

Comparison of Blue and Fin Whale Behavior, Headings, and Group Characteristics in the Southern California Bight during Summer and Fall 2008-2010

Bacon, Cathy¹; Smultea, Mari¹; Würsig, Bernd²; Lomac-MacNair, Kate¹
 (1) *Smultea Environmental Sciences, 29333 SE 64th Street, Issaquah, Washington, 98027, USA*

(2) *Texas A&M University at Galveston, Marine Mammal Research Program, Galveston, TX, 77553, USA*

Corresponding author: cathyebacon@gmail.com

Baseline undisturbed behavior and social patterns of blue (*Balaenoptera musculus*) and fin whales (*B. physalus*) are not well described and are needed to identify and understand potential effects of anthropogenic activities. Behavioral data for blue and fin whales were collected during line-transect and focal-follow effort. Initially observed behavior state, heading, and minimum and maximum inter-individual dispersal distance were recorded during line-transect sampling. Focal groups were circled for 10-60+ minutes and videotaped from outside Snell's sound cone to avoid disturbance. During 24,736 km of survey effort, 51 fin whale sightings (85 individuals) and 49 blue whalesightings (81 individuals) were seen. Over 7 hours of video was collected for 16 blue and 15 fin focal follows. During the summer seasons, blues (n=48) were seen more commonly than fins (n=35); in fall, fins (n=16) were seen significantly more frequently than blues (n=1). Mean group size was 1.7 whales for both species. Initially observed blue behavior was usually travel (85%) or mill (11%). Observed fin whale behavior was also mostly travel (90%), mill (4%), or surface-active travel (4%). Both species were seen socializing in fall but not summer; foraging was observed in summer through fall. Mean initial dispersal for blues and fins was 9.1 and 14.2 body lengths, respectively. In summer, blues were most frequently (26%) seen headed S; in fall (n=2), they were headed only inshore (E). In summer, fin whales were most commonly headed SSW (26%) or WNW (26%); in fall, they were headed mostly NE (38%) or WSW (38%). Dive/respiration/behavioral event rates were also collected. Both species may directly compete for food based on observations of inter-specific maneuvering for a bait ball. Data represent the most extensive record of systematic undisturbed behavior on these species in SOCAL and include social interactions not previously documented in this region.

Potential Kelp Habitat during the Late Pleistocene and Early Holocene in Southwestern Southeast Alaska: Implications for Marine Mammals

Baichtal, James¹; Crockford, Susan J²

(1) *US Forest Service, Tongass National Forest, PO Box 19001, Thorne Bay, AK, 99919, USA*

(2) *Pacific Identifications Inc., 6011 Oldfield Rd., Victoria, BC, V9E 2J4, Canada*
 Corresponding author: jbaichtal@fs.fed.us

During the Last Glacial Maximum (LGM) in southeastern Alaska, a coastal forebulge developed westward of continental ice. Exposed shell-bearing raised marine strata were used to generate a sea level curve for southwestern Southeast Alaska from 10,000 RCYBP to the present, defining collapse of the forebulge. Two points were used to generate a sea level curve from 14,000 to 10,000 RCYBP: 1) A shoreline at about 14,000 RCYBP represented by a terrace along the paleoshoreline at a depth of -165m dated by the eruption of a now submerged maar volcano, and 2) The 10,000 RCYBP point, at -70m, comes from Core EW0408-11JC from the Gulf of Esquibel that shows a change from fresh water to salt water at 9,997 RCYBP, indicating the time and depth of marine inundation. The sea level curve generated by these combined data sets was found to be similar to those reported from Haida Gwaii, British Columbia, Canada. A paleoshoreline model was developed from this sea level curve analyzing the coastal bathymetry in 1000 year increments. Potential

kelp habitat was modeled based on the knowledge that kelp beds flourish today at depths of 15m or less. The results show a far greater amount of kelp forest potentially available in the late LGM than exists today, habitat critical for a variety of marine mammals, including sea otter *Enhydra lutris*, harbor seal *Phoca vitulina*, and Steller sea lion *Eumetopias jubatus*. Evidence from other studies suggest this potential for extensive kelp forests was likely present along rocky shorelines to various degrees from Yakutat, AK south to Puget Sound, WA. Such extensive kelp forests available early in the deglaciation period would have greatly aided rapid re-colonization of the coast by marine mammals forced south by the emergence of Beringia and presence of sea ice in the North Pacific during the LGM.

Assessment of Critical Habitat for Endangered False Killer Whales in Hawai'i

Baird, Robin W¹; Hanson, M. Bradley²; Schorr, Gregory S. ¹; Webster, Daniel L. ¹; Gorgone, Antoinette M. ³; Mahaffy, Sabre D. ¹; McSweeney, Daniel J. ⁴; Oleson, Erin M. ⁵; Andrews, Russel D. ^{6,7}

(1) *Cascadia Research Collective, 218 1/2 W 4th Avenue, Olympia, WA, 98501, USA*

(2) *NOAA Northwest Fisheries Science Center, 2725 Montlake Blvd., E, Seattle, WA, 98112, USA*

(3) *NOAA Southwest Fisheries Science Center, 101 Pivers Island Road, Beaufort, NC, 28516, USA*

(4) *Wild Whale Research Foundation, Box 139, Holualoa, HI, 96725, USA*

(5) *NOAA Pacific Islands Fisheries Science Center, 1601 Kapiolani Blvd, Honolulu, HI, 96814, USA*

(6) *School of Fisheries and Ocean Sciences, University of Alaska Fairbanks, Box 757500, Fairbanks, AK, 99775, USA*

(7) *Alaska SeaLife Center, 301 Railway Avenue, Seward, AK, 99664, USA*

Corresponding author: rwbaird@cascadiaresearch.org

For species listed under the Endangered Species Act federal agencies must designate "critical habitat", areas containing features essential to conservation and/or which may require special management considerations. In November 2010 NMFS proposed listing a small (~150 individuals) demographically-isolated population of false killer whales in Hawai'i as Endangered, but has not proposed designating critical habitat. We assessed the population's range and critical habitat using location data from 27 medium-term satellite tags deployed from 2007-2010. Assessment of independence of individuals with temporally overlapping tag data indicated data were from 22 "groups", and analyses were restricted to one individual per group. Data were available for periods from 13-105 days (median=40.5 days), with 8,513 locations (87% from August-January). Association analyses of photo-identification data indicated the population is divided into at least three large associations of individuals, of which tag data were available from two. While range of individuals from the two associations were similar, one used significantly deeper waters than the other, and high use areas differed between them. Individuals moved extensively and often rapidly among islands, using both the leeward and windward sides. A minimum convex polygon range encompassing all locations was approximately 82,800 km², with individuals ranging from Ni'ihau to Hawai'i Island. Maximum distance offshore was 122 km, although individuals spent the majority of their time <50 km from shore. Areas of particularly high use were off the northwest and northeast sides of the island of Hawai'i, the north sides of Maui and Moloka'i, and west of Lana'i. While this analysis provides a basis for designation of critical habitat, there are likely other high use areas within the range that have not yet been identified due to seasonal limitations, availability of data from only two of the three main associations, and evidence that short-term movements were influenced by where individuals were tagged.