NORTH PACIFIC FISHERY MANAGEMENT COUNCIL

Angel Drobnica, Chair | Diana Evans, Executive Director
1007 W. 3rd Avenue, Suite 400, Anchorage, AK 99501
Phone 907-271-2809 | www.npfmc.org

BSAI Crab Plan Team
REPORT

January 15, 2026 Seattle, WA

Virtual Meeting

Committee Members in attendance:

Katie Palof, **Co-Chair** (ADF&G-Juneau)
Mike Litzow **Co-Chair** (AFSC-Kodiak)
Anita Kroska, **Coordinator** (NPFMC)
André Punt (Univ. of Washington)
Andrew Olson (NMFS-Juneau)
Ben Daly (ADF&G-Kodiak)
Caitlin Stern (ADF&G-Juneau)
Cody Szuwalski (AFSC-Seattle)

Erin Fedewa (AFSC-Kodiak)
Ethan Nichols (ADF&G-Dutch Harbor)
Ginny Eckert (UAF/CFOS-Juneau)
Tyler Jackson (ADF&G-Kodiak)
William Bechtol (UAF-Homer)
William Stockhausen (AFSC-Seattle)
Vacant, quantitative expert

Members absent: Brian Garber-Yonts (AFSC-Portland)

Council updates

This CPT meeting was convened outside the regular May and September CPT meeting schedule to cover topics that were not able to be addressed due to the government shutdown during the November CPT meeting. The Harvest Control Rule discussion also required timely input from the CPT as this topic is scheduled to go before the SSC at the February 2026 Council meeting.

Anita Kroska (NPFMC) presented brief Council updates, which included a question for the CPT on whether a quick 1-2 page summary document on SAFE formatting would be helpful for stock authors and reviewers. Anita noted that inconsistencies among SAFE documents have been noticed by the CPT co-chairs as well as 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 and are making a running list of more specific guidelines. The CPT plans to discuss these topics at the next scheduled CPT meeting in May.

Harvest Control Rule Discussion

Diana Stram (NPFMC) and Kirstin Holsman (AFSC-Seattle) presented alternative harvest control rule (HCR) options along with tools and approaches to support climate informed management decisions for crab stocks.

The CPT revisited a November discussion on HCRs and refocused on the Federal ABC control rule, with an emphasis on how this work will be reported to the SSC in February and how it fits within the broader climate work plan. The Alaska and GOA Climate Integrated Modeling Project (ACLIM and GOA-CLIM) were discussed as multimodel efforts to identify ranges of uncertainty in climate impacts and risk, with the goal of ensuring alignment with Plan Team needs and providing tools to support climate-informed fisheries management, including "on-ramps" for using climate information.

The discussion then narrowed to the harvest control rule (HCR) step, drawing on the SSC HCR workshop on alternative HCR evaluations through ACLIM and GOACLIM white paper and interactive HCR explorer tool. A suite of HCR scenarios was reduced to four including:

- HCR 1: The status-quo approach
- HCR 5: Extension of the status quo that seeks to maximize ecosystem and spawning biomass productivity by increasing reserves, creating a buffer against environmental shocks. This approach would operate similarly to existing caps on total TACs
- HCR 7: provides a way to transition from qualitative risk tables to a more explicit, analytical approach for species whose productivity is known to vary with environmental conditions.
- HCR 10: builds on HCR 5 by applying a proportional reduction in fishing mortality based on biomass levels, further enhancing stock and environmental productivity through strengthening the buffer against environmental shocks. This approach may improve age class diversity in the population.

The CPT discussed HCR 7 as an encouraging starting point for crab because it offers a transition from qualitative risk tables to a more explicit analytical approach when productivity varies with environmental conditions. HCR 7 works by introducing three parameters (represented as ω) which shift: 1) the F_{ABC}, 2) target biomass, and 3) the limit biomass that results in F = 0. An example of HCR 7 was examined in which there was a negative impact on productivity associated with increasing SST and one of the ω parameters was implemented to have the effect of buffering the F_{ABC} control rule, similar to how it may be done qualitatively using a risk table. Kirstin presented other examples of HCR 7 that varied the other ω parameters to highlight the flexibility of HCR. The concept of adding climate-linked buffers was discussed, noting that current models are climate-naïve despite known positive effects of factors such as the cold pool on survival. The CPT agreed that while climate-enhanced control rules seem best-suited for groundfish stocks, it would be helpful to understand if these HCRs improve management advice before being formally implemented. Moreover, there needs to be a basis to set the ω parameters.

CPT discussion raised concerns about clearly defining simulation objectives including emphasizing recruitment maintenance and productivity rather than simply long-term catch and implied fishing effort. CPT members questioned how proposed HCRs would align with the State TAC setting processes and management objectives under MSA, noting that State HCRs are generally not climate-informed and tend to be more risk-averse than current ABC control rules. Questions were raised about what benefits are actually "banked" by increased reserves in HCR

5, whether leaving crab in the water confers measurable benefits, and the need to ensure appropriate performance criteria and metrics (e.g., catch stability, mature male biomass, effort) are defined. There was strong emphasis on framing HCRs in a way that resonates with State perspectives, developing simulations that capture crab-specific demographics (e.g., male/female dynamics, shell condition), and recognizing stock-specific differences among crab species.

Some participants acknowledged both the value and the limitations of incorporating climate signals given the limitations on current understanding of crab population dynamics , including the lack of robust stock–recruit relationships and uncertainty around biological or environmental reference points, particularly for females. Some advocated for simpler, more static HCRs aligned with historical periods and existing State strategies, cautioning against overly complex hypotheses and simulations with limited real-world utility. Other participants noted that HCRs largely adjust exploitation rates incrementally rather than driving dramatic changes, and that past experience (*e.g.*, Tanner and snow crab) showed challenges in defining triggers and responding when stocks approach collapse.

The group generally supported continued simulation work but recommended prioritizing crab-specific, status-quo-aligned HCR development (for example, including potential use of female reference points) before layering in climate complexity. An important outcome was agreement to ensure crab stocks are fully included alongside groundfish in this process, with continued coordination with State efforts and awareness of potential "double-dipping" if both State and Federal management frameworks are modified concurrently. **The CPT recommends that members work with ACLIM and GOACLIM analysts to adapt the HCRs to be crab specific for at least one *Chionoecetes* and one king crab stock in order to capture the distinct biology of crab with a particular focus on snow and BBRKC. Specifically, this would include working on a more realistic "status quo" HCR (HCR 1) for crab stocks to mimic the current buffer and TAC setting process.**

Chionoecetes maturity data flow

Emily Ryznar (AFSC-Kodiak) presented a new workflow for producing *Chionoecetes* maturity information from the NOAA eastern Bering Sea trawl survey, with key data products including time series of mature crab abundance, annual size-at-maturity (SAM) estimates, and proportion mature at size ogives. The new workflow corrects an error found in the legacy workflow related to subsampling the catch: in Stage 1 sampling, carapace width measurements are taken on a subset of crab in a haul; in Stage 2 sampling, chela heights are taken on a smaller, length-stratified subsample of the males measured in Stage 1. In the legacy workflow, the proportion mature within each size bin of chela data was calculated by weighting a sampling factor that applied to Stage 1 only (i.e., the crab for which size measurements were taken). However, this is incorrect because chela data come from Stage 2, the subset of measured crab for which chela measurements were also taken. In addition to addressing the incorrect commingling of these subsamples, the new workflow provides benefits compared to the legacy workflow that include finer size resolution (5 mm size bins rather than 10 mm size bins), robustness to spatiotemporal gaps in sampling thanks to the use of spatiotemporal models

implemented in sdmTMB, improved treatment of uncertainty achieved by tying uncertainty to sample sizes, full model diagnostics, and weighting of both SAM and ogives by the population size. **The CPT noted that it would be possible to fit the models using a Bernoulli rather than a binomial likelihood, obviating the need to discretize the data.**

Following model selection, the spatiotemporal models selected included a spatially varying effect of size for both snow and Tanner crabs, although the models for the two species differed in the numbers of knots in the spatial meshes and the numbers of size-smooth knots. These models were evaluated using an appropriate suite of diagnostics, and fit the data well. CPT members noted that using spatiotemporal models takes into account spatial variation in maturity at size, which may be important for *Chionoecetes* crab in the Bering Sea. CPT members also noted that one extra component of variance needs to be accounted for in the new workflow: the step in which uncertainty is quantified by summarizing ogive variation across draws appears to be missing the subsampling component of variance. The subsampling fraction itself is uncertain and is regularly accounted for in design-based estimation. This uncertainty could be taken into account by bootstrapping from the subsample of animals for which data are available to the animals for which data are not available. **The CPT recommended incorporating this subsampling component of variance into the new workflow.**

The results from the legacy and new workflows were similar for the time series of mature crab abundance and annual SAM estimates, but differed in some years for the ogives. The new workflow provides uncertainty estimates around the ogives, which is useful in capturing, e.g., the effects of low sample sizes in the largest size bins and annual variation in the spatial variability in the probability of maturity at size. CPT members noted that *Chionoecetes* stock assessment authors will need to update the matrix of proportion mature-at-size annually under the new workflow. **The CPT requested that Chionoecetes stock assessment authors present a comparison of results from models using the legacy versus new workflow data sets at the May 2026 CPT meeting.**

The CPT thanked Dr. Ryznar for a clear and thorough presentation on work that represents important progress in improving Chionoecetes maturity data products.

New business

Anita Kroska (NPFMC) and Katie Palof (ADF&G) reviewed three topics for planning and logistics purposes: CPT meeting timing in 2027, suggestions for the upcoming Tanner CIE review, and data requests for hybrid crab analyses for the May CPT meeting.

As described in October and December 2025 [(E Action Memo Dec 2025)](#), the Council will transition to a 4-meeting/year annual schedule to reduce costs. If plans move forward, the Council will likely shift the June meeting to mid-May. The CPT was asked if there were any implications or additional considerations to take into account if the May CPT meeting were shifted to late April. Feedback included a positive response from those involved in NOAA survey efforts, as this would allow for an easier transition from the meeting time to survey launch. The CPT also noted that although this shift in timing would not impact the opening of any crab

fisheries, it was possible that the fishery for Aleutian Islands golden king crab would not be completed. However, this has occurred in past years and it would not impede the fishery.

The Tanner crab Center for Independent Experts (CIE) Review is scheduled for June 9-11th, 2026. This schedule meant that any CPT feedback on aspects for review had to be solicited prior to the May CPT meeting. Suggestions from the Modeling Workshop were presented to the CPT to allow for any additional feedback, and included:

- Review the bespoke and GMACS versions of the assessment model and make recommendations for improvement, with an emphasis on the transition to GMACS
- Explore reasons for why the current model estimates larger growth increments for males when compared with growth data
- Comment on the appropriateness of equilibrium-based Reference Points and Harvest Control Rules: are $F_{35\%}$ and $B_{35\%}$ reasonable reference point for this stock given that individuals exhibit a terminal molt to maturity
- Review the Bering Sea Fisheries Research Foundation (BSFRF) side-by-side (SBS) data and associated selectivity analysis: what steps should be taken to complete the analysis and how should it be used in the assessment?
- Should the assessment better account for differences in the fisheries and population structure in the State management areas (i.e., east and west of 166°W longitude): what are the costs and benefits? What would make "you" move to a model with two areas?

The CPT did not have any additional suggestions for the Tanner crab CIE Review.

Lastly, Modeling Workshop suggestions to address the SSC's hybrid crab requests (Oct 2025 SSC Report) were presented to the CPT for any additional feedback. The CPT endorsed the following high-level topics to be addressed for the May 2026 CPT meeting (list may not be fully inclusive):

- Tanner and snow crab stock authors complete three model sensitivity runs (including size composition and abundance data):
  - With hybrids included in survey data;
  - With hybrids included in catch data;
  - With hybrids included in both survey and catch data
- Present time series of hybrid data and associated assumptions (NOAA survey data; ADF&G catch data)
- The Kodiak Lab plans to present preliminary research results on the proximate causes of the spike in hybrid abundance, including changes in spatial overlap between snow and Tanner crab stocks.

Upcoming CPT meeting dates and locations:
- May 11th - 15th, 2026: virtual
- Sept. 14th - 18th, 2026: Seattle, WA

Others in attendance: *indicates presenter*

Diana Evans	Kirstin Holsman*	Mateo Paz-Soldan
Scott Goodman	Katie Latanich	Serine Reeves
Melissa Haltuch	Cory Lescher	Emily Ryznar
Madi Heller-Shipley	Tim Loher	Diana Stram
Shannon Hennessey	Danielle Merculief	