

Fisheries Interactions

ENTANGLEMENT AND COMPETITION FOR FOOD ARE AMONG THE INTERACTIONS BETWEEN THE COMMERCIAL FISHING INDUSTRY AND MARINE MAMMALS THAT REMAIN A PRESSING CONCERN FOR FISHERY AND WILDLIFE MANAGERS.

Observable interactions are generally restricted to direct mortality or entanglement in fishing gear and/or fishing gear damage, and catch loss for fishermen. Overlap in the species and size of prey items taken by marine mammals and targeted by commercial fisheries is more difficult to assess, but may limit the ability of marine mammals to obtain sufficient food for growth and reproduction. Since 2003, the Board has directed \$1.27 million to eight projects studying the interaction of various fisheries and marine mammal species.

MARINE MAMMALS :: Fisheries Interactions

Humpback Whale Entanglements

Project 826

AS HUMPBACK WHALE POPULATIONS IN THE CENTRAL North Pacific increase at an annual rate of 6-10%, interactions with the fishing industry are also on the rise. As many as 71% of the humpbacks in Southeast Alaska bear evidence of prior entanglements. These large baleen whales get tangled in nearly every type of coastal fishing gear in Alaska, from gillnets, longlines, and seines to shrimp and crab pots used in commercial, sport, and personal use fisheries.

Through workshops, cooperative observations, and monitoring of fishing practices and humpback whale behavior, researchers participating in Project 826 will improve our understanding of the nature of humpback whale encounters. The study will also reveal the effectiveness of devices and techniques currently being used by the fishing fleets to deter or respond to entangled whales in nearshore fisheries in Southeast Alaska.

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Northern Fur Seal Interactions with Fisheries

Project 636

PREVIOUS STUDIES HAVE SHOWN THAT NORTHERN FUR SEALS AND COMMERCIAL POLLOCK fisheries in the Bering Sea target similar prey. Given the overlap, the Bering Sea fishery could be linked to the decline of northern fur seals in the Pribilof Islands. Evaluating the role that commercial fisheries might be playing in the decline of northern fur seals requires fine-scale, high-resolution data on fur seal habitat use. Project 636 examined at-sea movement, habitat use and foraging behavior of adult female fur seals during the breeding season at a fine scale. Scientists tracked seven female fur seals using radio and satellite transmitters and dead-reckoning data loggers to assess where and how these females found food.

The fur seals ranged over a wide area of the Bering Sea with no perceived preference for feeding areas. The small sample of tracked fur seals suggests that the potential for competition with commercial pollock fisheries is low given the wide-spread distribution of fur seal foraging effort relative to the concentrated fishing activity along the outer shelf. Further sampling of the fine-scale movements and foraging of adult female fur seals throughout the summer and fall is being conducted as part of the Bering Sea Integrated Ecosystem Research Program and will aid in confirming the conclusions of this initial study.



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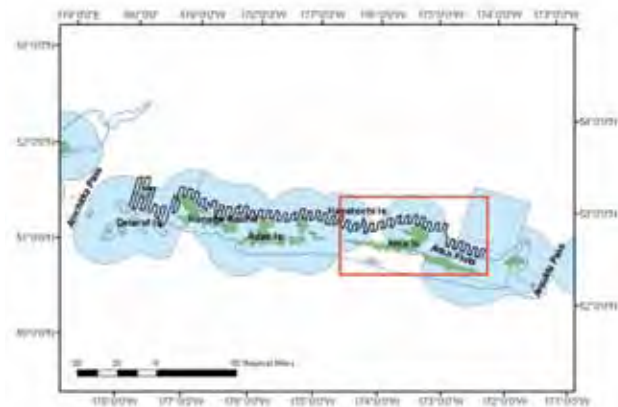
Steller Sea Lion Interactions with Fisheries

Project 730

LIKE SEVERAL OTHER MARINE MAMMAL POPULATIONS in the North Pacific, the western population of Steller sea lions has dramatically declined since the 1970s, resulting in their endangered species listing in 1997. Although researchers still do not know the causes of the population decline and the factors constraining recovery, resource managers put a suite of protective measures in place to mitigate potential competition between fisheries and sea lions, including trawl exclusion zones around sea lion rookeries and haulouts to protect sea lion critical habitat. Implicit in the designation of the trawl exclusion zones is that competition between fisheries and sea lions occurs at local scales.

In light of this, resource managers need new strategies at local scales for assessing groundfish abundance, and the impact on sea lions of groundfish removals. Project 730 is investigating whether cooperative biomass assessments and surveys can be an effective way to manage fisheries at the local scales that are important to Steller sea lions or other predators.

Working collaboratively with the fishing industry, scientists are trying to determine if winter acoustic survey data



Proposed study area. Heavy lines are acoustic transects. Shaded areas are Steller sea lion critical habitat. The 200m depth contour is also shown. The Oscar Dyson will survey the entire area. The cooperative survey vessel will survey the area outlined in red.

obtained from commercial vessels are of sufficiently high quality to conduct a biomass assessment at local scales. They're also collecting information about Steller sea lion distribution and diets in winter. By synchronizing the timing and spatial scale of the acoustic fishery survey and the sea lion work, researchers hope to determine how sea lions use the local area to forage relative to the biomass available, and the potential impact of reducing that biomass through fishery harvests.

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Stellers in Resurrection Bay

Project 807

PROJECT 807, CURRENTLY ON HOLD DUE TO PERMITTING ISSUES, PLANS TO INVESTIGATE THE HYPOTHESIS THAT depletion of local fish aggregations by the fishery has negative impacts on Steller sea lions. Researchers will manipulate the fishing effort around Chiswell Island, a well-studied rookery for Steller sea lions in Resurrection Bay, Alaska. Manipulation of the fishing effort and monitoring of the foraging behavior of adult females during the breeding season should give us evidence for or against the localized depletion hypothesis, with obvious implications to sea lion and fisheries management.



FEATURE PROJECT

MARINE MAMMALS :: Fisheries Interactions

Sperm Whales Targeting Blackcod Fisheries

Projects 309, 412, 527, 626

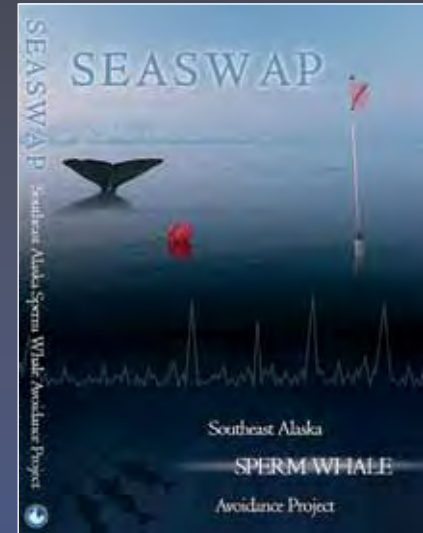
IN SOUTHEAST ALASKA, ENDANGERED SPERM WHALES TAKE SABLEFISH off the longline gear of commercial fishing boats. In other parts of the world, this depredation behavior sometimes results in mortality and serious injury to the whales. The economic loss to fishermen presents fisheries managers with a difficult assessment problem as the amount of sablefish lost is unknown.

Sperm whales have learned to depredate deepwater sablefish longlines off Sitka, Alaska, and over the past decade their behavior has become more aggressive and widespread. During a typical encounter, when whales are present during the haul, about 3-6% of the catch is estimated to be removed, but sometimes over 50% of the catch has been lost by individual fishermen.

Beginning in 2003, the Board funded a series of projects (309, 412, 527, and 626) to assist the Southeast Alaska Sperm Whale Avoidance Project (SEASWAP). A cooperative effort between scientists and fishermen, SEASWAP explores the occurrence of sperm whales in association with longline fishing activities along the continental slope and develop strategies to minimize these interactions.



The image above, taken from digital video filmed at a depth of 355 feet off the coast of Sitka, shows a sperm whale “flossing” a longline for sablefish. To capture this depredation as it happened, researchers and fishermen attached a camouflaged high-definition video camera and a single hydrophone to a longline carrying two sablefish, using a camera provided by a National Geographic grant.



In 2006, the North Pacific Research Board worked closely with the fishermen and researchers involved in SEASWAP to create a 35-minute video about the project. It features Alaska commercial fisherman Kendall Folkert, who joins researchers Aaron Thode of Scripps Institution of Oceanography and Jan Straley of the University of Alaska Southeast to investigate which signals draw sperm whales to the fishing vessel *Cobra*.

A cooperative effort between scientists and fishermen, SEASWAP explores the occurrence of sperm whales in association with longline fishing activities.



National Geographic

A sperm whale looks for sablefish near a longline fishing vessel. NMFS permit 473-1700-01.

Researchers learned that most depredation events are the result of male sperm whales removing fish directly from the longlines beginning in April or May, and continuing through the remainder of the fishing season. They also discovered that the distinctive noise made by fishing vessels as longlines are being hauled attracts animals within ten nautical miles of the fishing activity.

Deterrent measures, such as deploying decoy anchor lines, attaching acoustic reflectors to the fishing gear, conducting circle hauls to minimize the engine noise that attracts the whales, and changing the time of year when fishermen deploy their gear all show some promise and continue to be tested as a means of reducing sperm whale–fisheries interactions.