



MARINE MAMMAL COMMISSION

2 August 2021

Barry A. Thom, Regional Administrator
West Coast Regional Office
National Marine Fisheries Service

Dear Mr. Thom:

The Marine Mammal Commission (the Commission), in consultation with its Committee of Scientific Advisors on Marine Mammals, has reviewed the National Marine Fisheries Service's (NMFS's) proposed Amendment 21 (the Amendment) to the Pacific Coast Salmon (PCS) Fishery Management Plan (FMP) (86 Fed. Reg. 29544). The Amendment would establish a Chinook salmon (*Oncorhynchus tshawytscha*) abundance threshold, below which management measures would be implemented to limit adverse impacts of this fishery, which operates in federal waters offshore of California, Oregon, and Washington, on the availability of Chinook salmon for the endangered Southern Resident killer whale (SRKW), a Distinct Population Segment of killer whales (*Orcinus orca*). In addition, the Commission reviewed the associated draft environmental assessment (DEA),¹ biological opinion (BiOp),² and report of the Pacific Fishery Management Council's risk assessment (PFMC 2020).

It is clear that additional management actions are needed immediately to prevent the extinction of SRKWs and achieve their recovery. The SRKW stock is near its lowest population size observed or estimated since 1960 (BiOp Figure 4). After a relatively sustained period of growth from 68 whales in 1970 to 98 in 1995, the population size declined rapidly by 20.4 percent over the next six years. Although it recovered roughly half of those losses by 2006, the population declined again by another 16.9 percent over the last 14 years. In all, over the last 25 years, the population has declined from its peak abundance in 1995 to 74 whales at the end of 2020, a drop of nearly 25 percent over that interval, or at a mean annual rate of decline of 1.1 percent.³ Three anthropogenic factors are widely considered to be the current major threats to SRKWs and likely causes of the population decline since the mid-1990s: 1) reduced prey availability; 2) contaminants bioaccumulated from prey; and 3) interference and disturbance from vessels and vessel noise (NMFS 2008, Ford et al. 2010, Williams et al. 2016, Lacy et al. 2017, Murray et al. 2021). The Commission agrees with

¹ Draft Environmental Assessment - Amendment 21 to the Pacific Coast Salmon Fishery Management Plan: Salmon Fishery Management Measures to Allow for Prey Availability and Foraging Opportunities for Southern Resident Killer Whales (Regulatory Tracking Identifier Number: 0648-Xa696), May 2021. Accessed 7 July 2021 at: <https://www.fisheries.noaa.gov/action/amendment-21-pacific-coast-salmon-fishery-management-plan>.

² Endangered Species Act (ESA) Section 7(a)(2) Biological Opinion and Conference Opinion: Biological Opinion on the Authorization of the West Coast Ocean Salmon Fisheries through Approval of the Pacific Salmon Fishery Management Plan Including Amendment 21 and Promulgation of Regulations Implementing the Plan for Southern Resident Killer Whales and their Current and Proposed Critical Habitat, 2021.

Accessed 7 July 2021 at: <https://www.fisheries.noaa.gov/action/amendment-21-pacific-coast-salmon-fishery-management-plan>.

³ <https://www.whaleresearch.com/orca-population>. So far in 2021, no deaths and one new calf have been reported.

NMFS's conclusion that all three are potentially limiting factors⁴ on population growth and viability (NMFS 2008).

The Commission commends the PFMC and NMFS for recognizing that reduced prey availability may be adversely affecting the SRKW population and proposing fishery management measures to limit the impact of the PCS fishery on the whales. Addressing the impact of what is generally considered the most important of those factors is an important and positive step. Despite the positive action on the part of the PFMC, the Commission finds that the proposed amendment to the PCS FMP, which is based on the PFMC's recommendations to NMFS and the agency's Preferred Alternative in the DEA, falls short of what is needed to provide sufficient Chinook salmon to support the survival and recovery of the SRKW population. As such, it neither meets the agency's obligations under Section 7 of the ESA to insure that the proposed management action⁵ is not likely to jeopardize the continued existence of the species, nor its own goals established under the SRKW Recovery Plan to achieve a sustained, positive population growth rate of 2.3 percent (NMFS 2008). The Commission finds that, although Alternative 3 in the DEA provides a better potential strategy for avoiding prey depletion than the Preferred Alternative, it also sets the trigger for instituting additional management measures too low to insure that the prospects for the survival and recovery of the SRKW will be appreciably improved.

Based on the analyses of the PFMC SRKW working group and those in the BiOp, NMFS concluded in the BiOp that the proposed action (implementation of the preferred alternative of proposed Amendment 21) "is not likely to jeopardize the continued existence of the Southern Resident killer whale" population. For the reasons discussed below, the Commission concludes that both Alternatives 2 and 3 are inadequate to avoid jeopardy, and will do little to slow (Alternative 2) or reverse (Alternative 3) the 25-year decline of the population. NMFS has not demonstrated in the BiOp or DEA that Amendment 21 is likely to result in reversing the ongoing population decline, significantly enhance the recovery prospects for the population, or even result in a significant improvement in fecundity or survival rates. Therefore, regardless of whether NMFS chooses Alternative 2 or 3 as the threshold under the proposed Amendment, the SRKW population most likely will continue to decline. Even if the population decline were stopped, but the population did not show signs of recovery, it would still be facing jeopardy due to significant risks from stochastic and catastrophic events, such as ship strikes or oil spills, and effects associated with small population size (e.g., inbreeding depression). Given the SRKW's ongoing decline, predicted continuing decline over the next two decades, and the high risk of extinction, a much more precautionary alternative is required to support a "no jeopardy" finding. In other words, the threshold for triggering additional management actions in the PCS fishery needs to be set much higher than is proposed in either Alternative 2 or 3.

Alternative 2, 'the preferred alternative'. The threshold proposed in Alternative 2 for triggering additional management actions to increase the availability of Chinook salmon to SRKWs is set at the mean of the seven lowest years of Chinook abundance from 1992-2016, or roughly 0.966 million fish. This level was chosen because NMFS concluded that SRKW status was poor in five of those

⁴ Limiting factors, in this context, are any natural or anthropogenic process or state that constrains a population's demographic rates (e.g., growth, fecundity, mortality).

⁵ We note in this regard that allowing the fishery to continue to operate without additional management measures is even more likely to jeopardize the species' continued existence. Thus, although the proposed amendment is an improvement over the status quo, this does not necessarily mean that it is sufficient to avoid "jeopardy."

seven years, although the agency did not provide criteria for differentiating between what constituted ‘poor’ or ‘good’ status. NMFS states that “[b]oth resident killer whale populations ... appear to have [had] constrained body growth for most of these years,” and that “smaller growth in body size in whales was concurrent with an almost 20 percent decline [in SRKW abundance] from 1995 to 2001.” NMFS also notes that several deaths occurred in all three SRKW pods during the decline and the survival rates were relatively poor in all age and sex classes. However, NMFS does not define what constitutes “constrained body growth”.

The Commission finds the choice of “the mean of the seven lowest years” of Chinook abundance as the appropriate threshold to be arbitrary and poorly supported. The rationale for basing the threshold on the years of lowest Chinook abundance is apparent, but the choice of “seven” low years seems arbitrary. For example, those seven Chinook abundance estimates ranged from 0.813 to 1.042 million fish, but the next three higher abundances were only slightly higher (1.047, 1.063 and 1.080), which, considering the range of abundance estimates for the full time series (0.813 to 2.440), is a small difference.⁶ However, regardless of whether the management trigger is based on the proposed threshold of 0.966 million fish or one slightly higher that would include the 10 lowest years (0.977 million fish), Alternative 2 still likely would be inadequate to stop the decline in the population, let alone reverse it, as called for under section 7(a)(2) of the ESA and NMFS’s implementing regulations.

Implicit in NMFS proposing to use a Chinook abundance estimate to trigger management action is the assumption that abundances below that threshold are likely to limit SRKW population growth through limited prey availability, and that the management actions are needed to increase the availability of Chinook salmon and avoid adverse, population-level effects. This being the case, the proposed threshold is illogical or poorly defined for several reasons.

1. The threshold is based on past Chinook abundance levels that were associated with SRKW population declines, such that those levels would continue to limit SRKW population growth. Moreover, management actions should be taken in all years with similarly low abundances, but by using the mean of the lowest abundance years to set the threshold and assuming the past distribution of abundances is representative of those in the future, NMFS effectively is proposing to address the problem of limited prey availability in just the three, not seven, lowest years.
2. The projected Chinook abundance would be compared to the threshold at the beginning of the year before any fishing has occurred. If the threshold delineates years that are limiting to SRKW growth compared to those that are not, then, even if a complete closure of the fishery were implemented, the Chinook abundance would still be limiting to the population, and the closure logically would not stem further declines, although it might slow them somewhat.
3. The proposed amendment would not close the fishery, but rather would prompt actions to reduce the Chinook quotas and establish fishing closures at certain times and in certain areas. Thus, the likely result of implementing this alternative is that the SRKW

⁶ The largest of the additional three points is only 1.8 percentile points greater than that of the largest of the seven.

- population would continue to decline, as it would under a complete closure, but at a faster rate.
4. Had the proposed amendment been in place from 1992 to 2016 (years with Chinook abundance estimates) and the threshold set in accordance with Alternative 2, a management response would have been triggered just three times. Assuming that the range of annual Chinook abundances in the future will be similar to those experienced over the last 25 years, then management action would be expected to be triggered only about 13 percent of the time. However, during that same period, the SRKW population declined or showed no detectable change from one year to the next in 54 percent of the years (13 of 24). It is illogical, and easily can be demonstrated quantitatively, that taking action only to partially reduce the impact of an already limiting resource in only 13 percent of the years when the population is declining in over half of all years, cannot reasonably be expected to reverse the declining population trend.

Based on this assessment, it is almost certain that NMFS's "Preferred Alternative," if adopted, would result in the population continuing to decline, even if there were no other limiting factors. Thus, management of the PCS fishery under the Preferred Alternative clearly is insufficient to support a 'no jeopardy' finding in the BiOp, and does not meet the requirements of ESA section 7(a)2) that NMFS insure that any action is not likely to jeopardize the continued existence of any endangered species. If the population continues to decline, especially from its already very low population size, then its continued existence almost certainly would be jeopardized, as its already significant risk of extinction will only be increasing. Not only would this alternative pose a significant risk to the continued survival of the species, it would reduce appreciably the likelihood that the species would recover, in contravention of section 7 and the goals set forth in the SRKW Recovery Plan.

Therefore, the Commission strongly recommends that NMFS reject its Preferred Alternative, as it does not meet the 'no jeopardy' standard and will not meet the agency's legal obligations under Section 7 of the ESA.

Alternative 3. Under Alternative 3, the threshold to trigger additional management actions would be set at the maximum Chinook abundance level during the years 1995 to 2000, a period when the SRKW population was declining rapidly, or 1.144 million fish. Alternative 3 also differs from Alternative 2 in that the trigger for management action would be based on the average Chinook abundance over two year intervals, whereas Alternative 2 would be based only on predicted Chinook abundance in the current year. Alternative 3 is preferable to Alternative 2 because it bases the threshold on the maximum of a set of Chinook abundances, rather than their mean, and takes those abundances from the period of the most rapid decline in numbers of SRKWs. In addition, the Commission believes that it is more appropriate to base the trigger on the average Chinook abundance over two years rather than on just a single year. Nonetheless, the Commission finds that the proposed threshold under Alternative 3 is still too low, as it does not take into account the low Chinook abundances from 2006-2009. If NMFS were to include the latter years, then the maximum of the full set of years (1995-2000 and 2006-2009) would be 1.28 million fish. Had Alternative 3 been in place from 1992 to 2016, management action would have been triggered more often (in 11 of 25 years), which is still lower than the number of years in which the SRKW population decreased.

While this would be preferable to Alternative 2, it still falls short of meeting the requirements and goals of the ESA. Under even the best-case scenario, in which management actions would be instituted with roughly the same frequency as years with declining SRKW numbers, waiting for Chinook abundance to hit this threshold before acting is unlikely to prevent additional population declines. Thus, the population would still be at a considerable risk of extinction. In addition, points 2 and 3 raised with respect to Alternative 2 would still apply, in that the management response would only be partial in the years when Chinook abundance was below the threshold, and the population likely would continue to decline, albeit at a slower rate.

Therefore, the Commission recommends that NMFS also reject Alternative 3, as it too does not meet the agency's legal obligations under Section 7 of the ESA to avoid jeopardizing the continued existence of the SRKW.

Because both Alternatives 2 and 3 are inadequate to stave off further declines in the SRKW population and reverse the population's trajectory, thereby avoiding 'jeopardy', the Commission recommends that NMFS adopt a much more precautionary strategy and a higher Chinook abundance threshold for determining when remedial management actions are needed.

The thresholds considered under Alternatives 2 and 3 were seemingly selected to avoid or ameliorate the most severe impacts in years with the lowest Chinook salmon abundance. However, as discussed above, that approach is likely to fall short of the ESA's requirements, at least as formulated in the proposed amendment and the DEA. The Commission is recommending an alternative approach that is more likely to prevent further population decline and attain the ESA's recovery goals as laid out in the Recovery Plan. This alternative approach would more likely reverse the recent population trend and be in line with the Recovery Plan objective to achieve sustained population growth rate of 2.3 percent per year. The Commission finds that these outcomes almost certainly will not be achieved under the management scheme currently proposed in Amendment 21.

The Commission's recommended management strategy should include at least the following three elements:

1. Setting the management threshold based on the average Chinook abundance over two year periods, as was proposed for the triggers under Alternative 3. As discussed by NMFS in both the BiOp and DEA, multiple years of low or high Chinook abundance, in contrast to abundance in a single year, likely are a more reliable predictor of the condition and health of individual SRKWs, and therefore of the viability of the population. Given that the gestation period of killer whales is approximately 17.5 months (Robeck et al. 2017), it is not unreasonable to assume that prey availability over two to three years strongly influences the likelihood of a whale's giving birth and a calf's chances of survival. Similarly, studies of changes in the condition and health of individual SRKWs have suggested that it may take more than a year of deterioration in body condition before a killer whale dies from malnutrition (Fearnbach et al. 2018, Stewart et al. in press).

2. Using the SRKW population change over the same two year periods, but with an anticipated response lagged by one year, could also be considered for setting the management threshold.
3. Most importantly, implementing actions to reduce fisheries take whenever Chinook abundance drops below the levels historically associated with SRKW population growth rates of roughly two percent or greater would be consistent with the targets set forth in the Recovery Plan.

For example, from 1992 to 2016, there were five year-to-year SRKW growth rates greater than 2.3 percent.⁷ The mean Chinook abundance over those five intervals was 1.64 million fish, and the range included the highest values in the times series. Depending on the details chosen to implement such a strategy, applying the three elements above would result in thresholds that may vary somewhat between years, but would be substantially higher than those being proposed by NMFS, and more likely to avoid jeopardizing SRKWs and achieve the recovery goal of the ESA. The Commission suspects that even a threshold of 1.65 million fish is still not high enough to promote sustained growth of the SRKW population, but recognizes that every effort to detect a consistent relationship between Chinook abundance and SRKW demographic rates has fallen short. Thus, the Commission believes that NMFS should adopt a precautionary approach to setting a threshold and that the performance of this management strategy should be continually monitored and the threshold adjusted accordingly.

Therefore, the Commission recommends that NMFS assess additional alternatives, such as the example described above, that will contain higher, more precautionary thresholds that have a significantly greater chance of actually creating no jeopardy to the SRKW population and putting the population on a trajectory toward recovery.

Thank you for the opportunity to provide the Commission's recommendations and thoughts on the proposed amendment to the Pacific Coast Salmon Fishery Management Plan. The Commission encourages NMFS to consider the Commission's comments and recommendations carefully, and hopes that the agency will modify its proposed actions and analyses accordingly. If NMFS chooses not to follow or adopt any recommendation made herein, then the Commission reminds you of your responsibility to provide a "detailed explanation" of the agency's reasons for not doing so, as required under section 202(d) of the MMPA. Please contact me if you have any questions about our recommendations or their rationale.

Sincerely,



Peter O. Thomas, Ph.D.,
Executive Director

⁷ 1992-1993, 2002-2003, 2004-2005, 2014-2015 and 2015-2016

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