

## Diurnal Behavior and Group Size Patterns of Common Dolphins (*Delphinus* sp.) during 2008–2010 Aerial Surveys off San Diego, California

Lomac–MacNair, Kate<sup>1</sup>; Smultea, Mari<sup>1</sup>; Bacon, Cathy<sup>1</sup>; Bleses, Megan<sup>1</sup>

(<sup>1</sup>) Smultea Environmental Sciences (SES), 29333 SE 64th Street, Issaquah, Washington, 98027, USA

Aerial surveys offer an ideal observation platform to document the behavior and group size of dolphin species over a wide range in offshore waters in a short period. Eight aerial surveys were conducted near San Clemente Island off southern California, Oct/Nov 2008, Jun/Jul/Nov 2009 and May/Jul/Sep 2010 to monitor behavior of marine mammal species using line-transect and focal-behavioral circling methods. An estimated 94,867 short-beaked (*Delphinus delphis*) and long-beaked (*Delphinus capensis*) common dolphins were observed during 346 separate events. Number of sightings, mean group size and initial group behavior state were recorded and compared by diurnal periods. Daytime observation hours were divided into three periods, following the methods of Bearzi et al. (1999): "morning" (08:01–11:59)(n = 71 sightings, individuals = 22,777), "early afternoon" (12:00–15:59)(n = 191, individuals = 52,926), and "late afternoon" (16:00–19:59)(n = 85, individuals = 19,164). Sighting rates were highest in the early afternoon (4.1 indiv/km) followed by late afternoon (3.9 indiv/km) and morning (3.3 indiv/km). Mean group size was highest in the "morning" (321 ± 455.8), followed by "early afternoon" (277 ± 354.5) and "late afternoon" (225.5 ± 276.0). During the "morning", initial group behavior was most frequently surface-active mill (44%) followed by travel (29%) and surface active travel (13%). During the "early afternoon", travel (35%) occurred most frequently, followed by surface-active mill (33%) and surface-active travel (24%). During the "late afternoon", surface-active mill (35%) occurred most frequently, followed by travel (28%) and surface-active travel (27%). Social and apparent foraging behaviors typically occurred during surface-active behavior states. Results suggest that groups of common dolphins of both species aggregate in larger numbers and are generally exhibiting more surface-active mill behavior during the morning than early and late afternoon, potentially corresponding with socializing and foraging strategies. Further data gathering and multivariate analyses are underway to elucidate more specific diurnal trends and behavioral correlations.

## Sperm whale (*Physeter macrocephalus*) seasonal presence in the southern CalCOFI region

Karlina Merckens(<sup>1</sup>), Lisa Munger(<sup>1</sup>), Greg Campbell(<sup>1</sup>), Annie Douglas(<sup>2</sup>), John Calambokidis(<sup>2</sup>), John Hildebrand(<sup>1</sup>) (<sup>1</sup>)Scripps Whale Acoustic Lab, Scripps Institution of Oceanography, La Jolla, CA (<sup>2</sup>)Cascadia Research Collective, Olympia, WA

Sperm whales (*Physeter macrocephalus*) are odontocetes found in all oceans from the tropics to the polar ice edges. They produce sounds for communication and echolocation that are easily detected within a few (up to tens of) kilometers. By monitoring for acoustic signals and conducting visual surveys as part of the quarterly CalCOFI cruises (lines 93–77), we have been able to record sperm whale presence in this region for the past 7.5 years. Using data from April 2004–November 2009 (23 cruises) we recognize a seasonal pattern: sperm whale abundance is highest in the spring and summer cruises and lowest in the fall and winter cruises. Spatially sperm whales are found off the shelf and in deep water areas of the Southern California Bight. Environmental factors, such as sea surface temperature and seasonal fluctuations in prey may be driving these variations.

## Got Milk? Aircraft Observations Provide Rare Glimpses into Whale Calf Nursing and Back Riding

Meggie Moore, Mari A. Smultea, Cathy Bacon, Bernd Würsig, and Vanessa James

Nursing behavior by large cetaceans in situ is not well described. During ~30,000 km of aerial surveys off Southern California to monitor marine mammals relative to U.S. Navy military training activities (2008–2011), nursing behaviors were documented for three species: Eastern Pacific gray whale (*Eschrichtius robustus*), fin whale (*Balaenoptera physalus*) and killer whale (*Orcinus orca*). Photographs, video, notes and audio recordings were used to analyze mother-calf interactions. Back riding occurred in gray and fin whales, as described for bowhead whale (*Balaena mysticetus*) mother-calf pairs by Würsig et al. (1999). During slow sub-surface travel, a fin whale calf swam alongside mother's peduncle area, touching her head-first for short (<1 min) bouts at a 45° angle. During the sighting (~50 min) the calf switched from one side of the mother's peduncle to the other 12 times, usually by "riding" (n=8) the mother's back or swimming underneath her (n=4). Nursing was assumed based on the persistent (~1 min) position of the calf's head relative to mother's peduncle/teat area. Observations of the gray whale pair showed similar behavior (~19 min) with calf riding mother's back 3 times, except mother was resting not traveling. During nursing, the calf faced mother at a 45° angle while mother held up her flukes. Two apparent nursing positions of a traveling killer whale mother-calf pair were also photo-documented (~40 min). One position showed both whales lying parallel, facing one another, in the same orientation. The second position showed the same mother lying on her back, with calf nursing on top of mother, ventral side to ventral side. These positions were similar to those described among captive killer whales. Observations indicate nursing occurs during travel and calves of other whale species back ride. Data contribute to rare documentations of whales nursing in the wild, furthering the understanding of cetacean mother-calf interactions.

# SOUTHERN CALIFORNIA MARINE MAMMAL WORKSHOP

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