Spatial and Temporal Variation in the Calling Behavior of Cook Inlet Beluga Whales

Blevins, Rachael [1]; Atkinson, Shannon [1]; Lammers, Marc [2]; Small, Robert [3]
(1) University of Alaska Fairbanks, School of Fisheries and Ocean Sciences, 17101 Pt. Lena Loop Rd., Juneau, Alaska, 99801, USA
(2) University of Hawaii Manoa, Oceanwide Science Institute, PO Box 61692, Honolulu, HI, 96839, USA
(3) Alaska Department of Fish & Game, Marine Mammals Program, 115526, Juneau, AK, 99811, USA
Corresponding author: reblevins@alaska.edu

Cook Inlet beluga whales (CIBs) are a geographically and genetically isolated population. Between 1994 and 1998 their population declined by almost fifty percent, attributed to unsustainable native harvest. A subsistence hunt did not take place in 1999, and the harvest has subsequently been managed at greatly reduced levels; however, the population has not increased. In 2008, Cook Inlet belugas were listed as endangered. Many factors may be impeding population recovery, including noise. The vocal repertoire of CIBs was characterized to gain a greater understanding of their use of sound. Bottom-moored hydrophones were deployed at Eagle River and Trading Bay July 2009-February 2010 sampling at 25000 Hz with a 10% duty cycle. Data was qualitatively analyzed with the program CoolEdit. Each call was categorized as a whistle, pulsed call, or click train, and unique contours were identified. A custom Matlab program was used to quantitatively analyze calls, and a principal component analysis was performed in R using 7 variables. 3079 calls were analyzed from Eagle River during summer 2009, and 214 and 802 calls were analyzed from Trading Bay during summer 2009 and winter 2009-2010 respectively. The summer repertoires were compared between the two locations, as were the repertoires between summer and winter at Trading Bay; a chi-square test showed these comparisons were statistically significant ($p = 5.49e-74$). 91 unique call contours were identified, 27 of which were used across all three data sets. The first principal component explained 62% of the variation in the data and was dominated by frequency characteristics of the call. The second principal component was largely composed of the call duration and the number of inflections. The first two components explained 82.5% of the variation. The variation in calling behavior could indicate differences in habitat usage or differences in the surrounding environment, including background noise.

ABSTRACTS

20th BIENNIAL CONFERENCE

ON THE

BIOLOGY OF MARINE MAMMALS

2013

Dunedin, New Zealand
December 9-13