DRAFT REPORT
of the
SCIENTIFIC AND STATISTICAL COMMITTEE
to the
NORTH PACIFIC FISHERY MANAGEMENT COUNCIL
April 2nd –4th, 2018

The SSC met from April 2nd through 4th at the Hilton Hotel, Anchorage, AK.

Members present were:

Anne Hollowed, Co-Chair *NOAA Fisheries—AFSC*	Gordon Kruse, Co-Chair *University of Alaska Fairbanks*	Chris Anderson *University of Washington*
Amy Bishop *Alaska Sea Life Center*	Robert Clark *Alaska Dept. of Fish and Game*	Mike Downs *Northern Economics*
Jason Gasper *NOAA Fisheries – Alaska Region*	Dana Hanselman *NOAA Fisheries – AFSC*	Brad Harris *Alaska Pacific University*
George Hunt *University of Washington*	Dayv Lowry *Washington Dept. of Fish and Wildlife*	Franz Mueter *University of Alaska Fairbanks*
Terry Quinn *University of Alaska Fairbanks*	Matt Reimer *University of Alaska Anchorage*	Heather Renner *U.S. Fish and Wildlife Service*
Ian Stewart *Intl. Pacific Halibut Commission*	Alison Whitman *Oregon Dept. of Fish and Wildlife*	

Members absent were:

Sherri Dressel *Alaska Dept. of Fish and Game*	Kate Reedy *Idaho State University Pocatello*

B-1 Social Science Plan Team Nominations

The SSC reviewed the nomination of Sally Bibb to the Social Science Plan Team. The SSC finds this nominee to be well-qualified and recommends the Council approve her nomination.

B-1 Research Priorities Proposal

It has been difficult for the North Pacific Fishery Management Council (NPFMC) to review annually research priorities at a single meeting, particularly as the list of priorities has become lengthy. At its June 2017 meeting, the Council passed a motion to explore ways to refine the review process of Council research priorities. On March 6, 2018, a workgroup met by teleconference to discuss this issue. Participants included Council Chair Dan Hull, Vice-Chair Bill Tweit, SSC Co-chairs Anne Hollowed and Gordon Kruse, AKRO SF Administrator Glenn Merrill, Council Executive Director David Witherell, Deputy Director Diana Evans, and Council staff lead Jim Armstrong.

SSC Co-chair Anne Hollowed summarized the proposal that emerged from the workgroup. Under the proposal, research priorities will still be classified as Critical Ongoing Monitoring, Strategic, Urgent, and Important. However, the Council would include a paragraph indicating that continuation of Critical Ongoing Monitoring projects should continue to be of highest priority. The review in 2018 would then

focus on research projects in the Urgent and Important categories. From this comprehensive list, the Council will develop a "top ten list" (or some other number) of key research priorities. To do this, each Plan Team would identify their top 3-5 projects for 2018 with an associated rationale. The SSC would then review the submissions from all of the Plan Teams and develop an overall prioritization of all projects, including priorities not associated with particular plan teams (e.g., marine mammals, seabirds). In developing their priority list, the SSC can also provide greater depth in consideration of the particular projects, and a rationale for including priorities on the list. Finally, it was proposed not to review Strategic research priorities in 2018, as these are less likely to be applicable to management in the near term. The workgroup proposed that the Council and SSC should develop a vision statement for the Council's near-term and long-term activities, as well as the periodicity of reviewing longer-term (i.e., strategic) research priorities.

The SSC had a discussion about the need for changing the current process to review research proposals, as well as the usefulness of the resulting list of research projects. Although Council research priorities have found their way into the requests for proposals by the North Pacific Research Board (NPRB), current SSC members of the NPRB's Science Panel have not seen a direct connection in recent years. The SSC recommends that the Council should seek input from granting organizations, such as NPRB, and state and federal resource agencies regarding the utility of the Council's research priorities with regard to their funding and management action processes.

After considerable discussion, the SSC agreed that it seems reasonable to place the Critical Ongoing Monitoring projects into a preamble and not to review these projects this year. Also, the SSC agreed that it was acceptable to delay the review Strategic projects to next year. However, the process for reviewing such projects in the future needs to be identified. In addition to considering the establishment of a regular schedule for reviewing Strategic projects in the future, the Council might consider taking advantage of other related activities to provide input on these projects, such as the Fishery Ecosystem Plan for the Bering Sea, the Gulf of Alaska and Bering Sea Regional Action Plans, and the Social Science Planning Team.

The SSC was less comfortable with the proposal to develop a top ten list of Urgent and Important projects that trades off priorities for one group versus another. The SSC also recognizes that the top priorities for the NPFMC may not be the top priority for some funding agencies. For example, agencies responsible for non-fisheries ecosystem research may be interested in research priorities that do not appear on the top ten Council priorities. The SSC recognizes that there is value in the Council categorizing projects as Urgent and Important because it draws attention to them, even if they do not make the top ten list. Thus, maintenance of the full suite of priorities will remain an important activity. Despite these concerns, **the SSC agreed that it was reasonable to develop a list of the top three to five priorities for each group (e.g., groundfish, crab, scallop, social science), along with the rationale. The SSC agreed to try this approach for 2018.**

B-1 NMFS BSIA Guidance Update

Diana Evans (NPFMC) introduced this agenda item, which involves a revised white paper that was reviewed by the SSC in June 2017. The white paper aims to provide guidance on how councils document the use of Best Scientific Information Available (BSIA). Compared to the initial report, the revised document better emphasizes the key role that an SSC plays in the documentation process. The guidance in the revised document appears to be consistent with standard practices used by the NPFMC SSC, including

review of existing information and analysis and documentation of BSIA in its minutes or reports. Consequently, it is hard to understand how this guidance adds transparency to the NPFMC use of BSIA, although the SSC is happy to assist in the preparation of a report further documenting how BSIA is identified, evaluated, and used.

One concern that was mentioned is whether complying with the guidance, specifically the proposed timing of SSC review, NOAA Fisheries determination, and Council setting of harvest specifications, would require any additional work or meetings. Another concern was an ambiguous requirement that a NOAA Fisheries representative be available during SSC deliberations to bring up concerns about whether BSIA is being used. Who would that person be, what is their exact role in the meeting, and who is responsible for ensuring this requirement is met? And could current NMFS members on the SSC satisfy this requirement? A final concern was mention of the SSC needing to write a report justifying their decision when they disagree with an author's recommendations for ABC, OFL, etc. It was unclear whether the minutes already prepared by the SSC and presented to the Council meet this requirement, or whether preparation of an independent document would be required.

B-8 Seabird Conservation Working Group Update

The SSC received an informational briefing from Anne-Marie Eich (NOAA Fisheries - Alaska Region) and Liz Labunski (USFWS). Public testimony was provided by Gerry Merrigan (Freezer Longline Coalition). The SSC appreciates the time and effort that went into providing a professional and thoughtful report.

The briefing described the estimated bycatch of seabirds since 2010 in the groundfish and halibut fisheries in the Gulf of Alaska (GOA) and Bering Sea Aleutian Islands (BSAI) regions. The SSC also received a summary of the first two meetings of the newly created Alaska Groundfish and Halibut Seabird Working Group (Group). Creation of the Group was prompted by conservation concerns about ESA-listed short-tailed albatross and other seabirds, which are drawn to fishing vessels by bait and offal and may become hooked, entangled, or otherwise damaged by fishing gear.

Bycatch estimates expanded from observer data were provided in a series of summary tables, and maps were provided of both species-specific distributions of seabirds and fishery harvest by gear type. The presenters noted that bycatch estimates provided are likely to be underestimates of true seabird mortality from interactions with fishing gear because of hook loss, collision with wires/warps, and other events that occur outside an observer's sphere of observation.

Approximately 6,500 seabirds are estimated to be killed as bycatch annually in groundfish and halibut fisheries in the combined GOA/BSAI region. Bycatch in hook-and-line (HAL) fisheries (especially for Pacific cod) accounts, on average, for 88% of estimated seabird bycatch, while trawl fisheries and pot fisheries account for only ~10% and ~3%, respectively. Most of this mortality occurs in northern fulmar, gulls, and shearwaters, and mortality of these three species together accounts for ~83% of seabird bycatch across all fisheries annually. Though comparatively rare, bycatch of black-footed, Laysan, and short-tailed albatross does occur, and in 2017 several hundred black-footed albatross were taken in the sablefish and halibut HAL fisheries. Other notable years in which high bycatch occurred for various species were identified, but the reasons for these episodic peaks are not typically clear. Despite species-specific density estimates from scientific surveys being provided for the region, neither absolute nor relative estimates of

abundance were provided, making assessment of the population-level impact of this bycatch impossible.

The SSC notes several opportunities for enhancement and expansion of the information, including:

- Using available data to extend the timeframe for consideration back to the 1990s; data stored at the North Pacific Pelagic Seabird database could be accessed for a more complete picture of the distribution and abundance of seabirds in the GOA and SE Bering Sea;
- Providing an index of absolute or relative abundance of each species and population trends, where available, such that the impact of bycatch can be properly considered from a conservation standpoint;
- Inclusion of a concise table of seabird bycatch by species by fishery, especially for the highly impacted and/or sensitive species to facilitate comparison of the bycatch in different fisheries. Please include species of concern to USFWS conservation efforts such as: Aleutian and Arctic terns, *Brachyramphus* murrelets, and red-faced cormorants. These are likely rare in bycatch but any at all could be important at a population level;
- Providing statistical analysis, such as reporting the confidence intervals on the numbers of seabirds bycaught across seasons and years. Among-year summary statistics would be helpful to understand which years are outside the range of normal variability;
- Providing a map showing locations of bycatch events, by seabird species by monthly periods;
- Completion of a geospatial hotspot analysis to identify areas and seasonal timing of intense overlap between fisheries and regions of high seabird density, to identify areas and times of particular concern;
- Inclusion of a summary of seabird bycatch data from the US West Coast, and other regions, to provide context for the extent of impacts documented in Alaska.

Please be sure to include figure legends that indicate what different colors mean and to label axes.

Finally, the SSC expressed strong support for developing a set of leading indicators to identify years of high potential seabird bycatch. Analyses that reveal what contributes most to annual variability in bycatch rates, such as fishery effort, seabird distributions, oceanographic conditions or bird condition would be of value.

The SSC looks forward to receiving annual briefings from the Group.

C-2 Scallop SAFE and OFL/ABC Specifications

The Scallop SAFE was presented to the SSC by Quinn Smith (ADFG, Scallop Plan Team chair), Jim Armstrong (NPFMC), and Scott Miller (NMFS-AKRO). Public testimony was provided by Jim Stone (Alaska Scallop Association), who spoke in support of the expanded economic analysis in this year's SAFE including the break-even analysis that addresses the number of vessels that can be supported by this small fishery. In addition, a letter was received from David Morey (F/V Alaskan Patriot) who expressed concerns about consolidation and latent permits in this fishery.

The SSC greatly appreciates the efforts by the Scallop Plan Team and especially the authors of this year's scallop SAFE report. The report is very well done and contains valuable new information on recent fishery independent surveys, fishery performance metrics, and management activities. The SSC also appreciates the updated fishery economic section, as well as the appendix on economic factors in the fishery.

The SSC supports the Scallop Plan Team's recommendation to set the OFL for the 2018/19 season equal to maximum OY (1.29 million lb; 585 t) as defined in the Scallop FMP, which applies a 20% mortality rate to discards. **The SSC also supports the Team's recommendation to set ABC for scallops in 2018/19 consistent with the maximum ABC control rule (90% of OFL), which is equal to 1.161 million lb (527 t).** These recommendations are unchanged in recent years.

The SSC appreciates the responsiveness of the Scallop Plan Team to previous SSC comments. Action on many of the SSC's comments are dependent on staffing levels. Refilling the vacant scallop biometrician position should be a high priority. **As progress on most of the SSC's comments depend on filling ADFG's biometrician position, the SSC requests an update on the SSC's seven comments from April 2017 in next year's SAFE.** The SSC provides additional comments below.

In recent years, the SSC has commented on CPUE declines in a number of fishing areas. In this year's assessment, there are indications of improvement in stock status in some areas. For example, subsequent to a reduction in GHL from 160,000 to 120,000 lbs for Yakutat in 2012/13, fishery CPUE improved in the last 6 years. While trends in CPUE need to be interpreted cautiously, this trend toward higher CPUE may indicate an improved stock. In 2017/2018, the GHL for Yakutat was increased from 120,000 to 140,000 lbs, and commercial catch attained the GHL with a moderately strong CPUE. In contrast, the GHL was increased from 5,000 lb to 10,000 lb for Dutch Harbor since 2015/16 (p. 75); however, the fishery has taken only half of this amount over the past three seasons with low CPUE.

The SAFE provides information on fishery independent surveys that were implemented in 2016 and 2017. This is a welcome development, and the SSC greatly appreciates ADFG's efforts in this regard. Over time, these surveys may lead to the estimation of scallop abundance, facilitate the interpretation of long-term fishery CPUE trends, provide advance notice of recruitment strength, and allow development of biological reference points for management corresponding to a higher tier. The SAFE reports a substantial increase in the number of small scallops caught in this survey. Possibly, this indicates prospects for increased recruitment in some areas, which may result in improved stock status in the future. However, a time series of survey results will be needed to determine how well the survey estimates relative abundance trends in small scallops.

The SSC is very pleased to see progress in development of an age-structured stock assessment model for scallops in Kamishak Bay, which responds to a request made repeatedly by the SSC. The SSC encourages further development of this model for potential adoption for management. **The SSC requests a report and presentation on this model for SSC review when it is ready. Further, the SSC encourages attempts to develop age- or size-based models for data-poor areas to determine the general applicability of these methods for scallops throughout Alaska.** The SSC also notes that Kayak Island is a relatively data-rich area, so successful development of an assessment model for Kamishak may bode well for application to Kayak.

The SSC appreciates the Scallop Plan Team's interpretation of survey results as a relative abundance index. Considerable uncertainty remains about dredge catchability or dredge efficiency, q, which was assumed equal to 0.83 based on Gustafson and Goldman (2012). The density estimates from the CamSled were considerably higher than the dredge, particularly for small scallops indicating q may be too high if the index

were to be used as an absolute abundance index. It is not clear how *q* may vary with bottom type and other factors. In this regard, the SSC appreciates efforts to compare estimates of scallops from video (e.g., CamSled) and dredges. Reported comparisons for Kamishak versus Kayak suggest that water visibility may limit the utility of visual observations in some areas. The SSC is very supportive of plans to conduct experimental work on *q* during surveys in 2018. This addresses a high scallop research priority. **The SSC recommends examining catchability for different depths, bottom types, and other factors, which may affect catchability. Size selectivity needs to be considered so that fishery independent survey results can be accurately interpreted.**

For next year's assessment, the SSC requests the Scallop Plan Team address the following additional comments concerning fishery independent surveys and fishery performance: (1) report methods used to estimate meat weight reported in Table 2-4 and Figure 2-10; (2) attempt to use the percentage of clappers (empty, but still connected, valve pairs) in Table 2-5 to estimate natural mortality, (3) clarify the meaning of "density" and "count" of scallops of various shell heights from observer data reported for each fishing area (e.g., Figure 4-3 for Yakutat on p. 42), and (4) describe how fishery CPUE has been standardized (e.g., Figure 4-5 for Yakutat on p. 45).

Development of fishery independent surveys and age-structured stock assessment models may lead to improved estimation of OFL and ABC compared to the method in the Scallop FMP described above, as well as improvements in the procedures used by the state to estimate GHLs. **Towards this end, the SSC requests the Scallop Plan Team explore the application of OFL calculations analogous to Tier 5 used for groundfish.** Tier 5 requires availability of reliable point estimates of *B* and natural mortality rate *M* and sets $F_{OFL} = M$.

The SSC appreciates inclusion of ecosystem information in this year's SAFE beginning on p. 83. To assist in future development of this section, the SSC offers the following advice. Section 6 is perhaps better named "Ecosystem Considerations," consistent with groundfish SAFEs. A rather cursory overview of bycatch taken in the scallop fishery is included. **The ecosystem section would be enriched by considering the detailed spatio-temporal analysis of observed scallop bycatch reported by Glass and Kruse (2017; Spatiotemporal variability of benthic communities on weathervane scallop beds off Alaska. Marine and Coastal Fisheries, 9:1, 521-534, DOI: 10.1080/19425120.2017.1370041).** In addition to presenting an analysis of the benthic communities associated with scallop beds, the paper provides information relevant to EFH. Moreover, Glass and Kruse (2017) found evidence that scallop beds in the Bering Sea and Kodiak Shelikof bed 1 (KSH 1) were recovering from disturbance. Aside from these two instances, there was little evidence of such effects on other scallop beds where depth and sediment type seem to be most important to explaining benthic community patterns.

The SSC appreciates the additional economic analyses in this year's SAFE and offers the following comments. Since for scallop, there is no stand-alone Economic Considerations chapter like those produced by for groundfish and crab, the Scallop SAFE would benefit from a series of tables tracking a time series of annual quantitative indicators of sustained community participation, per National Standard 8. These could include:

- LLPs by community of ownership address
- Active vessels by community of ownership address

- Active vessels by homeport (both as determined from vessel data and other sources)
- Active vessel diversity (fishing portfolio)
- Number of offloads by port
- Number of unique vessels making offloads by port
- Number of processors receiving deliveries by port

Additionally, brief narrative text qualitatively describing the major patterns of change tracked in these indicators (and, where possible, the drivers of those changes) would inform the nature, direction, and order of magnitude of community engagement in and dependency on the scallop fishery. Further, some of the information provided in the economic analysis in the 2017 SAFE (pgs. 59-60) that was not carried forward would be beneficial to incorporate in future SAFE documents, including:

- Crew size pre-co-op formation.
- Attempted crew wage data collection effort in 2012/2013.
- Vessel maintenance and repair work done in Kodiak.

This is particularly important in the absence of quantitative data on volume and value of landings by port, due to data confidentiality restrictions, or other information on the community context of the fishery. For example, the Scallop FMP (February 2014) provides data on the number of offloads by specific port, but only for the years 1990-2003 (Table 5). The FMP is supplemented with community profiles (FMP Appendix F) for those communities that had landings of scallops in 1990-2003. However, while they were "intended to give an overview of the community, demographics, and involvement in North Pacific fisheries with particular emphasis placed on harvesting and processing of scallops," data on engagement was limited to the year 2000 alone and 10 of the 13 community profiles contain no mention of scallops (Cordova, Ketchikan, Pelican, Petersburg, Sand Point, Seattle, Seldovia, Seward, Sitka, and Yakutat). Information on the scallop fishery presented for the other three communities was limited to the following: Homer, 1 permit; Kodiak, 1 permit, 2 vessels delivered scallops, and scallop processing occurred; and Unalaska/Dutch Harbor, 1 vessel delivered scallops. This lack of basic information on the human dimensions of the fishery highlights the need to incorporate updated time series for community engagement indicator tracking in annual SAFE documents going forward.

The following publications may provide some additional useful general information on the historical development and management of the weathervane scallop fishery in Alaska:

- Kruse, G.H., J.P. Barnhart, and G.E. Rosenkranz. 2005. Management of the data-limited weathervane scallop fishery in Alaska. Pages 51-68 *In* Kruse, G.H., V.F. Gallucci, D.E. Hay, R.I. Perry, R.M. Peterman, T.C. Shirley, P.D. Spencer, B. Wilson, and D. Woodby (eds.), Fisheries assessment and management in data-limited situations. Alaska Sea Grant College Program AK-SG-05-02, University of Alaska Fairbanks.
- Shirley, S.M., and G.H. Kruse. 1995. Development of the fishery for weathervane scallops, *Patinopecten caurinus* (Gould, 1850), in Alaska. Journal of Shellfish Research 14(1):71-78.
- Kruse, G.H., and S.M. Shirley. 1994. The Alaskan scallop fishery and its management. Pages 170-177 *in* N.F. Bourne, B.L. Bunting, and L.D. Townsend, editors. Proceedings of the 9th International Pectinid Workshop, Nanaimo, B.C., Canada, April 22-27, 1993. Volume 2. Canadian Technical Report of Fisheries and Aquatic Sciences 1994.

- Kruse, G.H. 1994. Fishery management plan for commercial scallop fisheries in Alaska. Alaska Department of Fish and Game, Commercial Fisheries Management and Development Division, Draft Special Publication 5, Juneau.

C-5 Salmon Genetics and Bycatch Mortality

The SSC received presentations on published reports on the GOA and BSAI Chinook and chum salmon prohibited species catch (PSC) genetics, and an update on the Adult Equivalency model (AEQ) of Chinook PSC in the EBS pollock fishery. The SSC received these presentations from Chuck Guthrie (NMFS-AFSC), Jeff Guyon (NMFS-AFSC), Chris Kondzela (NMFS-AFSC), and Jim Ianelli (NMFS-AFSC). Bill Templin (ADFG) also provided an update on improvements to genetic baselines. There was no public testimony.

Genetics

The authors presented an impressive body of work, and the SSC particularly appreciated information provided in response to SSC requests during its April 2017 meeting. The new information included proportional stock/stock complex composition, with spatial and temporal breakouts, the age composition of genotyped Chinook salmon, and estimates of PSC by stock and area. The authors also presented a special project on evaluating the presence of hatchery fish via thermally marked otoliths recovered from PSC taken in the GOA rockfish program fishery. These samples were collected from the rockfish fishery with industry support and analyzed by the ADFG mark-tag-age lab. Of the samples evaluated, approximately 8% were thermally marked, with 18 of those 24 samples originating from southeast Alaska and British Columbia hatcheries. The SSC interprets these data with caution due the very small sample sizes, but encourages more work on hatchery contributions to PSC.

These reports provide important information for regulatory analysis and other scientific investigations that elucidate the potential impact of PSC at a regional level. The current stock composition breakouts by time and area likely approach the data resolution limits. Ongoing work in improving baseline aggregations may increase resolution in the future and reports should incorporate this information as appropriate.

However, a linkage between the information presented in the reports and in-season PSC management is still unclear. **The SSC reiterates past recommendations (April 2015, 2016, and 2017 minutes) that the informal salmon workgroup consider a workshop with industry participation to facilitate discussion on how to better focus the genetic reports and to discuss information gaps. The SSC also requests that Robert Clark and Dayv Lowry be placed on the workgroup as SSC representatives.** Bill Templin reported that work on a coast-wide single nucleotide polymorphism (SNP) baseline and comprehensive database for stock-specific identification of individual Chinook salmon in ongoing and has been put under the direction of Lisa Seeb. Development of this tool will make estimating stock-specific impacts, especially to ESA-listed stocks, possible and would represent a significant step forward for conservative management.

The SSC notes that the thermally marked otolith project was conducted without designated funding**. The SSC considers this an important research component needed to better understand PSC stock composition in the GOA.** The SSC recommends that funding for future work on this project be considered within the context of the Council's research priorities.

Salmon Mortality - AEQ Update

The SSC also received an update on the AEQ model. The AEQ model for Chinook salmon in the EBS pollock fishery was updated with the most recent genetic stock distribution information. The SSC concurs with the author's suggestions for future improvements to the model, including obtaining contemporary length-at-age data, and reexamining observer sampling levels, recognizing that this may be difficult given current observer sampling duties and workload. In addition, the authors should consider whether the assumed 10% coefficient of variation used to reflect run-size uncertainty is reasonable. This is likely much lower than the actual uncertainty associated with these estimates. To the extent possible, the SSC requests that run size uncertainty be incorporated into AEQ impact rate calculations. The SSC also requests that future changes made (e.g., model structure, new/revised data) between the past and current AEQ analyses be summarized at the beginning of the report. The SSC also discussed whether these AEQ methods used for the EBS pollock fishery PSC could be developed for the GOA. The amount of available data and complexity associated with regional salmon abundances in the GOA would make this a difficult task, although not insurmountable.

C-6 GOA Trawl CV Chinook PSC Limit Adjustments Initial Review

The SSC received a presentation from Sam Cunningham (NPFMC) on the initial draft of an analysis of GOA CV Chinook PSC limit adjustments. Public testimony was provided by Julie Bonney (Alaska Groundfish Data Bank, AGDB) and Neil DeWitt (recreational angler).

The SSC reviewed an earlier draft of this proposed amendment in February 2018, and recommended that the analysis be released for public review, following some important modifications intended to improve clarity to readers and further highlight the necessary tradeoffs to a range of audiences. The SSC commends the authors for comprehensively addressing requested modifications while also incorporating additional revisions in response to input from both the Advisory Panel and the Council. The addition of the hypothetical AEQ example specifically was noted as effectively showing the importance of at-sea mortality; this is conceptually important and highlights the continuing unavailability of key information about the at-sea natural mortality associated with stocks originating in the Pacific Northwest, which comprise a large portion of the GOA PSC and may include ESA listed stocks. The SSC would also like to recognize the importance of the data voluntarily provided by industry and specifically by the AGDB that has substantially contributed to the information available for use in the analysis. **The SSC recommends that the analysis be released for public review, following incorporation of the following information/modifications.**

- The addition of one or more examples that illustrate how in-season intersector transfers would interact with interseason/interyear rollovers.
- The analysis of impacts on Chinook salmon focuses on "*the direct effect of a marginal "saved" Chinook salmon*" (p. 184); however, the actual trade-offs involved could be characterized more clearly and are not limited to the potential loss of a few hundred additional Chinook salmon that might otherwise return to Southeast Alaska or other regions. The document states that "*the direct effect of the action alternatives is a reduction in the likelihood, all else equal, that the GOA non-pollock trawl CV fisheries will be closed by Chinook PSC in any given year*" (p. 178). Similarly, an indirect effect of the proposed alternatives is an *increased likelihood* that additional Chinook salmon restrictions may occur. This trade-off between the potential risks to groundfish fisheries against potential risks to Chinook salmon fisheries should be clearly stated. Numerous public

comments attest to the concerns of both groundfish and Chinook salmon user groups about the risks involved. This may also encourage consideration of the suitability of hard cap regulations in managing risks to the fisheries involved.

- Language in the document to the effect that the original Chinook salmon PSC hard cap was set conservatively low (and perhaps too low based on new information) should be modified or otherwise better contextualized. What may have been considered "conservative" at the time would seem far less conservative today, given the increase in the number of Chinook salmon stocks of concern.
- Information that has been developed on communities engaged in the different GOA Chinook salmon fisheries for other recent Council analyses (e.g., Section 4.3 GOA Chinook Salmon Fishery Indicators and Attachment 2: Detailed GOA Chinook Salmon Data Tables of the Preliminary SIA that was prepared for the Council's consideration of the GOA Trawl Bycatch Management Program in December 2016) should be incorporated by reference in Section 4.6 Description of Potentially Affected Chinook Salmon Fisheries, similar to what has been done in Section 4.5.5 Communities for the GOA groundfish trawl fishery communities.
- The parenthetical reference to National Standard 8 on line 5 of page 187 should be changed from "(minimize impacts on communities)" to "(provide for the sustained participation of fishing communities and to the extent practicable, minimize adverse economic impacts on such communities)."
- If determined applicable, revise Chapter 5 Magnuson-Stevens Act and Fishery Management Plan Considerations to include an EO 12898 Environmental Justice analysis to document whether disproportionate high and adverse impacts would potentially accrue to minority populations and/or low-income populations under one or more of the alternatives/options being analyzed.

C-8 Halibut Retention in BSAI Sablefish Pots Initial Review

The SSC received a presentation from Sarah Marrinan (NPFMC), Sara Cleaver (NPFMC Sea Grant fellow), and Stephanie Warpinski (AKRO). Public comment was received from Heather McCarty (Central Bering Sea Fishermen's Association) and Mateo Paz-Soldán (City of St. Paul), and Simeon Swetzof (self).

This management action would require the retention of legal-sized halibut in the BSAI sablefish pot fishery when sablefish and halibut Individual Fishing Quota (IFQ) or Community Development Quota (CDQ) are available onboard. The intent, as stated in the Council's purpose and need statement, is to alleviate issues associated with whale depredation when fishing with HAL gear. The purpose is to reduce the amount of unaccounted discard mortality associated with both pot and HAL gear due to whale depredation, and reduce mortality from discards of legal-sized halibut. The action alternative details four elements. These elements include, respectively, the use of single or longline pots, options for gear retrieval requirements, an exemption for the nine-inch tunnel opening, and monitoring requirements.

The SSC commends the analysts for an extremely thorough exploration of the potential effects of allowing retention of halibut in sablefish pot gear in the BSAI. It presents a persuasive argument that simply retaining halibut currently caught in sablefish pots will have *de minimis* effects. Further, if the management action induces a modest expansion of, or changes in, the utilization of pot gear for halibut, impacts across a range of outcome measures will be minor. **The SSC recommends that this analysis be released for public**

review, subject to the following minor modifications.

- Split table ES-1 into separate columns for the impacts if the utilization of sablefish pots does not change in response to the opportunity to retain halibut, and the impacts if changes occur. The discussion can then emphasize these cases separately and directly address the likelihood of there being a change in pot utilization.
- Add a table comparing the species and incidence of seabird bycatch associated with longline and pot gears.
- Improve the ability to address the differential distribution of potential beneficial and adverse impacts of the proposed action across communities engaged in the relevant fisheries along the following lines (including text modifications/additions to accompany modified and/or new tables):
    - Table 19: Add a "Total Unique Vessels" column for Pot gear and HAL gear to show annual year-to-year variation in unique vessels 2011-2016 for each gear type.
    - Table 20: Add a "Total Unique Vessels" column for Pot gear and HAL gear to show annual year-to-year variation in unique vessels 2011-2016 by vessel length category for each gear type.
    - Add a new Section 4.5.2.4 Community Engagement in the BSAI Sablefish IFQ and CDQ Fisheries Using Pot Gear
        - Add a table showing the community of ownership for the pot gear vessels (IFQ, CDQ, and total unique vessels) by length category shown in Table 20. For consistency with other analyses, show by individual Alaska community, but for the Pacific Northwest, use Seattle MSA, Other Washington, Oregon, and Other States category groupings as relevant.
        - Add a table showing the overlap of vessels fishing both GOA sablefish pot gear and BSAI sablefish pot gear in 2017 by community of ownership.
        - Add a table showing the number of shore-based processors accepting deliveries of pot-caught BSAI sablefish by community of operation 2011-2016.
    - In Section 4.5.4 Communities, Processors, and Tax Revenue
        - Add a table that shows community of ownership for vessels engaged in the Area 4 IFQ and CDQ fisheries. For consistency with other analyses, show by individual Alaska community, but for the Pacific Northwest, use Seattle MSA, Other Washington, Oregon, and Other States category groupings as relevant.
        - Add a table that provides simplified harvest diversity information (e.g., halibut, sablefish, salmon, other) for the vessels by community grouped as noted above to show relative dependence of the community fleet on Area 4 halibut IFQ and CDQ fisheries.
        - Add a table showing the number of shore-based processors accepting deliveries of Area 4 halibut by community of operation 2011-2016.
        - Add a table showing volume of deliveries accepted and first wholesale gross revenues (or ex-vessel gross revenues, if that is not possible) associated with those landings for 2011-2016 for halibut, sablefish, salmon, and other fisheries processed by shore-based processors operating in the economically/socially/politically relevant geographic aggregations of

communities to show processing diversity/relative dependency while preserving data confidentiality (e.g., using following groupings if feasible):

- Togiak, Naknek, and Dillingham (BBEDC Communities)
- Homer, Kodiak, King Cove, and Sand Point (GOA Communities)
- Unalaska/Dutch Harbor and Akutan (BSAI Large Multi-Species SBPR Communities)
- St. George, St. Paul, and Atka (CBSFA and Other APICDA Communities)
- Adak, Nome, and Savoonga (Adak and NSEDC Communities)

- Page 112, 4th full paragraph, add a table that shows the community of residence for those "operators most likely to use the increase flexibility proposed in this amendment" i.e., "those that already fish sablefish quota with pot gear and who also hold halibut quota in the appropriate regulatory area."
- Page 121 (3rd full paragraph) and page 123 (partial paragraph at top of page), identify the community of ownership of the estimated 3 vessels that will potentially need to add VMS gear and the estimated 11 vessels that will potentially need to begin using DFL under the proposed action.

The SSC notes that the current analysis does not evaluate an option where there is significant expansion of sablefish pot gear utilization in response to the increased opportunity to catch halibut. Such an option would capture the intent to incentivize longline vessels to convert to pots to reduce whale depredation, reflecting the objective articulated in the purpose and need statement. If the Council intends to effectively allow for pot fishing for halibut in the BSAI, the SSC notes that the document, as is, does not address this and would require an expansion of the scope of the analysis. This additional analysis would need to assess which longline vessels would likely convert to pots, how their behavior would change, and whether larger increases in utilization of pot gear would result in consequential impacts

In identifying preferred alternatives, the SSC encourages the Council to consider the following factors. First, the SSC sees Element 3 (9" maximum tunnel opening) as significantly influencing the extent to which there is an increase in halibut targeting with pots, and thus the extent of the impacts. Second, enforcement has identified a number of practical issues that will be important for the Council to consider when selecting specific alternatives. Despite enforcement identifying that the tunnel opening requirement is difficult to enforce, they supported its requirement. Third, the policy for pot utilization in the Pribilof Island Habitat Conservation Zone (PIHCZ) will be critical to determining the impact of increased pot utilization on Pribilof Island Blue King Crab stocks. The SSC notes that NMFS is recommending that the PIHCZ be closed to all pot fishing.

D-1 Halibut Abundance-Based PSC Limits

A discussion paper on halibut PSC abundance-based management (ABM) was presented by a workgroup with members Diana Stram (NPFMC), Jim Ianelli (AFSC), and Carey McGilliard (AFSC). Public testimony was given by Arne Fuglvog (Iquique), Gerry Merrigan (FLC), Linda Behnken (ALFA), John Gauvin (AKSC), and Chris Woodley (GFF).

The discussion paper provides a preliminary investigation of ABM control rules using "ABM strawmen" (example ABM alternatives) based on the Council's suite of elements, options, and trawl and setline survey indices of halibut abundance. The discussion paper was in response to the Council's request in October 2017 for additional description of control rules, including discussion of features that best meet the Council's objectives, a qualitative evaluation of the control rules, and their relative performance. The discussion paper provides a broad discussion of the different components of control rules (e.g., slopes, starting points, resolution, etc.) and how they pertain to Council objectives. The discussion paper also includes a reorganization of the Council's initial elements and options to reflect a clearer structure for developing ABM alternatives. Based on this reorganization, four ABM strawmen were constructed that differ in how the trawl and setline survey indices are combined into a PSC control rule (or rules). Each ABM strawman was evaluated according to how they influence PSC limits based on both historical and hypothetical values for the trawl and setline survey indices.

The SSC believes that the working paper has several useful features that will aid the Council in the development of ABM alternatives. The broad discussion regarding control rules does a nice job of reconciling the different "types" of control rules (i.e., continuous, linear, lookup-table, multidimensional) and explaining the different ways in which multiple abundance indices can be combined into a multidimensional control rule. The reorganization of the Council's ABM elements and options also provides a nice logical structure for developing ABM alternatives. The SSC believes, however, that some elements of the working paper fall short in meeting the Council's October 2017 request. The preliminary investigation is not adequate for evaluating the relative performance of the strawmen ABM control rules compared to several of the Council's objectives. For example, while evaluating the influence of control rules on PSC limits using historical and hypothetical abundance indices provides information on relative performance for meeting Objective 5 (i.e., the provision of stability in PSC limits), it does not provide information on the relative performance for meeting Objectives 2 through 4. Lacking this information, it is not possible to assess the tradeoffs among the different ABM strawmen presented in the document and to determine which control rules would be best for moving forward as a suite of alternatives for an initial review draft analysis. As the working group acknowledges, evaluating the relative performance of control rules for meeting all the Council's objectives will require a formal analysis that is capable of assessing the impact of PSC control rules on the groundfish fisheries, directed halibut fisheries, and the halibut stock.

Despite the shortcomings of the working paper, **the SSC recommends that the Council move forward in drafting an initial suite of ABM alternatives for a formal evaluation.** Choosing an initial set of ABM alternatives will allow the working group to develop a set of performance metrics and more sophisticated simulation models with population and fleet dynamics that are necessary for evaluating the relative performance of different control rules. **The SSC highly recommends that the Council's initial suite of alternatives be treated as the first of potentially several sets of alternatives that will need to be evaluated before arriving at a final set of alternatives for an Environmental Impact Statement (EIS).** The Council's initial suite of alternatives will not likely include the combination of elements and options that achieves the Council's preferred balance of their stated objectives. However, a formal evaluation of the initial suite of alternatives will provide additional information on the relative performance of control rule features. The Council can then redesign alternatives to foster those control rule features that achieve the intended objectives and remove those features that do not. **The SSC therefore recommends that the**

Council follow an iterative process for determining the final set of alternatives for evaluation in an EIS.

The SSC also has the following recommendations for the Council as they move forward in developing alternatives for halibut PSC ABM:

- The SSC should be involved in providing feedback and guidance on the performance metrics and methodology that will be used to evaluate ABM alternatives. If the Council decides to view an analysis of an initial suite of alternatives in October 2018, the SSC would like a presentation on an evaluation outline from the working group in June 2018.
- Careful consideration to what length of time-series appropriately reflects the mean and variability of each index is necessary (see SSC comments in April 2017). Alternative time series will have different mean values, which would have a direct effect on look-up tables or stair-stepped control rules that use standardized indices as breakpoints. Indices should be standardized to reflect current, as opposed to historical, fishery behavior, regulatory environment, biology, and population dynamics.
- The IPHC setline survey for all sizes of halibut (effectively O26) should be used in place of the O32 index used in the working paper. This expanded index may better represent the smaller fish encountered by the longline fleet.
- ABM strawmen 1 and 2 should not be used as a basis for developing initial alternatives. ABM1 uses only the trawl survey for a single PSC limit that is then allocated to gear/sector according to the status quo allocation, and thus fails to use information from the setline survey for determining PSC limits. ABM2 combines the trawl and setline survey indices into a single index, which results in a PSC limit that is continuously (and potentially uniformly) influenced by both indices. This approach is undesirable if one index is a better representation of the halibut population that is encountered in the fishery. ABM4 provides a better framework for a multidimensional control rule that considers both the trawl and setline survey indices.
- The working group indicated that the status quo (i.e., a fixed PSC limit) will be used as a baseline in the analysis of alternatives. One or a small number of alternative (but fixed) PSC levels should be included in the analysis, both for comparison, and to allow investigation of the performance of ABM alternatives relative to differences only in the scale of the starting points.
- Metrics such as the O26 portion of PSC and the fraction of the PSC removed from area 4CDE may be worth investigating as a performance metric and/or potential tool to create incentives in tandem with ABM control rules.
- A 3- or 5-year running average of PSC limits could be considered as an option for promoting stability in PSC limits.

The SSC also suggests the working group consider the following issues:

- The reorganized elements and options are clear and succinct as long as the control rule (or rules) use a single index. If, however, multiple indices are being used in the control rule, additional elements or options may need to be introduced that specify the form of the multidimensional control rule. As written in the working paper, there are no elements or options that would allow the Council to specify how a secondary index could be included in a control rule with multiple indices.

- A replacement was provided for Figure 14 in the working paper, but the replacement used a different x-axis (in years) from the other figures of the same format using quadrants.
- On page 7 (element 1) of the working paper, the wording of options 3 and 4 appeared to differ from options 1 and 2 with regard to indexing of fisheries to indices; there was also some written public comment that this was confusing.
- The working group did a great job of thoroughly describing the scenario approach to illustrating the behavior of the different control rules. However, the SSC noted that in the executive summary and Council Action Memo this approach is incorrectly described as "scenarios of forward projections…of potential future halibut trends." Importantly, the scenarios provided should not be interpreted as likely future states or trends.

The SSC also discussed the expected timing of ABM products in upcoming meetings. If the Council decides on an initial set of alternatives in April 2018, the earliest that a preliminary analysis could be produced is October 2018. If this occurs, the SSC requests an update from the working group in June 2018 on their analytical strategy for the October 2018 product. The SSC noted that *at least* one iteration and refinement of preliminary alternatives would be required, meaning that a refined analysis of alternatives could be delivered no earlier than April 2019, given the other requirements on the working group.