Long-term killer whale monitoring – Matkin (NGOS, 15120114-M)

FY15 PROPOSAL SUMMARY PAGE
Continuing, Multi-Year Projects

Project Title: Long-term Monitoring: Pelagic monitoring component - Long-term killer whale monitoring in Prince William Sound/ Kenai Fjords

Project Period: February 1, 2015 – January 31, 2016

Primary Investigator(s): Craig O. Matkin, Executive Director, North Gulf Oceanic Society 3430 Main St. St B1 Homer, Alaska 99603 907 299-0677

Study Location: Prince William Sound and Kenai Fjords

Project Website: www.whalesalaska.org and North Gulf Oceanic Society on Facebook

Abstract*: The proposed project is a continuation of the annual monitoring of AB pod and the AT1 population killer whales in Prince William Sound-Kenai Fjords. These groups of whales suffered significant losses at the time of the oil spill and have not recovered at projected rates. Monitoring of all the major pods and their current movements, range, feeding habits, and contaminant levels will help determine their vulnerability to future perturbations, including oil spills. The project also extends the scope of the basic monitoring to include an innovative satellite tagging program used to examine habitat preference, feeding ecology and assist in relocating whales for feeding studies. It continues examination of feeding habits using observation, prey sampling and innovative chemical techniques. The study will delineate important habitat, variations in pod specific movements and feeding behavior within a temporal and geographic framework. We will examine the role of both fish eating and mammal eating killer whales in the near-shore ecosystem and their impacts on prey species. Community based initiatives, educational programs (including our websites and Facebook page), and programs for tour boat operators will continue to be integrated into the work to help foster restoration by improving public understanding and reducing harassment of the whales.

Estimated Budget:

EVOSTC Funding Requested* (*must include 9% GA)*:

FY12	FY13	FY14	FY15	FY16	TOTAL
$7.2	$132.8	$132.8	$132.9	$132.9	$538.7

Non-EVOSTC Funds to be used:

FY12	FY13	FY14	FY15	FY16	TOTAL
$23.5	$23.5	$23.5	$23.5	$23.5	$117.5

Date: September 2, 2014

I. EXECUTIVE SUMMARY

Both resident ecotype (AB pod) and transient ecotype (AT1 population) killer whales suffered significant mortalities following the *Exxon Valdez* oil spill in 1989. AB pod is recovering after 22 years but has still not reached pre-spill numbers. The AT1 population is not recovering and may be headed toward extinction. This project has determined that killer whales are sensitive to perturbations such as oil spills, but has not yet determined the long-term consequence (which may include extinction) or the recovery period required. As an apex predator, this species (both fish and mammal eating types) has important impact on the ecosystem; additionally, they are a primary focus of viewing for a vibrant tour boat industry in the region. Data from this project is used by tour boats in the region to enhance viewers experiences and understanding of the local environment and fauna. Unlike many cetaceans, killer whales can be closely monitored. This is a unique opportunity to continue a comprehensive database initiated in the early 1980's for a keystone marine species. The wisdom of long-term killer whale monitoring has been borne out in other regions such as Puget Sound and British Columbia.

In this project we use photo-identification, prey sampling, biopsy sampling, and satellite tagging to develop population parameters and to study feeding ecology, range, and distribution. Analysis includes population dynamics, genetics, lipid /fatty acids in blubber, environmental contaminants, and development of location and dive data from tags. Although we focus on the southern Alaska resident and AT1 transient populations which were impacted by the spill, the study also includes the other two recognized populations in the region, the Gulf of Alaska transients and offshore killer whales and contributes substantially to the NMFS;/NOAA killer whale stock assessments.

Data is collected during a minimum 50-day field season from May through October from the R.V. Natoa, although opportunistic photographic data is contributed from other collaborating vessels. This is the continuation of a long-term project initiated over 30 years ago and has benefited from continued support of coastal communities of the north Gulf coast of Alaska.

II. COORDINATION AND COLLABORATION

A. Within the Program

We have been and will continue to be active collaborators on the studies examining the interaction of humpback whales and herring (John Moran and Jan Straley, PIs). We have contributed our substantial long-term humpback whale photo-identification database to their analysis. We will continue to collect humpback whale fluke identification data from our research vessel and share research platforms when possible. As possible the proposed study will be integrated with near shore studies that focus on sea otters and with the oceanographic studies of the Alaska Coastal Current. We recently collaborated on a publication with members of the Nearshore component of Gulf Watch:

Bodkin, J.L., D. Esler, S.D. Rice, **C.O. Matkin,** and B. E. Ballachey. 2014. The effects of spilled oil on coastal ecosystems: lessons from the *Exxon Valdez* spill. B. Maslo and J.L. Lockwood eds. In: Coastal Conservation, Cambridge University Press, U.K.

B. With Other Council-funded Projects

Although we have indirect links to projects in the herring program, we do not directly share equipment, personnel or assist in data collection in these other Council funded projects.

C. With Trustee or Management Agencies

This work directly contributes and is closely coordinated with NMFS stock assessment work for North Pacific killer whales. We are currently collaborating on a major revision of North Pacific killer whale stocks. One of our staff (Dr. Kim Parsons) is the lead genetics specialist in this project and is using samples collected by this project in her analysis. We are also contributing photo-identification and acoustic data that are being used to look not only at stock definition, but trends in abundance. Dr. Paul

Wade (National Marine Mammal Laboratory) is the lead in this endeavor which will result publications coauthored by Matkin, the P.I. of this project.

We work with National Marine Fisheries Service region and Aleria Jensen in Juneau to continue education and observation of tour boats that view killer whales, particularly in the Kenai Fjords region

We work directly with the Alaska Sea Life Center and Dr. Russ Andrews on the ARGOS tagging project and this data is also being incorporated into Stock Assessments and stock definition of killer whales in the Gulf of Alaska and western Alaska

Finally, we collaborate with the Stranding Network at the Alaska Sea Life Center by assisting UAA professor Dr. Debby Tobin in examining and sampling stranded animals, which has included killer whales from the populations studied in this project.

III. PROJECT DESIGN – PLAN FOR FY15

A. Objectives for FY15

1) Photo-identification of all major resident pods and AT1 transient groups that use Prince William Sound/Kenai Fjords on an annual basis. Realistically, all pods are completely documented on a biennial basis, despite annual field effort. Extension of individual histories, identification catalogues of individuals and an annual update of population model are products of these data.
2) Collection of blubber samples for chemical monitoring of PCBs, DDT's and PBDE's, lipids and fatty acids and stable isotope values to gauge changes in contaminant loads as well as feeding habit changes. Most analytical costs are borne by NOAA fisheries.
3) Collection of fish scale samples and marine mammal tissue from kill sites to monitor potential changes in feeding habits
4) Collection of genetic tissue samples (Genetic analytical costs paid by NMML/UBC)
5) Tracking of individuals/pods using ARGOS satellite telemetry to improve re-sighting rate and foster completion of objectives 1-3. Use of time/depth recorders to examine feeding patterns and diel behavior.
6) Determine details of range of pods/populations using both ARGOS and photo-identification data and identify important habitat on a pod specific basis

B. Changes to Project Design

There are no substantive changes in project design or objectives. There has been some re-alignment in emphasis and budget to insure that basic photo-identification and population dynamics work is not compromised by other aspects of the project. We have shifted fieldwork to focus on periods of highest historic rate of encounter with killer whales to emphasize the population work, which reduces our ability to characterize feeding ecology over the broad course of the season

IV. SCHEDULE

A. Project Milestones for FY 15

Objective 1. To prepare for and complete field collection of data, including identification photos, behavioral observations, prey sampling and biopsy sampling and ARGOS satellite tag attachments. Field work will begin in May 2015 and end by October 2015.

Objective 2. Conduct photo-identification analysis and update catalogues and individual registries. Analyze blubber samples, prey samples, skin samples, and plot results of tagging efforts.

Objective 3. Update all databases and compile and conduct statistical analysis on data for publication and/or compilation of annual report. Update website (Facebook site is updated constantly over the year) and present results

B. Measurable Project Tasks for FY 15

FY14, 1st quarter (October 1, 2014-December 31, 2014)

Workup satellite tag data in GIS format and update databases. Lipid/fatty acid, contaminant, stable isotope and genetic analysis will be initiated. Attend Annual Gulf Watch PI meeting.

FY14, 2nd quarter (January 1, 2015-March 31, 2015)

January 19-23 Annual Alaska Marine Science Symposium. Finish analysis of photographs from fieldwork, update catalogues, work up satellite tag data in GIS format and update databases. Lipid/fatty acid, contaminant, stable isotope, prey sample and genetic analysis completion.

FY14, 3rd quarter (April 1, 2015-June 30, 2015)

Prepare for April fieldwork. Conduct fieldwork in May- June (30+ days)

FY14, 4th quarter (July 1, 2015- September 30, 2015)

Conduct fieldwork in August-September (20+ days). Compile 2015 data and samples.

V. PROJECT PERSONNEL – CHANGES AND UPDATES

There are no major staffing changes at this time, although Dan Olsen (graduate student at UAF Juneau) is being trained to become a principle in the project.

VI. BUDGET

A. Budget Forms

Please see included program workbook for budget forms.

B. Changes from Original Proposal

Because of increased costs of field operations over the past decade (there had been no change in budget for field expense in a decade) and our first increase in salaries of personnel and contractors in eight years there is some realignment in budget. This has reduced the involvement of the Northwest Fisheries Science Center and reduced purchases of ARGOS tags but maintained adequate field time to complete data collection necessary to assess population status of the three killer whale populations. Also, additional monies were re-allocated to travel to fund both annual Gulf Watch meeting and Alaska Marine Science Symposium. There has NOT been an increase in overall budget.

C. Sources of Additional Funding

The Northwest Fisheries Science Center contributes substantial analytical and salaried employee time (approximately $10,000 in kind annually) to aspects of our project. The Norcross Wildlife Foundation, the Stan Stephens Memorial Fund, and other donors contribute funds for purchase all of our equipment and electronics. The North Gulf Oceanic Society contributes approximately $10,000annually in kind for additional vessel time. The Alaska Sea Life center contributes salaried time and ARGOS tracking site expenses (via Russ Andrews) to the project.