

U.S. Navy Funded Marine Mammal Monitoring In Southern California 2008–2012

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The U.S. Navy represented by the Pacific Fleet Environmental Readiness Division, Chief of Naval Operations Environmental Readiness and Energy, and Office of Naval Research fund significant marine mammal monitoring programs within Southern California. In an endeavor coordinated with the U.S. National Marine Fisheries Service to address specific questions, efforts are underway to deploy a variety of research tools as a collection of focused, collaborative studies. Monitoring methods include research elements designed to collect data in support of region-specific monitoring and also contribute to the overall scientific body of marine mammal knowledge. Research elements include visual surveys from airplanes and vessels, passive acoustic monitoring from bottom-mounted systems, photoID, biopsies, and marine mammal tagging. The framework for monitoring and results from August 2008 to August 2012 will be presented. During this period over 76,400 nautical miles of ocean were visually surveyed representing 4,450 hours of effort. There were over 4,660 sightings of an estimated 338,875 marine mammals. Over 45,000 hours of passive acoustic recordings were obtained and are undergoing continued analysis. In addition, 64,693 digital photographs were taken of marine mammals, and 45 hours of digital video taken of various marine mammal behaviors. There were also 241 individual tissue biopsies, and 74 satellite tracking tags attached to various species. Continuing efforts in 2013 will employ many of the same techniques used previously. The Navy's annual monitoring reports for 2009, 2010, and 2011 are publically available and posted on NMFS' Office of Protected Resources website as well as a new public Navy monitoring website.

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Sights and Sounds in the Sky: Integrated Acoustic/Visual Aerial Monitoring of Marine Mammal Behaviors Using Sonobuoys and Videography

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We conducted aerial-based monitoring of marine mammal behaviors off the Southern California Bight for 7 days during the winter and spring of 2012. We integrated visual methods (visual observations and videography) with passive acoustic methods (sonobuoys) to study behaviors of cetacean groups. We processed data in real-time, and post-survey, using custom-developed software (Difar-Matlab and Mysticetus). We deployed 23 sonobuoys (model AN/SSQ-53F) through a belly chute, with only a 9% (n=2) failure rate. Over 16 hours of acoustic data were recorded and analyzed from 23 in-flight hours. We acoustically detected and recorded sounds from focal groups of fin whales, gray whales, humpback whales and bottlenose dolphins, using DIFAR sonobuoys, and from Risso's dolphins using omni-directional sonobuoys. A possible case of Risso's dolphin call-matching with sonar (e.g. mimicry) was detected. Fin whales were the most commonly encountered species, as they migrated northward through the study area. We recorded high signal-to-noise acoustic signals and videography from five fin whale focal groups. We plotted bearings to sequential fin whale calls with call sources emanating from different directions, indicating counter-calling. During post-processing, we integrated visually estimated animal locations with acoustically determined bearings and/or localizations. Results indicate that fin whales did not call when at the surface. We greatly improved real-time and post-processing capabilities via integration of hardware and upgrades to software. Additional surveys and improvements to the system are planned to increase our understanding of marine mammal behaviors and the effects of anthropogenic activities. [Work sponsored by NAVFAC Southwest Division]

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SOUTHERN CALIFORNIA MARINE MAMMAL WORKSHOP

FEBRUARY 1-2, 2013 • NEWPORT BEACH, CA



Zalophus californianus

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