

MMC 2018 Annual Meeting SRKW Session summary

The Southern Resident killer whale (SRKW) population is declining and approaching the low point that it reached in 1970 following the period during which the live-capture industry removed a third of the population. Scientists, managers, conservationists and the public are becoming increasingly concerned for the fate of this iconic population of killer whales. This session addressed questions such as: 1) Is the population declining at a rate that will threaten its viability, 2) Is a constellation of factors (e.g., unusual oceanographic conditions, imbalanced sex/age structure, declining health and fecundity, declining prey availability, increasing vessel impacts) putting the population at greater risk of decline and extinction, and 3) What are the impediments to implementing the management actions needed to reverse this situation and achieve population recovery?

In the first half of the session, we learned first about current population demography and trends from Dr. Eric Ward (NMFS' Northwest Fisheries Science Center). Key issues identified included the prediction that the population is likely to continue to decline, that reproductive potential is diminished, that it may be suffering from 'small population' effects (e.g., inbreeding and demographic stochasticity), and that there is a sizeable list of gaps in our knowledge of the populations' biology and ecology. Next, Dr. Rob Williams (Oceans Initiative) presented modeling results that assessed the relative impacts of the three largest threats to SRKWs – decreased prey availability, vessels (disturbance and noise), and contaminants (pollution). The analyses suggested that SRKW recovery could be most efficiently achieved through a combination of increasing the availability of Chinook salmon and reduction in vessel noise. Finally, Dr. Dawn Noren (NMFS' Northwest Fisheries Science Center) reviewed how the condition and health of individual whales is related to their ecology, feeding and social behavior, and human impacts. She emphasized that identifying how much each stressor impacts individuals is very difficult given the number of stressors, confounding factors, additive and synergistic effects, and gaps in our scientific understanding. For example, she noted that during periods of low prey availability the whales move about more and break up into smaller groups, presumably to increase their foraging success, but potentially at the expense of social benefits such as prey sharing or calf rearing assistance. Additive effects include the possible interference of vessel noise with the ability of the whales' use of echolocation to find, track and capture prey. Interestingly, Dr. Noren presented unpublished data that showed a decline in the concentration of PCBs and DDTs in SRKWs over the past decade. Nonetheless, those persistent organic pollutants (POPs) are still present in sufficiently high concentrations in tissues that they may be causing immunosuppression, endocrine disruption, and reproductive failure. Because POPs are lipid-soluble, female killer whales pass large quantities of these compounds to their offspring transplacentally and in their milk, which may be a key factor behind the high mortality of calves in this population. In addition, Dawn described exciting new research, led by Dr. John Durban (NMFS' Southwest Fisheries Science Center), to assess body condition from photogrammetry of images obtained from micro-copters (drones).

In the second half of the session, the Commission heard about policy and management aimed at protecting and recovering SRKWs through regulation of human activities. The session focused mostly on federal and state actions being taken to increase the abundance of prey, federal actions addressing other threats, and other Washington State actions directed toward SRKWs. Elizabeth Babcock (NMFS'

West Coast Regional Office) and Penny Becker (Washington Department of Fish and Wildlife) described the wide variety of actions being taken that could increase the availability of salmon to SRKWs, such as salmon habitat restoration, the role of hatcheries, and harvest controls. They emphasized the considerable complexity of the factors affecting salmon populations and all of the protection and restoration actions. For example, they described the 22 runs of Chinook salmon found in watersheds around the Salish Sea and Puget Sound, each of which has its own constellation of government jurisdictions responsible for salmon and other natural resources. In total, they noted that in addition to the federal and state governments, there are 19 federally recognized tribes, 12 counties, 110 cities, 16 watershed recovery boards, 7 regional fisheries enhancement groups, 12 conservation districts, numerous environmental NGOs, and more than 4 million people that all have something to say about Chinook salmon policy and management. All of that interest is reflected in \$1.35 billion in federal grants, \$1.69 billion in state-matching and other funds, 13,200 projects, restoration of over 1.1 million acres, and restored access to over 10,500 miles of stream habitat. However, they shared that after a decade implementing a Chinook recovery plan that success is proving difficult to achieve due to a number of factors, such as budgetary constraints, limited authority and increasing human pressure.

Penny Becker then described the range of actions being taken by the State on behalf of SRKWs, such as fishery regulation enforcement, pinniped predation research, increases in hatchery production, public outreach and education, and the establishment of a new taskforce. Multiple state players are engaged in identifying the highest-priority areas for SRKW prey to guide harvest levels, protection of key marine habitats, spawning habitat restoration, hatchery operations, and hydropower policies, while the State's Department of Transportation is working to quiet state ferries. On March 14, 2018, Washington state Governor Jay Inslee established the high-profile [Southern Resident Killer Whale Task Force](#), which will address the multitude of threats faced by SRKWs and make recommendations for their mitigation.

Finally, Lynne Barre (NMFS' West Coast Regional Office), described NOAA's SRKW recovery plan, Species in Spotlight Action Plan and other federal actions directed toward SRKWs. Those plans include understanding and reducing contaminants that affect the health, reproduction and survival of individual whales, development of a health database, monitoring whale condition and health, stranding investigations, and conducting workshops and building partnerships. In addition, she described NMFS' efforts to protect killer whales from harmful vessel impacts through the use of approach and path regulations, monitoring and efficacy research, education, compliance and enforcement. One new and interesting action, which has been taken by San Juan County, involves the use of 'whale in the area' flags and the encouragement of voluntary actions by boaters to minimize their disturbance of killer whales. In addition, NMFS is considering the establishment of a protected area on the west side of San Juan Island, a key SRKW feeding ground, and the designation of critical habitat on the outer coast.