Draft SSC Report February 2022

Balance of SSC Report

SSC Leadership Election

- The SSC re-elected Sherri Dressel (ADF&G) and elected Franz Mueter (University of Alaska Fairbanks) as co-chairs for 2022
- The SSC also re-elected Alison Whitman (ODFW) as vice chair

General SSC Comments

- The SSC extends a warm welcome to new members Dr. Kailin Kroetz (Arizona State University) and Dr. Robert Foy (AFSC)

SSC Administrative Discussion

SSC Handbook Changes

- Revisions presented to the SSC included language added to clarify when SSC members should recuse themselves (pg. 4) and updated links in the reference section (pg. 14).

- The SSC is *supportive* of these changes and additions.

- When the Council reviews its SOPPs, the SSC refers to its recommendation from February 2021 regarding the description of SSC membership.

  - The SSC suggests changing "sociology" to "anthropology/sociology"

SSC Administrative Discussion

Reflections on Council Process and Ideas for Change

- The SSC *reviewed* the "Reflections on Council process and Ideas for change staff discussion paper and had limited discussion

- Ideas noted had support from one or more SSC members but don't necessarily represent a consensus

SSC Administrative Discussion

Reflections on Council Process and Ideas for Change

- *1. Reduce the number of annual Council meetings from 5 to 4, and drop the February meeting*

  - Some SSC members expressed support for this but others expressed concern due to the time-sensitive nature of issues and how to fit the current workload into fewer meetings

  - Some SSC members expressed support for continuing the February workshops even if number of meetings is reduced

SSC Administrative Discussion

Reflections on Council Process and Ideas for Change

- *2.   Create a schedule that makes 1-2 meetings per year virtual and the remaining meetings in-person*

    o SSC members did not address this directly but noted the value of in-person meetings.

    o A virtual option for attending SSC meetings might alleviate the SSC workload by allowing for a greater distribution among members when some members can not attend in person

SSC Administrative Discussion

Reflections on Council Process and Ideas for Change

- *4. Change the timing of the October meeting to avoid government shutdowns*

    o The SSC acknowledged the desire to avoid the impacts of holding a meeting during a time of potential government shutdown

    o The SSC noted the excessive amount of time required to develop and operate under multiple schedules

    o SSC members also questioned whether such excessive efforts should be made in an attempt to do an impossible task, but whether we need to accept that we may not be able to continue or reschedule a meeting

SSC Administrative Discussion

Reflections on Council Process and Ideas for Change

- *5. Reevaluate the timing of crab and groundfish harvest specifications in light of fishery needs and stock prioritization*

  o The SSC supported reevaluating the timing of harvest specifications for a number of reasons

    ■ Tight timelines, inability to include some survey data/modeling methods, inability in some cases to obtain reasonable model runs, excessive workloads, limited meeting time

  o One SSC idea to streamline specifications was to consolidate the preliminary model reviews for groundfish into the June (or earlier) SSC meeting

SSC Administrative Discussion

Reflections on Council Process and Ideas for Change

- *12.   Changes to the nomination/reappointment process for the SSC – timing, recruitment, soliciting SSC input*

  o   The SSC supported being able to share recommendations to the Council as to areas of needed expertise

SSC Administrative Discussion

Reflections on Council Process and Ideas for Change

- *13. Consider how to reduce SSC workload*

  - The SSC appreciated consideration of the SSC workload

  - Some members suggested limiting non-action agenda items

  - Others felt that many non-action items were critical to the role of the SSC as the Council's scientific review body

  - SSC members suggested reducing the peer review role, such as with more CIE reviews, might allow for focus on strategic discussions and setting harvest specifications

  - However, other members were concerned to reduce the SSC's focus on peer review, noting value of timeliness of review, institutional knowledge of PTs and SSC, the need for transparency

B1 Plan Team Nomination

- The SSC reviewed the nomination of Danielle Dickson (NPRB) to the Bering Sea Fishery Ecosystem Plan Team.

- The SSC *finds* Ms. Dickson to be well qualified and recommends that the Council approve her nomination.

C2 BSAI Crab

- The SSC supports the CPT general recommendations that
  - all stock assessments include results from the currently accepted model with new data (base model) so that changes in model performance can be assessed.
  - management-related quantities for all models that may be recommended by the CPT or SSC also be available.

C2 BSAI Crab - Harvest Specifications

<u>Norton Sound Red King Crab</u>

- The SSC *agrees* with the CPT and author recommended Tier 4 and Model 21.0

- The SSC *supports* the CPT recommended OFL and ABC (single natural mortality rate = 0.18)

- Results from this model indicate that the stock is not overfished and overfishing did not occur in 2021/2022

- SSC *supports* the CPT recommended 40% ABC buffer (same as last year) and appreciates CPT summary of buffer considerations

  - positive retrospective pattern, 2020 survey data still not well fit, summer fishery did not operate for 2nd year, natural mortality uncertainty

C2 BSAI Crab - Harvest Specifications

Norton Sound Red King Crab

The SSC *supports* the list of CPT recommendations and emphasizes the following:

- Estimation of discards has not been fully resolved. Continues as a priority

- Better understand biological context for natural mortality in model

- Explore length-dependent Tier 4 harvest specifications

- Continued work to resolve parameter estimates hitting the bounds

C2 BSAI Crab - Harvest Specifications

Norton Sound Red King Crab

The SSC **supports** the list of CPT recommendations and emphasizes the following: (cont.)

- Work directly with the biological scientists to better justify how the transition size matrix, informed by tagging data, informs the molting probability function

- Continued work towards using a GMACS and exploring the value of using VAST for assessing survey data

C2 BSAI Crab - CPT Report

<u>AIGKC Model Runs</u>

- The SSC reviewed CPT proposed assessment models for Aleutian Islands golden king crab, for the May 2022 CPT meeting

- The SSC *endorses* the five CPT recommended models

- The SSC *supports* CPT recommendation to include GMACS versions of these EAG and WAG models to AIGKC SAFE if ready

- The SSC *concurs* with CPT recommendations for additional work on
  - CPUE Standardization and year:area interaction
  - Utility of Aleutian Islands trawl survey
  - Revision size-at-maturity value

C2 BSAI Crab - CPT Report

<u>AIGKC Model Runs</u>

- The SSC *recommends* authors provide a biological rationale for change in size-at-maturity and a rationale for which years used to determine maturity

- The SSC *concerned* about continued retrospective pattern in the EAG model

- The SSC *recommends* authors examine the catchability parameters, which are about half as large in the EAG as in the WAG

- The SSC *requests* rationale for continued use of 1987-2016 for average recruitment given recent changes in environmental conditions

- The SSC *reiterates* previous recommendation to explore single model with shared parameters for the two areas, after addressing CPT priorities (e.g., transition to GMACS)

C2 BSAI Crab - CPT Report

<u>Survey Updates - BBRKC resampling</u>

- The SSC *concurs* with CPT recommendations:
  - o Clarifying the goals of resampling
  - o Consideration of standardization of station selection
- The SSC *suggests*
  - ○ crab movement relative to temperature should be considered when a threshold is determined
  - ○ exploring potential drivers in addition to temperature on timing of the molt-mate cycle
  - ○ examining temperatures prior to survey Leg-1 as predictor of state of embryos during survey
- The SSC looks forward to updates and opportunity to weigh in on recommended changes to protocol

C2 BSAI Crab - CPT Report

Survey Updates - St. Matthew and Pribilof Islands corner stations

- The SSC received summary of examination of impact of dropping St. Matthew and Pribilof Islands corner stations on survey abundance estimates

- The SSC *appreciates* need to look for cost-saving efficiencies

- The SSC *shares* CPT concerns about survey reduction and comparability over time

- The SSC *supports* CPT recommendation to extend analysis to size compositions and stock assessments

C2 BSAI Crab - CPT Report

<u>Updates to TORs</u>

- The SSC *supports* CPT proposed changes to the terms of reference for BSAI crab SAFE chapters, including clarification and standardization of summary tables

- The SSC *encourages* coordination with GPTs for consistent, standardized, and reproducible documentation

- The SSC *recommends*
  - executive summary of SAFE provide author recommended model
  - BSAI SAFE intro provide CPT recommended model noting if it differs from author
  - CPT minutes include deliberations at the CPT meeting

C2 BSAI Crab - CPT Report

<u>Modeling Workshop</u>

- The SSC *appreciates* continued efforts to improve GMACS
  - o Merging base code and terminally molting branch
  - o Improvements to projection model
  - o Updating/improving documentation and visualizations
- The SSC *encouraged* by progress in transitioning stock assessments to GMACS
- The SSC *supports* similar workshops in future
  - o Opportunity to make significant progress in short time

C2/C3 Snow crab modelling

- The SSC received an update on snow crab modelling work in preparation for the 2022 assessment.

- The SSC *supports* the transition to the GMACS platform after additional bridging work this spring.

- The SSC *recommends* development of a VAST model to include data from the northern Bering Sea. Would allow exploration of:
  - time variation in spatial distribution
  - potential covariates

- The SSC *suggests* outreach to harvesters in order to allow local knowledge on 2021/22 stock dynamics and distribution to aid in structuring further work.

C2/C3 Snow crab modelling

- The SSC *highlights* that it will be important to have a sufficient range of models to consider in June that represent different hypotheses:
  - crab movement and/or
  - crab mortality
- The SSC *recognizes* the 2021 snow crab assessment identified a high degree of sensitivity of management outputs to the estimated fishery selectivity relative to the maturity schedule.
- The SSC *recommends*
  - authors focus on best representing the biology of the species and the selectivity of the fishery in modeled population dynamics
  - how resulting population dynamics impact harvest specifications through the tier system should be addressed separately

C2/C3 Snow crab rebuilding

- The SSC received a progress report on the development of a rebuilding plan.

- The SSC *supports* inclusion of several time-periods for recruitment, and hypotheses for natural mortality be included
  - specifically recruitment periods of status quo (1982-2020), 1989-2020, each with and without continued high M
  - whether to include high 2014 recruitment in equilibrium recruitment
  - whether to include recruitment after 2013

- For each alternative SSC also *supports* inclusion of alternative projections of fishing mortality, including: no fishing mortality, bycatch only, an approximation to the state harvest control rule and others as necessary.

- The SSC *notes* that the 2022 trawl data may be very important in

C2/C3 Snow crab rebuilding

- The SSC *recommends* each alternative include specific hypothesis/rationale for why they may be appropriate to consider for the rebuilding plan

- The SSC *recommends* each alternative use consistent assumption (i.e. M and recruitment) for population trajectory and reference points

- The SSC *recommends* inclusion of uncertainty (including covariance) in time series estimates of MMB and B_{MSY} calculation

- The SSC *notes* that the 2022 trawl data may be very important in structuring the assessment and rebuilding analysis and recognizes that updates may be needed in the fall.

D4 Trawl Electronic Monitoring

- SSC-only preliminary review for pollock EM in the GOA and BSAI
  - First of its kind for NPFMC, using EM for compliance to verify logbooks, rather than for estimating catch and discards
  - Implementation targeted for 2024
  - A great model of collaborative work
- The SSC *found* the presentation and document laid out a solid foundation for the initial analysis and represent a great collaborative effort with industry

D4 Trawl Electronic Monitoring

- The SSC *suggestions* for initial review
  - Document the process of the collaborations with industry and other agencies to serve as a model for future collaborations
  - Provide scenarios of how any freed up monitoring resources would be reallocated
  - An overview of what the sector could potentially target, given the relaxations of MRAs
  - Pollock assessment authors be consulted to ensure current or future analyses are not negatively impacted
  - Provide details on how catches and biological data could be assigned to trip or haul-level information when catches from multiple CVs are mixed on tenders, or how pooled data can be tracked and analyzed appropriately

D4 Trawl Electronic Monitoring

- The SSC *suggestions* for initial review (cont.)
  - o Confirm that this program will not result in a loss of overall specimens and biological samples, particularly in the GOA
  - o Evaluate the potential for large shifts in discard estimates during the year within CAS as compliance monitoring is completed on video
  - o More detailed examples of how calculation of PSC, discards and other quantities have/will change when catches from multiple CVs are mixed on tenders
  - o Consider a formal direct mechanism for gathering feedback from captains, fleet, and processors

D5 Essential Fish Habitat

Species Distribution Models

- The SSC reviewed a report on Advancing Essential Fish Habitat (EFH) descriptions and maps for the 2022 5-yr review.

- The SSC *finds* that this work represents an impressive and substantial improvement of EFH descriptions compared to the previous review.
  - EFH defined for many more species with up to 3 life stages
  - Advancement from EFH level 1 (presence/absence) to Level 2 (abundance-based) definitions for most species/stages and Level 3 (based on growth/condition) for some juvenile stages.
  - Ensemble approach using weighted averages across a set of five models greatly improved model performance.
  - Model uncertainty was quantified and mapped (CV)

D5 Essential Fish Habitat

Species Distribution Models

- The SSC *finds* that for a large majority of species/stages, EFH descriptions reflect best available science to describe summer habitat.
- The SSC *finds* that in some cases, species distribution models resulted in a poor representation of EFH due to data inadequacies
  - species / stages that extend well beyond the survey area, or
  - species / stages that occupy habitats inaccessible to survey gears
- The SSC *finds* that in these cases, by themselves, the EFH maps for these species and life stages do not provide a sufficient basis for assessing adverse fishing effects
- The SSC *requests* that in these cases the limitations of the data are clearly highlighted and communicated to other analysts and to the public.

D5 Essential Fish Habitat

- The SSC *finds* that additional information will need to be considered when determining fishing impacts for species and life stage combinations that are poorly represented by summer survey data, because using the maps alone will not result in reliable indicators of overall fishing impacts

- The SSC heard from analysts that changing SDMs was not possible under the proposed timeline due to resource limitations

- The SSC *recommends* that, to the extent possible, EFH maps be updated with additional information before using FE models to determine fishing impacts for species where stock assessment authors had substantial concerns.

D5 Essential Fish Habitat

<u>Species Distribution Models</u>

- For species where stock authors have low confidence in EFH maps
  - the SSC *requests* that the SDM team work directly with stock authors to provide a summary table to evaluate the species against at least three criteria: survey reliability, seasonal representativeness, spatial representativeness
  - If these criteria are not met, the EFH map and text description should be flagged as being potentially unreliable or only reliable as indicators of limited summer distributions

<u>Fishing Effects Model</u>

  - In cases where SDM-derived EFH definitions are unreliable or potentially unreliable, the question of whether to elevate a species for possible mitigation should be based on other sources of information.

D5 Essential Fish Habitat

<u>Species Distribution Models</u>

- To better communicate uncertainties about overall reliability of EFH descriptions to the public, the SSC *suggests* that summary tables of model performance include a plain language reliability score (qualitative) based on performance criteria and any identified concerns.

- The SSC *emphasizes* the tremendous value of EFH products well beyond meeting MSA mandates.
  - Research on habitat changes & climate change impacts
  - Use of habitat information to improve stock assessments

- The SSC *recommends* that information on current and future uses be collected to help inform the next 5-yr review and to share EFH products more effectively and broadly to enhance their impact.

D5 Essential Fish Habitat

Species Distribution Models

- The SSC had a number of *recommendations* for developing the next EFH Research Plan and for a proposed EFH working group to consider:

  - adapt EFH definition to better use abundance information, e.g., EFH might encompass highest-density areas that cumulatively encompass 95% of the proportion of a species' abundance, rather than 95% of the total area occupied (current definition)

  - extend analyses to use fishery-dependent data, longline surveys, acoustic surveys, etc. to enhance summer maps and map distributions during other seasons, building on 2017 EFH descriptions

D5 Essential Fish Habitat

Species Distribution Models

- The SSC had a number of *recommendations* for developing the next EFH Research Plan and for a proposed EFH working group to consider (cont.):

  - select data from recent periods based on changing oceanographic conditions to better reflect current extent of potential habitat.

  - extend analyses to consider dynamic EFH descriptions that map EFH under contrasting conditions for species whose distribution is known to be linked to changing ocean condition (e.g. temperature)

  - consider mapping EFH by management area for separate stocks within an FMP area (e.g., red king crab)

  - consider additional technical recommendations.

D5 Essential Fish Habitat

<u>Fishing Effects Model</u>

- SSC received a presentation on the Fishing Effects (FE) model from AKRO and Alaska Pacific University staff

- The SSC ***finds*** the document adequate for understanding the structure, development and data inputs forming the FE model

- The SSC ***supports*** the current version of the FE model for analysis of fishing impacts for the 2022 5-year EFH review cycle, after addressing SSC suggestions as practicable

D5 Essential Fish Habitat

Fishing Effects Model

- The SSC *supports* the current method of averaging recovery time across habitat features
  - given the absence of specific methods or information for a priori assignment of the relative value (e.g., weighting) of habitat features
- The SSC *requests* expanded descriptions of, and justifications for the assumed recovery times
- The SSC *requests* an expanded description of the origin of assumed values for fishing gear nominal width, bottom contact adjustment, and the susceptibility of different habitat features
- The SSC *recommends* that authors work with AKRO personnel to determine if fishery definitions are complete

D5 Essential Fish Habitat

<u>Fishing Effects Model</u>

- The SSC *supports* the decision to base values for habitat feature susceptibility to fishing gear and recovery time on the Grabowski et al. (2014) global synthesis
  - However, SSC *supports* use of data specific to the North Pacific to the extent possible including forthcoming results from the 2020-2024 Alaska Deep-Sea Coral and Sponge Initiative and NMFS survey products

D5 Essential Fish Habitat

<u>Fishing Effects Model</u>

- The SSC *recommends* adding a map and/or table showing the extent of unobserved groundfish and halibut fishing relative to observed fishing for recent years

- The SSC *recommends*, to the extent possible, the authors should provide a qualitative discussion about how gaps in coverage may influence FE outputs.

- The SSC *recommends* that impact metrics not be aggregated to the North Pacific scale because that the proportion of observed fishing events varies across regions

D5 Essential Fish Habitat

Fishing Effects Model

- The SSC *notes* that for groundfish species in Tier 4 and below there is not available definition for MSST and suggests that species analysis of core habitat disturbance should not depend on biomass relative to reference points

- For future EFH reviews:
  - The SSC *recommends* inclusion of unobserved fishing events or development of a multiplier for observed fishing events to expand cumulative impact estimates
  - The SSC *recommends* review of the FE model by the Center for Independent Experts (may include model structure, parameter assumptions, data inputs)

D6 Marine Mammal Updates

- The SSC has received marine mammal updates since 2017.
- The SSC *finds* these reports valuable as new, fishery-relevant information and broad perspectives for the Council's strategic and ecosystem-based fishery management efforts
- In addition to presentations from the Marine Mammal Lab (NMFS), new information this year was presented from AKRO-PRD on broad direct and indirect interactions with fisheries, UAF researchers on monitoring mercury in Aleutian Island food webs, and USFWS on walrus.

D6 Marine Mammal Updates

<u>Direct and Indirect Interactions with Fisheries</u>

- AKRO-PRD highlighted outreach efforts targeting the fishing sector to minimize interactions with marine mammals.

- For many species, presently there are minimal direct interactions with fisheries; for some species it was noted that interactions may increase in the future as fisheries move north in concert with changes in water temperatures.

- The SSC is *supportive* of the upcoming virtual workshop AKRO-PRD is hosting regionally (Alaska) and nationally on effective methods of deterring marine mammal interactions with fishing operations.

D6 Marine Mammal Updates

Direct and Indirect Interactions with Fisheries

- MML is identifying killer whale stocks involved in depredation of catch from fishing gear and the temporal/spatial scope of those interactions.

- AFSC is also currently re-estimating depredation rates from sperm whales using existing data.

- The SSC looks forward to hearing the results of those analyses and ***noted*** that it would be informative to know how depredation is changing over time, including spatial changes in occurrence.

D6 Marine Mammal Updates

Ecosystem Links

- The SSC received a report on a study of mercury in the Aleutian Island food webs (designated as "Noteworthy" in the 2021 AI ESR)

- Relatively high total mercury concentrations have been observed in the western Aleutian Islands in both Steller sea lions and fish.

- Several ongoing, and planned projects including SSL diet modeling, quantifying mercury concentrations in invertebrates, and temporal and spatial patterns of mercury in fish

- The SSC continues to **strongly support** efforts that take integrative approaches to studying this ecosystem, and **encourages** further efforts toward co-production of information, outreach, and the dissemination of research results to local communities, especially for those with potential human health implications.

D6 Marine Mammal Updates

Population Trends and Distributions

- The SSC received current population trend updates for a number of species and information on survey timing.

- Steller sea lions: in 2021 surveys non-pup counts were increasing and pup numbers were constant in the Eastern and Central Gulf of Alaska. Surveys are planned for 2022 in the Aleutian Islands

- Northern fur seals: Surveys were conducted in 2021, though limited in scope, and showed a 3.84% decline over 3 years on St. Paul Island (2018-2021).

D6 Marine Mammal Updates

Population Trends and Distributions

- <u>Whales</u>: Abundance estimates for sperm whales (for a small part of their range) are expected to be updated in 2023. Abundance estimates of the Alaska resident stock of killer whales will be updated and available for public comment this spring, 2022. Cook Inlet Belugas were surveyed in 2021.

- <u>Walrus</u>: Walrus populations are currently considered robust, and population stressors low. Stressors are expected to increase into the future, and a decline is expected over time.

- The SSC *supports* efforts, across species, to incorporate new technology to improve population monitoring.

D7 Economic SAFEs

- The SSC *recognizes* the high quality of ongoing work to provide clear and consistent data summaries/analyses to address economic conditions
- The Groundfish SAFE continues to evolve nicely and is a useful, accessible reference for the economic status of groundfish fisheries.
- The Crab SAFE also provides important information on the economic status of the crab fisheries.
  - The SSC *supports* continuing efforts to increase the accessibility of the document and consistency with the Groundfish SAFE.
  - The draft dashboard indices will be a useful addition.

D7 Economic SAFEs

- The SSC *found* both SAFEs provided useful information related to COVID impacts and *recommends* developing a COVID effects narrative that is carried forward in the SAFEs
- The SSC expressed concern over dropping the Amendment 91 EDR data from the report
  - Recognize data collected have limitations
  - Important for transparency to summarize for the public what has been collected
  - Possible to present data and highlight limitations of what data does/does not show

D7 Economic SAFEs

- October 2021 - The SSC *acknowledged* the outstanding work that has been done to date in relation to the collection and use of social and economic data and indicators to address NS2 and NS8 (among others) in:

  - Annual community engagement and participation overview (ACEPO)
  - Ecosystem and Socioeconomic Profiles (ESPs)
  - Ecosystem Status Reports (ESRs)
  - Risk tables
  - Climate and Fisheries Initiative (CFI)

- October/December 2021 - the SSC *suggested* it may be prudent to undertake a review of how socioeconomic information is incorporated across the range of evolving Council decision-informing products to facilitate efficient reporting, future indicator development, and reduce staff burden.

D7 Economic SAFEs

- The SSC *recommends* continued discussions around the appropriate vehicle(s) for and timing of publication of related social conditions information to ensure a holistic view of socioeconomic conditions is available to the Council within the SAFE process as outlined in the National Standard 2 guidelines.
    - The lack of concurrence in timing between the release of the SAFEs and ACEPO was noted as a potential concern.
    - The SSC *recommends* consideration of revision of the timing of document release and, at least in the interim, inclusion of a few paragraphs at the beginning of each SAFE to cross-reference the availability of information in ACEPO and a brief summary of social and community status therein during future presentations.