

**FY21 CONTINUING INDIVIDUAL PROJECT PROPOSAL SUMMARY PAGE**

**Project Number and Title**

21110853 Pigeon Guillemot Restoration Program

**Primary Investigator(s) and Affiliation(s)**

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**Date Proposal Submitted**

15 August 2020

**Project Abstract**

Historically, the Naked Island Group had the largest breeding population of pigeon guillemot (*Cephus columba*) in Prince William Sound (PWS), Alaska, but it declined over 90% after the 1989 *Exxon Valdez* Oil Spill. Following the effects of the oil spill, predation of adults and their nests by introduced American mink (*Neovison vison*) was the primary factor limiting population recovery. During a 5-year pigeon guillemot restoration project, which included mink removal from guillemot nesting areas, counts of pigeon guillemots at Peak, Naked and Story islands have more than doubled from 2014-2018 (69 to 167 individuals) and numbers of nests increased more than four times (11 to 51 nests). In 2019, we began a second 5-year monitoring effort (2019-2023) at the Naked Island Group. Our objectives were to: (i) search for evidence of mink in guillemot breeding areas, (ii) monitor the recovery of pigeon guillemots, and (iii) monitor relative food availability, using black-legged kittiwakes (*Rissa tridactyla*) as indicators.

Overall, our 2020 effort to continue monitoring the population recovery of pigeon guillemots at the Naked Island Group was highly successful. No mink were recorded visiting bait stations and no mink tracks were observed at the 10 high-use areas identified during previous intensive trapping efforts. Guillemot population counts were conducted in early June and numbers of guillemots continued to increase at the Naked Island Group. Nest counts of black-legged kittiwakes were conducted and while results are pending, initial impressions are 2020 is a “poor” year for fish availability in PWS. Together, these data will inform future management actions by determining if mink are absent from the islands, measure the rate of recovery of pigeon guillemots following the removal of mink, and provide an indicator for productivity patterns of ocean conditions to help interpret pigeon guillemot population trends.

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

FY19	FY20	FY21	FY22	FY23	TOTAL
\$69,500	\$69,500	\$68,500	\$47,400	\$48,600	\$301,500

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

FY19	FY20	FY21	FY22	FY23	TOTAL
\$28,600	\$28,600	\$28,600	\$28,600	\$28,600	\$143,000

*\*If the amount requested here does not match the amount on the budget form, the request on the budget form will be considered to be correct.*

## 1. PROJECT EXECUTIVE SUMMARY

Once the most important pigeon guillemot (*Cephus columba*) nesting site in Prince William Sound (PWS), the guillemot population at the Naked Island Group had declined more than 90% since 1989 (Irons et al. 2000, Golet et al. 2002). Following the *Exxon Valdez* Oil Spill, predation on nests and adults by American mink (*Neovison vison*) was the primary limiting factor for guillemot reproductive success and population recovery (Bixler et al. 2010). To restore the guillemot population to the Naked Island Group, the *Exxon Valdez* Oil Spill Trustee Council funded a 5-year (2014-2018) effort to remove mink from guillemot colonies. While by 2018, no signs of mink were detected, we will continue to monitor the guillemot population at the Naked Island Group. In 2020, our objectives were three-fold: (i) search for evidence of mink in guillemot breeding areas, (ii) monitor the recovery of pigeon guillemots, and (iii) monitor relative food availability, using black-legged kittiwakes (*Rissa tridactyla*) as indicators.

*Mink Presence or Absence.* To search for evidence of mink, we focused efforts at 10 previously high density mink areas in winter and spring and deployed bait stations (herring enclosed in bait container) with two (2) time-lapse/motion triggered game cameras along game trails paralleling tidal beaches or headlands. Ten stations with two cameras operated from 26 March to 14 June 2020. Several images of deer and river otter were recorded, but no mink were detected. Additionally, checking for tracks along game trails resulted in no detection of mink tracks.

*Guillemot Recovery.* Following standard methods (Irons et al. 1988, Oakley and Kuletz 1996, Bixler et al. 2010), guillemot surveys were conducted 11-15 June 2020 at both the Naked Island Group (Naked, Storey, and Peak Islands) and the control islands (Smith, Little Smith, Seal, and Fool Islands). Numbers of guillemots recorded along shoreline surveys at the Naked Island Group has more than tripled since mink removal efforts began in 2014, up from 69 in 2014 to 221 in 2020 (Table 1).

*Food Availability Index.* Using productivity of black-legged kittiwake colonies (N=22) in PWS to derive an index of food available to breeding guillemots, we visited kittiwake colonies in late July to August 2020. While field work was only recently completed, initial impression of productivity was “poor”, but up considerably from nearly complete kittiwake breeding failures in PWS since 2016.

Overall, the second year of the effort to continue monitoring the population recovery of pigeon guillemots at the Naked Island Group was highly successful. No mink were recorded visiting bait stations and no mink tracks were observed in the 10 high-use areas identified during intensive trapping efforts 2014-2018. Guillemot population counts were conducted, and numbers of guillemots continued to increase at the Naked Island Group. Nest counts of black-legged kittiwakes were conducted and while results are pending, initial impressions are 2020 is a “poor” year for fish availability in PWS.

Table 1. Number of individual pigeon guillemots recorded during spring shoreline surveys at the Naked Island Group (NIG) and control islands, Prince William Sound, Alaska, 2012-2020. \*In 2012, three of the four control islands were not surveyed due to weather.

Year	Naked Island Group				Control Group*				
	Naked	Peak	Storey	NIG Total	Smith	L. Smith	Seal	Fool	Control Total
2012	33	12	13	58	NA	NA	NA	31	NA
2013	39	13	15	67	151	36	25	53	265
2014	49	8	12	69	171	38	53	106	368
2015	59	18	18	95	178	27	56	54	315
2016	88	17	46	151	168	39	46	57	310
2017	101	11	57	169	189	32	47	57	325
2018	77	14	42	163	178	45	66	88	377
2019	101	20	64	185	217	21	53	33	324
2020	111	10	100	221	161	14	30	17	222

## 2. PROJECT STATUS OF SCHEDULED ACCOMPLISHMENTS

### A. Project Milestones and Tasks

Table 2. Project milestone and task progress by fiscal year and quarter, beginning February 1, 2019. C = completed, X = not completed or planned. Fiscal Year Quarters: 1= Feb. 1-April 30; 2= May 1-July 31; 3= Aug. 1-Oct. 31; 4= Nov. 1-Jan 31.

Milestone/Task	FY19				FY20				FY21				FY22				FY23			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
<b>Milestone /Task</b>																				
Survey pigeon guillemots		C				C				X				X				X		
Collect Data on Relative Food Availability		C	C			C	C			X	X			X	X			X	X	
Set up and Retrieve Mink Bait Stations and Camera Traps	C	C			C	C			X	X										
Mink Track Surveys	C	C			C	C			X	X										
Analyze Data				C				C				X				X				X
<b>Reporting</b>																				
Annual reports	C				C				X				X				X			
Annual PI meeting				C				X				X			X					X
FY work plan (DPD)			C				C				X				X				X	

### B. Explanation for not completing any planned milestones and tasks

All but one planned milestones and tasks has been accomplished; Principle Investigators (PI) will share updates at the Gulf Watch Alaska annual PIs meeting in November 2020.

### **C. Justification for new milestones/tasks**

There are no new milestones or tasks for this project.

## **3. PROJECT COORDINATION AND COLLABORATION**

### **A. Within an EVOSTC-funded Program**

#### *Gulf Watch Alaska*

The proposed project will collaborate closely with the Gulf Watch Alaska program. Specifically, Continuing the Legacy: Prince William Sound Marine Bird Population Trends Project (Kaler and Kuletz, project 21120114-M) produces a sound-wide estimate for pigeon guillemots, which will be used to monitor the population recovery at the sound-wide scale. Where possible, the two projects will share field equipment, personnel, survey computers, and binoculars. Additionally, the forage fish project (Arimitsu and Piatt, project 21120114-C) and Middleton Island seabird research led by Dr. Scott Hatch (Institute for Seabird Research and Conservation) will provide background on forage fish availability in the northern Gulf of Alaska and PWS region. Lastly, the Fall-Winter Marine Bird surveys (M. Bishop, project 21120114-E) to collect comparable marine bird data, allowing us to compare summer and winter seabird communities and distributions. The shoreline guillemot surveys of our project will also be complimentary to the Nearshore component of GWA (H. Coletti, project 20120114-H) and the pelagic surveys complimentary to the Environmental Drivers component and the Long-term Ecosystem Research Program along the Seward Line (R. Hopcroft and K. Kuletz). Integration of GWA marine bird datasets will allow for comparisons across marine habitats and regions.

#### *Herring Research and Monitoring*

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

#### *Data Management*

This project will coordinate with the data management objectives submitting data and preparing metadata for publication as part of the Gulf of Alaska Data Portal, within the timeframes required.

### **B. With Other EVOSTC-funded Projects**

The data collected during this pigeon guillemot restoration project are available to all other EVOSTC-funded projects.

### **C. With Trustee or Management Agencies**

The project supports the US Fish and Wildlife Service's Migratory Bird Management mission to advance the conservation of migratory birds. The project will also inform other management agencies (US Forest Service, National Park Service, Alaska Department of Fish and Game) with lands and waters adjacent to our study area. Data on population trends are provided to the Alaska Maritime National Wildlife Refuge for inclusion in their annual report on status and trends of seabirds in Alaska.

Implementation of this plan requires coordination with state and federal agencies with authority and responsibility of the Naked Island Group and pigeon guillemots (see below). Monitoring of pigeon guillemots is being conducted by the U.S. Fish and Wildlife Service. Permits for working at the Naked Island Group are being obtained from the U.S. Department of Agriculture – Forest Service.

*The U.S. Fish and Wildlife Service.* The U.S. Fish and Wildlife Service mission is “to work with others to conserve, protect and enhance fish, wildlife and plants and their habitats for the continuing benefit of the American people.” Along with other Federal, State, Tribal, local, and private entities, the Service protects migratory birds,

endangered species, certain fish species, and wildlife habitat. The Service is the primary agency responsible for the conservation of the pigeon guillemot and its habitat as authorized by the Migratory Bird Treaty Act. The U.S. Fish and Wildlife Service is responsible for seabirds in Alaska. They have a monitoring program to assess the status and trends of seabirds. They have also spent more than 30 years eradicating introduced predators from seabird islands in the Aleutian Islands and other places. Much of their work has taken place on lands they manage and little USFWS money has gone to PWS, although they have supported the EVOSTC work in PWS since the oil spill. The contact person is Dr. Kathy Kuletz (Alaska Region Seabird Coordinator), a Principle Investigator on this proposed project.

*U.S Department of Agriculture Forest Service.* The mission of the Forest Service is “to sustain the health, diversity, and productivity of the Nation’s forests and grasslands to meet the needs of present and future generations.” The Forest Service is responsible for the management of the 5.4 million-acre Chugach National Forest that includes the Naked Island Group, along with most of the rest of the land area of Prince William Sound. The contact person is Ron Britton (Chugach National Forest).

## 4. PROJECT DESIGN

### A. Overall Project Objectives

#### Project Objectives, 2014-2018

**Objective 1.** Remove mink from pigeon guillemot nesting areas on Naked, Storey and Peak Islands.

**Objective 2.** Monitor guillemot population response to mink removal on the Naked Island Group.

### B. Changes to Project Design and Objectives

#### Project Objectives, 2019-2023

**Objective 1.** Search for evidence of mink in pigeon guillemot nesting areas on the Naked Island Group.

**Objective 2.** Monitor pigeon guillemot recovery on the Naked Island Group.

**Objective 3.** Monitor relative food availability, using kittiwakes as indicators.

The first five years (2014-2018) of this project focused on (i) removal of mink from the pigeon guillemot nesting areas on the Naked Island Group and (ii) monitoring the recovery of pigeon guillemots. Per our permit issued by the Alaska Department of Fish and Game, we trapped only in the pigeon guillemot nesting areas; however, throughout the project we found that male mink traveled greater distances in search of females during the mating season as they became rare. It is possible that no mink remain on the Naked Island Group.

*Mink Presence or Absence.* To search for evidence of mink presence, we proposed to focus efforts at 10 previously high-density areas where mink were trapped. Sixty-seven of the 106 mink trapped were in these relatively small areas (less than 2 km of shoreline), each had 5-9 mink trapped over the course of the first five years of the guillemot restoration project. During winter and spring 2019-2021, we proposed to set-up bait stations, camera traps, and carry-out track surveys at these 10 areas.

*Guillemot Recovery.* To continue monitoring the recovery of guillemots, we proposed to continue the annual spring shoreline survey that has been conducted throughout earlier studies. Population counts of guillemots at the Naked Island Group and the mink-free islands used as a control (Smith, Little Smith, Seal, and Fool Islands). The boat-based survey is done in late May or early June and parallels the shoreline 100m offshore. All pigeon guillemots are recorded.

*Food Availability Index.* Owing to the labor-intensive and high-cost of monitoring reproductive success of guillemots, we proposed to use an index of food availability measured indirectly using PWS black-legged

kittiwake nest and chick counts. Kittiwakes have been monitored in PWS for 35 years (Dragoo et al. 2018) and provide long-term baseline data to classify “good”, “moderate”, and “poor” years regarding food availability for seabirds in PWS, which will help determine if there is sufficient food for pigeon guillemot recovery. Kittiwakes in PWS rely on sand lance, herring, and capelin (Suryan et al. 2000, Suryan et al. 2001) and Golet et al. (2000) and Litzow et al. (2002) demonstrated that pigeon guillemots have higher nest success when there are forage fish such as sand lance, herring, and capelin available. Seabirds are regularly monitored to provide information on the status of forage in the oceans around the world (Piatt et al. 2007, Einoder 2009, Sydeman et al. 2017) and kittiwakes are known to be sensitive to changes in food availability (Suryan et al. 2002, Frank et al. 2006). Kittiwakes are also one of the primary species monitored within their circumpolar range, partly because they are good ecosystem indicators (Irons et al. 2015).

**5. PROJECT PERSONNEL – CHANGES AND UPDATES**

No changes to project personnel.

**6. PROJECT BUDGET**

**A. Budget Forms (See FY21 Budget Workbook for details)**

Summary Table

Budget Category:	Proposed FY 19	Proposed FY 20	Proposed FY 21	Proposed FY 22	Proposed FY 23	TOTAL PROPOSED	ACTUAL CUMULATIVE
Personnel	\$13,640.0	\$13,640.0	\$13,640.0	\$0.0	\$0.0	\$40,920.0	
Travel	\$2,284.0	\$2,284.0	\$2,284.0	\$0.0	\$0.0	\$6,852.0	
Contractual	\$47,850.0	\$47,850.0	\$46,910.0	\$43,450.0	\$44,550.0	\$230,610.0	
Commodities	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
Equipment	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
Indirect Costs (will vary by proposer)	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
<b>SUBTOTAL</b>	<b>\$63,774.0</b>	<b>\$63,774.0</b>	<b>\$62,834.0</b>	<b>\$43,450.0</b>	<b>\$44,550.0</b>	<b>\$278,382.0</b>	
General Administration (9% of subtotal)	\$5,739.7	\$5,739.7	\$5,655.1	\$3,910.5	\$4,009.5	\$25,054.4	
<b>PROJECT TOTAL</b>	<b>\$69,513.7</b>	<b>\$69,513.7</b>	<b>\$68,489.1</b>	<b>\$47,360.5</b>	<b>\$48,559.5</b>	<b>\$303,436.4</b>	
Other Resources (Cost Share Funds)	\$28,600.0	\$28,600.0	\$28,600.0	\$28,600.0	\$28,600.0	\$143,000.0	N/A

COMMENTS: The US Forest Service estimated that permitting the FWS for this project would have an annual cost of \$13,640 for permit staff and \$2,284 for site visit costs. Thus, an annual cost of \$17,357 (including 9% overhead, personnel costs and travel costs) are attributed to the US Forest Service for permitting during the mink portion of the proposed project (FY19-21). This summary page provides an five-year overview of proposed funding and actual cumulative spending. The column titled 'Actual Cumulative' must be updated each fiscal year as part of the annual reporting requirements. Provide information on the total amount actually spent for all completed years of the project. On the Project Annual Report Form, if any line item exceeds a 10% deviation from the originally-proposed amount; provide detail regarding the reason for the deviation.

**B. Changes from Original Project Proposal**

We are requesting changes in the budget for FY21, FY22, and FY23. The FY21 total request decreased \$1,024 due to combining the retrieval of time-lapse cameras at mink bait stations deployed in March with the May/June guillemot population survey. Additionally, flexibility in selecting a period of optimal weather has resulted in reducing the number of days necessary to complete the guillemot population survey. Requested funds for FY22 and FY23 have increased for two reasons: (i) the time needed for the relative food availability study using kittiwake productivity as a proxy has increased to ensure data are comparable with the 35 years of historical data; and (ii) to include a 3% increase to adjust for increased annual costs which were not included in the

original project proposal. The proposed changes to the food availability study uses the standard technique of counting breeding effort (nests built) in June (cost \$7,750) and counting number of chicks in late summer (cost \$7,750). The original project proposal budgeted for a single late summer count of kittiwake chicks, but unfortunately, the single count is insufficient to provide comparable data. The annual ~3% adjustment results in the budget in FY22 and FY23 to increase \$1000 each year. The total requested increase for the FY22 budget is for \$9,592. The total requested increase for the FY23 budget is for \$10,791.

### C. Sources of Additional Project Funding

Annual in-kind contributions as cost share include:

Matching salary: Dr. Kathy Kuletz, 2 weeks/year, \$5.5K; Robert Kaler, 5 weeks/year, \$9.4K; Elizabeth Labunski, \$4.7K.

Gear and Supplies: Field equipment and safety gear, computers and GPS receivers, \$5K/year; GSA leased truck, \$2K/year, warehouse space, \$2K/year.

Total annual FWS In-kind contribution: \$28.6K

## 7. FY19-20 PROJECT PUBLICATIONS AND PRODUCTS

### Publications (includes submitted)

Dragoo, D., H. M. Renner, and R. S. A. Kaler. 2019. Breeding status and population trends of seabirds in Alaska, 2018. U.S. Fish and Wildlife Service Report AMNWR 2019/03. Homer, Alaska.

Dragoo, D., H. M. Renner, and R. S. A. Kaler. 2020. Breeding status and population trends of seabirds in Alaska, 2019. U.S. Fish and Wildlife Service Report AMNWR 2020/01. Homer, Alaska.

Stark, S., D.D. Roby, and D.B. Irons. 2020. Restoration of pigeon guillemot nesting habitat through removal of introduced predators. Master of Science Thesis, Oregon State University.

Stark, S., D.D. Roby, and D.B. Irons (*Submitted*, Journal of Wildlife Management). Seabird Population Responses After the Removal of an Introduced Predator.

### Published and updated datasets

Elizabeth Labunski (USFWS) is in the process of updating metadata files using a USFWS Application (mdEditor) and plans to be completed by November 2020.

### Presentations

Kaler, R., 2020. Pacific Seabird Group Seabird Monitoring Committee, 2019 summary. **Oral presentation.** Portland, Oregon, 12 February 2020.

Kaler, R., 2020. Alaska's ocean sentinels seabirds as ecosystem indicators in Prince William Sound. **Invited presentation** at the Prince William Sound Natural History Symposium, 18 May 2020.

Stark, S., D. Roby, and D. Irons. 2019. Pigeon guillemot recovery at the Naked Island Group. **Oral presentation.** 46<sup>th</sup> annual meeting of the Pacific Seabird Group, Kauai, HI.

Stark, S., D. Roby, and D. Irons. 2020. Testing the use of artificial social attraction on two species of seabirds; Pigeon guillemots and parakeet auklets. **Oral presentation.** 47<sup>th</sup> annual meeting of the Pacific Seabird Group, Portland, OR.

Whelan, S., S. Hatch, D. Irons, A. McKnight, K., Elliot. 2020. Increased summer food supply decreases migration distances in black-legged kittiwakes. **Oral presentation.** 47<sup>th</sup> annual meeting of the Pacific Seabird Group, Portland, OR.

### Outreach

Irons, D., 2019. Prince William Sound Seabirds and Research. **Invited presentation** at the Prince William Sound Natural History Symposium, Whittier, Alaska, 4 May 2019.

Kaler, R., 2020. Alaska's ocean sentinel seabirds as ecosystem indicators in Prince William Sound. **Invited presentation** at the Prince William Sound Natural History Symposium, 18 May 2020

### **LITERATURE CITED**

- Bixler, K. S., D. D. Roby, D. B. Irons, M. A. Fleming, and J. A. Cook. 2010. Pigeon Guillemot restoration research in Prince William Sound, Alaska. Exxon Valdez Oil Spill Restoration Project Final Report, 267 pp.
- Dragoo, D., H. M. Renner, and R. S. A. Kaler. 2018. Breeding status and population trends of seabirds in Alaska, 2018. U.S. Fish and Wildlife Service Report AMNWR 2019/03. Homer, Alaska.
- Golet, G. H., P. E. Seiser, A. D. McGuire, D. D. Roby, J. B. Fischer, K. J. Kuletz, D. B. Irons, T. A. Dean, S. C. Jewett, and S. H. Newman. 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.
- Irons, D.B., S.J. Kendall, W.P. Erickson, L.L. McDonald, B.K. Lance. 2000. Nine years after the Exxon Valdez oil spill: effects on marine birds in Prince William Sound, Alaska. *Condor* 102:723-737.
- Irons, D.B., D.R. Nysewander, and J.L. Trapp. 1988. Prince William Sound waterbird distribution in relation to habitat type. U.S. Fish and Wildlife Service, Anchorage, AK.
- Oakley K. L., K. J. Kuletz 1996. Population, reproduction, and foraging of pigeon guillemots at Naked Island, Alaska, before and after the Exxon Valdez oil spill. *In* Rice S. D., R. B. Spies, D. A. Wolfe, B. A. Wright 1996. Proc Exxon Valdez Oil Spill Symp. *Am Fish Soc Symp* 18:759-769