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April 3, 2023

Simon Kinneen, Chair
North Pacific Fishery Management Council
1007 West Third Ave., Suite 400 Anchorage, Alaska 99501

Re: Agenda Item C2, Salmon Bycatch Reports

Mr. Kinneen:

The Boat Company is a charitable foundation with a 40 year history of operating in Alaska where it conducts multi-day conservation, education, sport fishing and adventure tours in Southeast Alaska aboard two small cruise vessels. The Boat Company's charitable work focuses on Alaska conservation issues, including the protection and maintenance of salmon and their habitat which support diverse community fishing economies throughout Alaska. The Boat Company requests that the North Pacific Fishery Management Council ("Council") include chum salmon bycatch limits among the alternatives recommended for addressing chum salmon bycatch and consider additional bycatch management measures to address ongoing Alaska Chinook stock struggles.

Move forward with analysis of abundance-based and time and area-based chum bycatch limits

The Council's Salmon Bycatch Committee's proposed purpose and need statement recognizes that Western Alaska chum salmon stocks have collapsed with repeated escapement goal failures despite severe restrictions to subsistence and commercial fisheries. The statement identifies environmental factors such as changing freshwater and marine environments as leading causes of run failures but recognizes that pollock industry chum bycatch reduces returning numbers of salmon.

Substantial proportions of the bycatch are from western Alaska.[1] Between 2011-2021, average bycatch of western Alaska chum and Yukon River chum was roughly fifty-thousand fish.[2] In 2022, pollock industry bycatch of Yukon River, western and southwestern Alaska chum was 64,456 fish.[3] These stocks comprised over a quarter of the total 242,375 fish bycatch. [4] The proportion of western Alaska chum (21%) was the highest proportion over the past ten years, more than twice as high as in 2020 (8.0%) and 2021 (8.9%) and higher than the long-term average (2011-2021) of 14.8%.[5]

The Salmon Bycatch Committee developed three action alternatives: (1) Alternative 2, which would establish chum bycatch limits and/or area closures through several options; (2) Alternative 3, which would add time and area closures during B season in two areas implemented by the industry or by NMFS and (3) Alternative 4, which would add new chum avoidance requirements for pollock industry Incentive Plan Agreements. Committee members from western Alaska communities that depend on salmon fisheries submitted Alternative 2. Options 2 and 3 would establish bycatch limits of zero, 22,000 or 54,000 chum salmon based on either a percentage of historical bycatch levels or triggered by multiple chum abundance metrics from 3 river systems. Option 4 proposes bycatch limits based on spatial and temporal management.

The Boat Company requests that the Council maintain and move forward with these multiple means to develop and analyze chum salmon bycatch limits under proposed Alternative 2. Consideration of various alternative means of achieving the purpose of a proposal is an important function of the National Environmental Policy Act because it helps to further define the key issues, improve the environmental analysis and inform public participation and agency decisionmaking.[6]

The development and analysis of an alternative or alternative sub-options linked to abundance-based metrics could align bycatch and salmon fishery management. Federal management of Alaskan chum salmon taken as bycatch is very different from the management of Alaska salmon fisheries. Alaska salmon fishery managers use escapement goals to maintain salmon productivity for directed fisheries.[7] Regulations require conservative management responses to escapement failures.[8] There is currently no operational bycatch limit for chum. Prior to 2016 pollock trawlers operated a rolling hotspot program to avoid areas of high chum bycatch. Regulations implemented in 2016 incorporated chum salmon avoidance into the Incentive Plan Agreements that are part of the Chinook bycatch management program.[9] Given the poor returns, consideration of another management approach is needed.

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1 Kondzela, C.M., J.A. Whittle, P.D. Barry, Hv. T. Nguyen, E.M. Yasumiishi, D.W. Nicolls, J.T. Watson & W.A. Larson. 2021. Genetic stock composition analysis of chum salmon from the prohibited species catch of the 2019 Bering Sea walleye pollock trawl fishery. U.S. Dep. Commer., NOAA Tech. Memo. NMFS-AFSC-422, 69 p.

2 NPFMC. 2022. Discussion Paper D1 Chum Salmon Bycatch (November 15, 2022); P. Barry, C. Kondzela, J. Whittle, J. Watson, K. Karpan, K. D'Amelio, & W. Larson Genetic Stock Composition Analysis of Chum Salmon from the Prohibited Species Catch of the 2021 Bering Sea Walleye Pollock Trawl Fishery Report to the North Pacific Fisheries Management Council. Agenda Item D1b BS Chum Salmon Bycatch Genetics 2021 June 2022.

[3] P. Barry, Kondzela, C., Whittle, J., D'Amelio, K., Karpan, K., Nicolls, D. & Watson & W.A. Larson, W. 2023. Genetic stock composition analysis of chum salmon from the prohibited species catch of the 2022 Bering Sea walleye pollock trawl fishery. Preliminary Report. North Pacific Fishery Management Council Agenda Item C2. March 28, 2023.

[4] *Id*.

[5] *Id*.

[6] 40 C.F.R. § 1502.14; *see also Barnes v. U.S. Dep't. of Transp.,* 655 F.3d 1124, 1131 (9th Cir. 2011); *Westlands Water Dist. V. U.S. Dep't of Interior,* 376 F.3d 853, 872 (9th Cir. 2004)(citations omitted).

[7] 5 AAC § 39.222 (Policy for the Management of Sustainable Salmon Fisheries).

[8] 5 AAC § 39.222.

[9] 50 C.F.R. § 679.21(f)(12)(E); (14)(i), (iv), NPFMC. 2020. Bering Sea/Aleutian Islands FMP at 33 § 3.5.2.1.2, 46 § 3.6.2.1.7

Any or all of a combination of failures to meet subsistence needs, escapement failures or other available data such as directed fishery CPUE or in-river fish counts would be an appropriate metric to trigger a lower bycatch limit in the following year. Over 27 percent of the 2022 Western Alaska chum bycatch were age 4 and otherwise could have returned to contribute to escapements. [10] The chum life cycle can be highly variable in terms of their spawning age.[11] Chum typically return to spawn between three and five years old and most frequently at age 4.[12] Historically, over two-thirds of the chum returning to the Yukon River were age four; five year old fish were the second most common returning age of spawners.[13] Most of the chum taken as bycatch are adult fish age three and four.[14] Each successfully spawning chum on average generates nearly two returning fish.[15] In other words, a bycatch limit that responds to poor escapements or other abundance metrics could allow for more returning chum the next year and provide for better future returns.

Past, recent and ongoing chum genetic stock composition analyses can inform the development of another alternative or sub-option that links bycatch limits with the spatial and temporal distribution of chum salmon bycatch.[16] The largest numbers of bycaught chum that originate in the northeastern Pacific – whether from western Alaska or other parts of Alaska – occur east of 170° longitude.[17] Most of the bycatch of western Alaska or other Alaskan fish there occurs during the middle of the B season, frequently in pulses such as in mid-July and mid-August in the eastern portion of the Bering Sea in 2021.[18]

Western Alaska and U.S. chum support high value fisheries

Chum are normally the most abundant salmon species in western Alaska and are critical for subsistence and commercial fisheries.[19] The Yukon and other western Alaska rivers support stocks from five ADF&G management areas, including the state's northernmost commercial salmon fishery.[20] Chum salmon are increasing in value, with ex-vessel prices ranging from 95 cents per pound in Norton Sound to $1.18 per pound in Southeast Alaska, with fillets from Southeast Alaska retailing for $20 per pound.[21] Yukon River and western Alaska chum have the potential to generate higher values because of niche marketing that can take advantage of higher fat and omega-3 fatty acid levels oil contents that make them a healthy and flavorful favorite of chefs

[10] Barry, P. et al. 2023.
[11] Johnson, O.W., Grant, W.S., Kope, R.G., Neely, K.G., Waknitz, F.W. and Waples, R.S., 1997. Status review of chum salmon from Washington, Oregon, and California.
[12] *Id.*
[13] *Id.*
[14] Kondzela, C.M. et al. 2021.
[15] Joint Technical Committee of the Yukon River U.S./Canada Panel. 2021. Yukon River salmon 2020 season summary and 2021 season outlook. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 3.A21-01, Anchorage. Appx. A.
[16] *See e.g.* NPFMC. 2022. Discussion Paper D1 Chum Salmon Bycatch (November 15, 2022).
[17] Barry, P. et al. 2023; Barry, P., et al. 2022.
[18] Barry, P. et al. 2023; Barry, P., et al. 2022.
[19] Westley, P.A.H. 2020. Documentation of en route mortality of summer chum salmon in the Koyukuk River, Alaska and its potential linkage to the heatwave of 2019. Ecology and Evolution 2020; 10:10296-10304.
[20] NPFMC. 2022.
[21] https://alaskagoldbrand.com/products/wild-keta-salmon-portions?variant=40318679056568
https://www.adfg.alaska.gov/static/fishing/pdfs/commercial/2022_preliminary_salmon_summary_table.pdf

and consumers.[22] Yukon River, Norton Sound and Kotzebue commercial chum fishermen caught 1.9 million chum worth $7.7 million in 2018 and 1.1 million chum worth $3.9 million in 2019.[23]

Then, in 2020 and 2021 Yukon River, Norton Sound and Kotzebue commercial fishermen caught 190,000 chum and 103,000 chum worth $650,000 and $360,000, respectively.[24] 2020 chum runs were low across the North Pacific ocean, particularly the age 4 class, with the most dramatic collapses occurring in western Alaska.[25] There were unprecedented low escapements in 2021.[26] In 2020 only half the escapement goals were met; in 2021, only 2 of 14 chum salmon escapement goals were met.[27] The 2021 Kuskokwim chum run was the lowest on record and the 2022 return was the second lowest.[28] Yukon River chum runs set multiple record lows, including record low returns per spawner from the 2016 and 2017 parent years and a 2021 record low run size that was roughly a third as large as the previous record low.[29] Parent year escapements in 2016 and 2017 met or exceeded goals but neither class showed up in western Alaska in 2020 or 2021.[30] Most Yukon River chum runs have not met escapement goals since 2020 despite fishery closures. [31]

The collapse of Yukon River chum illustrates why careful consideration of abundance-based or spatial/temporal bycatch limits is important. The 2020 fishery included a 14,000 chum commercial harvest and there was no commercial harvest in 2021 or 2022.[32] 2021 bycatch of 2,854 Yukon River chum exceeded the 2021 subsistence harvest. [33]

Year	Yukon River fall and summer chum commercial and subsistence harvest[34]	Year	Yukon River summer and fall chum subsistence harvest
2015	727,984	**2020**	47,761
2016	1,171,360	**2021**	1,971
2017	1,228,779	**2022**	9,052
2018	1,113,897		
2019	627,256		

The 2023 analysis for the first time includes some 2022 directed fishery harvest information from Kotzebue.[35] The Boat Company requests that future stock composition analyses include similar and more information about directed fisheries such as harvests, closures and escapements. The annual Chinook bycatch

[22] *See, e.g.* Yukon River Fall Keta (Chum) Salmon in Salmon and Halibut at Alaska Gourmet (akgourmet.com); ff-yukon-keta-salmon-sm.pdf (fortunefishco.net)
[23] https://www.adfg.alaska.gov/static/fishing/pdfs/commercial/2019_preliminary_salmon_summary_table.pdf https://www.adfg.alaska.gov/static/fishing/pdfs/commercial/2018_preliminary_salmon_summary_table.pdf
[24] https://www.adfg.alaska.gov/static/fishing/pdfs/commercial/2020_preliminary_salmon_summary_table.pdf https://www.adfg.alaska.gov/Static/fishing/pdfs/commercial/2021_preliminary_salmon_summary_table.pdf
[25] Jallen, D.M., C.M. Gleason, B.M. Borba, F.W. West, S.K.S. Decker & S.R. Ransbury. 2022. Yukon River salmon stock status and salmon fisheries, 2022: A report to the Alaska Board of Fisheries, January 2023, Alaska Department of Fish and Game, Special Publication No. 22-20, Anchorage; Siddon, E. 2021. Ecosystem Status Report 2021: Eastern Bering Sea, Stock Assessment and Fishery Evaluation Report. North Pacific Fishery Management Council, 1007 West Third, Suite 400, Anchorage, AK 99501
[26] Siddon, E. 2021; NPFMC. 2022. Discussion Paper, Table 4-5.
[27] NPFMC. 2022. Tables 4-1, 4-2
[28] Kuskokwim River Intertribal Fishery Commission. 2023. 2022 Kuskokwim River Salmon Situation Report.
[29] NPFMC. 2022. Table 4-5.
[30] Jallen, D.M. et al. 2022.
[31] *Id.*
[32] *Id.*
[33] Barry, P. et al. 2023.
[34] Data source: Jallen, D.M., et al. 2022.
[35] Barry, P. et al. 2023.

stock composition reports explain each year that "[t]he extent to which any salmon stock group is impacted by the bycatch of the Bering Sea trawl fishery is dependent on many stock-specific factors including 1) the overall numbers of the stock in the bycatch, 2) the ages of the salmon caught in the bycatch by stock group, 3) the ages of the returning salmon by stock group, and 4) the total annual run size of the affected stock groups."[36] But then the analyses rarely provide harvest or other components of the fourth factor, run size, that would provide critical context to bycatch numbers. The compilation of information related to bycaught salmon stocks each year would increase the value of these reports to stakeholders.

The proposed purpose and need statement seeks to minimize bycatch of Western Alaska chum and states that most of the chum bycatch is of foreign hatchery origin.[37] But in 2022, Asian stocks comprised 43.8 percent of the 2022 chum bycatch.[38] Nearly 72,000 chum - thirty percent of the 2022 pollock industry bycatch - originated in the Eastern Gulf of Alaska and Pacific Northwest.[39] The analysis does not distinguish between Canadian and U.S. chum so that more than half the 2022 bycatch could easily be domestic fish.

The Boat Company agrees that bycatch reduction measures should focus first on improving chum salmon escapements to support western Alaska and Yukon River fisheries. But bycaught chum in the Bering Sea are also important to other U.S. fisheries – roughly 27 percent of the bycaught chum return to the Eastern Gulf of Alaska/Pacific Northwest each year, with recent losses to bycatch ranging between 50,000 and 150,000 chum.[40] Some of these fish may be from the hundreds of rivers in Southeast Alaska that produce chum, or from Alaska hatchery programs funded by Alaska fishermen.[41] Pollock industry bycatch of three year old Southeast Alaska chum appears to overlap to a significant degree in time and space with other Alaska bycaught chum which could heighten the value of a chum bycatch limit. In other words, a significant portion of any additional savings of non-western Alaska chum may accrue to other Alaska fisheries.

Request to consider further actions to address Chinook bycatch

The Boat Company requests that the Council consider additional management measures and analyses aimed at reducing Chinook bycatch – whether through area or seasonal closures, improved monitoring of Gulf of Alaska trawlers, reduced and/or abundance based bycatch limits, or all of the above. Chinook originating from Alaska rivers migrate through the Gulf of Alaska and the Bering Sea where trawlers take them as bycatch.[42] It is a significant concern that this bycatch continues to occur at high levels in some years while multiple directed fisheries in Alaska are closed for conservation purposes.

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[36] *See, e.g.* Guthrie III, C.M., P.D. Barry, Hv. T. Nguyen, C.L. D'Amelio, K. Karpan & W.A. Larson. 2023. Genetic stock composition analysis of the Chinook Salmon (*Oncorhynchus tshawytscha)* bycatch from the 2021 and 2022 Bering Sea pollock trawl fishery. C2 BS Chinook Genetics Report 2021-2022, April 2023.

[37] Although most of the Asian fish are hatchery origin, overall hatchery production has been stable over the past decade and increases in natural origin chum from Russia's Amur River and Kamchatka Peninsula have been driving overall increases in chum abundance. *See* Ruggerone, G.T. and Irvine, J.R. 2018. Numbers and Biomass of Natural- and Hatchery-Origin Pink Salmon, Chum Salmon, and Sockeye Salmon in the North Pacific Ocean, 1925–2015. Mar Coast Fish, 10: 152-168.

[38] Barry, P. et al. 2023.

[39] *Id*.

[40] Kondzela, C.M., et al. 2021; NPFMC. 2022. Discussion Paper Discussion Paper, Figure 3-3; Barry, P. et al. 2022.

[41] Josephson, R., Wertheimer, A., Gaudet, D., Knudsen, E.E., Adams, B., Bernard, D.R., Heinl, S.C., Piston, A.W. and Templin, W.D. (2021), Proportions of Hatchery Fish in Escapements of Summer-Run Chum Salmon in Southeast Alaska, 2013–2015. North Am J Fish Manage, 41: 724-738. https://doi.org/10.1002/nafm.10580

[42] Guthrie III, C.M., et al. 2021. NOAA Tech. Memo. NMFS-AFSC-418; Guthrie III, C.M., Hv. T. Nguyen. K. Karpan & W.A. Larson. 2021. Genetic stock composition analysis of Chinook salmon bycatch samples from the 2019 Gulf of Alaska trawl fisheries. U.S. Dep. Commer., NOAA Tech. Memo. NMFS-AFSC-417. 35 p.

Chinook are Alaska's state fish and support diverse commercial, sport and subsistence fisheries. Productivity declines began in 2001 and intensified over the last two decades.[43] Climatic changes are major factors.[44] Bycatch impacts have been a concern for several decades because of disproportional impacts on vulnerable populations.[45] Many of the bycaught fish, to varying degrees, would be available for harvest by Alaska fishermen or would support recovery of fishery resources at such low abundance levels that Alaska fishery managers have had to close or severely restrict harvests. For stocks at the lowest abundance levels, in some years the only source of anthropogenic removals is trawl bycatch.

The inability to constrain Chinook bycatch during the 2000s with voluntary measures should inform the need to develop chum salmon bycatch limits. During the 1980s, prior to the Americanization of the domestic industry, there was a 55,000 Chinook trawl bycatch limit.[46] NMFS and the Council did not apply this limit to domestic industry, instead exploring time and area closures and industry run voluntary measures.[47] These measures failed to prevent the 2005-2007 bycatch of over 292,000 Chinook that preceded stock collapses.[48]

In 2010, NMFS and the Council set a 60,000 Chinook bycatch limit that would apply if trawl companies participated in an Incentive Plan Agreement and met performance standards.[49] The 2010 action preceded a more severe stock decline and complete closures of subsistence fisheries. Bycatch decreased to fewer than 20,000 Chinook between 2011 and 2015.[50] NMFS and the Council responded by adjusting the limit in 2016 with an abundance based mechanism that triggers a 45,000 fish limit.[51] Chinook bycatch then increased relative to the first five years of the decade to an average of 30,500 fish per year from 2016-2020, including 35,000 fish in 2020.[52] 2023 Chinook bycatch has already reached nearly 12,000 fish and on pace to reach 2016-2020 bycatch levels.[53] Stock composition estimates have consistently identified high proportions of western Alaska Chinook stocks.[54] Chinook originating in rivers flowing into the Bering Sea comprised 81 and 84 percent of the 2021 and 2022 bycatch, respectively, with higher percentages occurring during A season.[55]

Multiple Chinook stocks originating in rivers that drain into the Gulf of Alaska also failed to meet escapement goals in recent years, with times of record low escapements.[56] Fourteen populations are "stocks

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[43] Alaska Department of Fish and Game. 2013. Chinook salmon stock assessment and research plan. Alaska Department of Fish and Game Special Publication No. 13-01. Anchorage, AK; NMFS. 2016. Final Environmental Assessment/Regulatory Impact Review for Proposed Amendment 110 to the Fishery Management Plan for Groundfish of the Bering Sea and Aleutian Islands Management Area. Bering Sea Chinook salmon and chum salmon bycatch management measures.

[44] Jones, L.A., E.R. Schoen, R. Shaftel, C.J. Cunningham, S. Mauger, D.J. Rinella & A. St. Saviour. 2020. Watershed-scale climate influences productivity of Chinook populations across southcentral Alaska. Glob. Change Biol. 2020; 26:4919-4936.

[45] Heard, W.R., E. Shevlyakov, O.V. Zikunova, and R.E. McNicol. 2007. Chinook salmon – trends in abundance and biological characteristics. N. Pac. Andr. Fish Comm. Bull. 4: 77-91; Witherell, D., D. Ackley and C. Coon. An overview of salmon bycatch in Alaska groundfish fisheries. Reprinted from the Alaska Fishery Research Bulletin, Vol. 9 No. 1, Summer 2002.

[46] Sugihara, G. & K.R. Criddle et al. 2018. Comprehensive incentives for reducing Chinook salmon bycatch in the Bering Sea walleye pollock fishery: Individual tradable encounter credits. Regional Studies in Marine Science 22 (2018) 70-81.

[47] *Id*.

[48] NMFS. 2023. Chinook salmon mortality in BSAI. *Available at:* Chinook salmon mortality in BSAI (noaa.gov)

[49] NPFMC. 2020. Fishery Management Plan for Groundfish of the Bering Sea and Aleutian Islands at 43-44; Appx. A at A-18, A-21.

[50] NMFS. 2023. Chinook salmon mortality in BSAI. *Available at:* Chinook salmon mortality in BSAI (noaa.gov)

[51] NPFMC. 2020 Appx. A at A-21; 50 C.F.R. § 679.21(f); see also 75 Fed. Reg. 53,026; 81 Fed. Reg. 37,534; 50 C.F.R. § 679.21(f)(2).

[52] NMFS. 2023. Chinook salmon mortality in BSAI. *Available at:* Chinook salmon mortality in BSAI (noaa.gov)

[53] *Id.*

[54] Guthrie III, C.M., et al. 2021. NOAA Tech. Memo. NMFS-AFSC-418, 33p.

[55] Guthrie III, C.M. et al. 2023.

[56] McKinley, T., N. DeCovich, J.W. Erickson, T. Hamazaki, R. Begich & T.L. Vincent. 2020. Review of salmon escapement goals in Upper Cook Inlet, Alaska, 2019. Alaska Department of Fish and Game, Fishery Manuscript No. 20-02. Anchorage; Heinl, S.C. et al.

of concern."[57] Extended time and area closures protect Southeast Alaska's wild Chinook stocks but also eliminate opportunities to fish for more abundant Chinook stocks, reducing both total commercial and sport harvests and the number of active fishermen.[58] Regulations restricting sport fisheries for northwest Gulf of Alaska Chinook stocks include complete prohibitions on fishing for Chinook in many areas.[59] In sum, Chinook bycatch warrants ongoing attention in the Council process, whether through further direction to the Salmon Bycatch Committee or other means.

Conclusion

For the above reasons, The Boat Company requests that the Council move forward with management actions to address Bering Sea chum bycatch that includes alternatives that include chum salmon bycatch limits. The Boat Company also requests that the Council recognize an ongoing need to address Chinook bycatch.

Hunter McIntosh & Paul Olson
The Boat Company

2021. Review of salmon escapement goals in Southeast Alaska. 2020. Alaska Department of Fish and Game, Fishery Manuscript Series No. 21-03.

[57] *See* https://www.adfg.alaska.gov/index.cfm?adfg=specialstatus.akfishstocks

[58] Fowler, P.A., R.S. Chapell & Southeast Region Division of Sport Fish staff. 2021. Overview of the sport fisheries for king salmon in Southeast Alaska through 2020: a report to the Alaska Board of Fisheries. Alaska Department of Fish and Game, Special Publication No. 21-10, Anchorage, AK. Hagerman, G., M. Vaughn and J. Priest. 2021. Annual management report for the 2020 Southeast Alaska/Yakutat salmon troll fisheries. Alaska Department of Fish and Game, Fishery Management Report NO. 21-17, Anchorage.

[59] Alaska Department of Fish and Game. 2023. Sport Fishing Emergency Order. Emergency Order No. 2-KS-7-15-23. Homer, Alaska, March 2, 2023; https://www.adfg.alaska.gov/sf/EONR/index.cfm?ADFG=Region.R2&Year=2022