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T. Aran Mooney: Bioacoustic Tagging (DTAG)

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Bioacoustic Tagging (DTAG)

Acoustic Behavior, Baseline Ecology and Habitat Use of

Pelagic Odontocete Species of Concern

This is the project page for an upcoming/ongoing project to examine the baseline acoustic behavior of two Hawaiian odotocetes, the melon-headed whales (*Peponocephala electra*) and false killer whales (*Pseudorca crassidens*). The page will be updated regularly and will provide a summar of the results. It will also be associated with two soon-to-be-created sister pages that will provide day-to-day progress in the field.

Project Summary

The waters surrounding the State of Hawaii are regions of high U.S. Navy activity. These waters also form the habitat for more than 20 species of federally protected marine mammals including melon-headed whales (*Peponocephala electra*) and false killer whales (*Pseudorca crassidens*). These species are of particular interest to Naval activities and their associated impacts because (a) the Hawaii insular stock of false killer whales (FKWs) are currently a candidate species for listing under the Endangered Species Act due to evidence of a population decline and low population estimates, thus are potentially vulnerable to stochastic events, and (b) one recent melon-headed whale (MHW) near-mass stranding event was associated with U.S. Navy and Rim of the Pacific (RIMPAC) exercises. These actions imply that future Naval activities within Hawaiian waters should account for the behavior, habitat use and potential impacts of sonar on these cetaceans to avoid potential effects. Both species have been subjects for controlled exposure experiments as part of the Behavioral Response Study at AUTEC. However, surprisingly little baseline information has been established for these animals making it difficult to evaluate or mitigate potential impacts. Thus, in order to accurately assess potential effects of Naval activity, it is critical to establish key biological information including acoustic behavior, dive patterns, baseline ecology, and habitat use.

We propose to employ non-invasive, acoustic behavior and orientation tags (DTAGS) to establish critical baseline information on the ecology and sound use of these protected species. Both species specialize in sound use and likely depend on precise acoustic adaptations to enact key biological activities such as foraging, communication and orientation. DTAGs, tools which allow for powerful assessments of cetacean acoustic behavior, will be applied to FKWs and MHWs off the coast of Hawaii in previously identified areas of activity, including regions of Naval activity. Tags will provide novel and needed baseline acoustic characteristics and associated acoustic behavior and dive patterns for these species of concern. These data will be examined for their implications of subsequent predictions of whale acoustic detection, monitoring, habitat use and movement patterns.

This is an ONR funded project.

Last updated: October 30, 2011

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