EVALUATING POTENTIAL EFFECTS OF SATELLITE TAGGING IN LARGE WHALES: A CASE STUDY WITH GULF OF MAINE HUMPBACK WHALES

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LONG-TERM GOALS

This project is a study of satellite tag retention and health impacts among Gulf of Maine humpback whales (*Megaptera novaeangliae*). Its overall goal is to better understand short- and medium-term physical and physiological effects of tagging with type 1 tags and to investigate the processes involved in tag rejection, possible tag failure and tag loss. This work is expected to inform future tag design and deployment. Recommendations will specifically aim at ensuring that tag designs minimize impacts on

whales, while maximizing methodological performance.

OBJECTIVES

The specific objectives of this project are as follows: 1) to characterize the range of physical and physiological responses to foreign body penetration through the measurement of physical and physiological parameters; 2) to provide data to optimize tag performance, as well as minimize tag loss and impact; 3) to quantify the effect of tagging on individuals and to attempt to correlate that to sex, age class, reproductive condition, and tagging site. The focal population is well-studied and expected to facilitate repeated re-sightings of tagged individuals with or without tags. We therefore expect to evaluate possible post-tagging shifts in habitat use of tagged whales relative to their known preferred habitat and other non-tagged individuals with similar habitat use patterns. We also hope to gather data on movements and habitat use of humpback whales in the Gulf of Maine to improve scientific understanding and management of this population.

APPROACH AND WORK PLAN

Up to 20 satellite tags will be placed on individually identified Gulf of Maine humpback whales annually, 2011 through 2013. The satellite tags intended for use in this study will be the Wildlife Computers (Redmond, WA, USA) SPOT 5 transmitters custom-designed in an implantable cylinder housing (Mold 177). Tags will be deployed during a two-week period, as early as practicable in the feeding season. Project staff would identify individual humpback whales in the field and select them for tagging based on extensive data on individual age and/or age class, sex, reproductive histories and known residency patterns. Tagged whales would then be monitored on a weekly or bi-weekly basis through December of the tagging year. Monitoring would be undertaken through directed cruises and a collaborating network of commercial whale watching vessels. Wound size and healing would be assessed from high resolution photographs, and changes in tag site appearance will be combined with re-sighting data to assess the impact of tagging on individuals.

The project is a collaboration of scientists from four institutions: the Australian Marine Mammal Centre (AMMC), the Marine Mammal Center, (TMMC), the National Marine Mammal Laboratory (NMML) and the Provincetown Center for Coastal Studies (PCCS). PCCS will be responsible for grant management, with a sub-award granted to TMMC (in support of Dr Gulland). Technical aspects of the project will be coordinated by Dr. Robbins (PI, PCCS) and Dr. Zerbini (co-PI, Cascadia Research Collective/NMML). Drs Gales (Co-PI AMMC) and Zerbini will be responsible for the preparation and deployment of satellite tags. Dr. Robbins will lead the field work to locate and recommend individual animals for transmitter deployment. She will also direct follow-up monitoring of tagged whales. Telemetry data will be managed and analyzed by Drs. and Clapham (co-PI, NMML), Gales, and Zerbini, while images and biopsy samples will be managed by Dr. Robbins. Assessments of physical and physiological responses to tagging will be led by Drs. Gulland and Gales. Other data analysis and report writing will be led by Drs Robbins and Zerbini in close collaboration with all co-investigators. Publication of papers will involve all co-investigators.

The first round of satellite tagging will commence in Spring 2011. Vessel-based follow-up monitoring will then continue through December 2011.

WORK COMPLETED

This project is not scheduled to begin until Spring 2011.

RESULTS

This project is not scheduled to begin until Spring 2011.

RELATED PROJECTS

Two proposals have been submitted related to this upcoming project. The first would use the resulting satellite tagging data to quantify humpback whale habitat use in waters managed by the Commonwealth of Massachusetts. The second proposal was recently submitted to the Office of Naval Research Marine Mammal Program in response to the call for pre-proposals on the effects of stress on marine mammals. The proposed project would compare stress assessment methods, including those based on blubber cortisol in biopsy samples. It would specifically support the analysis of blubber cortisol in the biopsy samples obtained during satellite tagging, as well as samples obtained during the post-tagging monitoring period and from untagged conspecifics. The results of that analytical work would further inform the health assessments performed as part of the satellite tagging project. Although not directly related to the NOPP project, co-investigators carried out humpback whale tagging in the Bering Sea, New Caledonia, Brazil (Cascadia Research Collective/NMML) and Australia (AMMC) in 2010. These projects will provide useful data for comparison with information collected in the Gulf of Maine.