

# Alaska Cooperative Fish and Wildlife Research Unit

## Annual Report—2004

May 2005

Alaska Cooperative Fish and Wildlife Research Unit  
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Not for Publication: Because this report is one of progress, the data presented are often incomplete, and the conclusions reached may not be final.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



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## Unit Roster

### Federal Scientists

- Brad Griffith: Assistant Leader-Wildlife
- F. Joseph Margraf: Leader
- A. David McGuire: Assistant Leader-Ecology
- Abby Powell: Assistant Leader-Wildlife
- Mark Wipfli: Assistant Leader-Fisheries

### University Staff

- Michelle Das: Travel Coordinator
- Karen Enochs: Fiscal Technician
- Kathy Pearse: Administrative Assistant
- Ed Morgan: Student Assistant

### Unit Students

#### Current

- Corey Adler, MS Wildlife (Powell)
- Stacia Backensto, PhD Biology (Powell)
- Michael Balshi, PhD Biology (McGuire)
- Elizabeth Baney, MS Fisheries (Margraf)
- Colin Beier, PhD Biology (McGuire)
- Jeremy Carlson, MS Fisheries (Margraf)
- Catharine Copass Thompson, PhD Biology (McGuire)
- Dave Gregovich, MS Fisheries (Wipfli)
- Christie Hendrich, MS Wildlife (Wipfli)

- Jas







- Kevin Petrone -PhD (McGuire)
- Miranda Plumb, MS

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- Griffith, B., D. C. Douglas, R. G. White, and D. E. Russell. 2004. Climate, Fall Forage Availability, and Parturition in Barren-Ground Caribou. 10th North American Caribou Workshop, Girdwood, Alaska.
- Kimbirauskas, R. K., R. W. Merritt, M. S. Wipfli, and P. E. Hennon. 2004. Macroinvertebrate Community Response to Rip

- Calef, M. P., A. D. McGuire, and T. S. Rupp. May 2004. Human Impacts on Fire in the Western Arctic: A Statistical Assessment at the Regional Scale. 12th Conference of the International Boreal Forest Research Association, Fairbanks, AK.
- Eskelin, A. A., F. J. Margraf, and J. J. Hasbrouck. March 2004. Precision of Tr

in Northern <sup>3</sup> High Latitudes. An



- Morse, J. A. and A. N. Powell. 2003. Nesting habitat and breeding distribution of Marbled Godwits on the Alaska Peninsula



## Research Reports

Reports are listed as Completed or Ongoing, in the categories of Aquatic, Terrestrial, or Ecological Studies. The List of Abbreviations appears on the final page of the report.

### Completed Aquatic Studies

An Assessment of Trap Efficiency to Estimate Coho Salmon Smolt Abundance in a Small Alaskan Stream

Student Investigator: Anthony Eskelin, MS Fisheries

Advisor: F. Joseph Margraf

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locations. Sockeye salmon were radio tagged as they entered Lake Clark and tracked to spawning locations. After entering Lake Clark, sockeye salmon usually migrated to a region of the lake that was within 15 km of their spawning location. Tagged fish migrated faster and more directly to spawning locations in tributary rivers and lakes than to Lake Clark beaches. Thirty-three spawning locations were identified in the Lake Clark watershed including 18 new spawning locations compared to previous scientific research and 10 compared to traditional local knowledge. Most radio tagged sockeye salmon (65%) returned to spawning locations in glacially turbid waters and most spawning locations (75%) were adjacent to privately owned lands. Protective measures should be taken to conserve both migration corridors and spawning habitats.

### Ongoing Aquatic Studies

Distribution of Non-*Oncorhynchus* Salmonids in the Ugashik Lakes in Southwestern Alaska

Student Investigator: Miranda Plumb, MS Fisheries

Advisor: F. Joseph Margraf

Funding Agency: USFWS (RWO 111)

In-Kind Support: Boat, technical assistance and equipment provided by King Salmon Fish and Wildlife Field Office/FWS during field season

Few studies have investigated resident salmonids in Southwestern Alaska. Basic biological information is needed to accurately document the current status of resident fish. The Ugashik Lakes are warm thereimictic, meaning that they typically lack thermal structure. Normally, in deep lakes fish are distributed according to the temperature structure of the lake, but due to the lack of a thermocline, they are distributed throughout the lake.

A Spawning Habitat-Based Escapement Goal for Chum Salmon in the Tuluksak River, Southwestern Alaska

Student Investigator: John O'Brien, MS Fisheries

Advisor: F. Joseph Margraf

Funding Agency: USFWS (RWO 112)

In-Kind Support: Technical assistance and equipment provided by USFWS

A study of chum salmon (*Oncorhynchus keta*) spawning habitat was conducted from June 2002 to January 2005 on the Tuluksak River in Southwestern Alaska. Chum salmon are reported to favor riverine spawning sites that are influenced by both hyporheic upwelling water and groundwater upwelling. Landscape topography and channel morphology constitute hydraulic c

age, age at maturity, and reproductive investment. We gathered data on physical and biological aspects of the habitat and applied several foraging models to the data to understand regional differences in forage potential. We also conducted prey and diet sampling to understand prey preference. Estimated maximum size for Western grayling was at least 20% longer than interior grayling in each of the study years. Annual survival was also higher in Western region adult populations. We found that traditional and Net Rate of Energy Intake modeling methods of evaluating forage potential for Arctic grayling were inadequate to explain the differences found in growth and maximum size for Western and Interior populations. However, new information gained from this study on alternative prey sources and temperature regimes indicates that Western habitat is more favorable for increased growth. With this

Inconnu (*Stenodus leucichthys*) Spawning Habitat Selection: A Remote Sensing-based Predictive Model

Student Investigator: Theresa Tanner, MS Fisheries

Advisor: F. Joseph Margraf

Funding Agency: USFWS (RWO 127)

In-Kind Support: Technical assistance and equipment from Fairbanks Fish and Wildlife Field Office, USFWS during field season

relationships of lar

The Eelgrass Ecosystem of Izembek Lagoon: Retrospective Analysis  
and Development of a Protocol for Future Monitoring

Principal Investigator: C Peter McRoy

Funding Agency: USFWS (RWO 124)

Other Support: ARCUS, Sea Grant th



## Assessing Past Sockeye Salmon Population Trends in Katmai National Park



mining, fish

sites, as indicated by both drift and benthic data. We also expect invertebrate communities to differ between ecoregions, possibly as a function of rainfall and vegetation cover. These results are expected to have important management implications for headwater and riparian

Marine-Derived Nutrients (MDN) in Riverine Ecosystems: Developing Monitoring Tools for Tracking MDN in Alaska Watersheds

Student Investigator: Dan Rinella, PhD Biology

Advisor: Mark Wipfli

Funding Agency: EVOS Gulf Ecosystem Monitoring

Spawning salmon deliver massive q



duckling survival increased linearly throughout 2002, remained nearly constant in 2003, and was negatively related to daily precipitation in both years. Nest attendance patterns and incubation behaviors were not related to weather, female experience, clutch size, or day of incubation. Average number of recesses per day ( $2.9 \pm 0.05$ ), length of recesses ( $100.7 \pm 1.5$  min), and incubation constancy ( $79.8 \pm 0.3\%$ ) were similar to value

Breeding Ecology of Waterfowl on Yukon Flats National Wild



Broods of emperor gees

marked with neckbands. During subsequent summers and sporadically during the winter, observations of marked swans were made and an estimated total of nearly 10,000 resightings were recorded. Our specific objectives are to estimate nest survival and cygnet survival and annual, age-specific apparent survival, and breeding probability of adult swans. As part of a larger collaborative project, a population model will be constructed from these estimates to provide managers with information about which parameters had the greatest effect on the population.

Using Fat Metabolites to Infer Staging Site Quality for Post-breediA

## Effects of Recreational Disturbance on the Productivity

more than 50% between 1979 and 1996 for unknown reasons. The National Petroleum Reserve-Alaska (NPR-A) is being leased for oil and gas exploration and may potentially be developed. Within the northeast planning area of NPR-A is the highest known density of nesting King Eiders on the north slope of Alaska. The primary objective of this study is to provide information on eider nest survival and how it is influenced by nest site choice

nesting cycle. This area increased during the latter period of the nesting cycle and into the fledgling period. If human infrastruc

to be a valuable tool to monitor seabird populations and understand complex marine ecosystems. The glaucous-winged gull (*Larus glaucescens*) is an abund



the coast between Admiralty and Harrison Bays in mid-July, again achieving wide distribution by mB



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Sightability, Habitat Use, and Sexual Segregation in Moose:  
Implications for Population Management

Student Investigator: Susan Oehlers, MS Biology

Advisor: Falk Huettmann and R. Terry Bowyer

Funding Agencies: USDA Forest Service, ADFG, Bureau of Indian Affairs

In-Kind Support: Technical assistance and field support provided by ADFG

Few data are available on the health, sex and age composition, and size of the moose population on the Yakutat forelands. Moose are an important subsistence resource in Yakutat, Alaska, a community of approximately 800 people. Dense vegeta

effects of wildfire on the global carbon cycle. The initial focus has been on developing the model for Alaska and Canada due to the extensive historical fire record documenting the timing and location of fires since the 1950s. Progress in explaining inter-annual variability of fire with climatic variables at 5° latitude by 5° longitude resolution has been made over the last year. The next stage is to couple the fire model to the terrestrial ecosystem model (TEM) to simulate carbon dynamics of Alaska and Canada for the period 1860-2000. We expect to find that carbon dynamics simulated for Alaska and Canada will be similar to a simulation driven by observed fire history from 1959-2000. We will then use the coupled model to evaluate carbon dynamics for future scenarios of climate change. After developing and testing the model over the Alaska and Canada domain, the model will be evaluated for its ability to simulate the fire regime in boreal Eurasia. It is anticipated that coupled model simulation

Dr. Joyce, Dr. McGuire's lab has prepared the output of the Terrestrial Ecosystem Model (TEM) so that it is summarized by forest type regionally and at the county scale. We have developed a draft methods paper to describe the computations for climate change deltas so that TEM output c

Fire-Mediated Ch

results agree with data on atmospheric carbon dioxide concentrations. The TEM simulations indicate snow cover duration has decreased by approximately 6-8 days between the years 1972-2000. This result is generally consistent with NOAA satellite observa







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UAF University of Alaska Fairbanks

USDA U.S. Department of