



BSAI Crab Plan Team REPORT

November 6, 2025 Anchorage, AK

Virtual Meeting

Committee Members in attendance:

Katie Palof, **Co-Chair** (ADF&G-Juneau)
Anita Kroska, **Coordinator** (NPFMC)
André Punt (Univ. of Washington)
Ben Daly (ADF&G-Kodiak)
Caitlin Stern (ADF&G-Juneau)

Ethan Nichols (ADF&G-Dutch Harbor)
Tyler Jackson (ADF&G-Kodiak)
William Bechtol (UAF-Homer)
Vacant, quantitative expert

Members absent (those with an asterisk * are furloughed federal employees): Ginny Eckert (UAF/CFOS-Juneau), Mike Litzow, **Co-Chair** (AFSC-Kodiak)*, Andrew Olson (NMFS-Juneau)*, Brian Garber-Yonts (AFSC-Seattle)*, Cody Szuwalski (AFSC-Seattle)*, Erin Fedewa (AFSC-Kodiak)*, William Stockhausen (AFSC-Seattle)*

Council updates

Anita Kroska (NPFMC) presented Council updates, which included reminders on how to respond to CPT and SSC comments (presented previously), SAFE guidelines, current Council actions, and crab-specific SSC recommendations from the most recent SSC Report (Oct 2025). Anita noted that inconsistencies among SAFE documents had been noticed by the CPT co-chairs and also by the SSC, and offered a link to the existing [SAFE guidelines](#) document that was last updated in January 2023. She noted that she and the co-chairs were in the process of reviewing the document, making a running list of more specific guidelines that will be presented at the May CPT meeting. Examples of items that may need attention are the general structure of the document (including sub-sections where appropriate), types of tables and standardized formatting, and document length. Further discussion on these topics was not pursued at this meeting due to the limitations of missing federal CPT members due to the government shutdown. The CPT plans to discuss these topics at the next scheduled CPT meeting in May 2026.

Anita highlighted some crab-specific SSC Report recommendations from the October Council meeting, including general crab comments, and several pulled from the snow crab assessment subsection - research on clutch fullness, inclusion of hybrid data in snow and Tanner crab assessments, willingness to participate in a collaborative working group on snow crab ABC control rules, suggestions about likelihood profiles and jittering, and suggestions for risk table development. Finally, Anita reviewed relevant and ongoing Council topics that may be of interest, including Harvest Control Rule workshop updates, Pelagic trawl gear innovation motion industry updates, Gulf of Alaska Tanner crab protection Initial Review timing, EFH 5-Year Review work

plan launch and coordination with the CPT, and contingency planning for final harvest specifications. November Crab Plan Team meeting materials can be found on the [eAgenda](#).

NSRKC- final assessment, stock status, OFL/ABC

Caitlin Stern (ADF&G-Juneau) presented the 2025 final assessment for Norton Sound red king crab (NSRKC). This is the first final assessment for NSRKC under new authorship. The NSRKC assessment was transitioned to GMACS during the 2024 assessment cycle. Data sources used in the assessment include commercial fisheries during the summer and winter seasons, the winter subsistence fishery, ADF&G pot and bottom trawl surveys, and NMFS bottom trawl surveys (which includes the current Northern Bering Sea (NBS) survey). Growth is informed by tagging data.

Updates to standardized fishery CPUE in 2025 suggested the largest decrease in relative abundance in the time series. ADF&G managers indicated that the decrease likely reflects a precipitous drop in fishing performance that occurred near the end of the season. The CPT suggested examining the trend in CPUE over the course of the season. There was no ADF&G trawl survey in 2025; the 2025 NMFS NBS survey estimated a 3% decline from 2023. Caitlin has been developing spatiotemporal model-based indices of trawl survey data that address changes in survey spatial footprints. Those indices were not included in this assessment, but progress was presented to the CPT in September 2025.

In May 2025, Caitlin transitioned the 2024 accepted model (24.0) to model 24.0b, which updated the model to GMACS version 2.20.20 and corrected tier F_{OFL} allocation among multiple directed fleets.

Five other models were evaluated:

Model 25.0a – Model 24.0b without shell condition and an updated base natural mortality rate (0.23 yr^{-1}) for males $\leq 123 \text{ mm CL}$ based on the current estimate for BBRKC;

Model 24.0b6 – Model 24.0b with an upper bound on F in the winter commercial fishery based on value from BBRKC assessment model (2.95) ;

Model 24.0b7 – Model 24.0b with selectivity in the winter commercial fishery mirroring to that estimated for the summer commercial fishery;

Model 25.0a1 – Model 25.0a with an upper bound on F in the winter commercial fishery based on the value from the BBRKC assessment model (2.95); and

Model 25.0a2 – Model 25.0a with selectivity in the winter commercial fishery mirroring to that estimated for the summer commercial fishery.

The rationale for placing a bound on F and considering an alternative selectivity parameterization was to address unexpectedly high F values estimated for the winter commercial fishery; both of these were suggestions from CPT and SSC comments during the May/June meetings. The CPT noted that the upper bound of 2.95 borrowed from the BBRKC assessment may be an arbitrary value that was historically used to aid in BBRKC model convergence. As for changes in selectivity, the winter commercial fishery was previously mirrored to the winter pot survey, which estimates a dome-shaped selectivity. Caitlin explained similarities in gear configuration between the summer and winter commercial fisheries, particularly the use of escape rings, and highlighted the similar shape in size distribution. The summer commercial fishery estimated the parameters of an asymptotic logistic selectivity curve.

In general, models differed very little in fits to data. Of note, models that addressed high F values fit ADF&G trawl survey data slightly worse between 2002 and 2017 – particularly at the high point in the time series (2014). Fits to size-composition data clearly illustrated uncertainty associated with shell condition, or transition between shell condition states, in models 24.0b, 24.0b6, and 24.0b7. Recruitment estimates were similar across models, except for models 24.0b and 25.0a which estimated a larger recruitment pulse in 2012, which Caitlin attributes to the model fitting the high ADF&G trawl survey biomass in 2014. The MMB trajectories of all models estimate a decrease from a recent time series high in 2023. Retrospective patterns in MMB were improved from previous assessment cycles, with models 25.0a1 and 25.0a2 having the least evidence for retrospective patterns.

Caitlin presented stock projections assuming no fishing, $\max F_{OFL}$ and F_{OFL} given the estimated stock status. Projections indicated a decrease in MMB that approaches overfished status before building back up. The CPT was concerned that the $F=0$ did not appear to increase to a level consistent with an unfished biomass and noted that this may be a consequence of combining a tier 4 assessment approach to setting B_{MSY} and selecting random recruitment when projecting (an approach closer to that expected for a Tier 3 projection). The CPT also questioned whether recruitment draws for projections reflect the same reference period used for calculation of B_{MSY} , and noted that projections for a tier 4 stock may need some specific tailoring and the current results may be misleading, and therefore suggested removing them from this year's SAFE to avoid misrepresentation. Best practices for stock projections under tier 4 will be taken up by the CPT in a future modelling workshop.

The author recommended model was 25.0a2. This model removed uncertainty associated with shell condition data, aligned base natural mortality with Bering Sea king crab stocks, better parameterized winter commercial fishery selectivity, and reduced the retrospective pattern in MMB. The CPT agreed with Caitlin's recommendation. **Based on model 25.0a2, the stock was at 78% of $B_{MSY,proxy}$ which resulted in a F_{OFL} of $0.17yr^{-1}$ and an OFL of 193 t. The author and the CPT recommended a 30% ABC buffer (leading to an ABC of 135 t) citing concerns similar to the 2025 assessment, as detailed in the calculation of the ABC.**

During the next cycle, Caitlin proposed to incorporate model-based indices of abundance, introduce total catch data from subsistence winter and summer subsistence fisheries, better align

spatial areas for the different surveys used to compute size composition and abundance data, and revisit CPUE standardization, perhaps using a spatiotemporal model.

The CPT made the following recommendations:

- Provide more detail on the CPUE standardization analysis in future assessments and update the full time series with each assessment cycle
- Jittering plots should display a larger proportion of the jitter runs, especially if many of the runs converge to likelihood values not near the MLE. Further guidance on this will be discussed at the Jan modeling workshop.
- Remove the projections plots awaiting guidance to be developed during the January 2026 modeling workshop on the appropriate way to use the GMACS projection module for tier 4 stocks.

AIGKC- proposed model runs

Tyler Jackson (ADFG-Kodiak) presented proposed model scenarios for the 2026 Aleutian Islands golden king crab (AIGKC) assessment (final SAFE in May 2026). Tyler reviewed updates to the base model including GMACS updates, using a *sdmTMB* spatiotemporal model for the CPUE standardization analysis, and allowing catchability to change in time blocks corresponding to rationalization (1995-2004, 2005-2024). Model scenarios included differing selectivity and catchability time blocks and selectivity changing over time as a random walk. The random walk scenario (26.1a) applied random walk inter-annual changes in selectivity for the post-rationalized time period instead of defined time blocks. Soak time had the largest effect on the CPUE index for EAG and WAG whereas gear and depth had little effect. It was recommended that the prediction grid results from the spatiotemporal model be plotted with a log-scale color scheme (i.e., value in normal space but colors changing in log-space) to better visually differentiate values.

Tyler discussed time blocks for time-varying selectivity and/or catchability and noted changes in these quantities are likely related to the changing fleet vessel participation. Concern was expressed about catchability time block because it effectively creates multiple CPUE time series and could dilute the overarching CPUE signal. It was also noted that the CPUE standardization process should account for changes in catchability via vessel effects. Such treatment of catchability could lead to the model being too flexible (aka following noise). Tyler noted that the sigma for time varying selectivity was arbitrarily set to 0.3 to increase model flexibility. Tyler allowed for additional variance when fitting to the CPUE index given the CVs from the spatiotemporal model are unrealistically low and noted the differences it fits among model scenarios. It was noted that inter-annual time varying selectivity (26.1a) led to overfitting of the CPUE index, and time-varying selectivity should be most relevant to size composition data as opposed to the CPUE data. In the WAG there was little difference in the fit to CPUE data among model scenarios.

No glaring misspecifications were observed for the size composition fits, though Tyler noted a tendency to underpredict the proportion of mid-sized males and overpredict large males in total size composition data. Tyler then discussed the growth data fits and noted some issues with the

fits to the molt increment data. Revisiting the original data and growth function may be warranted, and it was noted that the model allowed for selectivity when fitting to tag-recapture data but the plots Tyler produced essentially assumed uniform selectivity. Tyler noted concern about risk in assigning variability to processes erroneously, and that time blocks were subjective, but that expanded diagnostics could help when evaluating the utility of time-varying selectivity and/or catchability.

Tyler noted differences among scenarios in estimated recruitment, particularly in the post-2015 period. Estimates of mature male biomass differed among model scenarios, and those differences were more pronounced in the EAG compared to the WAG. A question was asked about whether different time blocks in selectivity/catchability would require two separate models, which brought up the larger issue that the SSC has raised about area-specific vs. combined models. It was asked whether OFL variance differed among model scenarios, but this was not addressed in this document but could be produced for future comparisons. All jitter runs converged in the EAG, while for the WAG over 75% of the runs converged to the MLE. There was discussion about CPUE being related to legal size crab or retained crab, noting that the retention function should account for retention at size. Tyler recommended four model scenarios for the final assessment (23.1c, 26.0a, 26.1, and 26.1b). The CPT recommended dropping 26.1b due to concerns about the appropriateness of time-varying catchability when there is no survey index, and including model 26.0 as a bridging model. **Recommended models for the final assessment include 23.1c, 26.0, 26.0a, and 26.1.**

Tyler described an SSC recommendation for calculating the OFL, which is more of a blended area-combined approach which consists of adding MMB and B_{35} by area, applying a cumulative stock status F_{OFL} control rule using area specific F_{35} , then computing the OFL and summing between areas. This approach differs from the current approach which calculates area-specific OFLs and sums them. Tyler expressed caution in the approach suggested by the SSC because it applies “surplus” in the EAG to harvest in the WAG. The CPT acknowledged this concern and noted the differing population trajectories. The CPT recommended that Tyler bring forward an approach that combines the two areas when considering stock status, but uses area-specific corrections between the F_{MSY} proxy and F_{OFL} . Tyler then described an area-combined model noting that GMACS does not allow area stratification and subpopulation dynamics. A stopgap solution would include using sex in place of area, in GMACS. However, Tyler noted that sexes cannot share growth function or data in GMACS and that he had to combine the bycatch data. Tyler then presented combined vs. area-specific model fits (e.g., size composition) and estimates of selectivity and recruitment. Tyler solicited feedback about prioritizing pursuit of a combined model approach. For the January modelling workshop the CPT recommended that Tyler explore a combined modelling approach that moves to sex specific fleets, and to run the model using combined vs. area using the initial values for the model parameters to check that all the penalties and likelihood components are the same.

Tyler reviewed a size-at-maturity analysis including breakpoint estimation methods, noting recent studies by Olson et al. (2018) and Siddeek et al. (2022). Tyler summarized chela data collection efforts conducted in prior decades by fishery observers, ADFG biologists, and NOAA biologists, noting that fishery observer chela data tend to be noisier than data collected by biologists and

that the size at maturity estimates differ depending on the data source. The bootstrapping analysis yielded unexpected and highly variable probability density results suggesting problems with the analysis. Tyler concluded that bootstrapping may not be needed, that models seem to perform a bit better with aggregated data, that size at maturity is probably between 110–130 mm, that the link between *Lithodes* physiological and functional maturity is poorly understood, and that the analysis should be refined a bit more before setting reference points with alternative MMB sizes. The CPT recommended that the bootstrap analysis should be further explored before bootstrapping is excluded from consideration.

The SSC requested an analysis responding to concerns about gear conflict in the WAG as a possible explanation for recent low CPUE. Tyler used registered pots and daily fishing logs to explore trends by stat area, but this data was confidential and only able to be reviewed by ADFG staff. Tyler found no contrasting CPUE trends in areas of vessel-gear overlap vs. no gear overlap, and that there was/is no clear evidence of displacement of one vessel by another via the data.

Harvest Control Rule (HCR) update

Diana Stram (NPFMC) presented a high-level overview of the work of the Climate Change Task Force (CCTF), a summary of the SSC Harvest Control Rule (HCR) workshop and resulting recommendations, GPT review in September and outcomes, and key questions for CPT to provide input and planning.

The CCTF met for five years (2020–2024) and over that time worked on several projects, including climate on-ramps (2020), CCTF work plan (2021), Climate Readiness Synthesis Report (2022), Climate Scenarios Workshop (2023), and the CCTF Final Report (2024). The CCTF Final Report is posted to the NPFMC website and includes three key elements: 1) expanding existing and creating new inclusive processes, collaborations, and partnerships that facilitate incorporation of multiple knowledge systems into climate planning and response, 2) consider management tools and options focused on the inclusion of existing and emergent climate information, and 3) establish a dedicated review group charged with reviewing and packaging climate information entering Council processes. The NPFMC focused on the first two key elements in creating their work plan with the overall goal of creating more climate-resilient fisheries. They did not focus on key element #3, as they decided to reconstitute the Ecosystems Committee and will specifically task that group with that element. The Council Motion in December 2024 created a climate work plan that incorporated four key elements coming out of the CCTF review: 1) incorporate climate forecast linked management advice, 2) incorporate climate-driven interactions and cascading impacts through use of ecosystem indicators and models, 3) consider and incorporate dynamic management tools to increase in-season adaptation capacity, and 4) review tier systems, consider climate-informed biomass targets and limits and climate-robust or forecast-informed harvest control rules. Element #4 is the start of the Council's Climate Work Plan and was the primary focus of Diana's presentation.

The Council Motion in December 2024 established an SSC HCR Workshop, which was held in June 2025. Key information provided at the workshop and to the SSC were considerations on revising harvest control rules to be more climate resilient. This included:

- Identify available flexibility and/or lack thereof in current groundfish and crab tier systems;
- Identify recent issues by stock with the application of the current system; and
- compile existing literature and ACLIM/GOACLIM results to help inform sensitivity of stocks to HCR shapes compared with biological reference points and/or fishing rate modifications.
 - Council would need to weigh in on policy objectives (including risk tolerance) in modification of HCRs or reference levels.

Diana provided a summary of the HCR workshop schedule (broken into three sessions) followed by a brief review of the role of the plan teams, SSC, and Council in as it relates to establishing ABCs and OFLs, and how they differ between groundfish and crab.

Crab ABC control rules were defined during Amendment 36, with an ABC control rule that uses a P^* of 0.49. That was the risk policy that the Council determined at the time, with maxABC essentially equaling the OFL. However, practically speaking, that has never been used, which is why CPT discusses annually varying buffers. For groundfish, it's more specific because the max ABC control rule provides a buffer that varies by tier. However, in recent years, the GFPT has been using risk tables to set periodic adjustments below that. In the Crab FMP, the ABC is approximately equal to the OFL, while for groundfish, the ABC is set at a level below that. Diana noted that there is flexibility in the FMPs in setting ABC below the output of the maximum ABC control rule. However, there is limited flexibility without amending the FMP to change the OFL control rule, but there is considerable flexibility in establishing something different for a max ABC control rule. Diana flagged for CPT consideration whether the risk policy be reconsidered in light of recent CPT discussions of buffers and annually varying ABCs, and whether it would be more transparent to look at revising harvest control rules rather than using risk tables to have periodic adjustments below that.

Ten different control rules that were considered during the SSC HCR workshop, which are covered in detail in the [white paper](#) posted to the CPT November eAgenda. Importantly, four control rules were moved forward for further consideration based on the June SSC workshop and Council recommendations:

- HCR1 is status quo
- HCR5 looks to buffer stocks by maximizing productivity and increasing reserves
- HCR7 looks to bridge the risk table and look at covariates adjusted HCRs
- HCR10 looks to maximize productivity and increase the reserves

Council requested that the HCR group write a paper summarizing what the objectives of those four harvest control rules are, as well as the simulations to date; this is included in the paper posted to the CPT November eAgenda. That paper was reviewed by GFPT, but it has not yet been presented to the SSC and the Council for review. The goal is to get input from the plan teams and then bring it back to the SSC before making any recommendations to the Council. CPT members discussed HCRs and bycatch interactions with ABCs vs OFLs, the application and utility of “reserves” in crab management, snow crab-specific challenges given the recent population collapse, and acknowledged opposing viewpoints for managing during a decline. CPT

members also expressed concerns over the lack of a crab specific or intentional focus in the HCR work performed to date and expressed a need to determine if the four HCRs examined above included one that would be useful for crab stocks or if something additional was needed.

Diana discussed that the goal of the workplan is to answer questions such as which stocks are most sensitive, which if any should use alternative HCRs, and what options exist for alternative HCRs. The Council specifically requested feedback from the Plan Teams on:

- What HCRs are of interest?
 - SSC/Council focus on 1, 5, 7, and 10
- What species should we focus on first?
 - SSC recommendation for BSAI/GOA Pcod and pollock, sablefish, snow crab, and BBRKC
- What are some performance criteria to include in our evaluations?
- What to include in a work plan (priorities, capacity, evaluations)

These questions were posed to the GFPTs at the September 2025 meeting with the aim of receiving workplan guidance. The GFPTs noted the need to focus on species that are most susceptible to environmental change, adding Pacific Ocean perch to the SSC focus species of Pacific cod, pollock, sablefish, snow crab, and Bristol Bay red king crab.

The conversation at the September GFPT meeting focused on when do you invoke these harvest controls, and should we develop a framework for implementing the alternative control rules? Different ideas were put forward by the GFPTs regarding what a framework would look like and developing alternative frameworks, with the ultimate recommendation that a joint groundfish plan team meeting be conducted in early 2026 to allow for both groundfish plan teams to weigh in as an entire team on what those frameworks are. The concept put forward was having staff work on draft frameworks for when the harvest controls are invoked (and which ones are used), with alternative frameworks provided for consideration, resembling the process of standard council analysis. These draft frameworks would be brought forward at a one-day or half-day workshop in January, followed by a full joint GFPT meeting to review those alternative frameworks. Those recommendations on alternative frameworks would then be put forward in a plan team report.

Diana posed the following questions for the CPT to consider:

- Should alternative HCRs be developed for crab?
 - If so, at the OFL or ABC level, or both?
 - How does this interact with considerations for snow crab HCRs?
 - Timing for providing feedback prior to the February SSC meeting in preparation for the workplan development and review at the June Council meeting?
- Feedback on GPT plans for developing a framework for when/if alternative HCRs should be implemented?
 - Interest in a similar approach from CPT?
 - Participation in workshop/GPT meeting?

- Issues and progress is different so it would be participation but not a joint GF/CPT meeting

Conversation between CPT members focused on the utility of a joint GFPT and CPT workshop/meeting to allow for joint recommendations, fundamental differences between groundfish and crab stocks and state/federal management structure in the application of HCRs, HCR challenges specific to the snow crab stock, potential limitations in crab-specific staff availability for working on these questions, and current meeting scheduling challenges given the ongoing federal government shutdown. CPT participation in a joint meeting may not be productive due to the state of crab HCR modeling compared to groundfish, but members did discuss the utility of attending the groundfish meeting virtually to stay informed in the process. The CPT also noted the lack of progress on crab HCR modeling compared to the status of groundfish and expressed concern that crab stocks have not yet been included fully in the HCR work. CPT ultimately recommended that these questions be discussed in January 2026 immediately before or after the CPT modeling workshop when the full Crab Plan Team can participate, before making recommendations to the SSC on alternative HCRs.

January modeling workshop planning

CPT members discussed topics for the January modeling workshop, planned for January 13-15, 2025. This meeting will be hybrid and open to the public but is not a CPT meeting. Therefore, topics discussed at this meeting are considered to be part of the modeling process and will be vetted by the entire CPT when topics are incorporated into models or at the next official CPT meeting (May 2026) if CPT review is needed.

Tentative topics:

- GMACS short report on version history
 - GMACS to-do list
 - Catch projections at levels of the OFL (SSC suggestion)
 - Jitter guideline for plotting (show a % of runs?)
 - Projection model for Tier 4 stocks needs adjusting (NSRKC)
 - Retrospective - needs to accommodate time blocks (AIGKC)
 - Combined OFL calculation (AIGKC)
 - Selectivity random walk - should focus on comp data not index data (AIGKC)
 - AIGKC specific work on combined model
- Tanner crab
 - GMACS - PIN file
 - Present head-to-head comparison with TCSAM02 assessment model
 - “working” next gen RTMB GMACS prototype
 - BSFRF/NMFS selectivity analysis (Tanner and BBRKC)
 - CIE review - what aspects need to be weighed in on?
- BBRKC - MCMC output & diagnostics

- Model-based indices - NSRKC
- Snow crab - jittering with truncated data

New business

Upcoming CPT meeting dates and locations:

- Jan HCR meeting: likely sometime week of Jan 12th, 2026 (T)
- Jan 13th – 15th, 2026: modeling workshop (location TBD)
- May 11th - 15th, 2026: virtual
- Sept. 14th - 18th, 2026: Seattle, WA

Others in attendance: **indicates presenter*

Jennifer Bell
Kevin J Clark
Scott Goodman
Luke Henslee
Lenny Herzog
John Hilsinger
Wes Jones
Meghan Korte
Patrick Landback
Cory Lescher
Heather Mann

Harrison Moore
Madison Anne Shipley
Chris Siddon
Mateo Paz-Soldan
Diana Stram*
Jared Weems