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**AERIAL SURVEYS OF MARINE MAMMAL/SEA TURTLE
PRESENCE AND BEHAVIOR FROM 9 TO 14 MAY 2011
IN THE SOCAL RANGE COMPLEX**

Post-Survey Summary Report

May 24, 2011

Contract # N62470-10-D-3011 - CTO KB04

Prepared by M.A. Smultea, J. Black, and C. Bacon, HDR Inc.

This Preliminary Summary Report summarizes a single aerial survey conducted on the Navy's Southern California Range (SOCAL) to monitor marine mammals during a Major Training Exercise as described in the SOW. The goal was to complete approximately 32 hours of aerial visual survey effort per survey, weather permitting, which was as behaviorally focused as possible.

Aerial survey efforts occurred over 6 days: May 9-14, 2011, during an exercise. A total of 27.02 hours and 4,506 km (2,432 nm) was flown from "wheels up" to "wheels down" was flown (Table 1). Observers were on watch for approximately 94 percent of this time during systematic line-transect, transit, and circling effort (**Table 1**) (see Smultea & Lomac- MacNair 2010 for detailed protocol and definitions). The total hours and flight descriptions for each day by date are listed in **Table 1**.

Methods followed protocols implemented during similar aerial survey monitoring efforts conducted in the SOCAL during nine previous surveys (e.g., Smultea & Lomac- MacNair 2010). Primary exceptions to past protocols are identified as follows:

A newly developed software program "Mysticetus" (David Steckler/Entiat River Technologies) was used for again Beta testing efficacy of data collection from the aircraft, as was done during the April 2011 SOCAL aerial survey. The software had been modified and improved since April to further meet the needs of the aerial survey protocol based on feedback from the observer team and others.

This included the ability to quickly produce summaries of effort, sightings, etc., as well as plots of tracks and sightings on Google Earth maps.

The software also produced a final report in Excel format, using the same variables from past surveys.

The software was also key in producing real-time in situ maps of the relative position of sightings to the aircraft when a declination angle was entered, facilitating relocation and following of sightings with the touch of 1-2 keys.

Four different observers/recorders on the aircraft successfully used Mysticetus during the aerial survey and noted the improved ease of data entry and user interface friendliness. Continued feedback was provided during the survey to D. Steckler whom implemented the changes quickly.

The survey was the fourth recent SOCAL aerial monitoring effort conducted during the "cool-water" winter period. A total of 81 sightings of an estimated 3,309 individual marine mammals were made (**Table 2**). Most sightings and individuals were again common dolphins and California sea lions, similar

to the three surveys conducted in February, March and April of 2011. However, there were notably more blue (n = 13) and fin (n=9) whale sightings. No gray whale or Dall's porpoise sightings were identified unlike earlier surveys in 2011. For the first time since SOCAL aerial monitoring surveys began in fall 2008, a group of 19 sperm whales including 4 calves was seen. They were associated with both Risso's and northern right whale dolphins were seen. The sighting occurred on May 14 approximately 24 NM west of San Diego near the edge of an underwater ridge. Approximately 1 hour of focal observations occurred and included numerous photos and video. **Table 3** provides a list of all sightings and their GPS locations.

Details of focal session and behavioral observations will be provided in subsequent versions of this report.

Recommendations and Additional Notes

It is highly recommended that the software Mysticetus continue to be used and developed as needed during the aerial surveys. To obtain consistency of data collection, it is recommended that this program be considered for use on vessel surveys as well, including by observers conducting monitoring from aboard Navy vessels. A working meeting with the software developer is also recommended to identify variables, outputs and summaries that would be useful to include in the program. Use of this program is anticipated to cut back on the data processing, management, uploading and merging hours required for post-processing of data though it will not avoid the critical need to review and edit collected data.

A research assistant should be included in the SOCAL aerial survey budget and protocol to run the logistics, data editing and data management for an aerial survey given the high volume of data collected in SOCAL. There is insufficient time and energy for observers to do this in the field, and it is best if this is done soon after being in the field while observers still remember what happened. This assistant would be in addition to the three observers (one a recorder) required to collect data from the plane. The assistant is needed before, during and after each survey and should interact with the observers each day.

References:

Smultea, M.A. and K. Lomac-MacNair. 2010. Aerial Survey Monitoring for Marine Mammals off Southern California in Conjunction with US Navy Major Training Events, November 18-23, 2009 - Final Field Report. Prepared for Commander, Pacific Fleet, Pearl Harbor, HI. Submitted to Naval Facilities Engineering Command Pacific (NAFCOM), EV2 Environmental Planning, Pearl Harbor, HI 96860-3134, under Contract No. N62742-10-P-1917 issued to Smultea Environmental Sciences, LLC. (SES), Issaquah, WA, 98027. Submitted July 2010.

Smultea, M.A., R. Merizan, C. Bacon, and J. Black. 2010. Aerial Survey Marine Mammal Monitoring off Southern California in Conjunction with US Navy Major Training Events (MTE), SOCAL July 2010 Surveys: July 27-August 3, Draft Report. Prepared for Commander, Pacific Fleet, Pearl Harbor, HI. Submitted to Naval Facilities Engineering Command Pacific (NAVFAC), EV2 Environmental Planning, Pearl Harbor, HI 96860-3134. Contracted by University of California, San Diego, 7835 Trade St., San Diego, CA 92121. Submitted by Smultea Environmental Sciences, LLC. (SES), Issaquah, WA, 98027, www.smultea.com, Contract No. N00244-10C-0021, Purchase Order No 10309963. Submitted September 2010.