

MINUTES

Scientific and Statistical Committee

Pacific Fishery Management Council
Via Webinar

April 4, 2020

Members in Attendance

Dr. John Budrick, California Department of Fish and Wildlife, Belmont, CA
Mr. Alan Byrne, Idaho Department of Fish and Game, Boise, ID
Dr. John Field, SSC Chair, National Marine Fisheries Service Southwest Fisheries Science Center, Santa Cruz, CA
Dr. Marisol Garcia-Reyes, Farallon Institute, Petaluma, CA
Dr. Melissa Haltuch, National Marine Fisheries Service Northwest Fisheries Science Center, Seattle, WA
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. Kristin Marshall, National Marine Fisheries Service Northwest Fisheries Science Center, Seattle, WA
Dr. André Punt, University of Washington, Seattle, WA
Dr. William Satterthwaite, National Marine Fisheries Service Southwest Fisheries Science Center, Santa Cruz, CA
Dr. Jason Schaffler, Muckelshoot Indian Tribe, Auburn, WA
Dr. Ole Shelton, National Marine Fisheries Service Northwest Fisheries Science Center, Seattle, WA
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
Dr. Will White, Oregon State University, Corvallis, Oregon

Members Absent

None.

SSC Recusals for the April 2020 Meeting		
SSC Member	Issue	Reason
None.		

A. Call to Order

Dr. Galen Johnson called the meeting to order at 0800. Dr. Will White was welcomed to the SSC. Mr. Chuck Tracy briefed the SSC on the meeting and new events. The COVID-19 pandemic compelled us to conduct the April Council and advisory body meetings as webinars. Mr. Tracy thanked everyone for the patience and flexibility in conducting this meeting this way. It is unclear at this time whether the June meeting will also be conducted via webinar.

The Washington Department of Fish and Wildlife asked the SSC to review a proposal to change their market categories they use to account for commercial catch in Washington. Mr. Tracy recommended this be done in a more formal review process. The Council is taking up a court-ordered review of the Southern Oregon/Northern California Coast (SONCC) coho salmon consultation process. The National Marine Fisheries Service is recommending an SSC review of this process and impact model review by November. The proposal is to include freshwater fishery impacts as well in the review. Council direction on this is anticipated this week. The May Council Coordination Committee (CCC) meeting in Honolulu has been cancelled and a webinar is planned instead. The Steering Committee planning the seventh meeting Scientific Subcommittee of the CCC (SCS7), which is tentatively scheduled in early August, will make a recommendation next month to the CCC- on whether to convene or postpone the SCS7 meeting. Mr. Tracy noted that the Council action on Future Agenda Planning under Agenda Item I.4 will be a heavy lift. There were already more than seven days of candidate agenda items for June and the decision to only take up essential agenda items at the April meeting will make this a difficult task. Mr. Tracy asked the SSC to prioritize items they recommend be taken up in June.

Dr. Will White volunteered to serve on the Groundfish Subcommittee.

D. Coastal Pelagic Species Management

3. Pacific Sardine Assessment, Harvest Specifications, and Management Measures – Final Action

The Scientific and Statistical Committee (SSC) reviewed the 2020 stock assessment of the northern subpopulation of Pacific sardine (NSP). Dr. Peter Kuriyama (Southwest Fisheries Science Center) presented the results of the stock assessment and Dr. André Punt (SSC) provided an overview of the Stock Assessment Review (STAR) panel report. The SSC appreciates the effort by the stock assessment team to improve the assessment model in response to recommendations from previous full and update assessment reviews.

The SSC endorses the 2020 NSP base case assessment model as the best available science for use in management of the NSP. Major improvements from the last benchmark assessment in 2017 and the 2018 and 2019 updates include: 1) adjusting recent catchability of the Acoustic-Trawl (AT) survey to account for biomass seen inshore of the AT survey by the aerial survey; 2) using

vessel monitoring system location information for the Ensenada fleet to estimate the catch of the NSP; and 3) estimating time-varying age-0 selectivity for the AT survey. The base case model uses an integrated assessment approach (Stock Synthesis v.3.30.14) to estimate age-1+ biomass at the start of the 2020/2021 fishing year (July 1, 2020).

There is no information on the strength of the 2019 year-class from any data source in the assessment, so it was estimated from the stock-recruitment relationship. A substantial proportion of estimated total biomass available for the 2020-2021 fishing year may be from the 2019 year-class. The lack of an empirical estimate of age-0 biomass adds unquantified uncertainty to the biomass estimated to be available in 2020-2021. In addition, the Mexican fishing mortality rate on the NSP in January-June of 2020 is assumed to be the same as during that period in 2019, which influences the estimate of sardine biomass at the start of the 2020/2021 fishing year. The approach taken to determine AT catchability from 2015-2019 is the best available but makes assumptions about selectivity that cannot be substantiated using available data. Consequently, there is considerable uncertainty associated with the estimate of age-1+ biomass in 2020 and 2021. There are additional uncertainties associated with the natural mortality rate, AT target strength and species composition, and the lack of fishery age composition data now spanning five years, that influence the biomass estimate.

The estimate for total age-1+ biomass on July 1, 2020, is 28,276 mt (Table 15 of [Agenda Item D.3, Attachment 1](#)). The SSC recommends an overfishing limit (OFL) of 5,525 mt and that the base model be considered a category 2(d) assessment with a sigma (σ) of 1.0 when determining the acceptable biological catch. This designation is primarily due to the points highlighted above. The resulting acceptable biological catch (ABC) values as a function of P* can be found in row “ABC_{tier2}” in Table 22 of [Agenda Item D.3, Attachment 1](#).

The SSC endorses the research recommendations of the STAR panel to improve future assessments. The SSC reiterates that the assessment and OFL apply to the NSP, although a substantial proportion (e.g., 71 percent in 2018-2019) of the U.S. catch in recent years is inferred to be from the southern subpopulation (see Table 2 of [Agenda Item D.3, Attachment 1](#)). There may be benefits to the survey-based management approach advocated by the stock assessment team, and the use of the aerial survey data to adjust catchability of the AT survey is an important step towards that approach. There would be less uncertainty in the calculation of the OFL when using a survey-based approach if the time-lag between conducting the survey and the start of the fishing year was minimized. The SSC continues to recommend further evaluation of a survey-based assessment approach using a management strategy evaluation, which should include consideration of how to handle situations were the survey not to occur in a given year.

SSC Notes:

The 2020 assessment is similar to the last full assessment (2017) with the following changes: 1) Used SS v 3.30.14; 2) Used AT survey weight-at-age (based on annual age-length keys) as population weight-at-age. 3) Re-aged the 2017 and 2018 AT survey otoliths; 4) Adjusted the AT survey index due to updated herring target strength information; 4) Used VMS data from Ensenada to split catches from that area into SSP and NSP; 5) Fixed stock-recruit steepness at 0.3 (rather than estimating it); 6) Fixed Q at 1 from 2005-2014 and at 0.73 for 2015-2019 to account for nearshore biomass (rather than estimating Q as a single value); 7) Estimated time-varying age-0 selectivity for the AT survey, and time-varying age-based selectivity for the 3 fishing fleets (new); 8) Tuned recruitment deviations to new data, resulting in an increase in sigma R from 0.75

to 1.2 (fixed); 9) Omitted the spring AT survey age composition from the model; 10) Added a meta-analytical prior on M ; and 11) Assumed equivalent F rather than equivalent catches of the NSP in Ensenada for 2020 relative to 2019.

Nearshore grid covered by Lisa Marie and sail drones found only 1% of the biomass seen in AT survey in 2019.

Consideration of inclusion of inshore biomass (shoreward of area covered by sail drones and Lisa Marie) information as measured by aerial survey included four options: (1) ignoring it, (2) adding the 2019 estimate from the aerial survey to the AT estimate, (3) adding both the 2017 and 2019 estimates to the AT estimates, or (4) modifying Q .

Since no age composition data were available for the aerial survey, and aerial survey was not performed in all years, the STAT and STAR panel agreed on option (4); in 2019 the AT survey saw 0.73 of the combined biomass estimate. This was applied as the value of Q for 2015-2019, as one cannot assume a constant proportion of total biomass in the inshore, which should represent a larger proportion as the population declines. Changes in the AT survey over time to try to get more inshore should have the opposite effects, so further analysis could be undertaken. One hypothesis supporting this approach is that there is consistently 10-15,000 mt in the inshore, and varying amounts outside, and thus through 2014 the population was large enough that Q was close to 1. Simpler to apply a single change.

There may be an issue due to different selectivities from the two surveys. From the validation point sets that were conducted in California, it appears the aerial survey was not seeing many age-0 animals, so it is not as if inshore area is dominated by age-0 animals.

The prior on M is developed from data on maximum age and k .

Selectivity of MexCal fleet is assumed constant from 2014-2019.

The retrospective pattern looks better than in past assessments, but fixing Q , etc. does make it less informative.

M values from 0.5 to 0.7 result in similar biomass estimates and are most supported by data.

Steepness is not estimable - the best fit occurs for 0.25, but 0.6 still reasonable. Fixed at 0.3.

A major uncertainty is the estimates of inshore biomass and their age composition. The 2020 AT survey will expand further inshore in collaboration with industry. Improvements to CCPSS aerial surveys will aid as well.

Q values are fairly important. One question is if the STAT can use multiple years of data to change the value (or "prior") for Q in recent years. This appears to be similar to adjusting priors (for M , h , etc.) in updates, which has been allowed. The ability to update the value for Q (or " Q prior") should be add to the TORs for clarification.

The SSC should provide guidance on what type of assessment (catch only projection, etc.) and tier would apply for 2021 if there is no survey in 2020.

Is it possible to implement time-varying natural mortality in future assessments? Time-varying M can be estimated and estimating time-varying M had less of an impact when Q was fixed (which needs to be done to get reasonable results with time-varying M). While M is certainly variable, the contrast needed to estimate M as a function of time is not present over the current temporal range of the assessment. One would expect to see more change over a much longer period of time. Still, one could still bring in predator index, or some such. There is a good deal of interest in this question in terms of food habits data, but we don't have results of research yet.

In determining categories, should bias or asymmetric uncertainty be taken into account? The P^ -sigma approach essentially assumes that the OFL is lognormally distributed. Given that P^* is constrained to be ≤ 0.5 , it may be more important to properly characterize just the left-hand side of this distribution. This topic should be considered in TOR discussions.*

Additional research and data need: It would be worth exploring the relationship between habitat compression and the relative amount of sardine inshore vs. observed by the AT survey, which, for example, would inform the AT survey Q . This would involve considering sea surface temperature, the Coastal Upwelling Transport Index (CUTI), the vertical water flux, the Biologically Effective Upwelling Transport Index (BEUTI), and the: vertical nitrate flux.

SSC Administrative Matters (continued)

6. Planning the Research and Data Needs Database

John DeVore briefed the SSC on progress made in planning the development of the Research and Data Needs database. He will set up a webinar briefing with the SSC members who are assisting in database development (André Punt, Cameron Speir, John Budrick, Alan Byrne, Marisol Garcia-Reyes, and Owen Hamel) and PSMFC staff to begin the project.

I. Administrative Matters

4. Future Council Meeting Agenda and Workload Planning

The Scientific and Statistical Committee (SSC) would prefer to conduct our June meeting via webinar. If the meeting were to be in-person, several members will not attend due to health concerns. The SSC offers the following guidance on the future Council meeting agenda and workload planning.

The SSC Groundfish and Coastal Pelagic Species (CPS) Subcommittees and other interested Council advisory body representatives will hold a webinar on April 21, 2020, to discuss the Terms of Reference (TOR) for the Groundfish and CPS Stock Assessment Review Process for 2021-2022.

The SSC Groundfish Subcommittee will hold a methodology review webinar on May 12-14, 2020, for data-limited methods which will include two length-based data limited stock assessment methods and a review of data-limited approaches and tools for use in the upcoming stock assessment cycle.

The SSC agreed that finalizing the list of the 2021 Stock Assessments at the June meeting is valuable so that the Stock Assessment Teams can begin work. This could be combined with full SSC review of the length-based methodologies. The SSC recommends convening a meeting

between the states, the Science Centers, and the ageing laboratories shortly thereafter to coordinate ageing efforts and other data needs. The Remotely Operated Vehicle (ROV) Methodology review can wait until September.

The SSC notes that multiple topics of potential relevance to Salmon Methodology Review were raised at the March meeting and sees value in more discussion of Salmon Methodology issues in June.

If the Council wants SSC review of the sardine rebuilding plan with time for response before final action in September, the SSC could review that work in June.

The SSC discussed the Scientific Coordination Subcommittee's 7th national meeting to be held August 4-6, 2020, in Sitka, Alaska. The SSC anticipates finalizing a list of attendees at the June meeting if the Sitka meeting remains on the calendar.

The SSC Ecosystem Subcommittee plans to meet for one day prior to the September SSC meeting to review items from the California Current Ecosystem Integrated Ecosystem Assessment Team.

The Washington Department of Fish and Wildlife (WDFW) is revisiting how they assign market category catches to the species level, which could influence future stock assessments. The SSC seeks guidance on whether this needs SSC review and, if so, whether it would be part of the Council Operating Procedure (COP) 25 Methodology Review process in September or reviewed earlier this year.

Proposed Workshops and SSC Subcommittee Meetings for 2020

Workshop/Meeting		Potential Dates	Sponsor/ Tentative Location	SSC Reps.	Additional Reviewers	AB Reps.	Council Staff
1	Webinar for the Terms of Reference for Groundfish and CPS stock assessments	April 21	Council/ webinar	GF and CPS subcommittee members	Stock Assessment Analysts	GMT, GAP CPSMT, CPSAS	DeVore
2	Data-Limited Methodology Workshop, Combined with Length-Based Data-Moderate Assessment Methodologies Review	May 12-14	Council/ webinar	GF Subcommittee Members	Carruthers, Hordyk	NA	DeVore
3	7 th National Meeting of the Scientific Coordination Subcommittee of the Council Coordination Committee	August 4-6	NPFMC/ Sitka, AK	4 TBD	NA	NA	DeVore
4	Review of California sea lion pup count and growth rate as an indicator of forage conditions, the habitat compression index, port-specific revenue indices, the natural origin central valley fall Chinook stock indicator	September 10	Council/ Spokane, WA	Ecosystem, Economics, and Salmon Subcommittee Members	TBD	NA	DeVore Dahl
5	Salmon Methodology Review	October TBD	Council/TBD	Salmon Subcommittee	NA	STT, MEW	Ehlke

SSC Notes:

Previously discussed details of May methodology review: Dr. André Punt has agreed to chair this meeting. The meeting will include both a formal methodology review of two length-based data limited stock assessment methods (Length-based Integrated Mixed Effects, or LIME, and simple implementation of Stock Synthesis, SSS) proposed in September of 2019 ([Agenda Item H.10, Attachment 2, September 2019](#)), as well as a workshop to review of a variety of data-limited approaches and tools not explicitly under review for use in the 2021 stock assessment cycle. As reported in November, the SSC does not see a need for a committee of independent experts reviewer, and the SSC continues to recommend that Drs. Tom Carruthers and Adrian Hordyk be invited to participate.

Regarding the SCS7, it would be good to clarify whether additional NOAA SSC members (beyond the nominal four participants per Council) are welcome to attend the meeting. The meeting will focus on ongoing developments to better incorporate ecosystem indicators into the stock assessment process and otherwise consider ecosystem information by management.

For ROV review: The February panel review report is not available and thus, accommodating the advanced briefing book deadline on May 15th would be difficult. Thus, postponing the review until the September Council meeting, along with the review of length-based stock assessment methods, would be preferable.

With respect to WDFW's proposed change to market categories, a similar revision to estimation methods involving standardized weighting of age and length composition data across states is also under consideration. Prior reviews of commercial estimation methods by the SSC have included the ComX Bayesian Statistical methods for identifying market categories in California. The PacFIN Data Committee may also have an interest in reviewing the methods and could form a workgroup to review the implications of implementing changes from a logistical standpoint. The RecFIN Technical Committee reviews analogous considerations for estimation of recreational catch. There may be a benefit from convening an analogous group to the RecFIN Technical Committee that reviews recreational estimates to review changes to commercial catch estimates to conserve the SSC's efforts for review of methods that are beyond the scope of expertise for such a body as not to produce undue burden on the SSC.

Topics relevant to salmon methodology discussed in March: The SSC only explicitly endorsed the Willapa Bay coho forecast for use in 2020 and identified numerous potential improvements that there was insufficient time to adequately evaluate ([Agenda Item E.2, Supplemental Attachment 1, March 2020](#)). Both the agenda items E.2 and E.4 (review and forecasts) statements expressed interest in quantifying uncertainty in salmon management models. The SSC's [statement](#) under Agenda Item E.4 in March 2020 also raised the issue of quantitative evaluation of bias in forecast performance for all stocks where postseason abundance estimates are available for comparison with forecasts. Not discussed in March but mentioned by Chuck is the possible new control rule for coho.

SSC Subcommittee Assignments, April 2020

Salmon	Groundfish	Coastal Pelagic Species	Highly Migratory Species	Economics	Ecosystem-Based Management
Alan Byrne	John Budrick	André Punt	Michael Harte	Cameron Speir	Kristin Marshall
John Budrick	John Field	John Budrick	John Field	Michael Harte	John Field
Owen Hamel	Melissa Haltuch	Alan Byrne	Marisol Garcia-Reyes	Dan Holland	Marisol Garcia-Reyes
Michael Harte	Owen Hamel	John Field	Dan Holland	André Punt	Melissa Haltuch
Galen Johnson	Kristin Marshall	Marisol Garcia-Reyes	Kristin Marshall		Michael Harte
Will Satterthwaite	André Punt	Owen Hamel	André Punt		Dan Holland
Jason Schaffler	Jason Schaffler	Will Satterthwaite			Galen Johnson
Ole Shelton	Tien-Shui Tsou	Tien-Shui Tsou			André Punt
Cameron Speir	Will White				Will Satterthwaite
Tien-Shui Tsou					Ole Shelton
					Cameron Speir

Bold denotes Subcommittee Chairperson

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Council Meeting Dates	Location	Likely SSC Mtg Dates	Major Topics
<p>September 10-17, 2020 Proposed Subcommittees may meet Thur, Sept 10 Advisory Bodies may begin Fri, Sept 11 Council Session may begin Sat, Sept 12</p>	<p>DoubleTree by Hilton Spokane City Center 322 N. Spokane Falls Court Spokane, WA 99201 Phone: 509-455-9600</p>	<p>One-day SSC Ecosystem Subcommittee Session Thur, Sep 10 Two-day SSC Session Fri, Sep 11 – Sat, Sep 12</p>	<p>Review of CCIEA Focus Topics Pacific Sardine Rebuilding Plan Groundfish Methodology Prelim Topic Selection Salmon Methodology Review – Adopt Priorities HMS Biennial Management Measures and Harvest Specifications FEP 5-year Review Research and Data Needs Database Planning</p>
<p>November 13-20, 2020 Proposed Subcommittees may meet Fri, Nov 13 Advisory Bodies may begin Sat, Nov 14 Council Session may begin Sun, Nov 15</p>	<p>Hyatt Regency Orange County 11999 Harbor Blvd. Garden Grove, CA 92840 Phone: 714-750-1234</p>	<p>Two-day SSC Session Sat, Nov 14 – Sun, Nov 15</p>	<p>CPS Methodology Review Topic Selection CPS Prelim. EFP Review GF Methodology Final Topic Selection Salmon Methodology Review Final Report Research and Data Needs Update</p>
<p>March 3-10, 2021 Proposed Subcommittees may meet Wed, Mar 3 Advisory Bodies may begin Thur, Mar 4 Council Session may begin Fri, Mar 5</p>	<p>Doubletree by Hilton Hotel Seattle Airport 18740 International Boulevard Seattle, WA 98188 Phone: 206-246-8600</p>	<p>Two-day SSC Session Thur, Mar 4 – Fri, Mar 5</p>	<p>Identify Salmon Management Objectives Salmon Review/Pre I CA Current IEA Report</p>
<p>April 6-13, 2021 Proposed Subcommittees may meet Tue, Apr 6 Advisory Bodies may begin Wed, Apr 7 Council Session may begin Thur, Apr 8</p>	<p>DoubleTree by Hilton San Jose 2050 Gateway Place San Jose, CA 95110 Phone: 408-453-4000</p>	<p>Two-day SSC Session Tue, Apr 6 – Wed, Apr 7</p>	<p>Adopt Pacific Sardine Assessment CPS EFPs Salmon Methodology Review Topic Selection</p>

Council Meeting Dates	Location	Likely SSC Mtg Dates	Major Topics
<p>June 22-29, 2021 Proposed Subcommittees may meet Tue, June 22 Advisory Bodies may begin Wed, June 23 Council Session may begin Thur, June 24</p>	<p>Hilton Vancouver Washington 301 W. Sixth Street Vancouver, WA 98660 USA Phone: 360-993-4500</p>	<p>One-day Groundfish Subcommittee Session Mon, June 21 Two-day SSC Session Tue, June 22 – Wed, June 23</p>	<p>Adopt Northern Anchovy Assessment CPS Methodology Review GF Impact Analysis Methodology Review Adopt GF Stock Assessments Adopt Plan for 2023-24 Biennial Spex</p>