

**EVOSTC FY17-FY21 INVITATION FOR PROPOSALS
FY18 CONTINUING PROJECT PROPOSAL SUMMARY PAGE**

Project Number and Title

Gulf Watch Alaska: Pelagic Component Project

18120114-M—Continuing the Legacy: Prince William Sound Marine Bird Population Trends

Primary Investigator(s) and Affiliation(s)

Dr. Kathy Kuletz, US Fish and Wildlife Service

Robb Kaler, US Fish and Wildlife Service

Date Proposal Submitted

August 23, 2017

Project Abstract

We propose to conduct small boat surveys to monitor abundance of marine birds in Prince William Sound, Alaska, during July 2018 and 2020. Fourteen previous surveys over a 27-year period have monitored population trends of marine birds and mammals in Prince William Sound after the *Exxon Valdez* oil spill. We will use data collected to examine trends from summer to determine whether populations in the oiled zone are increasing, decreasing, or stable. We will also examine overall population trends for the Sound. Continued monitoring of marine birds and synthesis of the data are needed to determine whether populations injured by the spill are recovering. Data collected from 1989 to 2016 indicated that pigeon guillemots (*Cephus columba*) and marbled murrelets (*Brachyramphus marmoratus*) are declining in the oiled areas of Prince William Sound. We have found high inter-annual variation in numbers of some bird species and therefore recommend continuing to conduct surveys every two years. These surveys are the only ongoing means to evaluate the recovery of most of these injured marine bird species. Surveys would also benefit the benthic monitoring and forage fish monitoring projects of the GWA Long-term Monitoring Program as well as the Herring Research and Monitoring project. We are not proposing any major changes to this project for FY18.

EVOSTC Funding Requested* (must include 9% GA)

FY17	FY18	FY19	FY20	FY21	TOTAL
\$24,900	\$222,200	\$24,900	\$222,200	\$24,900	\$519,100

Non-EVOSTC Funds to be used, please include source and amount per source: (see Section 6C for details)

FY17	FY18	FY19	FY20	FY21	TOTAL
\$23,000	\$56,000	\$23,000	\$56,000	\$22,000	\$180,000

1. EXECUTIVE SUMMARY

Pelagic Component

The pelagic component research team proposed for FY17-21 to continue monitoring key pelagic species groups in Prince William Sound (PWS) using the same five projects focused on killer whales, humpback whales, forage fish, and marine birds (two projects: summer and fall-winter). Thus, the two over-arching questions for the pelagic component to answer during this 5-year period are:

1. What are the population trends of key upper trophic level pelagic species groups in PWS – killer whales, humpback whales, marine birds, and forage fish?
2. How do predator-prey interactions, including interannual changes in prey availability, contribute to underlying changes in the populations of pelagic predators in PWS and Middleton Island?

PWS Summer Marine Bird Monitoring

Boat-based marine bird surveys have been conducted on randomized transects in PWS (Figure 1), Alaska, over a 27-year period following the 1989 *Exxon Valdez* oil spill (EVOS). In order to better understand the dynamics of a marine bird community that has experienced the simultaneous effects of a major oil spill and climate variability, this project will collect additional information to monitor the distribution and abundance of marine birds in PWS. In order to assess population trends in the years following the EVOS, the objectives of this project are to: (1) determine the abundance of marine bird populations in PWS during July 2018 and 2020 in both oiled and unoiled regions; and (2) determine population abundance of marine bird populations in PWS during July 2018 and 2020 for PWS as a whole.

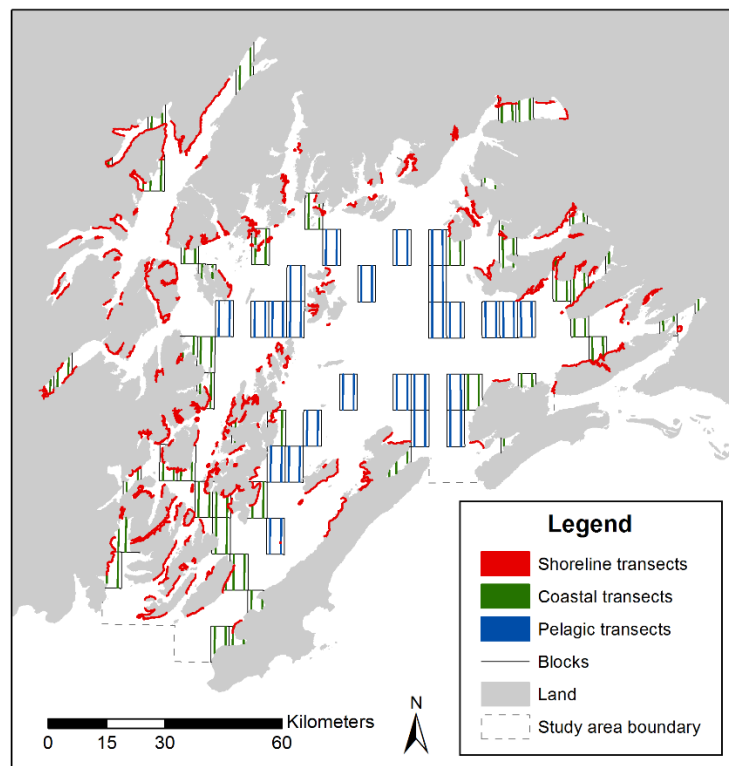


Figure 1. Location of marine bird survey transects within Prince William Sound, Alaska.

During the past reporting period, Daniel Cushing completed his degree of Master of Science at Oregon State University and his thesis titled “Patterns of Distribution, Abundance, and Change over Time in the Marine Bird Community of Prince William Sound, Alaska, 1989-2012” (Cushing 2014). Using data collected during small boat surveys (1989-2012), Cushing (2014) used taxon- and community-centric approaches to examine patterns of marine bird distribution and abundance in PWS and found marine bird communities as a whole to be spatially structured along a primary onshore-offshore environmental gradient, and secondarily structured along an estuarine-marine environmental gradient. Cushing (2014) also investigated spatial habitat associations and temporal change of *Brachyramphus* murrelets and found that abundance estimates for both marbled murrelets (*Brachyramphus marmoratus*) and Kittlitz’s murrelets (*B. brevirostris*) decreased by more than two-thirds over the study period. There was no evidence that rates of change differed along environmental or geographic gradients and no evidence that changes in seasonal patterns of abundance occurred. In FY18 we will continue to explore the hypothesis that climate variability has differentially affected nearshore and offshore components of PWS food webs, and how this may have contributed to the failure of some taxa to recover from the population injury caused by the EVOS.

FY17 is a non-survey year for the PWS marine bird survey and no field component occurred this year. Mr. Kaler has been working with a contractor to streamline data management, data analysis, and reporting. Specifically, data management and data analysis routines using Program R are being developed. Mr. Kaler has also been working with a contractor to replace electrical wiring, electronics, radar, and radio systems on the survey vessels. Additionally, a contract for basic fiberglass work, gel-coating, and anti-fouling paint for the hulls should be announced shortly.

We are not proposing any major changes to this project for FY18.

2. COORDINATION AND COLLABORATION

A. Within an EVOSTC-funded Program

Gulf Watch Alaska

The proposed project will collaborate closely with the Forage Fish project (M. Arimitsu, Pelagic Component Lead Investigator) and fall-winter marine bird surveys (M. Bishop, Principal Investigator) to collect comparable marine bird data, allowing us to compare summer and winter seabird communities and distributions. The shoreline surveys of our project will also be complimentary to the Nearshore component of GWA (H. Coletti, Nearshore Component Lead Investigator), and allow for comparisons across marine habitats.

Herring Research and Monitoring

This project provides relevant data on marine bird foraging activities to the Herring Research and Monitoring program.

Data Management

This project coordinates with the data management program by submitting data and preparing metadata for publication on the Gulf of Alaska Data Portal and DataONE within the timeframes required.

B. With Other EVOSTC-funded Projects

The proposed project complements the EVOSTC-funded effort to restore Pigeon Guillemot to the Naked Island Complex (Naked, Peak, and Storey islands, Little Smith and Smith Islands). Robb Kaler and Dr. David Irons are co-Principle Investigators (PIs) for the pigeon guillemot restoration study. Data collected on marine birds from the Naked Islands region will be used to quantify population trends of species anticipated to benefit from mink removal efforts. Populations of marine birds anticipated to increase following mink suppression include pigeon guillemots, tufted and horned puffins, parakeet auklets, and Arctic terns.

C. With Trustee or Management Agencies

The proposed project supports the US Fish and Wildlife Service’s (USFWS’s) Migratory Bird Management mission to advance the conservation of migratory birds. The project will also inform other management agencies (US Forest Service, National Park Service, Alaska Department of Fish and Game) with lands and waters adjacent to our study area. Additionally, Co-PI Dr. Kathy Kuletz (USFWS) is also a PI of the seabird component for two other long-term monitoring projects that complement the PWS marine bird survey and will allow us to examine oceanographic and plankton data in conjunction with seabird distribution and relative abundance, with a seasonal component, across the Gulf Watch Alaska study area and will inform the fisheries management process in the Gulf of Alaska.

3. PROJECT DESIGN – PLAN FOR FY18

A. Objectives for FY18

Objective 1. Determine population abundance, with 95% confidence limits, of marine bird populations in Prince William Sound during July 2018 in both oiled and unoiled regions.

Objective 2. Determine population abundance, with 95% confidence limits, of marine bird populations in Prince William Sound as a whole during July 2018.

B. Changes to Project Design

No changes.

4. SCHEDULE

A. Project Milestones for FY18

To determine population abundance of marine bird populations in PWS during July 2018 and 2020 in both oiled and unoiled regions, as well as in PWS as a whole, in order to assess population trends in the years following the EVOS.

Objective 1

Boat-based counts of marine birds will be conducted in July 2018 (1-28 July, depending on weather and mechanical issues). Survey design includes shoreline transects, coastal-pelagic transects, and pelagic transects. Densities (birds/kilometer²) of marine birds will be quantified and compared between oiled and unoiled areas. Processed count data will be made publicly available through the Gulf of Alaska Data Portal.

Objective 2

Boat-based counts of marine birds will be conducted in July 2018 (1-28 July, depending on weather and mechanical issues). Survey design includes shoreline transects, coastal-pelagic transects, and pelagic transects. Densities (birds/kilometer²) of marine birds will be quantified and long-term population trends

will be determined for PWS. A report on population abundance and long-term trends will be available by December 2018.

B. Measurable Project Tasks for FY18
FY 18 (Year 7)

FY 18, 1st quarter (February 1, 2018 - April 30, 2018)

February: Prepare contractual agreement, purchase request;
Prior year datasets available to public if applicable

March 1: Submit Annual Report

March: Hire project personnel

March –April: Submit paperwork contractual agreements

FY 18, 2nd quarter (May 1, 2018 - July 31, 2018)

May –June: Prepare for field season

June: Finalize volunteer observer travel papers

July: Conduct 15th PWS marine bird survey

FY 18, 3rd quarter (August 1, 2018 - October 31, 2018)

August: Put away field gear and winterize (4) survey boats

August 23: Submit FY19 annual Work Plan

September: QA/QC FY18 marine bird survey data;
Data compliance on Research Workspace

FY 18, 4th quarter (November 1, 2018 - January 31, 2019)

Oct.-Nov.: Attend annual PI meeting

January: Attend Alaska Marine Science Symposium

5. PROJECT PERSONNEL – CHANGES AND UPDATES

No changes.

6. BUDGET

A. Budget Forms (See GWA FY18 Budget Workbook)

Please see project budget forms compiled for the program.

B. Changes from Original Proposal

No changes.

C. Sources of Additional Funding

Kathy Kuletz salary for 2 months/year. Kathy will provide the project leader guidance and assist with data analysis and reporting.

Equipment contribution, U.S. Fish and Wildlife Service:

- Survey vessels (three, 25-ft Boston Whalers) at \$300/day/boat for 20 days = \$18K

Three survey vessels (and one vessel as an alternate) will serve as the survey platform for the marine bird and mammals surveys conducted across PWS.

- Equipment (computers and software, immersion suits, electronics, etc.) = \$12K

Each survey vessel has two survey laptop computers (for data collection), one salinity meter (for measuring salinity, sea surface temperature, and ocean pH), emergency equipment (for emergency evacuation from survey vessel; immersion suits, emergency locator beacon, satellite telephone, hand-held VHF radios), and Global Positioning Satellite receivers and associated software and hardware for data collection).

- GSA vehicle lease and fuel (full-size diesel truck for towing survey vessels) = \$4K

Total in-kind contribution from U.S. Fish and Wildlife Service for FY 18 = \$56K

7. RECENT PUBLICATIONS AND PRODUCTS

Publications

- Cushing, D., D. Roby, and D. Irons. (in press). Patterns of distribution, abundance, and change over time in a subarctic marine bird community. Deep Sea Research Part II: Topical Studies in Oceanography, Spatial and temporal ecological variability in the northern Gulf of Alaska: what have we learned since the *Exxon Valdez* oil spill? Published online at <http://www.sciencedirect.com/science/article/pii/S0967064516301874? rdoc=1& fmt=high& origin=gateway& docanchor=&md5=b8429449ccfc9c30159a5f9aeaa92ffb>
- Esler, D., B. E. Ballachey, C. Matkin, D. Cushing, R. Kaler, J. Bodkin, D. Monson, G. Esslinger, and K. Kloecker. (in press). Timelines and mechanisms of wildlife population recovery following the *Exxon Valdez* oil spill. Deep Sea Research Part II. Published online at <http://www.sciencedirect.com/science/article/pii/S0967064516303502>
- Kaler, R., E. Labunski, and K. J. Kuletz. 2017. Prince William Sound Marine Bird Surveys. *Exxon Valdez* Oil Spill Restoration Project Final Report (Restoration Project 16120114-K), U. S. Fish and Wildlife Service, Anchorage, Alaska.
- Stephensen, S., D. Irons, W. Ostrand and K. Kuletz. 2016. Habitat Selection by Kittlitz's *Brachyramphus brevirostris* and Marbled Murrelets *B. marmoratus* in Harriman Fjord, Prince William Sound, Alaska. *Marine Ornithology* 44: 31-42. <http://www.marineornithology.org/content/get.cgi?rn=1152>

Published Datasets

- Kaler, R., and K. Kuletz. 2017. Prince William Sound Marine Bird Data, Alaska, 2012-2016, Gulf Watch Alaska Pelagic Component. Dataset. *Exxon Valdez* Oil Spill Trustee Council Long-Term Monitoring program, Gulf Watch Alaska. Research Workspace. <https://doi.org/10.24431/rw1k113>

Presentations

- Cushing, D. A., K. J. Kuletz, R. R. Hopcroft, S. L. Danielson, and E. A. Labunski. 2017. Poster presentation. Shifts in cross-shelf distribution of seabirds in the Northern Gulf of Alaska under different temperature regimes, 2007-2016. Annual meeting of the Pacific Seabird Group, Tacoma, Washington.
- Esler, D., B. Ballachey, C. Matkin, D. Cushing, R. Kaler, J. Bodkin, D. Monson, G. Esslinger, and K. Kloecker. 2016. Oral presentation. Long-term data provide perspective on ecosystem recovery following the *Exxon Valdez* oil spill. Gulf of Mexico Oil Spill and Ecosystem Science Conference, Tampa, Florida.
- Kuletz, K. J., D. A. Cushing, R. R. Hopcroft, S. L. Danielson, and E. A. Labunski. 2017. Poster presentation. Running hot and cold: Shifts in seabird distribution in the Northern Gulf of Alaska under different temperature regimes, based on Seward Line surveys, 2017-2015. Alaska Marine Science Symposium, Anchorage, Alaska.

Outreach

- Kaler, R., K. Kuletz, D. Dragoo, and H. Renner. 2017. Unusual observations of seabirds in the Gulf of Alaska following the 2015-2016 mass die-off. Delta Sound Connections. <http://pwssc.org/wp-content/uploads/2017/06/DSC-2017-web2.pdf>.

Naked Island Seabird Restoration, Youth Marine Expedition, Organized by Lisa Matlock, Prince William Sound Regional Citizen's Advisory Council. The youth on this trip are a mix of grades 6-8 and included both diverse urban Anchorage kids (some of whom had never been on a hike or on a boat before this trip) and kids from the EVOS region (this year included Cooper Landing, Seward, Girdwood, and Whittier). The EVOS funded seabird restoration effort at the Naked Islands group provided the youth a chance to learn about field biology, social attraction efforts to expedite the recovery of extirpated seabirds, and learn about what seabirds feed their young. Special thanks to Sam Stark and Alexa Piggot (Oregon State University) for making time to connect kids with nature.

LITERATATURE CITED

Cushing, D. 2014. Patterns of distribution, abundance, and change over time in the marine bird community of Prince William Sound, Alaska, 1989-2012. Master's Thesis, Oregon State University, Corvallis, Oregon, USA.