

Project #: B77

Title: Bogoslof Patch Dynamics Study

Principal Investigator(s) and Recipient Organization(s):

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Contract Period and Amount of Funding:

October 2007-September 12, 2012: \$2,290,126

Report Period:

1 April 2008 through 30 September 2008

Report Date:

30 September 2008

Lead Author of Report:

Andrew W. Trites

Proposed timeline and milestones within report period:

<i>What</i>	<i>Who</i>	<i>When</i>	<i>Other key dates</i>
Conduct reconnaissance trip to Bogoslof Island to assess feasibility of deploying camp in 2009	Byrd, Trites, Kitaysky, Irons	July	2008
Assess beach areas for capturing northern fur seals	Trites	July	2008
Collect 75 northern fur seal scats	Trites	July	2008
Deploy geolocators on Black-legged Kittiwakes and Thick-billed Murres	Irons	July	2008
Collect 20 stress and stable isotope blood samples for thick-billed murres and black-legged kittiwakes	Kitaysky	July	2008
Photograph nesting concentrations of birds for population counts and record productivity data for kittiwakes	Byrd	July	2008

Project Summary:

We will undertake a fine-scale predator-prey study at Bogoslof Island and surrounding waters (in 2009) on seabirds (thick-billed murres and black-legged kittiwakes), marine mammals (northern fur seals), and forage fishes to examine controlling mechanisms that determine whether populations of top-predators grow or decline. Data from Bogoslof Island will be combined and contrasted with the Patch Dynamic Study at the Pribilof Islands (2008 and 2009) to predict how species in different domains of the Bering Sea ecosystem will respond to climate change.

Our research is addressing the BSEIRP hypothesis that climate-ocean changes will displace predictably located, abundant prey (hot spots) necessary for successful foraging by central place (seabirds and fur seals while nurturing young) and hot spot (baleen whales, walrus) foragers. We are also testing the hypothesis that central place foragers will shift their diet, foraging locations or rookery locations to increase foraging opportunities (based on differential foraging success).

Progress Summary:

The reconnaissance trip to Bogoslof Island (July 15-19, 2008) was based out of Dutch Harbor using the M/V Tiglax. Our assessment was that a field camp can definitely be deployed on Bogoslof Island for the 2009 summer field season providing conditions on the island don't change over the next year (i.e., volcanic eruption or disappearance of the beaches).

In addition to the reconnaissance, we were able to collect 93 northern fur seal scats for diet analysis, and found several suitable sites for fur seal and seabird captures. We also captured birds and had blood samples taken for stress and stable isotope analyses, and deployed geolocators that will be recovered next year. Twenty black-legged kittiwakes were caught and measured to estimate body condition index. Each was deployed with BAS geolocators prior to release. Twenty-three thick-billed murres were caught and measured to estimate body condition index, of which 15 were deployed with LOTEK geolocators prior to release. Digital photographs were obtained of concentrations of nesting kittiwakes and murres for subsequent counting as a population index, and data were gathered as a "snap shot" of breeding success for 545 black-legged kittiwake nests and 46 red-legged kittiwake nests. The NPRB patch dynamics support covers participation by one PI at the annual NPRB meeting and associated patch dynamics PI meeting, which occurred as planned for our supported milestone.

Preliminary results for inter-colony comparisons of body condition index (based on body mass adjusted for structural size of an individual) suggest that body condition was not different between black-legged kittiwakes breeding on Bogoslof and the Pribilof Islands (Fig. 1, upper panel); and that thick billed murres were heavier on St. Paul I. compared to those on St. George and Bogoslof Islands (Fig. 1, low panel). As it has been shown in earlier studies of murres and kittiwakes, body condition index is not a reliable and sometimes misleading measure of foraging conditions in breeding individuals. For example, an increase in endogenous energy reserves (and increase in body condition index) may occur as initial response to food shortages or might be indicative of long-distance foraging trips; which may explain why murres breeding on St. Paul I. were heavier than on the other two colonies. Alternatively, but very unlikely, foraging condition in July 2008 could have been opposite to what we expected (Bogoslof is a typically a food-rich colony and St. Paul is a food-poor colony). These potentially contradictory results will be reconciled when data for the nutritional stress (hormones) become available.

Lessons learned and project adjustments:

Bogoslof is a small island where we must limit our activity to avoid undue disturbance to breeding wildlife. There is no source of fresh water on the island — so water needs are a major consideration. We feel a maximum of six people should be permitted on the island at a time.

Bogoslof will be a challenging field camp to deploy and live in. Situations that could complicate or prevent deployment include significant changes to the substrate on the landing beach that would prevent

offloading of gear and personnel, the loss of the existing cabin over the winter from severe storms, or less likely, volcanic activity. With two different research focuses (seabirds and fur seals), team compatibility will be key for a successful field season. Personality and willingness to work as one team, practical skills such as carpentry, electrical, and practical field skills will be essential.

Integration activity:

All of the PIs involved in the Patch Dynamic Study will participate in the BSIERP PI meeting in Girdwood next month.

Education and Outreach:

Andrew Trites did a radio interview with Elizabeth Arnold (NPR) on the Patch Dynamic Study. Bogoslof Island and the comparisons that will be drawn with the Pribilof Islands were discussed.

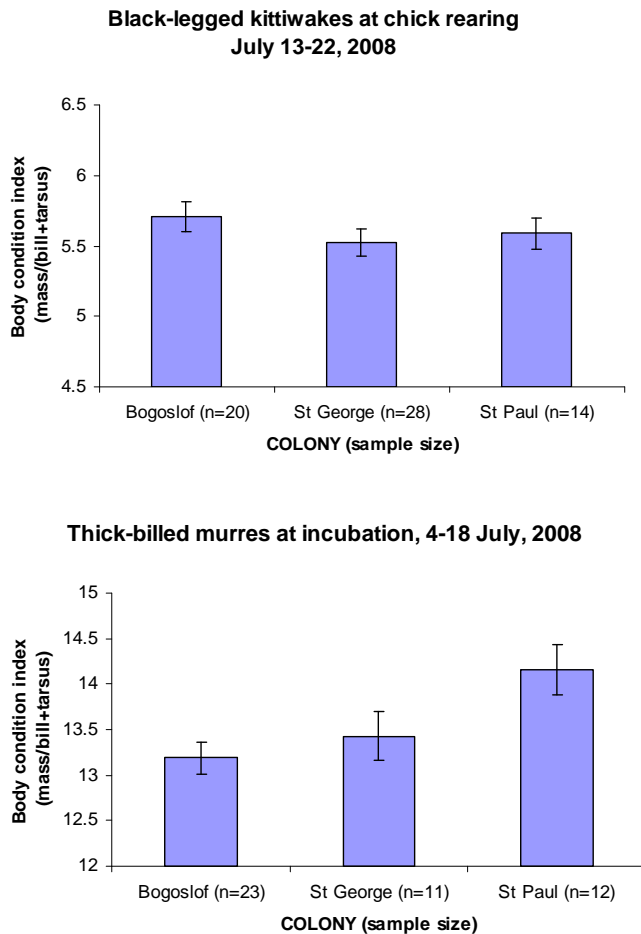


Figure 1. Inter-colony comparison of body condition index (body mass corrected for structural size) of black-legged kittiwakes (upper panel) and thick-billed murres (low panel) breeding on Bogoslof, St. Paul and St. George colonies in July 2008.

Next year's Work plan (2009-2012 Tasks, Assignments, Timeline):

Forage Fish. BSIERP B77, Forage Fish Patches Bogoslof Island, Scott Heppell, 541-737-1086, scott.heppell@oregonstate.edu

<i>What</i>	<i>Who</i>	<i>Start (2008)</i>	<i>Other key dates</i>
PI meeting	Heppell	October	
Contract Vessel	Benoit-Bird/Heppell	November	
Purchase equipment	Benoit-Bird, Heppell	October-December	
Recruit field assistants	Benoit-Bird, Heppell	February-April (2009)	
Fine-tune plan studies, including coordination with other BSIERP-Patch collaborators	Benoit-Bird, Heppell	February-March (2009)	Review annually as needed
Supply data to data manager	Benoit-Bird, Heppell	April/May (2009)	Annually
Conduct field studies	Benoit-Bird, Heppell, students, techs	July-August (2009)	Complete field studies in August each year 2008-2009

Northern fur seals. BSIERP B77, Fur seal foraging and patch dynamics, Andrew Trites, 604-822-8181, a.trites@fisheries.ubc.ca

<i>What</i>	<i>Who</i>	<i>Start (2009)</i>	<i>Other key dates</i>
Purchase tags for 2009 field season	Battaile, Nordstrom, Trites	January to May	
Hire research assistants for 2009 field season	Trites, Battaile	January to May	
Attend 2009 NPRB Alaska Marine Science Symposium and BSIERP PI meeting	Trites, Battaile	January	
Review and update protocols for 2009 field season	Battaile, Nordstrom, Trites	January to June	
Train field personal	Battaile, Nordstrom, Trites	June- July	
Organize and procure supplies and logistics for 2009 field season	Battaile, Trites	March-June	
Conduct field studies, capture, tag, retrieve tags and consolidate data	Battaile, Research assistants	July-September	
2009 field season Data Analysis	Battaile, Nordstrom, Trites	July-December 31	Ongoing
Supply data to data manager	Battaile, Nordstrom, Trites	January	Annually
Complete NPRB progress reports	Battaile, Nordstrom, Trites	April 1, October 1	Semi-annually 2008-2010
Report to communities of Dutch Harbor / Unalaska	Trites	TBD	2009-10

Complete publications	Collaborative among various PIs	January 2010	Continue thru 2012
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Seabirds (UAF) BSIERP B77, Seabird Diving, Stress & Stable Isotopes – Bogoslof Island, PI- Kitaysky, 907 474-5179, ffask@uaf.edu

<i>What</i>	<i>Who</i>	<i>Start (2009)</i>	<i>Other key dates</i>
Stress hormone analyses	Kitaiskaia	August-December	Annually 2008-2009
Stable isotope analysis	Dorresteijn, Barger, Young, Kitaiskaia	September-December	Annually 2008-2009
DNA-sexing of kittiwakes and murre	Barger	October-December	Annually 2008-2009
Select graduate student and a seasonal field tech	Kitaysky	March-May	
Coordinate logistics of field camp on Bogoslof	Byrd, Trites, Irons, Kitaysky	January-March	
Order data loggers	Kitaysky, NPRB	by January	
Revise protocols for data collection and order needed equipment and supplies	Kitaysky	March-May	
Have protocols reviewed by other team members	Kitaysky	April	
Coordinate field approaches to avoid conflicts	Kitaysky, grad students	April	
Train field personnel	Kitaysky, grad student	June	
Conduct field studies	Grad student, field tech	July-August	Complete field studies in August
Summarize available data on SIA, stress, and diving	Kitaysky, Kitaiskaia, grad students	December	Annually 2008-2009
Supply data to data manager	Kitaysky, grad students	January	Annually 2008-2009
Complete NPRB progress reports	Kitaysky, grad student	April 1, October 1	Semi-annually 2008-2010
Report to communities of Dutch Harbor/Unalaska	Kitaysky, grad student	TBD	2009-10
Complete publications	Collaborative among various PIs	January 2010	Continue thru 2012

Seabirds (USFWS), BSIERP B77, Seabird Telemetry, Diets, and Productivity, David Irons, 907/786-3376, david_iron@fws.gov; Dan Roby 541/737-1955

<i>What</i>	<i>Who</i>	<i>Start (2009)</i>	<i>Other key dates</i>
Plan studies, including liaison with other collaborators	Irons, Kitaysky, Kuletz, Roby	February	
Select Post Doc	Irons, Roby	Feb.	
Select seasonal biologists for Bogoslof Island	Irons, Roby	March	
Order GPS data loggers	Irons, Roby	Jan.	
Prepare detailed protocols for	Irons, Roby, and	March-April	

data collection and order needed equipment and supplies	Post Doc		
Have protocols reviewed by other seabird colony team members	Byrd, Irons, Kitaysky, Roby	April	
Coordinate field approaches to avoid conflicts	Byrd, Irons, Kitaysky, Roby	April	
Train field personnel	Irons, Roby, Post Doc	June	
Conduct field studies	Irons, Roby, Post Doc seasonal field biologists	July-August	
Send diet and blood samples to contractor	Byrd, field biologists	September	
Summarize available data	Irons, Roby, Post Doc	October	
Supply data to data manager	Irons, Roby, Post Doc		
Complete NPRB progress reports	Irons, Roby, Post Doc	1 April 1 October	
Complete publications	Collaborative among various PIs	January 2010	

Seabirds (USFWS), BSIERP B77, Seabird At-Sea Distribution and Diet, Kathy Kuletz, 907/786-3453, kathy_kuletz@fws.gov

<i>What</i>	<i>Who</i>	<i>Start (2009)</i>	<i>Other key dates</i>
AMSS and PI meeting	Kuletz	January / October	annually
Fine-tune study plans, coordinate with other PDS collaborators.	Kuletz, Heppell, Benoit-Bird, Irons, Kitaysky, Roby	January-March	
Select Observer/collector	Kuletz	Feb.-March	Arrange for graduate student or FWS biologist
Prepare detailed protocols for data collection and order equipment and supplies	Kuletz, Jones (grad.student)	March-April	Have protocols reviewed by other PIs by May
Arrange permits for collection of seabirds around Bogoslof	Kuletz	Feb-April	Submit IACUC proposal
Conduct at-sea surveys of birds and mammals in conjunction with prey studies	Kuletz, Jones (grad student 1), grad student 2	July-August	Also coordinate on-site tagged bird data transfer (Irons, Roby, Post Doc)
Send diet and blood samples to contractor	Kuletz, Jones, Byrd	September -October	
Summarize available data	Kuletz, Jones	October - December	Exchange data with forage fish PIs; preliminary analysis
Supply data to data manager	Kuletz	December	
Complete NPRB progress reports	Kuletz	1 April 1 October	
Complete publications	Collaborative among PIs	January 2010	