SCIENTIFIC AND STATISTICAL COMMITTEE
DRAFT REPORT TO THE
NORTH PACIFIC FISHERY MANAGEMENT COUNCIL
February 2nd – 4th, 2026

The SSC met from February 2nd – 4th, 2026 in Anchorage, AK. Members present in Anchorage were:

Sherri Dressel, Co-Chair *Alaska Dept. of Fish and Game*	Jason Gasper – Co-Chair *NOAA Fisheries—AKRO*	Ian Stewart – Co-Chair *Intl. Pacific Halibut Commission*
Alison Whitman, Vice Chair *Oregon Dept. of Fish and Wildlife*	Chris Anderson *University of Washington*	Fabio Caltabellotta *Washington Dept. of Fish and Wildlife*
Curry Cunningham *University of Alaska Fairbanks*	Martin Dorn *University of Washington*	Robert Foy *NOAA Fisheries—AFSC*
Dana Hanselman *NOAA Fisheries—AFSC*	Brad Harris *Alaska Pacific University*	Kailin Kroetz *Arizona State University*
Franz Mueter *University of Alaska Fairbanks*	Andrew Munro *Alaska Dept. of Fish and Game*	Robert Suryan *NOAA Fisheries—AFSC*
Sarah Wise *NOAA Fisheries—AFSC*		

SSC members who attended remotely were:

Curry Cunningham *University of Alaska Fairbanks*	Chris Siddon *Alaska Dept. of Fish and Game*

SSC members who were absent were:

Jennifer Burns
Texas Tech University

SSC Election of Officers

The SSC re-elected Sherri Dressel (ADF&G), Jason Gasper (NOAA-AKRO) and Ian Stewart (IPHC) as co-chairs for 2026. The SSC also re-elected Alison Whitman (ODFW) to serve as vice chair. Dr. Dressel will chair the February and December meetings and Dr. Stewart the June and October meetings, with

support from Dr. Gasper at all four meetings.

SSC Administrative Discussion

The SSC received a presentation from Diana Evans (NPMFC) on administrative matters. Ms. Evans announced NPFMC's new deputy director, Anna Henry. The SSC looks forward to working with Ms. Henry in her new capacity. Ms. Evans reviewed a number of relevant B report agenda items for the SSC and described the upcoming changes to the Council meeting schedule in 2026 and 2027.

C1 GOA Pacific Cod Harvest Specifications

The SSC received a presentation on an operational update of the Gulf of Alaska (GOA) Pacific Cod stock assessment from Sara Cleaver (NPFMC) and Pete Hulson (NOAA-AFSC) to set the 2026/2027 harvest specifications. The out-of-cycle update assessment was requested by the Council in December 2025 to incorporate 2025 survey data, as the bottom trawl survey showed an apparent increase in Pacific cod biomass as the stock continues to recover. In addition to the assessment, the SSC reviewed an abbreviated ESR, presented by Bridget Ferriss (NOAA-AFSC), which focused on environmental conditions relevant to Pacific cod, and an updated ESP for Pacific cod, presented by Kalei Shotwell (NOAA-AFSC). **The SSC commends the AFSC and all the analysts for producing the SAFE and associated documents on an abbreviated timeline and out of cycle. The SSC recognizes that taking up the GOA Pacific cod assessment out of cycle is a unique circumstance, but notes the danger of prioritizing assessments based on perceived trends. This approach, if repeated, can inadvertently create bias in the entire management system that was not anticipated in the FMP[1].**

Written public testimony regarding the Pacific cod assessment was provided by Jim Armstrong and Chad See (Freezer Longline Coalition, FLC), Heather Mann (Midwater Trawlers Cooperative), and Ben Ley on behalf of businesses and fishermen in the communities of False Pass, King Cove, and Sand Point. Oral testimony was provided by Ben Ley, Carlin Hoblet (self, False Pass), and Jim Armstrong (FLC). Public testimony expressed appreciation to the AFSC and the assessment authors for producing the out-of-cycle assessment for Pacific cod and supporting documents. Testimony highlighted the critical importance of Pacific cod to GOA communities and was generally supportive of the authors' and GPT's recommended ABC. Western GOA fishermen requested a thorough analysis of the migratory behavior of GOA Pacific cod and a re-examination of stock structure in the GOA and Bering Sea. The SSC considered these comments in its discussions as noted below.

Ecosystem Status Report (ESR)

Ecosystem conditions in 2025 appeared unfavorable for Pacific cod, reminiscent of the poor conditions associated with the 2014-2016 warm 'blob'. Early signs of low productivity and poor prey conditions include small-sized phytoplankton, low abundances of large copepods, and low larval abundances of cod and other groundfish species. However, mid-trophic level prey such as krill and forage fish (e.g., capelin) appeared to be more available in 2025, although the editor cautioned that primary effects of the 2014-2016 GOA heatwave on mid and upper trophic level species occurred in the second year of the heatwave. The winter of 2025/26 was warmer than expected, given the forecast for La Nina conditions. **While some cooling is occurring, much residual heat remains throughout the water column in the GOA and may affect bottom waters on the shelf in the future, which may adversely affect Pacific cod in 2026 and beyond.**

[1] Satterthwaite, W.H. 2023. The reproducibility crisis meets stock assessment science: Sources of inadvertent bias in the stock assessment prioritization and review process. Fisheries Research 266: 106763

Ecological and Socio-economic Profile (ESP)

The Pacific cod ESP was updated based on available data for a suite of indicators that are classified as predictive, contextual, or monitoring. Among the predictive indicators, an index of spawning habitat suitability showed a significant positive relationship with recruitment, suggesting promise for inclusion in causal analyses or as a direct input to the assessment. The index was below the long-term mean in 2025, which is expected to result in reduced egg survival associated with warm bottom temperatures and poor recruitment. This is consistent with low catches in both the larval and age-0 surveys in 2025. Furthermore, there were below- or near-average body conditions for juveniles and adults as well as relatively poor prey conditions for the larval stage reported in the ESR.

The SSC appreciates the new indicator figures that denote good (blue) and poor (red) conditions and supports the GPT recommendations for developing indicator thresholds and asymmetrical 'confidence bands' as appropriate. The SSC noted that some ESP indices show little variability and may be less informative than hoped. Although not in the presentation, the SSC noted and appreciated the inclusion of three economic indicators within the GOA Pacific cod ESP. All three indicators (Real ex-vessel value, ex-vessel price, revenue-per-unit-effort show a significant downward trend from 2023, with several metrics reaching historical lows in 2024. While many of the ecological indicators have gaps in some years and/or consist of relatively short time series, these indicators nevertheless provide valuable context. The SSC encourages analysts to consider including these indices in multivariate analyses (e.g., Dynamic Factor Analyses) to develop composite indices that permit clustering of similar years or in causal models that can accommodate missing values (such as DSEM). In cases where indicators tend to stay above or below average conditions for multiple years, the analysts may want to consider the addition of cumulative stress indicators. The SSC also highlights recent research in the GOA relating changes in size-at-age to the length of the growing season rather than mean temperature, which may affect size at age for both juvenile and adult Pacific cod.

Pacific cod assessment

The authors completed the operational update using the 2024 accepted model (24.0) with new data, including catches through December 8, 2025, fishery length compositions, and results from both the 2025 bottom trawl survey and longline survey (abundances/RPNs and length compositions). The estimated trawl survey biomass increased by 39.2% from 2024 with a relatively large CV (23%) but within the range estimated for other years of the time-series. An analysis in Appendix 2.2 indicated the apparent increase was not a result of the restratification of the survey in 2025, which had little effect on Pacific cod survey estimates when applied to historical data. In contrast to the bottom trawl survey, relative population numbers (RPN) in the longline survey decreased 5%, driven by a large decline in the estimated RPN in the eastern portion of the survey area. The authors noted future plans to re-examine how these longline indices are computed.

The assessment model successfully converged, provided reasonable fits to the survey indices, had an acceptable retrospective pattern in recent years, resulted in good fits to length composition data, and residual diagnostics indicated no concerns.

The SSC concurs with the use of Model 24.0 for setting harvest specifications for 2026 and 2027. Results from this model indicate the estimated spawning biomass for the stock is currently slightly below the $B_{35\%}$ reference point ($B_{34.5\%}$) and is projected to decrease slightly to $B_{33.1\%}$ in 2026, **placing the stock in Tier 3b.** The authors and GPT recommended setting the ABC at maxABC. **The SSC concurs with the authors' and GPT's recommendation on the resulting OFLs and ABCs of 49,782 t and 41,520 t, respectively, in 2026, decreasing to 38,812 t and 32,209 t in 2027. The stock is not subject to overfishing in 2024 and is not overfished or approaching an overfished condition in 2025.**

The SSC appreciates the detailed discussion of all categories in the risk table, regardless of the level of concern/no concern. The risk table changed in two important ways from the previous full assessment in 2024. First, the Population Dynamics category was assessed as a Level 2 concern in 2024, due to the historically low spawning biomass and below-average recruitment. The authors recommended reducing the risk to a Level 1 (normal) because the stock continues to recover and both recruitment and biomass dynamics are believed to be adequately accounted for in the model or encompassed in the application of the harvest control rule. Despite some remaining concerns related to continued below-average recruitment in recent years, the SSC agrees with the level 1 designation. The SSC highlights continued concerns over the use of the full recruitment time series for projections, as the stock appears to be in a period of reduced productivity with below-average recruitment estimates since 2014. Using average recruitment since 1977 likely results in overly optimistic biomass projections for future years (2028 and beyond) but does not affect short-term projections for setting OFL and ABC in 2026 and 2027. Moreover, there are some indications from beach seine monitoring and from fishery-dependent data that recruitment was above average for the 2020 and 2022 year classes and may be underestimated in the model.

Second, the Ecosystem Considerations category was elevated to a level 2 concern, due to continued elevated temperatures, which may affect egg survival as well as prey quality and availability for juveniles and possibly for adults in the future. As noted in the ESR, conditions are similar to the first year of the 'blob' (2014 – 2016) that led to the collapse of the Pacific cod stock. However, at this time, krill and forage fish availability appear favorable. The Fishery-informed Considerations category remained at a Level 1, and no concerning signals were reported by the fishing fleet in public testimony.

The SSC notes that these unfavorable environmental conditions imply an increased risk of continued poor recruitment, as well as poor growth and survival of Pacific cod in coming years. Therefore, conditions should be carefully monitored, especially if warm conditions continue into 2026 and beyond.

Subarea apportionments

The authors and GPT recommend a new methodology for subarea apportionments that uses the *rema* model with a single process error and an estimated additional observation error, consistent with other stocks (e.g. GOA thornyhead). The new approach tends to smooth the time series observations, thereby stabilizing apportionments over time, which the SSC considers to be a desirable feature. **The SSC supports the revised approach and the resulting subarea apportionments.** The SSC highlights and appreciates the clear comparison of the estimated biomass distribution among subareas over time using both the old and new methodology (Fig. 2.17).

The updated apportionment model estimates that 24.8%, 69.2% and 6.0% of the current biomass occur in the western, central and eastern GOA, respectively, resulting in the following subarea apportionments (in metric tons):

	Western	Central	Eastern	Total
2026 apportionment	10,297	28,732	2,491	41,520
2027 apportionment	7,987	22,289	1,933	32,209

Additional recommendations

The SSC notes that there have been numerous suggestions for model improvements since the last full assessment and looks forward to the authors and other analysts exploring recommendations from that assessment as well as those below in the next full assessment and through ongoing or new research.

- Given that recruitment as estimated in the model has been below average since 2014 and the expectation of continuing warm conditions, the SSC supports the GPT recommendation that the authors re-evaluate the portion of the recruitment time series used for projections to better reflect currently prevailing environmental conditions.

- The SSC suggests that the authors explore the use of temperature-informed mechanisms within the assessment model and temperature-informed growth or mortality. For example, the spawning habitat index identified in the ESP could be used as a predictor of recruitment. Alternatively, these relationships could first be explored and refined through causal modeling (e.g. DSEM) before considering their use in the assessment.

- The SSC highlights and supports public comments to re-examine the stock structure of Pacific cod in the Bering Sea and GOA regions based on historical and ongoing tagging work and other information. The SSC notes that a research project developing a spatial model for the combined GOA and Bering Sea region is under development and will incorporate movement among regions informed by tagging work. The SSC looks forward to results from this work.

- **In light of emerging information about the migratory behavior of Pacific cod, the SSC highlights the need to re-consider the assessment and management of Pacific cod in the Alaska region.** In addition to the development of a combined model that accounts for movement among regions, this may require an assessment of the data needed to support these modeling efforts as well as changes to the management of Pacific cod.

- The SSCs reiterates its recommendations from December 2024 regarding the relationship between trawl and longline survey selectivities and natural mortality, as well as among temperatures, changes in spatial distribution and estimates of selectivity (see December 2024 SSC report).

- The SSC supports the authors' plans to re-examine the computation of the RPN indices from longline survey data to better reflect the distribution of longline sets across depth strata and between the eastern and western portions of the survey region.

- The SSC supports bringing forward either harvest projections or an operational update in the fall 2026 assessment cycle, and looks forward to the next full assessment to address some of the research recommendations from various review bodies. Regardless of the type of assessment brought forward, the SSC requests that previous GPT and SSC comments, author responses, and plans for the next operational full assessment and for research models be tracked for prioritization.

- In response to the authors' request for feedback on abbreviated SAFE documents, such as this update, the SSC recommends including a brief section that describes planned or anticipated improvements by the assessment team. This is not intended to replace the Responses to SSC/GPT comments section typically included in operational assessments.

C3 2025 Preliminary Salmon SAFE of the Cook Inlet EEZ

The SSC received a presentation on the 2026 SAFE Report for the salmon fisheries of the Cook Inlet Exclusive Economic Zone (EEZ) from Lukas DeFilippo (NOAA-AFSC) and Diana Stram (NPFMC).

The SSC received oral public testimony from Noah Swenson (self), Dakota Alward (self), Kendra Zamzow (Matanuska-Susitna Borough Fish & Wildlife Commission), Penelope Hass (self), David Martin (Cook Inlet Fishermen's Fund), Roland Maw (United Cook Inlet Drift Association; UCIDA), Samuel Schimmel (Tikahtnu Inter-tribal Fish Commission), Tad Revelle Russell (self), and Abigail Turner-Franke (North Pacific Fisheries Association). The SSC received written public testimony from Penelope Haas (self), Tad Revelle Russell (self), and Steve Brown (self). As the C3 agenda item represents influential scientific information, public testimony is characterized below and was responded to during SSC deliberations.

Public testimony highlighted several issues and areas of concern, including:

- Testimony that the current management process does not comply with Magnuson-Stevens Act (MSA) requirements for the management of stock units throughout their range;
- Noted the unsuitability of the federal management process for salmon stocks;
- Support for reducing the ABC buffers for Tier 1 sockeye stocks;
- Interest in developing in-season management authority to increase harvests when the return is larger than expected;
- Concern about the potential of large escapement of sockeye to have detrimental effects on the stocks;
- Support for increasing fishing opportunities, particularly early in the season;
- Support for ending the restriction in participating in State and federal fisheries on the same day;
- Substantial discussion on the appropriateness of the 75% ABC buffer for coho;
    - Most public testimony supported a reduction of the buffer to a range of 25-50% because of the potential for premature fishery closure due to early attainment of the coho TAC, though there was also support for maintaining the current 75% buffer.
- Recommendation that coho salmon genetic testing be done to evaluate the impacts of the EEZ fishery on specific coho runs that are showing declines;
- Concern that the existing coho index streams, the Deshka and Little Susitna River, may not be representative of the larger Upper Cook Inlet region, that there are no index sites on the eastern side of Upper Cook Inlet, and that additional index streams may be available for coho, including Fish Creek, and Jim Creek;
- Interest in the development of a tribal fishery in the EEZ;
- Test fisheries are needed to distinguish stocks along with supporting genetics information;
- SAFE did not consider communities that are not participating directly in the EEZ fishery;
- Testimony noted a proposal to be considered by the Alaska Board of Fisheries that might shift more fishing effort in the EEZ.

The SSC considered these comments in their recommendations.

General Comments

The SSC highlights its appreciation for the extensive efforts of the NMFS Cook Inlet Salmon SAFE Team (SAFE team) in drafting the 2026 Cook Inlet EEZ Salmon SAFE report and responding to the SSC recommendations from February 2025. While there has been significant progress over the last three SAFEs, stock assessment of Cook Inlet salmon should still be considered an iterative process, evolving as new information, methods and understanding of the scientific process become available..

The SSC has the following recommendations, applicable to both Tier 1 and Tier 3 salmon stocks:

- The SSC recommends ongoing genetic sampling of EEZ salmon landings. Priorities include genetic sampling of sockeye to identify the stock structure and timing of the different sockeye runs in the EEZ fishery, and Chinook sampling to assess the importance of Kenai large late run Chinook in the EEZ fishery and to evaluate the prevalence of other Chinook salmon stocks in the fishery. Genetic sampling of coho landings in the EEZ is needed to evaluate the impact of EEZ landings on river systems where coho escapement has shown long term declines.

- The SSC recommends evaluating the correlation between run sizes for Kenai and Kasilof sockeye. If there is strong correlation, consideration should be given to developing a multivariate approach to reduce projection error. Furthermore, the correlation between run size and the State's harvest fraction should also be evaluated for the potential to improve projection of the harvest rates over a simple Beta distribution..

- The SSC recommends better documentation of data sources, including documenting what information is considered preliminary and what information is considered final. Some data used for salmon assessment are composites of multiple sources of information with differing levels of completeness at the time of SAFE development.

- The SSC recommends adding flowcharts and tables that diagram the various input data components, their source (i.e., agency that collects the data and whether they come from published reports, season summaries, data requests, etc.), the timing of when final data are typically available, and whether preliminary or placeholder data are used to provide preliminary estimates for the SAFE. If placeholder data are used, indicate how they were calculated (e.g., five-year averages).

- The SSC recommends more complete documentation of analyses in the SAFE and in presentations. Any material presented to the SSC should be fully documented in the SAFE. Bayesian analyses should report priors, model diagnostics, and plots of posterior distributions of key parameters.

- The SSC recommends TAC utilization rates be included in summary tables. Reasons for low utilization should be documented.

- Future SAFE reports should provide additional contextual information for the Tier 3 stocks including harvest in other fisheries, proportional representation to total harvest, and locations of these other sources of harvest in relation to the EEZ.

- For the MSST calculation for the aggregate Chinook salmon stock complex, the lower bound of the MSY-based Sustainable Escapement Goal (SEG) for Kenai River late-run Chinook (large fish) should be used rather than the lower bound of the Optimal Escapement Goal, which is set by the Alaska Board of Fisheries and considers both biological and allocative factors.

- The sentence regarding the Kenai River late-run Chinook (large fish) escapement goals (Section 4.5.3) should be corrected. The SEG is 13,500–27,000 fish and was established in 2017 by ADF&G and is the MSY-based escapement goal. The OEG, established in 2020 by the Alaska Board of Fisheries is the escapement goal that the stock is managed for, but the OEG does not replace the SEG.

- Clarify the stock of concern definition in (Section 4.6.5). Refer to the definitions for the various levels of stock of concern (yield, management, conservation) in the Policy for the Management of Sustainable Salmon Fisheries (5 AAC 39.222).

- The SSC recommends that the SAFE include mean absolute percentage error (MAPE) values comparing OFLpre and OFLpost, along with guidance on interpreting those MAPE values. This should include information on what constitutes a good fit versus poor model performance.

- The SSC requests that the GitHub repository be up-to-date at the time of the SAFE report to allow for review.

The SSC continues to find the risk table approach useful for adding transparency to the process of evaluating buffers. The draft risk table provided in the SAFE was helpful for discussion of the buffer for the aggregate coho complex. Given the extensive discussion regarding buffers for the two Tier 1 sockeye stocks, the SSC recommends draft risk tables also be provided for both Tier 1 stocks be presented as part of the next SAFE document.

Last year, a public workshop was held in May that included members of the SAFE team, Council staff and the SSC to provide an opportunity for review of new assessment methods. The authors considered the workshop useful for technical review and for generating suggestions for model improvement. If there are future workshops, the SSC recommends that a brief workshop report be prepared highlighting workshop recommendations (this was not done for last year's workshop). The SSC does not see an immediate need for additional workshops for Upper Cook Inlet salmon, but notes the importance of separating technical review from the recommendation of harvest specifications based on model output, and inclusion of the previously specified model in each assessment. If important changes in methods are planned, the SSC requests the SAFE team coordinate with Council staff to ensure there is adequate opportunity for technical review before the methods are used for harvest specification.

There were a number of minor errors in the SAFE document that were communicated directly to the SAFE team.

2026 Cook Inlet salmon harvest specifications and SAFE

Stock status determination criteria for salmon stocks in the Upper Cook Inlet EEZ in 2025 and the 2026 SSC harvest recommendations are summarized in Tables 1 and 2, respectively.

The SSC reviewed status determination criteria for 2025. Pending final harvest data, final determination cannot be made, but analysts noted that salmon stocks in Upper Cook Inlet were not subject to overfishing based on current information. Similarly, pending final harvest and escapement data, salmon stocks, with the exception of coho, chum and pink stocks, were not overfished. For coho, chum and pink stocks, an overfished status determination is not possible.

Table 1. Aggregate stock status in relation to status determination criteria for 2025 salmon fisheries of the Cook Inlet Exclusive Economic Zone Area. Values are in numbers of fish, except MFMT and F_{EEZ}. Preliminary status determination recommendations made by the SSC are based on the best scientific information available and final status determination will be made by NMFS Headquarters following SAFE review. This table combines Tier 1 and Tier 3 stocks into a single table; therefore, some columns will have information that is not applicable to a given tier or would require calculations that are not recommended based on the information available (NA).

Stock	Tier	MSST	Cumulative Escapement	S_{MSY}[1]	MFMT	F_{EEZ}	OFL	OFL_{PRE}	ABC	Catch	Overfished
Kenai River Late Run Sockeye	1	3,030,000	10,495,000	1,212,000	0.263	0.065	NA	514,761	360,332	262,415[2]	No
Kasilof River Sockeye	1	555,000	4,664,000	222,000	0.531	0.027	NA	664,294	285,646	30,872[2]	No
Aggregate Other Sockeye	3	100,000	557,000	NA	NA	NA	906,575	181,351	154,148	92,617[2]	No
Aggregate Chinook	3	40,500[3]	75,000	NA	NA	NA	2,237	373	261	46	No
Aggregate Coho [4]	3	NA	NA	NA	NA	NA	268, 053	67,013	16,753	15,444	NA
Aggregate Chum	3	NA	NA	NA	NA	NA	390,030	97,508[3]	78,006	27,236	NA
Aggregate Pink	3	NA	NA	NA	NA	NA	116,348	58,174	52,357	6,080	NA

[1] Hasbrouck et al 2022[2]

[2] Kenai late-run, Kasilof and Aggregate "Other" sockeye salmon catches are estimated to a stock-specific level using ADF&G inseason genetic stock composition information (see 2026 SAFE Table 3)

[3] Corrected from the 2026 SAFE

[4] Following 2025, data were not available to inform MSST, cumulative escapement, and therefore, preliminary overfished status

[2] Hasbrouck, J. J., W. D. Templin, A. R. Munro, K. G. Howard, and T. Hamazaki. 2022. Spawner–recruit analyses and escapement goal recommendation for Kenai River late-run sockeye salmon. Alaska Department of Fish and Game, Fishery Manuscript No. 22-01, Anchorage. http://www.adfg.alaska.gov/FedAidPDFs/FMS22-01.pdf

Table 2. SSC recommendations for the salmon fisheries of the Cook Inlet Exclusive Economic Zone Area for 2026. Values are in numbers of fish, except MFMT and ABC Buffer. Tier designations in this table are based on the SAFE report and accepted by the SSC. SSC recommendations that differ from the SAFE are in bold. This table combines Tier 1 and Tier 3 stocks into a single table; therefore, some columns will have information that is not applicable to a given tier or would require calculations that are not recommended based on the information available (NA).

Stock	Tier	MFMT	MSST	OFL	OFL_{PRE}	ABC	ABC Buffer
Kenai River Late Run Sockeye	1	0.265	3,030,000	NA	1,284,478	**937,993**	**27.0%**
Kasilof River Sockeye	1	0.538	555,000	NA	617,006	**489,936**	**20.6%**
Aggregate Other Sockeye	3	NA	NA[1]	906,757	181,351	154,149	15%
Aggregate Chinook	3	NA	40,500[2]	2,237	373	261	30%
Aggregate Coho	3	NA	NA[1]	268,053	67,013	**26,805**	**60%**
Aggregate Chum	3	NA	NA	390,030	97,508	78,006	20%
Aggregate Pink	3	NA	NA	282,813	141,406	127,266	10%

[1] Insufficient data that precludes the calculation of MSST
[2] Corrected from the 2026 SAFE

Tier 1 General Topics

In this assessment cycle, the SAFE team implemented three methodology changes for Tier 1 salmon stocks. The SSC appreciates the authors' efforts to respond to the prior year's SSC comments and improvements made to the SAFE. The SSC again notes the challenge of reviewing the SAFE methodology for the first time at the same meeting where harvest specifications are set.

The first methodology change was a change from adaptive ARIMA approach to Bayesian autoregressive (AR-1) model to forecast the run size and preseason OFL. The Bayesian framework allows probabilistic evaluation of the uncertainty of the OFL to assist in setting the ABC buffer. The second change was to use 25 years rather than ten years to calculate the median symmetric accuracy statistic used for the ABC buffer calculation. A third change was to model the state harvest fraction using a beta distribution. **The SSC endorses these changes as being responsive to previous SSC requests. The SSC requests that future salmon SAFEs report the effect of any methodology changes, as is standard for crab and groundfish assessments; these comparisons should include a comparison of model output between the model used in the previous assessment (updated with the most recent data and referred to as the base model) and output from the new model.**

For the 2026 specifications, the SSC continues to recommend the OFL and MFMT used in SDC calculations for Tier 1 stocks be based on the best available estimate for the spawning biomass that produces maximum sustainable yield over the long-term (S_{MSY}). Likewise, the SSC continues to support using an escapement target equal to S_{MSY}, also be used in defining the preseason OFL and ABC specifications for the 2026 season, which is the same method used in the 2025 SAFE. With this approach, full utilization of OFL would result in yield close to MSY and stock sizes that average S_{MSY}, but also varying both above and below the S_{MSY} level.

The SAFE team recommended using the median symmetric accuracy statistic of the OFL forecast error for the ABC buffer. This statistic has the favorable quality of producing a larger buffer when forecast uncertainty is larger, but has no logical relationship to attainment of management objectives. This year, the SAFE team provided an analysis of the probability that the ABC exceeds the OFL for both Tier 1 stocks across a wide range of potential buffers. The SSC found this analysis extremely useful in its deliberations regarding potential ABC buffers. The SAFE team cited research on West Coast salmon stocks indicating that ABC buffers with a probability of exceeding the OFL in the range of 0.33-0.35 should be considered in risk-averse situations (Satterthwaite and Shelton 2023[3]).

Kenai River Sockeye

The SAFE team recommended designating Kenai River late-run sockeye as a Tier 1 stock. A Bayesian AR-1 model approach was used to predict the 2026 run size, and the state waters harvest was simulated from beta probability distribution, both based on historical data, an approach similar to 2025 methods, with some minor modifications. Based on these results, the preseason OFL was determined. Buffers for reducing the preseason OFL to the ABC were based on the median symmetric accuracy of preseason OFL relative to post-season OFL, for those years where the OFL was over-predicted for a 25-year retrospective window. Harvest specifications were based on using S_{MSY} for the stock. **The SSC concurs with the SAFE team's recommendation of a Tier 1 designation for Kenai River late run sockeye in 2026.** The SSC accepts the methods used by the SAFE team to forecast the 2026 run size estimate and the estimated harvest rate in state waters.

[3] Satterthwaite, W. H., & Shelton, A. O. (2023). Methods for assessing and responding to bias and uncertainty in US West Coast salmon abundance forecasts. Fisheries Research, 257, 106502.

The SSC discussed the appropriate buffer for setting the ABC below the preseason OFL for Kenai River sockeye. The buffer recommended in the preliminary SAFE was 53.9% using the median symmetric accuracy of preseason OFLs, which resulted in a probability of exceeding the OFL of 0.26. **The SSC was concerned by the high level of precaution implied by this approach, and instead recommends multiplying median symmetric accuracy by 0.5, yielding an ABC buffer of 27%, which results in a probability of exceeding the OFL of 0.38.** This approach is broadly consistent with the work on uncertainty buffers for West Coast salmon stocks already cited. An ABC buffer of 27% is also similar to the 30% buffer used last year for Kenai sockeye.

Kasilof River Sockeye

The SAFE team recommended designating Kasilof River sockeye a Tier 1 stock. Methods were consistent with those for Kenai River sockeye. **The SSC concurs with the SAFE team's recommendation of a Tier 1 designation for Kasilof sockeye in 2026.** The SSC accepts the methods used by the SAFE team to forecast the 2026 run size estimate and the estimated harvest rate in state waters.

The SSC discussed the appropriate buffer for setting the ABC below the preseason OFL for Kenai River sockeye. The buffer recommended in the preliminary SAFE was 41.2% using the median symmetric accuracy of preseason OFLs, which resulted in a probability of exceeding the OFL of 0.18. **Similar to Kenai sockeye, the SSC was concerned by the high level of precaution implied by this approach, and recommends multiplying median symmetric accuracy by 0.5, yielding an ABC buffer of 20.6%, which results in a probability of exceeding the OFL of 0.34.** Again, this approach is consistent with the work on uncertainty buffers for West Coast salmon stocks already cited.

Additional Tier 1 Comments

The SSC recognizes that it is new to use analyses of the probability of exceeding the OFL to inform the ABC buffer setting process for Tier 1 stocks, and had an extensive discussion of what level of risk would be appropriate. **The SSC welcomes further guidance from the Council on an appropriate level of precaution for management of EEZ salmon.** The Council's process for salmon management relies on preseason forecasts of run size, which are the major source of uncertainty. The performance of AR-1 autoregressive models can be poorer than the State's sibling-regressions estimates, but these have not been available to use in the SAFE report. Autoregressive models may also work relatively poorly when there is large increase or decrease in run size, as occurred in 2025.

Tier 3 Stocks

The SAFE team recommended that aggregate "other" sockeye, Chinook, coho, chum, and pink salmon stocks be specified as Tier 3 stocks, where harvest specifications are based on historical catch statistics. **The SSC supports the designation of these stock complexes as Tier 3.**

The SSC supports the methods used to determine OFLs and preseason OFLs (OFL_{pre}) for Tier 3 stocks, based on recommendations implemented by the SAFE team in 2025. The SSC supports the defined period for calculating OFL and OFL_{pre} for each stock and notes that it includes the most recent year of data. This is reasonable given reduced uncertainty in the harvest data in the EEZ starting in 2024, but the SSC suggests that the time period used may be reconsidered in the future as more years of data under the current management system are accrued.

For the 2026 SAFE, the SAFE team implemented the SSC's recommendation to omit the indicator escapement goal in years when a given escapement index is missing or incomplete from the calculation of the cumulative escapement goal used for overfished determination. The SSC noted that annual assessment

of all indicator systems may be an issue for a variety of reasons and, if persistent, this approach may need to be re-evaluated in the future.

The SAFE team evaluated all Tier 3 stock complexes with respect to overfishing by comparing cumulative catch over the previous generation to the maximum cumulative catch. Due to limited availability of indicator stock information, only other sockeye and Chinook stocks could be evaluated for overfished status. For these two stock complexes, preliminary cumulative escapement estimates were not below the respective MSSTs. Complete escapement estimates have not been available for the two coho salmon indicator stocks for a number of years, which precluded calculation of an MSST for the coho salmon stock complex for 2026. **The SSC recommended that the SAFE team explore whether other coho stocks in Upper Cook Inlet with consistent and complete escapement enumeration and scientifically-based escapement goals would be appropriate indicator stocks to use for this stock complex.** There are no indicator stocks for the pink or chum salmon stock complexes, therefore overfished determination cannot be determined.

In its February 2024 minutes, the SSC requested that the SAFE team adopt a default 25% buffer for developing harvest recommendations for Tier 3 salmon stocks (the same as used for Tier 6 average-catch stocks in the groundfish FMP) as a starting point for consideration. The SAFE team requested clarification from the SSC on how to implement this request. The SSC discussed the possibility of proportionally adjusting the recommended buffers to align with the request. However, the SSC concluded that starting with a default 25% and providing a clear rationale for deviations from this for each stock, is sufficient. It is possible the SAFE team will arrive at the same buffers as used previously, but the rationale next year should be based on the specific issues that lead to a recommended departure from the 25% default buffer. The SSC noted that the default buffer should be used if a new Tier 3 stock is specified and departures from this should be justified based on specific issues, such as data availability and quality.

The SAFE team recommended ABC buffers for each Tier 3 stock, which were 15% for other sockeye, 30% for Chinook, 75% for coho, 20% for chum, and 10% for pink salmon. In general, the SAFE team's rationale for maintaining the same buffers as 2025 was based on no major changes from the previous year. **The SSC concurs with the recommended SAFE team buffers for 2026 for other sockeye, Chinook, chum, and pink salmon stock complexes, but recommends an alternative for the coho stock complex.**

In recommending a 75% buffer for the coho stock, the SAFE team outlined a number of concerns with this stock complex and provided a preliminary draft risk table. The risk table included no increased concerns for the assessment and population categories and increased concern for ecosystem and fishery-informed stock considerations categories. The SSC discussed these concerns and others, as well as the risk table. There is concern that there are incomplete escapement data for the indicator stocks in recent years because of environmental conditions. The SSC also heard public testimony that other coho salmon stocks (also in northern Cook Inlet) are generally meeting their escapement goals. In addition, given their size and overlap in run timing, coho salmon are vulnerable to capture in the drift gillnet fishery and cannot be selectively avoided. Overall, there is an imprecise understanding of population trends for coho salmon in Upper Cook Inlet. It was noted, however, that coho salmon populations are generally more robust in comparison to Chinook salmon populations. **Therefore, the SSC recommends a buffer of 60% for the coho stock complex and acknowledges this recommendation results in an increased risk of the ABC exceeding the OFL, relative to the buffer recommended by the SAFE team.** The SSC also acknowledged that the resulting ABC could potentially limit fishing for other species but clarified that this was not part of the rationale for the recommended buffer.

The SSC appreciates the SAFE team's revised preliminary draft risk table for the coho salmon stock complex and for their responsiveness to the recommendations from the February 2025 SSC report. This revised version was much improved, but the SSC suggests that under the Ecosystem Considerations

category, the SAFE team consider more indicators for the western GOA. Currently, this category relies heavily on information of coho salmon stocks from the eastern GOA and there is evidence for differences in responses of populations originating from either side of the GOA and some limited mixing in the GOA. The SSC also recommends revisiting the Fishery Performance risk component and focus on potential signals not captured in the assessment and population dynamics considerations that might be captured by the fisheries, rather than focusing on potential risks posed by the fisheries.

Socioeconomic Appendix

The SSC notes that the community and economic information presented in the SAFE appears to be drawn largely from the Environmental Assessment/ Regulatory Impact Review (EA/RIR). While evaluation of management alternatives is beyond the scope of the current SAFE review, the SSC recognizes analyst capacity constraints resulting from the furlough and appreciates the inclusion of available information under those conditions.

The SSC reiterates that a primary purpose of community and economic information in the SAFE is to track changes over time associated with the transition to federal management. Given the early stage in this process, it is particularly valuable to establish a strong knowledge foundation regarding the CI salmon fisheries in order to best understand changing environmental conditions moving forward. **Accordingly, the SSC emphasizes the importance of developing time series for available economic and social indicators, alongside the ongoing biological indicator development and genetic analyses.** As an initial priority, the SSC supports tracking revenue and landings by community over time, including periods prior to the management transition.

The SSC continues to recommend bringing forward pertinent information from the EA/RIR to identify community, economic, and fishery performance indicators to track. While indicators should be tailored to the specific species and FMP, the SSC suggests that analysts may also consider relevant metrics used in Economic and Social Profiles (ESPs) for other fisheries, as well as information presented in the Annual Community Engagement and Participation Overview (ACEPO).

Appendix E of the SAFE characterizes the Cook Inlet EEZ drift gillnet fishery as a small-entity fishery with concentrated economic dependence. The SSC supports continued development and integration of fisheries performance indicators in the SAFE, noting that such information is critical for addressing National Standards 2 and 8 of the MSA. Given that this period represents a key opportunity to improve understanding of fisheries participation and distributional impacts, the SSC notes the value of early collaboration across sectors and user groups. The SSC identifies the following areas as initial priorities for indicator development:

- Differential distribution of benefits across fishing communities and supporting sectors;
- Inclusion of processing-sector data to more fully characterize fisheries benefits and impacts;
- Changes in participation across commercial, recreational, personal use, subsistence, and emerging tribal fisheries;
- Tracking new and returning entrants over time to better understand participation dynamics.

The SSC appreciates and supports ongoing efforts to engage with and track developments related to tribal fisheries initiatives. The SSC further notes that incorporating Local and Traditional Knowledge could provide valuable longitudinal insight into fisheries performance and environmental variability. Public testimony highlighted interest in test fisheries, additional research, and collaborative approaches that could

help address current capacity limitations. The SSC encourages further work to advance development of community, economic, and fisheries performance indicators.

Overall, the SSC supports ongoing efforts to meet the National Standards through the development, synthesis, and presentation of community and economic information within the SAFE. The SSC also notes that some of the discussion reflects emerging fishery performance metrics that may warrant more explicit treatment in future assessments.

Finally, the SSC recommends careful attention to terminology in the presentation of economic information, particularly to clearly distinguish between revenue and profit. Cost considerations should be discussed within the context of profit, not revenue.

D1 Alaska Fisheries Science Center Report

The SSC received an AFSC briefing from Robert Foy (NOAA-AFSC). Ben Ley (small-boat Pacific cod fleet based in King Cove and Sand Point) provided public testimony. The briefing outlined the AFSC's ongoing priority planning work in response to staffing and resource constraints and presented developing frameworks for prioritizing surveys, groundfish stock assessments (including a stock/complex "risk-value" approach), ecosystem science, salmon science, and marine mammal science in support of MSA management needs. The SSC thanks AFSC staff and "tiger team" contributors for advancing this work and for providing a transparent foundation for future SSC review. The SSC understands that these prioritization frameworks are still under development and offers the following comments and recommendations as guidance for the agency.

The presentation described a priority-planning approach intended to align science with available human and fiscal resources through a reproducible, nationally consistent framework co-developed with science and management partners (NMFS Regional Offices and Councils) and used to inform resource allocation decisions. The AFSC's goal is a dynamic, resource-scalable approach to prioritize science (surveys, stock assessments, and ecosystem work) to serve MSA-required management and support fishery stability in a variable environment, including an ecosystem-based fisheries management emphasis on economically important fisheries and key climate/species interactions affecting stock production and stability.

To facilitate future feedback from the SSC, the SSC requests the AFSC provide a written, reviewable description of the prioritization framework (criteria, scoring/weighting, and decision rules as resources change). The SSC requests this description clearly articulate the AFSC's vision for how SSC input will be incorporated, on what timeline, and explicitly link prioritization outcomes to management performance and risk (e.g., overfishing risk, ABC stability, rebuilding considerations, and choke species/prohibited species catch (PSC) implications).

Survey Priorities

The AFSC summarized a survey-prioritization framework that distinguishes stock priorities from data priorities and presented survey portfolio tracking that identifies planned/completed, partially completed, and missed surveys, including instances of surveys that are no longer planned. **The SSC emphasizes that survey design, continuity, and biological sampling are foundational to assessment quality and, critically, to the ability to detect, track, and respond to rapid stock changes.**

The SSC recommends that the AFSC:

1. prioritize continuity in areal coverage and core biological sampling when effort must be reduced;

2. when reductions or disruptions occur (planned or unplanned), clearly state why they occurred and what outcomes are expected, including anticipated impacts on species-specific assessment uncertainty and management advice;

3. continue to report survey status in a way that clearly distinguishes "partial" outcomes (what was lost and what was retained) and identifies assessment/management consequences; and

4. for surveys shown as "no longer planned," provide a brief rationale and identify what data streams (if any) will replace those data for assessments and risk tables.

Where possible, the SSC suggests that, in addition to near-term assessment uncertainty and management advice changes, the AFSC retrospectively identify and report instances where survey changes likely led to substantial ABC/TAC reductions, reductions in stock status, and/or social or economic impacts. The SSC notes that rigorous quantitative analysis may be challenging because the available survey information was intentionally reduced, but encourages qualitative work as well as quantitative analysis. Retrospectively evaluating past decisions can provide important context for current decisions and support new projections of likely impacts ("lessons learned").

Groundfish Stock Assessment Prioritization

The AFSC described an approach in which assessment prioritization drives data needs and survey efficiencies by identifying users of assessment and monitoring products, incorporating economic and dependence metrics, updating prioritization criteria, and clarifying the scope of assessment products (e.g., aggregation, assessment frequency, and tier). The AFSC also reviewed assessment cycle concepts (annual, biennial, four-year) and described updates to guidance, including incorporation of harvest projection products.

The SSC recommends that the AFSC:

1. provide a clear crosswalk from priority category to expected assessment product (full/update, harvest projection, catch report, or alternative), including minimum data requirements and key assumptions for each product; and

2. evaluate prioritization decisions not only for workload savings but also for expected consequences to assessment quality, uncertainty, and management performance - particularly the ability to detect rapid stock changes and the likelihood of increased interannual ABC variability or binding constraints. The SSC also suggests that retrospective analysis of prior prioritization decisions, even if qualitative, could be informative for future decisions.

Stock/Complex Prioritization Indices

The AFSC presented a risk-value framing for prioritizing stocks/complexes, including value categories (commercial, recreational, social/community) and risk categories (e.g., fishery performance relative to limits, stock status/rebuilding considerations, ecosystem role, and current/forecast ecosystem and socioeconomic conditions). The AFSC described expert group ("tiger team") work to develop biological/assessment indices (tier, assessment frequency, catch/ABC, recruitment variability, biomass trends and duration of decline, ecosystem role) alongside socioeconomic and "fisheries importance" indices spanning commercial, community, constituent demand, non-catch value, recreational, and subsistence dimensions. **The SSC noted that because prioritization is expected to lead to changes in sampling, surveys, and assessment products, the indices must be sufficiently transparent, reviewable, and linked to expected impacts on harvest specification decisions.**

The SSC also discussed aspects of the socioeconomic and "fisheries importance" indices. First, the SSC discussed the importance of analyst involvement to ensure a process that considers implications for the many different stakeholder groups the Council serves, noting heterogeneity in groups' capacity and resources to engage in the Council process and advocate for themselves. The SSC also noted that "value" can reflect management structures and incentive programs (e.g., quota programs, cooperatives) that increase value and reduce costs in ways that may not be evident in simple revenue measures.

The SSC recommends that the AFSC

1. provide precise definitions, data sources, time windows, and update frequency for each index (including how missing data, small-sample issues, and zero-catch/underutilized stocks are handled);

2. document all scaling/normalization and any weighting used to combine indices into composite "value" or "risk" scores, and provide sensitivity analyses showing how rankings change under plausible alternative weights and time windows;

3. quantify uncertainty where feasible (or provide qualitative confidence levels), and identify which indices are most influential for each stock's classification;

4. evaluate redundancy/correlation among indices to avoid double-counting (including among multiple economic and community measures);

5. provide a transparent "decision audit trail" for any stock where indices suggest a change in assessment frequency/tier, including how choke species risk, PSC, and stability objectives were considered;

6. clarify if and how the approach is intended to generalize across stock types and regions, including which components are standardized nationally versus tailored regionally; and

7. leverage past work and retrospective analyses to show how social and economic information has been used historically in management and how proposed indices would have performed ("lessons learned") to inform future refinements.

Groundfish Prioritization Results and Implications for Surveys and Assessments

The AFSC reported that socioeconomic and overfishing concerns elevate choke species risk and emphasized that if survey reductions are needed, they should focus on frequency/intensity rather than areal extent or on-deck biological data collections The AFSC noted that reduced survey intensity in the GOA is not recommended due to choke species concerns, while reduced Bering Sea survey intensity and/or frequency may be possible if higher risk/higher value stocks are prioritized. The AFSC identified Pacific cod and crab stocks as high risk/high value under warm conditions and noted that assessment frequency reductions were flagged for 11 stocks and tier reductions for 14 stocks (primarily underutilized stocks). Public testimony emphasized the importance of maintaining GOA survey information and, if possible, adding winter/spring survey information to better capture seasonal dynamics.

The SSC recommends that the AFSC:

1. provide the specific list of stocks flagged for frequency (11) and tier (14) changes, along with the index values and rationale supporting each flag;

2. explicitly evaluate any proposed reductions for their effect on choke species and PSC management performance (including the likelihood of binding constraints, displacement effects, and unintended fishery impacts);

3. when proposing lower-tier or less frequent assessment approaches, clearly define the minimum monitoring needed to detect rapid changes in abundance and cohort strength, especially for environmentally sensitive and episodic-recruitment stocks; and

4. when reductions in sampling/surveys/assessments are proposed or implemented, clearly state why the reduction is being made and what outcomes are expected, including how the change is expected to affect SSC harvest specification decisions (e.g., uncertainty buffers, ABC stability, and confidence in status determinations).

Ecosystem Science Prioritization

The AFSC described an ecosystem science prioritization approach intended to be driven by assessment priorities, including identifying users, documenting how ecosystem information is currently used (in-model, interpretive context, risk tables, or broader ecosystem products), and mapping ecosystem metrics to time-varying assessment parameters (growth, mortality, recruitment, catchability, distribution) using a high/medium/low data-availability scoring framework. The SSC supported the intent to improve decision relevance, while noting the need for flexibility to explore emerging mechanisms and to learn iteratively as ecosystem conditions and stock responses evolve.

The SSC recommends that the AFSC:

1. operationalize and document the data availability scoring criteria (including time series length, spatial coverage, timeliness relative to assessment cycles, and thresholds for "high/medium/low");

2. provide a clear pathway for how prioritized ecosystem metrics will influence assessment advice (risk-table narratives, model inputs, or retrospective interpretation) to ensure ecosystem work is decision-relevant; and

3. pilot the framework across multiple stocks with contrasting life histories and management concerns, while explicitly reserving some capacity for exploratory/learning-oriented ecosystem work to identify unanticipated drivers and improve future prioritization.

Salmon Prioritization and Ongoing Products

The AFSC described salmon priorities spanning support for salmon fisheries managed under MSA, including salmon bycatch monitoring and assessment tools (e.g., genetics and AEQ), and support for Pacific Salmon Treaty obligations in partnership with Alaska Department of Fish and Game (ADF&G), including surveys and juvenile forecast work. The AFSC also noted ongoing work supporting Cook Inlet stock assessment needs in coordination with ADF&G escapement data.

The SSC recommends that the AFSC

1. identify the minimum viable sampling and analytical components needed to sustain reliable salmon bycatch and AEQ/genetic products under resource constraints;

2. clarify how salmon products will be prioritized relative to core groundfish assessment obligations when tradeoffs are required; and

3. for forecast tools, provide routine out-of-sample performance summaries and uncertainty characterization so the SSC can evaluate forecast skill and appropriate uses in the management context.

Marine Mammal Priorities and Fisheries Interactions

The AFSC presented a two-step approach for marine mammal prioritization: identifying which marine mammal stocks are most important to assess based on their significance to fisheries interactions (direct: bycatch/depredation; indirect: predation/competition), ecosystem role, and subsistence importance; and prioritizing assessment topics to monitor (abundance/trends, distribution, foraging ecology, health/condition, and direct/indirect fisheries impacts). The AFSC also described work to rank marine mammal species by relative importance as consumers of commercially important resources, using prey consumption and abundance information from stock assessment reports.

The SSC recommends that AFSC

1. clearly document how prey-consumption and interaction "importance" rankings are calculated (including assumptions, uncertainty, and treatment of data-poor species);

2. distinguish near-term management-relevant outputs (e.g., bycatch/depredation and spatial overlap) from longer-term ecosystem context products so priorities align with decision timelines; and

3. identify where and how these products will be integrated into fishery/stock assessment risk discussions (e.g., risk tables or other Council-facing advice) so the link between prioritization and management decisions is clear.

General SSC comments

Across topics, the SSC emphasizes that prioritization is most useful when it is transparent, reproducible, and explicitly linked to expected outcomes for stock status determination, harvest specifications, and social, community, and/or economic dimensions of fisheries. When changes to sampling, surveys, or assessment products are proposed, the SSC requests that the AFSC provide information on the rationale and anticipated consequences, with particular attention to the ability to detect rapid stock changes and the implications for choke species/PSC management performance. The SSC also noted the presence of social, community, and economic factors that influence both survey and stock prioritization and discussed the importance of continued data collection and synthesis to support these decisions.

D2 Planning for 2026 Groundfish Stock Assessment Cycle

An internal agency workgroup composed of AFSC staff, Council staff and SSC members met in late January to discuss and prioritize stock assessments for the 2026 groundfish assessment cycle. The SSC received a presentation on the summary of the workgroup's recommendations by Sara Cleaver (NPFMC), Diana Stram (NPFMC), Melissa Haltuch (NOAA-AFSC), and Chris Lunsford (NOAA-AFSC). The SSC appreciates the efforts and care of all involved in this planning phase and would like to thank the AFSC for their flexibility and work in advance of the 2026 groundfish assessment cycle and their planned efforts to take on such a heavy load of assessments. The workgroup recommended that all stocks on an annual cycle be assessed in 2026, noting that the second GOA Pacific cod assessment is currently planned as a harvest projection for the fall. Due to time and staffing limitations, a number of stock assessments on two- and four-year cycles were not recommended to be assessed in 2026. The workgroup used several criteria (e.g., catch/ABC, new data, staffing availability) in making these decisions, and the SSC concurred with those

outcomes. The stocks not recommended for operational assessments in 2026 will, however, have harvest projections (HP) or catch reports (CR) completed. The workgroup also identified several assessments that could be reviewed during the September/October meetings, as they received their first GPT/SSC review in September/October 2025.

The SSC agreed with the workgroup's recommendations of what stocks to complete with operational assessments, HPs, and CRs in 2026 and provided additional guidance to facilitate the timely and thorough review of all the assessments. The SSC recognized the importance of completing and reviewing as many assessments as possible during the 2026 assessment cycle after the government shutdown and lack of assessments in 2025. Therefore, the SSC explored the possibility of reviewing final assessments and having necessary process discussions that would normally occur in December, in June and October, instead of reducing the number of operational assessments from the list that the workgroup recommended. The SSC inquired of AFSC staff whether stock assessments could be completed in time for the June SSC meeting and, if so, which stock assessments could be ready for review at that time. AFSC staff indicated that some stock assessments could be ready for June review and suggested that GOA rex sole and arrowtooth flounder assessments were good candidates for SSC review at the June 2026 meeting to help alleviate time constraints in the fall. **The SSC recognizes that this would require an additional GPT meeting prior to the June SSC meeting. The SSC recommends that its June agenda include the following, as practicable: 1) presentation and discussion responding to October 2025 recommendations to further investigate the potential impacts of the changes to the GOA survey design including comparisons of across groups of similar species, 2) discussion of how to determine flexibility in BRDs for Council-identified stocks, 3) the GOA rex sole assessment, and 4) the GOA arrowtooth flounder assessment.** Since many of the fall assessments rely on the GOA survey results, the SSC wanted to ensure that there was sufficient time to review and discuss any potential concerns with the survey design changes so that assessment authors can incorporate any SSC recommendations into their upcoming assessments.

To the extent practicable, the SSC also had the following recommendations:

- scheduling final reviews of all GOA rockfish operational assessments for which there were large 2025 bottom trawl survey estimated decreases at the same meeting

- scheduling final reviews of stocks for which the Council recommended exploring potential flexibility in biologically-informed recommended distributions (BRDs) at the same meeting.

- scheduling as many final assessments as possible in the June and September/October meetings to balance the workload with the November/December meetings. The SSC reiterates that all assessments identified for potential final review in September/October already received their first review in the fall of 2025 and will therefore follow the same two-step review process as is the Council's normal practice

- exploration by AFSC staff as to whether it would be possible to change the operational full assessment for GOA shortraker to an operational update, to allow the potential review at the October meeting

The SSC recognizes the increased burden on assessment authors and review bodies to accommodate this ambitious schedule. **The SSC recommends that for stocks with operational full stock assessments authors bring forward only essential alternative models and revisions for review.** The SSC did not specifically define "essential", and the goal was to allow authors to use their best judgement in balancing important changes included in operational full assessments with the timeliness and workload of the review process.

D3 Essential Fish Habitat Five-Year Review Workplan

The SSC received a presentation on the Essential Fish Habitat (EFH) Five-Year review workplan from Anita Kroska (NPFMC) and Jodi Pirtle (NOAA-AKRO) to provide feedback on the overall scope of work, methodologies for updating EFH descriptions, methodologies for updating the fishing effects component, and on the overall timeline and SSC engagement plan. **The SSC supports the scope of the proposed workplan and provides and provides a number of suggestions and recommendations.** The SSC recognizes that some of the subsequent suggestions and recommendations may be beyond what is required for this five-year review, but encourages the EFH team to incorporate them, to the extent practicable, due to their potential utility in future fisheries research and management. The SSC recognizes staff limitations and that capacity constraints may not allow addressing all recommendations.

The overall objective of the EFH five-year review is to evaluate and synthesize new information for each of the ten EFH components. However, the EFH team proposed a more limited scope for the upcoming year that focuses on 6 of the 10 EFH components, and utilizes only a subset of species when revising Components 1 (Description and Identification of EFH) and 2 (Fishing activities that may adversely affect EFH). Specifically, the EFH team proposed reducing the number of species to a core group that included: sablefish, pollock, Pacific cod, Pacific ocean perch, and arrowtooth flounder in the BSAI and GOA Groundfish FMPs, along with all species of crab in the Crab FMP. The SSC supported using this core group of species and recommended that the EFH authors identify the rationale for the species included in the core group. **The SSC concurs that this scope of work is appropriate (while still ambitious) for the current review process.**

The SSC had a number of general suggestions and recommendations regarding the overall EFH five-year review and their components, in addition to a more detailed discussion and subsequent recommendations for Components 1 and 2. **Overall, the SSC recommends that the EFH team document the Council related products that contain EFH materials (e.g., Component 1 SDMs, FE Model outputs) to highlight the value of this five-year review and ensure these products reach the widest audience possible.** In addition, the SSC had the following suggestions to highlight available EFH information, recognizing that these would not solely be the responsibility of the EFH authors, but may also include Council and NOAA staff: 1) that Council related documents clearly identify EFH products and cross-reference with online resources (e.g. https://www.fisheries.noaa.gov/alaska/habitat-conservation/essential-fish-habitat-efh-alaska) and ensure online resources are updated, 2) ensure FMP appendices are available online as part of the FMPs, and 3) given the requirements in the FMPs, consider producing an EFH product for the annual SAFE report process, which includes ecosystem reports. The SSC encourages the EFH team to coordinate and/or collaborate with the forage report authors and the AFSC diet lab when revising Component 7 (Prey species). Additionally, the SSC encourages the EFH authors to actively participate and collaborate in the upcoming Council Research Priorities process to ensure EFH related priorities are brought forward.

The SSC appreciated the in-depth focus on planned revisions to the Description and Identification of EFH (Component 1). The overall plan for revisions are to: 1) refine and update environmental covariates, update ensemble SDMs for level 2 and 3 EFH with new survey data, 3) advance life-history specific mapping for crabs, and 4) build spatio-temporal models (STMs) to describe dynamic species distributions.

One recurring topic of the SSC discussion was the inclusion of other data sources for generating distribution maps, such as other fishery-independent surveys that would include earlier life-history stages and other fishery-dependent and/or cooperative surveys, or fishery-dependent catch rate observations (e.g., the Catch-in-Areas data already being used in the FE component below). While the bottom trawl surveys have long time-series and a consistent spatial extent, they may not be the most representative for species associated with high relief habitats (eg, some rockfish, golden king crab) or can be highly aggregated (eg., red king

crab). The SSC recommends exploring the use of alternative data sources in one (or a few) species (e.g., golden king crab) where these data sources are most likely to influence distribution maps, especially core EFH. Additionally, this will initiate further refinements of EFH definitions by using datasets across seasons. The SSC does recognize that there is already research being conducted outside of the EFH review process that incorporates other data sources and may provide information for this review.

The SSC supports the development of the STMs as 'supplementary descriptions' if the output can be made accessible. However, the SSC suggests additional discussion regarding the pros and cons and the potential utility of this information in EFH context and for other uses. The SSC also recommends that the STMs include a year effect in these models to account for interannual differences in overall abundance. As structured, these interannual changes are unlikely to be adequately accounted for in the other terms (e.g. effects of covariates). As STMs are developed for crab, be clear about the limitations in seasonal data availability and consider the relationship between crab movement and maturity status. The SSC also requests that bottom ocean pH be considered as a covariate as long as the MOM6 predictions have been adequately groundtruthed.

In the context of Level 2 static EFH maps created by an ensemble of GAM and maxEnt model predictions, the SSC recommends using a spatially-blocked cross-validation approach for evaluating model performance for the purpose of weighting ensemble members, to the extent practicable. The SSC highlights that this type of spatially-blocked cross-validation, where separate spatial units are used for the training and out-of-sample testing data sets, would provide a more representative description of model performance given the type of inference that is desired from these spatial models. Spatial blocks for cross-validation could be defined by the analysts, while ensuring balance in the number of observations within those blocks, or by leveraging existing tools like the blockCV package in R (https://cran.r-project.org/web/packages/blockCV/vignettes/tutorial_1.html; Valavi et al. 2019[4]).

Similarly, SSC appreciated the in-depth focus on planned revisions to the assessment of Fishing activities that may adversely affect EFH (Component 2). Revisions to this component, generally referred to as the Fishing Effects (FE) model, are planned to include: 1) the use of updated SDMs from Component 1 (see above), 2) updated Catch-In-Area effort data, 3) updated gear parameters, 4) updated benthic habitat data, and 5) updated habitat susceptibility and recovery rates. The SSC concurs with the EFH team's scope of work for this portion of the five-year review and looks forward to the updates. The SSC requests that the authors provide an SSC opportunity to review the updated gear parameters (including nominal widths and bottom contact adjustments) and any updates to the FE model habitat recovery parameters.

D4 Progress on Developing Harvest Control Rules

The SSC received an informational presentation from Diana Stram (NPFMC) and Kirstin Holsman (NOAA-AFSC) on progress in developing alternative harvest control rules (HCRs) to support climate resilience, and the proposed structure for a white paper outlining the process and objectives for June 2026. This follows the SSC Harvest Control Rule Workshop held in June 2025, during which the SSC provided feedback on a refined set of HCRs to explore, the structure of simulation analyses to examine alternative HCRs, and the species that should be considered. Crab Plan Team (CPT) co-chairs Katie Palof (ADF&G) and Mike Litzow (NOAA-AFSC) and Joint Groundfish Plan Team co-chair Jim Ianelli (NOAA-AFSC) provided summaries of their teams' recommendations on this topic following meetings in January 2026.

This research effort is intended to describe trade-offs among alternative HCR parameterizations in their resilience to future climate and/or ecosystem change. The SSC highlights that this informative exercise is

[4] Valavi R, Elith J, Lahoz-Monfort JJ, Guillera-Arroita G. blockCV: An R package for generating spatially or environmentally separated folds for k-fold cross-validation of species distribution models. Methods Ecol Evol. 2019; 10:225–232. https://doi.org/10.1111/2041-210X.13107.

an opportunity to learn more about 1) the extent to which alternative approaches to defining HCRs might address the diversity of sustainability and stakeholder objectives for management of Alaska's groundfish resources, and 2) the costs and benefits of potentially linking HCR elements to environmental processes for which a plausible species-specific biological relationship is evident. This is not an exercise to select a particular HCR per se. The SSC looks forward to the June 2026 document further outlining the proposed analysis methods, refined sets of HCR alternatives as they relate to defined objectives, description of progress in identifying performance metrics, and updated timelines for review and comment by Council bodies. The SSC offers the following considerations and recommendations.

Analytical Approach

The SSC supports the use of both retrospective analysis of the impacts of alternative HCRs on harvest recommendations had they been in place in the past, and closed-loop forward simulations supported by ACLIM/GOACLIM efforts to evaluate HCR tradeoffs in the future. The SSC noted that one benefit of retrospective analysis is its simplicity, the limited number of assumptions required, and reduced development time, with the major drawback being the lack of connectivity between past management decisions and future population dynamics. The SSC reiterates that continued staff support and analytical resources are essential to the success of this effort, given its multidisciplinary nature and the need to integrate results across modeling platforms and scientific disciplines.

SSC discussion considered the potential need to examine HCR performance in the face of possible changes in the quantity and quality of data available from fisheries resource and ecosystem surveys. AFSC staff highlighted that the current plan would be to consider HCR alternatives under conditions of existing data quantity and quality. **However, the SSC recommends that within the June 2026 paper, the analysts consider options for exploring HCR performance under alternative levels of uncertainty in data inputs to stock assessments.**

In the upcoming June 2026 document, the SSC requests better description of the "experimental design" of the specific perturbations of values in the climate models that will define the future environmental scenarios in which the performance of the various HCRs under consideration will be simulated. Specifically, the SSC requests further clarification on exactly which demographic processes are proposed to be linked to future environmental change for each case-study species. The SSC highlights that while changes in future recruitment, natural mortality, and growth are likely the most relevant processes, it is worthwhile to consider whether changes in maturity schedule may be important to explore in future simulations, even if current data limitations do not permit an environmental relationship to be identified at present. The SSC feels there is opportunity, as part of this exercise, to explore the tradeoffs among candidate HCR alternatives in the face of changing stock dynamics that are represented by existing demonstrated relationship with the environment, but also to explore alternative states of nature for stock dynamics that may occur in the future, even if not reliably observed at present.

Alternative HCRs

The SSC supports the decision to focus on three general categories of HCRs:

- HCR 1 - represents status quo HCR approaches
- HCR 7 - links fishing mortality and biomass reference points to covariates for those species whose productivity is believed to vary predictably with environmental conditions
- HCR 10 - includes a proportional reduction in fishing mortality based on biomass levels and may operate similarly to defined maximum ABC caps (e.g., 2 million mt cap in Bering Sea)

To clearly quantify the potential tradeoffs between alternative HCRs, it is critical to develop a robust representation of the status quo (HCR 1), which should consider existing procedures for reductions from maxABC using the current risk table framework to the extent practicable. Further, the SSC highlights the recommendation from the CPT that the status quo for crab stocks must consider both the federal and state TAC setting processes that regulate the realized fishing mortality for crab species.

With respect to HCR 7, SSC discussion highlighted that careful consideration is necessary in the development and testing of environmentally linked harvest control rules. In particular, the SSC discussed several sources of potential risk, including the potential for time-varying species-environment relationships, biased or imprecise understanding of the true underlying relationship, or misspecification of the true underlying structure of the relationship (e.g., an assumed linear relationship based on the available contrast in existing environmental observations, when the true underlying relationship is non-linear). Each of these circumstances limits the efficacy of this type of linked HCR, and may elevate risk. The SSC recommends that analysts explicitly address how ecosystem linkages and stock productivity assumptions are represented within and across modeling platforms, and evaluate the sensitivity of results to incorrect or changing assumptions. Robustness to evolving ecosystem relationships is a core element of climate-resilient management. **The SSC also discussed the potential utility** of a more **incremental variant of HCR 7 in which the HCR is only adjusted downwards to address a persistent low stock abundance not necessarily linked to an environmental covariate. This variant could also be used to evaluate the ABC buffing process currently used for crab management.**

The SSC highlights that given the foundational importance of HCRs to groundfish and crab management in Alaska, fostering transparency and understanding of the alternative explored for the Council and the public is critical. **To that end, the SSC recommends the analysts consider a more approachable naming convention for the HCR alternatives,** and highlights the excellent RShiny tool (https://kholsman.shinyapps.io/HCRshiny/) already developed by Dr. Holsman for exploring HCR alternatives.

Species Scope and Grouping Approach

The SSC supports the proposed species for future analysis and exploration, including Pacific cod, pollock, Alaska sablefish, and Pacific ocean perch as groundfish case studies and the CPT recommendation to consider at least one Chionoecetes (e.g. snow crab) and one king crab (e.g. Bristol Bay red king crab) stock.

The SSC supports Plan Team input that evaluation and design of alternative HCRs may be grouped by broader stock types (e.g., guilds or typologies), even if implementation decisions ultimately occur on a stock-by-stock basis. The SSC recommends that analysts clearly describe the purpose of any grouping approach, including whether grouping is intended to improve analytical efficiency, interpretability, management feasibility, or some combination of these factors.

Range of Objectives and Performance Evaluation

The SSC recommends that the discussion paper explicitly articulate the full range of Council objectives relevant to considering revised or alternative HCRs and clearly distinguish high-priority objectives from secondary objectives. The SSC further recommends that objectives be framed to reflect the full continuum of scientific advice and management decision-making, from assessment model outputs, through HCR application, to TAC-setting.

The SSC discussed several objective categories that could be addressed, including, for example, conservation and risk objectives, resilience and productivity objectives, and ecosystem and multispecies

objectives. Consistent with the SSC's June 2025 recommendations, the SSC also emphasized the importance of potential stability and socioeconomic objectives to evaluate outcomes related to catch and value stability over time, with explicit attention to downside risk.

The SSC appreciates the discussion on evaluating HCR performance using metrics that extend beyond biological outcomes to include fishery performance and socio-economic stability. The HCR Team identified three initial fisheries performance indicators for consideration: catch stability, fishing effort, and trends in total value over time. As this work progresses and additional indicators are tested, **the SSC notes that clarifying clear socioeconomic objectives will facilitate the selection and evaluation of fisheries performance indicators to align with those objectives.** These indicators will provide insight into how alternative HCRs translate model outcomes into real-world fishery conditions and community impacts. In particular, maintaining catch and fishery stability has been identified as a key objective, as downside shocks can impose disproportionate social and economic costs relative to the benefits associated with positive recruitment events.

The SSC agreed that transparency, credibility, and operability are essential objectives. Any proposed approach should be clear, explainable to the public, and operationally feasible within existing management processes.

The SSC recognizes the selection and prioritization of performance metrics will necessarily follow the objectives, which are not yet explicitly defined. However, the SSC suggests that early consideration of how to display trade-offs among HCRs will be important, particularly given that no HCR option is likely to simultaneously maximize long-term catch, optimize SSB reserves, and minimize interannual variability in catches, for example. The SSC requests that the June 2026 document provide examples for how the Council will evaluate trade-offs beyond tables of metrics under different scenarios. Relevant examples for describing trade-offs may include the summary of performance across multiple objectives in the form of radar plots or spider diagrams. In addition, the use of a two-axis framework, for example including (1) a biological resilience axis related to key biological or conservation-related performance metrics that could be summarized on a common scale from generally good to generally bad (e.g. probability of B falling below a threshold, age/size diversity, etc), and (2) a fishery stability axis (along a gradient capturing the degree of change in ABCs from year to year, frequency of large drops, probability of fishery closure, catch stability, etc). This type of visualization of the trade-off frontier might be particularly useful in exploring potential outcomes across both HCRs and alternative future states of nature.

Interannual Switching Among HCRs

The SSC recommends that analysts explicitly evaluate and compare 1) a conditional or toggling approach, in which an alternative HCR is applied only when a specified trigger is met; and 2) a replacement or default approach, in which simulations indicate that an alternative HCR (or suite of HCRs) more consistently meets high-priority objectives than the status quo under changing conditions, potentially reducing or eliminating the need for explicit triggers.

If a toggling approach is pursued, the SSC recommends that analysts clearly specify the operational details of any indicator-based trigger system, including whether covariates or indicators are annual or smoothed (e.g., multi-year running averages), forecast-based or retrospective, providing guidance on the criteria for a trigger if it is linked with risk table performance, and how uncertainty in indicators or forecasts is incorporated into decision-making.

Engagement and Communication

The SSC recommends that analysts provide a clear plan for regular engagement and communication with the Council bodies and the public including an implementation timeline with milestones and anticipated deliverables.

General Comments

The Plan Teams recommended that the HCR Workplan include guidance clarifying when climate-resilient strategies should be applied within assessment models, HCRs, or the TAC-setting process. This includes outlining procedural steps for proposing and evaluating alternative HCRs, demonstrating proof-of-concept, defining acceptance criteria, and establishing a process for periodic scientific updates informed by ongoing research efforts. **The SSC requests that the June 2026 discussion paper describe the benefits and drawbacks of implementing climate-resilient approaches within these three steps in the fishery management process.**

The SSC also forwards its recommendations from the June 2025 workshop that the range of and scientific basis for ocean warming scenarios should be clearly communicated and defined. The SSC also recommended including the most likely scenarios to better understand likely near- and long-term ocean conditions, alongside bracketing scenarios that represent mild to extreme warming. In addition, timeframes for evaluating HCR scenarios should reflect both near-term periods relevant to current business operations and community concerns, as well as longer-term forecasts when appropriate. Additionally, if an FMP amendment is considered, the SSC suggests it may be useful to add language that allows flexibility for a range of custom stock-specific HCRs rather than a prescribed set of HCRs that may or may not be directly related to climate resilience to address other Council objectives.

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 February 2026 meeting, a number of SSC members acknowledged associations with specific agenda items under SSC review. Robert Foy is the third or greater level supervisor for the following Chris Lunsford, Melissa Haltuch (D2 2026 groundfish planning); Jim Ianelli, Bridget Ferriss, Pete Hulson, Kalei Shotwell (C1 GOA Pacific cod assessment); Lukas DeFilippo (C3 Cook Inlet salmon specifications); Kirstin Holsman, Jim Ianelli, Steve Barbeaux (D4 HCR development); AFSC participants in (D3 EFH Five-year review workplan). Dana Hanselman is the first level supervisor of Chris Lunsford (D2 groundfish planning), third level supervisor of Pete Hulson, and married to Kalei Shotwell (C1 GOA Pacific cod assessment and ESP). Dr. Hanselman is second level supervisor of Lukas DeFelippo (C3 Cook Inlet salmon specifications). Brad Harris and Jason Gasper have an association with the D3 Essential Fish Habitat agenda item. Dr. Gasper is also a first level supervisor of Tristen Sebens (D3 EFH five-year review workplan). Rob Suryan was a contributor to the D1 AFSC report.