MATANUSKA-SUSITNA BOROUGH Fish & Wildlife Commission

350 E Dahlia Ave., Palmer, Alaska 99645

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Regular Meeting

May 8, 2025

Supplemental Handout – Table of Contents

Physical Location of Meeting: Assembly Chambers DSJ Bldg, Palmer. Remote Participation: See agenda.

Planning and Land Use Department - Planning Division

http://www.matsugov.us • planning@matsugov.us

Cook Inlet Salmon Stock Assessment Modeling Workshop

May 19, 2025, through May 20, 2025
Ted Stevens Marine Research Institute,
Royce Room (131), 17190 Point Lena Loop Road. Juneau, Alaska 99801
On-line access at
https://us06web.zoom.us/j/86284857360?pwd=RUjgtbanCtYiNrDQgqjaKAHRXIEaX9.1

Please contact Diana Stram if you wish to participate in-person to coordinate access to the lab at diana.stram@noaa.gov

The workshop objective is to prepare for the 2026 specifications process for the final Cook Inlet Salmon SAFE report. This is a technical workshop to address assessment related feedback from the SSC during the 2024 and 2025 assessment cycles. This includes methodological comments on the Tier designations for all 7 stocks as well as the calculation of the overfishing limit (OFL), the minimum stock size threshold (MSST), acceptable biological catch (ABC) and appropriate buffer levels for these stocks. Additional topics will include the structure of the SAFE report, data needs and availability and the development of draft risk tables.

Schedule 9-4pm Alaska time with lunch breaks daily ~12-1pm [updated 5/6/25]

Monday May 19:
9am-

- Introductions, objectives of assessment review

9:15am - 12

- Overview of Cook Inlet (CI) EEZ Stock Assessment methods and pre/post-season status determination criteria
    - Tier 1 stocks + 2025 SDC summary
    - Tier 3 stocks + 2025 SDC summary
- 2025 SSC Recommendations and proposed or in-progress SAFE team responses

12-1pm lunch break

1pm-4pm

- Proposed Bayesian Tier-1 approach for preseason forecast and OFL-ABC buffer determination
    - SSC report page 9, paragraph 1

Tuesday May 20:

9am-10am

- Continue Bayesian Tier 1 approach as needed

10am-12pm

- Additional considerations future stock assessment development;
    - Potential for stock prioritization
    - Discussion of timing of data availability
    - Risk Tables
        - 2025 SSC report page 11, paragraph 6
- 2025 SSC report:
    - Consideration of default buffer for tier-3 stocks → 25%, consistent with tier-6 crab and groundfish stocks, adjusted from here on case-by-case basis (page 11, paragraph 1)
    - Explore uncertainty in historical estimates of EEZ harvest for tier-3 stocks (page 11, paragraph 5)

12pm-1pm lunch break

1pm-4pm

- Additional questions or assessments comments for SSC consideration in the December review
    - 2025 SSC report:
        - Expanded/continued ASL and GSI sampling of salmon caught in the EEZ fishery (page. 4, paragraph 4)
        - Incorporation of in-season information, offshore test fishery (page. 4, paragraph 4)
        - Expanded information, consideration of socioeconomic factor, impacts of newly created federal fishery (page 4-5, paragraph 5)

4pm Adjourn

SCIENTIFIC AND STATISTICAL COMMITTEE
FINAL REPORT TO THE
NORTH PACIFIC FISHERY MANAGEMENT COUNCIL
February 3rd – 5th, 2025

The SSC met from February 3rd – 5th, 2025 in Anchorage, AK. Members present in Anchorage were:

Franz Mueter, Co-Chair (filling in for Co-Chair Sherri Dressel) *University of Alaska Fairbanks*	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*	Mike Downs *Wislow Research*
Robert Foy *NOAA Fisheries—AFSC*	Dana Hanselman *NOAA Fisheries—AFSC*	Brad Harris *Alaska Pacific University*
Kailin Kroetz *Arizona State University*	Andrew Munro *Alaska Dept. of Fish and Game*	Chris Siddon *Alaska Dept. of Fish and Game*
Patrick Sullivan *Cornell University*	Robert Suryan *NOAA Fisheries—AFSC*	Sarah Wise *NOAA Fisheries—AFSC*

SSC members who were absent:

Sherri Dressel, Co-Chair *Alaska Dept. of Fish and Game*	Jennifer Burns *Texas Tech University*

SSC Election of Officers

The SSC re-elected Sherri Dressel (ADF&G) and elected Jason Gasper (NOAA-AKRO) and Ian Stewart (IPHC) as co-chairs for 2025. The SSC also re-elected Alison Whitman (ODFW) to serve as vice chair. Dr. Gasper will chair the April meeting, Dr. Dressel the June and December meetings, and Dr. Stewart the October meeting. Former co-chair Dr. Franz Mueter (University of Alaska Fairbanks) is serving as co-chair at this February 2025 meeting due to unforeseen circumstances. The SSC expresses its sincere thanks for Dr. Mueter's leadership as co-chair since 2022.

SSC Administrative Discussion

The SSC extends a warm welcome to new member Sarah Wise (NOAA-AFSC). Jennifer Burns (Texas Tech University) will be starting on the SSC in April. The SSC is appreciative to the Council for their appointments.

Diana Evans (NPFMC) provided a summary of the NPFMC general code of conduct, an overview of the agenda items at this February 2025 meeting, and reviewed guidelines for oral public testimony, emphasizing that the SSC focuses on scientific evaluation. Ms. Evans also noted the April meeting in Anchorage, and that travel arrangements for the June NPFMC meeting will need to be completed soon. Staff will send out an email to SSC members with directions this week.

General Comments

Process for Reviewing Revised Analyses (e.g. Second Initial Review)

For items that the SSC has previously reviewed and in instances where there is limited time for presentations, the SSC supports focusing on responses to SSC comments, additions and key revisions. The SSC notes that there could be efficiency gains and potential improvement to public and SSC comments if a brief overview of the various analyses and components of the reports were summarized and included in the executive summaries of applicable agenda items.

Methodology for Analysis of Social, Economic and Cultural Impacts

The SSC notes the diversity of potential benefits associated with fisheries, many of which are best characterized using qualitative approaches. The SSC encourages the use of social indicators and human well-being frameworks that are well established in social science literature to better understand the suite and magnitude of social, economic, and cultural benefits related to issues such as subsistence harvest of salmon. These frameworks would enable the categorization of impacts from certain management actions and explore the scope of those impacts for fisheries and fishing communities (e.g., Leong et al. 2024[1]). Applying such frameworks in relation to specific regions and issues and the impacts of management programs, amendments or regulatory actions is valuable to identifying metrics which can be used to monitor and evaluate outcomes. This could include tables, figures, or dashboards that summarize various types of benefits and costs.

Local Knowledge, Traditional Knowledge, and Subsistence (LKTKS)

The SSC notes that how to most effectively apply LKTKS within the Council process is complex and evolving. **The SSC supports the inclusion of LKTKS in Council documents** and notes that the efforts related to inclusion of LKTKS information under agenda item C2 at this February 2025 meeting represent concrete progress toward the larger goal of providing these types of information for consideration and use in Council decision making processes on a regular basis.

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).

[1] Leong, K.M., Ingram, R.J., Kleiber, D., Long, S.H., Mastitski, A., Norman, K., Weng, C. and Wise, S., 2024. Aligning fisheries terminology with diverse social benefits. Marine Policy, 170, p.106377.

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 in management of Cook Inlet salmon
- 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 new 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 industry.** 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. **Pending final harvest data, final determination cannot be made, but the analysts noted that aggregate salmon stock complexes were not subject to overfishing based on current information. Similarly, pending final harvest and escapement data, aggregate salmon stock complexes, with the exception of aggregate chum and pink stocks, were not overfished. 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. 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%

*Hasbrouck et al 2022[2]

** corrected values to be updated in final 2025 SAFE

[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

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.

T**he 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.

C2 Initial Review of Preliminary Draft Environmental Impact Statement for Bering Sea Chum Salmon Bycatch Management

The SSC received a presentation on the C2 preliminary Draft Environmental Impact Statement (DEIS) for chum salmon bycatch management from Kate Hapaala (NPFMC), Sarah Marrinan (NPFMC), and Patrick Barry (NOAA-AFSC). Dr. Barry focused on the simplified adult equivalent (AEQ) analysis, while Dr. Hapaala and Ms. Marrinan focused on the content of the DEIS.

The SSC received written public testimony from Brooke Woods (Permafrost Pathways), Tom Enlow (UniSea), Chair Jonathan Samuelson (Kuskokwim River Inter-Tribal Fish Commission), Roark Brown (HOC Services) and Nathan Elswick (Anvik Village). The SSC received oral public testimony from Frank Kelty (City of Unalaska), Cory Lescher (Alaska Bering Sea Crabbers), Jimmy Hurley (Self), Heather Munro Mann (Midwater Trawlers Cooperative), Andrea Keikkala & Susie Zagorski (United Catcher Boats), Caitlin Yeager and Austin Estabrooks (At-Sea Processors Association), Glenn Merrill (Glacier Fish Company), Trent Hartill (American Seafoods), Craig Chythlook (Self), Brenden Raymond-Yakoubian (Kawerak), Francis Thompson (St. Mary's Village Council), Terese Vicente and Justin Leon (Kuskokwim River Inter-Tribal Fish Commission), Nick Jacuk (Ocean Conservancy) and Steve Martell (Sea State). As the C2 item represents influential scientific information, public testimony is required to be characterized and responded to during SSC deliberations.

Public testimony suggested several specific improvements to the analyses in the DEIS, including:

- Investigating the effects of the pollock fishery on crab and crab habitat, including evaluation of Alternative 5 in relation to crab distribution and seasonal movement patterns.
- Including the effects of alternatives on individual vessels, including smaller vessels that are unable to travel longer distances and larger vessels with differing production needs. It was noted that under the co-op structure, bycatch caps would likely translate into vessel-specific bycatch allotments and could result in a race for fish.
- The impact of alternatives on the performance of the Incentive Plan Agreements (IPAs). Specifically, the potential for reduced rolling hot spot (RHS) information that might lead to reduced ability to identify areas of lower chum bycatch.
- Evaluation of the non-monetary value and costs of the alternatives to Alaska Native communities.
- Replacing the Bethel Test Fishery Index (Alternative 3) with an index based on the Kuskokwim sonar count.

Pollock industry participants highlighted potential costs from PSC limits/caps that could create economic hardship for the pollock fishery participants, Community Development Quota (CDQ) programs, and dependent communities. Public testimony highlighted the economic importance and dependence of harvesters, processors and communities on the pollock fishery with the recent reductions in the crab fisheries. Particular concern was raised of effects on the CV fleet if closures affect areas that are easily

accessible to smaller vessels. Interactions between chum, Chinook and herring bycatch caps and management were identified as likely to change incentives and resulting behavior. Changes in global hatchery fish production were flagged as an uncontrollable factor that would affect performance alternatives. There was support for 'narrower' or more targeted corridors associated with the clusters in Alternative 5 and support for Alternative 4 to provide flexibility in responding to chum encounters through existing IPA and RHS approaches.

Public testimony also identified the need to protect chum salmon in migratory pathways and supported Alternative 5 - Option 1 (a Cluster 1 cap). Some supported Alternative 3 (with a low abundance threshold) to reduce risk and support recovery of the stock. Many comments highlighted the uncertainty in AEQ calculations, impact rates, and the conservation benefits that might accrue. Some highlighted that the AEQ approach was insufficient, not capturing the impacts to discrete spawning populations and impacts due to the waste of sentient species.

Testimony emphasized taking a precautionary approach - that every fish returning to spawn increases the likelihood of bringing back chum salmon stocks. It was reiterated that low impact rates may not translate into low effects on stocks and/or communities relying on the subsistence way of life. Cumulative impacts of fishing on the marine ecosystem and interaction with climate change were also raised as significant concerns. Public testimony identified a need for additional research to address uncertainty particularly in relation to market and non-market costs for Western Alaska (WAK) communities dependent on chum salmon. Testimony also questioned the treatment of potential impacts to WAK Alaska Native communities, suggesting that those impacts were not given equal consideration compared to those of the pollock fishery due to the lack of quantifiable data. Finally, many comments reflected the critical reliance of Alaska Native Peoples on chum salmon for social, spiritual, psychological, educational and cultural needs.

Following extensive discussions and considering the recommended revisions summarized below, the **SSC recommends that the February 2025 DEIS is sufficient to inform the Council's decision-making and the document be advanced for public release, after incorporating the recommendations in the following sections to the extent practicable.**

General Comments/Responses to Previous SSC Comments

The SSC appreciates the responsiveness of the analysts to previous SSC comments. This section focuses on general SSC comments on the current DEIS, previous SSC recommendations from the April 2024 meeting, and the subsequent responses by the authors in their current report. Additionally, the SSC provides general recommendations and suggestions to improve the clarity of the report**.**

The SSC highlights two previous comments from its April 2024 report for the Council to consider as this management action moves forward:

- "The SSC recognizes, however, that establishing new management lines based on historical data can be problematic for many reasons, particularly when climate change is leading to changes in migration and distribution for many marine species."

- **"The SSC recommends clearly defining which outcomes would be considered a success at the time of the action and how those outcomes would be measured. Therefore, the SSC recommends scheduling a performance review of any new management measures to reduce chum bycatch relatively soon after implementation. This will allow managers to quantitatively evaluate the effectiveness of management actions and make the needed corrections."**

The SSC appreciates the authors' diligence in addressing SSC recommendations from April 2024 to the extent practicable. The SSC offers some additional general recommendations to improve the clarity and accessibility of the final DEIS:

- **The SSC recommends that all relevant text and future presentations explicitly state that comparisons to Alternative 1 (status quo) are based on data from 2011 – 2023. This period includes the Council's 2022 request to industry to take immediate voluntary steps to avoid chum salmon in the 2022 B season following a high bycatch year in 2021. As a result, fleet changes during this time may not be fully reflected in the status quo comparison.** Although only two complete years of data have become available since this change, evidence suggests marked reductions in both chum and Chinook salmon bycatch. These reductions should be considered when comparing alternatives to the status quo. **The SSC also advises caution when interpreting results that rely on later years of the retrospective analyses.** Specifically, the quantitative analyses for Alternatives 2, 3, and 5 are based on past fishery data, including recent years when many of the Alternative 4 provisions were in effect. Although the SSC does not recommend additional evaluation on this issue, it urges analysts to acknowledge this limitation in the independent evaluation of Alternatives 2, 3, and 5. Analysts should also highlight where recent years may be outliers due to incentivized chum avoidance.

- **The SSC recommends that the authors further refine, consolidate and present chum fishery removals in one place.** Currently, bycatch, commercial catch, subsistence harvest, and Area M removals are in different sections of the DEIS. While the removals may not be directly comparable as they are not fully standardized and have their own limitations, presenting them together will improve their contextualization. To the extent possible, the SSC requests that analysts provide these data on similar scales. For example, the Area M South Peninsula commercial fishery harvested approximately 1.12 million chum in 2023 (DEIS, pg. 299). While the genetic stock structure of this catch is not known, limited information from earlier years suggests that 13-30% of the catches in those years were Coastal Western Alaska (CWAK) chum salmon, with lower proportions in a more recent study[3,4], potentially equating to substantial removals of CWAK chum salmon in 2023, if proportions were as high as in some earlier studies. Additionally, the DEIS should include a statement that available data suggest CWAK chum removals likely occur in high seas/international trawl fisheries.

- A similar approach should be taken for the Upper/Middle Yukon stock as part of the AEQ analysis (see Simplified AEQ section below for details).

- The SSC suggests that the authors consider separating each of the five regional areas (in Section 3.2.4.1.2) to explicitly highlight where major concerns exist within the CWAK reporting group.

- The SSC recommends that authors re-evaluate the use of averages when a median might be more appropriate. For example, the averages presented in Table 3-12 or Table 4-36 when there was marked step change in 2021 for many population and bycatch metrics. It is important to consider the distribution of the data being presented when choosing one over the other.

[3] Dann, T. H., H. A. Hoyt, E. M. Lee, E. K. C. Fox, and M. B. Foster. 2023. Genetic stock composition of chum salmon harvested in commercial salmon fisheries of the South Alaska Peninsula, 2022. Alaska Department of Fish and Game, Special Publication No. 23-07, Anchorage.

[4] Munro, A. R., C. Habicht, T. H. Dann, D. M. Eggers, W. D. Templin, M. J. Witteveen, T. T. Baker, K. G. Howard, J. R. Jasper, S. D. Rogers Olive, H. L. Liller, E. L. Chenoweth, and E. C. Volk. 2012. Harvest and harvest rates of chum salmon stocks in fisheries of the Western Alaska Salmon Stock Identification Program (WASSIP), 2007–2009. Alaska Department of Fish and Game, Special Publication No. 12-25, Anchorage. http://www.adfg.alaska.gov/FedAidPDFs/SP12-25.pdf

- The SSC notes that much of the information is presented in bar and line graphs with text describing relationships between the time series. In some cases, a simple correlation could more effectively illustrate the relationship between two metrics, making it easier for readers to identify patterns and outlying years. As an example, this approach may be useful in Figure 3-17 when comparing the annual total number of chum salmon to WAK chum salmon. Similarly, applying autocorrelation metrics with a one-year lag could help assess the reliability of using prior-year data to assess subsequent-year outcomes (e.g. salmon run size). **The SSC recommends that the analysts consider this type of evaluation in the analysis to the extent practicable.**

Finally, the SSC recommends that authors review content for clarity and condense and refocus pertinent information where possible, especially streamlining the lengthy executive summary.

Integration of LKTKS within the DEIS

The SSC supports the revisions to more fully incorporate LKTKS and acknowledges the breadth and depth of LKTKS information now in the main body of the DEIS and the LKTKS information that has been provided in a new series of appendices. The inclusion of information supplied by Cooperating Agencies, the Kuskokwim River Inter-Tribal Fish Commission (KRITFC) and the Tanana Chiefs Conference (TCC), in the analysis lent clarity and depth when evaluating the Alternatives. LKTKS information is critical to understanding the nature and magnitude of potential risks and benefits of the proposed action alternatives to WAK subsistence chum salmon reliant communities. Public testimony also provided valuable context given the complexity of the subject and possible alternatives.

AEQ and WAK Community Outcomes

The SSC encourages further exploration and expansion to contextualize the AEQ numbers relative to potential benefits of increased chum returns to WAK communities. The analysis notes that it is difficult to determine which communities may receive indirect benefits from potential bycatch reductions; however, it clearly outlines the substantial benefits to inland WAK communities with any increase in chum returns. Specifically, the AEQ numbers could be better contextualized with additional text that directly communicates the likely survival rates of fish caught at sea, and by explicitly addressing the potential for longer-term benefits if WAK bycatch were reduced and those fish escaped to add to stock productivity during periods where escapement goals are not met. When the escapement goals are not met, the AEQ is only a starting point from which the potential for population growth, time to reopening and potential future benefits should be explored.

Individual Vessel Impacts

The SSC appreciates the quantitative evaluation of vessel-specific impacts in Appendix 6, Section 6.4 and the qualitative discussion of potential vessel-specific responses and heterogeneity in responses across vessels within sectors and alternatives. The SSC notes that outcomes will be heavily dependent on how cooperatives choose to respond to the alternatives. **The SSC encourages the analysts to revise the main document to clearly identify relevant material on this subject located in appendices or other sections of the report and direct readers to those sections where appropriate.** The need for considering vessel-specific impacts was also highlighted in public testimony. This is especially needed for material relating to the potential differential distribution of social, economic, and community impacts across communities based on the different catcher vessel (CV) length categories noted in Table 4-26. These may occur within local fleets due to proximity to time and area closures and discussion should include potential safety at sea considerations. While the SSC notes there is a great deal of uncertainty, it would be beneficial to provide insights into the potential magnitude of costs.

Characterization of the Potential for Unintended Consequences

The SSC recommends the analysts summarize the potential for unintended consequences of all alternatives in a separate section for easier comparisons across alternatives. Specifically, this section should consider how fleet efforts to manage pollock harvest and total chum and WAK chum bycatch in response to an action intended to reduce WAK bycatch mortality could inadvertently lead to higher WAK bycatch mortality. This risk arises because the alternatives are structured around total chum bycatch, which can be monitored in real time whereas WAK chum bycatch cannot be determined until after genetic analyses have been completed. Since total chum bycatch is an imperfect proxy for WAK chum bycatch, directing the fleet to reduce total chum bycatch could unintentionally shift fishing effort to times or areas where the proportion or absolute number of WAK chum encountered is higher. Public testimony before the SSC in April 2024 presented data that suggest total chum to WAC chum ratios vary spatially, both between and within Clusters 1 and 2. The present analysis focuses on aggregate year-to-year changes in WAK chum proportion of total chum encountered, without considering the time or area composition of effort.

The SSC appreciates the quantitative and qualitative work summarizing how fleet responses under Alternative 5 could lead to increases in WAK chum bycatch relative to the status quo and requests the analysts consider a similar approach for Alternatives 2 and 3. This would focus on the potential for fleet behavior that is changing across space and time in response to incentives to reduce chum bycatch, and could lead to more fishing in areas that have lower overall chum bycatch but higher WAK chum bycatch. The new section should also include a general discussion of the potential for Alternatives 2, 3, and 5 to increase Chinook and/or herring bycatch relative to the status quo.

Research outlook

The SSC is encouraged by several potential new sources of data or decision support information and requests the analysts provide updates on the status of the Bristol Bay Science and Research Institute initiative to produce in-season chum genetics information, and ongoing work underway at AFSC in collaboration with ADF&G (PI: Dr. Wes Larson) to develop a new genetic marker panel with low coverage whole genome sequencing for WAK chum salmon that will improve the resolution of stock structure. **The SSC notes that in-season genetics for the inshore sector could importantly change the tools available to identify and potentially avoid areas with a high proportion of WAK chum.**

Simplified AEQ and Impacts

The goal of an AEQ analysis is to estimate the number and potential impact (e.g., proportion of a total run size, harvest, etc.) of bycaught salmon that may have otherwise survived the marine environment and returned to natal streams. In April 2024, the SSC requested the analysts prepare a simplified AEQ analysis, acknowledging that information would be limited. The SSC commends the analysts for the substantial work completed since the April SSC review and their responsiveness to SSC requests related to the simplified AEQ.

For the simplified AEQ analysis, the analysts used the CWAK Summer and the Yukon River Fall genetic baseline reporting groups. This aggregation approach, used by the United States Fish & Wildlife Service and ADF&G, differs from reporting groups in previous Council analyses by placing five Upper/Middle Yukon river stocks in the CWAK Summer group. The SSC supports this approach and notes that these groups are nearly identical to the CWAK and Upper/Middle Yukon reporting groups the Council is familiar with. To avoid confusion, the analysts have adopted “CWAK” and “Upper/Middle Yukon” terminology for these groups, respectively.

Chum bycatch in the Bering Sea pollock fisheries is dominated by age 3-5 fish, which are estimated to have survival rates ranging from 80 – 90%. As a result, the simplified AEQ estimates are similar in scale to the total WAK chum bycatch amounts. The SSC notes that AEQ estimates account for natural mortality and

fish maturation schedules but do not account for exposure of returning fish to other sources of fishing mortality (e.g., Area M fisheries).

Estimates of AEQ CWAK chum salmon removed due to pollock fishery B-season bycatch constituted 1.4% of total removals during 2011–2019, and 5.7% from 2020–2022 on average. These proportions are informative but subject to changes in run size as well as processes that influence fishery removals and are difficult to interpret without estimates of uncertainty. AEQ impact rates were not provided given the lack of run size estimates for this reporting group. Run reconstructions are available for the Upper/Middle Yukon group and the AEQ impact rate ranged from 0.22% of the run size in 2013 to 4.93% in 2021, averaging 1.0% over the time period (2011–2022). The notable increase in 2021 is attributed to low reconstructed run size and a doubling of the estimated AEQ from the previous year.

The SSC appreciates the clear and concise characterization of the numerous sources of uncertainty and the associated assumptions required to complete the AEQ analysis, including the conditions of oceanic maturity and survival, in-river age composition, estimates of stock of origin and run size.

The SSC agrees that AEQ estimates and impact rates are helpful in developing realistic expectations of salmon savings associated with status quo and policy alternatives but are not a complete assessment of the potential impact bycatch removals of chum salmon may have on WAK chum salmon populations. Further, Bering Sea pollock fishery bycatch is one of a number of processes that may affect WAK chum salmon abundance including catch from ocean and in-river salmon fisheries, competition from hatchery fish, and environmental factors associated with climate change.

The SSC appreciated the insights provided by KRITFC and TCC in the DEIS Section 4.3.3.2 - Importance of Chum Salmon for Indigenous Peoples in the Yukon and Kuskokwim Regions. The SSC requests that going forward the analysts provide a discussion of AEQ or AEQ impacts in the context of the ecological and cultural information provided by the Indigenous Peoples of the Yukon and Kuskokwim Regions.

The SSC considers the simplified AEQ analyses sufficient to inform the Council's decision-making for this action with the following additional recommendations:

- **Given that run size uncertainty is important for interpretation of AEQ impacts, the SSC requests that the analysts incorporate the available run size uncertainty information (e.g., Addendum Table Ad1 CV estimates) into the Upper/Middle Yukon AEQ impacts analyses and graphics.** The SSC requests the analysts provide 95% confidence intervals in lieu of CVs and that a description of uncertainty estimation methods be included (the SSC cautions against use of the implausibly low Yukon summer chum estimates of uncertainty without further supporting information). The aim is to provide the Council with an understanding of how likely a given reduction in chum bycatch is 1) to be detectable in chum assessments or run reconstructions, 2) to achieve the desired policy outcome, and 3) to support a fuller exploration of tradeoffs in the context of practicability.

- **Provide figures or tables with AEQ, commercial and subsistence catch as a proportion of total removals and - for the Upper/Middle Yukon group - as proportion of run size to provide context for AEQ interpretation,** in addition to the information provided in Figure 3-16. The SSC notes that text related to Figure 3-16 compares commercial harvests to the AEQ numbers and characterizes the AEQ numbers as "low." The SSC recommends not using subjective terms like "low" in the description and to simply report percentages.

- Provide additional information on the assumptions made regarding which year B-season bycatch savings would have returned to river systems, considering the geographic and temporal location of the bycatch in relation to the likely dates of spawning and in-river migration.

- Provide a set of definitions and examine the use of terms used to convey run size (e.g., returns, returns to natal system, escapement, drainage-wide escapement, run reconstruction) for consistency and clarify where terms differ in meaning.

Alternative 5 Methodology

The SSC reviewed the sections added to the DEIS that relate to Alternative 5, which was added for consideration by the Council in April 2024. Alternative 5 would implement in-season corridors triggered by area-specific PSC limits.

The SSC appreciates the efforts of the analysts to describe the potential benefits and associated costs of implementing the three mutually-exclusive options for in-season corridor caps under Alternative 5, both in isolation and in conjunction with other alternatives and options. The DEIS provides clear descriptions of the fundamental considerations for this alternative, including: (1) the large differences in average B season bycatch rates per metric ton of pollock among the proposed corridors, which are nearly four times higher in Cluster 2 when compared with the Cluster 1 or the Unimak corridors, (2) the average genetic composition of chum within each corridor, and (3) differences in realized corridor usage among pollock fishery sectors with higher reliance on the Cluster 1 and Unimak corridors by the shoreside and mothership sectors.

The DEIS also describes the development of a fleet movement model, similar to that utilized with the Bristol Bay Red King Crab EA/RIR, for evaluating the potential impacts of re-distributing effort weekly in response to options under Alternative 5, using haul-level information. In the development of this fleet movement model, the analysts considered reallocating effort in the event of a corridor closure based on either PSC rates or pollock catch per unit effort. Ultimately, the utility of this fleet movement model was limited because the shoreside and sometimes mothership sectors only fished within a single corridor, providing no basis for redistributing displaced effort across space to evaluate impacts on realized PSC. The SSC commends the analysts for their diligence in exploring the feasibility of using an explicit movement model in analyzing this alternative and the clear description of how and where data limitations preclude explicit quantitative analyses.

As an alternative to an explicit fleet movement model, the DEIS provides clear descriptions of differences across space and within the B season of potential pollock landings displaced and PSC rates for chum salmon, Chinook salmon and Pacific herring to contextualize the impact of potential pollock fishery effort displacement under the Alternative 5 options. **The SSC supports the authors' approach in stepping back to holistically consider the impacts of this alternative in the absence of a spatially-explicit fleet movement model.**

The descriptive analysis suggests that under Alternative 5, Option 3 (the Cluster 2 chum salmon PSC limit) presents the least risk of adverse outcomes associated with effort redistribution. Closures in Cluster 1 or the Unimak corridor could displace effort into Cluster 2 which typically had a higher overall chum salmon bycatch rate in the past.

The SSC highlights that behavioral responses to inseason area closures, either preemptively occurring prior to a limit being exceeded or following a corridor closure, will be sector and vessel-specific and that any delays in B season fishing activity until after the August 31 corridor end date will have implications for Chinook salmon PSC. Further, the SSC highlights the challenge in predicting future behavioral responses or impacts in a dynamic marine environment and the inherent challenge in defining static management boundaries in the face of uncertain changes in future species' distribution. The DEIS notes that responses to closure could disproportionately affect the CV sector due to their need to operate near processing facilities.

There was some SSC discussion surrounding the necessity of understanding how heterogeneity within sectors, specifically vessel-specific differences in size and capability, might lead to asymmetric impacts of the Cluster 1 and Unimak corridors under Alternative 5. For additional SSC comments on vessel-specific impacts, including safety considerations, see General Comments above. Potential safety impacts may be a particular concern under Alternative 5, considering increased risks of distant fishing on smaller inshore vessels.

The SSC suggests exploring information on week-area bycatch rates specifically from 2022, 2023 and 2024, where vessels operated under voluntary IPA provisions for chum bycatch management. This information can provide insight into the ability of the fleet, particularly the inshore sector most likely to be impacted by Alternative 5, to avoid triggering a corridor closure and needing to reallocate effort to areas where pollock and PSC catches are less certain. While only three years of information are available, an understanding of short-term effects of the changes to IPA provisions will better inform Council decision-making.

The SSC offers the following additional recommendations:

- In all figures comparing PSC rates and pollock landings across weeks within seasons (e.g. Figures 3-22, 3-30), it is useful to clearly define the week associated with the August 31 end date for Alternative 5 corridor closures, should they occur, to highlight how fishing effort might be re-distributed within the season.
- Further consideration, to the extent practicable, of whether conservation benefits accrued under Alternative 4 (IPAs) might be limited by Alternative 5 (corridors), given potentially more limited information and decreased flexibility for the fleet to actively respond to PSC risk.
- Expanded discussion of the cumulative impacts of multiple potential static closures including the Winter Herring Savings Areas in addition to the corridors defined under Alternative 5.

Economic and Social Impacts

The authors addressed all of the major SSC comments on the April 2024 economic analyses and the Social Impact Assessment (SIA), including the request to synthesize key portions of the SIA into the main body of the DEIS. The SSC finds that the document is largely adequate but requests that the following enhancements be considered to the extent practicable.

Language Related to the Direction of Impact and Uncertainty

The SSC suggests reconsidering language that implies directionality related to impacts. Specifically, language like "Uncertainty in the Potential Benefits for WAK Chum Salmon Savings" is misleading when discussing the impact on WAK bycatch, where there is a question of direction of impact (see "Uncertainty and Direction of Impacts" section below). Changes could be made to be consistent with language like "Effects of the Alternatives on Chum Salmon" that already appears in the text.

Uncertainty and Expected Direction of Impacts

The uncertainty in fleet response and WAK chum bycatch permeates the impact analysis of the alternatives. As outlined in the report, the RHS program can move the fleet to areas of lower total chum, but potentially higher WAK chum. The strategies available to avoid triggering Alternative 5 corridor closures will reflect similar responses to an imperfect proxy.

The SSC recommends an expanded analysis and discussion of how incentives to reduce total chum bycatch and uncertainty interact with the range of Alternative 2 and 3 caps. Specifically, the outcomes for WAK chum will vary in the degree to which the fleet is incentivized to move to avoid total chum bycatch. The

retrospective tables show variability in the prevalence of WAK chum within total chum bycatch and therefore uncertainty when considering future fleet WAK bycatch.

The SSC supports the use of Table 1-5 describing expected impacts of Alternatives 2 and 3, but suggests the analysts expand the discussion of how uncertainty in WAK bycatch varies with a cap to better justify the directions of the arrows. This discussion could build on the current retrospective analysis and consider the relationship between cap size and expected impact. For example, at a total chum cap of zero there would be no uncertainty in Alternative 2 performing better than Alternative 1 in terms of chum bycatch savings. At very low caps, Alternative 2 would have a higher likelihood of reducing WAK chum bycatch compared to Alternative 1, under the assumption that outcomes from past years fully characterize potential outcomes under Alternative 1. On the other hand, very large caps (e.g. the 550,000 cap, which is higher than the chum bycatch in all previous years) are unlikely to induce fleet behavior change relative to Alternative 1, so no impact on WAK chum bycatch would be expected relative to the status quo.

For the intermediate caps analyzed in the document, fleet behavior is likely to change as the fleet seeks to avoid total chum bycatch. For higher caps within the intermediate range, uncertainty in the composition of bycatch introduces uncertainty over the WAK chum bycatch relative to the status quo. However, for lower caps in the range examined, the analysts could build on the retrospective analysis to make some inference about the likely impact of Alternative 2 relative to the status quo. For example, for a 100,000 chum cap and the highest (annual, spatially aggregated) prevalence of WAK salmon in overall chum bycatch (25.1%, Table 3-12), meeting this cap would result in WAK bycatch of 25,100 fish. This is below the level observed in 11 of the last 13 years. Assuming the range of past WAK chum ratios represents ranges under future environmental and behavior conditions, this suggests that such a cap is very likely to lead to WAK chum savings relative to the status quo.

Evaluation of Alternative 4

The SSC recommends the analysts clarify the difference in potential impacts between Alternative 1 and Alternative 4. As indicated in the presentation, an Alternative 1 must represent current conditions; however, recent past and current conditions include any changes that fleets made due to the Council request to industry to take immediate steps to avoid chum salmon in the 2022 B season following the high chum salmon bycatch year in 2021. It also includes the recent series of changes to the fleet IPAs, including those that align the fleet IPAs with Alternative 4. The SSC suggests reframing Alternative 4 and its expected impacts, which in current form attributes future benefits to Alternative 4 implementation but considers associated ongoing costs to be part of the status quo. The SSC recommends interpreting the impact of Alternative 4 as removing the possibility of reverting to pre-2022 status under Alternative 1 by removing some or all of the Alternative 4 provisions. Then, the impact of Alternative 4 is that the fleet:

- Continues to incur any costs associated with the IPA provisions; and
- Continues to implement actions that generate either WAK savings or unintended increases in WAK bycatch.

The text, tables, and figures should all be consistent in the presentation of the expected impacts.

Combined Effects

The SSC recommends changes related to analysis of the alternatives outlined above carry forward into the analysis of combined effects.

Further Context
Public comment and SSC discussion paralleled an SSC comment from April 2024 regarding business and community level interdependencies between pollock and other fisheries:

> **"…** *conditions have evolved with the closure of major crab fisheries, declines in Pacific cod, and downturns in the halibut and sablefish fisheries, all of which create uncertainty for processing operations and the communities in which they operate in general … these sector and community context conditions have the potential to substantially influence the nature and magnitude of potential direct, indirect, and cumulative impacts related to the proposed action."*

The SSC recommends to the extent practicable that the analysts further develop this issue as it is important to the qualitative if not quantitative characterization of vulnerability and resilience capacity at the community level for fishing communities substantially engaged in or dependent on the Bering Sea pollock fishery. This would be especially valuable for communities with substantial support service sector activity and infrastructure that supports multiple pollock fishery sectors, as discussed during the staff presentation and noted in public testimony. The SSC further specifically requests the analysts edit Table 4-2 to put the discussion of potential crew spending impacts in perspective relative to other potential community impacts.

Suggested edits to address minor errors and typos in the document have been provided directly to the authors.

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 2025 meeting, a number of SSC members acknowledged associations with specific agenda items under SSC review. On C1 Cook Inlet salmon SAFE, Dana Hanselman is second level supervisor of Lukas DeFillipo, and third level supervisor of Josh Russell. Dr. Hanselman is second level supervisor of Patrick Barry and Lukas DeFillipo on C2 DEIS on chum salmon bycatch management action. Robert Foy is the third or greater level supervisor for Lukas DeFilippo, Patrick Barry, Josh Russell, and Bridget Ferriss. Jason Gasper was involved with the early development of C2 DEIS Alternative 5. Finally, Mike Downs was the primary author of the Social Impact Assessment component of the February 2024 Amendment 16 Environmental Assessment/Regulatory Impact Review (EA/RIR) that is incorporated by reference in the C1 Cook Inlet Salmon SAFE, but was not involved in the 2025 Cook Inlet Salmon Harvest Specifications EA/RIR.

MATANUSKA-SUSITNA BOROUGH
Planning and Land Use Department
Planning Division
350 East Dahlia Avenue • Palmer, AK 99645
Phone (907) 861-7833
www.matsugov.us

January 30, 2025

Ms. Gretchen Harrington
Assistant Regional Administrator
Sustainable Fisheries Division
Alaska Region, NMFS
PO Box 21668 Juneau, Alaska 99802-1668

David Witherell
Executive Director
North Pacific Fishery Management Council
1007 West 3rd Ave., Suite 400
L92 Building, 4th floor
Anchorage, Alaska 99501

Re: Fisheries of the Exclusive Economic Zone; Cook Inlet salmon; Harvest and Research 2025

The Matanuska Susitna Borough (MSB) Fish and Wildlife Commission (FWC) has been engaged with the NPFMC/NMFS process of management of salmon in the Cook Inlet Exclusive Economic Zone (EEZ) since 2023. In 2024, we recommended that proposed regulations reduce commercial drift gillnetting in the EEZ from two days a week to a single 12-hour period per week between July 16th and August 15th ,the critical period when salmon are moving into the Northern District. In addition, that drift gear be reduced from 200 fathoms to 150 fathoms. We would like to thank NMFS for only opening the EEZ for a single 12-hour period each week between July 16th and August 1st 2024.

The FWC has reviewed the 2024 harvest results from the Alaska Department of Fish and Game (ADFG) and the National Marine Fisheries Service (NMFS). We also reviewed sections of the NMFS Stock Assessment and Fishery Evaluation (SAFE) report for the Cook Inlet Exclusive Economic Zone (EEZ) and the 2025 draft Environmental Assessment for Harvest Specifications for Cook Inlet Salmon Fisheries in the EEZ off Alaska (EA).

Of the Alternatives provided in the 2025 draft EA, the FWC prefers Alternative 1, the No Action Alternative, in which there would be no total allowable catch (TAC) set and no commercial fishing in the EEZ. However, given that this does not meet the "purpose and need", the FWC supports Alternative 2, the status quo. We would amend Alternative 2 in the following ways:

- We encourage NMFS to only open the EEZ for a single 12-hour period between July 16th and August 15th 2025.
- We recommend that drift gillnet gear be reduced to 150 fathoms.

Additionally,

- We strongly support the reduction of Acceptable Biological Catch (ABC) for coho to 6,701 fish in 2025.

- We encourage NMFS to conduct research to fill data gaps on salmon populations and migration timing that are now part of the NMFS management mandate.
- We recommend that enforcement be expanded to ensure all fish that are harvested in the EEZ are counted.

The FWC represents the interests of the MSB in the conservation and allocation of fish, wildlife and habitat and advises borough officials, state or federal agencies and other organizations with interests that may impact conservation of fish, wildlife, and habitat. Specifically, the FWC advises MSB officials, state, or federal agencies and other organizations with interests that may affect conservation of fish, wildlife, and habitat across an area encompassing 25,258 square miles, an area slightly larger than West Virginia. Approximately half of Alaska's human population resides near the shores of Upper Cook Inlet (UCI). This includes the city of Anchorage (288,121 in 2021) an additional 110,000 plus residing in the MSB. This vast region contains more than 50,000 miles of mapped streams, and supports all five species of Pacific salmon. The MSB has invested millions in fish passage improvements, reopening more than 1,000 stream miles and 6,000 acres of lake habitat for salmon rearing and spawning.

Fishing Periods / Conservation Corridor

Throughout the UCI, there are commercial and sport fisheries, residents use dipnets for a personal use fishery, and four indigenous communities - Tyonek, Knik, Eklutna and Chickaloon – engage in subsistence, educational, or personal use fisheries. These fisheries are already fully allocated among the many user groups, but with careful conservative management and sustainable salmon populations there can be fair opportunity for people to access fishery resources.

All salmon bound for the MSB move through Cook Inlet. The "Conservation Corridor" is a net-free area in the Inlet that opens up when drift gillnetters are not fishing, which allows fish bound for the Northern District to move through the Central District. By limiting drift gillnetting to one 12-hour opening per week during the critical period, NMFS is helping to maintain the corridor.

The Northern Cook Inlet stocks are not as productive and much smaller than the Kenai and Kasilof stocks, and in many cases are not meeting escapement objectives. Over the past several years, king and coho salmon returns have reached historic lows; 2024 was no exception.

Actual escapement at Deshka and Little Su weirs over a generation. The generation time is considered 6 years for kings and 4 years for coho. Asterisks are shown where data is incomplete due to flooding at the weir.

	Deshka kings	Deshka coho	Little Su coho
BEG or SEG	9,000-18,000 (BEG)	10,200-24,100 (SEG)	9,200-17,700 (SEG)
2024	3,741	642*	964*
2023	3,440	1,817*	3,439*
2022	5,440	No data	2,816
2021	18,674	No data	10,229
2020	10,638		
2019	9,705		

Extremely low levels of coho returns resulted in ADFG announcing an emergency closure of all sport coho salmon fishing in the *entire* Susitna and Little Susitna River drainages effective August 15th 2024. At the Deshka River, only 642 coho passed the weir and at the Little Susitna River, only 964 coho passed the weir, far below minimum escapement goals of 10,200 and 9,200 respectively.[i] Although these are incomplete escapement estimates because the weirs flooded out, the numbers are so low that it is not reasonable to expect escapement was met. These low returns reflect the situation throughout the MSB, as the Deshka is an indicator for the entire Susitna River drainage and the Little Su coho escapement has a high correlation with coho escapement throughout the Knik Arm drainage.

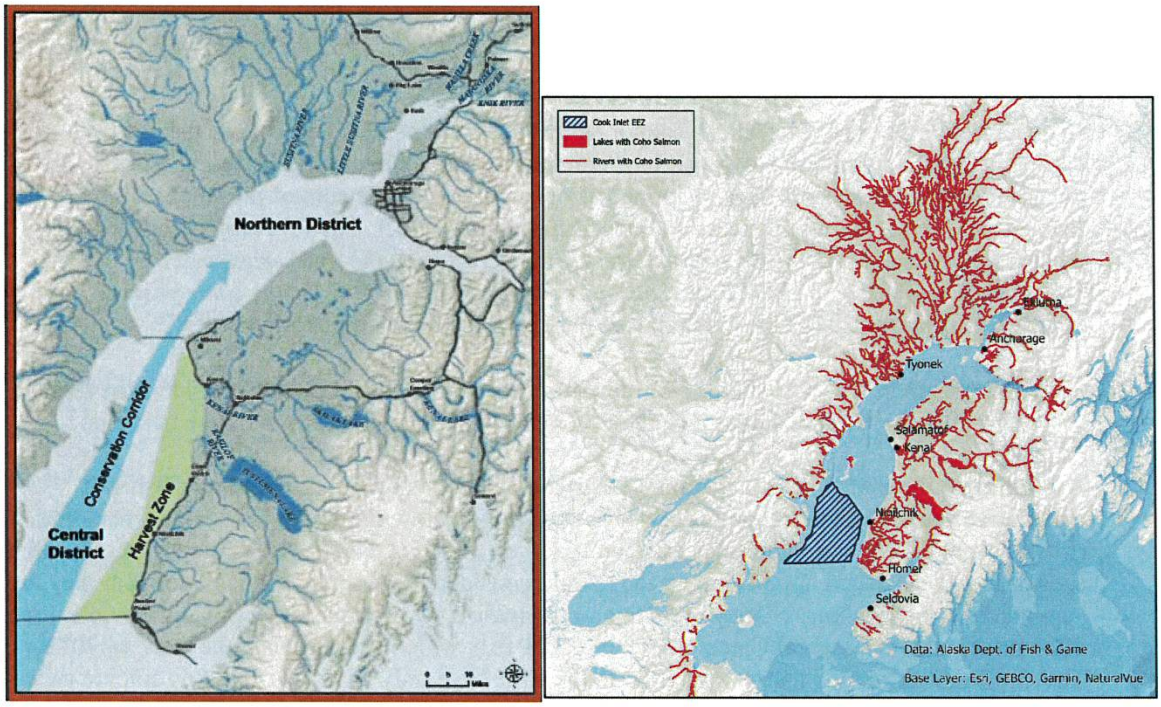

Figure 1. Left: When commercial fishing is limited to nearshore areas, a passage opens to allow salmon to migrate to the Northern District. Right: EEZ and streams that aggregate coho stocks return to.

The sustainable escapement goals (Little Su and Chuitna Rivers) and biological escapement goals (Deshka River) were not met for kings. As noted in the 2025 SAFE report 7.5.2.4, there are four Chinook Stocks of Concern in the northern part of Cook Inlet. Given recent escapement, there is an argument that all Chinook stocks in the Susitna drainage should be Stocks of Concern.

We appreciate the NMFS consideration of our comments in 2024, and their findings that

> *"Allowing salmon stocks of lower abundance bound for Northern Cook Inlet more opportunities to pass through the EEZ in July—particularly coho and Chinook salmon—means it is less likely the fishery will close early due to reaching the TAC for a stock of lower abundance before the drift gillnet fleet is able to harvest the TAC for abundant sockeye salmon. Additionally, spreading out the sockeye salmon harvest throughout the season by reducing fishing periods in late July will reduce pressure on Northern District sockeye salmon—which are Tier 3 stocks with less known conservation status"*

- We thank NMFS for only opening the EEZ for a single 12-hour period each week between July 16th and July 31st 2024, a critical period when salmon are moving into the Northern District. It is critical that NMFS maintain this single 12-hour opening each week and not expand commercial driftnet fishing in 2025 in the EEZ during this period.

Given the continued low escapements, particularly for coho and Chinook in 2024:

- We encourage NMFS to reduce the current two openings per week between August 1st and August 15th to a single 12-hour period each week in 2025 and all future years until escapement goals in the Susitna drainage are broadly met. This would enhance the effectiveness of a conservation corridor to allow salmon to migrate to the Northern District.

In general, Northern District stocks cannot have a determination of being "overfished" because escapement data is limited. However, they can be assessed to determine if "overfishing" occurred during the season. This is defined as occurring when the sum of the stocks EEZ harvests across a generation exceed the overfishing limit (OFL). NMFS recommends the OFL be "*the largest cumulative EEZ harvest across a generation in the timeseries under consideration and the 2025 OFL (preseason) is the average harvest for the same years...*". This is different from the 2024 OFL, which used the "largest estimated historic harvest".

- We support the 2025 method for determining the Tier 3 OFL_{pre} that considers the largest average EEZ harvest over a generation rather than the highest cumulative harvests.

According to the SAFE report, Northern District coho stocks can be declared overfished if cumulative spawning escapements are determined to be below minimum stock size threshold (MSST), and overfishing would be assessed based on the OFL. NMFS states that aggregate coho are not in an overfished condition, but they could consider a future recommendation that they are "approaching overfishing". They recommend applying a 90% buffer to the pre-season OFL for a 2025 Acceptable Biological Catch (ABC) of 6,701 fish, which is lower than the ABC of 2024. They note that estimated harvests of coho in the EEZ have only been less than this amount twice since 1999. Recognizing the very low returns of these Northern District coho stocks in recent years combined with the possibility in the future of a determination of "approaching overfishing" it seems very wise and prudent to apply the ABC at 6,701 fish.

- We appreciate and support the increased buffer and reduced ABC for coho to 6,701 fish in 2025.

Gear and Enforcement

NMFS allows up to 200 fathoms of drift gear to be fished in the EEZ. By reducing this to 150 fathoms, NMFS would align with state of Alaska code (5 AAC 21.331). It also recognizes that salmon can move through an area in bursts, and would reduce the potential for exceeding a TAC in a single period.

- We recommend that drift gear in the EEZ be reduced to 150 fathoms.

We understand that NMFS inspections of vessels in the EEZ documented unrecorded fish in 2024, including kings.

- We support increased enforcement to ensure that all salmon caught in the EEZ are counted.

Research/data gaps

Unlike Kenai and Kasilof stocks, there is no real time assessment of salmon entering the Northern District. There are weirs on a handful of rivers, but they are not always operational due to lack of funding or flooding, resulting in incomplete data. NMFS recognizes this and notes;

> *"The NMFS SAFE Team recommends prioritizing future research to better characterize the abundance, timing, spatial distribution, and genetic stock composition of the coho salmon harvested in the CI EEZ fishery."*

The purpose of the Central District Drift Gillnet Fishery Management Plan is "*to ensure adequate escapement and a harvestable surplus of salmon into the Northern District and to provide management guidelines to the (Alaska) Department (of Fish and Game). The department shall manage the commercial drift gillnet fishery to minimize the harvest of Northern District salmon and Kenai River coho salmon in order to provide all users a reasonable opportunity to harvest these salmon stocks over their entire run…*"

NOAA has a similar mandate concerning these stocks. The Magnuson-Stevens Act provides authority beyond the EEZ for all anadromous species throughout the migratory range of each such species.[ii] The primary research responsibility lies with NOAA Fisheries, which is required to conduct robust scientific studies to inform fishery management decisions, ensuring that all management plans are based on the best available scientific data[iii]… and promote sustainable fisheries **by monitoring fish populations**, identifying essential fish habitat, and assessing the impacts of fishing activities on marine ecosystems.

The ADF&G in the past annually operated an offshore test fishery (OTF) near the southern boundary of the Upper Cook Inlet (UCI). The purpose of this test fishery was to estimate the sockeye salmon run returning to UCI. In 2012, an additional OTF was implemented to examine the spatial and temporal distributions of various sockeye and coho salmon stocks to identify migration routes and run timings of Susitna and other UCI salmon stocks. Neither of these important test fisheries are in operation today.

In our letters to the NPFMC/NMFS in 2024, we outlined the need for additional data to support NMFS management of Northern District stocks that cannot have escapement enumerated in real-time. Specifically, in order to establish a reliable TAC based on the proportional contribution of each stock to this fishery, better data must first be established:

- Test fisheries need to be reinstated to help determine return abundance and take place where Northern bound fish are most easily differentiated from Kenai bound fish.
- In-season genetic data and more robust escapement data is needed for salmon stocks of Northern Cook Inlet.

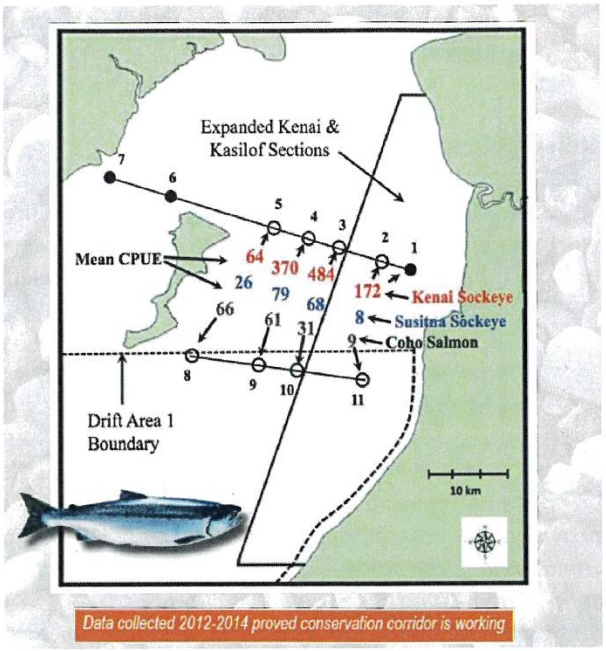

Figure 2. Results of offshore test fisheries conducted by ADFG.

SUMMARY

In summary, we advocate for a single 12-hour opener per week during the critical July 16th- August 15th period in 2025; we support the new buffer for the 2025 coho ABC; we strongly advocate for NMFS to conduct research, including test fisheries and genetic studies to fill data gaps on abundance and run strengths of salmon bound for Northern District rivers; we recommend increased enforcement efforts; we request that NMFS reduce drift gear lengths from 200 fathoms to 150 fathoms; ; and we support the method for determining the OFL.

Sincerely,

Andrew N. Couch

Andy Couch
Chair, Matanuska-Susitna Borough Fish & Wildlife Commission

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[i] ADFG 2024 Upper Cook Inlet Commercial Salmon Fishery Season Summary, released Nov 13 2024
[ii] https://www.st.nmfs.noaa.gov/st1/fus/fus08/11_general2008.pdf
[iii] https://www.fisheries.noaa.gov/topic/laws-policies

Cc's
Edna Devries, Mayor Matanuska-Susitna Borough
State of Alaska Doug Vincent-Lang, Commissioner, State of Alaska
Matanuska-Susitna Borough Assembly and Manager

MATANUSKA-SUSITNA BOROUGH
Planning and Land Use Department
Planning Division
Fish & Wildlife Commission
350 East Dahlia Avenue • Palmer, AK 99645
Phone (907) 861-7833
www.matsugov.us

May 10, 2024

Gretchen Harrington
Assistant Regional Administrator
Sustainable Fisheries Division, Alaska Region, NMFS
P.O. Box 21668, Juneau, AK 99802–1668

Re: Fisheries of the Exclusive Economic Zone off Alaska; Cook Inlet Salmon; Amendment 16

Dear Ms. Harrington,

The Matanuska-Susitna Borough (MSB) Fish and Wildlife Commission (FWC) represents the interests of the Borough in the conservation and allocation of fish, wildlife, and habitat. Specifically, the FWC advises borough officials, state or federal agencies and other organizations with interests that may affect conservation of fish, wildlife, and habitat.

We have read the final rule of April 30[1] with the understanding that comments will be accepted through May 13. This letter follows our previous letters of March 31, 2023, December 22, 2023, and January 30, 2024, in addition to testimony provided at the May 2023 and February 2024 NPFMC meetings.

Briefly,

- We support the restricted fishing of one 12-hour period per week from July 16-31.
- We support the 25,000 total allowable catch (TAC) proposed for coho salmon.
- We continue to strongly urge NMFS, through the Secretary of Commerce, to revise the proposed Amendment 16 in the manner we have consistently advocated for:
  a) maintain the current 150 fathoms net length instead of expanding it to 200 fathoms[2]
  b) implement the restricted fishery through Aug 15 to provide further protection of weak stocks migrating north.

All salmon bound for the MSB move through Cook Inlet. As described in Amendment 16 (italicized throughout the document):

> *As salmon begin to move into Cook Inlet, with the exception of Chinook, they typically group in large tide rips in the middle of Cook Inlet (i.e., the EEZ) to start moving north up the inlet toward their spawning streams, rivers, and lakes. The first commercial fishery that salmon typically encounter when moving up Cook Inlet is the upper Cook Inlet drift gillnet fishery. Commercial salmon fisheries south of this area occur entirely in State waters. In the Cook Inlet EEZ, salmon stocks originating from throughout Cook Inlet are mixed together. As they move northward up farther into Cook Inlet, individual salmon stocks will eventually move shoreward into State waters to reach their spawning streams. Stocks returning to freshwater systems farther*

[1] Federal Register Vol 89, No 84, April 30, 2024, Rules and Regulations
[2] FMP Amendment 16 § 679.118 Management Measures (f) (1). Federal Register Vol 88 No 201, October 19, 2023, p72339

north in Cook Inlet tend to stay close to the middle of the inlet when they move through the Cook Inlet EEZ Area....All salmon returning to the Northern District must first past through fisheries in the Central District before reaching fisheries and spawning grounds in the Northern District.[3]

When salmon move north past the Central District, they become available to Cook Inlet beluga whales, Northern District set-netters, subsistence, and sport and personal use fisheries in the MSB. A large part of the Conservation Corridor lies within the EEZ. The Environmental Assessment Impact Review of Amendment 16 for the FMP explicitly states that the FMP must contain conservation measures.

Conservative Management

In Amendment 16, NMFS states that they expect conservative management:

Because Federal managers have less administrative flexibility and less salmon management expertise than State managers, NMFS expects initial management of the Cook Inlet EEZ to be conservative to account for the significant uncertainty and minimize the risk of overfishing.

- We continue to have concerns that NMFS is interpreting "conservative management" as solely based on a TAC rather than recognizing the importance of harvest rates in conjunction with net length, run timing, and the Conservation Corridor as components of conservative management.

Gear Length

As we have noted in past comments, the amount caught each fishing period should also be part of conservative management. There is no information on fishing effort in EEZ versus State waters in the past. With set allowable catch numbers in the EEZ and no set limits in State waters, there could be heavy fishing effort early season in the EEZ until a TAC is reached, with a consequent shift to State waters. **By allowing gear length to be increased, more fish will be caught each period.** It is unknown whether this would have population-level impacts on early run northern stocks. Many of these northern stocks, particularly Chinook and coho, are so greatly reduced that they should be listed as stocks of concern. There does not appear to be any reason to change gear length. Indeed, for conservative management, gear length should not be increased.

Fishing Periods

We support the final rule published on April 30 that restricts fishing from July 16-31 to one 12-hour period per week. We strongly recommend extending the one 12-hour period per week through August 15 or until the TAC is reached:

Gillnet gear generally catch all species of salmon in the area and cannot target individual stocks....Therefore, management must consider all stocks that would be harvested by each drift gillnet fishery opening, the conservation status of each stock, and their relative abundance...

The drift gillnet fishery, particularly in the Cook Inlet EEZ, can catch significant quantities of Cook Inlet sockeye and coho salmon stocks bound for the Northern District. These are smaller and less productive stocks that cannot support as much harvest as co-occurring Kenai and Kasilof sockeye salmon stocks. Fishing at a rate to fully harvest the most abundant stocks would likely result in overfishing on these weaker or less abundant salmon stocks.

Therefore, to support conservation of these Northern District stocks, and to ensure at least some harvestable surplus for Northern District salmon fisheries, the State has reduced the number of drift gillnet fishing periods in Cook Inlet EEZ waters after July 15 to minimize mixed stock harvests. After this date, State management measures in the last decade generally reduced fishing time in the EEZ ... during the peak of the run. This management approach was in response to significant declines in coho salmon stocks and long-term yield concerns for Northern District sockeye salmon...

[3]Amendment 16. 50 CFR Parts 600 and 679. Federal Register Vol 88, No 201, October 19 2023, p72322

NMFS recognized that federal management of the EEZ would create "significant new management uncertainty" when they adopted the FMP Amendment 14, closing the EEZ to commercial fishing, in 2021.[4] Also, the NPFMC determined and NMFS agrees that closing the Cook Inlet EEZ to commercial salmon fishing is the management approach most likely to avoid uncertainty and maximize harvest of Cook Inlet salmon stocks while preventing overfishing.[5] The Alaska Department of Fish and Game (ADFG) also supported Amendment 14.[6]

Maintaining the Conservation Corridor as outlined in the State's Central District Drift Gillnet Fishery Management Plan developed by the Board of Fisheries has proven to be a key element in moving fish bound for the Northern Cook Inlet through the Central District. Recognizing the fact that these Northern Cook Inlet stocks are much smaller and in many cases are currently not meeting escapement objectives, necessitates the need to maximize the protections offered through the management plan and the subsequent Conservation Corridor.

The work of the MSB and the Alaska Board of Fisheries to establish a Conservation Corridor is recognized by NMFS and described, although not mentioned by name, in Amendment 16.[7] The crucial period is from July 16-August 15 for moving fish north. Implementing restricted fishing to 12 hours per week during this timeframe considers run timing and the need to move fish north.

- For these reasons, we strongly suggest changing proposed Amendment 16 to limit fishing gear to 150 fathoms, maintain the Conservation Corridor, and implement only one 12-hour fishing period per week through August 15.
- We appreciate federal effort to have the EEZ fishery occur on the same day as regular openings of the State fishery for conservation purposes.

Managing for Weak Stocks

Conservative management for weaker stocks was not on display in the SAFE report. We support NMFS reducing the TAC numbers down in the 2024 Harvest Specifications,[8] based on recommendations from the NPFMC Advisory Panel, NPFMC full council, and public comment.

- We agree that the TAC of 25,000 coho is appropriate based on the available, although extremely limited, information.
- We continue to have concerns that the TAC for aggregate sockeye may have a larger impact on the weaker sockeye stocks and is not conservative enough.

The methods applied to develop overfishing limits, as outlined in the SAFE report, do not consider the lower productivity of Susitna stocks. While a pair of Kenai sockeye may produce nine returning fish, a pair of Susitna sockeye will only produce three returning fish. The SAFE report uses a 5-year average run size to determine an annual biological catch (ABC), and the report originally set the ABC = TAC. While the TAC numbers were reduced by the Council, a new SAFE report will be written every year to set the TAC. The method used risks overfishing in years when there are small returns. This is an especially important point, again, for stocks headed to the MSB, as the actual returns will not be known until long after fish have (or have not) moved through the Central District.

- We urge NMFS to use the mid-range of escapement goals instead of the low end and consider trends in weak stocks when setting their TAC.
- We urge NMFS to develop a management system that is more responsive in-season than a single "allowable catch" number set before the season starts.

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[4] Amendment 14. Federal Register Vol 86 No. 210, November 3 2021, p60569, p60570
[5] Ibid, p60571
[6] Ibid, p60569
[7] Amendment 16. 50 CFR Parts 600 and 679. Federal Register Vol 88 No. 201, October 19 2023, p72322 – p72323
[8] 50 CFR Part 679. Federal Register Vol 89 No. 72, April 12 2024, Table 1, p25859

Management Concerns

Cook Inlet is one of the longest marine inlets in the United States where salmon management is difficult and complex. Within the MSB are the largest area of wetlands[9] and longest river systems of Cook Inlet. The State of Alaska has developed large amounts of data, real-time analysis of various salmon runs, and maintains the ability to implement timely emergency closures or openings as the situation demands. NMFS does not currently have these tools or the flexibility that the State enjoys.

NMFS and NOAA should consider a proposal to Congress that would allow them the authority to issue Emergency Orders (EO's) for opening and closing fishing periods, similar to what the State is able to do now, to provide the needed ability to make critical and timely decisions that are absent in the current proposed plan.

In addition to the unfortunate geography that places the mixed stocks in the path of the Central District area drift gillnet fleet prior to any fisheries further north, monitoring and understanding escapement is different for the different stocks. ADFG tools allow them to quickly understand the strength of salmon returning to the Kenai and Kasilof rivers. By the time salmon reach Northern District weirs, and run strength is determined, it is too late to open or close the EEZ fishery.

> *... reducing Cook Inlet EEZ harvests after July 15 allows for the collection of more data on escapement and realized salmon abundance in order to either avoid overharvesting a given stock or increase harvest to more fully utilize abundant runs. ... This issue is exacerbated for Northern District stocks, for which there is significant time lag (relative to Kenai and Kasilof stocks) between harvest in the Cook Inlet EEZ and information on escapement becoming available.*[10]

Unlike the well-monitored Kenai and Kasilof salmon runs, the success of salmon spawning in MSB freshwater is not known until long after the salmon have moved through the Central District. There are not enough weirs to understand run abundance across the multiple streams of the MSB, nor have they been funded consistently. The EEZ closures in July help deal with this uncertainty.

- Until appropriate responsive tools are available, we urge NMFS to maintain the one 12-hour fishing period per week from July 16-August 15 to maintain the Conservation Corridor.

From this summer forward, there will be information on fishing fleet effort, location and catches, since both NMFS and the State will collect fish tickets. This will help with management, but additional research is needed.

Research for Management

Although NMFS proposes that they apply the best science available, the unfortunate fact is that there is very limited science available. The State tracks what is caught in Cook Inlet, but there has been no effort to track what is caught specifically in federal EEZ waters, or when, or how many boats and permits have been applied to the catch effort. This puts both NMFS and the State at a disadvantage when attempting to develop this FMP amendment.

Despite a near decade long dispute over whether the State or NMFS would manage the EEZ, no research has been conducted on fishing effort in the EEZ. All parties have stated that additional research is needed and understand the difficulty of managing this mixed stock fishery.

- NMFS should conduct genetic research on mixed stocks to build a history of what populations are being caught, and when.

[9] Matanuska-Susitna Borough Wetlands Management Plan, March 2012, ES1
[10] Federal Register Vol 88, No 201, October 19 2023, p72323

- Several Chinook and coho stocks in the Northern District are in extremely low abundance. While the Northern District is outside the EEZ, it is impacted by activities in the EEZ. NMFS needs to invest in research to better understand the productivity of these stocks.
- NMFS should work with ADFG to develop indicator stocks to determine run strength in the Susitna River drainages.

Tribal Fishery

We would support the concept of a Tribal fishery in the EEZ. The two Tribes in the MSB are considered "urban" and not provided with an opportunity to fish at their traditional locations or in a traditional manner. A Tribal fishery would help to rectify past and current injustices.

Summary

A key driver of the move to statehood in Alaska in the 1950's was the federal mismanagement of salmon fisheries. The federal managers "failed to provide the financial resources needed to manage and research salmon stocks and fisheries such that fishing could be properly regulated and depressed stocks rehabilitated."[11] The result was years of overfishing resulting in the 1953 disaster declaration by President Eisenhower – a federal disaster that resulted not from what nature could throw at Alaska, but from the actions of poor fishery management.

We hope the federal mindset has changed as they prepare to take over managing the Exclusive Economic Zone (EEZ) in Cook Inlet in 2024. However, they do not appear to be prepared to commit financial resources or research to appropriately regulate the fishery, nor are they managing for weak stocks. Thankfully the EEZ is only a small part of the State's salmon fishing area. Unfortunately, all the salmon that return to the Anchorage, Eklutna, and MSB streams – supporting multiple fisheries, wildlife, and ecosystems – move through the EEZ. We are entering an era of marine and freshwater impacts of climate change on salmon in multiple areas around the state, which will make management decisions more difficult. We urge you to consider the actions we have outlined prior to the start of the 2024 commercial season.

Sincerely,

Andrew N. Couch

Andy Couch, Chair
Matanuska-Susitna Borough Fish and Wildlife Commission

cc: Mike Brown, Manager, Matanuska-Susitna Borough
Edna DeVries, Mayor, Matanuska-Susitna Borough
Doug Vincent-Lang, Commissioner, ADF&G

[11] https://www.adfg.alaska.gov/static/home/library/pdfs/afrb/meacv1n1.pdf

Game Special Meeting Questions

1. **What is the current status of Units 13, 14, and 16 moose populations? Please provide yearly survey data.**

Unit 13 Moose Population Index

Year	13A	13B	13C	13D	13E	Total
2000	2323	4123	1948	1425	4332	14151
2001	2411	4001	1605	2084	5294	15395
2002	2582	3661	1518	1797		9558
2003	3581	4237	2286	1914		12017
2004	3136	4073	1268	1818		10295
2005	3412	4123	1913	1467		10916
2006	2904	4055	2286	1946	4447	15636
2007	3398	4599	2693	1882	4397	16968
2008	3065	4658	2966	1818	4533	17040
2009	4216	4720	3024	1978	4874	18812
2010	4081	5460	3001	2137	5041	19720
2011	4401	5447	3524	1829	5149	20350
2012	4159	5407	2943	1829	6237	20575
2013	4608	4955	3670	1414	5988	20634
2014	4206	4855	3850	1606	5975	20492
2015	4653	5115	3978	1063	6281	21090
2016	4156	4973	3833	1404	6036	20402
2017	3445	4237	2390	1350	6324	17746
2018	4121	3643	3106	1350	6413	18633
2019	3968	3845	3588	1201	6394	18997
2020	3726	4336	3298	1031	6196	18587
2021	4641	4115	2902	1340	6300	19298
2022	3621	3690	2943	1063	5309	16626
2023	3745	2809	2460	638	4822	14473
2024	3904	3074	1809	1074	4939	14800

GMU 14A	MOOSE SURVEY DATA												
	2023	2021	2020	2019	2019	2018	2017	2013	2012	2011	2009	2008	2003
Dates	17-19 Nov	20 - 22 Nov	29 Nov - 4 Dec	6-Dec	9-13 Feb.	30-Oct	1-4 Feb	15 - 18 Nov	26 - 27 Nov.	14 - 19 Nov.	18-Nov	13 - 17 Nov.	07-12 Dec
Census Type	GSPE	Sex & Age Comp	GSPE	Sex & Age Comp	GSPE	Sex & Age Comp	GSPE	GSPE	Sex & Age Comp	GSPE	Comp Survey	GSPE	GSPE
Total moose obs.	1323	571	1704	2013	1845	1809	1420	1750	1474	1863	761	2158	1869
Calves obs.	234	123	358	363	293	342	243	458	284	479	215	540	371
Pop Est.	6657	~~~	7112*	~~~	7896*	~~~	8756*	8500*	~~~	7993*	~~~	6613*	6428
80% CI	15.9		10.00%		15.40%		17.5%*	12.70%		14.6%*		13.40%	11.60%
Bull:100 cows	30	28	31	34		34		21	26 - 29	17.4	24.7	23	20.7
Ylg bull:100 cows	5	4	5	9.7		7.4		8.18		6.5		7.5	8.5
Calves:100 cows	28	35	35	29		31		43	27.8 - 30.8	43.5	48.9	42	28.5
% Calves	18	21.5	21.00%	18	18.9		17.15	26.2		27.2		25	19.1
	* includes sightability correction factor												
Pop Objective	6000 - 6500												
Harv Objective	360 - 750												

GMU 14B	MOOSE SURVEY DATA												
	2024	2021	2019	2018	2013	2009	2005	1999	1998	1994	1992	1990	1989
Dates	29 Nov-Dec 6	12-16 No	6-9 Feb	6-Dec	25 - 29 N	16-18 Nov.	21-25 Nov.	16-20 Nov.	20 Nov.	28Oct.-5Nov.	10-12 Nov.	7-14 Nov.	13-15 Nov.
Census Type	GSPE	GSPE	GSPE	Sex & Age Comp	Pop. Census	Pop. Census	Ver Hoef	Gasaway	Comp Survey	Becker	Becker	Becker	Becker
Total moose obs.	809	1253	1136	1499	1261	744	646	699	440	969	659	754	563
Calves obs.	123	151	162	217	218	91	64	83	33	107	79	85	89
Pop Est.	1648	2463	3198*	~	2700*	1662	1412	1687		2337	1583	1380	~2125*
80% CI	12.60%	11.80%	12.30%		6.80%	13.24%	15.22%	14.47%		22.56%	11.23%	13.77%	19.90%
Bull:100 cows	22.3	37		42.1	29.9	34	29.82	40.2	37.5	31.1	27.2	27.1	24.4
Ylg bull:100 cows	3.9	5.9			6.25	11.67	5.35	12.3	9.5	8.2	4.4	8.5	5.1
Calves:100 cows	22.4	15.8		24.1	27.5	18.4	15.5	21.3	11.1	17.3	21.7	20.1	26
% Calves	15.5	12	14.2		17.3	12.23	10.7	13.2	7.5	11.7	14.5	13.7	15.8
Observable moose										2027	1164		2125*
Pop Objective	2500 - 2800												
Harv Objective	100 - 200												

GMU 16A	MOOSE SURVEY DATA											
	2023	2020	2019	2017	2009	2005	2000	1997	1994	1993	1992	1990
Dates	1 Dec.-4	5 Dec.-1	26 Feb - 2 Mar	22 Nov-9 Dec	14-16 Nov.	22-28 Nov.	17-25 Nov.	19-24 Nov	8-14 Nov	4-10 Dec	18-20 Nov	20 Nov - 3 Dec
Census Type	GSPE	GSPE	GSPE	GSPE	Pop. Census	Ver Hoef	Mod. Becker	Mod. Becker	Trend	Becker	Becker	Gas.
Total moose obs.	1090	1037	1248	1975	853	590	787	1234	981	828	963	1366
Calves obs.	164	219	153	436	162	80	126	260	177	130	184	258
Pop Est.	3598	3666*	4190*	8654*	2574	1619	2420	3636	~3300	3284	2902	3123
80% CI	10.4	12.30%	14%	16.90%	11.43%	12.19%	21.81%	16.89%		27.50%	19.40%	9.25%
Bull:100 cows	19	19.2		33.37	25.76	22.17	27.8	32.9	41.7	24.1	36.3	26.7
Ylg bull:100 cows	4.8	2.5		9	5.7	3	5.7	12.1	10	10.3	10.8	7.2
Calves:100 cows	21	32.5		36.3	29.4	19	22.2	34.5	31.2	23.7	31.9	30.9
% Calves	15	17.6	12	20.3	18.84	13.68	14.8	20.6	18	16	18.9	19.5
Observable moose								3001		2526	2150	
Pop Objective	3500 - 4000											
Harv Objective	190 - 360											

Unit 16, cont'd

GMU 16B- North	MOOSE SURVEY DATA										
	2022	2019	2014	2008	2003	2001	2000	1996	1994	1993	1990
Dates	Nov 18 - 21	Feb 22 - 25	6-11 Dec.	29-31 Oct	24 Nov-6 Dec	5-7 Nov	20-22 Nov	1-2 Nov	13-18 Nov	15-21 Nov	Nov
Census Type	GSPE	GSPE	GSPE	GSPE	Gasaway	Mod. Becker	Mod. Becker	Mod. Becker-trend	Mod. Becker	Becker	Gas.
Total moose obs.	699	672	835	340	326	438	268	557	431	416	745
Calves obs.	58	56	151	21	34	45	15	62	25	42	95
Pop Est.	1686	1671*	1587*	834	982	1187	908	1912	~2000	2006	2650
80% CI	19%	12.00%	13.00%	22.59%	18.10%	15.33%	20.26%	17.00%		21.54%	15.55%
Bull:100 cows	33		60.4	59.7	35.3	39.7	39.5	38	~45	50	32
Ylg bull:100 cows	7.2		17	16	6.8	7.0	5.5	7	~10	~10	9
Calves:100 cows	9.8		34.4	11	17	14.4	7.3	23	~10	16	23
% Calves	6.8	8.6	18.1	6.4	9.1	9.0	5.0	14	~5	9	~13

Pop Objective	6500 - 7500
Harv Objective	310 - 600

GMU 16B-Middle	MOOSE SURVEY DATA												
	2022	2020	2019	2018	2011	2009	2008	2005	2004	2001	1999	1994	1993
Dates	Nov. 30-Dec. 4	16 - 19 Nov.	5-Dec	Mar 10-13	20 - 26 Nov	15 - 17 Nov.	11/19-11/22	11/26-12/1	NONE	8-11 Nov	23-27 Nov	11-25 Nov	28 Nov - 3 Dec
Census Type	GSPE	GSPE	Sex & Age Comp	GSPE	GSPE	Comp Survey	GSPE	GSPE	Ver Hoef *	Mod. Becker	Gas.	Mod. Becker	Becker
Total moose obs.	1066	1120	1009	1875	825	359	678	628	545	537	631	374	463
Calves obs.	105	99	138	231	127	44	79	46	99	43	31	59	72
Pop Est.	3153	3740*	``	5339*	3458*	~~~	2446*	1714		1836	3313	~3600	3654
80% CI	13.80%	12.6%*	``	18.2%*	15.6%*		13.18%	12.74%		14.54%	14.73%		53.80%
Bull:100 cows	13.5	28	38		42.4	38.8	54	29.29	34	32	28	~26	21
Ylg bull:100 cows	3	4	8		9		10.8	4		4	2	~4	9
Calves:100 cows	11.7	13.7	21.9		25.9	19.4	21	14	30	10	9	~24	25
% Calves	9.38%	8.90%	13.70%	13%	14.10%	12.3	12%	10	~18	7	7	~16	17

* includes sightablity correction factor

Ver Hoef * uncompleted surv composition only

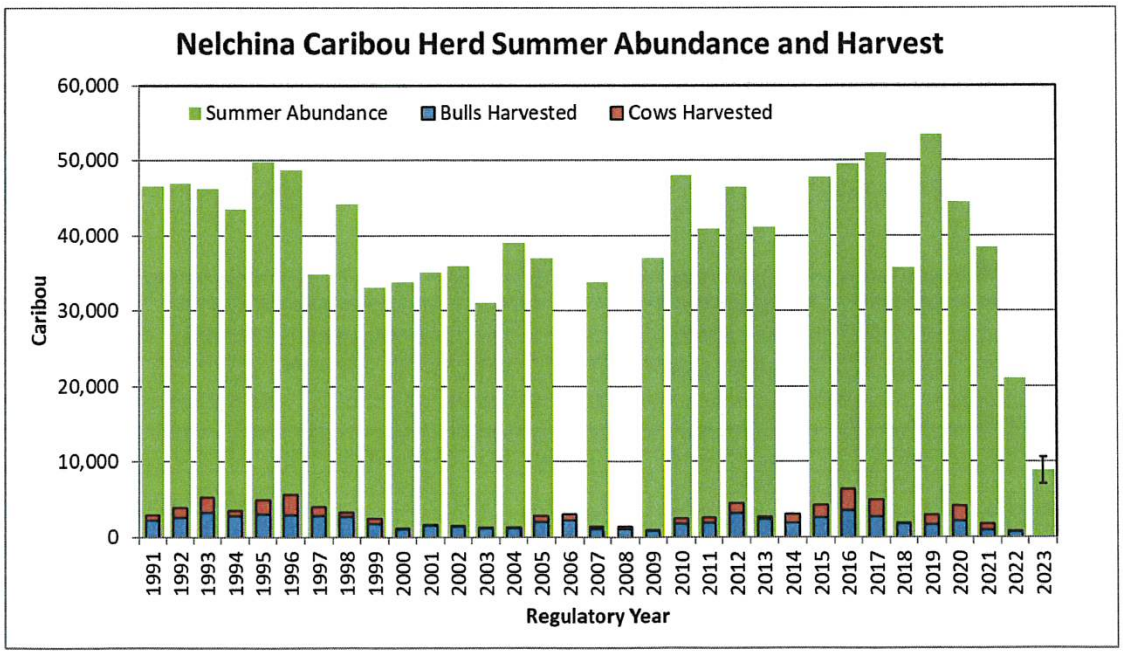
GMU 16B-South	MOOSE SURVEY DATA												
	2022	2019	2018	2010	2008	2004	2003	2001	2000	1999	1998	1997	1996
Dates	Nov 14 - 18	4-Dec	2/28/18-3/2/18	11/13-11/18	2-Dec	5-9 Dec	1-Dec	30 Oct, 4 Nov	16 Dec anlters?	15 Nov, 22 Nov	22-Nov	8 Nov, 3 Dec	8-9 Nov
Census Type	GSPE	Sex & Age Comp	GSPE	GSPE	Sex+ age comp.	Sex+ age comp.	Sex+ age comp.	Sex+ age comp.	Sex+ age comp.	Sex+ age comp.	Sex+ age comp.	Sex+ age comp.	Sex+ age comp.
Total moose obs.	814	894	1106	703	247	604	154	594	98	458	357	595	363
Calves obs.	36	69	147	75	23	95	21	55	13	26	20	51	33
Pop Est.	1950	``	3074*	2372*		~960		~700-850					
80% CI	21.70%		17.6%*	32.80%				30.00%					
Bull:100 cows	35	32		51.5	77.8	23.2	46.1	30.5		37.6	35.3	37.0	31.5
Ylg bull:100 cows	2.7	10		15.1	12.7	9.7	16.5	3.0		4.1	7.2	8.3	7.3
Calves:100 cows	6.4	11		17.8	18.3	23	23.1	13.3		8.3	8.0	12.8	14.2
% Calves	4.5	7.7	13.3%	10.6	9.3	15.7	13.6	9.3	13.3	5.7	5.6	8.6	9.9
Observable moose													

2. **What are the current moose population objectives for Units 13, 14, and 16 compared to the population objectives for prior years, e.g. (1980 to 1990) and (1990 to 2000)?**

	1989–1990	1991–1992	1993–2000	2001–Present
13A			3,500–4,200	3,500–4,200
13B			5,300–6,300	5,300–6,300 (2025: 4,500–5,500)
13C			2,000–3,000	2,000–3,000 (2025: 2,500–3,250)
13D			1,200–1,900	1,200–1,900
13E			5,000–6,000	5,000–6,000
14A		5,000–5,500		6000–6500
14B		2,500–3,000	2,500–2,800	
16A	10,000	3,000–4,000	3,500–4,000	
16B		>7,000	>6,500	6,500–7,500

3. **Provide a population update, current trends, and population objective for Nelchina Caribou in Unit 13.**

Population Objective: 35,000–40,000



4. **What are the same-day airborne (SDA) harvests of wolves for 2024 and 2025 in Unit 13?**

In Regulatory Year 2023 (2022/23) 177 wolves were taken and in RY24 (2023/24) 76 wolves have been removed.

5. **What is the sheep population status in Unit 13 and Unit 14?**

Chugach survey data Unit 13

Year	TCUA	TazWest	TazEast	Combined	Lambs:Ewes
2012	-	416	408	-	25
2013	-	390	-	-	34
2014	120	267	318	705	20
2015	-	-	292	-	32
2016	86	364	307	757	31
2017	122	-	-	-	27
2018	-	296	291		21
2019	-	-	-	-	-
2020	70	165	-	-	24
2021	-	-	-	-	-
2022	82	206	195	483	29
2023	25	-	-	-	22
2024	58	174	107	339	32

Talkeetna survey data Unit 13

Date	Sublegal	Full Curl	Class I	Class II	Class III	UNKN	Total	Ewes2	Lambs	UNKN	Total sheep
7/1/2019	202	26	57	88	57	0	228	497	212	0	937
7/18/2020	158	19	71	44	43	0	177	366	61	0	604
7/1/2021	168	17	26	88	47	7	185	311	111	4	611
7/1/2022	129	8	48	52	29	1	138	270	81	0	489
7/1/2023	142	9	26	57	59	1	152	247	37	0	436
7/1/2024	113	8	25	54	34	0	121	269	96	0	486

Chugach survey data Unit 14A

Count Area		2014	2016	2017	2018	2019	2020	2021	2022	2023
A	Knik Gl./Marcus Baker Gl.	8	1	0	0	0	3			0
B	Grasshopper to Metal Ck	128	~	172	110	102	95	114	103	72
C	Metal Ck to Friday Ck	155	250	248		197	179	220	98	191
D	Friday Ck to N. of Wolverine	132	145	192		164	185	169	167	139
E	N. Wolverine to Carpenter Ck	53	63	57		33	65		30	29
F	Carpenter Ck to Coal Ck	127	157	195		167	115		73	51
	Total	603	616	864	110	663	642	503	471	482

Talkeetna index unit survey data Unit 14A

Count Area		2014	2015	2018	2019	2020	2022	2023
H1	Chickaloon to Kings River	123	106	98	101	98	100	61
G2	Kings River to Little Su	109	60	51	134	69	62	44
		232	166	149	235	167	162	105

We are more consistent with our Chugach surveys in Unit 14A due to the drawing hunt in that area which requires more data to manage. The 14A Chugach sheep populations were doing well and increasing during the last decade until several severe winters occurred in 2019–2021. We surveyed some portions of the 14B Talkeetna mountains this past year that had not been surveyed since 2015. Count areas at the further extent of the unit had declined significantly, while areas at the core of the unit appeared to be more stable. Overall, the Talkeetna sheep population appears to be stable at low density. The Unit 14 sheep populations as a whole appear to be tracking what we are seeing with sheep statewide and the decline is not due to hunting or human disturbance.

6. **Are there current plans or projects to improve moose habitat in Units 13, 14, and 16?**

   In Unit 14 the Little Granite Creek prescribed burn is set to take place sometime in 2025. In the remainder of Units 14A&B and 16 we have encouraged a "Let it Burn" strategy with DNR to allow forest fires to continue burning with the intent of improving moose habitat.

   We have been pressuring DNR-Forestry to delineate a significant portion of Unit 16 as limited fire protection to allow for natural burns when safe and appropriate.

   The Alphabet Hills prescribed burn in Unit 13 and associated research projects have been blocked by USFWS.

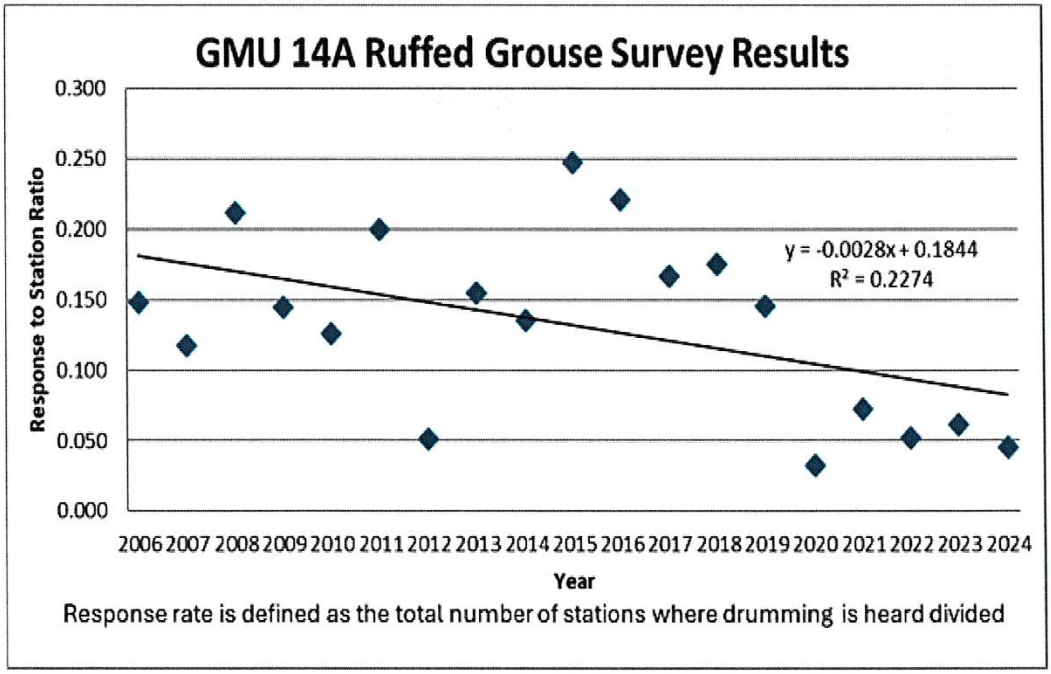
7. **If the only new infrastructure to be constructed in the West Susitna area is the 12-mile-long extension of the Korbel-mine (Portage Creek) road from the existing airstrip, how is this anticipated to affect sheep hunting in the area (Unit 16B)?**

   The disturbance from construction of the road and development of the mine has the potential to have a significant impact on sheep in the Portage Creek Valley. ADFG's most recent sheep survey from July 2022 observed 4 separate groups of sheep within 2 miles of the proposed road. The disturbance from construction and mining may displace sheep out of their traditional habitat and disrupt key time periods of lambing and breeding. Construction of the new road will create more access for hunting (if public), potentially resulting in additional harvest. Under full-curl management, additional harvest will not result in a population or management concern.

8. **The overwintering small bird population in the Mat-Su this winter appears to be low based on resident observations, sale of bird seed in Palmer, and the Mat-Su Birders club. According to the Mat-Su Christmas Bird count Common Redpolls and Pine Grosbeaks populations were down over 90% and chickadee species over 40% relative to average counts from 2018-2024. Ruffed Grouse were down 31%. In our 2024 meeting with ADFG, they noted that grouse populations for 2021–2023 were low. Please share the data from grouse and ptarmigan surveys. How does ADF&G track grouse and ptarmigan populations?**

   We conduct annual spring grouse drumming counts to monitor the Ruffed Grouse population in Unit 14A. Ptarmigan populations are monitored with spring surveys along the Denali Hwy. which provide an index of abundance and not a population or density estimate.

   We have just begun our spring surveys for Ruffed grouse this year and the counts appear to be higher than we have seen since 2020. We are still in the early stages of the spring Drumming surveys.



9. **Has avian flu been found in grouse or ptarmigan in Units 13, 14, or 16? Is this disease expected to impact population levels?**

   We are not aware of any documented cases of avian Influenza in grouse in southcentral Alaska. However, it appears to be widespread in all avian species and has been detected in several mammals. I would assume that it could be spread to Grouse. Grouse are not a high-density flock species and rapid spread of disease through the population is less likely.

10. **How did this winter's MSB moose road and train kill compare to those in the past? In what years and in what areas were targeted hunts conducted to remove moose from road areas in the past 10 years?**

This winter (October-March) roadkill was reported as 65 and is below the average of 228.

This winter's (July-March) railkill was reported as 14 and the 10-year average is 61.

RY	Roadkill
2015	239
2016	250
2017	245
2018	245
2019	283
2020	–
2021	219
2022	277
2023	176
2024	65

RY	Railkill
2015	16
2016	47
2017	86
2018	55
2019	151
2020	33
2021	77
2022	64
2023	23
2024	14

*Targeted hunt (AM415) were used from 2011–2016.

11. **Does ADF&G have plans to implement any new processes or procedures in the near future with the passage of Proposal 75 (Add Department removal of wolves, brown bears, and black bears to Unit 16 Intensive Management Plan) at the latest Central and Southwest Regional BOG Meeting?**

The department now has the tools in place to get directly involved in the Unit 16 IM program. This year's harvest of wolves was very low due primarily to poor snow conditions. In the future we anticipate that permitted pilots will meet our wolf reduction goals without the involvement of the department because the last time the program was initiated in 2004 the public was successful. If the public is unable to meet wolf reduction goals when conditions are conducive, then the department may get involved. Those decisions are complicated and require the evaluation of many moving parts like weather, public participation, and priority among competing programs. There are no plans to start department removal in the near future.

12. **Is ADF&G researching new ways to execute moose surveys in Southcentral if issues related to lack of snow in the early fall persist? An article published in the ADN (see attached) regarding a study led by UAF examined alternative methods used in other states as well as in Canada. Is ADF&G considering the implementation of these alternative methods?**

    Yes, We currently do all incarnations of collecting moose population information from trend and minimum counts to snowless surveys and GSPEs in atypical survey months outside of November/December such as in February.

13. **To fully understand the decline of the moose population in GMU 16 since 2019, would the department benefit from additional research and information regarding moose populations, calf mortality, brow availability, and estimates of wolf and bear populations? What resources does the department lack in order to effectively execute the necessary research and data collection to provide a comprehensive data set on these topics?**

    The department has a good dataset for Unit 16 right now. We have funding and tools for regular moose surveys. However, the weather conditions are not always conducive. We are monitoring collared cows for calf production, twinning, and survival. We recently deployed additional collars and should have between 60 and 70 cows on the air this spring to meet sampling needs. We would like to have current bear estimates but given the high cost and high effort to conduct bear density estimates is not a priority. We know from monitoring harvest that hunting is not likely limiting the bear population and that bears are the leading cause of neonate moose mortality.

    We have a recent wolf minimum count of 120 wolves and estimate 150–180 as of 2024. and SDA is active Our goal is to reduce the population in Unit 16 to 35–55 wolves to allow for increased moose survival. There are studies that would be beneficial to related to predation from bears and wolves to help us understand the relationships of all three large predators and their impacts on the moose population but the ideal situation is to conduct these studies when we are not actively trying to reduce the predator populations.

14. **GMU 16 is the second-largest GMU, with two-thirds of the state's population residing in close proximity. Does this increase the priority level for managing moose as a food source compared to other GMUs?**
    No. Unit 16 moose management is currently the number one priority for the Palmer office. However, we also have Unit 14A that requires consistent monitoring due to our very high productivity and use of antlerless permits to regulate that population. Both populations have been identified by the BOG as being important for human consumption. Currently we are doing all we can to monitor the 16 moose population and assist it is recovery through harvesting predators. The BOG just approved adding department staff to the IM plan, and that becomes effective in July. That doesn't mean that we are going to run out next year and use department predator removal but it is now an option. The last time we started wolf control (2004) the public was very effective at quickly reducing

the wolf numbers. Our hope is that we get good conditions next season and that the public is effective at reducing the wolf numbers.

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Less-reliable fall snow makes Alaska moose population surveys more difficult

By Yereth Rosen, Alaska Beacon

Published: December 1, 2024

A few moose are seen from the air as they walk across snow at the edge of a forested area in Interior Alaska in this undated photo. Biologists who count moose from the air need adequate snow cover to spot the animals in the fall. Snow has become less reliable at that time of the year in some parts of the state, and fall moose surveys will be increasingly difficult if the trend continues. (Mike Taras / Alaska Department of Fish and Game)

When state biologists want to know how many moose are wandering around in different parts of Alaska, they usually get into small planes, take to the air and count the animals that stand out in the snow-covered landscape below.

Now climate change is threatening that practice.

A study led by University of Alaska Fairbanks scientists found that the time window for counting moose in the fall is being squeezed by later arrival of adequate snow. By

midcentury, it said, there may be too little snow to continue to do these traditional fall aerial surveys in more than half of Alaska's moose habitat.

The idea for the study was sparked by biologists' complaints about surveys becoming more difficult to complete, said lead author Todd Brinkman of UAF's Institute of Arctic Biology.

"Totally, that's the motivation," Brinkman said. "Being able to complete these in the fall is becoming more unpredictable."

For now, the fall surveys remain "pretty effective," but there is already some impact that is akin to "noise in the system," he said. "If these patterns continue, we've got to start thinking about what we're going to do."

Statewide, Alaska's snow season has shrunk, with snow arriving about a week later in the fall than in the 1990s and disappearing about a week earlier, on average, according to a 2019 report by the Alaska Center for Climate Assessment and Policy at UAF.

But the mere arrival of snow is not enough to support a successful moose survey.

Snow cover must be adequate, which is at least 15 centimeters, or about 6 inches, Brinkman said. Less snow than that may make the landscape look white, but not dependably so, and plants sticking up can make the ground look mottled, he said.

"It's not just snow onset. It's good enough snow to cover some of that ground vegetation so that those moose stick out. Because they're brown, of course," he said. "You need snow accumulation to cover up some of that vegetation, so that brown moose really jump out when these folks are in the plane at 500 feet or whatever it is."

A bull moose rests in the newly-fallen snow along Point Woronzof Drive in Anchorage on October 31, 2024. Brown moose stand out against the white snow, but they can be hidden in dark-colored trees. (Marc Lester / ADN)

Also needed for surveying is adequate daylight, which gets scarce at Alaska's high-north latitude and which makes midwinter moose-counting flights impossible.

If aerial surveying is delayed until daylight returns in the late winter or spring, biologists will not be able to spot from the air the difference between male and female moose, removing information needed to determine population sex ratios, Brinkman said. That is because the males, known as bulls, lose their antlers in the winter after growing them over late summer and fall.

Additionally, there are potential mismatch problems if surveys are delayed until spring, he said. Moose may have shifted locations since the start of winter, and it could be unclear what animals are being seen from the air, he said. "Are those the same moose, or does the distribution change?" he said.

Another problem with changing when surveys are done is that the state would lose consistency in its recordkeeping. Long-term data is from fall surveys, so the potential

seasonal differences in moose distributions could mean a data interruption if biologists have to switch to spring surveys.

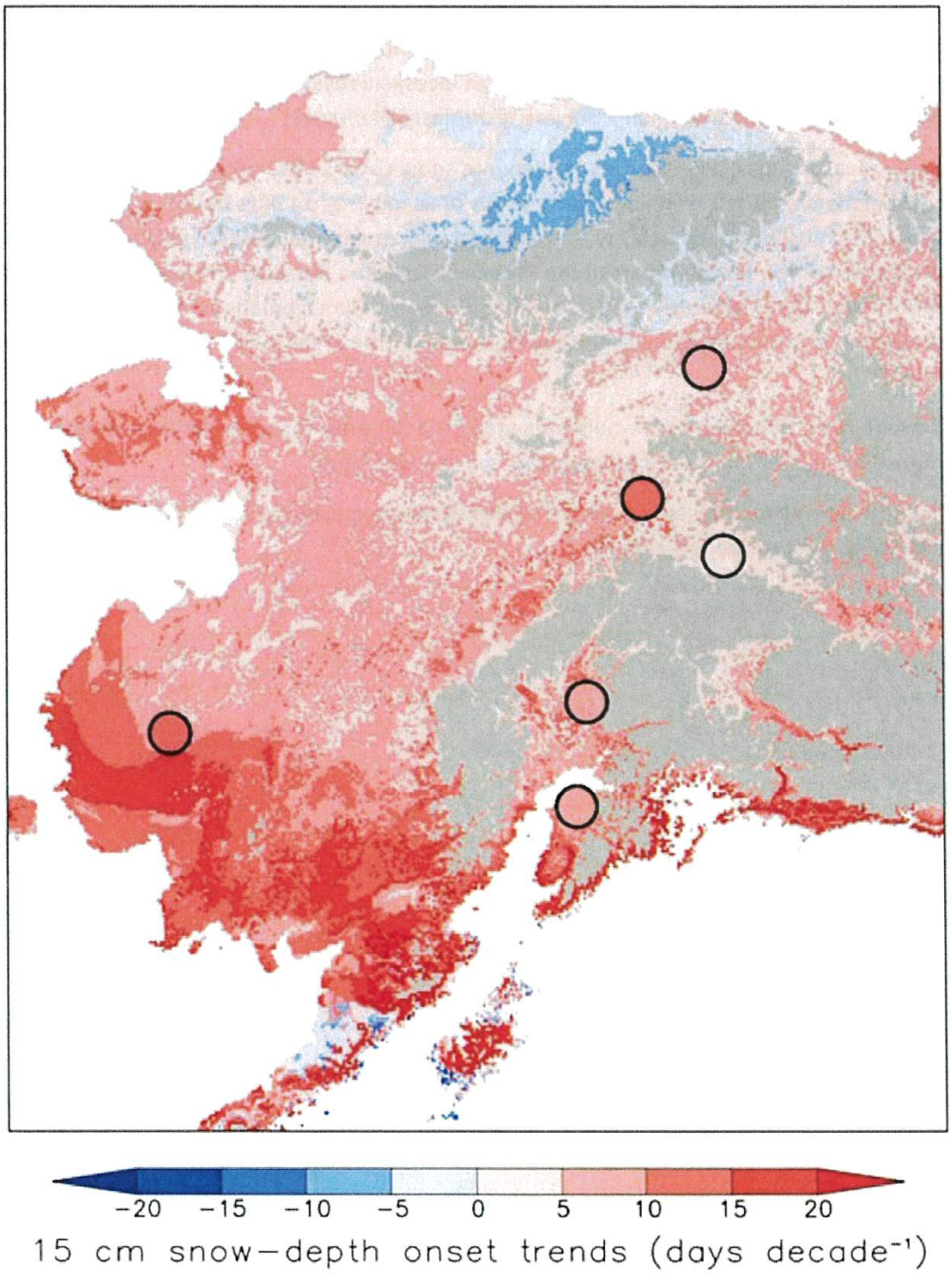
The concern goes beyond science and academia, Brinkman said. The changes could affect state managers' decisions and, ultimately, moose-hunting opportunities for the public, he said.

"If you don't have really good data, you've got to be cautious to avoid overharvest. And the goal usually is to try to give hunters as many opportunities as they can so they can build their freezers and, and their families can consume this really renewable healthy protein source," he said.

On the other hand, if hunting levels are set too low, there may be too many moose on the landscape for the habitat to support, he said.

Brinkman's study, which was co-authored by a UAF colleague and scientists at Colorado State University and Columbia University's Lamont Doherty Earth Observatory, combined past records with climate projections through the middle of the century.

It examined snow and survey records at seven areas within different Alaska game management units, the regions where specific wildlife regulations and hunting limits are applied. The records were from surveys done between 1987 and 2019 in seven subunits, which are portions of management units. In that time period, 170 surveys were completed and 41 canceled. The average start date was Nov. 12, but there was a lot of variation by region. Late arrival of adequate snow cover corresponded to survey cancellation, the study found.



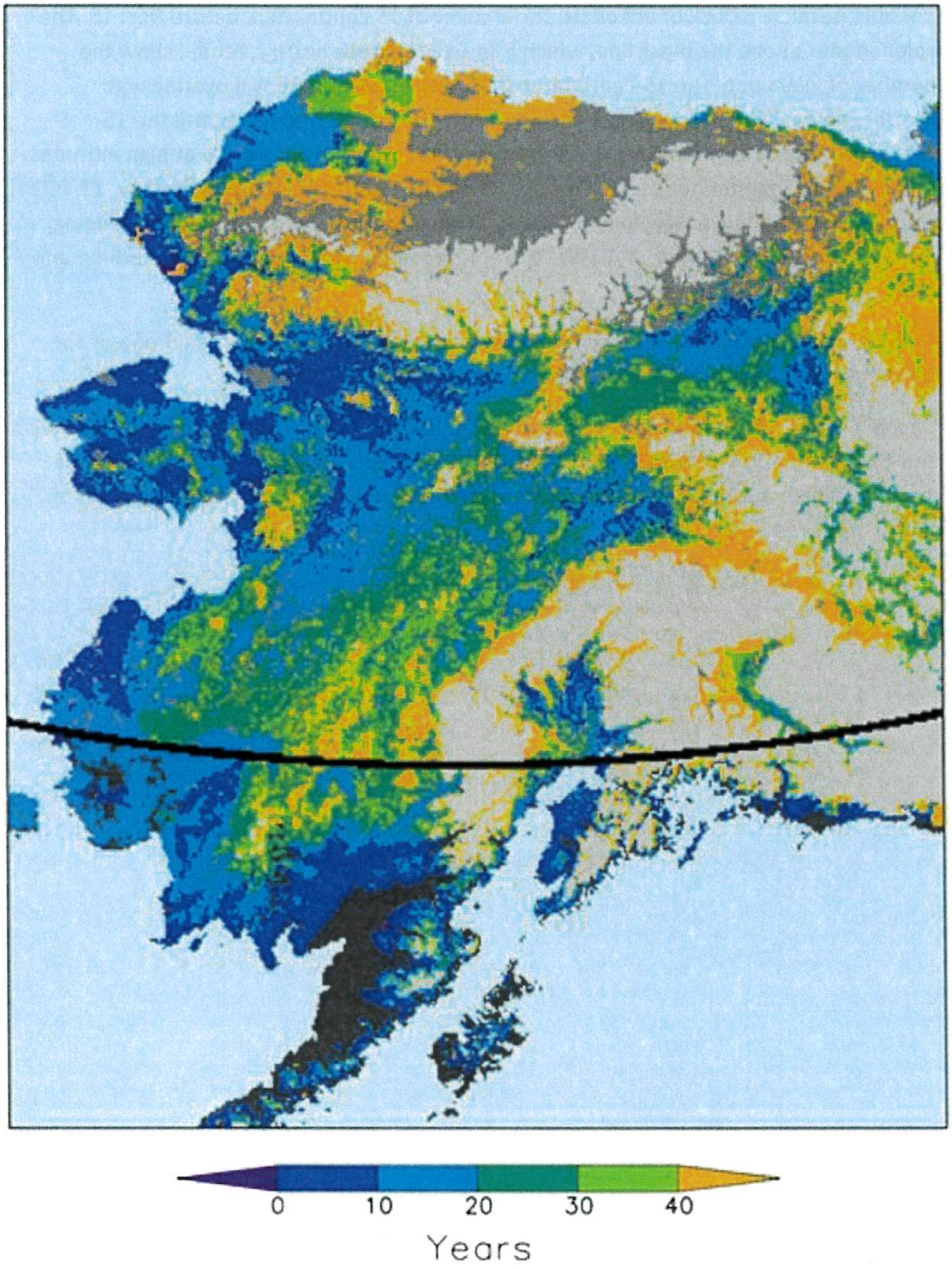
A map shows how the onset of snow changed in Alaska from 2005 to 2020. The map show

timing of snow accumulations of 15 centimeters, with red indicating later onset. The map is from the paper in the Nov. 11, 2024, issue of the Wildlife Society Bulletin titled: "Changing snow conditions are challenging moose (Alces alces) surveys in Alaska." (Graph provided by lead author Todd Brinkman / University of Alaska Fairbanks)

Snow records reveal a later onset of adequate snow cover in five of the seven game management subunits examined, with delays of as much as 14 days between 2005 and 2020. The most dramatic delay was in Game Management Subunit 14A, which encompasses the southern part of the Matanuska-Susitna Borough. In contrast, there was little change in fall snow cover over the period in Game Management Subunit 15A, which is on the Kenai Peninsula and was the southernmost of the areas in the study, the results found.

Continuation of those trends would mean too little fall snow for aerial surveys in most moose habitat within three or four decades, the study found.

In Southcentral and Western Alaska, that threshold is expected as soon as 10 years from now, according to the projections.



A map shows projections of periods when fall aerial moose surveys will no longer be

possible because of lack of adequate snow cover of 15 centimeters before Dec. 15. The color shades above the black line, which is at 61.3 degrees north latitude, show the number of years until the 15-centimeter snow depth onset date will overlap with insufficient daylight. Colors below the line show the number of years until the 15-centimeter depth is no longer expected by Dec. 15. Light gray areas are at high altitudes, assumed to be habitat not used by moose. The map is from the paper in the Nov. 11, 2024, issue of the Wildlife Society Bulletin titled: "Changing snow conditions are challenging moose (Alces alces) surveys in Alaska." (Graph provided by lead author Todd Brinkmann / University of Alaska Fairbanks)

A time crunch has already emerged to cause problems in some places, said one of the biologists who goes airborne each fall to assess moose numbers.

Lincoln Parrett, the Fairbanks-based regional supervisor for the Alaska Department of Fish and Game's Division of Wildlife Conservation — and a pilot himself — said fall snow is most reliable in Interior Alaska, where he works, and less reliable in areas closer to the coast.


Biologist Lincoln Parrett, who is both a pilot and the Fairbanks-based regional supervisor for the Alaska Division of Wildlife Conservation, is seen flying in this undated photo. (Photo provided by Lincoln Parrett)

But even in the Interior, where snow cover used to start reliably in October, there have been some challenges.

"As it turns out, what we found is that we're just getting pinched, right?" Parrett said.

He was speaking on Nov. 21, the day after this group started one of the area surveys, which is relatively late in the year.

"And now we're in a little bit of a race to get it done before a couple of things happen — before the bulls start to drop their antlers and before we run out of daylight. And so we just get pinched on that end," he said.

The state's fall surveys use a method called GeoSpatial Population Estimator, which samples boxes that are usually around 5 or 6 square miles, Parrett said. It generally takes

about 45 minutes to survey each of those boxes, depending on terrain. The system allows for a margin of error, as it is nearly impossible to count all moose, he said.

Parrett, like the numerous other pilots working on the fall moose surveys, flies with an observer as a partner sitting behind him. Both look out the plane windows on either side to count the moose below.

Parrett normally flies about 600 feet above the ground, making patterns that vary with the terrain below. Over flat landscapes, his flight patterns are in straight lines; over hilly terrain and curvy mountains, the flight paths are contoured accordingly. Over forested and heavily vegetated areas, where moose are harder to spot, he has to make more and tighter flight passes; over open tundra, where sight lines are clear, he makes fewer passes.

Other necessities for successful fall surveys, beyond adequate snow cover, include safe flying conditions and an adequate number of pilot-observer teams and planes.

Uncertain fall snow cover is not new in some places of Alaska, Parrett said.

In some parts of Western Alaska, for example, biologists have been relying on spring surveys rather than fall surveys for about 20 years, despite the drawbacks of those spring counts, he said.

Spring surveys have also been used in part of Interior Alaska as well, where the climate is very dry and snow can be scarce, he said.

In the future, as later-arriving snow makes the old-school fly-and-count method less feasible, technology could fill in the gaps, Parrett said.

Biologists at the Department of Fish and Game are looking at the option of tracking moose populations through genetics, using a method called close-kin mark-recapture, he said. That method uses extrapolations to estimate population sizes by tracking the genetics that link kin relationships between animals. The method has been used with other species like bearded seals in the Bering, Chukchi and Beaufort seas off Alaska and Arctic grayling fish in Canada's Yukon.

Moose surveying in the future could also incorporate the use of drones or infrared technology that can track the animals' presence through their body heat, Parrett said.

Two moose are seen from the air in a forested area of Interior Alaska in this undated photo. Moose are harder to spot when they are in vegetated areas. (Mark Nelson / Alaska Department of Fish and Game)

For now, though, he and his colleague are still using the traditional method, as long as daylight and weather holds out.

While he was grounded by fog on Nov. 21, he was expecting better moose-spotting conditions in the days to come.

"Right now, the air is very moist, and so the one thing that it's doing, I can see it happening before my eyes, is it's frosting. So all the trees and all the willows are going to be covered with frost, which will produce excellent conditions," he said.

Such conditions allow biologists to use the time-honored — and very low-tech — practice of seeking out moose by following the marks they leave in the stands of trees and bushes.

"That frost is amazing, because the moose knock the frost off as they walk around and they make these incredible trails," he said.

Originally published by the Alaska Beacon, an independent, nonpartisan news organization that covers Alaska state government.