

Behavioral Analysis and Distribution of Marine Mammals in Southern California

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In the summer months, the Southern California bight serves as feeding grounds for many species of marine mammals. Prey is concentrated along the continental shelf due to seasonal upwelling increasing nutrients. We hypothesized we would observe migratory whales feeding on the edge of the Continental Shelf, while resident species would be observed throughout the study area engaged in an equal mix of behaviors. We conducted surveys via boat transects and shore stations to monitor distribution of all marine mammals species, as well as boat traffic. Animals were photographed for identification, and behaviors and respiration data were recorded. GIS mapping was used to visualize the distribution and habitat use of each species, along with the locations and interactions of boats with marine mammals. The most commonly observed species (most frequent to least) were California Sea Lions (*Zalophus californianus*), Long Beaked Common Dolphins (*Delphinus capensis*), Blue Whales (*Balaenoptera musculus*), Bottlenose Dolphins (*Tursiops truncatus*), and Short Beaked Common Dolphins (*Delphinus delphis*). Twenty-one individual Blue Whales were identified and five individuals were resighted multiple times. Feeding was the most commonly observed activity in Blue Whales. Blue whales spent significantly more time feeding than traveling, resting, socializing, mating, milling, or unknown ($\chi^2 = 36.57$, $p < 0.05$, $df = 6$, $N = 37$). GIS analysis is ongoing but the majority of sightings are on the edge of the continental shelf, as hypothesized. This research provides important data on marine mammal abundance, distribution, and habitat use.

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Use of Passive Acoustic Monitoring to assess beaked whale distribution and habitat use in the Gulf of Alaska

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Beaked whales are among the most poorly understood marine mammals. They are deep-diving odontocetes, spending most of their time submerged with infrequent, short surface intervals. Due to this behavior, they are difficult to study using visual observation methods alone. However, recent advancements in passive acoustic detection and survey techniques have shown to provide viable methods for studying beaked whales (Yack et al. 2013). In the Gulf of Alaska (GOA), there is little known about beaked whale abundance and distribution. During the 2013 Gulf of Alaska Line Transect-Survey (GOALS II), a five-element hydrophone array was towed around-the-clock to detect and monitor marine mammals in combination with daylight visual observations. During 23 days of acoustic effort, 456 hours of real-time monitoring/recording was conducted over 6,678 km of trackline. Three species of beaked whales were detected acoustically: Baird's (*Berardius bairdii*; $n=9$), Cuvier's (*Ziphius cavirostris*; $n=34$) and Stejneger's (*Mesoplodon stejnegeri*; $n=6$). The survey was divided into four strata (inshore, offshore, seamount and slope), providing the opportunity to examine distribution and habitat use within the study area. Baird's beaked whales were encountered primarily in the slope stratum, Cuvier's beaked whales primarily in the seamount stratum, and Stejneger's beaked whales were encountered equally in both strata. Beaked whales have been found to have habitat associations with seamounts and north-west facing slopes in the California Current (Yack et al. 2013). Similar habitat associations may also exist in the GOA. In addition to variation in habitat use by species, properties of echolocation signals were analyzed in more detail to see if region specific characteristics exist. As such, a subset of acoustic encounters (five per species) were analyzed by measuring inter-pulse intervals (IPI) and peak frequencies of clicks using PAMGuard Viewer Mode software. Results of this analysis were compared to published data (Baumann-Pickering et al. 2013). The results of these comparisons will be discussed. The acoustic survey results provide critical knowledge necessary to assess the distribution, abundance, and habitat preference of beaked whales in the study area in order to make effective conservation and management decisions.

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SOUTHERN CALIFORNIA MARINE MAMMAL WORKSHOP

JANUARY 31 – FEBRUARY 1, 2014

• NEWPORT BEACH, CA •



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