Session 5aAB

Animal Bioacoustics: General Topics in Passive Acoustic Monitoring of Animals I

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Contributed Papers

8:30

5aAB1. Comparison of visual and acoustic detection rates for cetaceans off Washington. John Calambokidis (Cascadia Res., 218 1/2 W 4th Ave., Olympia, WA 98501), Erin Oleson (Pacific Islands Fisheries Sci. Ctr., Honolulu, HI 96814), Erin Falcone, Greg Schorr (Cascadia Res., Olympia, WA 98501), Sean Wiggins, and John Hildebrand (Scripps Inst. of Oceanogr., La Jolla, CA 92037)

From 2004–2010, we examined marine mammal occurrence off Washington acoustically and visually. Acoustic monitoring was conducted by Scripps Institution of Oceanography using high-frequency acoustic recording packages (sample rate 80–200 kHz) in Quinault Canyon, part of the Navy's Northwest Range. Visual surveys were conducted using small 6 m rigid-hull inflatable boats covering out to the location of the HARPs during favorable weather year-round. Visual surveys detected over 500 sighting of 12 species of cetaceans. Humpback whales were the most common baleen whale; harbor and Dall's porpoise were the most common odontocete detected visually. Species detected acoustically included Pacific white-sided and Risso's dolphins, and beaked, killer, sperm, humpback, blue, and fin whales. While there were similarities in the detections by both methods there were also some Stark contrasts. Overall, there were more acoustic detections than visual sightings and these included sperm whales, which were detected frequently acoustically but never visually. For humpback whales, acoustic detections were highest in fall and winter (and low in summer), while visual sightings showed highest numbers in summer and early fall. These differences can be explained by the dive and calling behavior of these species and demonstrate how the strengths and weaknesses of these approaches complement each other.

8:45

5aAB2. North Atlantic right whale seasonal presence off the coast of New Jersey: Confirmation by passive acoustic monitoring and ship survey data. Kathleen M. Dudzinski, Amy Whitt, and Jennifer Laliberte (2201 K. Ave., Ste. A2, Plano, TX 75074, kdudzinski@geo-marine.com)

North Atlantic right whales (NARW) are one of the most critically endangered marine mammals with abundance estimates for the North Atlantic population at about 438 individuals cataloged in 2008. Data presented here were part of a larger, long-term study to assess presence of marine mammals, sea turtles, and birds along the New Jersey coast in advance of wind farm development. Seasonal presence of NARW off New Jersey was characterized using static passive acoustic monitoring (PAM) and line-transect shipboard surveys. NARW upcalls were detected on 115 days over 21 months of deployment (March 2008 to December 2009) with a significant difference in number of upcalls detected between PAM stations by month (F-ratio = 3.1292, df = 22, p = 0.000). NARW upcalls were detected from March to June and September to December 2008 and from January to March and in June 2009, with the greatest number of calls detected during spring months annually. Presence of NARW was confirmed by sighting data, with sightings all seasons except summer. Four sightings were recorded: three during November, December, and January when right whales are on calving grounds farther south or in the Gulf of Maine and the fourth sighting was a cow-calf pair in May.

9:00

5aAB3. Relationships between gray whale (Eschrichtius robustus) calling rates, group size, and ambient noise levels in Laguna San Ignacio, Mexico. Diana Ponce-Morado, Aaron M. Thode, Melania Guerra (Marine Physical Lab., Scripps Inst. of Oceanogr., San Diego, CA 92093-0205, dponcemo@ucsd.edu), Jorge Urban (Laboratorio de Mamxxed;feros Marinos de la Universidad Auto de Baja California Sur (UABCS), Baja California Sur Mxico), and Steven Swartz (Laguna San Ignacio Ecosystem Program, Darnestown, MD 20874)

Determining relationships between calling activity and group size for marine mammal species is challenging, in part due to difficulties in obtaining reliable independent visual censuses of animals in open waters. In this study, acoustic calling rates of eastern Pacific gray whales were measured over a 4-week period during their 2008 breeding season in the sheltered lagoon of Laguna San Ignacio of Baja Mexico. Visual counts were conducted for 6 days during the deployment. It was found that the lagoon population more than doubled over the observational period, with much of the increase occurring over a 7-day period. Acoustic data collected during those 6 days were manually reviewed to yield counts of various gray whale call types during each day. All call rates showed peaks in early morning and evening, with minimum rates generally detected in the early afternoon, a time of low ambient noise but high tourist panga activity. The number of *S*1-type calls counted over 24 h increased roughly as the square of the number of the animals in the lagoon, when call counts were adjusted for variations in background ambient noise levels. An exception to this trend occurred during a time of rapid population increase in the lagoon.

9:15

5aAB4. Variations in the number of fin whale calls recorded at different locations in the Northeast Pacific Ocean. Michelle J. Weirathmueller, Dax C. Soule, and William S. D. Wilcock (School of Oceanogr., Univ. of Washington, Box 357940, Seattle, WA 98195-7940, michw@u.washington.edu)

A large number of fin whale calls have been observed in a 3-year ocean bottom seismometer dataset (2003–2006) over the Endeavor Ridge (48°N /129°W), a hydrothermally active area in the Northeast Pacific Ocean. Most of the vocalizations were detected during the winter months. Because zooplankton constitute an important part of fin whales' diets, and enhanced populations of zooplankton have been observed at all depths above the Endeavor hydrothermal vents, it has been hypothesized that the fin whales could be near the vents specifically for feeding. As part of the analysis of the Endeavor vent field data set, algorithms have been developed, which utilize the absolute and relative spectral energy levels in the frequency band of the whale vocalizations. In order to test whether the concentrations of whale vocalizations are unusually high over the hydrothermally active area, the detection algorithm is being applied to data from individual ocean bottom seismometers at other nearby locations including the center of Explorer Plate (49.5°N, 129°W), and the base of the continental slope off Nootka Sound (49.3°N, 127.6°W).