

Draft SSC Report June 2020



General SSC Comments

- Review of NMFS-HQ policy directive on stock status determination
- Subgroup of the SSC was formed to review the document by late June



B1 Plan Team Nominations

- The SSC reviewed the nominations of
 - Erin Fedewa (NOAA-AFSC) to the BSAI Crab Plan Team
 - Kate Haapala (NPFMC) and Scott Miller (NOAA-AKRO) to the Social Science Planning Team
- The SSC *finds* the nominees to be well-qualified and *recommends* the Council approve their nominations.



B3 AFSC Report - Surveys

- Dr. Bob Foy (NOAA-AFSC) reported that five of six large-scale assessment surveys are cancelled in 2020 owing to uncertainties surrounding the pandemic:
 - Trawl surveys – EBS, northern Bering Sea, and Aleutian Islands
 - Bering Sea pollock acoustic survey, and
 - Fall ecosystem survey
- The following assessment survey will occur:
 - GOA-AI longline survey
- In addition:
 - Saildrone mission to collect acoustic data on pollock biomass in the EBS



B3 AFSC Report - Surveys

- The SSC *notes*:
 - Loss of surveys will likely increase uncertainty in stock status and projections that may necessitate larger buffers for between OFLs and ABCs
 - Groundfish and shellfish assessments in the BSAI, especially for short-lived species and species without an ASA, are most affected
- Dr. Foy pointed out difficult questions to be answered for 2021, such as:
 - Should the GOA or AI or both be surveyed next year?
 - If the GOA is surveyed, should a 3rd vessel be included or should the NBS be surveyed instead?
- Dr. Foy seeks SSC recommendations to set survey priorities



B3 AFSC Report - Surveys

- The SSC *welcomes* an opportunity to help set survey priorities. Following the procedure used in 2018, the SSC *recommends*:
 - Workshop including public participation to be held in August
 - Coordination between NMFS and NPFMC
 - Motivating questions and scenarios to be developed by Dr. Foy
 - Involvement of appropriate survey scientists including reports of recent research on survey prioritization (e.g., Kotwicky et al., ICES Workshop)
 - SSC subcommittee to draft advice for full SSC consideration in October
- Finally, the SSC *recommends* NMFS to consider how this situation can be treated as a learning experience to increase agency resilience in the future



B3 AFSC Report – Ecosystem & Socioeconomic Profiles (ESPs)

- Dr. Kalei Shotwell (NMFS) reported on progress of ESPs
- An ESP is a framework that facilitates the integration of ecosystem and socioeconomic factors within the stock assessment process
- Reported as appendices to stock assessments in SAFE reports
- ESPs may inform fishery management in three ways:
 - **Risk** – contextual information about uncertainties not in the model
 - **Rebuilding** – indicators of productivity regimes for rebuilding plans
 - **Readiness** – tools to evaluate and be prepared for unforeseen changes
- The SSC **thanks** Dr. Shotwell and colleagues for outstanding efforts
- The SSC **supports** plans for further ESP development and evaluation



B3 AFSC Report – Ecosystem & Socioeconomic Profiles (ESPs)

- Given that ESPs are a commitment to a process not a static product, the SSC *recommends:*
 - Consideration be given to the regularity (and timing) of reviews and revisions
 - This effort should not stop with ecosystem indicators
 - Work towards formally incorporating into SAFEs to achieve ecosystem-linked stock assessments for use in fishery management



C1 Scallop SAFE and Harvest Specifications

- A full assessment conducted
- Scallop stock status is unknown (no stock size and MSST)
- Overfishing did not occur in 2018/19
- The SSC **recommends** setting OFL for the 2020/21 season equal to max OY (582 t, 1.284 million lb) and ABC at 524 t (1.156 million lb, 90% OFL), consistent with the scallop FMP
- Survey effort covers only 2 of 9 fished beds, but these beds account for the majority of fishery landings
- The SSC notes that the recent hire of an ADF&G Biometrician has yielded several improvements to the assessment this cycle and looks forward to seeing future improvements
- To facilitate these improvements the SSC **recommends** that SAFE updates be delivered as executive summaries only in alternate years



C2 BSAI Crab

- Specifications for Aleutian Islands golden king crab (AIGKC), Pribilof Islands golden king crab (PIGKC), and Western Aleutian Islands red king crab (WAIRKC)
- Model reviews for September/October
 - Bristol Bay red king crab (BBRKC)
 - EBS Tanner
 - EBS snow
 - St. Matthew Island blue king crab (SMBKC)
- Other issues from Crab Plan Team Report



C2 BSAI Crab Harvest Specifications

Aleutian Islands Golden King Crab (AIGKC)

- Male-only, length-based stock assessment model based on fishery data
- Single OFL and ABC, but separate models for eastern (EAG) and western (WAG) stock components.
- The SSC ***supports*** the Plan Team recommended model (20.1b) for harvest specifications (last year's model updated with 2018/19 and 2019/20 data and new error structure for CPUE)
- The SSC ***agrees*** with Tier 3 status for AIGKC, the Plan Team recommended OFL (4,798 t, 10.579 million lb) and ABC (3,599 t, 7.934 million lb), and 25% buffer because of retrospective patterns, model stability, and recruitment regime
- SSC ***recommended*** exploration of a one-area model or more justification for the two separate area models



C2 BSAI Crab Harvest Specifications

Pribilof Islands Golden King Crab

- Full assessment (triennial)
- SSC **recommends** a Tier 5 assessment based on average catch (1993-1998 reference period), in agreement with CPT
- Catch is confidential
- Overfishing did not occur in 2017, 2018, 2019
- No assessment of stock biomass (no overfished determination)
- SSC **supports** the CPT recommended specifications and 25% ABC buffer
 - Buffer is unchanged from recent assessments
 - OFL (93 t, 0.20 million lb) and ABC (70 t, 0.15 million lb) for 2021, 2022, and 2023



C2 BSAI Crab Harvest Specifications

Pribilof Islands Golden King Crab

- The SSC **recommends** continued development of a Random Effects (RE) model using the slope survey MMB estimates
- The SSC **recommends** the assessment remain on a triennial schedule
- For the next assessment in 2023, the SSC requested three model runs:
 - Tier 5 assessment
 - Tier 4 assessment using a RE model
 - Tier 5 assessment using Tier 4 methods (e.g., survey reference period and $F=M$)
- SSC notes the slope survey could be informative to this stock, but its future is unknown, which complicates its use for a Tier 4 assessment



C2 BSAI Crab Harvest Specifications

Western Aleutian Islands Red King Crab

- Full assessment (triennial)
- Overfishing did not occur in 2017/18, 2018/19, 2019/20
- No current information on stock biomass (no overfished determination)
- The SSC **recommends** Tier 5 assessment using status quo methods
 - Agreement with author and CPT
 - OFL (56 t; 123,867 lb) and ABC (14 t; 30,967 lb) for 2020/21, 2021/22, 2022/23
- 75% buffer ABC
 - depressed status of stock
 - lack of stock information



C2 BSAI Crab

Model Runs for September - General Advice

- There was much discussion about whether the 2020 survey cancellations should prompt changes in the overall 2020 assessment tactical plan
 - e.g., is it more useful to conduct analysis on the effect of loss of survey data rather than, or in addition to, presenting new assessment models?
- SSC provided specific advice for crab model runs
- In addition, the SSC co-chairs will discuss this topic with CPT and GPT co-chairs to determine whether specific tactical advice might be provided to stock assessment authors in time for the fall assessments. This advice could apply to both crab and groundfish and may provide further guidance beyond the crab-specific advice provided by the SSC here.



C2 BSAI Crab

Model Runs for September - General Advice

- Following CPT co-chair Dr. Martin Dorn's suggestions, the SSC provides general advice to assessment authors regarding fall 2020 models:
 - Base model (last year's model with updated catch, fishery size compositions, bycatch)
 - Base model with sensitivity to addition of new data (catch, size compositions)
 - Base model with sensitivity to loss of 2020 survey data
 - CPT preferred model from May 2020
 - Another model alternative that shows promise (if time allows)



C2 BSAI Crab

Model Runs for September - General Advice

- To support the OFL/ABC recommendations in fall 2020, the SSC requests:
 - Usual diagnostics for base and alternative model runs
 - Recommendations for model choice including justification
 - Consideration of effects of additional uncertainty (e.g., ABC buffer size)



C2 BSAI Crab

Model Runs for September - BBRKC

- Eight scenarios were considered that address the way that natural mortality, selectivity, catchability and the use of VAST estimates are modeled
- The SSC *supports* CPT recommendations:
 - Base model (Model 19.0a)
 - Model 19.3 as the preferred alternative (estimates sex-specific survey selectivity)
 - If time allows, develop an additional model from 19.3 in which the prior on catchability is relaxed and estimated separately by sex (and revisited in light of the catchability implied by the BSFRF data)



C2 BSAI Crab

Model Runs for September - EBS Tanner crab

- Nine model scenarios explored including alternatives that consider dropping pre-1982 biomass and size composition, use of cubic splines, use of VAST estimates, and exploration of different ways to include BSRF side-by-side survey data
- The SSC appreciates the assessment author's responses to CPT and SSC comments. However, several issues have not yet been addressed:
 - Models be reparameterized, simplified, or have parameter bounds adjusted such that no parameters remain at the bounds after estimation
 - Provide additional information on data weighting
 - Responses are pending on several other requests



C2 BSAI Crab

Model Runs for September - EBS Tanner crab

- The SSC *supports* CPT recommendations:
 - Model 19.03 – Base model
 - Model 20.07 – among models using BSFRF side-by-side data, this was the most robust and makes best use of available data
 - Model 20.07b – modification of Model 20.07 in which the empirical availability curves are input as data vectors with specified uncertainty rather than assumed to be known (if time allows)



C2 BSAI Crab

Model Runs for September - EBS snow crab

- Successful transition of assessment to GMACS
 - New option for terminal molt (for snow and Tanner crab)
 - GMACS models produce converged fits to the growth data
 - GMACS models fit both NMFS and BSFRF survey data better than does the status quo model
- The SSC *supports* CPT recommendations:
 - Base model – status quo
 - “free q” GMACS model
 - “prior q” GMACS model



C2 BSAI Crab

Model Runs for September - SMBKC

- Three-stage, length-based, male-only model has been modeled in GMACS since 2016
- The authors investigated five model scenarios with mixed results. For instance, two models fit the NMFS trawl survey better and the ADF&G pot survey worse than the base model.
- The SSC *supports* CPT recommendations:
- Model 16.0 (2019 reference model)
- Three exploratory (research) models:
 - Model 19.1 using VAST given high variance at one survey station
 - A model with a random walk in pot survey catchability
 - Model 16.0 without ADF&G pot survey data



C2 BSAI Crab

Plan Team Report - Other Topics

- Summer Trawl Surveys
 - The SSC **acknowledges** challenges with loss of survey data.
 - The SSC **recommends** authors explore and report how missing data affect assessments, Tier status and buffers.
- GMACS (Generalized Modeling for Alaskan Crab Stocks)
 - The SSC **supports** CPT prioritized future developments (e.g. retrospective analysis, estimating S/R relationship internally)
 - The SSC **recommends** side-by-side comparisons with current models be reported.



C2 BSAI Crab

Plan Team Report - Other Topics

- VAST models (spatial temporal models)
 - The SSC ***supports*** continued work on VAST
 - Land barriers
 - Development and standard reporting of diagnostics
 - The SSC ***recommends*** developing standardize reporting format and continued collaborations in development and application
- BSFRF survey selectivity
 - The SSC ***recommends*** authors and CPT continue to explore these data to ensure they are fully utilized
 - The SSC ***recommends*** continued analysis of these data and looks forward to reviewing future results



C2 BSAI Crab

Plan Team Report - Other Topics

- Ecosystem and Socioeconomic Profile (ESP) for BBRKC
 - The SSC **supports** incorporation of the ESP into the SAFE and **recommends** review of the economic SAFE and relevant Ecosystem Status Reports to ensure complementary socioeconomic information is provided in each document and to reduce duplication
- Crab PSC
 - Initial review (October 2020) to reduce crab PSC in all fisheries when directed crab fisheries are closed
 - The SSC **supports** detailed examination of factors determining current PSC limits and looks forward to seeing the initial review



C2 BSAI Crab

Plan Team Report - Other Topics

- Board of Fisheries update on Proposal 261
 - Harvest strategy for EBS Tanner crab
 - ADF&G, UW, Natural Resource Consultants, BSFRF, and NMFS
 - The SSC *finds* that the MSE was broadly collaborative and well executed and *supports* a similar approach for other crab stocks
- LK/TK and Climate Change Taskforce approach, NSRKC
 - The SSC *recommends* using 2020 as a relationship building year and waiting until 2021 to initiate concerted data collection



C4 Cook Inlet Salmon – Preliminary Review

- The SSC reviewed a preliminary EA/RIR for a court-ordered action to include the UCI driftnet salmon fishery (EEZ) in the salmon FMP
- The SSC *finds* the preliminary EA and RIR sufficiently summarize the marine environment, the UCI salmon fishery, other affected fisheries, and the communities that could be impacted by the Alternatives.
- The SSC *recommends* that the description of the Alternatives, once finalized, be improved to help the public better understand differences among alternatives.



C4 Cook Inlet Salmon – Preliminary Review

- The SSC *suggests* additions to aid comparisons among alternatives:
 - An overview table comparing the main elements and options between Alternatives 2 and 3
 - An infographic that shows the overall decision-making process, with key decision points tied to the relevant management body and highlighting the type of information being used in the decision
- The SSC *suggests* a stronger rationale for, or alternatives to, defining MSY based on the lower limit of escapement goal ranges, which appears much less conservative, and possibly riskier, than MSY-based control rules in other FMPs, but may be justifiable given the unique characteristics of salmon life history and management



C4 Cook Inlet Salmon – Preliminary Review

- The SSC *requests* an opportunity to review State management and escapement goal determinations prior to setting salmon ABCs as required under a new process
- The SSC *recommends* clarification of the level of catch accounting required under each Alternative to meet minimum MSA requirements
- The SSC *notes* that the analysis of impacts from the alternatives will be challenging, as it is hard to predict how they will impact the regulatory operations of the fishery in the EEZ, and in turn, how the industry, Board of Fisheries, and ADF&G will respond to these changes



D1 Observer program update

- The SSC received an update of the Fisheries Monitoring and Analysis Division's response to the COVID-19 pandemic
- The SSC *appreciates and supports* the agency approach to the protection of lives and livelihoods
- The SSC *finds* the agency adapted the fishery-dependent data collection enterprise to these unprecedented conditions
- The SSC *recommends* that the costs and benefits of remote training should be documented in the Annual Report to inform options for future training approaches
- The SSC *recommends* that a high priority is placed on quantifying the impacts of changes in observer and EM coverage, and these impacts should be communicated to assessment authors and fisheries managers



D2 Sablefish apportionment

- The SSC provided initial feedback and recommendations on methods and preliminary results. An expanded report and analysis are expected in October.
- The SSC *finds* that the model has potential which, after improvements, could be used to assess the implications of area apportionments of the ABC
- The SSC *recommends*:
 - An extended discussion on the conditioning of the operating model
 - A more realistic treatment of catch vs. ABC (especially for western areas)
 - Accounting for SSC adjustments to the coastwide ABC
 - Consideration of additional sources of variability, and two additional performance metrics (effort required to achieve the area ABC and variance in apportionment in each management area)



D2 Sablefish apportionment

- The SSC *noted* that high rates of non-directional movement and low fishing mortality rates suggest a low probability of localized depletion or stock-wide conservation concern
- However, the SSC *noted* that maintenance of spawning biomass across the full range of the species may still be biologically important given existing scientific uncertainties
- The SSC *noted* that a detailed social and economic analysis could be helpful in understanding the implications of alternative apportionment approaches



D2 Sablefish apportionment

- SSC **suggests** the Council consider requesting a complementary social and economic analysis
- The SSC **requests** guidance from the Council such that the SSC may guide the analysts in developing the appropriate degree of social and economic information to support subsequent results and discussion



D3 Essential Fish Habitat (EFH) Descriptions

- SSC reviewed proposed methods and products, and progress to date on the description and identification of EFH
- Reviewed analyses under development to define EFH in the GOA, BSAI, and Arctic for upcoming 2022 5-year review
- EFH regulations provide four levels of information to describe and identify EFH:
 - Level 1: Distribution
 - Level 2: Habitat-related densities
 - Level 3: Growth, reproduction, or survival rates within habitats
 - Level 4: Production rates by habitat



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D3 Essential Fish Habitat (EFH) Descriptions

- Four studies:
 - Advancing species distribution models (SDMs) for GOA/BSAI groundfish
 - Use of SDM to define EFH for Arctic and saffron cods and snow crab
 - ID of optimal thermal habitats for juvenile pollock (laboratory + SDM)
 - Biophysical life-stage integrated individual-based models for early life history stages of sablefish and Pacific cod



D3 Essential Fish Habitat Descriptions

- The SSC *supports* ongoing efforts to improve SDM methods.
- The SSC *recommends* consideration of alternative sources of information to describe and define EFH
- The SSC *supports* use of out-of-sample skill testing for comparing SDMs, but also *suggests* consideration of ensemble methods
- The SSC *requests* justification for selection of the ‘best’ model
- The SSC *supports* research to move toward Level 3 EFH (vital rates), with laboratory studies, SDM, and individual-based models
- The SSC *suggests* consideration of how we progress to a more dynamic definition of EFH (e.g., time blocks), given climate and species distribution changes.

