March 29th, 2024

Ms. Angel Drobnica Chair
North Pacific Fishery Management Council
1007 West Third, Suite 400
Anchorage, AK 99501

RE: Comments on Agenda C-2 Bering Sea Chum Salmon Bycatch Management

Dear Chair Drobnica and Council Members:

The At-sea Processors Association ("APA") appreciates the opportunity to comment on Agenda item C-2, Bering Sea Chum Salmon Bycatch Management. APA is a trade association representing five companies that own and operate 15 U.S.-flag catcher-processor vessels that participate in the Bering Sea / Aleutian Islands ("BSAI") Alaska pollock fishery. The members of the APA understand the importance of minimizing salmon bycatch in these times of salmon collapses in Western Alaska. Our captains' fishing decisions are centered on avoiding salmon using real-time data and every tool available—at all times.

Members of the APA have consistently demonstrated a strong commitment to minimizing salmon bycatch, whether through funding of dedicated salmon research, development of salmon excluders and bycatch mitigation strategies, or proactive changes to our Incentive Plan Agreement (IPA). We recognize the importance of chum salmon bycatch reduction given the recent salmon run declines in Western Alaska – which have threatened food security and cultural survival – and continue to be proactive and constructive partners in a shared salmon conservation goal.

Since 2011, the catcher processor sector has operated exclusively under an IPA regulatory program to reduce salmon bycatch. Incentive Plan Agreements (IPAs) require NMFS regulatory approval, and IPAs must demonstrate on an annual basis that they are meeting the regulatory requirements of the program through reporting to the Council. The legally binding agreement, with strict financial penalties and clear economic incentives, requires the fleet to meet 13 specific regulatory objectives in reducing both Chinook and chum salmon at any level of abundance.

The Preliminary Draft EIS Bering Sea Chum Salmon Bycatch Management document (DEIS) and Social Impact Assessment for Bering Sea Chum Salmon Bycatch Management (SIA) provide a tremendous amount of information. The DEIS and SIA highlights the important role the pollock fishery plays in supporting Western Alaska communities[1,2]. APA members harvest all CDQ pollock allocations, and the 65 CDQ Program communities with nearly 30,000 Western Alaskan residents have substantial ownership in our sector. With poor crab abundance, and challenging markets, the value of direct investments in the pollock fishery support CDQ groups and investments those groups have made in their communities as well as other fisheries[3]. The DEIS also highlights for the first time the sector specific impacts to WAK chum, with APA members harvesting B season pollock predominantly in genetic clusters 3 & 4, where

[1] Section 6.1.10.2, Pages 191-193, DEIS
[2] Section 4.2, Pages 72-93, SIA
[3] Figure 6-33 & Table 6-29, DEIS Addendum

Western Alaska (WAK) chum salmon proportions are typically lower[4].

Although the DEIS contains a wealth of information, our comments suggest several areas that could be enhanced in the document.

Limitations of some Alternatives to meet Purpose and Need

While we are committed stewards of the marine environment as our livelihoods depend on sustainable fisheries, there should be a clear understanding for the public and policy makers as to what this action can and cannot do to further conservation of WAK chum salmon stocks. While the basis for adjustments to the management of chum salmon bycatch in the pollock fishery has been framed in the public realm as necessary to meet equity and fairness goals, the best available science suggests the pollock fishery's ability to improve in-river returns is limited. This is underscored by recent peer reviewed science highlighting the myriad of environmental factors related to chum salmon declines and is summarized well in the *Description of the Problem Being Addressed*[5] as well as Section 6.1.3 of the DEIS.

Statements that assert reductions in pollock fishery chum salmon bycatch: *...could increase escapement which is necessary for the long-term sustainability of chum salmon fisheries*[6]; and *...could potentially have some positive benefit on the number of chum salmon that return to Western Alaska rivers. Any additional chum salmon returning to Alaska river systems improves the ability to meet the State's spawning escapement goals which is necessary for the long-term sustainability of chum salmon fisheries*.[7] are logically correct on their own but fail to address the uncertainty that any of the bycaught fish would return to spawn given the high levels of natural mortality and additional fishing effort between pollock fishing grounds and spawning beds of interior Western Alaska. Nor do the statements and conclusions about possible benefits of this action address the statistical significance of total WAK chum bycatch numbers across such a large geographical range and total returns. The Council and public may erroneously conclude that some alternatives being considered could have significant implications for meeting escapement goals as well as long-term sustainability for WAK chum salmon, which is not supported by the best available science.

There is an extensive discussion in sections 6.1.4.5-6.1.4.7 of the DEIS regarding the data limitations to estimate an impact rate or Adult-equivalency (AEQ) for chum salmon bycatch in the Bering Sea pollock fishery. However, recent Council publications have directly addressed this question, see for example: *In all but the highest years (e.g., 2007), Chinook salmon bycatch in the Bering Sea is less than 3% and Chum salmon bycatch is less than 1% of the total returns to Coastal Western Alaska Rivers*[8]. We compiled publicly available data to show a minimum estimate of total WAK chum returns, which would reflect a maximum total global impact across all combined river systems. The Table 1 below should be noted for the following missing data: 1.) No Kuskokwim data is included prior to 2017. 2.) No subsistence data is included apart from the post-2018 Bethel (Kuskokwim) and Pilot Station (Yukon) sonar counts. 3.) No escapement data is included for Norton Sound or Kotzebue Sound river systems. 4.) No Area M June

[4] Figures 6-11 & 6-15, DEIS
[5] Page 14, DEIS
[6] Page 13, DEIS
[7] Page 20, DEIS
[8] https://www.npfmc.org/wp-content/PDFdocuments/bycatch/BeringSeaSalmonBycatchFlyer.pdf, accessed 28 March 2024.

fishery data is included. 5.) Pollock fishery bycatch would be some number less due to natural mortality and variable age composition. Over the recent time series 2011-2023, the WAK chum salmon bycatch in the pollock fishery as a percent of total known WAK chum salmon returns was just 1.2%. Thus, the absolute maximum possible impact the pollock fishery could have had on increased chum salmon returns to WAK river systems is some amount less than 1.2%. This information is critical to balancing the tradeoffs and meeting expectations for this action and should be highlighted more robustly in the document.

Table 1. Total known WAK chum includes the combined Yukon and summer fall chum (Pilot Station sonar), Kuskokwim Bethel sonar counts from 2018 onward, Bristol Bay westside (Nushagak & Togiak) catch + escapement, Norton Sound commercial catch, Kotzebue district commercial catch.

Year	Total known WAK chum	WAK + Mid/Upper Yukon pollock fishery bycatch	Maximum % Impact
2011	4,002,868	45,791	1.1%
2012	4,048,647	3,932	0.1%
2013	5,325,742	31,488	0.6%
2014	4,366,124	40,365	0.9%
2015	3,609,551	43,323	1.2%
2016	4,373,180	76,791	1.7%
2017	6,975,772	96,070	1.4%
2018	6,016,384	58,810	1.0%
2019	5,016,326	55,862	1.1%
2020	1,507,492	28,694	1.9%
2021	691,944	50,797	6.8%
2022	1,742,092	54,108	3.0%
2023	1,963,234	11,786	0.6%

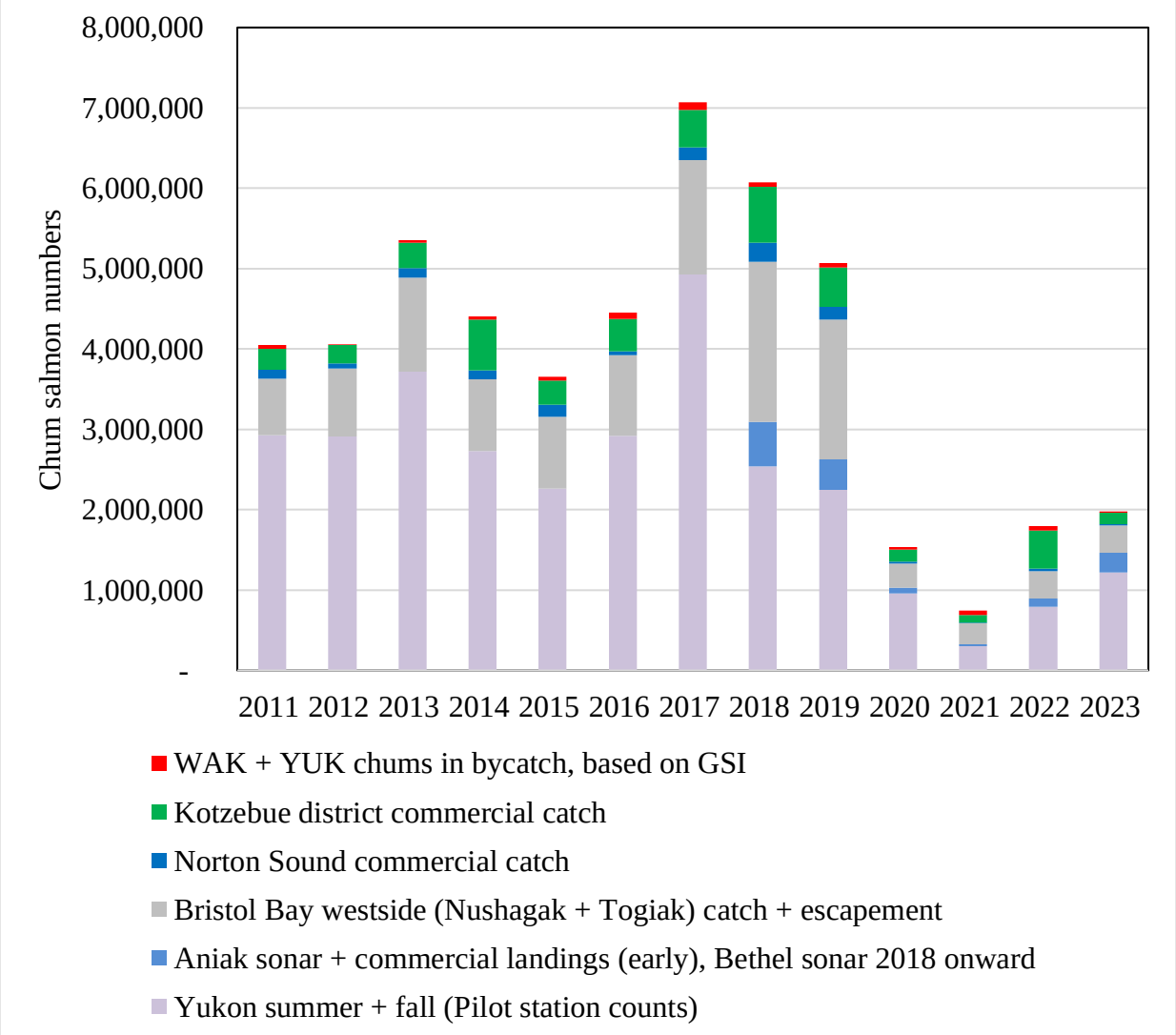
A footnote on page 143 of the DEIS asserts that WAK chum salmon removals may negatively impact discrete spawning stocks, especially at low abundance levels (e.g., in 2020-2023). However, there is no evidence to suggest that pollock fishery WAK chum removals are having disproportionate effects on discrete stocks, while there is evidence to suggest that removals are proportional to run strength given data available from the Kotzebue stock group relative to the combined WAK group. Despite this, in an effort to illustrate a disproportionate worst case impact scenario, we looked at Kuskokwim and Yukon River chum salmon sonar counts for 2023, which include a 95% or 90% confidence interval for the annual point estimates. Even if one were to assume that all WAK chum salmon caught as bycatch in the pollock fishery were bound for one river system, in most years, total WAK chum bycatch in the pollock fishery is less than the confidence interval for individual river systems for which data exists. For example, in 2023, even if the total 10,719 WAK chum salmon caught as bycatch in the pollock fishery were all to return as Yukon Summer chum salmon, they would be well within the 90% confidence interval for total returns (35,973 fish), similarly the Kuskokwim River point estimate had a 95% confidence interval for total returns of 40,612 chum salmon[9].

[9] https://www.adfg.alaska.gov/index.cfm?adfg=commercialbyareayukon.salmon_escapement and

In other words, assuming a maximum possible impact scenario to either the Yukon or Kuskokwim River systems in 2023, coupled with perfect marine survival, the complete absence of a pollock fishery would have yielded no statistically measurable increase to the overall chum returns. The DEIS would benefit from contrasting the effects of reducing WAK chum bycatch in the pollock fishery to statistically measurable increases in chum salmon returns across Western Alaska. Even in an implausible scenario, the individual WAK chum salmon stock benefits would not be detectable in most years.

The figure below demonstrates visually for the Council and the public the extremely limited impact this action can have. The Council can only manage and reduce the "red bars" in this graph, which again are reflected as a maximum component of total WAK chum salmon numbers.

Figure 1. WAK chum bycatch in the pollock fishery and available WAK chum catch & escapement data.



https://www.adfg.alaska.gov/index.cfm?adfg=commercialbyareakuskokwim.emihd accessed 28 March 2024.

Russian/Asian Hatchery Chum Salmon Confounds Bycatch Avoidance

The purpose and need for this action is to reduce the Western Alaska component of chum salmon bycatch in the Bering Sea pollock fishery. However, Alternative 2 and 3 introduce management strategies that emphasize reductions in overall chum salmon bycatch without considering unintended management outcomes for WAK chum bycatch. Under the Council's management measures for Chinook salmon, which include an overall hard cap, every Chinook regardless of stock ID is to be avoided and vessel behavior is therefore driven strictly by bycatch rates. That is, the fleet constantly moves to areas where their Chinook per pollock rate is low. A hard cap for chum salmon, would elicit similar behavior: vessels will move to areas where chum per pollock rates are low. While this may seem like a beneficial outcome, it fails to account for the predominance of Russian (N.E. Asian)/Asian (S.E. Asian) hatchery fish on the fishing grounds, and the fact that areas with the lowest chum bycatch rates often have higher proportions of WAK chums**. Thus, a hard cap would incentivize vessels to prioritize fishing locations with the lowest rate of chum salmon bycatch in order to stay below a total chum cap, while simultaneously deemphasizing avoiding areas that historically have high incidence of WAK chum salmon.**

Currently, the overwhelming predominance of Russian and Asian hatchery chum salmon on the fishing grounds is a significant factor driving bycatch avoidance and vessel behavior. In 2021, the pollock fishery took more than 545,000 chum salmon. More than 303,000 of those were estimated to be Russian hatchery chum salmon, while another 64,695 were estimated to be Asian hatchery chum salmon. In that same year, the combined WAK chum salmon stocks, totaled an estimated 51,512 chum. The resulting June 2022 Council direction was to 'immediately implement additional chum salmon bycatch avoidance measures in the 2022 B season pollock fishery'. Additional efforts to avoid all chum salmon bycatch were made in 2022, resulting in the pollock fishery reducing overall chum salmon bycatch by more than half (242,309 total) with increased bycatch of WAK chum salmon specifically. This was done by avoiding acute bycatch spikes of hatchery chum salmon (i.e. areas with the highest rate of chum salmon per ton of pollock) and moving vessels towards lower rates of bycatch that most likely also included areas with higher proportions of WAK chum salmon. The net result was a 262,538 reduction in Russian and Asian chum salmon catch, while total combined WAK chum salmon catch rose to 55,724. While it's likely that environmental conditions also contributed to reduced chum salmon bycatch, **it's clear that a hard cap management approach that emphasizes reductions of all chum salmon is likely to have net negative effects on WAK chum specifically**.

To summarize, there is no direct evidence in the DEIS to assert that Alternative 2 or 3 would provide any additional tools for the fleet to avoid WAK chum salmon specifically, and thus both fail to meet the purpose and need for action. Furthermore, hatchery releases of Russian chum salmon have been increasing by an average of 61 million per year since 2000 alone[10], and the Council has no control over future releases of hatchery chum salmon in the North Pacific Ocean. Nor does this action and DEIS consider future underlying oceanographic and climatic conditions that may force large volumes of non-WAK chum salmon into the Bering Sea to feed during the summer.

Section 6.1.2.1.3 of the DEIS provides extremely basic and brief information about hatchery releases, while the impact and confounding nature of hatchery fish in efforts to avoid WAK chum salmon is not well articulated. As noted in Figure 6-4, more than 3 billion chum salmon smolts are released into the North Pacific annually, but the analysis does not consider how many of those survive and forage in the Bering Sea and subsequently interact with the pollock fishery. Literature derived chum salmon survival

[10] https://www.npafc.org/ See Russian whole country hatchery release statistics. Accessed 28 March 2024.

estimates[11] would suggest 94 million hatchery chum salmon from 2022 releases will survive and subsequently forage in the North Pacific Ocean. A significant but unknown proportion of those chum salmon will be present in the Bering Sea given their dominance in pollock fishery bycatch and other adjacent Alaska state waters fisheries[12]. We request the next iteration of this analysis visually display the expected hatchery survival and abundance of total chum salmon estimates relative to the WAK stocks. This would provide context to the discussion, particularly given more than 80% of the chum salmon encountered in the Bering Sea are not returning to rivers there.

Alternative 4 Incentivizes WAK Chum Avoidance

APA believes the IPA program (Alternative 4) continues to be the best method to achieve the objectives currently in regulation and articulated within the purpose and need. Total chum salmon bycatch numbers in the pollock fishery are largely driven by the presence of hatchery fish in the Bering Sea, ocean temperatures, and pollock distributions. Likewise, our understanding of the location and timing of WAK chum on the pollock grounds is constantly improving[13], while the longer-term population trends of discrete WAK chum stocks are highly variable. IPAs are the most adaptive and responsive management tools to account for these factors because they apply at the vessel level and can enact closures and re-direct fishing effort in near-real time, something that NMFS in-season management cannot do. Due to the federal rulemaking process and other statutory constraints, the Council and NMFS are not able to act in such a responsive manner. Furthermore, IPAs can establish incentives that focus avoidance measures to achieve the objectives outlined in the purpose and need, *…to minimize bycatch of Western Alaska chum salmon in the Eastern Bering Sea pollock fishery…* at the same time also *…to achieve optimum yield in the BSAI groundfish fisheries on a continuing basis*…

The continuous refinement of genetic information, through more refined analysis of genetic samples (e.g.: Kotzebue Sound GSI, pollock sector, fishing area, finer temporal scales), has greatly improved our understanding of areas and times when WAK chum salmon are most likely to be present. For example, this DEIS was the first time IPA managers have seen sector level estimates of WAK chum bycatch for the complete time series (2011-present). Thus, future analysis of spatial VMS tracks from our pollock fleet (CP and CDQ) and comparisons with the breakdown of estimated catches by stock group across years may elucidate when and where the WAK chum were most likely encountered on the fishing grounds. Through every new year of spatial fishing information and genetic composition data we can further refine the boundaries of when and where WAK chum were most likely encountered and therefore target future avoidance of WAK chum. However, it's important to understand that environmental dynamics play a critical role in the variability of both chum salmon and pollock distributions. The IPA is best positioned to incorporate and optimize the disparate pieces of information that drive the pollock fishery's interactions and avoidance of chum salmon.

We request that the next iteration of this analysis include an extensive discussion of spatial chum catches relative to stock proportions by year and fleet. This would serve to outline areas and times where WAK chum are most likely to occur and narrow the range of management tools the pollock fishery could utilize

[11] Zavarina, L.O., 2003. Chum salmon. P. 79-82 in Condition of biological resources of the North-West Pacific. Siniakov, S.A., N.I. Naumenko, Yu.P. Diakov, O.G. Zolotov, and B.B. Vronsky (Eds.). Petropavlovsk-Kamchatsky, KamchatNIRO.

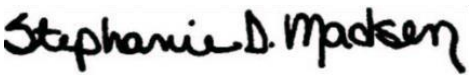
[12] Figure 6-18, DEIS

[13] Initial genetics reporting was significantly delayed and only provided the basic information that genetic clusters 1 and 2 and the first half of the B season had a relatively higher incidence of WAK chum salmon. Today, we can assess genetic composition patterns at much more refined scales thanks to the incredible work of Auke Bay Lab and SeaState analytics.

to improve avoidance of WAK chum salmon specifically while harvesting their pollock allocations. A more detailed discussion of spatio-temporal genetic bycatch trends would also allow the public more transparency and accountability in future IPA reporting.

We commend the authors for the extensive volume of information compiled in the abbreviated timeframe and look forward to the Council's discussion and input to staff at this meeting. We request our suggested information be included in the document so the public can further benefit from the DEIS.

Sincerely,



Stephanie Madsen
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At-sea Processors Association