



BERING SEA FISHERIES RESEARCH FOUNDATION
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FORGING COOPERATIVE RESEARCH PARTNERSHIPS IN THE BERING SEA

October 2, 2026

Dr. Sherri Dressel, Dr. Jason Gasper, and Dr. Ian Stewart – Co-Chairs
Scientific and Statistical Committee, NPFMC
1007 West Third, Suite 400
Anchorage, AK 99501

RE: C2 – September 2025 Crab Specifications

Dear Dr. Dressel, Dr. Gasper, Dr. Stewart, and SSC Members,

The Bering Sea Fisheries Research Foundation (BSFRF) is a non-profit research organization formed in 2003 by voluntary participants within the Bering Sea crab industry. Our ongoing mission is to conduct or support collaborative research to improve scientific understanding and management of Bering Sea crab stocks. We again appreciate the efforts of the CPT and their recent review of the 2026 BSAI crab survey and assessment results, and the diligence of the assessment authors to, once again, pull together the latest information from surveys and elsewhere for crab stock specifications. We offer our comments for your review, focused mostly on snow crab and *Chionoecetes* hybrid crab.

The crab industry continues to see this time of year as a critical planning period for the current and future seasons. We especially appreciate the continued pattern of early sharing of preliminary information that has been established over the last few years. We are encouraged to see the general, positive signals from survey results, especially for *bairdi*, with additional interest in the large apparent abundance of hybrids, but note our ongoing concerns for the snow crab stock.

Opilio Stock

Our overall comments on snow crab are similar to the last couple of years, with continuing uncertainties around both the stock status and the assessment. We look forward to getting to know the new assessment author, Dr. Grant Adams, and appreciate Dr. Szuwalski's continued persistence in providing guidance on the status of the stock. We acknowledge that the current period of apparent recovery for the stock has several embedded challenging details that are difficult to model, including: a missing survey year (2020), smaller-sized mature males, larger-sized mature females, skewed sex ratios for mature crab, uncertainty about appropriate maturity metrics for management options and overall model performance related to convergence challenges, and the subsequent tier specification change for OFL where the assumptions and reference points used differ substantially between Tiers 3 and 4. In addition, an important stock dynamic to consider relates to the boom in both hybrids and the Western *bairdi* crab stock. **We had hoped that this year's stock assessment would show improved model stability,**

performance, and utility to better match the overall picture for snow crab post-collapse, but the industry is again struggling to understand how the current stock assessment helps with overall management.

Similarly, crab industry stakeholders were looking to this year's NMFS survey trends for continued signs of snow crab recovery. Unfortunately, the 2026 survey results reflect lower snow crab levels, with total stock abundance dropping about 12% (6.3 billion crab), and most male opilio survey metrics reflecting declines. Year-over-year abundance declined 26% for ≥ 95 mm males, 28% for ≥ 101 mm (industry preferred) males, and 41% for new hard-shell males using chela-based maturity. In contrast to the male stock, mature female abundance increased by 95% and is at a time-series high, comprised of strikingly large-bodied opilio females. **The overall trend in the stock from the survey is not what the industry was hoping for after seeing modest increases in the preferred males over the last three survey years, acknowledging that commercial preferred size males ($>4''$) are still near historically low levels.**

In an effort to provide some level of guidance, we have updated a figure we shared last year reflecting a 12-yr glimpse of opilio management (Attachment 1). The mature male biomass, OFL, and ABC are drawn from Table 1 in the assessment, paired with survey indices of biomass (NOAA Tech Memo) and TAC levels. Importantly, the OFL and ABC reflected for 2026 are the currently proposed values. The figure shows the reality for snow crab over this period, which includes the scaling up of the stock biomass (2015-2018), the collapse (2019-2020), the missing survey (2020), the first-ever season closures (2021-2022), and the resulting variability around the recent years' specification. **The industry continues to express frustration in trying to understand the opilio status via the assessments,** and to make sense of the overall management of the opilio stock – through mismatched survey/model trends, high OFL-ABC buffers, and tier considerations.

Despite the challenges for snow crab, we appreciate the extensive efforts to arrive at tractable outcomes for opilio management, including the SSC's deliberations and advice to help industry stakeholders make sense of this period of high uncertainty and identify tractable options for engaging in research to support improved management. **As part of that effort, we are working with ADFG and NOAA partners to develop a management strategy evaluation (MSE) for opilio that considers the currency of management and the role of large males in stock dynamics, among other objectives, to identify harvest control rule changes that are warranted.** We'll be reporting more on this over the next 18 months.

Hybrids

The SSC should be aware of a continuing, substantial increase in the *Chionoecetes* hybrid resource which has been the subject of extensive discussions among stakeholders and managers. We noted this last year in our comment – as the hybrid biomass was growing. The 2025 NOAA survey technical memo reported a nearly 10-fold increase in commercial-sized ($4''+$) male hybrids. **The 2026 survey results from this summer reflect another increase (+51% from 2025), and the commercial male hybrid biomass now exceeds the commercial snow crab biomass (52.3 mill lbs v. 51.3 mill lbs).** We have attached a hybrid summary figure, 'Commercial Male Biomass – Opilio, Bairdi (W), and Hybrids, 2021-2026' to help with a clear understanding of the recent changes in large *Chionoecetes* male crab on the western Bering Sea shelf (Attachment 2). The figure reflects the 'flat' to moderate trajectory for snow crab, but substantial

increases in bairdi and hybrids. We noted last year that typically, hybrids constitute 1-2% of Chionoecetes landings in the eastern Bering Sea (EBS). Further, the biomass signal in the survey is at times confounded by identification uncertainty, but historically has been relatively low in comparison to snow and Tanner crab. In 2025, there was a close review of the strong hybrid signal from survey results to be certain it was valid. The 2026 results corroborate the strong and increasing presence of large male hybrids. The BSFRF science team has refreshed a set of summary bullets to address questions in some specific areas that we have shared with stakeholders and resource managers (Attachment 3). We highlight those considerations for the SSC again, understanding that hybrids are not a rationalized or an FMP-defined resource and that any advice may be ad hoc at this point. **Importantly, the survey estimate of 52.3 million lbs of 4"+ hybrid male crab is also reflecting larger body size in size composition plots, with more crabs approaching 5" carapace width than last year. A review of this year's spatial survey results also shows more overlap between bairdi, opilio, and hybrid biomass than last year. Looking forward, the hybrid pulse appears to be growing and could soon exceed Western bairdi biomass.** We acknowledge that access to the hybrid resource is confounded by its mixing with the other two stocks, that current fishing and management has limits to flexibility, and that removal of too many large opilio is a substantial concern. Last year's approach to access hybrids by adding an amount to the opilio TAC had limited success, and there may not be an easy option for this year without broader coordination. However, as the hybrid stock continues to increase, we need a more concerted, high-priority effort focused on hybrids to improve management options. **We would welcome a specific recommendation from the SSC to that end – such as a hybrid research and management workshop coordinated as soon as possible. Given limited time and resources to address emerging hybrid issues, BSFRF could assist with this effort.**

We offer these comments to you as you hear from CPT members and other stakeholders and consider appropriate status determinations and crab specifications for each stock. We are happy to answer any questions that you may have for us.

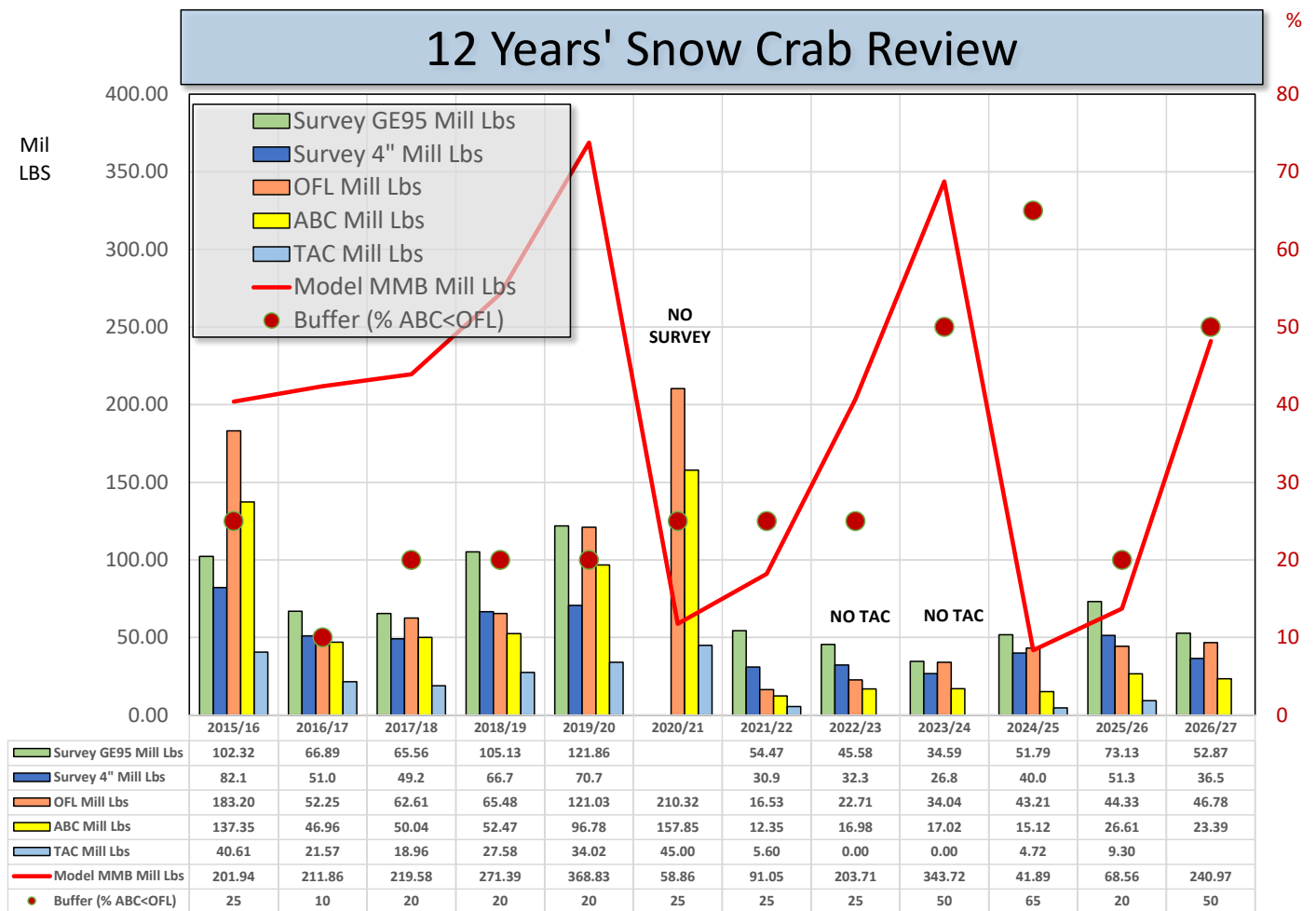
Thank you for your time and consideration.

Sincerely,



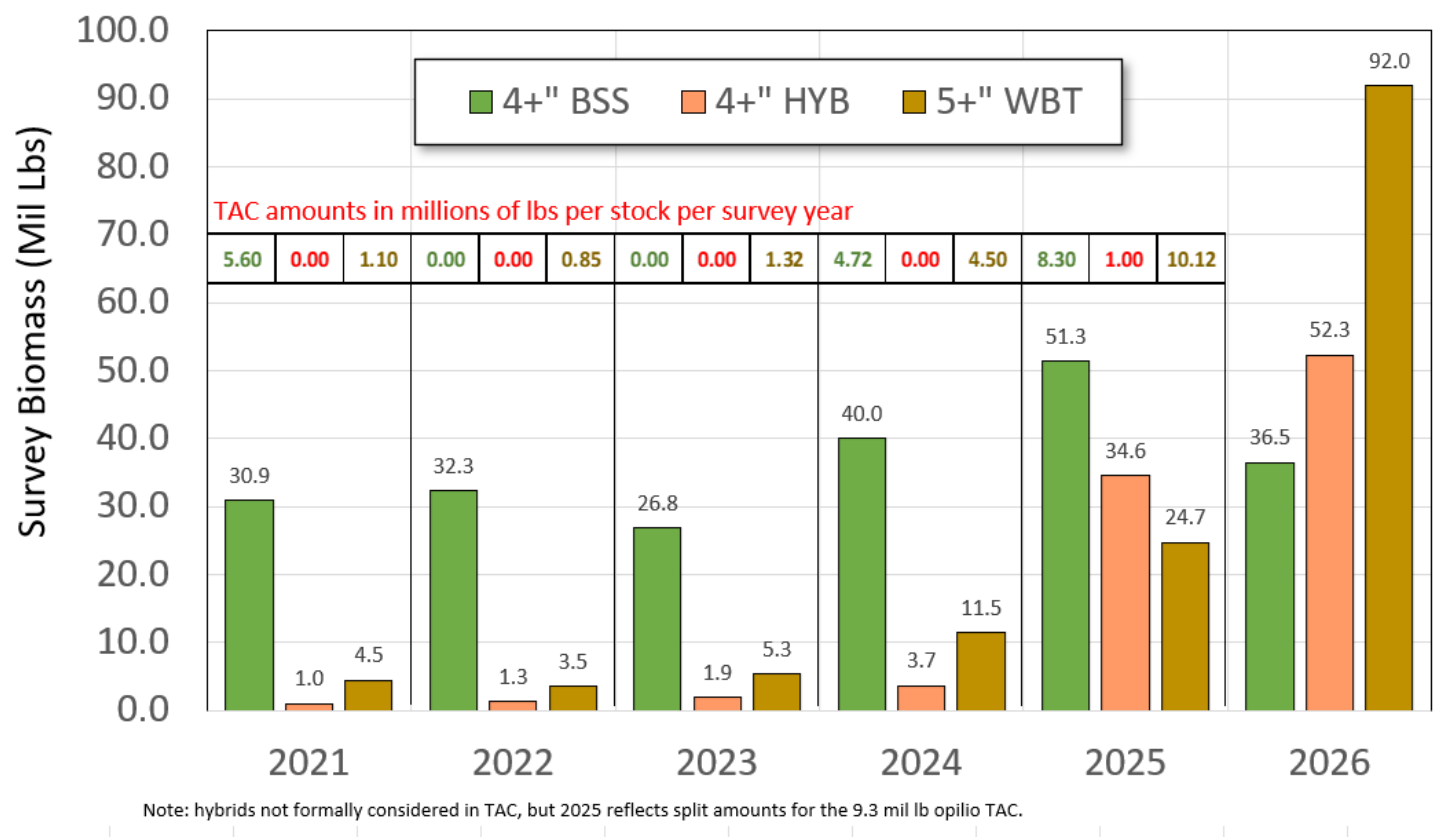
BERING SEA FISHERIES RESEARCH FOUNDATION
Scott Goodman
Executive Director

Attachment 1 – 12-Yr history of snow crab management



12-yr history of snow crab management values are drawn from three sources. Survey biomass values for 95+ mm CW males and 101+ mm CW (4"+) males are from the 2026 draft NOAA Tech Memo (Table 25, tons converted to lbs). OFL, ABC, and buffer values are from published crab SAFE Intros and the current 2026 SAFE intro. The Model mature male biomass (MMB) values are from the 2026 opilio SAFE Table 1. The MMB values are the historical estimates per year (matching the historic and updated values in the published SAFE intro tables for opilio).

Commercial Male Biomass - Opilio, Bairdi (W), and Hybrids, 2021-2026



Attachment 3 – 2026 Hybrid *Chionoecetes* Considerations

The issue

Typically, hybrids constitute 1-2% of *Chionoecetes* landings in the eastern Bering Sea (EBS). For regulatory purposes, the state considers *Chionoecetes* with two red eyes and an M-shaped mouth as Tanner crab (*bairdi*), whereas anything else, including crab with characteristics typical of hybrids, is considered as a snow crab (*opilio*). However, during EBS trawl survey processing, hybrids are not identified as *opilio*. Rather, they are segregated into a hybrid category that does not contribute to the estimation of *opilio* abundance. Thus, landed hybrids count toward the snow crab TAC without contributing to the magnitude of that TAC, effectively providing a buffer on the snow crab TAC. In 2025, the NMFS summer trawl survey indicated a dramatic increase in the number of hybrids in the EBS to the extent that about 1/3 of all *Chionoecetes* commercial males in the west side of the eastern Bering Sea were hybrids. The 2026 survey reflects further increases in large hybrid males, such that current commercial hybrid biomass exceeds that of snow crab. Given this, there is considerable interest in the possibility of an independently computed hybrid TAC that would be additive to the snow crab TAC, allowing for a larger fishery commensurate with the abundances of the various components of the *Chionoecetes* complex, if efforts could be coordinated to reduce potential impacts on large male snow crab. This interest raises a number of considerations to be addressed.

Biological Considerations

- What would be the benefits or deleterious effects of reducing hybrid abundance? Is there an effect on stock dynamics? Should harvest rate be high or low? Specifically, how should we view hybrids ecologically? For example:
 - Are hybrids a beneficial development in the evolution of snow crabs that will make them less vulnerable to climate change and heat waves? If so, should they be protected?
 - Or, are they a maladapted form of *Chionoecetes* that reduces the fitness and productivity of the genus (for example, due to their lower fecundity than either parent species), for which very high harvest rates should be applied?
- What effects on size at terminal molt in *opilio* might hybrids have: for example, can large male hybrids cause juvenile male *opilio* to delay their molt to maturity, or do they have little or no effect on *opilio* molt decisions?
- Is there a relationship between the abundance of hybrids in the survey and the numbers of hybrids in the landings? This relationship may not be simple. It may involve the degree of overlap between hybrids and both snow and/or Tanner crab as a function of temperature, as well as the grounds actually fished by the fleet.

Economic Considerations (not directly addressed by BSFRF)

- Is there a flavor difference between hybrids and *bairdi* of the same size? Would processors be able to market large hybrids as *bairdi*? Are processors willing to accept deliveries with a large proportion of hybrids?
- Do processors pay (or receive) a differential price for larger vs. smaller *Chionoecetes*?
- Do processors pay (or receive) the same price for hybrid vs. snow or Tanner crab?

Regulatory Considerations

- What can be done under the current FMP and BOF constraints? Is an FMP amendment or state regulatory revision required to provide for a hybrid harvest?

- Are there current requirements for optimal yield (OY) of hybrids as specified by the Magnuson Stevens Act (MSA)? Or do these requirements only apply if hybrids are an FMP species? OY is calculated based on maximum sustainable yield, reduced by relevant social, economic, and ecological factors.
- Which definition of hybrid is the most appropriate to use in calculating hybrid abundance: the “survey” definition (i.e., based on ~6 attributes) or the “commercial” definition (i.e., based simply on eye color and mouth shape)? Would abundance based on the latter be markedly different from estimates from survey data?
- Would it be possible to harvest hybrids as *opilio* even if the “purebred” *opilio* ABC is too low to allow a targeted *opilio* fishery?
- If spatial management were an effective tool for adding TAC intended to allow hybrid harvest, what would need to change (e.g., legislatively or within the FMP) to allow ADF&G to create spatial harvest boundaries? That is, we have been told that ADF&G cannot open specific areas to hybrid harvest; they can only close areas as TAC of either *opilio* or *bairdi* is reached. What would need to occur to allow that management strategy to be reversed?
- Does it make more sense to consider all crab with two green eyes and a straight mouth as snow crab and everything else as Tanner crab?
- Would it be possible to regulatorily define hybrids as either species, depending upon size? For example, can crab ≥ 127 mm be defined as *bairdi* and smaller individuals as *opilio*, for harvest considerations?

Practical Considerations

- Are we experiencing a short-term spike in hybrid abundance, or is the expectation that hybrids will continue to provide a significant biomass of males ≥ 101 mm CW requiring a long-term plan?
- If a TAC were added to the *opilio* TAC to account for the estimated number of harvestable hybrids, with the understanding that the hybrids would be harvested to the northeast of the Pribilofs and not on the northern *opilio* grounds, how many vessels would actually target the hybrid grounds?
- Would it be helpful (or necessary) for a clear definition of “hybrid” to be added to the FMP?