

NATIONAL MARINE FISHERIES SERVICE REPORT:  
SOUTHERN RESIDENT KILLER WHALE ASSESSMENT OF  
2019 PFMC SALMON FISHERIES  
April 11, 2019

On March 6, 2019, NOAA's National Marine Fisheries Service (NMFS) provided guidance to the Pacific Fishery Management Council (Council) related to effects of the Council salmon fisheries on endangered Southern Resident killer whales (SRKW) ([Agenda Item D.1.a, Supplemental NMFS Report 4](#)). In the letter, we announced our plan to re-initiate ESA consultation on the Council salmon fisheries and invited the Council to help reassess the effects of Council salmon fisheries on SRKW. The re-initiation will not be complete prior to the start of the 2019 fisheries. In the interim, we requested in the letter that the Council work with NMFS during the 2019 pre-season ocean salmon fisheries management process to help us understand the potential impacts of the 2019 Council salmon fisheries alternatives on the draft priority SRKW Chinook salmon prey stocks ([NMFS and WDFW 2018](#)). At the March 2019 Council meeting, one of the tasks the Council assigned to the Salmon Technical Team (STT) was to examine a draft list of SRKW priority Chinook salmon prey stocks and identify the stocks that are represented in models used annually in the ocean salmon fishery process. In response, the STT created a table that aligned NMFS' list of priority Chinook salmon prey stocks for SRKW with PFMC Chinook salmon stocks with model representation, as well as identified priority Chinook salmon prey stocks without model representation. The STT presented the table to the Council on March 12, 2019 ([Agenda Item D.8.a, Supplemental STT Report 2](#)).

This document describes our qualitative assessment of the 2019 Council salmon fisheries alternatives. A central aspect of our assessment is our current understanding of the potential impacts of the proposed 2019 Council salmon fisheries on the draft list of priority SRKW Chinook salmon prey stocks. NMFS considered all the information currently available to assess these impacts including: estimated percent reductions in prey availability from the Council's three fishery alternatives compared to past percent reductions (using a similar Fishery Regulation Assessment Model (FRAM) based retrospective analysis to that used in previous fisheries Endangered Species Act section 7 consultations); estimates of abundance in coastal waters (from central British Columbia southward to California) and inland waters (including waters in the Strait of Juan de Fuca, Puget Sound, Georgia Strait and Johnstone Strait) derived using the Chinook FRAM; Supplemental STT Report 2; 2019 pre-season translated forecasts of abundance for each priority Chinook salmon prey stock that contributes to the Council salmon fisheries; and the contribution rates of the priority Chinook salmon prey stocks to total catch (both current predicted contribution and historical contribution) in the Council salmon fisheries.

As described in our March 6, 2019 letter to the Council (Agenda Item D.1.a, Supplemental NMFS Report 4), NMFS is developing an adaptive management framework that could help inform a fisheries management response when conditions are present that pose a risk to the recovery of the whales. An example of such conditions would be a year with relatively low Chinook salmon abundance coupled with relatively large percent reductions in SRKW prey availability. This would be an example situation where a fisheries management response would

most likely be needed in addition to other measures. For 2019, we used the draft adaptive management framework to assess whether the percent reductions expected to result from the three fishery alternatives under consideration contribute substantially to an unacceptable level of risk to the whales when considered together with pre-season Chinook abundance estimates, such that additional management measures are needed to mitigate that risk.

The percent reductions resulting from Council salmon fisheries were calculated using an approach similar to that used in the 2009 biological opinion (NMFS 2009). Overall, total percent reductions in prey availability in coastal waters anticipated from each fishing alternative ranged from 7.1% in Alternative 3 to 9.9% in Alternative 1, which fall within the middle range (the range between the lower and upper quartile boundaries) of what was observed during the retrospective time period (1992 to 2016). The majority of these reductions to prey occur during spring and summer months (May through September), as percent reductions during the winter time period (October through April) ranged only from 0.4% in Alternative 3 to 0.6% in Alternative 1. Alternative 3 would result in the smallest percent reduction in Chinook salmon available and thus may be more beneficial to the whales. However, the magnitude of the potential benefit is not known because we cannot currently assess the spatial and temporal overlap between the whales and the additional remaining Chinook salmon available under each alternative.

The results also indicate pre-season coastal and inland Chinook salmon abundances are likely to fall within a middle range of abundances estimated during the retrospective time period. Therefore, coastal and inland Chinook salmon abundances projected for 2019 are not in the low nor high quartiles for abundances compared to previous years. We also found that the 2019 pre-season estimates for both coastal and inland Chinook salmon abundances are likely to be slightly higher than those estimated in 2018.

We also assessed the forecasted pre-season abundances of the priority Chinook salmon prey stocks relative to past abundances during the same retrospective time period (1992 to 2016). Four priority stocks are anticipated to have relatively high Chinook salmon abundances (above the upper quartile boundaries) and ten stocks are anticipated to be within a middle range of abundances (i.e., neither substantially low nor high). Therefore, 2019 abundance estimates for 14 of the 16 priority prey stocks contributing to Council-area salmon fisheries are expected to be in the middle or upper quartiles of abundance when compared with the retrospective time period.

Two priority Chinook salmon prey stocks, the lower Columbia River spring and the upper Willamette spring, have abundance estimates in the lowest quartile compared to the retrospective time period. We focused on these two priority stocks to help assess if the impacts of the 2019 Council area fisheries on these stocks would result in unacceptable risk because of the stocks' relatively low 2019 abundance compared to their abundances over the retrospective time period. The lower Columbia River spring stock is a low abundance stock but considered high priority because of its spatial and temporal overlap with the whales and because it has been observed in the whales' diet during the winter period when the whales have a higher likelihood of reduced body condition. However, the stock is a minor contributor to the catch composition of Council area salmon fisheries. Over the retrospective time period, this stock contributed to approximately 0.5% of the annual catch on average in Council Area fisheries. In 2019, the percent contribution

to the annual catch of the lower Columbia River spring Chinook stock under each alternative is estimated as 0.1%.

The upper Willamette spring Chinook stock has not been observed in the whales' diet but does overlap in space and time with the whales and thus is further down the priority prey list. This stock is more abundant than the lower Columbia River spring Chinook stock, but still considered relatively less abundant when compared to other priority Chinook salmon prey stocks, such as Southern Puget Sound fall, Lower Columbia River fall, and Strait of Georgia fall, among others. The expected contribution of the upper Willamette spring Chinook stock to the catch in 2019 is similar to the historical contribution of this stock to the Council salmon fisheries catch, which averaged less than 0.5% during the retrospective time period. Although two priority stocks are anticipated to have low abundance relative to previous years, we do not anticipate the Council fisheries would substantially reduce the availability of those priority Chinook prey stocks to the whales. Furthermore, the overall forecast composition in 2019 contains a higher proportion of Chinook salmon stocks that are considered to be higher priority than the average composition in the retrospective time period.

Therefore, we do not anticipate that any of the three Council fishery alternatives will contribute at an unacceptable level to conditions that pose a risk to the recovery of the whales (i.e., we do not anticipate relatively low Chinook salmon abundance coupled with relatively large percent reductions from any of the three alternatives, and we do not anticipate the Council fisheries to substantially reduce the availability of the relatively low abundance priority Chinook salmon stocks).

NMFS West Coast Region looks forward to working collaboratively with the Council and its advisory bodies to reassess the effects of the Council salmon fisheries on SRKW during re-initiation of the 2009 biological opinion on the effects of PFMC salmon fisheries on SRKW. We believe, if needed, the development of a risk assessment and adaptive management approach that identifies high risk conditions and triggers for actions to reduce impacts on prey in a meaningful way will help ensure the Council's harvest management over the long term will be responsive to the status and needs of SRKW.

## References

- National Marine Fisheries Service and Washington Department of Fish and Wildlife. 2018. Southern Resident Killer Whale Priority Chinook Stocks Report. June 22, 2018. Available at: [https://www.westcoast.fisheries.noaa.gov/protected\\_species/marine\\_mammals/killer\\_whale/](https://www.westcoast.fisheries.noaa.gov/protected_species/marine_mammals/killer_whale/)
- National Marine Fisheries Service. 2009. Endangered Species Act Section 7(a)(2) Consultation Biological Opinion. Effects of the Pacific Coast Salmon Plan on the Southern Resident Killer Whale (*Orcinus orca*) Distinct Population Segment. F/NWR/2009/02298. May 5, 2009. 82 p.