North Pacific Fishery Management Council

Simon Kinneen, Chair | David Witherell, Executive Director
1007 W. 3rd Avenue, Suite 400, Anchorage, AK 99501
Phone 907-271-2809 | www.npfmc.org

SCIENTIFIC AND STATISTICAL COMMITTEE
DRAFT REPORT TO THE
NORTH PACIFIC FISHERY MANAGEMENT COUNCIL
April 5th – 8th, 2021

The SSC met remotely from April 5th – 8th.

Members present were:

Anne Hollowed, Co-Chair *NOAA Fisheries – AFSC*	Sherri Dressel, Co-Chair *Alaska Dept. of Fish and Game*	Alison Whitman, Vice Chair *Oregon Dept. of Fish and Wildlife*
Milo Adkison *University of Alaska Fairbanks*	Chris Anderson *University of Washington*	Amy Bishop *University of Alaska Fairbanks*
Curry Cunningham *University of Alaska Fairbanks*	Mike Downs *Wislow Research*	Jason Gasper *NOAA Fisheries–Alaska Region*
Dana Hanselman *NOAA Fisheries—AFSC*	Brad Harris *Alaska Pacific University*	George Hunt *University of Washington*
Andrew Munro *Alaska Dept. of Fish and Game*	Matt Reimer *University of California, Davis*	Chris Siddon *Alaska Dept. of Fish and Game*
Ian Stewart *Intl. Pacific Halibut Commission*	Patrick Sullivan *Cornell University*	Tien-Shui Tsou *Washington Dept. of Fish and Wildlife*

SSC Administrative Discussion

Diana Evans (NPFMC) informed the SSC that the June 2021 SSC meeting will be held virtually. In recognition of the Memorial Day holiday, the meeting will start on Tuesday June 1 and will end on Friday June 4. She also informed the SSC that the October and December meetings could potentially be held in person. If one or both of these meetings are held in-person, the NPFMC requests that SSC members attend in-person.

Ms. Evans also reminded the SSC that we are hosting the seventh national meeting of the Scientific Coordination Subcommittee (SCS7) the week of August 9th, 2021 (virtually). Anne Hollowed noted that all SSC members are encouraged to participate and that key leads will be identified to represent the NPFMC. Proposed themes for this meeting are listed on the NPFMC April Agenda under item B1.

Ms. Evans also noted that requested edits to the SSC Handbook will be reviewed by the Council's Executive Committee during this meeting, after which the document will be finalized.

B-3 Seabird Status

The SSC received a presentation from Joe Krieger (NMFS-AKRO), and Elizabeth Labunski (USFWS) on seabird bycatch, recent die-offs and seabird monitoring efforts. There was no public testimony.

Bycatch

Seabirds are caught in fishing gear when the birds come close to vessels seeking food in the form of bait from longline operations or scraps from nets during retrieval. Seabird mortality from longline operations declined significantly with the introduction of Tory lines or streamers starting in 2001, and streamer regulations in 2004. Seabird mortality can be of conservation concern if high numbers of birds are killed, or if threatened or endangered species of seabirds, such as short-tailed albatross, are involved.

The present indications are that the numbers of bycaught seabirds in general, and albatrosses in particular, declined somewhat in 2020. As longline fisheries shift to pots to avoid whale depredation, there may be further decreases in seabird bycatch on longline gear. Two short-tailed albatrosses were killed in 2020, the first recorded bycaught since 2014. The take must not exceed six short-tailed albatrosses within a two-year period, or a consultation under Section-7 of the Endangered Species Act will result. **The SSC suggests that future presentations on seabirds include time series of short-tailed albatross population size and numbers caught,** as the numbers caught may be the result of an increasing albatross population.

There were also two threatened eiders bycaught: One was a Steller's eider in 2019 north of St. Lawrence Island, and the other, a spectacled eider in 2020 just north of False Pass. At least in the case of the Steller's eider, it was apparently attracted to a fishing vessel's lights at night. A new biological opinion completed in 2021 allows take of 25 spectacled eiders in a floating 4-year period, but only 3 Steller's eiders in a floating 3-year period. If these numbers are exceeded, a consultation under Section 7 will be required.

There was some evidence of increased seabird bycatch in years with large seabird mass mortality events. Further exploration of this pattern would be helpful to identify if mass mortality events are indicators of potential direct interactions with fisheries. The SSC noted that analysts should explore whether observers could record weights of bycaught birds to determine if emaciation is correlated with increased likelihood of seabird encounters with fishing vessels.

Deck Lights and Seabirds

The issue of the nighttime attraction of seabirds to vessel deck lights has not been of concern to the Council to date. However, it is known that high numbers of seabirds may die when they land on a well-lit vessel at night and cannot take flight from it. The issue becomes a concern to the Council when this involves endangered or threatened seabirds that are attracted to fishing vessels in the federal waters off Alaska. The 2021 biological opinion mentions that there will be a request for vessels to employ minimal deck lighting, within the limits of safety, to avoid attracting seabirds to fishing vessels at night. **The SSC requests that an effort be made by observers to record the date, time of day, general location, numbers, and species of seabirds landing on vessels.** The SSC expects that attraction of seabirds onto vessels at night is generally not a problem, except under limited circumstances. To minimize conflicts in the future, it would be helpful to identify when and where problems have occurred.

Shifts in Distribution/Abundance

The SSC received a report of shifts in seabird distributions recorded in the northern Bering Sea and Chukchi

Sea in the period 2017–2019. It is likely that these reflect changes in the availability of preferred prey. Several papers were recently published in a special volume of Deep-Sea Research II (vol. 181-182, December 2020) on the effects of reduced sea-ice cover on the northern Bering Sea ecosystem. Collectively, these papers show a major shift in the pelagic ecosystem in the warm years of 2018 and 2019, including changes in the distributions of commercially important fish. **The SSC supports continued efforts to place seabird observers on research vessels in the federal waters off Alaska**.

Mass Mortality Events/Beach-caste Seabirds

There were several major die-offs of seabirds in 2018 and 2019, but fewer birds dying in 2020. It is hypothesized that these die-offs have been the result of starvation, as beach-caste carcasses have been emaciated. In 2018, there was also a report of a beach-caste thick-billed murre on St. Lawrence Island that tested positive for an Asian strain of avian influenza. In 2018 and 2020, most beach-caste seabirds were encountered along the coasts of the Chirikov Basin and north into Kotzebue Sound. In 2019, not only were there many beach-caste birds in the north, but also high numbers were encountered in the Bristol Bay region.

Most of the beach-caste seabirds in the northern Bering and Chukchi sea were planktivorous alcids, whereas most of those that were encountered in the Bristol Bay region and at the Pribilof Islands were short-tailed shearwaters that migrate from Australian breeding grounds to the Bering Sea to feed on euphausiids in the Austral winter. These die-offs signal that crustacean zooplankton, in particular large copepods and the Arctic, ice-associated amphipod, *Themisto libellula*, were in short supply for seabirds in the northern Bering Sea. These zooplankton are also major prey for fish. In the southeastern Bering Sea (Bristol Bay region), the die-offs of shearwaters were probably due to difficulty in obtaining their preferred prey, euphausiids (krill). This information is of relevance to fisheries, as age-0 pollock depend on euphausiids in years with little sea-ice (e.g., 2018, 2019) when the preferred large lipid-rich copepods are scarce or unavailable. **The SSC requests an examination of the historical frequency and magnitude of seabird die-offs in the waters off Alaska.** It will be important to attempt to relate these die-offs to the dietary preference of the seabird species involved and to events in the marine environment, as well as to account for observation effort in trying to assess the numbers of birds involved. Thus, not only the raw totals are needed, but also numbers adjusted for survey effort.

B-3 Essential Fish Habitat 2022 Planning

The SSC received a presentation from Dr. Gretchen Harrington (NOAA-AKRO) on a discussion paper that describes the progress and upcoming plans for the 2022 five-year review of essential fish habitat (EFH) for the North Pacific, including the BSAI, GOA and Arctic regions. Oral public testimony was provided by Jon Warrenchuk (Oceana), Jaime Goen (Alaska Bering Sea Crabbers), and John Gauvin (Alaska Seafood Co-op). The SSC thanks them for their testimony, which provided helpful feedback in regard to the process and substance of this review. There were written comments submitted on this agenda item as well. Additionally, the SSC thanks the presenter for an informative presentation, and other contributors for making themselves available to answer specific SSC questions.

The document provides an update on each of the ten EFH components, with a focus on six that were prioritized for this particular cycle by NMFS. These six include:

- Component 1) EFH descriptions and identification
- Component 2) Fishing activities that may adversely affect EFH
- Component 4) Non-fishing activities that may adversely affect EFH
- Component 6) EFH conservation and enhancement recommendations

- Component 7) Prey species list and locations
- Component 9) Research and information needs

In addition to providing details on how each of these components will be advanced, the plan and timeline for review are also described. It is anticipated that a summary report will be presented to Council in June 2022.

With regards to Component 1, EFH descriptions and identification, the objectives from the updated Alaska EFH research plan included: 1) developing level 1 or 2 EFH information where missing from the 2017 review (including new species and life history stages) and 2) raising EFH information to level 2 or 3 where possible. These objectives lead to the development of four research projects that are in progress, and which the SSC reviewed in June of 2020. These projects include:

- Development of new species distribution models (SDMs) with new data and a refined methodology in Laman *et al* (in prep).
- Novel SDMs for several Arctic species in Marsh *et al.* (in prep)
- Development of spatially explicit vital rates for juvenile pollock in the GOA in Copeman *et al.* (in prep)
- Use of individual-based models or IBMs to describe EFH for early life history stages of sablefish and Pacific cod in Shotwell *et al.* (in prep)

The SSC provided a detailed review of these four projects in their June 2020 report. A list of SSC recommendations and the analyst responses to these are included in the current document. The SSC appreciates the responsiveness of the analysts to multiple recommendations and suggestions for improvements of EFH identification and description. As noted in June 2020, there continues to be substantial progress on this front, and the analysts and contributors should be commended for their efforts. Items addressed since June 2020 include the use of more appropriate error distributions and alternative modeling approaches where GAMs and negative binomial models are included in ensembles that are appropriately weighted proportional to out-of-sample predictive performance, and explicit definition of regions where SDM uncertainty is high relative to expected biomass.

There are multiple recommendations that were not finalized or developed during this review cycle to which the SSC continues to call attention. As an example, the SSC is pleased to hear about the exploration of more dynamic time scales to evaluate EFH in the Barnes *et al.* (in prep) study and looks forward to seeing this develop further in the future under changing climate conditions. Other efforts to expand the data incorporated into EFH descriptions beyond traditional large-scale fishery-independent data sources or development of covariates for habitats that are under-represented in current datasets, as suggested in the June 2020 SSC minutes, would be critical to continue in the future. Overall, the SSC is supportive of the use of this package of products for the advancement of EFH in the 2022 cycle, which will advance the objectives of the Alaska EFH research plan and lead to improved definitions of EFH in the BSAI, GOA, and Arctic.

For Component 2, Fishing Activities that may adversely affect EFH, the plan for the 2022 EFH is to run the Fishing Effects (FE) model with updated inputs from the Catch-in-Areas (CIA) database and updated SDMs. During the previous 2017 EFH review, the SSC reviewed this novel model and provided recommendations for improvements. The FE model has been published (see Smeltz et al., 2019, Can. J. Fish. Aquat. Sci.), and many of these recommendations have apparently been addressed, though the EFH planning document was not very detailed in this regard. The SSC requests clarification about whether any

outstanding comments, relevant to this EFH review cycle, remain unaddressed.

For Component 4, Non-fishing activities that may adversely affect EFH, the Limpinsel *et al.* (2017) report on non-fishing activities' impacts to EFH will be updated and this effort is already underway.

There are annual reports that inform Component 6, EFH conservation and enhancement, and updated information from the FE model will be considered as well.

For Component 7, prey list and locations, the 2022 review will focus on nearshore habitats for prey species. As clarified during the presentation, each Fishery Management Plan's (FMP) information on prey will be updated during this EFH cycle. An updated AFSC Nearshore Atlas (Gruss *et al.* 2021) and the Shorezone database are available to inform this effort. The application of SDMs for prey species is an encouraging avenue of development to improve the information related to this EFH component. This would also be another component where the SSC suggests the exploration of alternative or more localized datasets that may be helpful, similar to a previous recommendation with regards to Component 1.

Finally, for Component 9, research and information needs, the SSC notes that impressive list of EFH-related projects funded since the 2017 review. For those projects that do not have a peer reviewed publication associated, it may be useful to review funding reports or other grey literature to fully incorporate the information provided in all of these projects into the body of EFH knowledge. A new Alaska EFH research plan will be developed that will be provided as a part of the 2022 review. This is to be developed by habitat and ecological processes research (HEPR), with participation from AKRO and AFSC scientists. The SSC suggests that outside expertise may be beneficial to this update. As the analysts suggest, it may be helpful for the SSC to review the draft research plan in late 2022 for the next review cycle.

The SSC has a number of process-related recommendations and suggestions. The SSC believes the timeline on this agenda item is ambitious and is concerned with the lack of an iterative review process under the tight timeline presented. The SSC notes that transparency was also a concern brought forward in public testimony. Products from this EFH process are hierarchical in nature, and inform Council actions beyond EFH reviews. The SDMs are an integral component of the FE model, which, in turn, now inform multiple products, from EFH conservation and enhancement efforts (Component 6) and future EFH cumulative impact analyses to indicators of habitat disturbance levels in the annual Ecosystem Status Reports. **While the SSC greatly appreciates the analysts' responsiveness to previous reviews, the SSC recommends that additional opportunity for SSC review is necessary prior to the presentation of a final product, currently planned for June 2022, and suggests a two-part approach. First, the SSC requests a review of the SDM model results and an overview of discussions or recommendations from stock assessment authors, to take place at the October 2021 SSC meeting.** This review would ideally present pertinent summary information that allows the SSC to review the predictive capacity of different model types and ensemble models across species and life stages. To be clear, the SSC is not requesting an exhaustive review of all SDM results and the identified core areas. Rather, the SSC is requesting to receive a summary of model performance issues, depending on the species examined, modeling methodology, and quality of the underlying data (especially for models deemed to provide Level 3 or 4 information). For example, the SSC is interested in analytical elements such as: a summary of important covariates across species; a report on model convergence issues and how these were addressed; a summary report on data limitations that created important model performance issues; a summary of results from the skill testing and resulting ensemble member weights, by species; highlight potential seasonality issues and large changes in core areas when compared to previous results; a discussion on weighting issues encountered with the ensemble modeling; and any other pertinent issues identified by the stock assessment and EFH authors.

Second, an additional review that would be focused on the FE model is requested during spring of 2022, to take place at either the February or April SSC meetings. The SSC suggests this include

analysts' responses to the October 2021 review, as well as a review of the FE model structure and parameterization, model inputs, a summary of methodological changes to the FE model since the 2017 EFH review, and preliminary results, which should also be available at this time. The SSC had previously noted during the 2017 review, that a Center for Independent Experts (CIE) review of the FE model was planned; the SSC requests a summary of the CIE review be brought forward during this second review, if it did occur. These additional opportunities for SSC review will ensure a fully vetted product is presented in June 2022.

There was some confusion on the role of the PTs and the timeline of their review of EFH products. Clarifying this for future EFH review cycles would be helpful. **The SSC considers consultation with assessment authors to be a critical link in evaluating model configuration and output, and was pleased to hear the EFH team was involving assessment authors early in the EFH review process.**

The SSC is encouraged to see substantial progress in the consideration of EFH in the NPFMC fishery management system, and looks forward to continuing to participate in the 2022 review process.

C-1 Scallop SAFE

The SSC received a presentation on the 2021 Executive Summary Scallop SAFE from Scallop Plan Team (SPT) co-chairs Jim Armstrong (NPFMC) and Tyler Jackson (ADF&G), and economist Scott Miller (NMFS-AKRO). During its June 2020 meeting, the SSC recommended an executive summary of the SAFE be prepared biennially. This is the first SSC review of the Executive Summary SAFE in this revised format. No public testimony was provided.

2021/2022 Harvest Specifications

The SSC supports the SPT's recommendation to set the OFL for the 2021/22 season equal to maximum OY (1.284 million lbs.; 582 t meat weight) as defined in the Scallop FMP, which applies a 20% mortality rate to discards. The SSC also supports the SPT's recommendation to set the 2021/22 ABC for scallops consistent with the maximum ABC control rule (90% of OFL), which is equal to 1.156 million lbs. (524 t meat weight). Management of the scallop fishery appears to be conservative, and recent harvest has been less than 20% of the identified OFL based on the best available science, justifying these identified harvest maxima. **Overfishing did not occur in 2019/20 and overfishing cannot be assessed for 2020/21 because estimates of discards are not yet available.**

Assessment Schedule

The OFL/ABC specifications for scallop have not changed since the 2011/12 season, and harvest amounts during this period have been well below the ABC. Given the low exploitation of scallops, slow development of new assessment methods, and stable harvest specifications, the SSC discussed whether further simplification of the SAFE review process is possible by eschewing the Executive Summary format in favor of a multi-year specification with "off-years" (i.e., no SAFE produced). A decrease in assessment frequency will reduce burden on staff and review resources, noting that a multi-year assessment schedule would allow the SPT, SSC, and agency staff to focus on research and assessment development during the off-cycle rather than producing a SAFE. The off-cycle schedule would not preclude SPT or SSC review of important issues and research. However, during discussion, Council staff noted that the FMP requires that a SAFE report be produced annually and that an FMP amendment would be required to accommodate an off-year assessment cycle. The SSC supports such an amendment to the extent that it allows greater flexibility in scheduling the SAFE report cycle. Pending an FMP amendment, the SSC reiterates its past recommendation that the Executive Summary SAFE format be used every other year.