Point Blue Publication Brief

Environmental conditions and prey-switching by a seabird predator impact juvenile salmon survival

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Food webs in upwelling systems are variable, and managing species of interest can be difficult because predators and their prey can be impacted by changing ocean conditions.

Seabird predators like common murres *(Uria aalge)* in the Gulf of the Farallones are numerous during the breeding season. At this time, large numbers of juvenile Chinook Salmon (*Oncorhynchus tshawytscha*) enter the ocean.

Salmon is a species of huge management concern and great public interest, therefore it is important to know the impact seabird predation has on coastal California salmon populations.

We assessed seabird impacts on juvenile salmon populations over a 30 year period by simultaneously examining the impacts of environmental conditions (like upwelling strength and river discharge rates), distribution and abundance of both common murres and a suite of forage fish species, and the diet of chick rearing murres from the Farallon Islands National Wildlife Refuge.

We found that in years when juvenile rockfish (*Sebastes* sp.) are less available near the colony, common murres will forage nearshore for adult northern anchovies (*Engraulis mordax*), also consuming juvenile salmon.

Our results demonstrate the complexity of ocean ecosystem interactions, and the need to quantify these elements in modelling efforts for effective ecosystem based management.

The Pacific Fisheries Management Council adopted planning policies that are intended to enable managers to take ecosystem interactions – like the ones discussed here - into account when considering management measures as well as when to coordinate information across fisheries management plans for decision making purposes.

Main Points

Common murres foraging nearshore eat outgoing juvenile salmon.

As murre predation on salmon increases, population survival of salmon is reduced.

Our results support earlier findings that timing and strength of upwelling, and the makeup of the local forage fish community influence Chinook salmon return rates to breeding streams.

Wells BK, Santora JA, Henderson MJ, Warzybok P, Jahncke J, Bradley RW, Huff DD, Schroeder ID, Nelson P, Field JC and DG Ainley. 2017. Environmental conditions and prey-switching by a seabird predator impact juvenile salmon survival. Journal of Marine Systems 174:54-63. doi.org/10.1016/j.jmarsys.2017.05.008