August 24, 2016

Elise Hsieh, Executive Director
Exxon Valdez Oil Spill Trustee Council
4210 University Drive
Anchorage, AK 99508-4626

Dear Elise:

Final FY 2017-2021 Proposal Submittal for Long-term Monitoring

17120114-M. Prince William Sound Marine Bird Population Trends

Gulf Watch Alaska, the long-term monitoring program of the *Exxon Valdez* Oil Spill Trustee Council (EVOSTC), has finalized our program and project proposals for fiscal years 2017-2021 funding based on comments received from EVOSTC's Science Panel on May 19, 2016. Below is the final budget summary and response to Science Panel comments for the Prince William Sound marine bird population trends project.

EVOSTC Funding Requested *(including 9% GA)*

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

Non-EVOSTC Funding Available

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

Science Panel comment: *There are no project specific comments.*

PI Response:

- The proposal was not revised.

Sincerely,

Mandy Lindeberg
Gulf Watch Alaska Program Lead designate

Attachment: Gulf Watch Alaska: Pelagic Component Project Proposal: 17120114-M—Continuing the Legacy: Prince William Sound Marine Bird Population Trends

EVOSTC FY17-FY21 INVITATION FOR PROPOSALS
PROGRAM PROJECT PROPOSAL SUMMARY PAGE

Project Title

Gulf Watch Alaska: Pelagic Component Project:

17120114-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

24 August 2016

Project Abstract

We propose to conduct small boat-based surveys to monitor abundance of marine birds in Prince William Sound (PWS), Alaska, during July 2018 and July 2020. Historical data include fourteen surveys spanning 1989 to 2014 (a fifteenth survey will be conducted in July 2016) and have been used to monitor population trends for marine birds in PWS following the 1989 *Exxon Valdez* oil spill (EVOS). Continued long-term monitoring of marine birds in PWS and synthesis of the data are needed to determine recovery of marine bird populations injured by the spill, as well as evaluate the possible effects of climate variability and climate change on these populations. Data collected from 1989 to 2014 indicated that pigeon guillemots (*Cepphus columba*) and *Brachyramphus* murrelets had declined in the oiled areas of PWS. Furthermore, declines were observed of offshore-associated plantivorous and piscivorous genera of marine birds suggesting that changes have likely occurred in the pelagic food webs of PWS. Continuation of boat-based marine bird surveys in PWS will (i) build upon an important data set for long-term monitoring of population recovery of marine bird species following the EVOS, and (ii) provide managers and researchers with a tool to track impacts of climate variability and climate change on important groups of marine predators. Marine bird surveys compliment the benthic monitoring and forage fish monitoring aspects (including Middleton Island proposed project) of the Long-term Monitoring Project by providing a population trend index useful for interpreting marine ecosystem patterns observed in PWS.

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

FY17	FY18	FY19	FY20	FY21	TOTAL
$24.9	$222.2	$24.9	$222.2	$24.9	$519.1

Non-EVOSTC Funding Available

FY17	FY18	FY19	FY20	FY21	TOTAL
$23	$56	$23	$56	$22	$180

1. Executive Summary

Pelagic Component

In the aftermath of the 1989 *Exxon Valdez* oil spill (EVOS) it was difficult to distinguish between the impacts of the spill and natural variability in affected animal populations. The main problem for assessing impacts on pelagic species was that long-term baseline data were largely absent. As a result, managers struggled to make informed decisions regarding estimation of damages and recommendations for recovery. Ten years after the spill it became widely recognized that there had been a major climatic regime shift (from colder to warmer than average) that altered the marine ecosystem prior to the spill, including marine birds, marine mammals, groundfish, and the shared forage species they all consumed. As we begin to close the second decade of the 2000s we are experiencing anomalous ocean warming events driven by changing atmospheric conditions at both inter-decadal (i.e., Pacific Decadal Oscillation) and shorter (e.g., El Niño Southern Oscillation) time scales. These changes may have profound effects on pelagic ecosystems such as unusual mortality events, harmful algal blooms, and fishery closures.

During the first five years of the Gulf Watch Alaska (GWA) program, the pelagic component research team addressed two main questions: 1) What are the population trends of key pelagic species groups in PWS, and, 2) How can forage fish population trends in PWS be monitored most effectively? To answer these questions, five projects focused on species that play a pivotal role in the pelagic ecosystem as trophic indicators for short and long-term ecosystem change: forage fish, marine birds, humpback whales and killer whales. Monitoring of killer whales and marine birds benefitted from having pre-existing long-term data sets as a result of the damage assessment process following the EVOS (>25-year time series).

Moving forward for the next five years, the pelagic research team re-evaluated their primary objectives. The group's primary goal — to determine the long-term population trends of key pelagic species groups in PWS — will remain the same. The second primary objective was fundamentally different: Develop a means to effectively monitor forage fish. Based on knowledge gained in the first five years of the pelagic program, we have developed a broader focus that includes an integrated study of forage fish using marine bird and mammal predators as samplers of the forage base. In addition to providing a means to effectively monitor indices of forage fish trends, our integrated approach will also enhance our understanding of predator-prey relationships and help us identify some mechanisms of change in populations. Ultimately, the integrated surveys along with information from the GWA Environmental Drivers component will provide a way to evaluate climate variability and climate change on the PWS pelagic ecosystem.

Thus, the two over-arching questions for the pelagic component to answer in the next five years are:

1. What are the population trends of key upper trophic level pelagic species groups in Prince William Sound – 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 Prince William Sound and Middleton Island?

The pelagic component research team is proposing to continue monitoring key pelagic species groups in PWS using the same five projects focused on killer whales, humpback whales, forage fish, and marine birds. However, modifications have been made to some projects for greater integration, increased precision of information, and achieving new goals. Ultimately this will provide more information to the EVOS Trustee Council, agency resource managers, non-governmental organizations, and the public.

MARINE BIRD MONITORING

Boat-based marine bird surveys have been conducted in PWS over a 25-year period following 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. These data will be combined with data collected in 1989-91 (Klosiewski and Laing 1994), 1993 (Agler et al. 1994a), 1994 (Agler et al. 1995a), 1996 (Agler and Kendall 1997), 1998 (Lance et al. 1999, Irons et al. 2000, Lance et al. 2001) and 2000 (Stephensen et al. 2001), 2004 (Sullivan et al. 2005), 2005 (McKnight et al. 2006), 2007 (McKnight et al. 2008), 2010 and 2012 (Cushing et al. 2012) to examine trends in marine bird distribution and abundance.

The goals of this long-term study are to

1. Identify changes in marine bird populations, particularly in oiled and unoiled portions of PWS, and
2. Evaluate possible effects of climate variability and climate change on marine bird populations in PWS.

The proposed project will benefit restoration of PWS by determining whether populations that declined due to the spill are recovering and by identifying which species are still of concern. To evaluate possible effects of climate on marine bird populations, we will explore patterns of marine bird population trends with oceanographic data and environmental variables (e.g., sea surface temperatures, sea surface salinity) collected by partners and state and federal agencies (e.g., Alaska Department of Fish and Game, US Geological Survey, National Oceanic and Atmospheric Administration, GWA)

McKnight et al. (2008) examined whether marine bird and mammal species designated as injured by the EVOS Trustee Council (EVOSTC) had shown signs of recovery. Data collected from 1989 to 2007 in the oiled area indicated that common loons (*Gavia immer*) and cormorants (*Phalacrocorax* spp.) were increasing, while pigeon guillemots (*Cepphus columba*), and marbled murrelets (*Brachyramphus marmoratus*) declined. Pigeon Guillemots remain the only bird on the EVOSTC injured species list that has not recovered following the EVOS. Cushing (2014) examined spatial patterns of marine bird community composition in PWS from 1989 through 2012 and found that seven of 18 evaluated genera of marine bird declined in abundance over the study period while three increased in abundance. Genera of marine birds noted to have declined over the study period primarily feed on fish or zooplankton and results supported finding of Agler et al. (1999), who concluded that in PWS piscivorous taxa of marine birds were more likely than non-piscivorous taxa to have declined in abundance between 1972 and the early 1990s.

The marine bird data and environmental data will be collected following the standardized protocols and project design used since 1989. The marine bird protocol and study design was reviewed by the GWA Science Review Panel, which provided useful input and endorsed the standardized methods as a well-designed marine bird study with a useful study design for monitoring of population trends in PWS.

2. Relevance to the Invitation for Proposals

The proposed project is relevant to the Invitation for Proposals in terms of (i) monitoring the restoration of species impacted by EVOS, and (ii) contributing to an integrated evaluation of the possible effects of climate change on the pelagic ecosystem. Continuation of the PWS Marine Bird Population Trends project will add two new data points (2018 and 2020) to a legacy data set spanning 27 years (1989-2016), one of the

longest data streams available for PWS and the northern coast of the Gulf of Alaska (GOA). These legacy data provide the EVOSTC and GWA researchers with a meaningful way to track species recovery following the spill. Furthermore, the proposal is relevant to the Invitation which noted the need to evaluate the possible effects of climate change. The marine bird survey contributes baseline information which will aid in interpretation of observations of pelagic bird species influenced by factors such as short-term climate variability (e.g., the Pacific Decadal Oscillation) and long-term climate change (i.e., global warming).

Data collected during the proposed marine bird survey project will provide detailed population trend data and distribution maps for approximately 21 species or species groups (e.g., loons, Brachyramphus murrelets) of birds in the PWS region, providing important information to managers (e.g., Bureau of Ocean Energy and Management, National Marine Fisheries Service, Chugach National Forest) and marine researchers (e.g., GWA, Prince William Sound Science Center, US Geological Survey, university researchers). Owing to their reliance on the marine ecosystem, marine bird species are important indicators of the status of pelagic ecosystems, and these data have broad utility in efforts to inform policy makers, resource managers, and the general public.

3. Project Personnel

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Please see 2 page CVs at end of this document

4. Project Design

A. Objectives

In order to assess population trends in the years following the EVOS, the first project objective is a continuation of the primary objective identified in the 2012-2016 PWS Marine Bird Population Trends project — determine population abundance, with 95% confidence limits, of marine bird populations in PWS during July in both oiled and unoiled regions. The secondary project objective is aimed at identifying factors influencing observed population trend patterns using field census data, field environmental data, and GWA and partner agency environmental data.

The continuation of the PWS Marine Bird Population Trends project will add two new data points (2018 and 2020) to a data set spanning 27 years (1989-2016). These legacy data provide GWA researchers with a meaningful way to track ecosystem recovery following the EVOS, as well as integrate additional

complimentary biological and environmental data sets collected in the GOA by GWA researchers and other agency partners.

B. PROCEDURAL AND SCIENTIFIC METHODS

Survey methodology and design will remain identical to that of past marine bird surveys conducted by the US Fish and Wildlife Service in 1989, 1990, 1991 (Klosiewski and Laing 1994), 1993 (Agler et al. 1994), 1994 (Agler et al. 1995), 1996 (Agler and Kendall 1997), 1998 (Lance et al. 1999), 2000 (Stephensen et al. 2001), 2004 (Sullivan et al. 2005), 2005 (McKnight et al. 2006), 2007 (McKnight et al. 2008), and 2010, 2012 (Cushing et al. 2012). We will conduct two surveys: one during July 2018 and 2020. We will use three 7.7 m fiberglass boats traveling at speeds of 10-20 km/hr to survey transects over a 3-week period.

We will continue to use a stratified random sampling design containing three strata: shoreline, coastal-pelagic, and pelagic (Klosiewski and Laing 1994) (Figure 1). The shoreline stratum will consist of waters within 200 m of land. Irons et al. (1988a) divided this stratum, by habitat, into 742 transects with a total area of 820.74 km^2. We will locate shoreline transects by geographic features, such as points of land, to facilitate orientation in the field and to separate the shoreline by habitat (Irons et al. 1988a,b). Shoreline transects will vary in size, ranging from small islands with <1 km of coastline to sections of the mainland with over 30 km of coastline. Mean transect length will be 5.55 km. During summer, we plan to survey 212 shoreline transects. All transects were randomly chosen, and the same transects are used each survey (Klosiewski and Laing 1994).

C. DATA ANALYSIS AND STATISTICAL METHOD

As in previous surveys (Klosiewski and Laing 1994, Agler et al. 1994, 1995, Agler and Kendall 1997, Lance et al. 1999, Stephensen et al. 2001, Sullivan et al. 2005, McKnight et al. 2006, McKnight et al. 2008, Cushing et al. 2012), we will use a ratio estimator (Cochran 1977) to estimate population abundance. Shoreline transects will be treated as a simple random sample; whereas the coastal-pelagic and pelagic transects will be analyzed as two-stage cluster samples of unequal size (Cochran 1977). To do this, we will estimate the density of birds counted on the combined transects for a block and multiply by the area of the sampled block to obtain a population estimate for each block; any land or shoreline area (within 200m of land) intersecting a block will be subtracted from the total area of that block. We then will add the estimates from all blocks surveyed and divide by the sum of the areas of all blocks surveyed. We will calculate the population estimate for a stratum by multiplying this estimate by the area of all blocks in the strata. Population estimates for each species and for all birds in PWS will be calculated by adding the estimates from the three strata, and we will calculate 95% confidence intervals for these estimates from the sum of the variances of each stratum (Klosiewski and Laing 1994).

TRENDS IN THE OILED REGION

We will perform a linear regression on log-transformed population estimates over time (1989 – 2016) in the oiled region of PWS. Prior to calculating the log10 of each population estimate, we will add a constant of 0.167 to each estimate to avoid the undefined log10 of 0. In all analyses we will use a test size alpha = 0.10 to balance Type I and Type II errors. The reasons for this include: 1) variation is often high and sample sizes low (n = 14 survey years); and 2) monitoring studies are inherently different from experiments and the number of tests being run with a multi-species survey are many, therefore, controlling for the number of tests by lowering alpha levels (e.g., Bonferroni adjustment) might obscure trends of biological value.

COMPARING TRENDS BETWEEN OILED AND UNOILED REGIONS

We will use the regression technique detailed in (a) to perform regression analyses on population estimates (1989 – 2016) in the unoiled region. We will use a homogeneity of slopes test (Freud and Littell 1981) to compare population trends between the oiled and unoiled zones of PWS to examine whether species with population estimates of >500 individuals have changed over time. To do this, we must assume that marine bird populations increase at the same rate in the oiled and unoiled zones of PWS. Significantly different slopes would indicate that population abundance of a species or species group changed at different rates.

Taxa showing no difference in trends between the oiled and unoiled regions will be considered "not recovering." Taxa showing significantly greater trends in the oiled region compared with the unoiled region will be considered "recovering." Taxa showing significantly greater trends in the unoiled region compared to the oiled region will be considered to be suffering "continuing and increasing effects."

Overall, a species will be considered "recovering" if it meets the requirements for this category in either the regression analysis within the oiled region or the homogeneous slopes analysis.

To determine optimum survey frequency, we conducted a power analysis to estimate the probability of detecting trends in abundance using linear regression from a given number of samples (Taylor and Gerrodette 1993). We examined our power to detect trends when coefficient of variation (CV) of the population was 0.30 (greater than the mean CV from previous surveys for 73% of the injured species; Fig. 2) and when the CV = 0.13 (the mean summer CV for *Brachyramphus* murrelets, which had the lowest CV among injured species). Models of seabird population growth predict most species cannot increase more than 12% per year (Nur and Ainley 1992), so we used 10% for our comparisons. With CV=0.30 the probability of detecting an average annual change of 10% would be 92% based on using survey data from 1989-2010 (Figure 1).

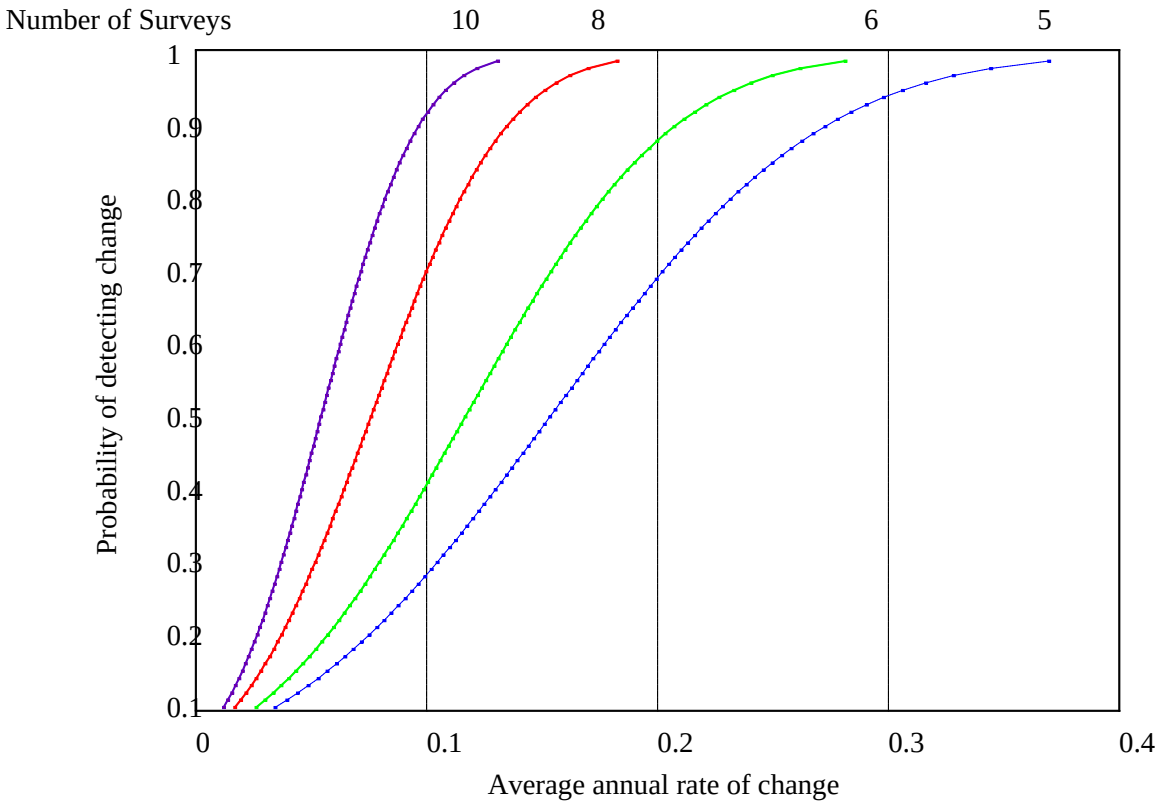

Figure 1. Estimated power based on numbers of surveys (5, 6, 8, and 10) conducted to detect a trend in marine bird populations in Prince William Sound when the CV = 0.30.

D. Description of Study Area

Our study area is the inside waters of PWS (Figure 2, bounding coordinates: 61.292, -148.74; 61.168, -146.057; 60.273, -145.677; 59.662, -148.238), an area of approximately 9000 km^2. Marine bird surveys were conducted in July during 12 years within the interval 1989-2012. Surveys were conducted from 7.6-m boats, using 200m-wide strip-transects. The same transects, totaling approximately 2000 linear km, are surveyed during each survey year (every even year since 2010).

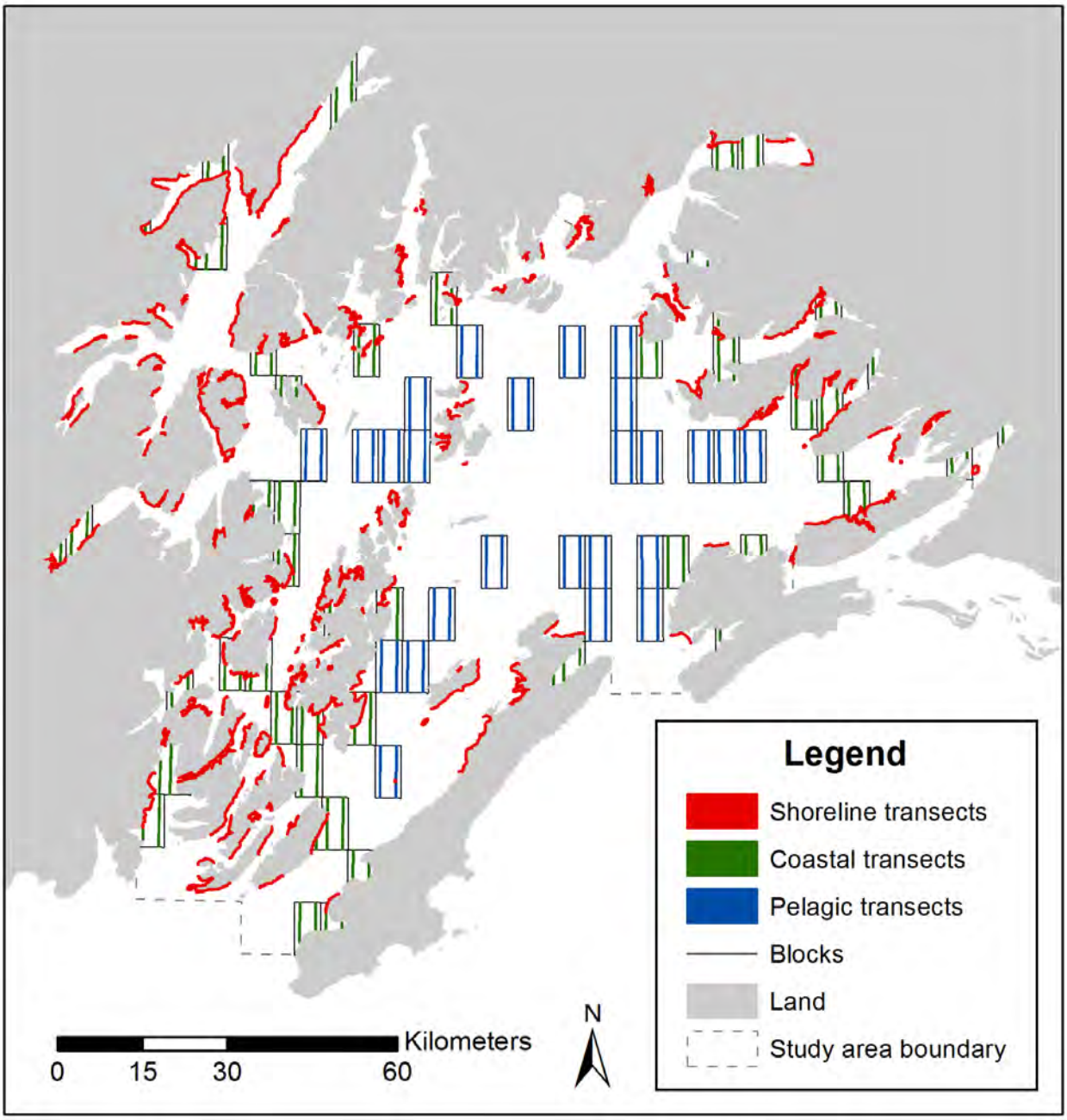

Figure 2. Location of marine bird survey transects within Prince William Sound, Alaska.

5. Coordination and Collaboration

WITHIN THE PROGRAM

Within GWA Coordination and Collaboration: The proposed project will collaborate closely with the Forage Fish project (Arimitsu/Piatt) in collection of marine bird data while conducting data collection of schools of forage fish. The proposed project will also collaborate with Winter Seabird Surveys (Bishop) 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, and allow for comparisons across marine habitats.

WITH OTHER EVOSTC-FUNDED PROGRAMS AND PROJECTS

With Other EVOSTC-funded Programs and 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 includes pigeon guillemots, tufted and horned puffins, parakeet auklets, and Arctic terns.

WITH TRUSTEE AND MANAGEMENT AGENCIES

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 land management agencies (US Forest Service, National Park Service) 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 GWA study area and will inform the fisheries management process in the GOA. Additional long-term studies include:

1. Seabird surveys are a sub-award of the 'Seward Line' project funded by the North Pacific Research Board (Project 1427, "Measuring the pulse of GOA: Oceanographic observations along the Seward Line"; lead PI, Dr. R. Hopcroft, University of Alaska Fairbanks). Dr. Kuletz coordinates pelagic surveys of marine birds in conjunction with the oceanographic and plankton surveys. The project includes the transit along the outer coast of the Kenai Peninsula between Homer and Seward, the Seward Line (which runs to the shelf break), and transits between stations throughout western PWS. Two sampling cruises (May and September) are conducted each year for the next five years, with plans to continue additional years, pending funding.
2. Seabird surveys in lower Cook Inlet funded by the Bureau of Ocean Energy Management (BOEM; Intra-agency Agreement No. M14PG00031, "Seabird Abundance and Distribution with Respect to Ecological Processes in Lower Cook Inlet"). This project collects data for the upper trophic level component of the BOEM environmental studies program, in partnership with an existing multidisciplinary monitoring program (Monitoring temporal and spatial trends in lower Cook Inlet and Kachemak Bay waters, GWA, PIs A. Doroff (Kachemak Bay Research Reserve) and K. Holderied (National Oceanographic and Atmospheric Administration)). The USFWS/BOEM marine bird surveys are conducted in conjunction with oceanographic and plankton sampling across four transect lines in Lower Cook Inlet, four times per year (spring, summer, fall, winter), 2012 - 2016.

WITH NATIVE AND LOCAL COMMUNITIES

Involvement with the marine bird population trend project at the local and native community level will occur through the USFWS's Migratory Bird Management Outreach Biologist. As the marine bird survey stages operations from four areas across PWS (Whittier, Chenega, Cordova, and Valdez), opportunities to involve local and native communities are mostly information exchanges. The 2015-2016 murre wreck (a major seabird die-off event observed across the northern coast of the GOA) would be an ideal topic in which to engage local and native communities to gain valuable observation data from residence with years of experience and knowledge living in PWS and the GOA. For example, in February 2016 Dr. Kuletz was

invited to give a presentation about the murre die-off at the quarterly webinar of One Health Group, led by the Alaska Native Tribal Health Consortium, and she will be providing regular updates to the group.

6. Schedule

Project Milestones

To determine population abundance, with 95% confidence limits, 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.

To be met by March 2019 and 2021.

Measurable Project Tasks

Measurable project tasks are presented by fiscal year and quarter graphically in Table 1 and descriptively below.

Table 1. Marine bird population trends monitoring task schedule.

Task	FY17				FY18				FY19				FY20				FY21			
	EVOSTC FY Quarter (beginning Feb. 1)																			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Task 1 admin & logistics																				
Contracting & hiring					X	X							X	X						
Recruit volunteers, housing/travel & permits					X	X							X	X						
Survey vessel Preparation & Winterization		X	X			X		X		X	X			X	X					
Task 2 data acquisition & processing																				
Boat-based marine bird survey							X								X					
Marine bird and mammal data processing								X	X						X	X				
Task 3 data management																				
Database mgmt./QAQC	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Metadata	X								X								X			
Workspace upload		X								X								X		
Task 4 analysis & reporting																				
Analysis and summary	X				X								X				X			
Annual Reports	X				X				X				X				X			
Annual PIs meeting				X				X				X				X				X
FY Work Plan			X				X				X				X					
Permit reports				X				X				X				X				X

FY 17 (Year 6)

FY 17, 1st quarter (February 1, 2017 - April 30, 2017)
February: *Submit final FY16 marine bird survey data to shared website*
March: *Submit FY16 annual report*

FY 17, 2nd quarter (May 1, 2017 - July 31, 2017)
June: *Repair boat hulls and outboard engines, as needed*
July: *No field work, non-survey year*

FY 17, 3rd quarter (August 1, 2017 - October 31, 2017)
August: *FY18 project proposal*
October: *Synthesis of 2012-2016 survey results and manuscript*

FY 17, 4th quarter (November 1, 2017 - January 31, 2018)
November: *Attend annual PI meeting*
January: *Attend Alaska Marine Science Symposium;*

FY 18 (Year 7)

FY 18, 1st quarter (February 1, 2018 - April 30, 2018)
February: *Prepare contractual agreement, purchase request*
March: *Submit FY17 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 16th PWS marine bird survey*

FY 18, 3rd quarter (August 1, 2018 - October 31, 2018)
August: *Put away field gear and winterize (4) survey boats*
September: *QA/QC FY18 marine bird survey data*

FY 18, 4th quarter (November 1, 2018 - January 31, 2019)
November: *Attend annual PI meeting*
January: *Attend Alaska Marine Science Symposium*

FY 19 (Year 8)

FY 19, 1st quarter (February 1, 2019 - April 30, 2019)
February: *Submit final 2018 marine bird survey data to shared website*
March: *Submit FY18 annual report*

FY 19, 2nd quarter (May 1, 2019 - July 31, 2019)
May-July: *Analyze 1989-2018 marine bird data*

FY 19, 3rd quarter (August 1, 2019 - October 31, 2019)
August-October: *Prepare annual report*

FY 19, 4th quarter (November 1, 2019 - January 31, 2020)
November: *Attend annual PI meeting*
January: *Attend Alaska Marine Science Symposium*

FY 20 (Year 9)

FY 20, 1st quarter (February 1, 2020 - April 30, 2020)
February: *Prepare contractual agreement, purchase request*
March: *Hire project personnel*
March: *Submit FY19 Annual Report*
March –April: *Submit contractual agreements award*

FY 20, 2nd quarter (May 1, 2020 - July 31, 2020)
May –June: *Prepare for field season*
June: *Finalize volunteer observer travel papers*
July: *Conduct 16th PWS marine bird survey*

FY 20, 3rd quarter (August 1, 2020 - October 31, 2020)
August: *Put away field gear and winterize (4) survey boats*
September: *QA/QC 2018 marine bird survey data*

FY 20, 4th quarter (November 1, 2020 - January 31, 2021)
November: *Attend annual PI meeting*
January: *Attend Alaska Marine Science Symposium*

FY 21 (Year 10)

FY 21, 1st quarter (February 1, 2021 - April 30, 2021)
February: *Submit final 2020 marine bird survey data to shared website*
March: *Submit FY20 annual report*

FY 21, 2nd quarter (May 1, 2021 - July 31, 2021)
May-July: *Analyze 1989-2018 marine bird data*

FY 21, 3rd quarter (August 1, 2021 - October 31, 2021)
August: *FY22 project proposal*
August-October: *Prepare annual report*

FY 21, 4th quarter (November 1, 2021 - January 31, 2022)
November: *Attend annual PI meeting*
January: *Attend Alaska Marine Science Symposium*

7. Budget

BUDGET FORMS (ATTACHED)

Completed budget forms are attached.

Personnel: A project leader (GS 11) is needed to run the project and must possess supervisory skills to govern the activities of eight subordinate workers. A minimum of three persons per boat (3 boats) for a total of nine persons are needed to conduct the survey. We will need a supervisory biological technician for five months to assist in field preparation and equipment maintenance, we will need three other biological technicians and four volunteers (due to lack of funding) -- approximately 20 days of survey time plus 25 days for field gear preparation/maintenance and training. The project leader will allocate 8 months to the project during years with a survey and 3 months during the off years. The project leader will be responsible for conducting QA/QC on the data, entering data into the North Pacific Pelagic Seabird Database, conducting analysis, writing reports and meeting attendance.

Travel: Nine people will be traveling throughout PWS and will need approximately 15 nights of lodging the Sound (and additional 7 will be aboard the charter vessel). Per diem will be given to each person during each survey. A tunnel fee is assessed to every vehicle traveling through the tunnel near Portage and the truck/boat will make 8 round trips during each survey.

Contractual: PWS is large and requires extensive travel by boat. To make the survey cost effective, a support vessel will be contracted to provide lodging and food for 7 survey days. The boats will operate for hundreds of hours and will need repairs and replacement parts. There are also fees associated with launching and parking the boat in the harbors.

Commodities: Includes gas and oil to support boat transport and operation during the surveys; food for 9 people while on survey; and personal safety devices.

Equipment: We are using USFWS equipment for this survey as an in-kind contribution but the survey work takes a toll on boats; on average, each boat will run a total of 20 full days per survey. As a result, we are including funds for emergency replacement of motor parts that fail during the survey should that need arise.

SOURCES OF ADDITIONAL FUNDING

Over the life of the project, USFWS will make a substantial in-kind contribution of $180,000. Specifically, salary for Kathy Kuletz includes: 1 month for PWS marine bird surveys, 1 month for Lower Cook Inlet surveys (in collaboration with the Bureau of Ocean Energy Management), 1 month for the Seward Line project (in collaboration with the North Pacific Research Board and the University of Alaska Fairbanks.

LITERATURE CITED

Agler, B. A., P. E. Seiser, S. J. Kendall, and D. B. Irons. 1994. Marine bird and sea otter populations of Prince William Sound, Alaska: population trends following the *T/V Exxon Valdez* oil spill. Restoration Project No. 93045. Final Rep., U. S. Fish and Wildl. Serv., Anchorage, Alas. 51 pp. + appendices.

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Lance, B. K., D. B. Irons, S. J. Kendall, and L. L. McDonald. 1999. Marine Bird Population Abundance of Prince William Sound, Alaska: Trends following the *Exxon Valdez* oil spill. Restoration Project No. 98159. Final Rep., U.S. Fish and Wildl. Serv., Anchorage, Alas.

McKnight, A. E., K. M. Sullivan D. B. Irons, S. W. Stephensen and S. Howlin. 2006. Marine Bird and Sea Otter Population Abundance of Prince William Sound, Alaska: Trends following the *Exxon Valdez* oil spill 1989-2005. Restoration Project No. 050751. Annual Rep., U.S. Fish and Wildl. Serv., Anchorage, Alas.

McKnight, A. E., K. M. Sullivan D. B. Irons, S. W. Stephensen and S. Howlin. 2008. Marine Bird and Sea Otter Population Abundance of Prince William Sound, Alaska: Trends following the *Exxon Valdez* oil spill 1989-2007. Restoration Project No. 070751. Annual Rep., U.S. Fish and Wildl. Serv., Anchorage, Alas.

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PROJECT DATA ONLINE

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Dr. KATHY J. KULETZ
Curriculum vitae
Wildlife Biologist/Seabird Coordinator, U.S. Fish and Wildlife Service
1011 East Tudor Road, Anchorage, Alaska 99503
Phone: 907-786-3453 Email: Kathy_Kuletz@fws.gov

PROFESSIONAL PREPARATION

Ph.D. Biology	Univ. of Victoria, British Columbia (2005); Dr. Alan Burger
M.S. Ecology & Evolutionary Biology	Univ. of California, Irvine (1983); Dr. G.L. Hunt, Jr
B. S. Wildlife Ecology	California State Polytechnic Univ., San Luis Obispo, (1974)

WORK EXPERIENCE - OVERVIEW

2015-current	Wildlife Biologist/Seabird Coordinator, Migratory Bird Management, U.S. Fish and Wildlife Service, Anchorage, Alaska
2005-2015	Wildlife Biologist/Seabird Specialist & Pelagic Program Coordinator, USFWS
2015-current	Chair, Pacific Seabird Group (http://www.pacificseabirdgroup.org/)
2009-current	Expert member, Circumpolar Seabird Group (CAFF Arctic Council)
2004-current	Short-tailed Albatross Recovery Team (Endangered Species/ USFWS)
2007-2012	Science & Statistical Committee of North Pacific Fisheries Management Council
2000–2006	NOAA/N. Pacific Fisheries Manage. Council Groundfish Fisheries Plan Team
1998-2005	Seabird Specialist, Migratory Bird Management, USFWS, Anchorage

RELEVANT SYNERNISTIC ACIVITIES

- PI for Seabirds in 'Seward Line Long-term Monitoring' (2014-2019; NPRB grant)
- Co-PI for Gulf Watch Alaska seabird surveys, Prince William Sound (2012-2016; EVOS grant)
- PI for Seabirds, 'Alaska Marine Biodiversity Observing Network' (2014-2019; BOEM)
- PI for 'Seabird Distribution & Abundance in Cook Inlet' (2014-2016; BOEM IA)
- PI for 'Seabird Distribution in the Offshore Environment' (2010–2015; BOEM IA)
- PI for 'Aleutian Islands Seabird Risk Assessment' (2012- 2015; USFWS special grant)
- PI or collaborator, Arctic research projects (ArcticEIS, SOAR, PacMARS; 2011-2014)
- PI for Seabirds, Bering Sea Integrated Research Program (2008-2012; NPRB grant)
- Co-PI for 'Seabirds as Predators on Juvenile Herring' (2006-2013; EVOS grant)
- PI for North Pacific Pelagic Seabird Observer Program (2006-2008; NPRB grant)
- PI and Co-PI for multiple *Exxon Valdez* Oil Spill (EVOS) projects, 1989 - 1999
- Co-PI for seabird projects in Lower Cook Inlet /Kachemak Bay (EVOS, ADFG, USFWS)
- Assisted NOAA & NPFMC with Programmatic Environmental Impact Statements
- Collaboration with NOAA and Univ. of Washington, studies of fisheries seabird bycatch
- Detailed during Deepwater Horizon Oil Spill – assisted implementation of studies
- Marine Important Bird Areas Committee (Audubon working group)
- Reviewer for variety of peer-reviewed journals; lead reviewer for UN World Ocean Assessment (http://www.worldoceanassessment.org/)

SELECTED RELEVANT PUBLICATIONS

Bishop, MA, Watson, JT, **Kuletz**, KJ, and Morgan, T. 2015. Pacific Herring (Clupea pallasii) consumption by marine birds during winter in Prince William Sound, Alaska. *Fisheries Oceanography* 24:1-13.

Dawson, Neil M., Mary A. Bishop, Kathy J**. Kuletz**, and Alain F. Zuur. 2015. Using Ships of Opportunity to Assess Winter Habitat Associations of Seabirds in Subarctic Coastal Alaska. *Northwest Science* 89(2):111-128.

Golet, G. H., P. E. Seiser, A. D. McGuire, D. D. Roby, J. B. Fischer, K. J. **Kuletz**, D. B. Irons, T. A. Dean, and S. C. Jewett. 2002. Long-term direct and indirect effects of the “Exxon Valdez” oil spill on pigeon guillemots in Prince William Sound, Alaska. *Marine Ecology Progress Series* 241:287–304.

Kuletz, K.J., Nations, C.S., Manly, B., Allyn, A., Irons, D.B. & McKnight, A. 2011. Distribution, abundance, and population trends of the Kittlitz’s Murrelet *Brachyramphus brevirostris* in Prince William Sound, Alaska. *Marine Ornithology* 39: 97-109.

Suryan R, **Kuletz** K, Parker-Stetter S, Ressler P, Renner M, Horne J, Farley E, Labunski E. *In Press*. Temporal shifts in seabird populations and spatial coherence with prey in the southeastern Bering Sea. *Marine Ecology Progress Series. 2016*

OTHER SIGNIFICANT PUBLICATIONS

Benoit-Bird KJ, Battaile BC, Heppell SA, Hoover B, Irons D, Jones N, **Kuletz** KJ, Nordstrom CA, Paredes R, Suryan RM, Waluk CM, Trites AW. (2013) Prey Patch Patterns Predict Habitat Use by Top Marine Predators with Diverse Foraging Strategies. *PLoS ONE* 8(1): e53348.

Kuletz, K., M. Ferguson, A. Gall, B. Hurley, E. Labunski, T. Morgan. 2015. Seasonal Spatial Patterns in Seabird and Marine Mammal Distribution in the Eastern Chukchi and Western Beaufort Seas: Identifying Biologically Important Pelagic Areas. *Progress in Oceanography* 136: 175-200.

Kuletz, K.J., M. Renner, E.A. Labunski, and G.L. Hunt. 2014. Changes in the Distribution and Abundance of Albatrosses in the Eastern Bering Sea: 1975-2010. *Deep Sea Research II* 109: 282 – 292.

Renner, M. and **Kuletz, K**. J. 2015. A spatial-seasonal analysis of the oiling risk from shipping traffic to seabirds in the Aleutian Archipelago. *Marine Pollution Bulletin*, 101:127–136.

Sigler MF, **Kuletz** KJ, Ressler PH, Friday NA, Wilson CD, Zerbini AN. 2012. Marine predators and persistent prey in the southeast Bering Sea. *Deep Sea Research II* 65-70:292-303.

RECENT COLLABORATORS

C. Ashjian (Woods Hole Oceanographic Inst.); M.A. Bishop (PWS Science Center); Kelly Benoit-Bird (Oregon State U.); B. Bodenstien (USGS/NWHC); L. Cooper (U. Maryland); B. Day (ABR, Inc, Fairbanks); D. Irons (USFWS); E. Farley (NOAA, Juneau); M. Ferguson (NMML/NOAA, Seattle); A. Gall (ABR, Inc., Fairbanks); J. Grebmeier (U. Maryland); S Heppell (Oregon State U.); R. Hopcroft (U. of Alaska, Fairbanks); G. L. Hunt, Jr. (U. Washington); K. Iken U. Alaska, Fairbanks); D. Irons (USFWS); A. Kataysky (U. Alaska, Fairbanks); S. Moore (NOAA, Seattle); F. Mueter (U. Alaska, Juneau); S. Parker-Stetter (U. Washington); J. Piatt (Alaska Science Center, USGS); P. Ressler (NOAA, Seattle); H. Renner (USFWS); M. Renner (Tern Again Consulting); D. Roby (Oregon State U.); M. Sigler (Alaska Fisheries Science Center, NOAA); R. Suryan (Hatfield Marine Science Center, Oregon State U.); A. Trites (U. British Columbia).

<u>Graduate Students advised (on their committees and used data collected during my projects):</u>
Athina Catherine Pham (MS, current) – Hawaii Pacific University, Honolulu, HI
Dan Cushing (MS, 2015) – Oregon State University, Corvalis, OR
Nathan Jones (MS, 2012) – Moss Landing Marine Lab, Moss Landing, CA
Brian Hoover (MS, 2012) - Moss Landing Marine Lab, Moss Landing, CA
Andrew Allyn (MS, 2011) - University of Massachusetts Amherst, MA

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Robb S. A. Kaler
Curriculum vitae
Wildlife Biologist, US Fish and Wildlife Service
1011 East Tudor Road, Anchorage Alaska 99503
Phone: 907-786-3984 Email: robert_kaler@fws.gov

EDUCATION

2007 – MS, Kansas State University, Manhattan, KS. (Biology)
1997 – BS, The Evergreen State College, Olympia, WA. (Wildlife Biology)

WORK EXPERIENCE (2005-present)

2010-present	Wildlife Biologist, Migratory Bird Management, US Fish and Wildlife Service (USFWS), Anchorage Alaska
2011-present	Principle Investigator: Kittlitz's murrelet breeding biology study at Adak Island, Migratory Bird Management-USFWS Anchorage, Alaska
2008-2011	Principle Investigator: Kittlitz's murrelet breeding biology study at Agattu Island, Alaska Maritime National Wildlife Refuge-USFWS, Homer, Alaska
2005-2007	Graduate Research Assistant, Kansas State University, Kansas. Project: Restoring Evermann's Rock Ptarmigan at Agattu Island, Western Aleutian Islands, Alaska
2005	Biological Science Technician, Alaska Maritime National Wildlife Refuge-USFWS: Attu to Agattu islands Evermann's Rock Ptarmigan reintroduction

PUBLICATIONS (2009-present)

Kaler, R.S.A., L.A. Kenney, A.L. Bond, and C.A. Eagles-Smith. Mercury concentrations in breast feathers of three upper trophic level predators from the western Aleutian Islands, Alaska. Archives of Environmental Toxicology.

Kenney, L.A. and R.S.A. **Kaler**. 2013. Identifying nesting habitat of Kittlitz's Murrelet Brachyramphus brevirostris: Old nests lead to a new breeding record. Marine Ornithology 41:95-96.

Gregory, A.J., R.S.A. **Kaler**, T.J. Prebyl, B.K. Sandercock, and S.M. Wisely. 2012. Influence of translocation strategy and mating system on the genetic structure of a newly established population of island ptarmigan. Conservation Genetics 13:465-474.

Kaler, R.S.A., and B.K. Sandercock. 2011. Effects of translocation on the behavior of island ptarmigan in B.K. Sandercock, K Martin, and G. Degelbacher (eds.). Ecology, conservation, and management of grouse. Studies in Avian Biology 39:295-306.

Manning, J. A. and R.S.A. **Kaler**. 2011. Effects of survey methods on Burrowing Owl Behaviors. Journal of Wildlife Management 75:525-530.

Braun, C.E., W.P. Taylor, S.E. Ebbert, R.S.A. **Kaler**, and B.K. Sandercock. 2011. Protocols for successful translocation of ptarmigan. In R. T. Watson, T. J. Cade, M. Fuller, G. Hunt, and E. Potapov (eds.). Gyrfalcons and ptarmigan in a changing world. The Peregrine Fund, Boise, Idaho, USA.

Kaler, R., S. Ebbert, C. Braun, and B. Sandercock. 2010. Demographic measures of translocation success: reintroduction of an island population of Evermann's Rock Ptarmigan. Wilson Journal of Ornithology 122:1-14 (Winner of 2010 Edwards Prize (Best Paper of the Year).

Kaler, R., L. Kenney, and B. Sandercock. 2009. Breeding ecology of Kittlitz's Murrelets at Agattu Island, Aleutian Archipelago, Alaska. Waterbirds 32:363-373.

COLLABORATIONS

Barb Bodenstein (USGS National Wildlife Health Center), Alex Bond (Royal Society for the Protection of Birds), Collin Eagles-Smith (USGS-Corvallis), David Irons (US Fish and Wildlife Service, retired), Julia Parrish (University of Washington), John Piatt (USGS, Alaska Science Center), Heather Renner (Alaska Maritime National Wildlife Refuge), Frank von Hippel (University of Alaska Anchorage)

Budget Category:	Proposed FY 17	Proposed FY 18	Proposed FY 19	Proposed FY 20	Proposed FY 21	TOTAL PROPOSED	ACTUAL CUMULATIVE
Personnel	$22.9	$108.1	$22.9	$108.1	$22.9	$284.8	
Travel	$0.0	$12.5	$0.0	$12.5	$0.0	$25.1	
Contractual	$0.0	$37.1	$0.0	$37.1	$0.0	$74.2	
Commodities	$0.0	$40.1	$0.0	$40.1	$0.0	$80.2	
Equipment	$0.0	$6.0	$0.0	$6.0	$0.0	$12.0	
SUBTOTAL	$22.9	$203.8	$22.9	$203.8	$22.9	$476.3	
General Administration (9% of subtotal)	$2.1	$18.3	$2.1	$18.3	$2.1	$42.9	N/A
PROJECT TOTAL	$24.9	$222.2	$24.9	$222.2	$24.9	$519.1	
Other Resources (Cost Share Funds)	$23.0	$56.0	$23.0	$56.0	$22.0	$180.0	

COMMENTS:
Boat-based seabird surveys conducted every other year. During the FY17-21 period surveys will be conducted in FY18 and FY20.

FY17-21

Project Title: PWS marine bird population trends
Primary Investigator: Kathy Kuletz & Robb Kaler
Agency: USFWS - Migratory Bird Management

TRUSTEE AGENCY SUMMARY PAGE

Personnel Costs:		Months	Monthly		Personnel
Name	Project Title	Budgeted	Costs	Overtime	Sum
R. Kaler	Project Leader	3.0	7.6		22.9
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
		Subtotal	7.6	0.0	
				Personnel Total	$22.9

Travel Costs:	Ticket	Round	Total	Daily	Travel
Description	Price	Trips	Days	Per Diem	Sum
None					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

FY17

Project Title: PWS marine bird population trends
Primary Investigator: Kathy Kuletz & Robb Kaler
Agency: USFWS - Migratory Bird Management

FORM 4B
PERSONNEL & TRAVEL DETAIL

Contractual Costs: Description	Contract Sum
None	
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
None	
Commodities Total	$0.0

FY17

Project Title: PWS marine bird population trends
Primary Investigator: Kathy Kuletz & Robb Kaler
Agency: USFWS - Migratory Bird Management

FORM 4B
CONTRACTUAL & COMMODITIES DETAIL

New Equipment Purchases: Description	Number of Units	Unit Price	Equipment Sum
None			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
None		

FY17

Project Title: PWS marine bird population trends
Primary Investigator: Kathy Kuletz & Robb Kaler
Agency: USFWS - Migratory Bird Management

FORM 4B
EQUIPMENT DETAIL

Personnel Costs:		Months	Monthly		Personnel
Name	Project Title	Budgeted	Costs	Overtime	Sum
R. Kaler	Project Leader	8.0	7.6		61.0
TBD	Supervisory Biological Science Technician	6.0	5.2		30.9
TBD	Biological Science Technician	1.5	3.6		5.4
TBD	Biological Science Technician	1.5	3.6		5.4
TBD	Biological Science Technician	1.5	3.6		5.4
Volunteer		0.0	0.0		0.0
Volunteer		0.0	0.0		0.0
Volunteer		0.0	0.0		0.0
					0.0
					0.0
					0.0
					0.0
		Subtotal	23.6	0.0	
				Personnel Total	$108.1

Travel Costs:	Ticket	Round	Total	Daily	Travel
Description	Price	Trips	Days	Per Diem	Sum
Truck & boat tunnel fee (Portage - Whittier)	0.1	8			0.8
Per diem ($5/day), 9 people, 25 days summer			225	0.0	1.1
Per diem (travel rate), 9 people/2 days summer; 6 people /3 days training			36	0.2	6.3
Lodging, 6 nights, 3 rooms @ $120/night/room (Cordova)			18	0.1	2.2
Volunteer travel to Anchorage 2 people	1.0	2	2	0.1	2.2
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
				Travel Total	$12.5

FY18

Project Title: PWS marine bird population trends
Primary Investigator: Kathy Kuletz & Robb Kaler
Agency: USFWS - Migratory Bird Management

FORM 4B
PERSONNEL & TRAVEL DETAIL

Contractual Costs: Description	Contract Sum
Charter vessel (summer - 7 days @ 3,500/day	24.5
Harbor fees	0.6
Emergency boat repairs and parts	12.0
If a component of the project will be performed under contract, the 4A and 4B forms are required. **Contractual Total**	$37.1

Commodities Costs: Description	Commodities Sum
Boat fuel (70 gal/boat/day) 60 boat-days summer @ $6/gal	25.2
Outboard oil (4 gal/boat/survey), 3 boats @ $20/gal	0.2
Food ($20/person/day) 9 people 18 days in summer	3.2
Misc. commodities (cleaning supplies, replacement of emergency locator beacons, etc.)	5.5
Boat maintenance	6.0
Commodities Total	$40.1

FY18

Project Title: PWS marine bird population trends
Primary Investigator: Kathy Kuletz & Robb Kaler
Agency: USFWS - Migratory Bird Management

FORM 4B
CONTRACTUAL & COMMODITIES DETAIL

New Equipment Purchases: Description	Number of Units	Unit Price	Equipment Sum
Emergency replacement of equipment	1.0	6.0	6.0
			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	$6.0

Existing Equipment Usage: Description	Number of Units	Inventory Agency
Immersion suit	9	USFWS
25' Boston Whaler, electronics (GPS Plotcharter, Sonar, Radar, VHF radio)	4	USFWS
Computer, laptop (survey only; no network access)	6	USFWS
Dinghy, inflatable	4	USFWS
F-350 diesel pickup truck to haul 25' survey vessel	1	USFWS
Pickup truck to transport field crew	1	USFWS
Salinity meter	4	USFWS

FY18

Project Title: PWS marine bird population trends
Primary Investigator: Kathy Kuletz & Robb Kaler
Agency: USFWS - Migratory Bird Management

FORM 4B
EQUIPMENT DETAIL

Personnel Costs:		Months	Monthly		Personnel
Name	Project Title	Budgeted	Costs	Overtime	Sum
R. Kaler	Project Leader	3.0	7.6		22.9
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
		Subtotal	7.6	0.0	
				Personnel Total	$22.9

Travel Costs:	Ticket	Round	Total	Daily	Travel
Description	Price	Trips	Days	Per Diem	Sum
None					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

FY19

Project Title: PWS marine bird population trends
Primary Investigator: Kathy Kuletz & Robb Kaler
Agency: USFWS - Migratory Bird Management

FORM 4B
PERSONNEL & TRAVEL DETAIL

Contractual Costs: Description	Contract Sum
None	
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
None	
Commodities Total	$0.0

FY19

Project Title: PWS marine bird population trends
Primary Investigator: Kathy Kuletz & Robb Kaler
Agency: USFWS - Migratory Bird Management

FORM 4B
CONTRACTUAL & COMMODITIES DETAIL

New Equipment Purchases: Description	Number of Units	Unit Price	Equipment Sum
None			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
None		

FY19

Project Title: PWS marine bird population trends
Primary Investigator: Kathy Kuletz & Robb Kaler
Agency: USFWS - Migratory Bird Management

FORM 4B
EQUIPMENT DETAIL

Personnel Costs:		Months	Monthly		Personnel
Name	Project Title	Budgeted	Costs	Overtime	Sum
R. Kaler	Project Leader	8.0	7.6		61.0
TBD	Supervisory Biological Science Technician	6.0	5.2		30.9
TBD	Biological Science Technician	1.5	3.6		5.4
TBD	Biological Science Technician	1.5	3.6		5.4
TBD	Biological Science Technician	1.5	3.6		5.4
Volunteer		0.0	0.0		0.0
Volunteer		0.0	0.0		0.0
Volunteer		0.0	0.0		0.0
					0.0
					0.0
					0.0
		Subtotal	23.6	0.0	
				Personnel Total	$108.1

Travel Costs: Description	Ticket Price	Round Trips	Total Days	Daily Per Diem	Travel Sum
Truck and boat tunnel fee (Portage - Whittier)	0.1	8			0.8
Per diem ($5/day), 9 people, 25 days summer			225	0.0	1.1
Per diem (travel rate), 9 people/2 days summer; 6 people/3 days training			36	0.2	6.3
Lodging, 6 nights, 3 rooms @ $120/night/room (Cordova)			18	0.1	2.2
Volunteer Tavel to Anchorage 2 people	1.0	2	2	0.1	2.2
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
				Travel Total	$12.5

FY20

Project Title: PWS marine bird population trends
Primary Investigator: Kathy Kuletz & Robb Kaler
Agency: USFWS - Migratory Bird Management

FORM 4B
PERSONNEL & TRAVEL DETAIL

Contractual Costs: Description	Contract Sum
Charter vessel (summer - 7 days @ 3,500/day)	24.5
Harbor fees	0.6
Emergency boat repairs and parts	12.0
If a component of the project will be performed under contract, the 4A and 4B forms are required. **Contractual Total**	$37.1

Commodities Costs: Description	Commodities Sum
Boat fuel (70 gal/boat/day) 60 boat-days summer @ $6/gal	25.2
Outboard oil (4 gal/boat/survey), 3 boats @ $20/gal	0.2
Food ($20/person/day) 9 people 18 days in summer	3.2
Misc. Commodities (cleaning supplies, replacement of emergency locator beacons, etc.	5.5
Boat Maintenance	6.0
Commodities Total	$40.1

FY20

Project Title: PWS marine bird population trends
Primary Investigator: Kathy Kuletz & Robb Kaler
Agency: USFWS - Migratory Bird Management

FORM 4B
CONTRACTUAL & COMMODITIES DETAIL

New Equipment Purchases: Description	Number of Units	Unit Price	Equipment Sum
Emergency replacement of equipment	1.0	6.0	6.0
			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	$6.0

Existing Equipment Usage: Description	Number of Units	Inventory Agency
Immersion suit	9	USFWS
25' Boston Whaler, electronics (GPS Plotcharter, Sonar, Radar, VHF radio)	4	USFWS
computer, laptop (survey only; no network access)	6	USFWS
dinghy, inflatable	4	USFWS
F-350 diesel pickup truck to haul 25' survey vessel	1	USFWS
Pickup truck to transport field crew	1	USFWS
Salinity meter	4	USFWS

FY20

Project Title: PWS marine bird population trends
Primary Investigator: Kathy Kuletz & Robb Kaler
Agency: USFWS - Migratory Bird Management

FORM 4B
EQUIPMENT DETAIL

Personnel Costs:		Months	Monthly		Personnel
Name	Project Title	Budgeted	Costs	Overtime	Sum
R. Kaler	Project Leader	3.0	7.6		22.9
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
		Subtotal	7.6	0.0	
				Personnel Total	$22.9

Travel Costs:	Ticket	Round	Total	Daily	Travel
Description	Price	Trips	Days	Per Diem	Sum
None					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

FY21

Project Title: PWS marine bird population trends
Primary Investigator: Kathy Kuletz & Robb Kaler
Agency: USFWS - Migratory Bird Management

FORM 4B
PERSONNEL & TRAVEL DETAIL

Contractual Costs: Description	Contract Sum
None	
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
None	
Commodities Total	$0.0

FY21

Project Title: PWS marine bird population trends
Primary Investigator: Kathy Kuletz & Robb Kaler
Agency: USFWS - Migratory Bird Management

FORM 4B
CONTRACTUAL & COMMODITIES DETAIL

New Equipment Purchases: Description	Number of Units	Unit Price	Equipment Sum
None			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
None		

FY21

Project Title: PWS marine bird population trends
Primary Investigator: Kathy Kuletz & Robb Kaler
Agency: USFWS - Migratory Bird Management

FORM 4B
EQUIPMENT DETAIL