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Marine Mammal Observations at SCORE 2008: A brief summary of effort, sightings, and satellite tag deployments

Prepared by Cascadia Research, November 2008*

Introduction

The fourth and fifth in a series of collaborative visual-acoustic surveys for marine mammals at the Southern California Offshore Range (SCORE) near San Clemente Island (SCI) were conducted in August and October 2008. During these surveys, visual observers are vectored to areas of marine mammal vocal detections using the M3R system developed at the AUTEC hydrophone array in the Bahamas. As the array configuration and species diversity at SCORE varies from that at AUTEC, the initial collaborative surveys in the region focused primarily on verifying position and species associated with acoustic detections. By the third survey in October 2007, this technique had been refined considerably, and during favorable conditions experienced observers were reliably vectored within sighting distance of groups of Cuvier's beaked whales. A substantial amount of information was collected on this species during that survey, including data on short term movements, surfacing and vocalization cycles, and group composition. Further, identification photos were collected for approximately 30 unique individuals forming the basis of a catalog for ongoing photo-identification studies.

The goal of effort at San Clemente Island in 2008 was to continue collecting baseline sighting data on all marine mammal species encountered in the study area, expand photo-ID data on species of interest (beaked whales, fin and other baleen whales, bottlenose and Risso's dolphins), and deploy medium-duration satellite tags primarily on beaked and fin whales. This report summarizes effort and sightings from all visual survey platforms, and preliminary results of satellite tagging for the year.

Survey Effort

Visual surveys were conducted at San Clemente Island from 2-10 August and 17–30 October 2008. Similar to the survey in October 2007, this effort combined visual observations from the R/V Sproul (Scripps Institution of Oceanography, SIO) with those from 2-3 small RHIBS operated by Cascadia Research (N1 and N2) and SIO (the Paula Christine, PC). Cascadia RHIBs launched daily from the Sproul for most survey days in 2008, while the PC was based on San Clemente Island and transited to the range each day, weather permitting. As with previous surveys, a little less than half of effort hours were spent in observer conditions rated as "Fair" or "Poor", indicating that the ability to sight and approach animals was significantly limited by visibility, wind, or swell height. Table 1 summarizes all effort at SCORE to date.

Although most effort was focused over the instrumented range on the west side of the island, surveys were sometimes shifted to the east side due to weather or range restrictions. On one day in October 2008 surveys were conducted at nearby Santa Catalina Island due to range conflicts. Several hours of survey effort were also spent at Tanner Bank to the west of the array in October 2008.

Sightings

Tables 2a and 2b summarize sightings by species in 2008. Sighting rates were generally lower in 2008 than in previous years. This difference is most striking when comparing October 2007 with October 2008. Protocols were similar during these two surveys (two RHIBS and the Sproul focusing on beaked whale detections during calm weather and switching to other species as winds increased) as were the overall proportions of time spent in favorable conditions. The October 2007 survey was considerably shorter than the October 2008 survey (approx. 150 versus 267 effort hours), but the overall sighting rate was more than double (0.75 sightings/hr in 2007, 0.30 sightings/hr in 2008). Species diversity was also low. Risso's dolphins were not sighted at all in October 2008, and bottlenose

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dolphins were sighted only five times during that survey, with four of these sightings at Catalina Island and the remaining sighting on the east side of San Clemente, not on the instrumented range.

Cuvier's beaked whales were sighted regularly in August and October 2008 with the aid of acoustic localizations when wind conditions were less than a Beaufort 3. As in October 2007, observers were able to remain with groups for periods up to several hours in calm conditions, recording surfacing behavior and movements and collecting photos for individual identification. Another notable difference in October 2008 was that the average group size for Cuvier's beaked whales was smaller than previously recorded. Most group sighted contained three or fewer whales, and these smaller groups were typically less approachable than the groups of 4-7 regularly encountered in earlier survey. Several calves were also observed in 2008, representing our first observations of obviously young individuals in the population.

Fin whales were sighted less frequently in August 2008 than in previous surveys, and were virtually absent from the range in October 2008 on all but two days. No fin whales were sighted in the first five days of effort in October 2008, despite broad geographic coverage. A number of fin whales were sighted on 22-23 October, mostly along the northwest border of the array, and no further sightings were made for the remainder of the trip.

Analysis of photo identification data from Cuvier's beaked whales and fin whales is currently underway.

Satellite Tagging

Four medium duration satellite tags were deployed at SCORE in 2008: one on a Cuvier's beaked whale and three on fin whales. These small tags, which are attached to the dorsal fin or dorsal ridge area via two barbed darts, are designed to maximize tracking duration and minimize impact on the tagged individual, particularly for smaller odontocetes such as beaked whales, where full implant tags are not currently feasible. They have been deployed previously on seven species of odontocetes in other regions, including Cuvier's and Blainville's beaked whales, sperm whales, killer whales, and pilot whales, providing day-to-day movement data over periods from several weeks to several months.

The first tag was deployed on an adult female Cuvier's beaked whale on 3 August 2008, and is continuing to provide movement data as of 24 November 2008. Daily movements of this individual were recorded throughout the surge in training activity on the range in October 2008, and may provide an opportunity to look at the movements of this whale in relation to sonar use. The remaining three tags were deployed on fin whales on 8 August, 22 and 23 October 2008 (Figure 2), representing the first satellite tagging of fin whales with this type of tag, and the first insights into movements of this species in the region. The first two tags transmitted for 34 and 26 days respectively, and the third tag was still transmitting as of 24 November 2008. A preliminary look at the tracks from these four deployments suggest a limited movements by the beaked whale with frequent use of the instrumented range (Figure 1), and very broad regional movements by the fin whales.

The number of successful deployments was limited by several factors, including weather, number and behavior of animals encountered, and a decision to focus on beaked whales whenever possible. Weather is the primary obstacle to tagging for all species, given that it impacts both our ability to locate animals (particularly beaked whales), and to make the controlled close approach necessary for deployment. Cuvier's are especially difficult to tag due to their very short surfacing intervals and long intervening dives: there is often two minutes or less to close approach before the end of a surfacing series. Group composition also affected our ability to deploy tags. In general, small groups reacted to the approach of the boat more strongly than larger groups, and even when close approaches were successful, animals often oriented away from the boat precluding a square shot.

Despite these challenges we are optimistic that with additional effort in good conditions, we can deploy enough tags to begin to address questions of movement and residency of species within SCORE, and potentially assess some of geospatial impacts of sonar use in the region.

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Table 1. Total effort hours and proportion of effort in "Excellent" or "Good" conditions for all surveys at SCORE to date.

Survey Dates	Participating Vessels	Vessel Days	Total Survey Hours	Hours (%) in Excellent or Good Conditions
13-20 Aug 2006	2 CRC RHIBs	15	131.6	75.7 (58)
13-22 Apr 2007	2 CRC RHIBs	14	95.8	45.5 (47)
22-26 Oct 2007	2 CRC RHIBs, Sproul	16	149.9	96.3 (64)
2-10 Aug 2008*	2 CRC RHIBs, 1 SIO RHIB, Sproul	31	228.5	126.4 (55)
17-30 Oct 2008	1 CRC RHIB, 1 SIO RHIB, Sproul	28	266.6	160.2 (60)

*August 2008 totals do not include survey hours for SIO RHIB.

Table 2a and 2b. Total number of groups sighted, number of groups sighted on and off the range, estimated number of individuals sighted, and average groups sizes for cetacean species encountered at or near SCORE in 2008. Tables exclude sightings of unidentified whales and dolphins.

2A. Sightings 2-10 August 2008.

Common Name	Groups Sighted	On range	Off range	Est Total Individuals	Avg Group Size
Blue Whale	3	1	2	5	1.7
Fin Whale	47	30	17	66	1.4
Long-beaked Common Dolphin	2	0	2	90	45.0
Short-beaked Common Dolphin	29	17	12	4133	142.5
Common Dolphin, Species unknown	9	5	4	420	46.7
Risso's Dolphin	11	2	9	296	26.9
Pacific White-sided Dolphin	4	2	2	22	5.5
Bottlenose Dolphin	29	2	27	612	21.1
Cuvier's Beaked Whale	13	13	0	54	4.2

2B. Sightings 17-30 October 2008. Table includes sightings from one day at Santa Catalina Island.

Common Name	Groups Sighted	On range	Off range	Est Total Individuals	Avg Group Size
Blue Whale	1	1	0	1	1.0
Fin Whale	18	14	4	32	1.8
Long-beaked Common Dolphin	3	1	2	1033	344.3
Short-beaked Common Dolphin	14	6	8	2951	210.8
Common Dolphin, Species unknown	6	4	2	652	108.7
Pacific White-sided Dolphin	2	0	2	15	7.5
Humpback Whale	2	2	0	3	1.5
Dall's Porpoise	1	0	1	5	5.0
Bottlenose Dolphin	5	0	5	55	11.0
Cuvier's Beaked Whale	9	7	2	24	3.0

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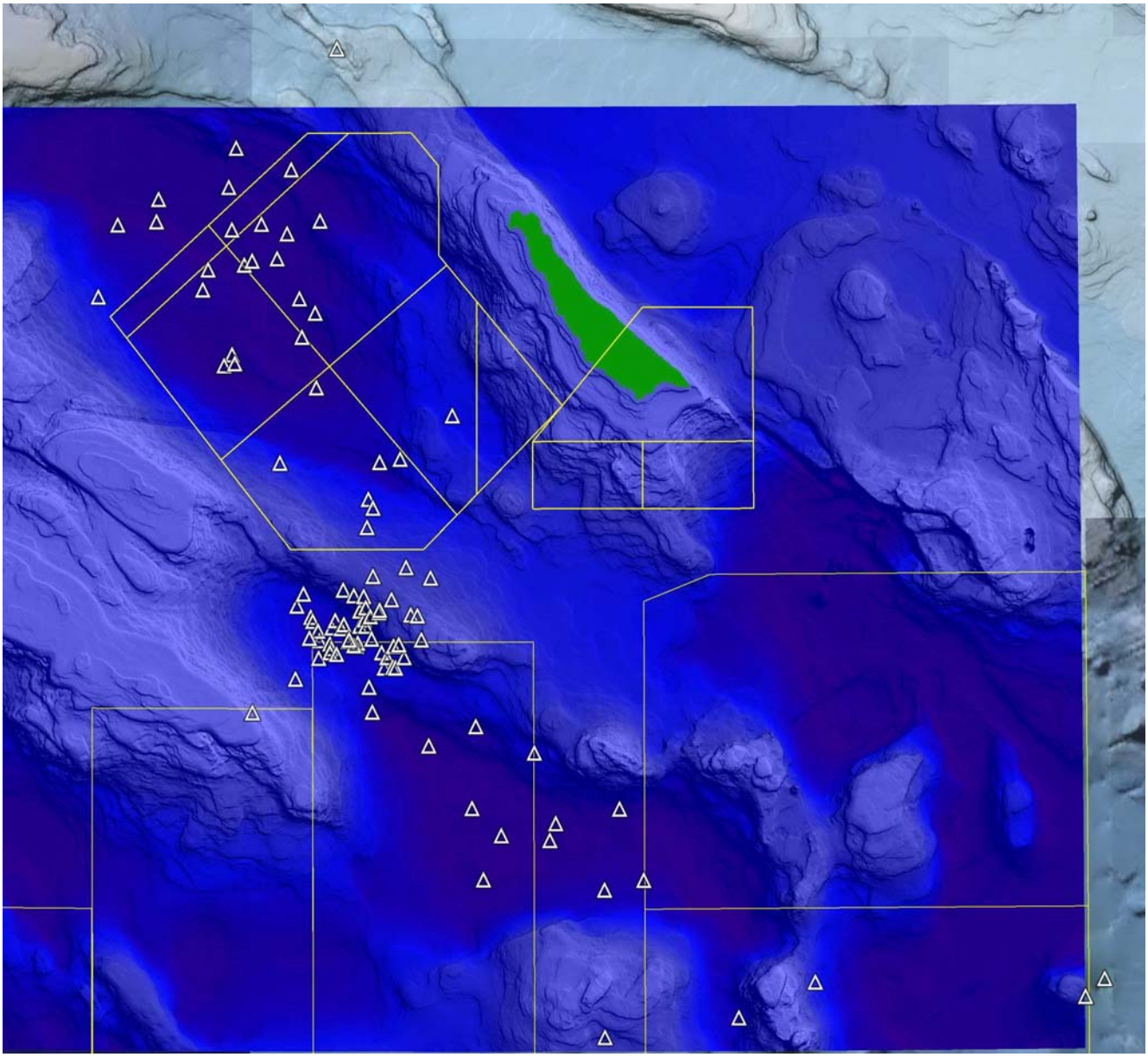

Figure 1. Map showing one representative daily location of a satellite tagged Cuvier's beaked whale over a period of 106 days. The maximum distance moved from the original tagging location is currently 151 km.

Figure 2. Medium duration satellite tag on a fin whale 23 October 2008. Photo by Erin Falcone.

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