review to further evaluate these models based on recommendations made at that meeting. Dr. O'Farrell reported that some errors were discovered and corrected in calculations used for Table 7. An additional test of model performance using leave-one-out cross

validation showed little difference in the performance of the models. Based on these results, the SSC agrees with Dr. O'Farrell that there is no basis for selecting a best-performing model using the small data set available at this time. As additional years of data become available, a more rigorous evaluation will be possible, especially as the effects of the drought on this stock are manifested. The addition of drought year data may allow us to better differentiate among the models.

Scientific and Statistical Committee Salmon Subcommittee Report on Preseason Abundance Forecasts for Sacramento River Winter Chinook Salmon

The Scientific and Statistical Committee's Salmon Subcommittee (SSCSS) met in Portland, OR, on 18 October 2016 for a joint methodology review with the Salmon Technical Team of the report, "An evaluation of preseason abundance forecasts for Sacramento River winter Chinook salmon". The report was presented by Dr. Michael O'Farrell (Southwest Fisheries Science Center, SWFSC), with co-author Mr. Michael Mohr (SWFSC) in attendance and co-author Dr. Noble Hendrix (QEDA Consulting) joining the discussion via telephone.

Sacramento River Winter Chinook (SRWC) have a life history that precludes the use of jack returns to predict adult abundance prior to ocean fisheries, given the standard sampling methods and timing of jack return estimation. Thus, the current harvest control rule (HCR) for SRWC uses the recent 3-year geometric mean number of spawners. The SRWC Workgroup developed a suite of models to forecast the age-3 escapement in the absence of fishing ($E_{t,3}^0$) with the goal of better capturing rapid changes in population than is possible by relying on a mean of previous years. The SRWC model development and testing had three main components: (1) the fitting of a population dynamics model to fry and/or spawner data to estimate population parameters, (2) use of the estimated parameters in three forecast models, and (3) comparison of the performance of the three forecast models. The formulation of the underlying population dynamics model was published in a peer-reviewed journal and is extensively documented (Winship et al. 2014). The Winship paper was not reviewed by the SSCSS. Compared to the Winship et al. model, the population dynamics model was updated by adding recent data, and modified by including year-specific fecundity estimates rather than a constant number of eggs per female spawner and by adding a temperature covariate to the egg-to-fry relationship to better capture low survival in drought years. Additionally, in one proposed model variant, the juvenile survival rate (fry to end of ocean age 2) was modeled as a function of the egg-to-fry survival rate in an attempt to capture apparent correlation between survivals of the two stages.

Three forecast models (Base, ETF, and No JPI) were explored. The Base forecast model takes a random draw for the number of fry based on an empirical estimate of the fry-equivalent Juvenile Production Index (JPI, the estimated number of juveniles passing Red Bluff Diversion Dam standardized to the fry stage) and its uncertainty, and takes a random draw of juvenile survival from a beta distribution fitted by the population dynamics model. These draws are multiplied together (yielding a forecast for fish alive at the end of age 2) and scaled by natural mortality and maturation rates to generate the distribution of $E_{t,3}^0$ for natural-origin fish. The second forecast model ("ETF") differs from the Base model in that the juvenile survival rate distribution is estimated using an egg-to fry survival covariate, with the covariate based on an empirical estimate of the egg-to-fry survival rate. A third forecast model ("No JPI") was also tested, because in some years the JPI is unavailable. In this case, a model-based distribution of fry numbers is used that is estimated based on the number of spawners, their fecundity, and temperature-dependent egg-to-

fry survival. The juvenile survival rate is modeled as in the Base model. A forecasted distribution of the number of hatchery-origin fish was made in all three models by multiplying the known number of hatchery fish that were released by scaled versions of the juvenile survival rate draws used in each model. The natural and hatchery forecasts were summed to get the total $E_{t,3}^0$. The three forecast models were evaluated using a one-year-ahead cross-validation with post-season estimates of $E_{t,3}^0$, which was limited to four years (2012-2015) due to the small size of the data set relative to the number of parameters that need to be estimated.

The report authors recommended using the Base model to forecast $E_{t,3}^0$ when the JPI estimate is available, and the No JPI model in years where the JPI is unavailable. The SSCSS agrees that the Base model performed as well or better than the other two model scenarios given the metrics used to assess them and the No JPI option is acceptable to use in years without a JPI estimate. The SSCSS recommends assessing the model's performance for all years, leaving out one year of data each time. Another possible evaluation of the models is to generate forecasts for each year using each model fitted to the full dataset, and compare these forecasts to the post-season estimates of $E_{t,3}^0$ for those years. This is not a rigorous method of validation but gives some idea of how each model performs across a range of inputs, and provides values that should match figures in the document.

The report authors recommended using the mode of the forecasted escapement distribution from the Base model to estimate $E_{t,3}^0$. The SSCSS recommends that when choosing an $E_{t,3}^0$ the full distribution of the estimate should be considered as this allows an assessment of the uncertainty of the estimate and an analysis of risk when used with a HCR. Results from the mode were more conservative than the median, but were biased low providing forecasts that were less than half of the post-season estimates of escapement with forecasts in all but one year. The SSCSS suggests examination of the mode, mean, the median, or other quantiles from the escapement distribution as inputs for alternative HCRs in the upcoming management strategy evaluation.

The SSCSS notes that there is not a HCR in place that can use these forecasted $E_{t,3}^0$ estimates. The existing HCR is based on the recent 3 year geometric mean of the number of spawners, which is not directly comparable to the forecasted age 3 SRWC escapement without fishing.

The report authors noted that the ETF model performance increased as additional years of data were added. All four cross-validation cohorts had empirical egg-to-fry survival rates well above the average across the time series, whereas the next two returning cohorts (including those that spawned in summer 2016) experienced well below the average egg-to-fry survival. The SSCSS agrees that this model should be monitored for feasibility as more years of data become available. In addition, other environmental variables such as flow should be examined and model performance assessed.

Works Cited:

Winship, AJ, MR O'Farrell, and MS Mohr. 2014. Fishery and hatchery effects on an endangered salmon population with low productivity. Transactions of the American Fisheries Society 143:957-971.

SSCSS Notes:

Recusals: Will Satterthwaite and Cameron Speir, since Mr. Michael Mohr is the supervisor of Will and, because of an unfilled intermediate position, currently directly above Cameron as well.

Approximately 95% of each cohort returns to the river as age-3 (for hatchery-origin fish for which cohort reconstructions are possible.

Model is a Bayesian state-space model fitted to natural origin female spawners and natural origin fry data.

Performance metrics to assess the model were: Mean Error (ME), Root Mean Square Error (RMSE), and Log Pointwise Predictive Density (LPPD).

Theoretically, a fourth forecast model with the juvenile survival rate modeled using the temperature-predicted egg-to-fry survival rate, or the temperature covariate itself, could have been tested. Neither the authors nor the SSCSS saw any promise in pursuing that approach.

The Winship et al. 2014 population dynamics model was also part of the MSE examined previously during a workshop associated with the April 2013 Council meeting in which members of the SSC, Salmon Technical Team, and Salmon Advisory Subpanel participated (see March 2014 Briefing Book Agenda Item F.8.b Supplemental SSC Report; http://www.pcouncil.org/wp-content/uploads/F8b_SUP_SSC_MARCH2014BB.pdf).

G. Coastal Pelagic Species Management

   4. Northern Anchovy Stock Assessment and Management Measures

Dr. André Punt summarized the October 2016 review by the SSC CPS subcommittee of the indices of abundance for the central subpopulation of northern anchovy (CSNA) based on egg and larval data for the California Cooperative Oceanic Fisheries Investigations (CalCOFI) survey area. Dr. Ed Weber then briefed the SSC on the seasonal indices of relative abundance developed in response to the guidance provided at the October review meeting (Agenda Item G.4.a, SWFSC Report). The Supplemental SWFSC Report (Agenda Item G.4.a, Supplemental SWFSC Report 2) was submitted far too late (November 11th) for adequate SSC review. However, the report was discussed because it included analyses specifically requested by the subcommittee.

The egg and larval production indices presented in the SWFSC report represent the best available science for trends in spawning biomass in the CalCOFI survey area. However, the report did not expand the trend information to estimate absolute spawning biomass in that area. The SSC agrees that this expansion is not appropriate, because it would require scaling the egg and larval indices using the Daily Egg Production Methods estimates for the 1980s. Neither the winter nor spring survey is conducted at the right time to fully capture spawning of CSNA, and the degree of mismatch may vary though time due to changing oceanographic conditions. A proper expansion from eggs and larvae to spawning biomass would require data on sex ratio, mean female weight, and fecundity. Variability in the timing of spawning may also complicate interpretation of the egg and larval time series as an index of relative abundance.

The spatial extent of the CalCOFI survey is limited (by depth and latitude) relative to the distribution of the broader CSNA population. The proportion of the population contained in the survey area at any given time is unknown and changes through time due, in large part, to oceanographic conditions. As trends in the CalCOFI survey area may not be representative of the broader population, it is difficult to infer population-level trends. However, the indices do indicate that the relative abundance of the CSNA in the CalCOFI survey area has remained low over the past decade, relative to the higher levels observed in the 1980s (during the peak of the fishery) and the mid-2000s (when a substantive fishery was absent).

The supplemental SWFSC report included results of the 2015 Acoustic Trawl Method (ATM) survey, which estimated the biomass of the CSNA to be approximately 31,427 metric tons (95% confidence interval 17,780-48,302t), with much of that biomass represented by age 0 (2015 year class) fish. The central California juvenile rockfish midwater trawl survey also provided evidence that the relative abundance of pre-recruit CSNA was high in 2015 and moderate in 2016. Although ATM data on the CSNA were collected during 2016, these data have not yet been analyzed to provide an estimate of biomass. Inshore areas where anchovy are known to occur, sometimes in large aggregations, remain outside the ATM survey area. Thus, the ATM estimate of anchovy biomass is likely to be negatively biased, with the degree of bias potentially changing from year to year. In common with the egg and larval production indices, the 2015 ATM results indicate that the current biomass for the CSNA appears to be well below historical levels.

The SSC recognizes that there is substantial uncertainty associated with how oceanographic conditions impact the spatial distribution of CSNA, including the proportion of anchovy biomass inshore of all available surveys (ATM, CalCOFI, and the Southern California Coastal Ocean Observing System – SCCOOS), and how those relationships change over time.

The biomass of the CSNA has undergone considerable variability over the last three decades, and as a consequence, there is a basis for reconsidering the current OFL, which is based on a model using data from a historical period and collected under dramatically different environmental and abundance conditions. However, there are several important steps and data needs that must be considered to develop a revised OFL. These steps include the estimation of F_{MSY} or identification of a suitable proxy and developing methods for estimating total stock biomass, which would at a minimum require calibrating survey estimates to account for unsampled areas and preferably analyzing all the data in an integrated stock assessment. It is also important to consider time lags introduced by the collection, processing, and analysis of abundance data due to the highly dynamic nature of anchovy.

The SSC notes that in contrast to actively-managed CPS, there are currently no set procedures for setting and updating OFLs and ABCs for monitored species, including CSNA. Development of such procedures would be a useful addition to the FMP, but should be based on an understanding of the population demographics of these species, preferably using some form of population dynamics model.

SSC Notes:

There were some concerns over the most appropriate approach for estimating variance associated with point estimates for biomass indices from systematic surveys such as the CalCOFI survey. The October 2016 review meeting suggested using the spatial tessellation approach with bias-

corrected jackknife estimates due to the clustered nature of the samples following MacCall et al. 2016 (Fisheries Research 175: 87-94), which was the approach used in the SWFSC report. It was pointed out that jackknife procedures rely on independence among samples, but the CalCOFI data are spatially correlated. Thus it would be useful to know the percent change introduced by the jackknife bias correction. A stratified random design has been used in Alaska to estimate variances, but this ignores sample clustering (the survey stations do not form a single grid but rather the inshore area has higher sample density) and spatial autocorrelation. A geostatistical model-based approach was noted as being preferable as it would account for the covariance structure inherent in the data and should be explored during subsequent analyses.

The SSC agrees that scaling the relative abundance index by the 1980s DEPM estimates to get absolute abundance should not be done.

The SSC agrees that the winter and spring surveys are essentially uncorrelated and should remain as separate seasonal indices of abundance.

The 2015 ATM estimate provided in the supplemental SWFSC Report provides a minimum biomass estimate and is more synoptic spatially than the CalCOFI survey. However, there is currently only a single ATM point estimate for CSNA and an inshore correction factor is currently unavailable. The 2016 ATM biomass estimate for anchovy is anticipated to be available by April 2017. This amount of lead time is what can be expected for future ATM surveys.

It could be informative to stratify the ATM estimate into the area overlapping the CalCOFI area versus the area not sampled by CalCOFI.

The SSC suggests that correction factors be developed that account for the proportion of biomass outside of the survey sampling area. These factors could then be used to calibrate current ATM (estimates of absolute biomass) and CalCOFI egg and larval production (indices of relative abundance) surveys. The calibrated surveys would then be representative of the broader CSNA population and could then form the basis for the input to a full integrated stock assessment. The proposed aerial survey (Agenda Item G.2) could provide an inshore correction factor for the ATM survey if conducted in a synoptic or representative manner.

OFLs will likely need to be set according to a mean F level applied to an estimate of average biomass over a recent time period (or similar approach) given the life history of anchovy and the anticipated lag in availability of survey (or stock assessment) estimates. OFLs could be updated yearly or when new estimates become available.

F. Groundfish Management

2. Methodology Review Final Topic Selection

The Scientific and Statistical Committee (SSC) met with the Groundfish Management Team (GMT) to discuss methodology review topics for models used to develop regulatory specifications for the 2019-2020 biennium. In addition, the SSC discussed assessment methodologies and other methods informing management in need of review prior to application. The SSC and the GMT also discussed the potential timing of the reviews relative to upcoming workload and stock assessment cycle.

One meeting of the SSC groundfish sub-committee is proposed prior to March to review methods that may be used in 2017 stock assessments. Review of geostatistical methods proposed for use in developing indices of abundance will require inclusion of an outside expert reviewer with particular knowledge of the methods employed to compliment the experience of existing SSC sub-committee members.

Review of the discard mortality rates proposed by the GMT could be carried out at the March Council meeting. A webinar between the GMT and the SSC groundfish subcommittee is proposed to be held after the March briefing book deadline to prime discussion at the March review meeting.

Another meeting of the SSC and the GMT is proposed for the September Council meeting to review methodologies to be used in the regulatory specification process. While the March meeting will only require attendance of presenters and the SSC groundfish sub-committee, the SSC recommends that a representative from the West Coast Groundfish Observer Program attend the September meeting to answer questions regarding methods employed in generating mortality estimates used in the nearshore and non-nearshore models under review. Review of the proposed probability analysis to be used to evaluate the risk of exceeding catch limits may be taken up at the mop-up meeting in September as time allows.

Each of the items proposed by the SSC and GMT provided below are followed by the meeting at which they are proposed to be discussed.

The GMT proposed the following methodologies for review:

- Review of the nearshore catch projection model improvements. (September Council Meeting)
- Review non-nearshore catch projection model improvements. (September Council Meeting)
- Review of changes to discard mortality rates. (March Council Meeting)
- Probability analysis used to evaluate the risk of exceeding catch limits. (Mop-up Meeting in September).

Methodologies identified for review by the SSC:

- Development of new catch per unit effort standardization methods. (Groundfish Sub-committee Meeting before March)
- Development of a revised steepness prior (h). (Groundfish Sub-committee Meeting before March)
- Updating of the prior on natural mortality (M). (Groundfish Sub-committee Meeting before March)
- Evaluation of methods used in the weighting of length and age composition in Stock Synthesis model. (Groundfish Sub-committee Meeting before March)
- Adjustments to sigma used in quantifying the extent of scientific uncertainty contributing to the buffer between the OFL and the ABC. (Mop-up Meeting in September).

The SSC also discussed the draft report on accepted practice guidelines for groundfish stock assessments provided in Agenda Item F.2, Attachment 1. This is a living document that will be posted to the Council website and is intended to be suggestive rather than proscriptive, though explanation of deviations should be provided by the stock assessment author.

SSC Notes:

Nearshore Model Review

Dr. Sampson and Dr. Hastie mentioned that original purpose of the nearshore model was to account for all mortality shoreward of the RCA as compared to the current model used to project impacts only for a limited suite of nearshore rockfish species. For instance exclusion of lingcod caught in the nearshore are not accounted for.

There is concern regarding trying to align with WCGOP estimations in the interest of improving the accuracy of projections when the estimation methods have not been reviewed and limiting stratification to that found in the WCGOP estimates may limit flexibility in modeling at a finer spatial resolution. The GMT is proceeding with the assumption that methods in WCGOP estimates and projections are going to need to use the same denominator of landings in projecting catch. The SSC noted that it is not necessarily critical that the methods are the same to provide a reasonable projection. Denominator stocks are the primary focus of need for consistency and composition between areas in the model and projection provide discrepancies, which would be partly alleviated by WCGOP stratifying north of 40°10' N lat.

Confidentiality considerations and consistency with the nearshore estimates for WCGOP may pose an issue in terms of accounting for the 4 depth bin model vs the current 10 fm depth bin model. Updating of discard mortality rates for the 20-30 fm depth bin may be more representative of actual mortality.

Application of discard mortality rates requires application of proportion of gear types and proportion of catch by depth. Previously proportions of gear type were from Oregon log-book data and applied to California. Now WCGOP data is now available for California on the proportion of catch by gear to allow stratification. Updating of the data source does not require model review, but potential changes to address bias in the observer coverage may necessitate review.

There are trade-offs with the number of years of data used in terms of consistency of stratification to maintain similar bycatch rates used in WCGOP vs. stratification by depth and area to allow representative analysis management measures.

The GMT will provide comparisons of methods used in WCGOP estimates vs. modeling to clarify the basis for review in considering attempts to align projections and estimates.

Non-Nearshore (sablefish targeted model for north of 36° N. Lat.)

Model structure changes would include changes to align with WCGOP stratifying by LE primary, LE DTL and OA, though not sufficient sample size so it will be forgone.

Landed vs. total catch in the denominator and grand mean vs. running average have been identified as changes per the previous review could bring this to the SSC if interested since it was recommended by the SSC, but may not be necessary for the SSC since it is just addressing a previous request.

The main change proposed is a separate model that determines the probable catch of yelloweye with some estimate of uncertainty as requested by the SSC in the previous review and exploring a two-step hurdle model or bootstrap methodology focusing on yelloweye since it is the major constraint.

Lingcod and sablefish mortality rates of 50% for trawl and 7% for fixed gear, which would need to be updated by March if they are to be changed on the basis of methods used in the NPFMC and additional research by Ottmar and Davis 2006 and development of rapid assessment of mortality protocol etc. This would be an improvement on the current methods determined based on a literature review and conservative estimates as indicated in the EIS.

Methods recommended by the SSC

Spatial autocorrelation function of the Thorson geospatial method is still outstanding to have approval of his methods to facilitate use of fishery dependent indices would need to be done by March. The level of analysis needed for review is a consideration. The geostatistical GLM is likely to be used frequently in assessment and review would facilitate its use. Simulation analysis was provided, but still have yet to see it applied in an assessment and compared to the results of the Stephens McCall in a sensitivity analysis.

Though methods can be reviewed as part of the STAR panel review process, the SSC would prefer to carry out reviews of proposed assessment methods prior to the STAR panel reviews to ensure sufficient time for vetting, uniform application and prevent detracting from the remainder of the assessment.

The March meeting with the GMT would be part of the Council meeting for mortality rates with a webinar for review prior to the meeting after the briefing book deadline to orient the SSC. The GMT model review and sigma related analyses covered by the last week of the September Council meeting accounting for need for mop-up the week of September 25th. This provides limited time for the GMT to update models, make projections and conduct public meeting for the Oct 16 is the briefing book.

Workload obligations for items proposed by the SSC (further discussion of the details of the methods are provided in the SSC minutes from September):

- *Owen Hamel will be addressing updating of the prior on natural mortality and steepness accounting for autocorrelation, environmental variability and similarities between species in a meta-analytical framework in January/February.*
- *Chantel Wetzel will be evaluating how sigma propagates into results of assessments in the future including the effects of ageing of assessments over time, calculation based on comparison of the assessments and comparison of all the OFLs for all years of an assessment since SS can now record OFLs for all years.*
- *Jim Thorson: everything else.*

G. Coastal Pelagic Species Management, Continued

2. Methodology Review Preliminary Topic Selection

The Scientific and Statistical Committee reviewed potential topics for Coastal Pelagic Species Methodology Review in 2017. Mr. Kirk Lynn (California Department of Fish and Wildlife (CDFW)) presented the Proposal for Methodology Review of the Southern California Coastal Pelagic Species Survey (Agenda Item G.2, Attachment 1). This proposal contains two projects: Project 1, to develop relative indices of nearshore abundance for sardine and anchovy; and Project 2, to develop an inshore correction factor for the Acoustic-Trawl Method (ATM) survey index/estimate. Both projects rely on aerial survey estimates of observed biomass. For Project 1, the goal is to cover the entire mainland and island coastal areas in the Southern California Bight, while for Project 2, the goal is to cover both an inshore portion of ATM transect lines and extensions of the lines to the coast over the nearshore area not covered by the ATM. Information from both areas would then be used to estimate the proportion of biomass missed by the ATM survey. Either project individually, or in conjunction, could potentially provide expansion factors for the ATM survey. Mr. Lynn indicated that the proposed methods would be ready for review by Spring 2017.

The SSC provided comments on the proposed methodologies, including recommendations for further analyses and documentation to be completed prior to the review. One question is whether the projects will be limited to the Southern California Bight or if one or both would be extended over a larger area of the west coast. Another issue is that the point sets used to validate the pilot estimates of school biomasses are limited to those small enough to be fully wrapped by the gear. The lack of point sets for larger schools can result in bias in the total biomass estimates, while acoustic estimates of school depth could, in conjunction with school surface area, provide for the validation of biomass estimates for these schools.

The SSC concluded that the Southern California Coastal Pelagic Species Survey should be ready for a methodology review in Spring 2017. The SSC recommends the CDFW work with the Southwest Fisheries Science Center (SWFSC) to ensure participation of assessment scientists and provision of a Center for Independent Experts (CIE) reviewer. It will be important to work with assessment scientists prior to the review to clarify how the aerial survey data could be incorporated into assessments.

Mr. Dale Sweetnam indicated that the SWFSC is suggesting a review of the ATM survey in early 2018. Given the need to obtain CIE involvement, the SWFSC may wish to present a proposal in April 2017.

SSC Notes:

Aerial surveys have never been fully adopted into CPS stock assessments due to inconsistent methodology and other issues. CDFW has been conducting aerial surveys for several years and would like to have a formal methodology review. Besides being restricted spatially to the nearshore, there are two main issues that need to be addressed in the calibration and expansion of aerial estimates. The first issue concerns calibration or conversion estimates of aerial school size estimates to biomass. For anchovy and sardine, because of the exponential relationship between school volume and biomass, measuring the larger schools is critical in avoiding potential severe undercounting bias. Currently, tonnage estimates are converted to an abundance index via a calibration obtained by a ratio of a whole school catch tonnage and pilot estimated tonnage. However, large schools cannot be caught in entirety. In that case, the catch vessel can provide a school thickness estimate using the catch boat sonar measuring a subset of large schools and

together with the aerial surface area estimate, converted to a school volume which is used instead of the catch weight as a pilot estimate calibration. An alternative is simply estimating school surface area and volume for all schools and replacing the pilot tonnage estimate. The second expansion issue is how to convert the school counts in a given survey area to absolute abundance (which can be compared to an acoustic estimate in the same or overlapping area). For that, you need the mid-school depth distribution to estimate the number of schools below the visual counting range; this is then used to expand surface schools to total schools in the area. The same catch boat can obtain this measurement for a given survey period during the same diurnal period of the aerial survey. The calibration, validation vessel cannot be the same vessel doing acoustic transects since the school thickness and depth range measurements are best done on a stationary vessel (or one passively drifting).

F. Groundfish Management, Continued

    6. 5-year Catch Share Program and Intersector Allocation Review Plans and Fishery Management Update

The Scientific and Statistical Committee's (SSC's) Groundfish and Economics Subcommittees met on November 13 and 14, 2016 to review the Blueprint for the West Coast Groundfish Trawl Catch Share Program Five-Year Review (Agenda Item F.6.a, Blueprint). The Blueprint consists of an annotated outline describing the components and proposed methods of the review. The subcommittees received presentations on proposed elements of the program review from the analysts and provided technical comments on many specific aspects of the proposed work.
The Blueprint outlines a wide-ranging analysis of the fishery in terms of economic, community, environmental, and program management criteria. The proposed analyses will not be able to assign causality for many observed changes, but rather will document the state of the fishery before and after catch share program implementation. This limitation of the analysis should be understood by stakeholders and clearly stated in the final document.

The program review would benefit from guidance from the Council regarding the most important questions to be answered. The SSC identified four such potential questions:

1. How did the net benefits to the nation from the fishery change after implementation of the catch share program?
2. How did financial outcomes for participants in the fishery change following catch share program implementation?
3. Did the distribution of cost, revenues, effort, and net benefits among fishery participants (including geographic communities and different user groups) change?
4. Did utilization rates for specific species change following catch share program implementation?

The review, as proposed in the Blueprint, will contain information to inform these questions. However, it would be useful to provide a summary of the results organized around these specific questions (or others).

The SSC Groundfish and Economics subcommittees will review the public review draft of the program review document at a meeting tentatively scheduled for May 24-25, 2017. The SSC will provide comments on this draft to the Council at the June 2017 PFMC meeting.

SSC Notes:

The analysis as proposed is not capable of assigning observed changes to catch share program implementation. Doing so would require longer time series of data and far more sophisticated (and time consuming) methods of analysis. The analysts indicated that it may be possible to do causal analysis for a limited number of issues. One example is the effects of some specific elements of the catch share program on non-whiting species utilization rates: elimination of regulatory discards, gear switching provision, vessel caps.

Net benefits to the nation include consumer surplus, which might be increased by lower prices for seafood or higher quality fish products, and producer surplus, which might be increased higher profits for vessel operators or processors. Financial outcomes in this context include accounting profits or loss for those participating in the fishery directly.

The Blueprint itself is a big document and the completed analysis will be even larger. The review will most useful if it is focused and easy to use; a focused and well-organized executive summary and cross referencing within the document will help readers interested in specific topics get a full sense of the information in the document.

Net revenue calculation – specific recommendation to 1) ignore quota costs/rev in fishery-wide net revenue calculation and 2) include in individual net revenue calculations with the understanding that you can bracket the true individual net revenue values with an upper and lower bound 3) surveying all quota shareholders (rather than only participating fishing vessels in the EDC survey) would significantly improve the accuracy of net revenue calculations.

The analysis highlights an information gap in the EDC data. Surveying all quota owners would provide additional information to estimate the true net revenue.

4. Groundfish Essential Fish Habitat (EFH) and Rockfish Conservation Area (RCA) Amendment 28 Alternatives

Development of Spatial Boundaries for Groundfish EFH

Allison Bailey (Sound Geographic Information Systems) presented "Development of Spatial Boundaries for Groundfish EFH Alternative 2.b, New EFHCAs within the Trawl RCA based on presence of Priority Habitats" (Agenda Item F.4.a, Supplemental Project Team Report 2, pp. 16-19) to the Scientific and Statistic Committee. Alternative 2.b involves opening the trawl RCA to bottom trawling, but establishing EFH Conservation Areas (EFHCAs) that are closed to bottom trawling. The EFHCAs would be based on the presence of priority habitats. This report outlines the approaches proposed to identify areas where there are hard substrates, habitat-forming invertebrates, submarine canyons and gullies, seamounts, and areas with the 20 percent highest suitability for overfished groundfish species.

The Scientific and Statistical Committee (SSC) was unable to review the methods and data sets underlying the approaches in detail as these are not fully described in the documentation included in the Briefing Book. Many of the methods rely on the 2013 Groundfish EFH Synthesis Report. The SSC was asked to review this report at its April 2013 meeting, but the SSC was unable to review the methods underlying the report as the Appendices (which provided the documentation

of the methods) were not available in time for review (Agenda Item D.6.c, Supplemental SSC Report, April 2013).

Although it is unable to conduct a full review of the approaches on which the priority habitats are based, the SSC provides the following comments and suggestions to the analysts.

- The locations of habitat-forming invertebrates were based on several data sets, but only data sets that had 1km or finer resolution. Thus, the data from the Northwest Fisheries Science Center (NWFSC) trawl survey were excluded. The SSC recommends that the trawl survey data be used even if its resolution is coarser than 1km.
- The 20 percent highest suitability for overfished groundfish species was defined by computing habitat suitabilities by location and selecting the locations for which the habitat suitability is 80 percent of the maximum. This approach will be sensitive to the presence of areas with anomalously high habitat suitability. Analyses presented during the meeting showed that there was a 200-fold difference in the area determined to be in the highest 20 percent habitat suitability for yelloweye rockfish depending on which of two models was used. A more robust way to use habitat suitability information would be to sort locations by habitat suitability and then select some quantile as a threshold. The data sets on which habitat suitability is evaluated would need to be species-specific.
- The analyst identified priority habitats by overlaying the priority habitat for each data source. This ignores the extent to which each location could be considered a priority habitat (e.g., some locations may be considered as priority habitat based on multiple data sources). The SSC recommends providing maps for each data source as well as for the union of the maps.

Overfished Species Hot Spots Analysis Tool

Dr. Kit Dahl (Council Staff) presented '"Hotspot Analysis" to Identify Discrete Area Closures for Overfished Species' (Agenda Item F.4.a, Supplemental Project Team Report 2, pp. 20-25, the SSC received an earlier draft of this material) to the SSC. This analysis tool is based on applying a spatial clustering algorithm to catch rate data. Dr. Dahl provided results using fishery-dependent (West Coast Groundfish Observer Program) and fishery-independent (NWFSC trawl survey) data. The SSC recommends not basing identification of hot spots on fishery-dependent data, because few of the fishery-dependent data will have been collected from within the RCA. The SSC also has major concerns with the analyses based on fishery-independent data.

There is a need to better understand the performance of the analysis tool prior to its use for developing options for closures. This could be achieved by reviewing the scientific literature for papers that have evaluated this method in situations similar to identifying hotspots using trawl survey catch-rate data or using simulation analysis. Until the properties of the analysis method are better understood, the SSC recommends using the results of habitat suitability modeling or a geostatistical hurdle approach such as that developed by Dr. Jim Thorson (NWFSC) to identify hot spots.

SSC Notes:

Yelloweye rockfish is caught more frequently in the International Pacific Halibut Commission longline survey than the NWFSC trawl survey. This data source should be accounted for when defining habitat suitability for yelloweye rockfish.

Few of the WCGOP data will have been collected from within the RCA so these data should not be used to define hotspots within the RCAs. In principle, fishery-dependent data from before the establishment of the RCAs could be used to identify hotspots, but those data sets will be smaller if based on observer samples. The logbook data will include more data points, but there are concerns with the accuracy of the reported locations in logbooks and that logbooks do not report discards. In principle, the ability to identify hotspots will be enhanced by analyzing multiple types of data sets (e.g., trawl survey data and hook and line survey data), but the analysis tool cannot use data from different sampling methods simultaneously.

The hotspot analysis tool is based on assumptions that are unlikely to be valid given the available data. In particular, the data sets contain a large number of zeros whereas the algorithm expects normally distributed data. Transforming the data, for example, by analyzing log-CPUE may address this issue to some extent, but this cannot be confirmed without further analysis. The algorithm is based on a fixed distance input, but the value for this input and its implications were not provided for evaluation.

It is necessary to clarify whether observers record retained catches as well as discards.

C. Council Administrative Matters

   2. National Standard Guidelines Update

The Scientific and Statistical Committee (SSC) received a briefing from Ms. Erin Schnettler (NMFS Office of Sustainable Fisheries) on the recently finalized changes to the National Standard 1 guidelines. Major changes include: (1) measures meant to increase stability of fisheries harvest (phasing in changes to catch levels, carrying over unused quota into the next year, multi-year overfishing status determinations); (2) measures to increase flexibility in rebuilding plans (alternative ways to determine T_{MAX} and criteria for discontinuing rebuilding plans); (3) changes to criteria for determining adequate progress in rebuilding; (4) changes to criteria for determining which stocks require federal management; and (5) clarification of the meaning of optimum yield (OY) and advancement of ecosystem-based fisheries management (EBFM) including guidance for determining an aggregate maximum sustainable yield and OY for groups of species. In general, the applicability of the new guidelines and whether they will require or enable changes to status determination or management of individual stocks and fisheries must be determined on a case-by-case basis and may require changes to Fishery Management Plans.

There are new guidelines for determining if adequate progress has been made toward rebuilding of overfished stocks. The SSC intends to follow the new guidelines when it provides advice on whether progress toward rebuilding is adequate during the harvest specifications process.

SSC Notes:

Although it has been some time since the 2007 MSA reauthorization and a new reauthorization is being considered it is not clear whether or when this will occur and new NS1 guidelines address a number of the issues that were to be addressed in the current stalled re-authorization bill.

A number of questions were raised during the presentation and clarifications were made. These are listed here grouped under the changes made to the guidelines.

(1) measures meant to increase stability to fisheries harvest (phasing-in changes to catch levels, carrying over unused quota into the next year, multi-year overfishing status determinations);

The guidelines do not explicitly preclude the use of a 3 year phase in of a catch reduction for overfished and rebuilding stocks, but it remains a priority to rebuild those stocks as quickly as possible. The phase in is meant to be applied to stocks that have not been determined to be overfished. Catch must still be reduced below the OFL immediately.

Carryover provisions that would allow for the increase of an ABC to accommodate carryover have to be explicitly spelled out in a carryover ABC control rule that will still prevent overfishing. The guidelines do not allow for carrying over uncaught catch year after year in a way that would allow the ABC to keep building over time. The carryover policy must be designed to prevent that. The provisions do not say anything specific about whether the ACL attainment affects the ability to use the carry-over provision, though this might be a consideration of using one (e.g., if low attainment suggested the stock might be depleted).

The three-year maximum for overfishing status was chosen because many assessments are done every year, but the decision to use a multiyear criteria and the number of years used could depend on life history characteristics as well as assessment frequency.

(2) Measures to increase flexibility in rebuilding plans (alternatives says to determine T_{MAX}, criteria for discontinuing rebuilding plans;

It was noted that estimating mean generation time is generally easier that determining T_{MIN}, so, if it is possible to estimate T_{MIN}, it is generally possible to estimate T_{MIN} plus mean generation time. Therefore, it should not necessary or best available science to use T_{MIN} *2 as a means of determining T_{MAX}. There was a study done by NMFS comparing the three methods for calculating T_{MAX}, and they generally gave similar results for T_{MAX}. The guidelines do not express a preference for one of the three methods. However, each Council does need to consult with their SSC and use best available science in determining T_{MIN}.

It is permissible to discontinue a rebuilding plan if a new assessment shows the stock was not actually overfished when it was determined to be overfished, but if a later assessment indicates the stock is overfished it would be necessary to return to a rebuilding plan. It is not clear whether you would have to go back to rebuilding though if the current assessment says the stock is not overfished but that it was overfished earlier- this needs clarification. Council would not necessarily want to discontinue rebuilding if the new status determination (of not being overfished) is uncertain or very close to still being overfished.

(3) Changes to criteria for determining adequate progress in rebuilding;

The PFMC SSC needs to examine its guidance on adequate progress in rebuilding and make sure it is consistent with new NS1 guidelines. The expectation is that they are, but this should be checked and the Council should be informed that the SSC will be advising the Council on adequate progress in rebuilding according to this new guidance.

(4) Changes to criteria for determining which stocks require federal management.

The new criteria for determining if a stock requires management does apply to stocks that are not currently in a federal FMP. The guidelines do not specify what triggers a review - only criteria of the review if done. It was noted that this policy is a significant change to existing policy and if applied could require consideration of many stocks that are not currently in an FMP.

To remove a stock from an FMP the Council needs satisfy that none of the 10 factors in the guidelines that indicate a stock should be managed are satisfied.

(5) Clarification of the meaning of OY and advancement of ecosystem-based fisheries management (EBFM) including guidance for managing species aggregates.

Aggregate MSY used to set an aggregate OY does not to be stock complexes (e.g., cap used in Alaska).

6. Future Council Meeting Agenda and Workload Planning

The Scientific and Statistical Committee (SSC) discussed its anticipated schedule of subcommittee meetings, workshops, methodology reviews, and stock assessment reviews for 2017. The attached table reflects the SSC's anticipated schedule at this time. Dates, staffing, and locations are subject to change and meetings may be added or removed from this list depending on workload, meeting site availability, Council priorities, and the timely completion of relevant analyses.

The SSC also discussed a potential Economics and Groundfish Subcommittee meeting to discuss economic analyses of the impacts of different Essential Fish Habitat and Rockfish Conservation Area alternatives. The SSC suggests this would be best handled via webinar or a regular agenda item for the full SSC in March.

The SSC recommends review of changes to the GMT's nearshore and non-nearshore models be carried out as regular agenda items during the March (discard mortality rates) and September (other changes) 2017 Council meetings as described in the Supplemental SSC report under agenda item F.2, with the option to follow up during the "mop-up" meeting of the Groundfish Subcommittee at the end of September if needed.

The SSC recommends a half hour item on the Council's April 2017 agenda to consider topic selection for the 2018 Coastal Pelagic Species methodology review, given the likelihood that the Southwest Fisheries Science Center will be prepared to host a review of the Acoustic Trawl Method in early 2018 (Agenda Item G.4.a, Supplemental SWFSC Report 2), which would need significant advance planning and coordination.

An expert in geostatistics would be very helpful for the review of groundfish assessment methods proposed for January or February of 2017.

	Proposed Workshops and SSC Subcommittee Meetings for 2017 *Note: these tables reflect the statement given to the Council in Nov. 2016.* *Updated tables are at the end of the minutes.*						
	Workshop/Meeting	**Potential Dates**	**Sponsor/ Tentative Location**	**SSC Reps.**	**Additional Reviewers**	**AB Reps.**	**Council Staff**
1	Review of Groundfish Assessment Methods	Jan. or Feb. (~3 days)	Council/ Seattle WA	GF Subcommittee	Geostatistics Expert	GMT GAP	DeVore
2	Sardine Assessment Review	Feb. 21-24	Council/ La Jolla, CA	Punt (Chair), Satterthwaite, and Brown	2 CIE	CPSMT CPSAS	Griffin
3	Webinar on GMT's nearshore and non-nearshore model changes	Late Feb. / early Mar.	Webinar	GF Subcommittee	None	GMT GAP?	DeVore
4	P. Mackerel Update Review	Apr. 8	Council/ La Jolla, CA	CPS Subcommittee	None	CPSMT CPSAS	Griffin
5	CPS Methodology Review	Spring	Council/ La Jolla, CA	Punt (Chair), Brown, Hamel	1-2 CIE + SWFSC Assessment Scientist	CPSMT CPSAS	Griffin
6	5-year IFQ Program Review	May 24-25	Council/ Seattle, WA	GF & Economics Subcommittees	None	GMT GAP	Seger
7	Groundfish Update Assessments & Cowcod Catch Report Review	June 6	Council/ Spokane, WA	GF Subcommittee	None	GMT GAP	DeVore
8	Lingcod & Yelloweye STAR Panel	June 26-30	Council/ Seattle, WA	Sampson (Chair)	2 CIE + Piner	GMT GAP	DeVore

	Proposed Workshops and SSC Subcommittee Meetings for 2017 *Note: these tables reflect the statement given to the Council in Nov. 2016.* *Updated tables are at the end of the minutes.*						
	Workshop/Meeting	**Potential Dates**	**Sponsor/ Tentative Location**	**SSC Reps.**	**Additional Reviewers**	**AB Reps.**	**Council Staff**
9	Yellowtail RF & POP STAR Panel	July 10-14	Council/ Seattle, WA	Field (Chair)	2 CIE + Budrick	GMT GAP	DeVore
10	Blue/Deacon RF & CA Scorp. STAR Panel	July 24-28	Council/ Santa Cruz, CA	Dorn (Chair)	2 CIE + Hamel	GMT GAP	DeVore
11	CCIEA Indicator Review	Sep. 13-14	Council/ Boise, ID	Ecosystem Subcommittee	None	None	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	TBD
14	National SSC Meeting	December?	Council & NMFS/ TBD	Satterthwaite, Punt, +2(?) TBD	TBD	None	DeVore Others? TBD

[1] Possibly CIE if stock assessments are referred to mop-up.
[2] If review of GMT's nearshore and non-nearshore model changes not fully completed at September Council meeting.

SSC Subcommittee Assignments, November 2016

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

DRAFT Tentative Council and SSC Meeting Dates for 2017

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 may begin Wed, June 7 Council Session may begin Thurs, June 8	DoubleTree by Hilton Spokane City Center 322 N. Spokane Falls Court Spokane, WA 99201 Phone: 509-455-9600	One-day SSC GF Subcm Session **Tue, June 6** Two-day SSC Session **Wed, June 7 – Thu, June 8**	Pacific Mackerel Assessment Groundfish Update Assessments & Cowcod Catch Report 5-year IFQ Program Review 2019-2020 Groundfish Spex Planning Groundfish EFH Analyses CCC Meeting Update
September 11-18, 2017 Advisory Bodies may begin Mon, Sept 11 Council Session may begin Tues, Sept 12	The Riverside Hotel 2900 Chinden Blvd Boise, ID 83714 Phone: 208-343-1871	Two-day SSC Session **Mon, Sept 11 – Tue, Sept 12** Two-day SSC Ecosystem Subcommittee Session **Wed, Sept 13 - Thu, Sep 14**	Groundfish Assessments Review 2019-2020 Groundfish Spex Groundfish Stock Assessment Methodology Review Topic Selection Off-year Science Improvements Salmon Methodology Topic Priorities

November 13-20, 2017 Advisory Bodies may begin Mon, Nov 13 Council Session may begin Tues, Nov 14	Hilton Orange County/Costa Mesa 3050 Bristol Street Costa Mesa, CA 92626 Phone: 714-540-7000	Two-day SSC Session **Mon, Nov 13 – Tue, Nov 14**	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

SSC meeting dates and durations are tentative and are subject to change in response to Council meeting dates, agendas, workload, etc.

	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	CPS Methodology Review	Apr. 17-18	Council/ La Jolla, CA	Punt (Chair), Hamel, + Brown	1 or 2 CIE + SWFSC Assessment Scientist	CPSMT CPSAS	Griffin
3	P. Mackerel Update Review	May 1	Webinar	CPS Subcommittee	None	CPSMT CPSAS	Griffin
4	5-year IFQ Program Review	May 24-25	Council/ Seattle, WA? TBD	GF & Economics Subcommittees	None	GMT GAP	Seger
5	Groundfish Update Assessments & Cowcod Catch Report Review	June 6	Council/ Spokane, WA	GF Subcommittee	None	GMT GAP	DeVore
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9	CCIEA Indicator Review	Sep. 13-14	Council/ Boise, ID	Ecosystem Subcommittee	None	None	Dahl

	Workshop/Meeting	Potential Dates	Sponsor/ Tentative Location	SSC Reps.	Additional Reviewers	AB Reps.	Council Staff
10	Groundfish Mop-up	Sep. 25-29	Council/ Seattle, WA	GF Subcommittee	None[1]	GMT[2]	DeVore
11	Salmon Methodology Review	Oct. TBD	Council/ Portland, OR	Salmon Subcommittee	None	STT SAS MEW	Ehlke
12	SCS6 Meeting	Jan. 17-19, 2018	Council & NMFS/ So Cal TBD	Satterthwaite, Punt, + 2(?) TBD	TBD	None	DeVore Others? TBD

Table title: **Proposed Workshops and SSC Subcommittee Meetings for 2017 and 2018**

[1] Possibly CIE if stock assessments are referred to mop-up.
[2] If review of GMT's nearshore and non-nearshore model changes are not fully completed at the September Council meeting.

PFMC
02/14/17