

## **ENVIRONMENTAL STUDIES PROGRAM: Ongoing Studies**

**Region:** National

**Planning Area(s):** All Planning Areas

**Title:** Support for NOPP Project on Improving Cetacean Electronic Data Loggers  
NT-10-03

**BOEM Cost:** \$450,000

**Period of Performance:** FY 2010-2014

**Conducting Organization(s):** Office of Naval Research as NOPP lead agency and BOEM prime vendor (M10PG00076) ; project funding recipient: Cascadia Research Collective, 218 1/2 W 4th Avenue, Olympia, WA 98501; principal investigator Dr. John Calambokidis

**BOEM Contact:** [Dr. Jim Price](#)

### **Description:**

**Background:** In recent years, BOEM has funded studies employing satellite-tracked tags attached to beluga and bowhead whales in the Alaskan Arctic and sub-Arctic waters and has plans to use this instrument on walrus in the Chukchi Sea. The tags are instruments attached to the bodies of selected animals and tracked by satellites. They can record information about the tagged animals such as the depths and durations of the animals' dives in addition to basic environmental information such as the temperature and salinity of the water in which they are diving, and other environmental variables of ecological significance. The recorded information is transmitted back to researchers through the tracking satellites when the animals return to the surface.

The seasonal migration of tagged bowhead whales in the Beaufort Sea this past winter and spring (2008 – 2009), to cite one example, has been observed with great success. The whales are tracked night and day, in good weather or bad, during times of extensive ice cover and not, making this observational technique a very valuable augmentation of existing observational methods using ships and aircraft. When location and dive information is combined with ancillary environmental information like prevailing ice cover, significant understanding of bowhead habitat use is gained, and a significant enhancement of BOEM's environmental risk assessments is realized.

The particular NOPP research to be funded will conduct a detailed follow-up of the large number of blue, humpback, and gray whales in the eastern North Pacific that have had a variety of tags deployed on them to examine site healing, health, and short- and long-term consequences of tag deployment on reproduction, health, and survival. These represent populations exposed to more than 400 deployments of various tags (split between suction cup and penetration tags) and also represent some of the best-studied populations with extensive photo-identification histories making them an ideal case study. Eastern North Pacific blue whales with approximately 200 deployments of penetration tags represents

the largest number of implant tag deployments on any whale population (OSU implant tag deployments on 186 eastern North Pacific blue whales, for example). We will use the extensive sighting histories from high re-sight rates of blue, humpback, and seasonal-resident gray whales already available (virtually uninterrupted since 1986) combined with targeted additional effort to determine tag site condition, health condition, and reproductive rate.

The tasks of the research are:

1. Compile and extract photographs and video in Year 1 taken in more than 400 tag deployments showing the exact placement location of tags and unique markings suitable for identifying the individual tagged.
2. Compare these photographs in Year 1 and 2 to the extensive photo-ID catalogs maintained by Cascadia Research and collaborators that represent the majority of the members of the three populations in this region as well as gathered in SPLASH (comprehensive North Pacific basin-wide photo-ID study of humpback whales) to confirm the individual identity of the tagged animals and connect this to the long sightings histories of this animal.
3. Conduct field efforts in Year 1, 2, and 3 along the US West Coast to collect full body photographs suitable for examining tag site condition and visual health assessment.
4. Conduct DNA analysis to determine sex and genotyping in Year 1 of the more than 100 skin samples collected during tag deployment and primarily in Year 3 of additional samples collected from re-sightings of tagged animals and animals with injuries known or possibly connected with tagging to determine if they had been tagged.
5. Conduct visual health assessments of gray, blue, and humpback whales known to have been tagged using both historical photographs as well as in the dedicated effort in Year 1, 2, and 3 and compare health assessment between tagged and not-tagged whales as well as for tagged whales before, when tagged, and after tagging.
6. Evaluate tag site conditions and healing by having a veterinary/pathology team experienced in injuries in large whales evaluate photographs of tag sites from archived photographs and those obtained in Year 1, 2, and 3. This will include histological examination of any skin or body conditions sampled by biopsy during field effort.
7. Examine reproductive success comparing tagged and not tagged adult animals using both sighting histories, presence of calves in field effort in Year 1, 2, and 3 and from pregnancy testing of biopsy samples collected.
8. Conduct an analysis and write up summarizing findings including differences in tag site condition, re-sighting rates, reproductive rates, and health assessment based on whether animals were tagged or not, as well as tag type and species deployed on.

**Importance to BOEM:** This study will enhance BOEM's ability to research the important ecological issues of cetacean feeding, migration, and other habitat uses by improving an important research tool. Subsequent environmental studies using this tool will produce valuable information on migrating marine mammals, which, in turn, will be used for impact analyses and consultations under NEPA, ESA and MMPA, pertaining to offshore activities, including renewable energy projects, in all leasing areas..

**Current Status:** Awarded June 15, 2010; tasks 1 – 6, described above been either completed or nearly completed

**Final Report Due:** December 31, 2013

**Publications:** None

**Affiliated Web Sites:** <http://www.cascadiaresearch.org/>

**Revised Date:** May 17, 2012

**ESPIS: Environmental Studies Program Information System**

**All *completed* ESP studies can be found here:**

[http://www.data.boem.gov/homepg/data\\_center/other/espis/espisfront.asp](http://www.data.boem.gov/homepg/data_center/other/espis/espisfront.asp)