

## Aerial Surveys Conducted in Conjunction with US Navy Training Exercises off Southern California 2008-2010

Smultea, M.A.<sup>1,2</sup>, K. Lomac-MacNair<sup>3</sup>, J.R. Mobley, Jr.<sup>4</sup>, L.M. Mazzuca<sup>5</sup>, C. Bacon<sup>6</sup>, and R. Merizan<sup>7</sup>

<sup>1</sup>Smultea Environmental Sciences, LLC (SES), 29333 SE 64th St., Issaquah, WA 98027; <sup>2</sup>HDR|EOC Inc., 500 108th Ave. N.E., Suite 1200, Bellevue, WA 98004-5549; <sup>3</sup>SES, PO Box 15034, Fritz Creek, AK 99603; <sup>4</sup>Marine Mammal Research Consultants, 1669 St. Louis Dr., Honolulu, HI 96816 <sup>5</sup>US Navy, SPAWAR Systems Center Pacific, 56530 Hull Street, San Diego, CA 92152; <sup>6</sup>SES, 1616 Quails Nest Dr., Fort Worth, TX 76177, <sup>7</sup>SES, 28617 Newcastle Road, Highland, CA 92346

Eight aerial surveys were conducted during fall and summer 2008-2010 to monitor marine mammals and sea turtles before, during and after US Navy (Navy) major training events (MTEs) in the SOCAL Navy range off Southern California. The survey purpose was to collect baseline data and monitor potential effects, if any, from MTEs on marine mammals. Line-transect, focal behavioral sampling and shoreline stranding surveys were conducted. A total of ~37,808 km (~207 hr) of observation effort occurred: 8401 km in Oct and Nov 2008; 12,640 km in June and July 2009; 4823 km in Nov 2009; 4891 km in May 2010; 3125 km in July 2010; and 3928 km in September 2010. Effort consisted of 38% systematic line transect, 38% random/transit transect and 24% circling (focal follow/photo species verification). Beaufort 2-3 predominated. A total of 1,284 marine mammal sightings were recorded; no sea turtles were seen. Three pinniped, 7 dolphin and 6 whale species were identified, including Cuvier's beaked whales, killer whales and sei and Bryde's whales considered rare in the area. Line transect estimates of abundance were made for the most commonly observed species: 7 blue whales, 51 fin whales, 54 Pacific white-sided dolphins, 2,443 Risso's dolphins, 372 bottlenose dolphins, 24,748 common dolphins (mostly *D. delphis*), and 1,587 California sea lions. Risso's dolphins were most common in June/July 09 (n= 93 groups). Killer whales were seen twice during the same survey in Nov 09. Four dead pinnipeds and a dead subadult male blue whale were seen in Nov 08, and a live fin whale dragging a buoy was seen in June 09, none of which were attributable to Navy activities. Eighty-three focal follows of 10-60+ min occurred with 9 cetacean species, including extended video of blue, fin, humpback and killer whale as well as Risso's dolphin behavior at and below the water surface. Risso's dolphins primarily traveled slowly with no surface-active behaviors while common dolphins primarily surface-active milled or traveled; both species were headed predominantly east or west. Baleen whales tended to travel north or south, with some feeding observed, including lunge-feeding by sei whales. Marine mammals were seen in the area before, during and immediately after MTEs. Distributions were concentrated along underwater ridges and mounts, coastal waters, and other areas of bathymetric relief. Effort was coordinated with other regional, ongoing marine mammal studies (e.g., tagging, photo-ID, sound playback, passive acoustic monitoring, etc.) to compliment efforts when possible. Results represent the largest most recent systematic effort within this Navy range and the first systematic behavioral study from aircraft in the Southern California Bight.