

Alaska Cooperative Fish and Wildlife Research Unit

Annual Report: 2000–2001

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Not for Publication: Because this report is one of progress, the data presented are often incomplete, and the conclusions reached may not be final. Consequently, permission to publish any of the information herein is withheld pending approval from the Alaska Cooperative Fish and Wildlife Research Unit.

Bathurst Caribou Calving Ground Studies: Influence of Nutrition and Human Activity on Calving Ground Location	44
Habitat Selection of Dall's Sheep Within and Adjacent to the Yukon Charley National Preserve	45
Assessing Habitat Suitability for Dall Sheep in Wrangell-St. Elias National Park and Preserve.....	45
Beringian Shared Heritage Program: Inventory and Survey of Fungi, Lichenized Fungi, Lichenicolous Fungi, Mycetozoans, and Bryophytes.....	46
Ongoing Projects—Integrated	48
Arctic Transitions in the Land Atmosphere System	48
Fate of Carbon in Alaskan Landscapes	48
Landscape Analysis of Moose Distribution Relative to Fire History in Interior Alaska	

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Introduction

This is the Biannual Report for the Alaska Cooperative Fish and Wildlife Research
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Klein, D

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River near a suspect

adjoining pack home ranges incr

of *Martes americana* represent only one colonization. Cytochrome b data were consistent with the recognition of these as monophyletic clades; however, aldolase C sequences and microsatellite data indicated that these generally parapatric groups interbreed in at least one region of limited geographic overlap. These clades probably were isolated during the late Pleistocene in eastern and western glacial refugia, but geographic separation apparently has not led to reproductive isolation.

Habitat

of forage quality). An experiment with captive geese found no effect of herbivory on biomass or nitrogen concentrations at low foraging intensity ten nnnn

(Seiser) graduated with an MS degree in Wildlife Biology, and the other student (Blundell) is nearing completion of her PhD degree.

Mechanism of Impact and Potential Recovery of Pigeon Guillemots (*Cephus columba*) after the *Exxon Valdez* Oil Spill

Personnel:

- Dr. A. David McGuire, Principal Investigator, AKCFWRU
- Dr. R. Terry Bowyer, Co-Principal Investigator, IAB
- Dr. Lawrence Duffy, Do-Principal Investigator, IAB
- Pamela E. Seiser, Student Investigator (MS), DBW
- Howard Golden, Cooperator, ADFG/WC/Anchorage
- Lisa Thomas, Cooperator, USGS/BRD/ABSC

Funding Source: USGS/BRD/ABSC (RWO 40)

Note: Pam Seiser graduated from UAF in May 2000. Her thesis abstract follows.

Abstract—The abundance of pigeon guillemots in oiled areas of Prince William Sound, Alaska, failed to increase after the 1989 *Exxon Valdez* oil spill. Population growth may be constrained by the physiological effects of oil exposure, food availability, and nest predation. I conducted a comparative study among unoiled, oiled, and pre-spill data sets, to provide insight on factors limiting population recovery in oiled areas. Blood samples from chicks in oiled and unoiled areas provided little evidence of physiological effects of exposure to oil. Pigeon guillemot diet, productivity, growth rates, and fledging weights in unoiled areas of southwestern Prince William Sound from 1994 to 1998 indicate oiled areas had a lower proportion of high-lipid fish in the chick diet and lower fledging weights, compared to unoiled and pre-spill studies. These results suggest that the lack of recovery in oiled areas is associated with a prey base that results in lower fledging weights, which may reduce juvenile survival.

Social Organization and Spatial Relationships in Coastal River Otters: Assessing Form and Function of Social Groups, Sex-biased Dispersal, and Gene Flow

Personnel:

- Dr. R. Terry Bowyer, Co

otters were radio-tracked in three study areas in Prince William Sound, Alaska, from 1996 to 1999, to dete

Land Cover Change on the Seward Peninsula: The Use of Remote Sensing to Evaluate the Potential Influences of Climate Change on Historical Vegetation Dynamics

Personnel:

- Dr. Terry Chapin, Lead Investigator, IAB
- Dr. A. David McGuire, Co-Investigator and Faculty Advisor, AKCFWRU
- Dr. David Verbyla, Co-Investigator, FSD
- Cherie S. Silapaswan, Student Investigator (MS), DBW

Funding Sources: USFS (RWO 94), NASA, and NSF

Note: Cherie S. Silapaswan (e) 414-226-0463 (c) 414-007-1244 (o) 917-756-0411 (a) 31045

Atmosphere-Ice-Interactions (LAI)

fire. The model has also been used to model carbon dynamics for a chronosequence of burn sites in interior Alaska, and a paper that describes this research has been accepted for publication in the *Journal of Geophysical Research Atmospheres* (Zhuang et al. In press.). During previous years, Dr. McGuire has also worked with a postdoc who used inversion models of the global carbon cycle to help elucidate how fire disturbance in high latitudes influences the global carbon cycle. The investigations by this post-doc, who worked in Dr. McGuire's laboratory between July 2000 and July 2001, resulted in the development of two papers, one of which has been accepted for publication (Dargaville et al. In press. *Climatic Change*) and the other which is still in review. These papers indicate that there is good agreement with the forward modeling research on the role of fire conducted by Dr. McGuire and his student.

Land-cover Change in High Latitude Ecosystems: Implications for the Global Carbon Cycle

Personnel:

Dr. A. David McGuire, Co-Investigator, AKCFWRU
Qianlai Zhuang, Student Investigator (MS), DBW (partial support)
Cherie Silapaswan, Student Investigator (MS), DBW (partial support)
Dr. David Verbyla, Co-Investigator, FSD
Matt Macander, Student Investigator, FSD
Aaron Woods, Student Investigator, FSD
Dr. W. Scott Armbruster, Co-Investigator, IAB

Funding Source: NASA

The purpose of this study was to develop a prototype spatially explicit modeling framework focused on Alaska that is capable of using satellite-derived data to estimate how changes in land cover cause changes in ecosystem carbon storage at high latitudes. This study involves four tasks: (1) development of spatially explicit contemporary land-cover data sets in Alaska; (2) development of transient spatially

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stock identification does not hold promise for fine-scale allocation of chum salmon along the US-Canada boundary.

In-Kind Support:

In 2000, the USFWS provided laboratory chemicals and supplies (\$8200); travel to UC Davis for instruction (\$1000); summer salary (\$10,000); study samples; and lab space in summer.

Predicting Growth and Habitat Selection of Juvenile Arctic Grayling in Chena Slough

Personnel:

Dr. James B. Reynolds, Principal Investigator, AKCFWRU and SFOS

Dr. Nicholas F. Hughes, Co-Principal Investigator, SFOS

Cheryl A. Dion, Student Investigator (MS), SFOS

Funding Source: ADFG/SF (RSA)

Chena Slough in interior Alaska may be the most productive spawning and rearing areas for Arctic grayling *Thymallus arcticus* in the Chena River drainage. However, the quality and quantity of favr

Standardized Evaluation of Electrofishing Injury in North American Freshwater Sport Fishes

Personnel:

Dr. James B. Reynolds, Principal Investigator, AKCFWRU and SFOS
F. Michael Holliman, Student Investigator (PhD)

Evaluation of Urban Impacts on

parameters and non-esterified fatty acid analysis as an evaluation of stress effects and energy expenditure in fall chum salmon (*Oncorhynchus keta*) on the Toklat River, Alaska. Blood plasma samples were collected in 2000 and 2001 from fall chum salmon. In 2000, samples were analyzed for sti91

plast

Climate Change Effects on Caribou Habitats and Population Processes

Personnel:

Dr. Brad Griffith, Principal Investigator, AKCFWRU

The effects of global and regional climate may exert substantial influence on caribou habitats and populations and make it difficult to identify the effects of industrial development on performance of Arctic calving caribou. The goals of this umbrella project, which covers various portions of Griffith's programmatic work, are to estimate the effects of climate warming on Arctic caribou calving grounds throughout North America, to assess the value of these habitats to the annual nutritional profile of herds, and to estimate the effects of potential industrial displacement of caribou. During 2000, two manuscripts were published in Polar Research, one manuscript was accepted by Rangifer, and four presentations were made at scientific and technical meetings. This work is funded principally by NSF Grant OPP-9521459 and the Canadian national Climate Change Action Fund (CCAF). During 2001, graduate students (PhD) will be selected to pursue the funded components of the program. The results of this work may be utilized to rank the relative importance of various portions of Arctic calving caribou annual ranges and to provide guidance for use of remotely sensed data to monitor Arctic habitats.

In-Kind Support: UAF library facilities and services.

Bathurst Caribou Calving Ground Studies: Influence of Nutrition and Human

Age 0 41 211 0 Tm (159975 525 3145 2B3 0 10r (C) 5 0 0 15 (106 82 600411 122780 Tj 450 (

renowned for its trophy sheep, biologists currently have no quantitative expectations of the relative suitability of various survey

and displayed as titled: Beringian Fungi, Beringian Lichens, Beringian Slime Molds, Living With Fungi, Cesium 137 in Lichens, Recycling Fungi, and Cycles in the Forest; (5) a CD-ROM of cogent species has been produced for both 1999 and 2000 studies conducted on the Kobuk River; (6) the project's web page is under construction as www.memberserviceadvantage.com/diversity for High Latitude Cryptogams; (7) the Beringian Fungi Project and Lichen Query mgd.NACSE.ORG/qml/lichenair/arctic and www.nacse.org/lichenair/index1.html web pages will be linked to the Beringian Mycology web page; (8) curation, data matrix, and database construction continue; (9) angiosperm Mycorrhizal studies resulted in root collections for ongoing winter analysis; and (10) Chukotka 2002-4 preparations are underway. Management implications are (1) providing the Shared Beringian Heritage Program with new information on Beringian cryptogams; (2) information on cryptogams i

Ongoing

responses after fire. The understanding from these field studies wi

List of Abbreviations

ADFG Alaska Depar

NSF	National Science Foundation
NWR	National Wildlife Refuge
ORCFWRU	Oregon Cooperative Fish and Wildlife Research Unit
OSU	Oregon State University, Corvallis, OR
PI	Principal Investigator
RSA	Reimbursable Services Agreement
RWO	Research Work Order
SFOS	School of Fisheries and Ocean Sciences, UAF
UAA	University of Alaska Anchorage
UAF	University of Alaska Fairbanks
UAM	University of Alaska Museum
UAS	University of Alaska Southeast
USACE	U.S. Army Corps of Engineers
USAF	U.S. Air Force
USDA	U.S. Department of Agriculture
	USFS U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
	FAO Fisheries Assistance Office
	NWR National Wildlife Refuge
USGS	U.S. Geological Survey
	BRD Biological Resources Division
	ABSC Alaska Biological Science Center