

Project Title: Stock-specific modeling of Bering Sea chum salmon

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Study Location: Eastern Bering Sea continental shelf

Abstract: Recent returns of chum salmon have been poor throughout their range in Alaska. This trend is particularly problematic in western Alaska, where record low chum salmon runs, compounded by low return abundance of Chinook salmon, have threatened a vital component of subsistence food security. While many factors influencing the abundance of western Alaska chum salmon (e.g. trophic interactions, climate and ocean conditions) likely cannot be controlled, mitigating the impacts of prohibited species catch in the US walleye pollock fishery presents a significant opportunity to minimize unnecessary mortality. Prohibited species catch of chum salmon has increased substantially during the past decade, with incidental harvest exceeding 500,000 fish in 2021. Concerns about the impacts of these incidental chum (and Chinook) salmon catches resulted in petitions from regional Tribal organizations for the closure of the 2022 pollock fishery and implementation of a quota for chum salmon prohibited species catch. However, it remains unclear how the spatial distribution of western Alaska chum salmon compares to stocks from other regions (e.g. Asia) and if this vulnerable metapopulation can be avoided by altering spatial or temporal patterns of fishing effort. In order to address this pressing issue, the proposed research seeks to leverage genetic stock identification efforts focused on salmon caught as prohibited species catch in the Eastern Bering Sea to construct stock-specific spatial distribution models for chum salmon during the fishing season. Additional efforts will seek to determine if the available data are sufficient to support exploration of potential distribution shifts over time and their links to environmental conditions. Upon completion, this work will provide fisheries managers with additional tools to inform preemptive prohibited species catch avoidance strategies in place of reactive fishing restrictions and better support runs of vulnerable western Alaska chum salmon.