

## **Sperm Whale and Longline Fisheries Interactions in the Eastern Gulf of Alaska**

Jancie Straley<sup>1</sup>; O'Connell, Victoria<sup>2</sup>; Behnken, Linda<sup>3</sup>; Thode, Aaron<sup>4</sup>; Liddle, Joseph<sup>1</sup>; and Mesnick, Sarah<sup>5</sup>

<sup>1</sup>University of Alaska Southeast, 1332 Seward Ave., Sitka, AK 99835 USA

<sup>2</sup>Alaska Department of Fish and Game, 304 Lake St., Sitka, Alaska 99835 USA

<sup>3</sup>Alaska Longline Fishermen's Association (ALFA), PO Box 1229, Sitka, Alaska 99835 USA

<sup>4</sup>Marine Physical Laboratory, Scripps Institution of Oceanography, San Diego, CA 92093-0205 USA

<sup>5</sup>Southwest Fisheries Science Center, NOAA Fisheries, La Jolla, CA 92037 USA

In the eastern Gulf of Alaska, depredation by sperm whales (*Physeter macrocephalus*) of demersal longline fishing gear set for sablefish (*Anoplopoma fimbria*) has occurred since the 1970s. Concern about the potential for entanglement with an endangered species and the growing economic losses to fishermen prompted ALFA to form the Southeast Alaska Sperm Whale Avoidance Project (SEASWAP). In 2003, the North Pacific Research Board funded this collaborative study among fishermen, scientists and managers to collect quantitative data on longline depredation. The goal of the study is to recommend deterrents or changes in fishing behavior to reduce depredation. SEASWAP fishermen and researchers collected acoustic, fishing, behavioral and photographic data. Acoustic findings will be presented by co-PI Thode. Fishermen recorded information on 124 sets. Researchers found fewer whales present at the set and while gear was "soaking" than at the haul. Whales were present about a third of the time at the haul and evidence of depredation was noted for 71% of these sets. When there was evidence of depredation the CPUE was significantly reduced by about 3% (t-test of difference in sablefish CPUE =  $-0.0332$ ,  $p=0.0228$ , 95% CI  $(-0.0047, -0.0616)$ ). Genetic results determined the whales were male and 47 whales were individually photo-identified. Bayesian mark-recapture analysis estimated 96 (64, 134; 95% credible interval) whales in the study area. This study proved successful in monitoring sperm whales near fishing vessels, evaluating the magnitude of the depredation and recommending passive deterrents.

Based on these observations and the acoustic findings we have derived four low-cost depredation reduction techniques to quantitatively test in 2006: (i) circle hauls that minimize engine cycling, which seems to attract animals, (ii) deploying anchor lines that have no fishing gear attached (decoys), (iii) testing of an existing variant of fishing gear using acoustic reflectors and shortened gangions and (iv) changing the time of year the fishermen deploy their gear.