

Environmental Studies Program: Ongoing Study

Study Area(s): Southern California, Central California, Northern California, Washington-Oregon

Administered By: Pacific OCS Region

Title: California Current Cetacean and Ecosystem Assessment Survey and Use of Data to Produce and Validate Cetacean and Seabird Density Maps (NSL #PC-16-05)

BOEM Information Need(s) to be Addressed: The Energy Policy Act of 2005 authorized BOEM to regulate renewable energy activities on the OCS. As part of this responsibility, BOEM is tasked with conducting detailed environmental analyses of proposed renewable energy projects. These analyses include evaluating the potential direct, indirect, and cumulative impacts on the marine environment, including marine mammals and seabirds. They will allow BOEM to make environmentally sound decisions about managing renewable energy activities and developing mitigation measures to minimize their impacts. The proposed study would provide data and analytical products to enable BOEM to fulfill these responsibilities.

Total BOEM Cost: \$150,000

Period of Performance: FY 2016–2018

Conducting Organization(s): National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Southwest Fisheries Science Center

Principal Investigator(s): [Dr. Lisa Balance](#)

BOEM Contact(s): [Greg Sanders](#)

Description:

Background: BOEM partnered with the Southwest Fisheries Science Center (SWFSC) to conduct surveys of marine mammals and, to the extent possible, sea turtles and seabirds, along the West Coast in Fall of 2016. Analysis of the data collected during the survey is nearing completion. This work will supplement and complement ongoing efforts by SWFSC to conduct comprehensive marine mammal, sea turtle, seabird, and ecosystem surveys along the entire U.S. West Coast that are used to estimate the abundance of marine mammal populations and monitor status and trends. These surveys provide a broad-scale basis for managing marine mammal stocks within an ecosystem context that includes sea turtles, seabirds, prey sampling, and oceanographic measurements. The data and subsequent analyses by National Marine Fisheries Service (NMFS) will be used by BOEM in future environmental assessments.

Objectives: The primary objective of this California Current survey is to estimate density of beaked whales and other acoustically active species (e.g., sperm whales *Physeter microcephalus*, and pygmy and dwarf sperm whales (genus *Kogia*)) throughout the California Current ecosystem using new survey technology and increased acoustic sampling effort compared to past large-scale transect surveys (which

have been more visually focused). A secondary objective is to improve our ability to identify acoustic calls to the species level.

Methods: Between August 19 and September 30, 2016, SWFSC conducted a dedicated acoustic survey for cetaceans throughout the California Current offshore Washington, Oregon, and California. Focal study species were beaked whales (family Ziphiidae), which due to their cryptic nature are less amenable to visual survey than most other cetacean species. Other species of interest for acoustic survey were sperm whales, and dwarf and pygmy sperm whales. This survey was conducted from the NOAA ship *Bell M Shimada*, which is a much quieter vessel than older NOAA vessels used in the past. More importantly: rather than collecting data solely from a single-towed hydrophone array along linear transects, SWFSC collected data from 30 deployments of drifting acoustic spar buoy recorders (DASBRs). The buoys were deployed randomly throughout the study area so as to achieve a representative random-sampling design. DASBR hydrophones are suspended 100 m below the surface.

Between DASBR deployments, SWFSC conducted dedicated towed hydrophone array surveys in high-density beaked whale areas for the purposes of (a) providing information to estimate the depth profile of acoustic recordings, which are needed to estimate the horizontal range of DASBR detections (for density estimation) and (b) provide visual confirmation of the species identification associated with different beaked whale call types within the genus *Mesoplodon*. Currently SWFSC can identify acoustic signals to this genus but not to species within this genus, which compromises the information content and hence the value of marine mammal stock assessments for these species. When SWFSC can accurately assign species ID to *Mesoplodon* calls, the DASBR data can be used to generate species-specific estimates of density (density estimates are currently at the genus level for beaked whales). Acoustic data were recorded to hard disk at data sampling rates of 500 ks/sec for towed hydrophone data and 192–576 kHz for DASBRs data.

Preliminary data quality assurance and control (QA/QC) took place at sea. Post-survey data was processed by a senior acoustician technician to identify and extract cetacean detections using acoustic processing software (PAMGUARD), and associate location information to the calls (depth, distance). A preliminary look at the acoustic data indicates that high-quality acoustic data was obtained for 28 of the 30 deployments.

Current Status: The BOEM-NOAA interagency agreement was awarded June 16, 2016. The initial coordination meeting was held in mid-July 2016. The August–September 2016 cruise/field work was completed successfully; the buoy deployment was highly effective, with all buoys having detections of the target species. Analysis of the acoustic data is near completion.

Final Report Due: June 19, 2018

Publications Completed: None

Affiliated WWW Sites: <https://marinecadastre.gov/espis/#/search/study/100116>

Revised Date: February 1, 2018