North Pacific Fishery Management Council

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SCIENTIFIC AND STATISTICAL COMMITTEE
FINAL REPORT TO THE
NORTH PACIFIC FISHERY MANAGEMENT COUNCIL
April 4 – 5th, 2022

The SSC met from April 4 – 5th, 2022 in Anchorage, AK, with some members participating remotely. Members present in Anchorage were:

Franz Mueter, Co-Chair *University of Alaska Fairbanks*	Sherri Dressel, Co-Chair *Alaska Dept. of Fish and Game*	Amy Bishop *University of Alaska Fairbanks*
Curry Cunningham *University of Alaska Fairbanks*	Mike Downs *Wislow Research*	Robert Foy *NOAA Fisheries—AFSC*
Dana Hanselman *NOAA Fisheries—AFSC*	Brad Harris *Alaska Pacific University*	Kailin Kroetz *Arizona State University*
Andrew Munro *Alaska Dept. of Fish and Game*	Ian Stewart *Intl. Pacific Halibut Commission*	Patrick Sullivan *Cornell University*

Members present remotely were:

Alison Whitman, Vice Chair *Oregon Dept. of Fish and Wildlife*	Chris Anderson *University of Washington*	Jason Gasper *NOAA Fisheries–Alaska Regional Office*
George Hunt *University of Washington*	Kathryn Meyer *Washington Dept. of Fish and Wildlife*	Chris Siddon *Alaska Dept. of Fish and Game*

General SSC Comments

The SSC wishes to acknowledge the long career of Jie Zheng with the Alaska Department of Fish and Game (ADF&G) and his substantial contributions to managing Alaska's fisheries over the past three decades. During this time, Dr. Zheng served on both the Crab and Scallop plan teams and was the lead author for the Bristol Bay red king crab assessment for many years. The current assessment was developed from the first length-based model for the stock in 1993, which was published by Dr. Zheng in 1995. In addition, he has been a co-author on multiple other crab stock assessments. His experience and sage advice will be missed, and the SSC wishes him the best in retirement.

The SSC thanks Council staff for their extraordinary efforts over the past two years of the COVID pandemic to enable the SSC, Advisory Panel (AP), and the Council to conduct their business remotely, as well as for their current efforts to transition to a hybrid mode for this and possibly future meetings.

The SSC welcomed the opportunity to meet Jon Kurland, the new NOAA Regional Administrator for Alaska Region (AKRO) and looks forward to working with him towards the shared goal of sustainable fisheries management informed by sound science.

SSC Administrative Discussion

The SSC received a B1 report on Ideas for Council Process Changes from Diana Evans (NPFMC). The SSC appreciates the concise report that provides a summary of a meeting of the Executive Committee and SSC and AP leadership. The report identifies five priorities for the Council to consider. **The SSC supports these priorities, in particular the need to reassess the current timeline for crab and groundfish harvest specifications**. The SSC highlights the need to engage the SSC, the Plan Teams, Alaska Regional Office, and the stock assessment authors as soon as possible in any future revisions to the timeline. **The SSC suggests that, as appropriate, a subgroup of members of these groups could be formed to inform any process changes.** The SSC notes, in particular, the importance of engaging the Crab Plan Team early due to the timing of survey data availability, assessment development, and the State of Alaska management process.

The SSC discussed a possible half or one day workshop at the February 2023 meeting focused on managing stocks with the rapid ecosystem changes that have been observed in the northern Bering Sea (NBS) and southern Chukchi Sea and possible ecosystem responses. Ideally, the workshop could include a focus on both U.S. and Russian waters, although the difficulty of engaging Russian participants at this time was noted. Recent changes in the NBS include shifts in the distributions of fish and fisheries, changing prey availability, and seabird die-offs. These have important consequences for data collection, commercial fisheries, fisheries management, and communities in the region. A workshop would provide an opportunity to proactively provide scientific guidance to the Council regarding these issues, and could include not only fisheries scientists, but also representatives of other stakeholder groups. The SSC was generally supportive of such a workshop and noted the need to consider other ongoing activities such as the Alaska Climate Integrated Modeling (ACLIM) project, the National SSC meeting in August 2022, and the Climate Readiness Synthesis (CRS) effort. **A subgroup of the SSC was tasked with determining an appropriate scope and focus for a workshop for feedback from the full SSC and the Council.** One goal of the workshop would be to determine whether a future, more extensive workshop or conference may be needed.

The SSC discussed the 7th National Meeting of the Scientific Coordination Subcommittee (SCS7), which will take place in Sitka from August 15-17, 2022. A number of SSC members expressed interest in attending the meeting. The SSC will identify representatives from the NPFMC's SSC and determine the total number of SSC participants as soon as possible.

B-2 Seabird Working Group Report

The SSC received a written report from the NMFS Alaska Groundfish and Halibut Seabird Working Group (Working Group), which includes contributions from NMFS and the United States Fish and Wildlife Service (USFWS). There was no public testimony.

Recognizing extenuating circumstances this year that precluded an in-person presentation, **the SSC highlighted the value of two-way dialogue during informational reports and looks forward to an in-person update next year**. The SSC and Council receive seabird ecology and population information in the Ecosystem Status Reports (ESRs), which is very useful for understanding broader ecosystem trends, especially as the seabirds can be indicators of ecosystem change. **The report from the Working Group complements ESR information by providing additional details on direct interactions between seabirds and fisheries.** In addition to the existing topics covered in the report, the SSC suggests the authors

consider including details on one or two new and notable studies or publications that may be informative to the Council and SSC on these broad topics in the future.

Bycatch in Federal Fisheries & Endangered Species Act-Listed Species

Bycatch estimates in 2021 were lower relative to the long-term average from 2012 to2020, and the authors note the expanded use of pots in the sablefish individual fishing quota (IFQ) fishery may explain the reduced bycatch in 2021. **The SSC noted that it was encouraging to see the apparent effectiveness of pot gear in reducing seabird bycatch in the sablefish IFQ fishery, and that increased use of pot gear in the future may further reduce bycatch.**

Although lower than the long-term trend, estimates of bycatch in 2021 were greater than estimates from 2020. The Working Group attributed this to two factors. The first was that differences in bycatch rates reflect changes in fishing effort related to the COVID-19 pandemic in 2020. Second, the report then suggests: "Observer deployments also increased in 2021, particularly in the partial coverage sectors, as COVID-related observer deployment restrictions were relaxed […] As more fishing trips had an observer on board in 2021, there was more seabird bycatch reporting, and higher bycatch estimates". While observer deployments increased, **the SSC strongly suggests the authors revisit and review the suggested connection between increased bycatch reporting and higher bycatch estimates and provide clarification as necessary.** Observer coverage in the partial coverage sector is distributed to be a representative sample; therefore, increased observer coverage should result in more observations of seabirds being caught, even if bycatch stays constant, but should not necessarily result in an increased estimate of total bycatch.

No bycatch of Endangered Species Act (ESA)-listed species (i.e., short-tailed albatross, Steller's eiders, spectacled eiders) was reported in 2021. Guidance in the March 2021 USFWS Biological Opinion provides recommendations for fishing vessels to mitigate interactions with these ESA-listed species including: (1) to the maximum extent practicable, vessels should minimize the use of external lighting at night and avoid the use of sodium lighting and other high-wattage light sources, except when necessary for vessel and crew safety, and (2) all lights should be angled or shielded downward toward the surface of the water, except when necessary for vessel and crew safety. **The USFWS has asked NMFS to engage with fishing vessels in the NBS to report observations of spectacled eiders in the fishing grounds, and the SSC supports these and other outreach efforts** (described below).

Population Status and Trends

Information on seabird productivity at monitored colonies in the Gulf of Alaska (GOA), Bering Sea, and Aleutian Islands was provided in the Working Group report. While somewhat duplicative to the annual ESRs, the SSC reiterated concerns with the low productivity and die-offs observed in the NBS, as this mirrors trends being observed in that food-web through other indicators.

For both the topics of bycatch and population trends, the SSC noted that annual estimates are informative for tactical decision-making (e.g., informing risk tables), but suggested the Working Group report would be strengthened with the inclusion of temporal and spatial data that captures long-term trends in the system if available. **Specifically, the SSC suggests that data on historical trends in population size, trends in the frequency and magnitude of die-offs, and spatially explicit information on foraging distributions and/or shifts in distributions be included in future reports.** Spatial and temporal datasets may facilitate assessments of the factors associated with direct seabird-fisheries interaction patterns, and potential mitigation efforts. Recognizing there may be some serious data limitations to this request, the SSC suggests authors could describe what data are and are not available and include a brief summary of any work being done on spatial and temporal trends by external researchers.

The Working Group report briefly described efforts to review, extract, and synthesize information detailed in observer notes, which could provide further temporal and spatial information about interactions with fisheries. The SSC notes this was promising and looks forward to seeing the results of these efforts in future years.

The USFWS has developed draft seabird identification materials for fishing vessels to help fishers both identify seabirds of special interest (ESA-listed) and to know what to do should they encounter or see ESA-listed seabirds. The Working Group agreed that efforts to engage fisheries to help mitigate seabird interactions would be worthwhile. The report noted that both NMFS and the USFWS are hoping to collaborate with industry on these efforts to ensure these outreach materials are effective and useful. The SSC commends these efforts and notes that the draft materials were well designed for addressing mitigation measures and timing considerations. For materials related to identifying ESA-listed species, the SSC feels the materials are a great resource for cases of identifying birds that are on deck (due to vessel-strike or bycatch). However, for observations of flocks of birds in the air or on the water, the SSC suggests the authors consider including more *in situ* examples and/or consulting with industry to determine what materials are most useful.

C-3 Scallop SAFE

The SSC received a presentation on the 2022 Scallop SAFE from Scallop Plan Team (SPT) co-chairs Sarah Rheinsmith (NPFMC) and Tyler Jackson (ADF&G), and Scott Miller (NOAA-AKRO). There was no public testimony.

Under the FMP, the scallop stock assessment is developed by ADF&G with input from the NMFS. The Stock Assessment and Fishery Evaluation Report (SAFE) is compiled by the Council's SPT. The SPT meets and sets specifications annually, but the stock is assessed biennially. This is a full assessment year.

Currently, there is no stock assessment model for weathervane scallops in Alaska, although efforts to develop an age-based assessment are ongoing. In the absence of a formal stock assessment, ADF&G sets guideline harvest levels (GHLs) using data gathered through the scallop fishery observer program as well as fishery-independent scallop dredge surveys. In addition to trends in nominal CPUE, standardized CPUE indices are estimated to account for variations by depth, month, vessel, bed, and season. Estimates of the spatial scale of fishing effort and catch are also used to interpret trends in CPUE.

New information in the 2022 SAFE includes: 2021 fishery-independent dredge and trawl survey results, State management region–specific discard estimates, fishery CPUE, landings for 2020/21, and preliminary landings and CPUE estimates for 2021/22. The 2021 dredge survey was conducted in scallop beds in the Yakutat and Prince William Sound (PWS) registration areas. Abundance and biomass of small and large scallops increased in the two PWS outside district beds (WKI and EKI) and decreased in Yakutat districts beds. Meat weight to shell height and round weight decreased in all areas. In 2020, the SPT recommended that the dredge survey be implemented with broader spatial coverage at the potential cost to precision. The increased spatial coverage in 2021 had a modest impact on CVs which were all less than 0.35, except for the largest scallop bed off Yakutat (YAK3) where CVs were higher.

Scallop abundance is estimated for portions of three of the nine registration areas only. Therefore, in the absence of stock-size estimates, the status of the scallop stock relative to overfished is unknown. The total catch estimate for the 2020/21 season was 238,551 lb. (108 t) of shucked meats. This is 20.6% of the ABC (1.156 million lb.; 524 t) and 18.6% of the OFL. Scallop landings in 2021/22 are estimated to be 298,755 lb. (136 t), and discard estimates are not yet available.

Consistent with assessments since 2011/12, the SPT recommends that the 2022/23 OFL be set equal to the Optimum Yield (1.284 million lb.; 582 t) as defined in the Scallop FMP and the 2022/23 ABC be set equal to the maximum ABC control rule value (90% of OFL or 1.156 million lb.; 524 t). **The SSC supports the SPT's OFL and ABC recommendations and concurs with the SPT's perspective that the management of the scallop fishery via GHLs continues to be very conservative with recent harvest levels at less than 20% of OFL**. Overfishing did not occur in 2020/21 and overfishing cannot be assessed for 2021/22 because estimates of discards are not yet available.

Given the conservative GHLs for scallops and stable harvest specifications over time, the SSC, in its June 2021 minutes, discussed whether a decrease in assessment frequency would reduce burden on staff and reviewing bodies, thereby providing more time for development of new assessment methods. The FMP requires that a SAFE report be produced annually, and an FMP amendment would be required to accommodate an alternative assessment cycle. **The SSC reiterates its support for 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 in assessment "off" years.

The SSC appreciates the concerted efforts of the analysts to provide responses to the SSC's June 2021 and earlier comments. Responding to the SSC request to better document the fraction of the area or population being exploited, the analysts reported an index of the spatial extent of fishing, which was helpful in interpretation of the observed CPUE; however, this did not address the larger question of the scope of exploitation. **The SSC requests that in the future, a map be produced of all beds that have been surveyed or fished (even if only historically)**. From this map, the footprint of the current fishery relative to the extent of the overall historical distribution should be provided in each SAFE.

The SSC recognizes that the management approach, allowing modest harvest on only a fraction of the known beds, appears to be inherently conservative with regard to limiting fishery yield and the probability of overfishing; therefore, the stock is likely to be underutilized. Based on the data collection program at present, there appears to be little avenue for improved information on total stock productivity in the future. If there is interest in improving the understanding of stock distribution and productivity in order to allow for the potential of an expanded fishery in the future, the **SSC recommends that the State consider allocating some portion of the annual survey effort to mapping of scallop beds to better define the boundaries of existing beds.**

The SSC commends the authors on the preliminary modeling work completed for the Kamishak and Kodiak districts. The SSC agrees with the author and SPT conclusions that a statewide assessment model is too large a project to complete at present given data and resource limitations, particularly the lack of survey information for many beds. **The SSC recommends that future modeling efforts be focused on an age-structured model (and/or other models for data-limited situations for comparison) for a single district, perhaps Yakutat where the recent fishery has been active.** The goal of this effort may be best focused on assessing the productivity and yield (both short and longer term) under the current status quo management approach.

For future age-structured modeling efforts, the SSC has the following recommendations, in addition to those provided by the SPT:

- The models should include discard mortality.
- If survey dredge efficiency is assumed to be known, include this information as a prior on catchability and force selectivity to be 1.0 for a reasonable range of sizes rather than allowing dredge selectivity to be less than 1.0 across the entire size range.

- Consider dropping the westward region large-mesh trawl survey index as it is highly uncertain. If the trawl index is retained, provide justification for the implausibly small log(SE) = 0.01 for several of the observations.

- As recommended by the SPT, further work on standardizing the fishery CPUE index will be needed, including a careful evaluation of its suitability as an index of abundance by region or overall.

- Provide an explicit basis for data weighting. Recent groundfish assessments may be helpful to assess the range of approaches commonly employed.

- Provide a basis for the selection of the variance in recruitment deviations.

- Provide a graphical summary of the fits to size-at-age data.

The SSC appreciates the work of the SPT and offers the following comments on the SPT Report:

- The SSC appreciates the work of the state-wide scallop survey team and notes that, while constrained to a limited number of scallop beds, the survey provides valuable information to inform both in-season ADF&G district-level management as well as the development of a formal stock assessment model. Going forward, the SSC recommends that the survey team consider adjusting the survey plan to include key beds in the Yakutat Area annually rather than in alternating years. The goal would be to produce a consistent survey time series to inform the development of an assessment model and allow important comparisons between fishery-independent abundance and biomass estimates and fishery-dependent nominal and standardized CPUE estimates. The SSC recognizes that this may limit survey effort in the Cook Inlet and Kodiak regions.

- The SSC recommends the SPT and ADF&G survey team consider the value of re-deploying the ADF&G CamSled optical sampling platform relative to the current sampling methods. A recent publication (Batter et al. 2021, Journal of Shellfish Research) demonstrates the efficacy of this sampler to support abundance and biomass estimation. Importantly, the local scallop density and distribution information captured in the seabed imagery would provide independent estimates of abundance and biomass, insights into the planned dredge calibration study, and potentially support direct estimates of natural mortality (e.g., ratio of live to dead scallops), as well as support essential fish habitat assessments. If the CamSled tool is deployed, the SSC considers mapping of scallop bed boundaries to allow comparison between scallop distribution and fishing footprint to be a high priority.

- The SSC notes the importance of the dredge calibration experiment in interpreting the time series in the near future until the new gear has its own series. The SSC looks forward to seeing the details of the calibration study, including overall catchability and size-selectivity when the experiment is complete.

- The SSC recommends that the survey team consider documenting uncertainty associated with time on bottom for the survey dredge and methods used to estimate area swept.

- The SSC appreciated the analysts' efforts to examine scallop data collected in the westward region large-mesh trawl survey. Scallop catches in this gear were small and highly variable, likely due to the survey gear not being designed for scallops. The SSC concurs with the SPT's assessment that these data provide little additional information to inform the age-structured modeling work and continued efforts are unlikely to be fruitful.

However, examination of scallop catches outside the known beds may provide insights into the locations of scallop beds not currently detected in the fishery or state-wide survey.

- **The SSC recommends that the SPT consider whether the OFL levels are appropriately set using the current reference period from 1990-1997, given the more recent CPUE trends and biological information (e.g., average weight) available.**

- The SSC encourages the continued monitoring of weak meats and supports the SPT recommendation to improve collection of quantitative data for monitoring individual scallop condition indices and stock health trends. The SSC recommends the analysts and SPT consider additional observer training and other more objective sampling protocols to standardize and improve weak meat detection.

- The SSC was pleased to see that CTD data were collected during the 2021 survey reported in the SAFE. To the extent possible, the SSC recommends continuing this sampling in subsequent surveys.

- The SSC encourages continued investigation of trends in meat weight and whether these may be driven by environmental factors, such as temperature, in addition to the timing of the survey.

- Regarding the change in the shell height definition from the 'top shell' to 'outer shell,' the SSC appreciated the brief analysis of paired valve measurements provided. The SSC concurs with the analysts that redefining the shell height from "top valve" to "outer shell margin" is appropriate without using a conversion for survey data, given the mixed history of data collection. The analysts indicated that there are plans to conduct a similar analysis on shells collected during the fishery. The SSC looks forward to seeing this analysis.

- The SSC noted that although the scallop fishery has a small spatial footprint, scallop fishing should be included in future fishing effects modeling because of the bottom-tending characteristics and rigid nature of the gear.

- The SSC suggests that the SPT and ADF&G survey team may benefit from a deeper examination of recent and ongoing science and management efforts for Atlantic sea scallops, including development of appropriate survey designs, cooperative survey data collection, and ecosystem interactions and effects, particularly with regard to management in the context of choke species, as well as invasive species such as the tunicate *Didemnum vexillum*.

- **The SSC recommends that the SPT consider whether there would be value in conducting an analysis to assess whether this fishery is underutilized and, if so, identify barriers to increased participation in this fishery.**

- The SSC recommends that the SPT consider the value of a study on the genetics of scallops to help define stock structure.

- The SSC is encouraged to see that its multi-year comments on socioeconomic considerations in the scallop SAFE are in the process of being addressed and looks forward to continued work in this area as described in Appendix 1. This fishery is important from a socioeconomic analytic perspective in that the National Standard 8 goal of providing for the sustained participation of fishing communities does not appear to have been met over time. It has the potential to serve as a case study including lessons learned that would be of benefit to future management program design and application in other fisheries. The SSC requests that the analyst carefully examine the text regarding fishery taxes and crew shares to ensure accuracy and remove speculative content.

- The SSC supports the SPT recommendations to streamline the SAFE document by including the survey history and methods via references to the appropriate ADF&G documents. In addition, reductions in the area-specific fishery performance sections may also be warranted as these do not directly inform stock status determination. Finally, several minor editorial issues should be reconciled if these sections continue to be included:
    - Table 2.2 headers missing for 'total' and 'sampled' stations.
    - Tables 4.4, 4.5, 4.6: why are there no discard mortality estimates?
    - Table 4.11, 4.12 report an order of magnitude lower discard mortality rates – are these correct? If so, perhaps include a comment on why this is the case.
    - If trawl data are to be reported, please convert to lb/nm^2 instead of kg/km for comparability with dredge data.
    - Check accuracy of numbers presented for OY and OFL on page 6 section 1.1 and MSST on page 8.
    - In Table 2.1, separate landings and discards so trends can be discerned.

C-4 Initial Review of GOA Rockfish Program Adjustments

The SSC received a presentation from lead analyst Jon McCracken (NPFMC). Public testimony was provided by Julie Bonney (Alaska Groundfish Data Bank), Jon Warrenchuk (Oceana) and Heather Mann (Midwater Trawlers Cooperative; MTC). Additional written comments were provided by Linda Behnken (Alaska Longline Fishermen Association), Heather Mann (MTC) and Jon Warrenchuk (Oceana).

The proposed adjustments include an option for an earlier season start as well as several options related to relaxing use caps. The earlier start date is consistent with options explored under the original program design. It is expected to allow vessels and plants to remain active given the loss of the wholesale market for the flatfish fishery, which used to be prosecuted in April; however, concerns were expressed in public comment related to this early opening coinciding with rockfish parturition (release of larvae).

While the proposed adjustments relax some GOA rockfish program (RP) use caps that are generally considered to support sustained community participation, the analysis suggests the current cap limits may actually be undermining their intended purpose, and other program elements would likely be sufficient to support the original goals. Regarding the latter, the SSC notes that the Kodiak landing restriction, which would not change under any of the management alternatives being considered, is the primary community protection program element. Additionally, allocations of quota are not severable from LLP licenses, and there are accumulation limits related to LLP license ownership intended to prevent consolidation of quota ownership within the fishery.

The analysis as written supports the conclusion that the current use caps proposed for modification under Alternative 2, Options 2-4, are likely undermining economic efficiency and some of their efficacy as sustained community participation protection measures. Related to the specific use cap changes considered, the analysis suggests that: the reduction in the number of processors in Kodiak in recent years was not driven by the RP, and processor accumulation limits are constraining processing volumes such that some stocks are currently underutilized or could become underutilized if TACs were to increase or other exogenous shocks were to occur; the intention of the cooperative holding cap is better achieved through processor caps; and the dusky and northern rockfish processing caps are currently resulting in underutilization of the available TACs.

As noted below, the SSC recommends minor extensions to the analysis to more fully describe the potential impacts of changes to the use caps on dimensions of sustained community participation. Although the analysis supports efficiency gains associated with Alternative 2, Options 2-4, for processing plant and vessel owners, potential near-term and long-term impacts on processing labor and vessel crew are less well developed in the analysis.

The SSC finds the analysis sufficient for Council decision making at final action, subject to minor modifications.

The SSC recommends the following points be addressed in the analysis:

- Correct language describing cooperative formation around processors to reflect the current RP, rather than the prior GOA rockfish pilot program.
- Enhance the usability of Figures 2-4 and 2-5 by labeling the weeks corresponding to the April 1 and May 1 season breaks. In addition, the potential effect of Option 1 on changes to the temporal fishing patterns could be enhanced by also including similar figures for a pre-COVID year.
- **Draw more extensively from monthly PSC data, in particular for the April 2021 fishery, to demonstrate the effect of the earlier start date on Chinook salmon and halibut PSC.** This could be accomplished through modifying Table 2-2. In addition, a summary description of PSC reallocation rules pertinent to the RP should be provided.
- Provide additional information about regulations relevant to prohibitions on discarding and exceedance of quota amounts, particularly in regard to sablefish.
- Ensure there is a description of the original rationale for the season and use caps in this document. Ensure the analysis addresses the extent to which these Options may undermine or reinforce any of the original program objectives.
- More thoroughly characterize, or indicate uncertainty, regarding the administrative costs that are likely to be saved and potential employment changes associated with allowing CV cooperatives to consolidate at holding caps in excess of 30%.
- **Clarify the specifics of what has driven processor consolidation**. In particular, addressing:
    - The extent to which the RP has or has not influenced past consolidation and the extent to which the processor cap is likely to influence future potential processor participation.
    - The concern that a long season leads to lower daily landings which will demand lower daily processing capacity and therefore may drive further consolidation.
- **More fully characterize the potential impacts of changes to the use caps on vessel crew and processing workers**, including:
    - Strengthening the links between better quota utilization and longer processing seasons to impacts on crew and processing workers.
    - Considering potential longer run impacts associated with further processing sector and fleet consolidation due to changes in the use caps, if any, including any tradeoffs between number of positions, wages, and length of employment.

- Reflecting any preferred alternative identified by the Council, consider the extent to which a single or a subset of the Options under Alternative 2 could increase flexibility and efficiency while potentially outperforming an implementation of all options simultaneously in terms of sustained community participation.
    - For example, consider the potential for a permanent and anticipated change in season length extending past the COVID crisis (Alternative 2 Option 1 only) to provide opportunities for increased utilization of dusky and northern rockfish and support four active rockfish processors (i.e., continuing to control processor and harvester consolidation with the same accumulation limits as in the past intended to ensure competitive processing labor and crew labor markets).

Public comments highlighted a concern that under an April 1 start date, additional harvest could occur during important rockfish parturition periods under Option 1. The SSC questioned whether the action would require an Environmental Assessment and NPFMC staff noted that the current thinking among analysts is that it likely falls under a Categorical Exclusion. The SSC noted that the Categorical Exclusion for the 2021 Emergency Rule that modified the season start date from May to April indicated that the date range was analyzed for the Central Gulf RP and found to have no significant effects. However, April 1 was not explicitly included in the dates originally analyzed. The SSC also notes that, in addition to the starting date change under Alternative 2, Option 1, of this action, the flexibility under Alternative 2, Option 4, may increase utilization of rockfish quota for northern and dusky rockfish. Public testimony indicated that utilization of quota may increase; however, northern and dusky rockfish are difficult to catch and their harvest will likely occur throughout the timeframe that the fishery is operating. **Given the issues raised, the SSC recommends the analysts consult with stock assessment authors of dusky and northern rockfish and Pacific ocean perch, and/or other relevant experts to consider the timing of parturition and exploitation relative to Options 1 and 4 under Alternative 2 in making a final determination about the appropriate analytic document**. The SSC recommends that the RIR background section contain key conclusions from the evaluation, similar to what was done for the RIR associated with the 2021 Emergency Order action.

D-2 Bering Sea Fishery Ecosystem Plan

Bering Sea Fishery Ecosystem Plan Team Report

The SSC received a presentation from co-chairs Diana Evans (NPFMC) and Kerim Aydin (AFSC), as well as a report from the Bering Sea Fishery Ecosystem Plan (BS FEP) Team, which summarized progress towards implementing the BS FEP. This was an update to the SSC (i.e., a non-action item). There was no public testimony. Updates on work towards implementing two of the BS FEP action modules through the Local Knowledge, Traditional Knowledge, and Subsistence (LKTKS) and Climate Change taskforces were covered under separate sections within this agenda item.

Bering Sea Strategic Ecosystem Evaluation/Health Report (Report): The BS FEP team efforts were focused primarily on the continued development of the Report at their March 2022 meeting, which is intended to characterize the state of the Bering Sea ecosystem relative to the six overarching ecosystem goals and associated objectives as identified in the BS FEP. **The SSC recommends that the BS FEP team adopt their formal title, the Bering Sea 'Strategic Ecosystem Evaluation' (SEE) and avoid using the term 'health'** for reasons previously identified in the February and June 2021 SSC reports. The SSC restated that the term 'health' places a somewhat subjective interpretation on the system, and in particular, one that is limited to a stationary concept in an ecosystem where the dynamics are, in fact, changing (non-stationary).

The SSC appreciates the continued efforts of the BS FEP Team to distinguish this strategically focused

ecosystem work product from others that are intended to provide tactical advice on an annual basis, such as the ESRs and Ecosystem and Socioeconomic Profiles (ESPs).

While the SSC recognizes the Report is designed to evaluate whether the "Council is achieving ecosystem goals", **the SSC strongly recommends that the BS FEP Team provide indicators that are likely to remain informative to those overarching goals in the BS FEP into the future**, given shifting baselines in the Bering Sea. In addition, **the SSC highlights the need for an iterative process whereby indicators are reviewed and refined periodically to ensure that they are informative to their respective goals.**

The SSC looks forward to reviewing the partial pilot report in the fall, and notes that SSC members will be able to provide more insightful feedback once a preliminary indicator list is presented. **The SSC is supportive of the BS FEP Team decision to delay expanding the process into other large marine ecosystems until a later date**, possibly coincident with the completion of the GOA-CLIM for that specific region.

Climate Change Taskforce Report

The SSC received a presentation from Diana Stram (NPFMC) and Kirstin Holsman (AFSC) from the BS FEP Climate Change Taskforce (CCTF) on their recent meeting and progress. There was no public testimony.

The CCTF held their fifth meeting in two parts (January and March of 2022) in which they focused on development of a Climate Readiness Synthesis (CRS) report. The CRS report will synthesize the Council's current state of readiness by providing a management overview, an overview of the state of knowledge, and a review of SAFE documents for climate change information. As part of the report, the CCTF plans to identify near-term/'low-hanging fruit' actions or modifications to advance climate readiness for each of the main sections (Management Process, SAFE Reports & Plan Team Minutes, and Knowledge & Information). **The SSC appreciates this approach and concurs that it will be a useful component of the report.** The SSC looks forward to the opportunity to review and provide comments on the CRS report.

While the CRS report will provide an initial synthesis of the Council's current state of climate readiness, the SSC sees value in periodically updating the CRS report to track progress toward this objective over time. **The SSC suggests that the CCTF consider outlining a process and timeline for revisiting and updating the CRS report in the future.**

The CCTF also reviewed and discussed a stakeholder-developed ecosystem matrix (EcoMatrix). The SSC extends its appreciation to the coalition of stakeholders for their initiative and engagement. The CCTF was generally supportive of the concept but listed some concerns and challenges with components of the matrix and implementation, and potential overlap with existing products (e.g., ESPs), and chose not to adopt it as a tool. Identification of potential management tools is a component of Objective 3 of the CCTF's work plan and will be a focus once the CRS report is completed.

The CCTF indicated in their report that there is a need to increase public engagement in their meetings (perhaps through Zoom meetings). **The SSC concurs with this assessment and encourages the CCTF to explore ways to increase public engagement in their process.**

The SSC appreciates the progress being made by the CCTF and looks forward to future updates and the opportunity to review and provide comments on work products when available.

Local Knowledge/Traditional Knowledge/Subsistence Taskforce Report

The SSC received a presentation from Kate Haapala (NPFMC) and Sarah Wise (AFSC), co-chairs of the

LKTKS Taskforce. The presentation provided an update on Taskforce activities over the past year, with a focus on the recently completed "Draft Protocol for Identifying, Analyzing, and Incorporating Local Knowledge, Traditional Knowledge, and Subsistence Information in the North Pacific" (hereafter, Draft Protocol) and the newly developed LKTKS search engine. No public testimony was received.

The LKTKS Draft Protocol is intended to provide guidance for analytical staff, researchers, and the Council for identifying, analyzing, and incorporating LK, TK, and subsistence information into the Council's decision-making process. The development of the Draft Protocol has been, and will continue to be, an iterative process. **The SSC found the Draft Protocol enlightening and helpful, and encourages its further development.** The SSC looks forward to the development of more information regarding onramps for LKTKS information into the Council decision-informing process. The SSC suggests that in addition to the onramps discussed in the Draft Protocol, a useful approach would include consideration of potential onramps within the recurring cycles of updating and improving existing decision-informing analytic products such as ESRs, SAFE documents, including ESPs where relevant, and the Annual Community Engagement and Participation Overview (ACEPO), among others. The SSC also suggests expanding the Conclusions section of the Draft Protocol to include any information on next steps and guidance where to go from here, recognizing the LKTKS Taskforce's role in this process and acknowledging that final decisions rest with the Council.

In developing the LKTKS search engine, the LKTKS Taskforce has identified and collated hundreds of sources of LK, TK, the social science of LK and TK, and subsistence information relevant to federally managed fisheries in the North Pacific. Designed to support the use of best scientific information available in the Council's decision-informing analyses and decision-making processes, a search engine was developed and will be a publicly available tool maintained by Council staff. **The SSC recognizes the value of the search engine and commends the efforts that went into its creation.** The SSC supports finalization of the current iteration of the search engine work product while recognizing that, like the protocol work product, it will continue to be refined and evolve over time.
The SSC recommends early implementation of several of the practical steps outlined on page 21 of the Draft Protocol. These may include having Council staff use the LKTKS search engine for current and new analytic decision-informing products and modifying analytical templates used by Council staff for those same products where practicable. This early use could serve to provide useful and timely feedback to protocol and search engine developers, as well as early identification of Tribal governments and communities that may be impacted by a particular action. Early identification of those potentially impacted may also serve to make outreach (and formal consultation where appropriate) more robust.

D-3 Intergovernmental Panel on Climate Change Update

The SSC received a presentation from Kirstin Holsman (AFSC) on the Intergovernmental Panel on Climate Change (IPCC) 6th Assessment Report, with a focus on results from Working Group I (The Physical Science Basis) and Working Group II (Impacts, Adaptation, and Vulnerability). Especially pertinent to management of Alaskan fisheries is the cross-chapter Paper 6 dealing with Polar Regions, of which Dr. Holsman is one of the authors. Key highlights include:

- The North Pacific is already experiencing and projected to see an unprecedented pace and extent of change in sea surface temperature.
- Two of five low carbon mitigation scenarios predict a practically ice-free Arctic, which could be observed as early as 2070.
- Declines in fish biomass are projected in both the eastern Bering Sea (EBS) and GOA, while variable or increased fish biomass is expected in the Beaufort and Chukchi seas.

- Decreasing production of walleye pollock, Pacific cod, and arrowtooth flounder are expected due to declines in large copepods.
- There is high confidence that climate change will have impacts on subsistence and commercial fisheries and will threaten the dependence on polar regions for food production.

The SSC thanks Dr. Holsman for the informative presentation.

The SSC inquired about Dr. Holsman's experience with the IPCC process as a collaborator on the assessment report and chapters, and specifically whether there were any lessons that could guide the development of climate-informed management strategies within the North Pacific. Dr. Holsman highlighted that a multinational and cross-disciplinary approach, including experts from a wide range of fields, was necessary in considering the risks and adaptation strategies in response to climate change. **The SSC agrees that, as data collection, stock assessment, and fishery management systems are evaluated and adapted for climate readiness and resilience, it is important to draw upon expertise and examples outside of fisheries and from other panarctic countries that are confronting similar challenges**.

The SSC posed several questions about how the projections of reduced fish biomass in the GOA and EBS were made and how those broad regional projections relate to specific stocks. Specifically, the SSC would be interested in learning what regional data are assimilated into these models and if the stark projections of biomass decline are mainly due to the movement of pollock. The SSC also noted that the use of the SSP5 - 8.5 climate scenario has been recently criticized as highly implausible and would like to see more realistic scenarios used as the default for examples of specific stock projections. The SSC noted the important information gap between global projections and regional manifestations of species-specific dynamics, distributions and decision-making. One example of this are crab rebuilding plans that continue to rely on status quo recruitment projections. In future updates on IPCC findings and research, **the SSC would be interested in additional details about the models used for generating fish biomass projections, and discussion of what species or stocks would be impacted most by projected climate-driven changes in physical and ecological conditions within the GOA, SEBS, NEBS, and Arctic regions.** The SSC would also be interested in additional information on the extent to which the adaptive capacity of fish species was considered within biomass projections under climate change scenarios, or whether projections were based on a static thermal niche.

The SSC noted that the NPFMC's fishery management plans rely on the "prevailing ecological and environmental conditions" as their foundation. However, climate change projections suggest increasing variability and continuing changes. **This suggests renewed discussion of more dynamic reference points and explicit planning for a future with lower predictability are necessary, and planning should begin now.** The SSC feels that explicit consideration of management strategy performance in the face of reversible vs. non-reversible, and rapid vs. slow, changes to Alaska's marine ecosystems is necessary.

D-4 Best Scientific Information Available Directive

The SSC received a presentation from Anne Hollowed (AFSC) on how Best Scientific Information Available (BSIA) is currently implemented within the Alaska region in the context of the National BSIA Procedural Directive. The NOAA Fisheries BSIA Procedural Directive requires a response from each region by May 2022 on the process for applying the BSIA guidelines within their region. The AFSC developed a draft response to the Procedural Directive, with input from the AKRO and ADF&G. The draft response was presented to the SSC for review and comment, and to provide feedback and recommendations to the Council pertaining to this document.

The NOAA Fisheries BSIA Procedural Directive outlines the motivation and guidance for establishing the

basis for identifying and implementing BSIA for use in fishery management decisions. The Procedural Directive speaks to BSIA as used in stock assessment, peer review, assessment revision, SSC and NOAA Fisheries actions, catch specifications and subsequent NOAA Fisheries approval. Appendix A of the BSIA Directive provides some key excerpts from the MSA and National Standard (NS) 2 Guidelines for reference. Appendix C outlines points that should be considered for inclusion in operational stock assessment review processes and Terms of Reference (ToR), with some comments on how the ToR for research stock assessments should reflect greater generality.

The response to the BSIA Directive provides a Draft Regional Framework that focuses on Alaska BSIA considerations for stock status determination and allowable catch limit setting. It describes annual timelines for groundfish, crab and scallop assessment and review, with comments on procedures for salmon and Arctic fishery management. Table 1 of the report provides BSIA Framework actions on a fishery by fishery basis for groundfish, crab, and scallop, identifying the roles of AFSC, AKRO, ADF&G and NOAA Fisheries Headquarters. The themes outlined in Table 1 parallel those outlined in the Procedural Directive. These include BSIA processes for stock assessment, peer review, SSC recommendations for OFL and ABC, SSC comments, catch specifications, archives and NOAA Fisheries approval. The SSC noted that the Procedural Directive and the Regional Framework both focus on BSIA as applied only to stock assessments, stock status determination, TAC setting and risk determination, and do not cover other aspects of SSC review where scientific information on biology, economics or communities is used, such as decision-informing analyses, Environmental Assessments, Regulatory Impact Reviews, and Environmental Impact Statements.

The SSC finds that the Draft Regional Framework provides an adequate response to the BSIA Directive, but recommends the following additions and clarifications:

- The SSC recommends that the NS2 Guidelines criteria that are considered when implementing BSIA (relevance, inclusiveness, objectivity, transparency, openness, timeliness, verification and validation and peer review) be restated in the Regional Framework to provide the context for BSIA.

- In addition to groundfish, crab and scallop, the SSC suggests that salmon fisheries and Arctic fisheries management also be included in the opening statements of the Regional Framework, even though timelines for implementing BSIA in those FMPs are not specifically outlined in the document.

- The term “stock status determination” is not explicitly stated in the Draft Regional Framework and its inclusion would be useful for clarity.

- In addition to BSIA review of models to support stock assessments, the SSC suggests additional clarification that assessment inputs such as survey data, catch data, or CPUE information are part of the BSIA used in the process leading up to stock status determination.

- To further clarify the NPFMC process, increased consistency in the level of detail across the groundfish, crab, and scallop review and harvest specification processes, including timing and State/federal engagement, would be valuable.

- **Specific reference to how the assessment and review process addresses the NS2 Guidelines section on inclusiveness that states, “relevant local and traditional knowledge (e.g., fishermen’s empirical knowledge about the behavior and distribution of fish stocks) should be obtained, where appropriate, and considered when evaluating the BSIA” (50 CFR 600.315(a)(6)(ii)(C)) should be added into the timelines in the Regional Framework as appropriate.**

- **As ESRs and ESPs are part of the process of stock status determination and catch setting, the SSC recommends these be included in the timelines as one of the steps leading to BSIA.**

- The specification of the length of time (e.g., five years) between Center for Independent Experts (CIE) reviews should be viewed as a desirable target and not a requirement, to allow for some flexibility in scheduling. In addition, it is not expected that every assessment (e.g., Tier 4-6 groundfish and Tier 4 crab) will be reviewed at that target frequency by CIE and may occur less frequently.

- While the Regional Framework reflects broadly the current timelines by which the process takes place, the specific month by month schedules provided in the report for groundfish, crab and scallop are, on occasion, revised as the need arises. The SSC suggests a note to that effect in the Regional Framework would recognize this level of flexibility in the process.

SSC Member Associations

At the beginning of each meeting, members of the SSC publicly acknowledge any direct associations with SSC agenda items. If an SSC member has a financial conflict of interest (defined in the 2003 Policy of the National Academies and discussed in Section 3) with an SSC agenda item, the member should recuse themselves from participating in SSC discussions on that subject, and such recusal should be documented in the SSC report. In cases where an SSC member is an author or coauthor of a report considered by the SSC, that individual should recuse themselves from discussion about SSC recommendations on that agenda item. However, that SSC member may provide clarifications about the report to the SSC as necessary. If, on the other hand, a report is prepared by individuals under the immediate line of supervision by an SSC member, then that member should recuse themselves from leading the SSC recommendations for that agenda item, though they may otherwise participate fully in the SSC discussion after disclosing their associations with the authors. The SSC notes that there are no financial conflicts of interest between any SSC members and items on this meeting's agenda.

At this April 2022 meeting, a number of SSC members acknowledged associations with specific agenda items under SSC review. Jason Gasper is a member of the CCTF and reviewed the BSIA directive report. Chris Siddon is the direct supervisor of Tyler Jackson (SPT co-chair and Scallop SAFE co-author) and is married to Elizabeth Siddon (BS FEP team member). Mike Downs clarified his connection to agenda item C4 GOA Rockfish Program, in which he is listed as a contributor. Dr. Downs contributed to an analysis that is referenced in the document but did not contribute directly to the analysis for this C4 agenda item. Dana Hanselman is the second-level supervisor of Elizabeth Siddon (BS FEP team member). Brad Harris and Ian Stewart are members of the BS FEP team. Dr. Harris is also a co-author of the Fishing Effects model referenced in the SPT minutes. Finally, Robert Foy is the third or greater level supervisor for contributors to the following agenda items: Sarah Wise, Kerim Aydin, Kirstin Holsman, Elizabeth Siddon, and members of the BS FEP team (Agenda item D2 BS FEP); Kirstin Holsman (D3 IPCC update); Anne Hollowed (D4 BSIA directive); and contributors to the B2 Seabird Working Group Report.