SCIENTIFIC AND STATISTICAL COMMITTEE REPORT ON PACIFIC SARDINE REBUILDING PLAN – FINAL ACTION

The Scientific and Statistical Committee (SSC) reviewed the Pacific Sardine Rebuilding Analysis Based on the 2020 Assessment (NMFS Report 1) along with the Pacific Sardine Rebuilding Plan Preliminary Environmental Analysis (Attachment 1, noting the errata reported in Supplemental CPSMT Report 2) prepared by Coastal Pelagic Species Management Team (CPSMT), as well as CPSMT Report 1. The SSC had limited time to review Supplemental CPSMT Reports 2 and 3, but provided some comments on the economic analysis contained in Supplemental CPSMT Report 3. Dr. Kevin Hill (National Marine Fisheries Service [NMFS] Southwest Fisheries Science Center, CPSMT) presented the rebuilding analysis and members of the CPSMT answered questions regarding the documents prepared by the CPSMT. Dr. André Punt (University of Washington, SSC) presented the report from the SSC's CPS subcommittee meeting held on July 15-16, 2020 via webinar (subcommittee report appended to the end of this statement). The CPS subcommittee report also describes 2020 survey plans and recommendations for 2021 assessments. However, this will be addressed in the SSC report under Agenda Item C.7.

Rebuilding Analysis

The rebuilding analysis described in NMFS Report 1 reflects changes that adequately addressed the recommendations of the SSC at its June meeting and the July meeting of the CPS subcommittee. The rebuilding analysis is parameterized based on the 2020 stock assessment, as required by the Groundfish Terms of Reference (TOR) for rebuilding, with minor modifications (annual rather than seasonal time steps, zero fecundity for age-0 fish) necessary for compatibility with the Rebuilder software. The SSC agrees that these changes are appropriate. While acknowledging the challenges associated with projecting rebuilding for a highly dynamic species whose recruitment seems to be largely driven by environmental factors, the SSC reiterates its endorsement of using Rebuilder for this purpose. The SSC also reiterates its endorsement of calculating the B_{MSY} proxy by projecting forward under $E_{MSY} = 0.18\ yr^{-1}$. The rebuilding plan should specify a process for assessing progress toward rebuilding and the SSC's role in this.

Recruitment values from two time-periods (one a more recent subset of the other) were used to create two productivity states of nature (or productivity scenarios) for this analysis. There was no analysis presented to the SSC that would clearly justify choosing one productivity scenario over the other. The low recent recruitments estimated in the 2020 assessment could imply that recruitments over the next few years may be more similar to the lower productivity $SB_{0(2010\text{-}18)}$ scenario, and so that scenario might better characterize the near term. However, rebuilding is projected to take many years under either scenario, and projections are provided for multiple decades. It is difficult to forecast what productivity is likely to be decades into the future. Note that even the more productive $SB_{0(2005\text{-}18)}$ scenario projects quite moderate recruitment compared to the recruitment that produced the high population levels during the early 2000s. The SB_{MSY} value for the $SB_{0(2005\text{-}18)}$ scenario (median 116,374 mt) is not high compared to historical estimates of population size. Thus, the $SB_{0(2005\text{-}18)}$ scenario might be a better representation of the possible

recruitment levels that could be seen over the next 10+ years. When assessing the progress toward rebuilding, thought should be given to the merits of considering recruitment estimates from further back in time, as well as more recent values. For estimates of earlier recruitment, consideration should be given to the merits of a single assessment parameterized over a longer time period versus stringing together information from multiple assessments performed over time. Future rebuilding plans should consider scenarios that project forward using regime shifts in recruitment.

The SSC agrees with the CPSMT that assuming a constant harvest rate for the Mexican fishery is likely to better reflect reality than assuming constant catch by this fishery and endorses how this rate was calculated. The SSC notes that the projections under Alternative 1 assume the full U.S. acceptable biological catch (ABC) will be harvested. However, in practice U.S. catches have been below the ABC, and some of the U.S. catch has been from the southern subpopulation.

The stock will be declared rebuilt once the spawning biomass is assessed to have been rebuilt to SB_{MSY}. In other words, once the biomass trajectory achieves the rebuilding target, the stock is considered to have rebuilt by that year, regardless of its future trajectory or subsequent population declines. Thus, the probabilities of achieving rebuilding status on or before a given year from the Rebuilder monotonically increase through time in all scenarios, even in those in which the expectation is for the stock to be driven below the target, or even below the Minimum Stock Size Threshold (MSST) in some cases, after it rebuilds. Note also that biomass projections and the rebuilding target are expressed in terms of spawning biomass, but the MSST and cutoff are expressed in terms of 1+ biomass. Therefore, the horizontal dashed lines at 50,000 mt and 150,000 mt in the plots of spawning biomass trajectories (NMFS Report 1 Figures 8-10 and 14) are not informative with respect to overfished status or exceeding cutoff.

Simulations suggesting that rebuilding occurs faster under the lower productivity $SB_{0(2010\text{-}18)}$ scenario likely reflect rebuilding targets that are closer to the starting biomass combined with high variability in recruitments. Under the lower productivity $SB_{0(2010\text{-}18)}$ scenario, there is little further increase in rebuilding probability through time after the first several years. This is because assumptions about recruitment in the first year, along with random fluctuations leading to large recruitments in subsequent years, can drive the biomass above the rebuilding target from modest levels. Over time, biomass is expected to decline further such that larger positive fluctuations, or less likely sequences of large recruitments, are required to achieve rebuilt status. Still, the probability of rebuilding continues to increase slowly over time because the right sequence of fluctuations can still occasionally drive rebuilding from low biomass.

NMFS Report 1 characterizes average SB_{MSY} values for each scenario using arithmetic means. However, medians are more comparable to the presented trends in median biomass, and the median is more consistent with the 50 percent probability used to characterize rebuilding times.

Economic Analysis

The economic analysis contained in Supplemental CPSMT Report 3 is largely qualitative. The SSC found that the scope of the economic analysis adequately addressed the recommendations contained in the subcommittee report and the June 2020 SSC report. While a more quantitative analysis that compares the expected economic outcomes of the three alternatives in present value

terms would be desirable, the SSC recognizes that there was insufficient time and data to support such an analysis. There is an error in the table on p. 23 of Supplemental CPSMT Report 3, under Alternative 3 and the scenario used in the report ($SB_{0(2010\text{-}18)}$) productivity scenario, constant Mexican catch rate) the probability of age 1+ biomass reaching cutoff exceeds 50 percent before the probability of spawning biomass reaching the rebuilding target does, so the directed fishery is not projected to remain closed after rebuilding occurs (although some biomass trajectories may subsequently fall below cutoff again).

PFMC
09/11/20

Scientific and Statistical Committee Coastal Pelagic Species Subcommittee Report to the SSC on Review of the Draft Sardine Rebuilding Plan and 2021 Assessments

A. Background

The Scientific and Statistical Committee (SSC) Coastal Pelagic Species (CPS) Subcommittee (SSCCPSS) met by webinar with analysts from the Southwest Fisheries Science Center (SWFSC) and members of the Coastal Pelagic Species Management Team (CPSMT), the Coastal Pelagic Species Advisory Subpanel (CPSAS) and the public on July 15 and 16, 2020. The meeting's purpose was to review model specifications of the draft Pacific sardine rebuilding analysis based on the Council Rebuilder tool and to discuss the 2021 CPS assessments and Stock Assessment Review (STAR) Panels.

The SSCCPSS Chair (Dr. André Punt, University of Washington) called the meeting to order, summarized the aims of the meeting (Appendix A), after which the Agenda (Appendix B) was adopted. Appendix C lists the members of the SSC, CPSMT, CPSAS, Council Staff, and the public who participated in the webinar. The meeting was conducted over two days to allow for a limited number of requests to the analysts (see Section B.2). Dr. Punt noted that he updated the rebuilding tool in response to the SSC discussions at the June 2020 Council meeting and provided advice to the analysts.

B. Review of the draft Pacific sardine rebuilding analysis

Dr. Kevin Hill (SWFSC), on behalf of the analysts (Dr. Hill, Dr. Peter Kuriyama, and Dr. Paul Crone), presented the draft rebuilding analysis. The Subcommittee discussed the draft rebuilding analysis under the items listed in the meeting description. Dr. Hill noted that the rebuilding tool had been updated by Dr. Punt to: (a) allow projections to be conducted for a control rule that is a combination of a constant exploitation rate strategy (mimicking the current Acceptable Biological Catch, ABC, control rule for Pacific sardine) and a constant catch strategy (used for the catches off Mexico), (b) allow the control rule to pertain to 1+ biomass and not exploitable biomass, (c) allow reporting of the probability of rebuilding to given level of 1+ biomass (the cutoff value of 150,000 mt for this analysis), and (d) allow the target relative biomass (the biomass corresponding to MSY relative to unfished biomass, B_{MSY}/B_0) to differ among steepness values.

B.1 Specific review items (see Appendix B)

B.1.1 Establishing a stock-recruitment relationship and associated uncertainty

The stock-recruitment relationship was modeled as a Beverton-Holt curve with steepness profiled from 0.3 through 0.8 in steps of 0.05. Each steepness value was weighted based on the likelihood from the assessment. The steepness value of 0.8 led a likelihood with less than 0.5% weight, and was consequently ignored for the analyses. In principle, values for steepness between 0.2 and 0.3 could be considered in the rebuilding analysis, but it was not possible to consider steepness values less than 0.28 due to technical problems. The Subcommittee agreed that the range of steepness values were adequate.

Recruitment values from two time-periods (one a more recent subset of the other) were used to create "high" and "low" states of nature (or productivity states) for this analysis. Note that the

"high" state of nature is really quite moderate compared to those that produced the high population levels during the early 2000s. Thus the "high" state of nature might be a better representation of the possible recruitment levels that could be seen over the next 10+ years. On the other hand, the "low" state of nature would more accurately reflect the recent low recruitments and could represent a low productivity regime that persists into the future. The "high" state of nature (based on 2005-2018) encompasses values from the "low" state of nature alternative (based on 2010-2018), and reflects lower as well as moderate levels of recruitment. Each alternative should be considered in relative terms rather than as extremes of the biological potential of the stock. The highest potential of the stock during periods of strong recruitment prior to 2005 are not reflected in either alternative.

B.1.2 Establishing T_{min}, T_{max}, and B_{MSY}

The draft rebuilding analysis was based on steepness-specific B_{MSY} values. The analysts should develop a single value for B_{MSY}/B_0 across the steepness levels as has been done for groundfish in similar cases (see B.2, Request 1) and report results for both options for specifying B_{MSY}. The current approach creates some unexpected results, such as 36% of runs for the low state of nature being already rebuilt. However, using a single value for the rebuilding target does not eliminate the modest probability of being already rebuilt or rebuilding very quickly under the low productivity scenario, because the single value of the rebuilding target is moderate, and there is a large amount of variation in projected recruitments.

B.1.3 Setting other model parameters

Changes in model structure from the assessment to the rebuilding analysis included some simplifications that are expected to have very small effects: (a) changing the model time-step from seasonal to annual, (b) basing selectivity and size-at-age in the projections on a single fishery (Mex-Cal season 2) rather than three fisheries, and (c) setting maturity and fecundity at age zero to zero (the analysts should annotate Table 2 to make this explicit).

B.1.4 Application of the rebuilder for the Council's rebuilding alternatives

The harvest strategies analyzed in the draft rebuilding included:

a. Total E=0; used to establish T_{MIN}
b. US E=0 and Mexico catch = 6,044 mt per year
c. US E=0.18 and Mexico catch = 6,044 mt per year, i.e., 'Status Quo'
d. US E=0.05 and Mexico catch = 6,044 mt per year
e. US E=0.05 and Mexico=0; this strategy was not requested by the PFMC or its Advisory Bodies but was included as a sensitivity scenario.

Note that the US E is modified by "Distribution" (0.87) and the Category 2 ABC-OFL buffer.

The SSC recommends that the analysts and the CPSMT consider additional sensitivity scenarios, including projecting the impacts of Mexican fishing assuming a constant Mexican harvest rate rather than a constant Mexican catch (see Request 2 for suggestions). In addition, the CPSMT should provide the rationale for the E=0.05 harvest strategies in relation to the rationale for the Council motion.

There were 101 parameter vectors due to rounding when assigning whole percent probabilities across the range of steepness values. However, 2,000 projections were undertaken so the intended probability of each steepness was not achieved. Given 101 vectors, the total number of simulations should be 2020 rather than 2000 for all 101 parameter vectors to be used an equal number of times

in each rebuilding simulation. The analysts instead chose to develop the best distribution of weight across steepness values using 100 vectors instead of retaining 101, and incorporated that change into their responses to requests (below).

B.1.5 Reviewing model outputs for the development and analysis of alternatives

The probability of rebuilding in any projection year should reflect the proportion of runs where the rebuilding target for each scenario has been met, either in that year or in any prior year, even if the biomass is below the target in the year reported due to a subsequent decline. This differs from way the draft rebuilding analysis was conducted, which defined the probability of rebuilding in any year as the proportion of simulations in which the spawning biomass was above B_{MSY} in that year. The suggested approach is more consistent with management practice because the stock will be declared rebuilt once the spawning biomass is assessed to have rebuilt to B_{MSY}. In other words, once a simulated biomass trajectory achieves the rebuilding target, it is considered to have rebuilt by that year, regardless of its future trajectory or subsequent population declines. Thus, the probabilities of achieving rebuilding status on or before a given year monotonically increase through time in all scenarios, even in those in which the expectation is for biomass to be driven below the target, or even below the Minimum Stock Size Threshold (MSST) in some cases, after it rebuilds.

Other presentational suggestions:

- Add a table with reference points, including T_{MIN} and T_{MAX};
- Add a plot showing the uncertainty in the projections (e.g. the distribution of possible future catches and spawning biomass) because the medians for Pacific sardine are less representative of the full range of outcomes than would be the case for longer-lived species such as most groundfish.
- Add plots showing the probability of 1+ biomass being greater than or equal to 150,000 mt each year.
- Add plots of depletion over time, with corresponding probabilities of exceeding target levels adjacent for each alternative for both the rebuilding target and cutoff.
- The term E_{MSY} is being used in two contexts in the document (as a parameter of the rebuilder that determines B_{MSY} and as a parameter of the harvest control rule). These two uses should be clearly distinguished. In addition, the E values in the strategies are best considered "strategy parameters" rather than alternative E_{MSY} values.

B.1.6 Other

The SSCCPSS had the following additional observation and suggestions:

- Why is the probability of rebuilding faster when productivity is "low" rather than "high"? This likely reflects low rebuilding targets combined with high variability in recruitments. Note that under the low productivity scenarios, there is little further increase in rebuilding probability through time after the first several years. This is because stochastic fluctuations (and assumptions about the deterministic recruitment the first year) can drive the biomass above the rebuilding target from modest levels, but over time the biomass is expected to be driven far below the target such that larger positive recruitment deviations, or less likely sequences of positive deviations, are required to achieve rebuilt status. The SSC should revisit the reasons for this effect once the final rebuilding analysis is available.
- Why can the probability of rebuilding (or: having rebuilt) be high when median biomass and catch are low and declining?

- The discussion should state that the prior for the biomass inshore of the ATM survey is based on a subset of the coast and changing this would impact the scale of biomass and recruitment.
- The discussion should state that the B_{MSY} value for the "high" productivity scenario (377,567t) is not high compared to historical estimates of population size or even the average biomass from the simulations used to determine the current harvest control rules.
- Reasons should be given as to why the "low" or "high" productivity scenarios are more or less likely (the analysts should examine past rebuilding analyses when there were multiple states of nature – e.g. the earlier bocaccio rebuilding analyses), as well as the results of studies of rebuilding rates for Pacific sardine and past historical evidence for sustained low productivity and abundance levels even in the absence of fishing (e.g., Soutar and Isaacs, [1974]; Baumgartner et al., [1992]; McClatchie et al. [2017] paleo-studies regarding the average length (years/decades) of low abundance/collapse level). The analysts should emphasize that we do not know what future recruitment will be or how it will respond to the environment. Some members of the Subcommittee suggested that the "high" recruitment scenario was more likely because it is actually moderate relative to the long run of the stock and may be more representative of the expected productivity (range) over the rebuilding period of the next 10+ years.
- What are the reasons for the bimodality in the distribution for unfished spawning biomass for the "low" recruitment scenario.
- Any presentation of this work should include a summary of what a rebuilding analysis is, including a description of how individual projections are conducted. Dr. Steven Ralston developed a presentation for groundfish on which a sardine-related presentation could be based (this presentation was subsequently located and shared with both the analysts and the SSCCPSS).
- Is the biomass maintained above the "overfished" threshold (perhaps quantified by the probability of being below the overfished threshold one, two, etc. years after being rebuilt)[1].
- The analysts should re-enforce that sardine biomass is largely driven by environmental conditions. For example, it will not be possible to rebuild to the biomass levels of the early 2000s if the stock is in a low productivity regime. In contrast, if the environment changes to a better state (i.e. the recruitments observed during the early 2000's) the stock could rebuild more quickly to a higher biomass than expected under the "high productivity" scenario.
- The SSCCPSS did not review the social/economic analysis. Moreover, a rigorous social/economic analysis cannot be completed until the rebuilding time projection analysis is complete.

B.2 Requests

Request 1: Develop an approach to produce single target depletion level across scenarios and determine that depletion level.

Rationale: Given difficulty in determining productivity, a single target depletion level has been used for other rebuilding analyses, such as those for groundfish, including those profiling over steepness levels.

Response: The analysts produced weighted averages of the target depletion level across steepness values for the high and low scenarios. Both produced averages of 36.5% to the nearest half-percent. This value will be used as target depletion across all runs going forward.

Request 2: The analysts should work with the CPSMT to determine other future catch scenarios to be analyzed. In particular, additional scenarios should use a constant exploitation rate for Mexico [e.g. Catch = $Biomass_{age1+}$*(ER_{US}*Buffer*US_Distribution + ER_{Mexico})] determined from

[1] The probability of being below the overfished threshold as a function of time since becoming rebuilt is not computed by the current version of the rebuilder tool.

the overall rate over the four years used to determine average Mexican catch. The value for ER_{Mexico} could be determined by dividing the Mexican catch (6,044t) by the 1+ biomass for the corresponding year for each value of steepness and then weighting the steepness-specific ER_{Mexico} values by the corresponding likelihoods.

Other assumptions to consider are a constant US catch at low population levels, or a total US catch based on combination of constant catch and exploitation rate for different parts of the fishery.
Rationale: Future catch scenarios should attempt to reflect the (potential) realities of the fisheries that are being modeled.
Response: The analysts calculated exploitation rate as average catch divided by average 1+ biomass over the last four years for which those values are available. This was done using either season 1 or season 2 biomass values, and across steepness values (though the latter only led to small changes across the range). Since the rebuilder uses biomass at the start of the year, season 1 biomass is the correct value to use. Weighting across steepness values leads to a Mexican (or non-US) exploitation rate of 0.0986. This value will be used going forward.

The CPSMT discussed which scenarios would be useful, but did not draw any firm conclusions as to what scenarios should be undertaken, other than the requested runs using a constant non-US exploitation rate rather than constant catch for that sector.

C. Discuss 2021 stock assessments for coastal pelagic species.
Dr. Annie Yau (SWFSC) provided an update on COVID-19 impacts on SWFSC surveys and biological sampling, and discussed plans for 2021 CPS assessments.

The 2020 CalCOFI egg and larvae survey and the spring Acoustic Trawl (AT) survey were canceled. The juvenile rockfish survey was conducted entirely on contracted industry vessels with greatly reduced scope and some methodology changes that may limit its use in assessments. The status of the summer AT survey remains uncertain, but at best it will last approximately 45 days compared to the usual 80 days, and begin substantially later than its usual start date in June. There will likely be some unknown impacts of COVID-19 on 2021 surveys. SWFSC staff are aging backlogged anchovy and sardine otoliths so new historical age data should be available for assessments in 2021. Even if an AT survey is conducted in 2020, it is unknown whether the biological samples from that survey could be processed in time for use in 2021 assessments.

Dr. Yau noted that it would be impossible to adequately cover the range of Pacific sardine in a 45-day survey. Thus, a 2020 AT survey abundance estimate for Pacific sardine would not be comparable to abundance estimates from other years. The Subcommittee agreed and therefore concurred with a suggestion that a 2020 AT survey focus on attaining sufficient coverage of the Central Subpopulation of Northern Anchovy (CSNA), to be make it as comparable as possible to past surveys with respect to CSNA.

The SWFSC will engage in discussions on how industry survey efforts in 2020 and 2021 can be most useful for assessments. It was noted that the aerial survey has previously been used in conjunction with the AT survey to provide a prior on catchability (q), but doing this requires both surveys operate simultaneously, which may not be possible in 2020. Past juvenile rockfish surveys using contracted industry vessels attempted to maximize utility and comparability by conducting

paired surveys to allow estimation of vessel effects, using depth monitoring gear to assure the correct sampling depth, duration, and net deployment, and by contracting the same vessel(s) in subsequent years when paired surveys with NOAA vessels would be possible.

An update assessment of Pacific sardine is scheduled for spring of 2021. In the absence of a usable 2020 AT survey estimate for sardine, a catch-only projection may be more appropriate. Revisions to historical catch estimates can be accommodated within catch-only projections, although a slightly elevated level of review involving refitting of the model would be needed if any of the revised catches are for years entering the likelihood calculations. Substantial additions of age data would require an update assessment, but the information content of a modest amount of new age data may not justify the workload impact of an update assessment. Alternatively, if the inclusion of the new age had negligible impact on the assessment, it could be considered as catch-only update.

A full assessment of CSNA is planned for late 2021. The Subcommittee sees considerable value in conducting this assessment even if 2020 AT survey estimates are unavailable, and supports conducting the assessment as planned. An assessment would increase the biological understanding of CSNA and could be informative with respect to reference points. Substantial new age data for CSNA will be available, as will multiple historical survey estimates (e.g. from CalCOFI). Egg and larval data have been reviewed for use with the CSNA, and the juvenile rockfish survey has been approved for use in groundfish assessments. There could be workload benefits to scheduling the CSNA assessment as late in the year as possible, which may allow incorporation of data from 2021 surveys. However, the high natural mortality of the CSNA means that it is important for survey timing to be comparable across years, or differences to be accounted for in the assessment.

The Pacific mackerel catch-only projection scheduled for delivery to the Council in June 2021 should proceed as planned regardless of 2020 and 2021 surveys.

References

Baumgartner, T.R., Soutar, A., and Ferreira-Bartrina, V. 1992. Reconstruction of the history of Pacific sardine and northern anchovy populations over the last two millennia from sediments of the Santa Barbara Basin, California, *CalCOFI Rep.* **33:** 24-40.

McClatchie, S., Hendy, I.L., Thompson, A.R. and Watson, W., 2017. Collapse and recovery of forage fish populations prior to commercial exploitation. *Geophysical Research Letters*, *44*(4), pp.1877-1885.

Soutar, A. and Isaacs, J.D., 1974. Abundance of pelagic fish during the 19th and 20th centuries as recorded in anaerobic sediment off the Californias. *Fishery Bulletin*, *72*(2), pp.257-273.

Appendix A: Meeting Description: Scientific and Statistical Committee (SSC) Coastal Pelagic Species (CPS) Subcommittee meeting

The Pacific Fishery Management Council (Council) will hold an online meeting of its Scientific and Statistical Committee (SSC) Coastal Pelagic Species Subcommittee to review model specifications regarding the Pacific sardine rebuilding plan Rebuilder tool. The Council's Coastal Pelagic Species Management Team (CPSMT) is responsible for the overall development of the Pacific sardine rebuilding plan and will be considered full meeting participants. This meeting is open to the public and public comment will be taken at the discretion of the Chair. Draft documents being reviewed by the Subcommittee are not available for public dissemination, and will be available for public dissemination via the Council's September Briefing Book.

Key personnel

Meeting Chair: André Punt
Principal Analyst: Kevin Hill
Council Staff Officers: Kerry Griffin and John DeVore
Members of the SSC CPS Subcommittee and the CPSMT

Dates/times: Wednesday and Thursday, July 15-16, 2020; 8:30 a.m. to 1 p.m. Pacific Daylight Time each day, or until business for the day has been completed.

Background

The estimated biomass of Pacific sardine fell below the minimum stock size threshold of 50,000 metric tons, based on the 2019 stock assessment. The Council and NMFS are required to develop a rebuilding plan, which is scheduled for Council adoption at its September 2020 meeting. The primary purpose of the July 15-16 SSC Subcommittee meeting is to provide review and advice on developing proposed rebuilding alternatives relative to the Pacific sardine rebuilding plan.

Meeting objectives

SSC CPS Subcommittee to review and provide advice on:

1. Establishing a stock-recruitment relationship and associated uncertainty
2. Establishing T_{MIN}, T_{MAX}, and B_{MSY}
3. Setting other model parameters
4. Application of the rebuilder for the Council's rebuilding alternatives
5. Reviewing model outputs for the development and analysis of alternatives.
6. Discuss 2021 stock assessments for coastal pelagic species.
7. Other technical aspects of the sardine rebuilding plan may also be considered, as appropriate

Roles and Responsibilities

- The Chair is responsible for overall prosecution of the meeting, ensuring objectives are met, making rapporteur assignments, coordinating a report to the full SSC, and managing public comment.
- The SSC CPS Subcommittee is responsible for providing expert review and advice relative to the meeting objectives.
- The CPSMT is responsible for developing a reasonable suite of alternatives for consideration at the September Council meeting. The CPSMT is expected to fully participate in the meeting, especially as related to development of alternatives for Council consideration.
- Council Staff Officers are responsible for running the online meeting platform and supporting the meeting Chair as needed.

Appendix B: Agenda

Wednesday, July 15, 2020 – 8:30 a.m.

8:30 a.m.	Introductions, rapporteurs, recusals, review agenda and meeting objectives	André Punt, Kerry Griffin
8:45 a.m.	Proposed Rebuilder specifications (S-R relationship, T_{MIN}, T_{MAX}, B_{MSY}) and discussion	Kevin Hill
9:15 a.m.	Discussion and requests	All
10 a.m.	Rebuilder results for application to alternatives – discussion with CPSMT	André Punt
11 a.m.	Public comment	André Punt
11:30 a.m.	Discussion and parking lot issues	André Punt

Thursday, July 16, 2020 – 8:30 a.m.

8:30 a.m.	Rebuilder specifications - response to requests & discussion	Kevin Hill
9:15 a.m.	SSC Subcommittee discussion of 2021 CPS assessments and STAR panels	André Punt, Galen Johnson
10:15 a.m.	Rebuilder specifications, as needed	Kevin Hill
11 a.m.	Rebuilder results for alternatives and discussion with CPSMT	All
12 p.m.	SSC summary, wrap up, next steps, discuss plan for September Council meeting	André Punt

Adjourn

Appendix C: Participants

SSC CPS Subcommittee	
André Punt	UW, SSC, Chair
Alan Byrne	IDFG, SSC
John Budrick	CDFW, SSC
John Field	SWFSC, SSC
Marisol García Reyes	Farallon Inst., SSC
Owen Hamel	NWFSC, SSC
Theresa Tsou	WDFW, SSC
Will Satterthwaite	SWFSC, SSC
STAT members:	
Kevin Hill	SWFSC, CPSMT
Peter Kuriyama	SWFSC
Other attendees:	
Al Carter	Ocean Gold Seafoods, CPSAS
Alan Sarich	Quinault Indian Nation, CPSMT
Annie Yau	SWFSC
Ben Enticknap	Oceana
Briana Brady	CDFW, PFMC
Corey Niles	WDFW, PFMC
Dale Sweetnam	SWFSC
Diane Pleschner-Steele	Cal. Wetfish Producers, CPSAS
Dianna Porzio	CDFW
Emmanis Dorval	SWFSC
Frank Lockhart	NMFS WCR
Galen Johnson	NWIFC, SSC
Geoff Shester	Oceana
Greg Krutzikowsky	ODFW, CPSMT
James Hilger	SWFSC, CPSMT
John DeVore	PFMC
Josh Lindsay	NMFS WCR, CPSMT
Kerry Griffin	PFMC
Kirk Lynn	CDFW, CPSMT
Kris Kleinschmidt	PFMC
Kym Jacobsen	NWFSC, CPSMT
Lorna Wargo	WDFW, CPSMT
Lynn Massey	WCR
Meg Johnson	
Mike Burner	PFMC
Mike Okoniewski	Pacific Seafoods, CPSAS
Richard Parrish	
Sandra Krause	PFMC
Steve Crooke	CPSAS
Theresa Labriola	Wild Oceans
Trung Nguyen	CDFW, CPSMT
Whitney Roberts	WDFW, GMT