FY12 INVITATION
PROPOSAL SUMMARY PAGE

Project Title: Long-term monitoring pelagic component - Long-term monitoring of seabird abundance and habitat associations during late fall and winter in Prince William Sound.

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

Primary Investigator(s): Mary Anne Bishop, Ph.D., Prince William Sound Science Center, Cordova

Collaborators: Kathy Kuletz, Ph.D. US Fish & Wildlife Service, Migratory Bird Mgmt, Anchorage; John Moran, Auke Bay Lab, NOAA, Juneau; Michelle Buckhorn, Ph.D. & Richard Thorne, Ph.D. Prince William Sound Science Center, Cordova

Study Location: Prince William Sound

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. The vast majority of seabird monitoring in areas affected by the *Exxon Valdez* oil spill has taken place around breeding colonies during the reproductive season, a time when food is generally at its most plentiful. However, seabirds spend most of the year widely dispersed. Late fall through winter are critical periods for survival as food tends to be relatively scarce or inaccessible, the climate more extreme, light levels reduced, day length shorter and water temperatures colder. Post-spill ecosystem recovery and changing physical and biological factors all have the potential to affect PWS seabird populations. Of the seabirds that overwinter in PWS, nine species were initially injured by the *Exxon Valdez* oil spill, including three species that have not yet recovered (marbled murrelet, Kittlitz's murrelet and pigeon guillemot). Here we propose to continue to monitor from 2012 through 2016 seabird abundance, species composition, and habitat associations using multiple surveys (up to 5 surveys per season) during late fall and winter. The data will improve our predictive models of seabird species abundance and distribution in relation to biological and physical environmental factors. In addition, by monitoring the top-down forcing by seabirds, a major source of herring predation, this project will complement the suite of *PWS Herring Research & Monitoring* studies, including improved mortality estimates for herring population models. This project is part of the pelagic component within the integrated *Long-term Monitoring of Marine Conditions and Injured Resources and Services* submitted by McCammon et. al. Our project uses as observing platforms the vessels associated with the *LTM Humpback Whale surveys* and *PWS Herring Research & Monitoring Juvenile Herring Abundance Index* as well as the *Extended Adult Herring Biomass Survey*s and integrates the seabird observations with those studies.

Estimated Budget:
EVOSTC Funding Requested: *(breakdown by fiscal year and must include 9% GA)*
FY 12 $51.7, FY 13 $78.6, FY 14 $80.9, FY 15 $83.4, FY 16 $86.3
Non-EVOSTC Funds to be used:
(breakdown by fiscal year)

Date: May 25, 2011

PROJECT PLAN

I. NEED FOR THE PROJECT

A. Statement of Problem

Seabirds spend most of the year widely dispersed. At higher latitudes, late fall through winter are critical periods for survival as food tends to be relatively scarce or inaccessible, the climate more extreme, light levels reduced, day length shorter and water temperatures colder. Consequently daily energy requirements increase (Fort *et al*. 2009) and birds have to forage for a large proportion of daylight hours (Daunt *et al*. 2006). Wind and sea state are known to affect surface-feeding seabirds in particular (Dunn 1973, Taylor 1983) but diving birds can also be impacted (Harris and Wanless 1996, Piatt and Van Pelt 1997, Frederiksen *et al*. 2008).

Of the seabirds that overwinter in Prince William Sound (PWS), nine species were initially injured by the *Exxon Valdez* oil spill, including three species that have not yet recovered (marbled murrelet, Kittlitz's murrelet and pigeon guillemot. Nevertheless, the vast majority of seabird monitoring in areas affected by the Exxon Valdez oil spill has taken place around breeding colonies during the reproductive season, a time when food is generally at its most plentiful. Long-term monitoring of seabirds in PWS during winter is needed to understand how post-spill ecosystem recovery and changing physical and biological factors are affecting seabird abundance and species composition, as well as their distribution and habitat use.

Changes in the timing of biological events, geographic range and/or relative abundance of species, community structure, and system productivity can be indications of a changing ecosystem (Parmesan 2006). For example, a recent 10-year monitoring effort along the transition zone between the California Current and the Gulf of Alaska documented significant increases in seabird species diversity and relative abundance during the nonbreeding season that corresponded with a possible regime shift to cooler conditions (Sydeman et al. 2009).

In December 2004, we began monitoring seabird abundance and distribution in PWS during late fall and winter months. Initially our surveys were concurrent with hydroacoustic surveys for adult herring in northeast PWS. Beginning in March 2007, we expanded our winter survey efforts to other areas of PWS under EVOS Project 070814. Since then surveys have been conducted concurrent with either juvenile herring hydroacoustic surveys or with humpback whale surveys. Results from seven cruises conducted over two winters found consistent trends and species-distinct patterns in distribution. Habitat association modeling revealed that winter climate conditions may influence these distribution patterns (Dawson et al. *in review*). When we examined distribution at a fine- scale (1 km) using data from seabird transects with concurrent fish data, we found a positive association between presence of seabirds and predictable fish prey fields (Bishop et al. *in prep.*). Furthermore, our consumption model of herring predation quantified the potential impacts of such prey association by seabirds during the winter. Our model shows that seabirds consume ~3-10% of the total adult herring biomass during each winter and underscores the importance of further examination of top-down forcing (Bishop et al., *in prep, b*).

Post-spill ecosystem recovery and changing physical and biological factors all have the potential to affect PWS seabird populations. Here we propose to continue to monitor seabird abundance

and habitat associations using multiple surveys during late fall and winter. While this proposal encompasses a five-year period, we would foresee this project continuing over a 20-year period in order for ecosystem changes to be detected.

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 submited by McCammon et al.

This study specifically monitors several injured seabird species that overwinter in PWS. These include marbled murrelet, an injured species with an unknown recovery status, as well as pigeon guillemot, a species that has not recovered. Kittlitz's murrelet is a species frequenting PWS during some winters that has not recovered. Other seabird species initially injured by the spill and wintering in PWS include common loon, cormorants (pelagic, red-faced, and double-crested), common murre and bald eagle. In addition, our project will provide information on the impact of these seabird species on Pacific herring, a species that has not recovered since the Exxon Valdez oil spill.

II. PROJECT DESIGN

A. Objectives

This project is part of the pelagic component of the Long-term Monitoring of Marine Conditions and Injured Resources and Services. There are two primary research goals for the pelagic team: population monitoring of key species groups, and understanding the energy flow through the pelagic ecosystem with key measurements. Objectives of this study include:

1) Characterize the spatial and temporal distribution of seabirds in PWS during late fall and winter.
2) Relate seabird presence to prey fields identified during hydroacoustic surveys.
3) Identify critical biological and physical habitat characteristics for seabirds across PWS within and between winters.
4) Utilize increased temporal sampling resolution to improve our estimates of consumption of herring by seabirds during the winter.

The monitoring of top down forcing by seabirds and whales, the largest predators on herring, will complement the suite of *PWS Herring Research & Monitoring* studies, including insertion of key data into the population modeling of herring In addition, this project will provide information on the wintering ecology of several seabird species injured by the oil spill that can be used to help restore and/or conserve their populations.

B. Procedural and Scientific Methods

This study will be a continuation of systematic late fall and winter seabird surveys begun in 2007 by Bishop and Kuletz. Surveys will be conducted during the months of October, November, December, February, and late March/early April. Depending on the vessel of opportunity used, surveys will either be coupled with the *LTM Humpback Whale systematic surveys*. (October, December, February) or with surveys associated with the *PWS Herring Research and Monitoring* including *Juvenile Herring Abundance Index* in November and *Expanded Adult Herring Surveys* in late March/early April).

All surveys will employ established U.S. Fish and Wildlife Service protocols that have been adapted for GPS-integrated data entry programs (USFWS 2007). One observer will record number and behavior of birds and marine mammals occurring along a strip transect width of 300 m (150 m both sides and ahead of the boat, in distance bins of 50m). Additionally, any noteworthy observations will be recorded out to 1 km either side. Observations will be recorded into a GPS-integrated laptop computer using the program Dlog (Ford Consulting, Inc., Portland OR). This GPS-integrated program provides location data at 20-sec intervals and for every entered observation program. In addition, sea conditions including sea surface temperature (as indicated on the vessel's fish finder) and weather can be entered and tracked on site by the observer.

Seabird transects that are coupled with hydroacoustic fish surveys will occur in four to eight select bays in PWS. Seabird transects will also be conducted when the boat is in transit during daylight hours. Seabird surveys conducted onboard humpback whale surveys will follow specified routes from northeast to southwest PWS. Depending on the results from the 2010-2011 winter season, nighttime surveys employing infrared cameras and a variable width transect may be conducted when possible.

At the end of first 5 years of the long-term monitoring (September 2016), this study will have data sets from broad-scale coverage of PWS ranging from 4 to 10 years. In addition, there is data from select bays for cruises conducted between Dec 2004 and Oct 2006 including: October (1 yr), December (1 yr) and March (2 yrs).

Table 1. Total years of broad-scale PWS seabird surveys, by month. March 2007 – March 2016.

Month	Total Survey Years
October	5
November	9
December	4
January	2
February	4
March	10

C. Data Analysis and Statistical Methods

Density (birds • km^{-2}) of each seabird species will be calculated for each km of survey trackline. We will use all surveys conducted since 2007 to describe the seasonal patterns of abundance and distribution. Seabird observations will be mapped using ArcView GIS. Temporal variability in bird density will be addressed at inter- and intra-annual scales.

The November and late March/early April seabird transects will be conducted concomitant with hydroacoustic fish surveys. The November *Juvenile Herring Abundance Index* survey will take place in the four bays (Simpson, Eaglek, Zaikof, Whale) surveyed in the 1990's as part of the

EVOS-sponsored Sound Ecosystem Assessment (SEA) program. Locations of the expanded adult herring surveys are not yet defined. Data on fish biomass (kg/m2) by depth will be available for each trackline. Composition of fish schools will be made available by the *Validation of Acoustic Surveys for Pacific Herring Using Direct Capture,* a separate project that is part of the *PWS Herring Research & Monitoring* program. We will combine acoustic survey data on prey composition with a suite of additional independent variables shown to be relevant to seabird predation (eg., school density, school area, species composition and size structure, water depth, depth to school, depth below each school, and distance from shore [Kuletz 2005; Ostrand et al. 2004, 1998; Day and Nigro 2000]). We will use logistic regression to determine the role of these covariates on the presence of seabirds (Maniscalco et al. 1998; Manly et al. 1993). Model selection criteria (eg., AIC, GCV) will be chosen according to the most effective model framework (eg., GLM, GAM).

We will model seabird abundance and distribution in relation to biological and physical environmental factors. While the prey field data will be available from the *PWS Herring Research and Monitoring* cruises, seabird abundance surveys will cover both the herring and LTM humpback whale cruises. Seabird abundance data are typically zero-dominated therefore hurdle models will be applied whereby data are analysed initially as presence-absence, followed by a separate analysis of presence-only data (Boucher and Guillén, 2009, Zuur *et al*. 2009). Hence, the first analysis will determine which covariates are driving the presence and absence of birds, while the second analyses will focus on covariates driving the abundance of birds when they were present. GIS will be used to determine covariates such as distance to shore, water depth, distance to eelgrass beds, distance to kelp beds, and slope. Locations of coastal kelp and eelgrass beds will be obtained from the ShoreZone database (NOAA Fisheries 2009), and slope from the Alaska Ocean Observing System bathymetry grid. Other covariates including sea surface temperature, year, and month will also be examined. For the presence-absence data a binomial generalised additive mixed model (GAMM) will be used. For presence-only data we will use a GAMM. For a detailed description of the proposed statistical methods see Zuur *et al*. (*in press*).

Late fall and early winter plankton tows will be conducted in October and November each year in PWS as part of the *LTM Long term monitoring of oceanographic conditions in Prince William Sound.* Surveys will be conducted in the four bays (Simpson, Eaglek, Zaikof, Whale) surveyed in the 1990's as part of the EVOS-sponsored Sound Ecosystem Assessment (SEA) program. In addition, plankton surveys will include the major entrances to PWS. We will examine zooplankton data to see if there are linkages to seabird hotspots observed during October, November and December cruises.

To describe the relationship between seabird densities and zooplankton biomass and herring biomass in PWS we will run linear regressions, using zooplankton and herring survey data provided from their respective projects. For each bird species, a best model for explaining variability in bird densities will be determined using a general linear model. A natural log or square root transformation of the dependent variable will be used when appropriate to improve the fit of the model to the data. The relationship between date, densities of each seabird species observed, and food abundance (zooplankton or herring biomass) will be evaluated by bay (the four SEA bays and the four additional bays), and in the case of herring biomass, by transect.

Current seabird survey data provide little information regarding the residence times of most seabird species in Prince William Sound from November through March. Our recent efforts to quantify herring consumption by seabirds utilizes the best available data about such residency and estimates seabird consumption based on a daily energy budget projected over each species winter residency period (Bishop et al., *in prep b*). The increased temporal resolution of sampling in the current proposal will enable us to include direct observations of seabird presence throughout the season to improve upon the current data. Refined data for each species will be used to update the residence time parameter in our current consumption model, thereby improving estimates of seabird consumption of herring during winter.

D. Description of Study Area

The pelagic component of the *LTM* project, including this project and the *Humpback Whale Intensive Surveys* includes all of Prince William Sound. Seabird observations associated with the *PWS Herring Research & Monitoring Juvenile Herring Abundance Index* will focus on the four bays (Zaikof, Whale, Eaglek, and Simpson) that were extensively studied during the Sound Ecosystem Assessment study and PWS Herring Survey program (Figure 1). This allows the work to build upon the historical research completed in those bays. These bays also cover four different quadrants of the Sound. The *PWS Herring Research & Monitoring Juvenile Herring Abundance Index* and the *Expanded Adult Herring Surveys* will include other bays based on the results from the synthesis and aerial surveys, respectively.

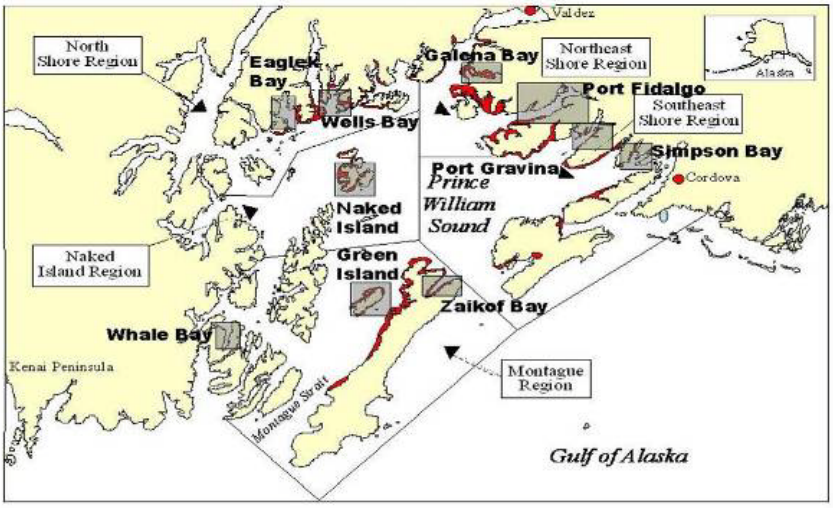

Figure 1. Study area, Prince William Sound. Hi-lighted in gray are the four SEA bays (Whale, Zaikof, Eaglek, and Simpson), as well as other bays historically important for juvenile herring.

E. Coordination and Collaboration with Other Efforts

See Above. Additional information specific to this project:

This project is a component of the integrated *Long-term Monitoring of Marine Conditions and Injured Resources and Services* submitted by McCammon et al. Our proposed long-term monitoring program is composed of several components (Environmental Drivers, Pelagic and Benthic Monitoring), with a series of projects in each component lead by principal investigators

from a number of institutions. The seabird project, headed by Dr. Mary Anne Bishop, is part of the pelagic monitoring component and shares research vessels associated with the *LTM Humpback Whale Systematic Surveys*, also part of the pelagic monitoring component. In addition, this seabird project is highly integrated with the *PWS Herring Research & Monitoring* program, and shares research vessels with the two projects in this program (see below).

This project builds on previous seabird data sets. Since 2004, winter seabird surveys have been performed on vessels conducting hydroacoustic surveys for adult herring (5 cruises, 2004-2006) and juvenile herring (8 cruises, 2007 to present). Cruises since 2007 have been part of EVOS Projects 070814 and 10100132-H. In addition, seabird surveys have been performed on vessels conducting Humpback Whale surveys (6 cruises, 2007-2009) as part of EVOS project 070804.

This long-term seabird monitoring project uses as observing platforms vessels associated with three different projects. Cruises begin in Cordova, and therefore the staff member would not need to travel. One seabird observer (PWSSC staff) will be onboard all cruises associated with the *LTM Humpback Whale systematic surveys*. (Oct, Dec, Feb, years 1-4). In addition, a seabird observer (PWSSC staff) will be onboard surveys associated with *PWS Herring Research and Monitoring.* Specifically the observer will be onboard *Juvenile Herring Abundance Index* surveys (Nov yrs 2-5) and the *Expanded Adult Herring Surveys* (late March/early Apr yrs 2-5). Seabird observations from this project will be shared and integrated into the whale and herring surveys. In addition, information on herring, other fish and zooplankton prey fields around whale foraging areas, juvenile herring schools and adult herring schools will be used for the seabird analyses.

Information from this project will feed into the *North Pacific Pelagic Seabird Database*, a database that is maintained by US Fish & Wildlife Service and USGS. This databsed is currently being integrated into a single database that will be available over the internet through an ARC/IMS.

III. SCHEDULE

A. Project Milestones

Objective 1. . Characterize the spatial and temporal abundance of seabirds in PWS during late fall and winter.
Data analyses incorporating data collected through April 2016 will be completed by July 2016 and incorporated into LTM program report by August 2016.

Objective 2. Model species abundance and distribution in relation to biological and physical environmental factors
Data analyses incorporating data collected through April 2016 will be completed by July 2016 and incorporated into LTM program report by August 2016.

Objective 3. Assess seabird habitat associations within and between winters
Data analyses incorporating data collected through April 2016 will be completed by July 2016 and incorporated into LTM program by August 2016.

Objective 4. Relate species composition and distribution to prey fields.
Data analyses incorporating data collected through April 2016 will be completed by July 2016 and incorporated into LTM program report by August 2016.

Objective 5. Identify critical marine habitats used by seabirds during late fall and winter
Data analyses incorporating data collected through April 2016 will be completed by August 2016 and incorporated into LTM program report by August 2016.

B. Measurable Project Tasks

The following provides a schedule for this seabird project's monitoring activities proposed over the five-year period. Additional information on program schedules can be found in the main narrative

FY12 1st Quarter (October 1, 2011 to December 31, 2011)

November	Annual PI meeting
December	Field cruise: *LTM* humpback whale and seabird surveys

FY12 2nd Quarter

January	Alaska Marine Science Symposium
February	Field cruise: *LTM* humpback whale and seabird surveys

FY12 3rd Quarter

Apr – June	Analyze data
June	Submit FY13 work plan for review

FY12 4th Quarter

Jul - Sep	Analyze data
August	Submit annual report

FY13 1st Quarter (October 1, 2012 to December 31, 2012)

October	Field cruise: *LTM* humpback whale and seabird surveys
November	Field cruise: *LTM* seabird survey in conjunction with *PWS Herring* juvenile abundance index
November	Annual PI meeting.
December	Field cruise: *LTM* humpback whale and seabird surveys

FY13 2nd Quarter

January	Alaska Marine Science Symposium
February	Field cruise: *LTM* humpback whale and seabird surveys
late Mar/early Apr	Field cruise: *LTM* seabird survey in conjunction with *PWS Herring* extended adult biomass cruise

FY13 3rd Quarter

late Mar/early Apr	Field cruise: *LTM* seabird survey in conjunction with *PWS Herring* program extended adult biomass cruise
Apr – June	Analyze data
June	Submit FY14 work plan for review.

FY13 4th Quarter

Jul - Sep	Analyze data
August	Submit annual report

FY14 1st Quarter (October 1, 2013 to December 31, 2013)

October	Field cruise: *LTM* humpback whale and seabird surveys
November	Annual PI meeting

November	Field cruise: *LTM* seabird survey in conjunction with *PWS Herring* juvenile abundance index
December	Field cruise: *LTM* humpback whale and seabird surveys

FY14 2nd Quarter

January	Alaska Marine Science Symposium
February	Field cruise: *LTM* humpback whale and seabird surveys
Winter	Joint EVOS sponsored workshop: Herring & Long-term Monitoring programs
late Mar/early Apr	Field cruise: *LTM* seabird survey in conjunction with *PWS Herring* extended adult biomass cruise

FY14 3rd Quarter

late Mar/early Apr	Field cruise: *LTM* seabird survey in conjunction with *PWS Herring* extended adult biomass cruise
Apr – June	Analyze data
June	Submit FY15 work plan for review

FY14 4th Quarter

Jul - Sep	Analyze data
August	Submit annual report

FY15 1st Quarter (October 1, 2014 to December 31, 2014)

October	Field cruise: *LTM* humpback whale and seabird surveys
November	Field cruise: *LTM* seabird survey in conjunction with *PWS Herring* juvenile abundance index
November	Annual PI meeting
December	Field cruise: *LT*M humpback whale and seabird surveys

FY15 2nd Quarter

January	Alaska Marine Science Symposium
February	Field cruise: *LTM* humpback whale and seabird surveys
late Mar/early Apr	Field cruise: *LTM* seabird survey in conjunction with *PWS Herring* extended adult biomass cruise

FY15 3rd Quarter

late Mar/early Apr	Field cruise: *LTM* seabird survey in conjunction with *PWS Herring* extended adult biomass cruise
Apr – June	Analyze data
May	Submit five-year plan for FY17-22 and work plan for FY16

FY15 4th Quarter

Jul - Sep	Analyze data
August	Submit annual report

FY16 1st Quarter (October 1, 2015 to December 31, 2015)

November	Field cruise: *LTM* seabird survey in conjunction with *PWS Herring* juvenile abundance index

November	Annual PI meeting

FY16 2nd Quarter

January	Alaska Marine Science Symposium
late Mar/early Apr	Field cruise: *LTM* seabird survey in conjunction with *PWS Herring* extended adult biomass cruise

FY16 3rd Quarter

late Mar/early Apr	Field cruise: *LTM* seabird survey in conjunction with *PWS Herring* extended adult biomass cruise
Apr – June	Analyze data
June	Submit work plan for FY17

FY16 4th Quarter

Jul - Sep	Analyze data
August	Submit annual report

IV. LITERATURE CITED

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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	$46.0	$70.0	$72.0	$74.3	$77.3	$339.6
Travel	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Contractual	$1.4	$2.1	$2.1	$2.1	$1.8	$9.5
Commodities	$0.0	$0.0	$0.1	$0.1	$0.1	$0.3
Equipment	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Indirect Costs (*will vary by proposer*)	waived	waived	waived	waived	waived	waived
SUBTOTAL	$47.4	$72.1	$74.2	$76.5	$79.2	$349.4
General Administration (9% of subtotal)	$4.3	$6.5	$6.7	$6.9	$7.1	$31.5
PROJECT TOTAL	$51.7	$78.6	$80.9	$83.4	$86.3	$380.9
Other Resources (Cost Share Funds)	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0

COMMENTS: PWSSC waives the indirect cost on this proposal due to its administration of the overall proposal. This project is part of the *Long-Term Monitoring of Marine Conditions and Injured Resources and Services (LTM), Pelagic Monitoring Componen*t. We are using vessels of opportunity for the seabird observers. Vessel costs are in the *LTM* project *Humpback whale monitoring* and in the proposal by W.S. Pegau, *PWS Herring Research & Monitoring.*

FY12-16

Project Title: Long-term monitoring of seabird abundance & habitat associations during late fall & winter in Prince William Sd
Project PI: M.A. Bishop, PWS Science Center

FORM 3A
NON-TRUSTEE
AGENCY SUMMARY

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

Personnel Costs:		Months	Monthly		Personnel
Name	Project Title	Budgeted	Costs	Overtime	Sum
B. Hsu	Research Assistant	4.0	6.4		25.6
M.A. Bishop	Principal Investigator	1.9	11.0		20.4
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
		Subtotal	17.4	0.0	
				Personnel Total	46.0

Travel Costs:	Ticket	Round	Total	Daily	Travel
Description	Price	Trips	Days	Per Diem	Sum
					0
					0
					0
					0
					0
					0
					0
					0
					0
					0
					0
				Travel Total	0

FY12

Project Title: Long-term monitoring of seabird abundance & habitat associations during late fall & winter in Prince William Sd
Project PI: M.A. Bishop, PWS Science Center

FORM 3B
PERSONNEL & TRAVEL DETAIL

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

Contractual Costs: Description		Contract Sum
network & software subscriptions $150/staff mo		0.9
communications (phone & fax) $50/staff mo		0.3
printing & copying $25/staff mo		0.2
If a component of the project will be performed under contract, the 4A and 4B forms are required.	**Contractual Total**	1

Commodities Costs: Description	Commodities Sum
Commodities Total	0

FY12

Project Title: Long-term monitoring of seabird abundance & habitat associations during late fall & winter in Prince William Sd
Project PI: M.A. Bishop, PWS Science Center

FORM 3B
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
		New Equipment Total	0

Existing Equipment Usage: Description	Number of Units	Inventory Agency
Desktop computer (2) and ruggedized computer (1)	3	PWSSC

FY12

Project Title: Long-term monitoring of seabird abundance & habitat associations during late fall & winter in Prince William Sd
Project PI: M.A. Bishop, PWS Science Center

FORM 3B
EQUIPMENT DETAIL

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

Personnel Costs:		Months	Monthly		Personnel
Name	Project Title	Budgeted	Costs	Overtime	Sum
B. Hsu	Research Assistant	6.5	6.6		42.9
M.A. Bishop	Principal Investigator	2.4	11.3		27.1
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
		Subtotal	17.9	0.0	
				Personnel Total	70.0

Travel Costs:	Ticket	Round	Total	Daily	Travel
Description	Price	Trips	Days	Per Diem	Sum
					0
					0
					0
					0
					0
					0
					0
					0
					0
					0
					0
				Travel Total	0

FY13

Project Title: Long-term monitoring of seabird abundance & habitat associations during late fall & winter in Prince William Sd
Project PI: M.A. Bishop, PWS Science Center

FORM 3B
PERSONNEL & TRAVEL DETAIL

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

Contractual Costs: Description		Contract Sum
network & software subscriptions $150/staff mo		1.4
communications (phone & fax) $50/staff mo		0.5
printing & copying $25/staff mo		0.2
If a component of the project will be performed under contract, the 4A and 4B forms are required.	**Contractual Total**	2.1

Commodities Costs: Description	Commodities Sum
Commodities Total	0

FY13

Project Title: Long-term monitoring of seabird abundance & habitat associations during late fall & winter in Prince William Sd
Project PI: M.A. Bishop, PWS Science Center

FORM 3B
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
		New Equipment Total	0

Existing Equipment Usage: Description	Number of Units	Inventory Agency
Desktop computer (2) and ruggedized computer (1)	3	PWSSC

FY13

Project Title: Long-term monitoring of seabird abundance & habitat associations during late fall & winter in Prince William Sd
Project PI: M.A. Bishop, PWS Science Center

FORM 3B
EQUIPMENT DETAIL

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

Personnel Costs:		Months	Monthly		Personnel
Name	Project Title	Budgeted	Costs	Overtime	Sum
B. Hsu	Research Assistant	6.5	6.8		44.2
M.A. Bishop	Principal Investigator	2.4	11.6		27.8
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
		Subtotal	18.4	0.0	
				Personnel Total	72.0

Travel Costs:	Ticket	Round	Total	Daily	Travel
Description	Price	Trips	Days	Per Diem	Sum
					0
					0
					0
					0
					0
					0
					0
					0
					0
					0
					0
				Travel Total	0

FY14

Project Title: Long-term monitoring of seabird abundance & habitat associations during late fall & winter in Prince William Sd
Project PI: M.A. Bishop, PWS Science Center

FORM 3B
PERSONNEL & TRAVEL DETAIL

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

Contractual Costs: Description		Contract Sum
network & software subscriptions $150/staff mo		1.4
communications (phone & fax) $50/staff mo		0.5
printing & copying $25/staff mo		0.2
If a component of the project will be performed under contract, the 4A and 4B forms are required.	**Contractual Total**	2.1

Commodities Costs: Description	Commodities Sum
Supplies	0.1
Commodities Total	0.1

FY14

Project Title: Long-term monitoring of seabird abundance & habitat associations during late fall & winter in Prince William Sd
Project PI: M.A. Bishop, PWS Science Center

FORM 3B
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
		New Equipment Total	0

Existing Equipment Usage: Description	Number of Units	Inventory Agency
Desktop computer (2) and ruggedized computer (1)	3	PWSSC

FY14

Project Title: Long-term monitoring of seabird abundance & habitat associations during late fall & winter in Prince William Sd
Project PI: M.A. Bishop, PWS Science Center

FORM 3B
EQUIPMENT DETAIL

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

Personnel Costs:		Months	Monthly		Personnel
Name	Project Title	Budgeted	Costs	Overtime	Sum
B. Hsu	Research Assistant	6.5	7.0		45.5
M.A. Bishop	Principal Investigator	2.4	12.0		28.8
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
		Subtotal	19.0	0.0	
				Personnel Total	74.3

Travel Costs:	Ticket	Round	Total	Daily	Travel
Description	Price	Trips	Days	Per Diem	Sum
					0
					0
					0
					0
					0
					0
					0
					0
					0
					0
					0
				Travel Total	0

FY15

Project Title: Long-term monitoring of seabird abundance & habitat associations during late fall & winter in Prince William Sd
Project PI: M.A. Bishop, PWS Science Center

FORM 3B
PERSONNEL & TRAVEL DETAIL

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

Contractual Costs: Description	Contract Sum
network & software subscriptions $150/staff mo	1.4
communications (phone & fax) $50/staff mo	0.5
printing & copying $25/staff mo	0.2
If a component of the project will be performed under contract, the 4A and 4B forms are required. **Contractual Total**	2.1

Commodities Costs: Description	Commodities Sum
supplies	0.1
Commodities Total	0.1

FY15

Project Title: Long-term monitoring of seabird abundance & habitat associations during late fall & winter in Prince William Sd
Project PI: M.A. Bishop, PWS Science Center

FORM 3B
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
New Equipment Total			0

Existing Equipment Usage: Description	Number of Units	Inventory Agency
Desktop computer (2) and ruggedized computer (1)	3	PWSSC

FY15

Project Title: Long-term monitoring of seabird abundance & habitat associations during late fall & winter in Prince William Sd
Project PI: M.A. Bishop, PWS Science Center

FORM 3B
EQUIPMENT DETAIL

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

Personnel Costs:		Months	Monthly		Personnel
Name	Project Title	Budgeted	Costs	Overtime	Sum
B. Hsu	Research Assistant	4.0	7.2		28.8
M.A. Bishop	Principal Investigator	3.9	12.4		48.5
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
		Subtotal	19.6	0.0	
				Personnel Total	77.3

Travel Costs: Description	Ticket Price	Round Trips	Total Days	Daily Per Diem	Travel Sum
					0
					0
					0
					0
					0
					0
					0
					0
					0
					0
					0
				Travel Total	0

FY16

Project Title: Long-term monitoring of seabird abundance & habitat associations during late fall & winter in Prince William Sd
Project PI: M.A. Bishop, PWS Science Center

FORM 3B
PERSONNEL & TRAVEL DETAIL

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

Contractual Costs: Description		Contract Sum
network & software subscriptions $150/staff mo		1.2
communications (phone & fax) $50/staff mo		0.4
printing & copying $25/staff mo		0.2
If a component of the project will be performed under contract, the 4A and 4B forms are required.	**Contractual Total**	1.8

Commodities Costs: Description	Commodities Sum
Supplies	0.1
Commodities Total	0.1

FY16

Project Title: Long-term monitoring of seabird abundance & habitat associations during late fall & winter in Prince William Sd
Project PI: M.A. Bishop, PWS Science Center

FORM 3B
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
		New Equipment Total	0

Existing Equipment Usage: Description	Number of Units	Inventory Agency
Desktop computer (2) and ruggedized computer (1)	3	PWSSC

FY16

Project Title: Long-term monitoring of seabird abundance & habitat associations during late fall & winter in Prince William Sd
Project PI: M.A. Bishop, PWS Science Center

FORM 3B
EQUIPMENT DETAIL

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