

Vocalization behaviors of minke whales in relation to sonar in the planned Undersea Warfare Training Range off Jacksonville, FL

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Autonomous acoustic recorders are effective for investigating the distribution, occurrence, and acoustic behaviors of a variety of marine mammals in remote and deep-water locations. Nine Marine Autonomous Recording Units (MARU's) were deployed in a rectangular array at a site coinciding with the United States (U.S.) Navy's planned Undersea Warfare Training Range (USWTR) approximately 60-150 kilometers offshore Jacksonville, FL. All 9 units were deployed for 26 days in fall (13 September to 8 October) and 37 days in winter (3 December to 8 January) 2009-2010 at shallow, mid-depth, and deep sites (45, 183, 305 meters). The timing of the deployments allowed recordings of cetacean vocalizations and sonar activity to be made before, during, and after two U.S. Navy training exercises. The goal of this study was to characterize minke whale vocal activity in relation to U.S. Navy mid-frequency sonar signals. Data were reviewed in detail using the MATLAB program Triton (Wiggins 2007). Event logs were created for each day at every site. Custom-written MATLAB scripts were used to calculate the probability of minke whale vocalization events occurring in the presence and in the absence of mid-frequency sonar. Minke whale vocalization events were completely absent in the fall deployment period, but occurred almost continuously during the winter deployment, indicating a strong seasonal pattern of occurrence. Minke whale vocalizations were detected most frequently at deep-water sites, but only at low levels (< 0.03% of time) at shallow-water sites. 'Speed-up' and 'slow-down' pulse trains were the predominant vocalization types detected. Results of the probability analysis indicated a strong negative correlation to sonar. Minke whale vocalization events were greatly reduced, or completely ceased, during most days with nearly continuous sonar events during an approximate 3-day period. To our knowledge, such changes in acoustic behaviors of minke whales in relation to sonar have not been reported before.

Fishers' ecological knowledge of Antillean manatees around the Samana Bay area, Dominican Republic

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In many areas of their range, endangered Antillean manatees are still hunted for food and captured accidentally in fishing gear, but quantitative data on these sources of mortality are difficult to obtain because fishing and hunting are poorly monitored. In an effort to assess these threats in the Wider Caribbean Region, a multinational Manatee Bycatch Pilot Project was started in 2012 to evaluate the effectiveness of a standardized questionnaire approach in collecting information. One of the participating countries is the Dominican Republic, where manatees have been officially declared critically endangered and a current assessment of their distribution, population trend and captures is needed. The animals are locally rare, so purposive sampling was used to select subjects who were knowledgeable about manatees. Between August and December 2012, the questionnaire was administered by trained local

volunteers to 101 artisanal fishers around Samana Bay. The questionnaire proved a useful tool for capturing valuable local knowledge. One of the areas most fishers agreed was regularly frequented by manatees, San Lorenzo Bay, overlapped with fishing grounds. Most fishers (57%) perceived a decline in the number of manatees compared to when they started fishing, mainly because of hunting and by-catch in nets. However, only three manatee capture events were reported by two fishers, including an accidental capture within the last year. Almost all fishers knew it was illegal to capture manatees deliberately (96%) or accidentally (61%). Most fishers (61%) would not report an accidental manatee death to the relevant authorities due to their fear of legal consequences. Unwillingness to report accidental deaths leads to underestimates of manatee mortality and hinders conservation efforts. Similar surveys are currently underway in the northwest and southwest coasts of the Dominican Republic and in Haiti, to fully assess the conservation status of manatees in Hispaniola Island for the first time.

THE FIRST DETAILED AT-SEA OBSERVATIONS AND NEW DIAGNOSTIC DESCRIPTIONS OF SHEPHERD'S BEAKED WHALE (*Tasmacetus shepherdii*)

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Shepherd's beaked whale (*Tasmacetus shepherdii*), is amongst the most poorly understood of all mammals and is one of the least known cetaceans in the world (Mead 1989, 2002). Up until 2008, there had been just two confirmed at-sea sightings of this species (Pitman et al 2006, Pitman pers. comm. 2012). Apart from good observations of an individual stranded alive in New Zealand in 1994, there has been a paucity of detailed descriptive data on the external morphology of live *T. shepherdii*. To date, additional morphological information has been acquired from a combination of a small number of aerial observations and data collected from beach cast specimens. Offshore vessel based surveys between May 2008 and January 2012, in northern New Zealand and southern Australian waters, have presented us with rare opportunistic sightings of free-swimming *T. shepherdii*. These sightings have enabled the collection of greatly enhanced diagnostic and behavioural data as well as insights into their habitat preference. Here we present relevant data pertaining to the first detailed morphological description of live *T. shepherdii* using first hand accounts gathered from four confirmed at-sea sightings of the species.

Quantifying risk to marine mammal populations from aquatic noise via expert elicitation in dose-response curves

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There are currently many large developments for off-shore renewable energy around the coasts of the UK. These are predominantly wind farms in varying states of operation or construction, and further large expansions are planned. Installation of the turbines typically produces large amounts of far-reaching noise, potentially disturbing thousands of marine mammals for months to years. Quantification of the consequent