

FY12 INVITATION PROPOSAL SUMMARY PAGE

Project Title: Long-term monitoring: Pelagic monitoring component - Data synthesis, analysis and recommendations for sampling frequency and intensity of nearshore marine bird surveys to detect trends utilizing existing data from the Prince William Sound, Katmai and Kenai Fjords coastlines.

Project Period: October 1, 2011 – September 30, 2016

Primary Investigator(s): Heather Coletti, Marine Ecologist, Southwest Alaska Network Inventory and Monitoring Program, National Park Service, Heather_Coletti@nps.gov, 907-644-3687

Collaborators: David Irons, James Bodkin, Brenda Ballachey, Tom Dean

Study Location: **Prince William Sound, Katmai National Park and Preserve and Kenai Fjords National Park**

Abstract: This project is a component of the integrated Long-term Monitoring of Marine Conditions and Injured Resources and Services submitted by McCammon et. al. Skiff based surveys for marine birds along the Prince William Sound, Katmai and Kenai Fjords coastlines have been conducted for over 5 and 20 years, respectively. The results of these surveys provide estimates of the species composition, relative abundance, and distribution of all marine birds and mammals within this nearshore zone. The focus of these surveys is on marine birds that are trophically linked to the nearshore food web, and include species of sea ducks (Harlequin ducks, Barrow's and common goldeneye, and scoters), mergansers (common and red-breasted), and shorebirds, specifically the black oystercatcher, cormorants, glaucous-winged gulls and pigeon guillemots. Sustainability of long-term monitoring programs requires the optimization of sampling intensity and efforts to minimize costs while concurrently having sufficient power to detect a trend. While there has been critical thought in the past regarding these questions, current available analytical methods now allow for the use of existing data in simulations, using a Bayesian framework, to estimate number of samples and sample frequency required to detect a specified trend as well as examine effects contributing to variation, such as imperfect detection.

Estimated Budget: \$52.7K

EVOSTC Funding Requested: \$30K without GA; \$32.7K with 9% GA

(breakdown by fiscal year and must include 9% GA)

FY12 - \$32.7K

Non-EVOSTC Funds to be used:

(breakdown by fiscal year) FY12: \$20K

Date: May 25, 2011

(NOT TO EXCEED ONE PAGE)

PROJECT PLAN

I. NEED FOR THE PROJECT

A. Statement of Problem

The National Park Service (NPS) Southwest Alaska Network (SWAN) Inventory and Monitoring Program (I&M) and the US Fish and Wildlife Service (USFWS) have been conducting skiff based surveys for marine birds along the Prince William Sound, Katmai and Kenai Fjords coastlines for over 5 and 20 years, respectively. These surveys do not currently account for imperfect detection nor do they focus on any single species in particular or nearshore habitat type. However, within the SWAN program, the goal is to estimate trends for a select group of marine bird species reliant on the nearshore food web and that were impacted by the *Exxon Valdez* Oil Spill. These include: black oystercatchers (*Haematopus bachmani*), cormorants (*Phalacrocorax spp.*), glaucous-winged gulls (*Larus glaucescens*), goldeneyes (*Bucephala spp.*), harlequin ducks (*Histrionicus histrionicus*), mergansers (*Mergus spp.*), pigeon guillemots (*Cephus columba*), and scoters (*Melanitta spp.*).

From preliminary analysis of NPS data, the current survey design does not provide variance estimates for detecting trends for the identified indicator species with suitable confidence (<0.50) depending on the species. We utilized coefficients of variance (CVs) to determine within year as well as across year variation for each species. NPS determined that we may not be adequately surveying for some species possibly because: (1) certain species are highly aggregated (2) we are focusing on inappropriate habitat for the species in question, (3) our sample size is too small or (4) the year to year variation in distribution is great enough that we should be conducting replicate surveys within a single season.

We are proposing to continue to monitoring existing transects to have continuity with legacy data, but to improve on existing protocols by minimizing variation by examining the effects of sampling error and imperfect detection while also making recommendations to improve efficiency through sample intensity and frequency. Improving sampling methods will provide a better sense of population trends of specific species (listed above) across the western Gulf of Alaska and increase efficiency as we move forward in our efforts to monitor species of interest within the *Exxon Valdez* spill area.

B. Relevance to 1994 Restoration Plan Goals and Scientific Priorities

Please see pages 2-4 of the integrated proposal titled “Long-Term Monitoring of Marine Conditions and Injured Resources and Services,” and submitted by McCammon et. al

II. PROJECT DESIGN

A. Objectives

List the objectives of the proposed research, the hypotheses being tested during the project, and briefly state why the intended research is important.

Concept: We propose to use existing datasets from Prince William Sound, Katmai and Kenai Fjords to conduct data synthesis and analysis to answer questions regarding sampling intensity and sample frequency for detecting trends. These are essential components to building a long-term monitoring program. Even though critical thought has gone into this in the past, it seems prudent to utilize existing data to examine the following:

- A. Use existing data in simulations, in a Bayesian framework, to estimate number of samples and sample frequency required to detect a specified trend or change with some level of confidence for selected species/species groups' density/abundance.
 - i. The levels of change or trend deemed ecologically significant will be specified by the investigators.
- B. Determine impact of imperfect detection
 - i. Conduct a series of simulations applying different levels of detection bias, based on best available information, to evaluate the effects of various levels of detection bias (and variability therein) on some true population trend.
 - ii. Assuming detection probabilities are not constant through time; determine the magnitude of the effects of variation in detection probability on trend estimates and the ability to detect trends if present.

This approach to the long-term monitoring effort may be a way of displaying for the Trustees that we are thinking about a long-term, sustainable monitoring program that will allow us to estimate trends that we deem ecologically important across a variety of temporal and spatial scales and providing information to inform the group of the scale and intensity of monitoring needed over potentially 20 yrs and cost saving due to reduced sampling where feasible based on simulation results.

There may be increased costs on the front-end for data synthesis and analysis, but if results allow for a decrease in sample intensity OR can identify areas that may require more efforts, the upfront costs may be minimal to the long-term costs of unnecessary sampling or poor power to detect trend.

Linkages: This exercise will utilize and link datasets spanning several years within Prince William Sound, Kenai Fjords and Katmai. Focal species include those that have exhibited protracted recovery from EVOS. This work would be an interagency effort between NPS, USFWS and USGS to improve the power to detect trends of coastal marine birds across the entire spill area.

B. Procedural and Scientific Methods

Logistics/Budget:

Data synthesis, analysis and reporting of results will be a one-time cost awarded to a contractor or university. Estimated cost for this work is approximately **30K**. The NPS/SWAN program will provide all existing data for the Kenai Fjords National Park and Katmai National

Park and Preserve coastlines. The USFWS will provide all pertinent survey data from PWS. The NPS/SWAN will also provide a marine ecologist to assist the contractor in the data synthesis, provide expertise as to ecosystem processes and provide assistance in the compilation and reporting of results. NPS/SWAN estimates that the in-kind support is equivalent to approximately **20k**. See table below.

C. Data Analysis and Statistical Methods

See above.

D. Description of Study Area

See above.

E. Coordination and Collaboration with Other Efforts

See above.

III. SCHEDULE

A. Project Milestones

For each project objective listed above (II.A.), specify when critical project tasks will be completed. Project reviewers will use this information in conjunction with annual project reports to assess whether projects are meeting their objectives and are suitable for continued funding. Please format your information like the following example.

Objective 1. Complete all necessary documents to the National Park Service contracting officials for review and submission.
To be met by November 2011

Objective 2. Compile marine bird survey data from Prince William Sound, Katmai National Park and Preserve and Kenai Fjords National Park.
To be met by January 2012

Objective 3. Provide final report with recommendations for continued monitoring.
To be met by December 2013

B. Measurable Project Tasks

FFY 12, 1st quarter (October 1, 2011-December 31, 2011)

October: Project funding approved by Trustee Council
November: Write contract for analysis and submit to NPS contracting officials
November: Data compilation from PWS, KATM and KEFJ to begin

FFY 12, 2nd quarter (January 1, 2012-March 31, 2012)

January: Continue data compilation
March: Contract to be awarded
March: Preliminary meetings with contractor to discuss data analysis options

March: Provide contractor with all available data in standardized format

FFY 12, 3rd quarter (April 1, 2012-June 30, 2012)

April - June: Begin analysis

FFY 12, 4th quarter (July 1, 2012-September 30, 2012)

July - September: Continue analysis and begin report writing in cooperation with the contractor.

FFY 13, 1st quarter (October 1, 2012-December 31, 2012)

December: Submit final report. This will consist of analysis results, statistical code developed for analysis and interpretation of results. Also provided will be recommendations for future monitoring.

**EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL
DETAILED BUDGET FORM FY 12-FY16**

Budget Category:	Proposed FY 12	Proposed FY 13	Proposed FY 14	Proposed FY 15	Proposed FY 16	TOTAL PROPOSED
Personnel	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Travel	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Contractual	\$30.0	\$0.0	\$0.0	\$0.0	\$0.0	\$30.0
Commodities	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Equipment	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
SUBTOTAL	\$30.0	\$0.0	\$0.0	\$0.0	\$0.0	\$30.0
General Administration (9% of subtotal)	\$2.7	\$0.0	\$0.0	\$0.0	\$0.0	\$2.7
PROJECT TOTAL	\$32.7	\$0.0	\$0.0	\$0.0	\$0.0	\$32.7
Other Resources (Cost Share Funds)	\$20.0	\$0.0	\$0.0	\$0.0	\$0.0	\$20.0

COMMENTS: In-kind contributions will be for the staff time, primarily from NPS (approximately 2 months of a GS12), but also from USFWS and USGS, to gather and provide the data to the contractor as well as provide expertise as to ecosystem processes and provide assistance in the compilation and reporting of results.

FY12-16

Program Title:
Team Leader:
Agency:

**FORM 4A
TRUSTEE AGENCY
SUMMARY**

**EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL
DETAILED BUDGET FORM FY 12-FY16**

Personnel Costs:		Months Budgeted	Monthly Costs	Overtime	Personnel Sum
Name	Project Title				
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
		Subtotal	0.0	0.0	
Personnel Total					\$0.0

Travel Costs:	Ticket Price	Round Trips	Total Days	Daily Per Diem	Travel Sum
Description					
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
Travel Total					\$0.0

FY12

Program Title: Data synthesis, analysis and recommendations for sampling frequency and intensity of nearshore marine bird surveys to detect trends utilizing existing data from the Prince William

**FORM 4B
PERSONNEL &
TRAVEL DETAIL**

**EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL
DETAILED BUDGET FORM FY 12-FY16**

Contractual Costs: Description	Contract Sum
Data synthesis, analysis and recommendations for detecting trends in specific nearshore marine bird species	30.0
If a component of the project will be performed under contract, the 4A and 4B forms are required.	Contractual Total \$30.0

Commodities Costs: Description	Commodities Sum
	Commodities Total \$0.0

FY12

Program Title:
Team Leader:
Agency:

**FORM 4B
CONTRACTUAL &
COMMODITIES DETAIL**

**EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL
DETAILED BUDGET FORM FY 12-FY16**

New Equipment Purchases: Description	Number of Units	Unit Price	Equipment Sum
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
New Equipment Total			\$0.0

Existing Equipment Usage: Description	Number of Units	Inventory Agency

FY12

Program Title:
Team Leader:
Agency:

**FORM 4B
EQUIPMENT DETAIL**

**EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL
DETAILED BUDGET FORM FY 12-FY16**

Personnel Costs:		Months Budgeted	Monthly Costs	Overtime	Personnel Sum
Name	Project Title				
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
		Subtotal	0.0	0.0	
Personnel Total					\$0.0

Travel Costs:	Ticket Price	Round Trips	Total Days	Daily Per Diem	Travel Sum
Description					
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
Travel Total					\$0.0

FY13

Program Title:
Team Leader:
Agency:

**FORM 4B
PERSONNEL &
TRAVEL DETAIL**

**EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL
DETAILED BUDGET FORM FY 12-FY16**

Contractual Costs: Description	Contract Sum
If a component of the project will be performed under contract, the 4A and 4B forms are required.	Contractual Total \$0.0

Commodities Costs: Description	Commodities Sum
	Commodities Total \$0.0

FY13

Program Title:
Team Leader:
Agency:

**FORM 4B
CONTRACTUAL &
COMMODITIES DETAIL**

**EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL
DETAILED BUDGET FORM FY 12-FY16**

New Equipment Purchases: Description	Number of Units	Unit Price	Equipment Sum
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
New Equipment Total			\$0.0

Existing Equipment Usage: Description	Number of Units	Inventory Agency

FY13

Program Title:
Team Leader:
Agency:

**FORM 4B
EQUIPMENT DETAIL**

**EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL
DETAILED BUDGET FORM FY 12-FY16**

Personnel Costs:		Months Budgeted	Monthly Costs	Overtime	Personnel Sum
Name	Project Title				
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
		Subtotal	0.0	0.0	
Personnel Total					\$0.0

Travel Costs:	Ticket Price	Round Trips	Total Days	Daily Per Diem	Travel Sum
Description					
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
Travel Total					\$0.0

FY14

Program Title:
Team Leader:
Agency:

**FORM 4B
PERSONNEL &
TRAVEL DETAIL**

**EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL
DETAILED BUDGET FORM FY 12-FY16**

Contractual Costs: Description	Contract Sum
If a component of the project will be performed under contract, the 4A and 4B forms are required.	Contractual Total
	\$0.0

Commodities Costs: Description	Commodities Sum
	Commodities Total
	\$0.0

FY14

Program Title:
Team Leader:
Agency:

**FORM 4B
CONTRACTUAL &
COMMODITIES DETAIL**

**EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL
DETAILED BUDGET FORM FY 12-FY16**

New Equipment Purchases: Description	Number of Units	Unit Price	Equipment Sum
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
New Equipment Total			\$0.0

Existing Equipment Usage: Description	Number of Units	Inventory Agency

FY14

Program Title:
Team Leader:
Agency:

**FORM 4B
EQUIPMENT DETAIL**

**EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL
 DETAILED BUDGET FORM FY 12-FY16**

Personnel Costs:		Months Budgeted	Monthly Costs	Overtime	Personnel Sum
Name	Project Title				
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
		Subtotal	0.0	0.0	
Personnel Total					\$0.0

Travel Costs:	Ticket Price	Round Trips	Total Days	Daily Per Diem	Travel Sum
Description					
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
Travel Total					\$0.0

FY15

Program Title:
Team Leader:
Agency:

**FORM 4B
 PERSONNEL &
 TRAVEL DETAIL**

**EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL
 DETAILED BUDGET FORM FY 12-FY16**

Contractual Costs: Description	Contract Sum
If a component of the project will be performed under contract, the 4A and 4B forms are required.	Contractual Total
	\$0.0

Commodities Costs: Description	Commodities Sum
	Commodities Total
	\$0.0

FY15

Program Title:
Team Leader:
Agency:

**FORM 4B
 CONTRACTUAL &
 COMMODITIES DETAIL**

**EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL
DETAILED BUDGET FORM FY 12-FY16**

Personnel Costs:		Months Budgeted	Monthly Costs	Overtime	Personnel Sum
Name	Project Title				
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
		Subtotal	0.0	0.0	
Personnel Total					\$0.0

Travel Costs:	Ticket Price	Round Trips	Total Days	Daily Per Diem	Travel Sum
Description					
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
Travel Total					\$0.0

FY16

Program Title:
Team Leader:
Agency:

**FORM 4B
PERSONNEL &
TRAVEL DETAIL**

**EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL
 DETAILED BUDGET FORM FY 12-FY16**

Contractual Costs: Description	Contract Sum
If a component of the project will be performed under contract, the 4A and 4B forms are required.	Contractual Total \$0.0

Commodities Costs: Description	Commodities Sum
	Commodities Total \$0.0

FY16

Program Title:
Team Leader:
Agency:

**FORM 4B
 CONTRACTUAL &
 COMMODITIES DETAIL**

**EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL
DETAILED BUDGET FORM FY 12-FY16**

New Equipment Purchases: Description	Number of Units	Unit Price	Equipment Sum
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
New Equipment Total			\$0.0

Existing Equipment Usage: Description	Number of Units	Inventory Agency

FY16

Program Title:
Team Leader:
Agency:

**FORM 4B
EQUIPMENT DETAIL**