

C1 2025 Preliminary Salmon SAFE of the Cook Inlet EEZ

The SSC reviewed and received a presentation on the 2025 SAFE Report for the Salmon Fisheries of the Cook Inlet Exclusive Economic Zone (EEZ) from Diana Stram (NPFMC), Richard Brenner (NFMS-AKRO) and Aaron Lambert (NMFS-AKRO).

The SSC received oral public testimony from Pat Shields (self), Janet Carroll (OBI Seafoods), Nick Jacuk (self), Alfred Tellman (Knik Tribe), Samuel Schimmel (Tikahtnu Inter Tribal Fish Commission), Jim Sykes (Matanuska-Susitna Borough Fish & Wildlife Commission), Roland Maw (United Cook Inlet Drift Association; UCIDA), and David Martin (Cook Inlet Fishermen's Fund). The SSC received written public testimony from Mike Simpson (Alaska Salmon Alliance), Andy Couch (Matanuska-Susitna Borough Fish & Wildlife Commission), and David Martin (UCIDA). As the C1 agenda item represents influential scientific information, public testimony is required to be characterized and responded to during SSC deliberations.

Public testimony highlighted several common areas of concern, including:

- The unsuitability of EEZ harvest management based on a preseason total allowable catch (TAC), given the high interannual variability in return abundance, and support for the use of abundance/escapement-based harvest policies with active and adaptive in-season management
- Failure to manage to maximum sustainable yield (MSY) and optimum yield (OY) as well as lost harvest opportunity due to surplus escapement
- Use of recent data to inform status determination and harvest specifications due to recent fishery disaster declarations and State of Alaska management decisions, which may not be representative of long-term productivity trends
- Not all harvest is reported and escapement enumerated (e.g. small Chinook in recreational harvest and Kenai River escapement)
- SAFE is specific to the EEZ only and the drift gillnet fishery in particular, but does not consider the harvest of stocks that pass through the EEZ before and after the drift gillnet fishery
- Economic and industry stability under this management system
- The need to consider broader management implications across both state and federal components of the fishery relative to MSY and OY

Public comment included general support for:

- Use of the lower bound of the escapement goal for calculating status determination criteria and harvest specifications
- Efforts to allow northern Cook Inlet stocks to pass through the EEZ and associated SAFE-recommended ABC buffers specifically for coho and Chinook aggregate stocks.
- Research to fill data gaps on salmon populations and migration timing, including a test fishery, collection of real-time data and use of genetic stock identification of the harvest
- Interest in a test fishery, potentially Tribally led

- Expanded enforcement to ensure all harvested salmon are counted
- Inclusion of Indigenous Knowledge
- Engaging in government-to-government consultation as relevant

Public comment also included recommendations for timing and frequency of fishing periods in the EEZ as well as gear specifications to allow for passage of fish to northern Cook Inlet salmon streams. 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 2025 Cook Inlet EEZ Salmon SAFE report and responding to the SSC recommendations from February 2024. **The SSC reiterates the challenge of providing a basis for status determination and harvest specifications for this salmon fishery that requires adapting the escapement-based management policy used by the State of Alaska to comply with the Magnuson Stevens Act (MSA) framework.** As noted last year, this is an iterative process and there are opportunities to benefit from lessons learned in MSA salmon management on the West coast by the Pacific Fishery Management Council (PFMC).

Reviewing the SAFE methodology for the first time at the same meeting where harvest specifications are set - without the benefit of independent review - poses a significant challenge. Last year, the SSC highlighted the value of long-format Plan Team meetings for reviewing groundfish and crab stock assessments. These meetings serve as a critical forum for in-depth discussions, allowing for substantive progress in improving processes and models that support management decisions, as well as reviewing proposed methodological changes prior to harvest specifications. **The SSC reiterates its recommendation from last year that a workshop, or series of workshops, focused on further developing Cook Inlet Salmon harvest specification and status determination methods in the context of continued in-season EEZ management be held in the coming year.** This workshop could include members of the SAFE team, ADF&G, SSC, and experts from the PFMC where issues related to federal management of salmon fisheries have been extensively considered. **The SSC also recommends evaluating the establishment of a Plan Team for federally managed salmon stocks in the Cook Inlet EEZ, recognizing that costs, timing of data availability, and determining membership of a plan team need to be considered carefully.**

With regards to the annual assessment and specifications cycle, the SAFE team suggested providing an early draft of the SAFE by December for review by the SSC. The SSC discussed the benefits of previewing newly proposed analyses and methods in response to requests and recommendations from the previous harvest specifications cycle, whether originating from the SSC, workshops or a plan team. The timing of presenting an early preview would be dependent on how soon the SAFE team could prepare a report and when the SSC could accommodate it in their schedule. This would allow for the SSC to provide feedback and recommendations prior to the meeting at which specifications are set.

The SSC also discussed the need for continued research and data collection, especially genetics and age-sex-length data of the salmon harvested in the EEZ fishery. 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 EEZ fishery, and to evaluate the prevalence of non-Cook Inlet Chinook in the fishery. Given the number of Chinook salmon reported to be harvested, it would be reasonable to obtain a census sample from the fishery. The SSC acknowledges the value of in-season information that could be provided by a test fishery, as noted during public testimony.

A test fishery could help characterize the timing, magnitude, and distribution of returning salmon, as well as support stock composition estimates if in-season genetic stock composition analysis are feasible.

The SSC reiterates its February 2024 report comment that as the Cook Inlet EEZ management process matures and consistent with National Standard (NS) 2, **the SSC looks forward to the SAFE incorporating a summary of scientific information on the most recent social and economic condition of the relevant fishing interests, fishing communities, and the fish processing industries.** The SSC recognizes the capacity challenges facing the analysts in the absence of a plan team. However, it is important in the context of NS8 to capture the differential distribution of impacts associated with the change to federal management in the early years, especially if there are substantial changes in patterns of engagement or dependency for fishing communities, fishery sectors, and/or fishery support sectors. It is difficult in general to capture information on correlation or causation of changes seen in retrospect, especially with respect to those who exit the fishery. Further, it is important to capture changes in participation across commercial, sport, personal use, and subsistence fisheries, as well as the potential for new or returning entrants, including those represented in evolving Tribal fishery initiatives.

The drainage maps provided at the beginning of each SAFE chapter for the aggregate salmon stock complexes do not align with the Federal definition of these Upper Cook Inlet aggregates provided below each map. The SSC requests that the authors correct these maps for the final SAFE.

The SSC appreciates the SAFE team providing the GitHub repository with data used for the assessment and requests that this practice continue for future salmon SAFEs.

2025 Cook Inlet aggregate salmon harvest specifications and SAFE

Stock status determination criteria for aggregate salmon stock complexes in the Upper Cook Inlet EEZ in 2024 and the 2025 SSC harvest recommendations are summarized in Tables 1 and 2, respectively.

The SSC reviewed status determination criteria for 2024. **Aggregate salmon stock complexes were not apparently subject to overfishing, pending final harvest data. Aggregate salmon stock complexes, with the exception of aggregate chum and pink stocks, were not apparently overfished, pending final harvest and escapement data. For aggregate chum and pink stocks, an overfished status determination is not possible.**

Table 1. Aggregate stock status in relation to status determination criteria for 2024 salmon fisheries of the Cook Inlet Exclusive Economic Zone Area for 2025. Values are in numbers of fish. 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.

Stock	Tier	MSST	Cumulative Escapement	MFMT	F _{EEZ}	OFL	OFL _{PRE}	ABC	Catch	Overfished
Kenai River Late Run Sockeye salmon	1	3,030,000	8,258,000	0.204	0.072	NA	901,932	431,123	189,380*	no
Kasilof River Sockeye salmon	1	555,000	4,008,000	0.495	0.036	NA	541,084	375,512	77,960*	no
Aggregate Other Sockeye salmon	3	163,000	529,700	NA	NA	1,271,000	887,464	177,493	57,496*	no
Aggregate Chinook salmon	3	44,200	70,800	NA	NA	3,072	2,697	270	31	no
Aggregate Coho salmon	3	38,800	24,400**	NA	NA	439,000	357,688	35,769	4,432	no
Aggregate Chum salmon	3	NA	NA	NA	NA	561,000	441,727	110,432	28,832	NA
Aggregate Pink salmon	3	NA	NA	NA	NA	300,000	270,435	135,218	6,249	NA

*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

** 2025 SAFE notes that this escapement estimate is based on incomplete information

Table 2 SSC recommendations for the salmon fisheries of the Cook Inlet Exclusive Economic Zone Area for 2025. Values are in numbers of fish. 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	MSST	Escapement goal, lower bound	S _{MSY} *	OFL	OFL _{PRE}	ABC	ABC Buffer (%)
Kenai River Late Run Sockeye salmon	1	3,030,000	750,000	1,212,000	NA	514,761	360,332	30 %
Kasilof River Sockeye salmon	1	555,000	140,000	222,000	NA	664,294	285,646	57%
Aggregate Other Sockeye salmon	3	163,000	65,000	NA	906,757	181,351	154,148	15%
Aggregate Chinook salmon	3	40,500**	13,500**	NA	2,237	373	261	30%
Aggregate Coho salmon	3	38,800**	19,400**	NA	268,053	67,013	16,753	75%
Aggregate Chum salmon	3	NA	3,500	NA	390,030	97,508	78,006	20%
Aggregate Pink salmon	3	NA	NA	NA	116,348	58,174	52,357	10%

*Hasbrouk et al 2022

** corrected values to be updated in final 2025 SAFE

Tier 1 General Topics

S_{MSY} vs Lower Bound of the State's Scientifically-based Escapement Goals

The Salmon fishery management plan (FMP) specifies the lower bound of the escapement goal range as the default for calculating status determination criteria (SDC) and harvest specifications, unless the SSC recommends otherwise. In its 2024 review of the first Cook Inlet EEZ SAFE, the SSC recommended that the S_{MSY} should be used for Tier 1 stocks to provide sufficient precaution for setting the preseason OFL and SDCs and to be consistent with the interpretation of this reference point. For the 2025 preliminary Cook Inlet EEZ SAFE, the SAFE team recommended using the lower bound of the State's escapement goal range for Tier 1 stocks with the rationale that this represents the best scientific information available for maximizing yield and preventing overfishing over the long term, in fulfillment of NS1 Guidelines. The SAFE team provided a reasonable rationale for considering using the lower bound of the escapement goal. The SSC appreciates the flexibility in determining the value used to estimate the productive capacity of the stock. For example, in the East Area, the MSST for coho uses the lower bound of the escapement goal range, but Chinook uses the mid-point. Both public testimony and the authors noted the PFMC Salmon FMP includes several examples of reference points that are equal to the lower bound of MSY escapement ranges or other lower bound escapement targets. Part of the challenge with determining the correct approach is the unique nature of the harvest specifications for the Cook Inlet EEZ salmon fishery, including the challenge of using escapement-based management with federal reference point requirements under the MSA. **For the 2025 specifications, the SSC recommends that 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 recommends that an escapement target equal to S_{MSY} also be used in defining the preseason OFL and ABC specifications for the 2025 season. The SSC also recommends further consideration of this issue, such as by the proposed workshop(s) discussed under General Comments.** The SSC recommends this issue be considered on a stock-by-stock basis based on data availability.

MSST scaling

In 2024, the SSC recommended using S_{MSY} as the escapement target for calculating MSST for Tier 1 stocks for consistency with how the MSST is defined in the crab and groundfish FMPs. Under this approach, the MSST is $0.5 * S_{MSY}$ (summed over a generation) or half of the spawning abundance expected to produce MSY over the long term. The SAFE team requested input from the SSC on the potential for changing the scalar used to adjust the escapement target in the calculation of MSST to values other than 0.5. The authors noted that this approach is used for select West coast salmon stocks. The SAFE team suggested that the SSC might consider scaling factors from 0.5 to 0.75 and provided examples using 0.6 of the lower bound of the escapement goal as footnotes in Tables 7 and 12 of the preliminary SAFE report. **The SSC acknowledges flexibility in the MSST definition but recommends continuing to use $0.5 * S_{MSY}$ (summed over a generation) for the 2025 specifications. The SSC also recommends that the SAFE team provide a more detailed rationale for selecting appropriate scalars for different stocks as necessary.**

SDC and Harvest Specifications Methods/Buffer Calculations

The SAFE team presented three options to calculate components of the preseason OFL for the Tier 1 stocks:

- Using the State-produced preseason forecast of run size

- Autoregressive modeling of historical total run size estimates to project next year's run size as well as the harvest rate in state waters (F_{state}). This was the same method used in 2024 and included calculation of buffers for reducing OFL to ABC based on the probability of over forecasting.
- A new Bayesian approach, which is similar to the autoregressive model framework currently used, except that the preseason run size forecast is fit using an AR1 model and the state harvest model fixed to the best models for the current year. As with the current method, buffers for reducing OFL to ABC are based on the magnitude of positive errors in preseason OFL estimates.

The SSC supports the SAFE team's recommendation to use autoregressive models for both Tier 1 stocks (Kenai River late run sockeye and Kasilof River sockeye) to forecast run size and the state waters harvest rates component of the preseason OFL. Details associated with these models are provided for each stock. The SSC notes that the State-produced preseason forecast sibling models had lower forecast error but are currently unavailable due to the timing of when those estimates are produced relative to when they are needed for harvest specifications. The SAFE team also provided a Bayesian approach that retrospectively evaluated the probability that an ABC exceeded the post-season OFL under different buffers on the preseason OFL. The SSC appreciates the SAFE team's work on this analysis, and supports further efforts to develop this model, including consideration of a longer time series where available. The SSC further recommends the SAFE team consider whether the magnitude of the buffer could be scaled relative to the cumulative probability of a preseason $OFL < 0$ under the posterior distribution for this quantity, rather than the proportion of years in which the ABC was over forecasted.

Kenai River Sockeye

The SAFE team recommended designating Kenai River late-run sockeye as a Tier 1 stock. An autoregressive model approach was used to predict the 2025 run size (AR1) and state waters harvest (AR model - zero mean white noise) based on historical data, similar to the 2024 methods. Based on these results, the preseason OFL was determined. Buffers for reducing the preseason OFL to the ABC were based on the retrospective median symmetric accuracy of preseason OFL relative to post-season OFL, for those years where the OFL was over-predicted between 2015 and 2024. Harvest specifications based on using S_{MSY} for the stock and the lower bound of the escapement goal were both presented. **The SSC concurs with the SAFE team's recommendation of a Tier 1 designation for Kenai River late run sockeye in 2025.** The SSC accepts the methods used by the SAFE team to forecast the 2025 run size estimate and the estimated harvest rate in state waters given the numerous constraints and data availability at this time. The SSC discussed the appropriate buffer for setting the ABC below the preseason OFL. The buffer recommended in the preliminary SAFE using S_{MSY} as a basis for calculating the preseason OFL based on the retrospective accuracy of preseason OFLs was considered conservative by the SSC. **The SSC recommends setting an ABC buffer of 30% (rounded from the buffer calculated using the lower bound of the escapement goal). This recommendation recognizes that the S_{MSY} estimate for this stock is near the upper end of the MSY escapement goal range based on the stock-recruit relationships presented in the SAFE. Additionally, there are no conservation concerns for this stock.**

Finally, the SSC noted a number of minor editorial comments that will be communicated directly to the SAFE team for the final 2025 SAFE, including correcting the pre-2020 estimates of S_{MSY} and the lower bound of the escapement goal in Table 10. The SSC recommends that the SAFE team provide additional detail (e.g., a table) in the assessment that lists components of the harvest (commercial, sport, personal use, subsistence) and escapement information such that the reader can more easily identify what are final versus preliminary estimates. In addition, the SAFE team should clearly state whether the status determination recommendations (i.e., overfishing and overfished status) include preliminary information.

Kasilof River Sockeye

The SAFE team recommended designating Kasilof River sockeye a Tier 1 stock. An Autoregressive model approach was used to predict the 2025 run size (AR1) and State waters harvest (autoregressive moving average model) based on historical data, similar to the methods used in 2024. Based on these results, the preseason OFL was determined. Buffers for setting an appropriate ABC below the preseason OFL based on the retrospective accuracy of preseason relative to post-season OFL estimates were proposed similar to Kenai River late-run sockeye salmon. Harvest specifications based on using either S_{MSY} or the lower bound of the escapement goal were both presented. **The SSC concurs with the SAFE team's recommendation of a Tier 1 designation for Kasilof River sockeye in 2025.** The SSC accepts the methods used by the SAFE team to forecast the 2025 run size estimate and the estimated harvest rate in State waters, given the numerous constraints and data availability at this time. The buffer recommended in the preliminary SAFE using S_{MSY} as a basis for calculating the preseason OFL based on the retrospective accuracy of preseason OFL estimates was considered conservative by the SSC. **The SSC recommends setting an ABC buffer of 57%** (the buffer based on the same analysis, but using the lower bound of the escapement goal).

Finally, the SSC noted several minor editorial comments that will be communicated directly to the SAFE team for the final SAFE, including correcting the pre-2020 estimates of S_{MSY} in Table 15. Similar to Kenai River late-run sockeye, the SSC suggests that the authors provide additional detail for the components of the State harvest (commercial, sport, personal use, subsistence) and clearly distinguish final estimates from preliminary estimates.

Tier 3 Stocks

The SAFE team recommended that aggregate “other” sockeye salmon, aggregate Chinook salmon, aggregate coho salmon, aggregate chum salmon, and the aggregate pink salmon stock complexes 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.**

In its February 2024 minutes, the SSC made several recommendations regarding the Tier 3 aggregate stocks for the 2025 SAFE. The OFLs should be based on limiting harvest in the current year, rather than the multi-year approach that was used in 2024. The SSC recommended that ABC buffers be expressed as a percent reduction from OFL, consistent with groundfish and crab. Finally, the SSC suggested that a starting point might be the 25% default buffer used for Tier 6 average-catch stocks in the groundfish FMPs, though alternatives should be considered on a stock-by-stock basis.

In response, the SAFE team developed a new Tier 3 approach in which the preseason OFL is based on the maximum average catch over a generation during the period 1999-2024. The maximum average over a generation tends to be 40-60% higher than the overall average but will always be lower than the maximum catch over the equivalent period. Overfishing is determined by comparing the cumulative catch over the previous generation to the maximum cumulative catch. **The SSC supports this more transparent approach and considers it a substantial improvement over last year.** However, it should be acknowledged that this will be less precautionary than the groundfish Tier 6 average-catch approach. Although not articulated in the SAFE, a potential rationale is that for most salmon stocks, a single brood year will return to spawn over several years, so that not all of the stock is exposed to harvest in any single year. This may result in additional resilience to harvest compared to groundfish, where all of the exploitable stock is exposed to harvest.

The SAFE team recommended ABC buffers for each Tier 3 stock, starting with a 15% default ABC buffer. Recommended buffers were 15% for other sockeye, 30% for Chinook, 90% for coho, 20% for chum, and 10% for pinks. In general, proposed departures from the default 15% buffer were well justified. **The SSC**

raised concerns about the recommended buffer for aggregate coho as noted below, but otherwise concurs with the recommended SAFE team buffers for this year.

Overall, the SSC is concerned that a 15% default buffer does not adequately recognize the severe limitations of basing harvest specifications on historical catch statistics. These specifications do not respond to changes in the stock abundance due to varying environment conditions, and their relationship to sustainable yield is highly uncertain. In some cases, there is no adequate basis for determining overfished status. These limitations are the same as for Tier 6 groundfish, implying that the default 25% buffer to obtain the ABC for these stocks would be applicable to Tier 3 salmon stocks to maintain a consistent approach to uncertainty across FMPs. **The SSC therefore requests the SAFE team adopt a default 25% buffer for developing harvest recommendations next year.** Departures from the 25% buffer (both higher and lower) should be justified based on specific issues for each aggregate stock complex such as data availability and quality.

The SSC agrees with the SAFE team's concern with low coho abundance. Harvest in the EEZ and escapement counts from coho index stocks are at all-time lows. Complete weir counts are not available for either coho indicator stock in the last three years. The SAFE team-recommended buffer of 90% is very large and the resulting ABC would have led to an early fishery closure in 24 of the last 26 years. Instead, the SSC recommends a large, but less extreme buffer of 75% for aggregate coho. This magnitude is comparable to the largest buffer used for BSAI crab stocks of 75% for West Aleutian Islands red king crab, which is at very low abundance and has been closed to directed fishing since 2003.

The SAFE team evaluated aggregate "other" sockeye salmon, aggregate Chinook salmon, aggregate coho salmon, aggregate chum salmon and aggregate pink salmon 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 aggregate "other" sockeye, aggregate Chinook, and aggregate coho could be evaluated for overfished status. While none of these stocks were below the MSST, escapement data to compare to the respective MSST are very limited for aggregate coho. In addition, Kenai large late run Chinook may not be a suitable indicator stock since it is likely not well represented in the EEZ salmon fishery.

The SAFE team requested input from the SSC on how to treat overfished determinations with missing or incomplete weir data. The SSC recommends that the calculation of the cumulative escapement goal omit the indicator goal in years when the index is missing or incomplete. For example, when a weir count is missing, the escapement goal for that site in that year is not counted towards the cumulative escapement target over a generation.

The 2025 SAFE document highlighted some sources of uncertainty that were not considered in the assessment, including the unconfirmed historical estimates of salmon harvests in the Cook Inlet EEZ prior to 2024. However, for Tier 3 stocks, these estimates are the basis for the 2024 and 2025 SDC and harvest specifications recommendations. The SSC recommends that, to the extent possible, the SAFE team explore the uncertainty in the historical estimates of salmon harvests in the Cook Inlet EEZ prior to 2024 for all the Tier 3 stock complexes in future assessments.

The SSC appreciates the draft risk table for the aggregate coho salmon complex. While the risk table served to highlight the serious concerns regarding the status of Cook Inlet coho, the scoring was elevated compared to how the risk table has been used for groundfish. Attributes that are typical of Tier 3 stocks should not result in an elevated risk score as they are reflected in the default buffer. The SSC looks forward to further refinement of risk tables for the aggregate salmon stocks in the Cook Inlet EEZ.

The SSC identified the following data needs that would provide an immediate benefit to Tier 3 salmon assessments:

- There should be 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 EEZ fishery and to evaluate the prevalence of non-Cook Inlet Chinook in the fishery.
- It is a concern that monitoring of salmon escapement in Cook Inlet has decreased over time. Ideally, each Tier 3 aggregate stock complex should have several monitored indicator stocks. Increased support for the existing coho indicator stocks is the highest priority.

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