ALASKA CHAPTER OF THE WILDLIFE SOCIETY
2024 ANNUAL MEETING
Science to Prepare for a Changing World

The Nave, Anchorage
In Person and Virtual

April 15 - 17, 2024

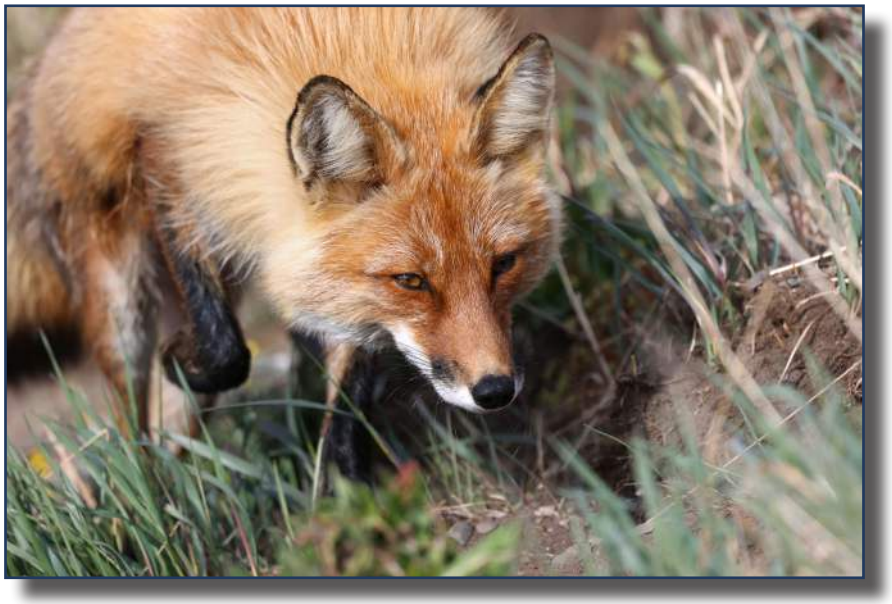
Alaska Chapter of the Wildlife Society
2024 Annual Meeting

The Nave
3502 Spenard Rd
Anchorage, Alaska
April 15 – 17, 2024

MEETING PLANNING COMMITTEE

Alex Lewis, Christi Heun, Ryan Mollnow, Shannon Finnegan, Cyndi Wardlow, Jeff Wagner, Nick Fowler, Jeff Stetz, Shawn Crimmins, Nate Svoboda, and Arin Underwood.

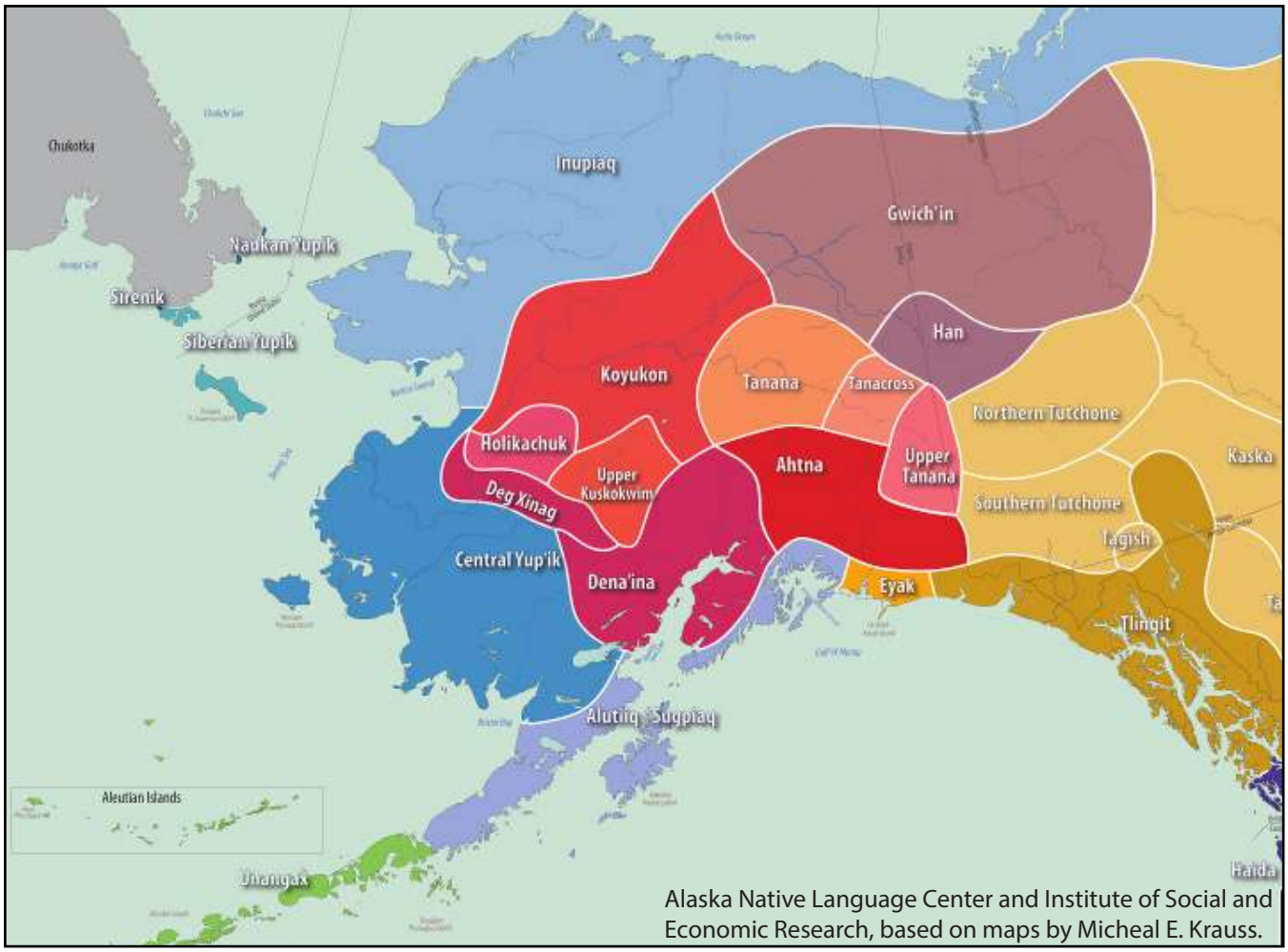
***Cover Photos*:** Hoary Marmots and Grizzly Bear - Jeff Wagner (ADFG/UWyo); Collared Pika and White-crowned Sparrow - Arin Underwood (ADFG), Caribou - Chelsea Arnold; Grey Gray Owl fledglings and Muskox - Jared Hughey (NPS).



Red fox (NPS/Jared Hughey)

Land Acknowledgment

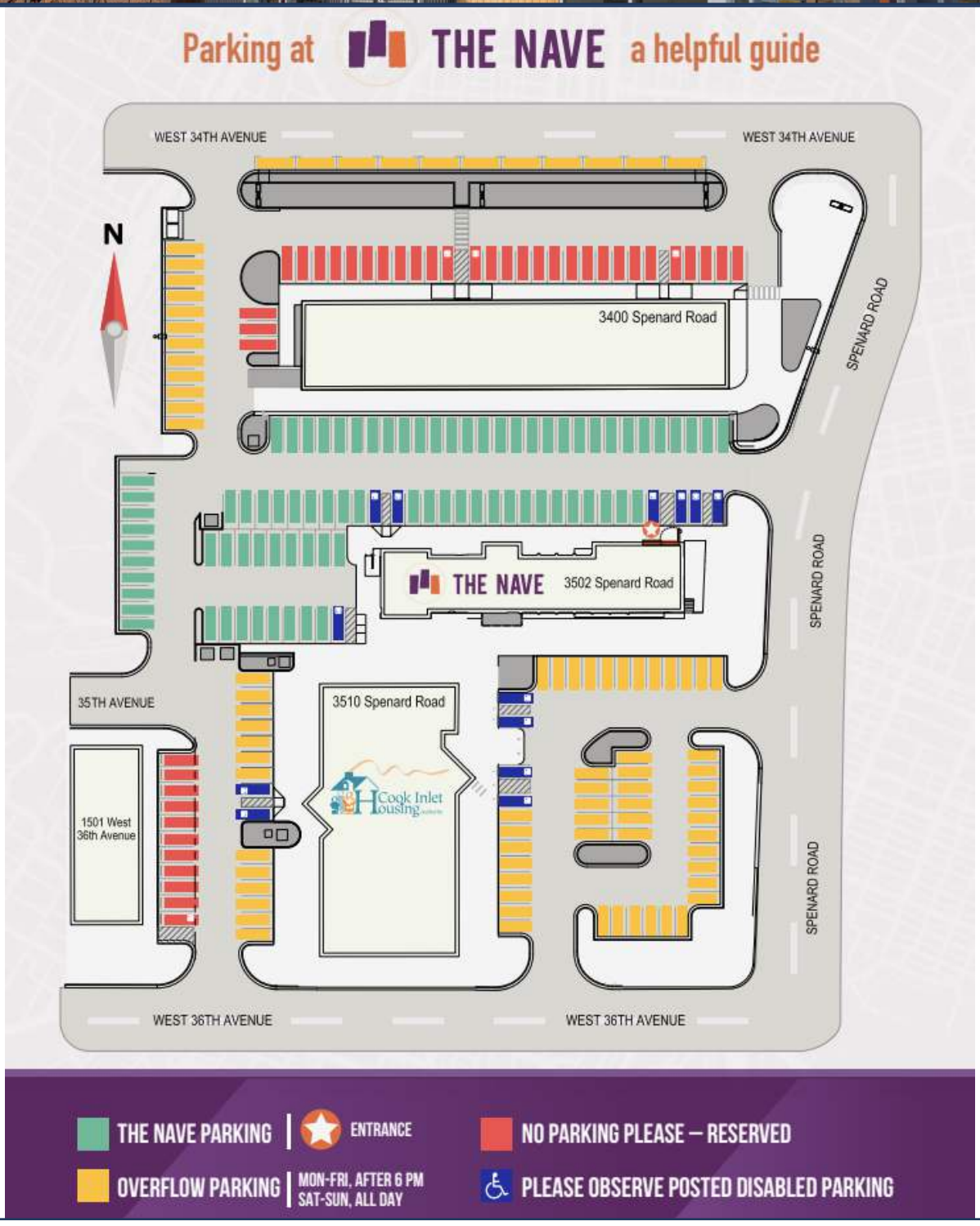
The Alaska Chapter of The Wildlife Society would like to acknowledge that we are gathered on traditional lands where indigenous peoples have cared for Alaska's land, water, and wildlife for over ten thousands years. Their intimate knowledge of, and connection to, the land and its animals continues to inspire us in our professional and personal lives. Please take a moment to acknowledge the Native tribes in your area.



Alaska Native Language Center and Institute of Social and Economic Research, based on maps by Micheal E. Krauss.

Denali Panorama (Jeff Wagner)


THE NAVE
502


Parking at THE NAVE a helpful guide
WEST 34TH AVENUE
WEST 34TH AVENUE
N
3400 Spenard Road
SPENARD ROAD
THE NAVE 3502 Spenard Road
SPENARD ROAD
35TH AVENUE
3510 Spenard Road
Cook Inlet Housing
1501 West 36th Avenue
SPENARD ROAD
WEST 36TH AVENUE
WEST 36TH AVENUE
THE NAVE PARKING
ENTRANCE
NO PARKING PLEASE – RESERVED
OVERFLOW PARKING
MON-FRI, AFTER 6 PM
SAT-SUN, ALL DAY
PLEASE OBSERVE POSTED DISABLED PARKING

We would like to thank the following organizations for their contributions. Your support ensures the continued success of the Alaska Chapter of The Wildlife Society and Annual Meeting.

Title Sponsors

ALASKA DEPARTMENT OF FISH AND GAME

ALASKA WILD SHEEP FOUNDATION

Plenary & Session Sponsors

TELONICS

ABR Environmental Research & Services

Award Sponsors

Global Wildlife Resources

CWS

ALASKA WILDLIFE CONSERVATION CENTER

Banquet Sponsors

NUNIAQ
KODIAK ISLAND, ALASKA

The Den
CATERING & EVENT PLANNING
907.202.1139
THEDENCATERING@GMAIL.COM

Horstman's Kodiak Guide Service
HUNT THE ALASKAN LEGEND

Conference-at-a-Glance

Monday, April 15, 2024		
9:00 am	MoveApps Workshop - The Nave	
3:00 pm		
Tuesday April 16, 2024		
8:30 am	Welcome and Opening Remarks	
9:00 am	Plenary Session	J. Littel (USGS Alaska Climate Adaptation Science Center)
9:30 am	Break	
9:50 am	Session A	Oral Presentations
11:10 am	Break	
11:30 am	Working Group Updates	Updates from Active Committees and Working Groups
12:00 pm	Lunch	Board of Game Nominations Discussion (*Pizza provided*)
1:30 pm	Session B	Oral Presentations
2:30 pm		Break
2:50 pm		Oral Presentations
3:50 pm	Break	
4:00 pm	Poster Session	
5:00 pm	Wrap up and announcements	
6:00 pm	Banquet and Awards Ceremony	Speaker: J. Lewis-Nicori (Navigating the New Arctic Community Office)
Wednesday, April 17, 2024		
8:30 am	Welcome and Opening Remarks	
8:40 am	Session C	Oral Presentations
10:00 am		Break
10:20 am		Oral Presentations
11:20 am	Break	
11:30 am	Business Meeting	Updates from Executive Board, Elections
12:00 pm	Lunch	Business Meeting cont. (*Pizza provided*)
1:00 pm	Session D	Oral Presentations
2:20 pm	Break	
2:40 pm	Session E	Oral Presentations
4:00 pm	Break	
4:20 pm	John Trent: In Memorium	
5:00 pm	Wrap up and announcements	

New AK-TWS Swag Alert!

Support the Chapter by visiting our Swag Booth. Take home one of these awesome new hats (assorted colors) or a keychain!

Or, visit our Swag Swap Table!

Bring your old TWS Meeting coffee mugs, shirts, binders etc., and score vintage swag or send your old gear to a new home instead of the thrift store or landfill!

Also, stay tuned for some swag raffles on Tuesday and Wednesday!

ALASKA TWS
2024 ART & PHOTO CONTEST
At the Annual Meeting: April 15th - 17th, 2024

Photography

Landscapes & Still Life (including Flora)
Wildlife
Creative/Comedic
People & Wildlife (Human dimensions)
*Game camera**

**personal images only*

Creative Expression

A catch-all category for drawings, paintings, jewelry, ceramics, sculpture, mixed-media, etc. If you craft wildlife-themed art that isn't photography, please enter it here!

Winners in each category will receive $50 and choice of AKTWS swag!
Additional $100 prize for overall Best in Show across categories.

Entrants must bring printed photos or original art to the Annual Meeting in Anchorage to enter. Voting will take place on Tuesday and Wednesday and winners will be announced on Wednesday.

Monday, April 15

The Nave

9:00 am - 3:00 pm **MOVEAPPS WORKSHOP**
Ashley Lohr (Movebank / North Carolina Museum of Natural Sciences

Tuesday, April 16

The Nave

8:00 am REGISTRATION AND CHECK-IN OPEN

8:30 am - 9:30 am **PLENARY SESSION: SCIENCE TO PREPARE FOR A CHANGING WORLD**
R. Mollnow, Moderator

8:30 WELCOME AND OPENING REMARKS
R. Mollnow

9:00 ALASKA CLIMATE FUTURES: COMMON THEMES, REGIONAL DIFFERENCES, AND POTENTIAL SURPRISES FOR ASSESSMENT AND ADAPTATION
Jeremy Littel (USGS Alaska Climate Adaptation Science Center)

9:30 BREAK

9:50 am - 11:10 am **SESSION A: MOOSE ECOLOGY AND MANAGEMENT I**
J. Wagner, Moderator

9:50 ANALYSIS OF HUNTER REPORTED DATA VERSUS SEALER COLLECTED DATA ON MOOSE ANTLERS IN THE KENAI PENINSULA DURING REGULATORY YEARS 2012-2022
S. Newberry

10:10 EVALUATING CONGRUENCY OF GEOSPATIAL POPULATION ESTIMATION OF MOOSE ABUNDANCE AND STOCHASTIC LEFKOVITCH MATRIX POPULATION INDICATORS
N. Fowler

10:30 UTILIZING IMAGE-BASED METRICS TO ASSESS MOOSE ANTLER DEVELOPMENT
J. Pelham

10:50 IMMEDIATE EFFECTS OF WILDFIRE ON MOOSE HARVEST
T. Brinkman

11:10 BREAK

11:30 am - 12:00 pm **WORKING GROUP UPDATES**

12:00 LUNCH **BOARD OF GAME NOMINATIONS DISCUSSION (PIZZA PROVIDED)**

** denotes student*
+ denotes virtual presentation

Tuesday, April 16 (continued)

1:30 pm - 3:50 pm **SESSION B: ADVANCES IN TECHNOLOGY FOR WILDLIFE MANAGEMENT**
A. Lewis, Moderator

1:30 INFERENCES ABOUT SUMMER DIETS OF BARREN-GROUND CARIBOU FROM DNA METABARCODING AND VIDEO CAMERA COLLARS
H. Johnson

1:50 LEANING INTO NEW TECHNOLOGIES FOR WILDLIFE MANAGEMENT: COMPARISONS ON THE USE OF THERMAL DRONES AND CAMERA TRAPS FOR STUDYING SITKA BLACK-TAILED DEER
S. Finnegan

2:10 THE POWER OF SOUNDSCAPE MONITORING IN THE ARCTIC
M. Perra*

2:30 BREAK

2:50 ESTIMATING SPATIALLY EXPLICIT SURVIVAL AND MORTALITY RISK FROM TELEMETRY DATA WITH THINNED POINT PROCESS MODELS
J. Eisaguirre

3:10 GPS VIDEO COLLARS PROVE A POWERFUL TOOL FOR COLLECTING CARIBOU DATA
G. Coulombe+

3:30 REMOTE SENSING OF JUNIPER INTRUSION INTO SAGEBRUSH: UAS EFFICACY & LIMITATIONS
S. Sullivan*+

3:50 BREAK

4:00 pm - 5:00 pm **POSTER SESSION**
N. Fowler, Moderator

POSTERS

ALASKA DEPARTMENT OF FISH AND GAME – WILDLIFE HABITAT AND SPATIAL ANALYSIS PROGRAM (WHESAP) UPDATE
R. Adam

EXPLORING NOVEL TECHNOLOGIES TO ASSESS SPOTTED SEAL TERRESTRIAL ECOLOGY IN THE ALASKA CHUKCHI AND BEAUFORT SEAS
M. Connor*

POPULATION DYNAMICS OF CANADA LYNX IN AN URBAN ENVIRONMENT
K. Young

PREMATURE INCISOR EDENTULISM IN MOUNTAIN GOATS ON THE KENAI PENINSULA: FREQUENCY AND POTENTIAL CAUSES/CONSEQUENCES
T. McDonough

** denotes student*
+ denotes virtual presentation

Tuesday, April 16 (continued)

POSTERS

ASSESSING THE IMPACTS OF ANTHROPOGENIC NOISE ON CARIBOU BEHAVIOR: AN INNOVATIVE APPROACH COMBINING AI AND TRADITIONAL OBSERVATIONS
M. Plichta*

RED-TAIL HAWK AND SHORT-EARED OWL SPACE USE IN ALASKA
J. Rothleder*

EVALUATING MECHANISMS OF DECLINE IN A BOREAL-BREEDING AERIAL INSECTIVORE USING INTEGRATED POPULATION MODELS
J. Wagner*

QUANTIFYING BEHAVIOR AND DIET IN GREY WOLVES USING VIDEO COLLARS
J. Polasik

BULL MOOSE SEASONAL MOVEMENT & DISTRIBUTION IN INTERIOR ALASKA
F. Rosenbower

HUMAN-BEAR CONFLICT IN JUNEAU, AK: DIFFERING DEFINITIONS, DRIVERS, AND DESIRED SOLUTIONS
B. Wold*

RELATIONSHIPS BETWEEN HUMAN AND BEAR ABUNDANCE AT THE ANAN WILDLIFE OBSERVATORY IN SOUTHEAST ALASKA
K. McCarthy*

5:00 WRAP UP AND ANNOUNCEMENTS
R. Mollnow

6:00 pm - 10:00 pm **BANQUET AND AWARDS CEREMONY -** The Nave
Keynote Speaker: J. Lewis-Nicori (Navigating the New Arctic Community Office)

Wednesday, April 17

The Nave

8:30 am - 11:20 am **SESSION C: MANAGEMENT, SUBSISTENCE AND DISEASE IN A CHANGING WORLD**
S. Finnegan, Moderator

8:30 WELCOME AND OPENING REMARKS
R. Mollnow

8:40 PATTERNS OF GENE FLOW IN HOARY MARMOTS (*MARMOTA CALIGATA*)
N. Hamilton

9:00 RECENT AVIAN MORTALITY EVENT IN THE NEAR ISLANDS: THE POTENTIAL ROLES OF ALGAL BIOTOXINS AND AVIAN INFLUENZA
E. Byrd*

** denotes student*
+ denotes virtual presentation

Wednesday, April 17 (continued)

9:20 CHANGES IN SUBSISTENCE USES OF WILD GAME IN KODIAK COMMUNITIES
J. Keating

9:40 OPPORTUNITIES AND CHALLENGES OF USING CAMERA TRAPS TO MONITOR ARCTIC WILDLIFE
S. Leorna

10:00 BREAK

10:20 ASSESSING ADAPTIVE GENETIC VARIATION OF WOLVERINES ACROSS WESTERN NORTH AMERICA
E. Stacy*+

10:40 WOOD BISON RESTORATION PROJECT
L. Rogers+

11:00 ACUTE PHASE RESPONSES IN FREE-RANGING CARIBOU (*RANGIFER TARANDUS GRANTI*) IN DIAGNOSIS OF A BRUCELLOSIS OUTBREAK
K. Beckmen+

11:20 BREAK

11:30 **BUSINESS MEETING: UPDATES FROM THE EXECUTIVE BOARD, ELECTIONS**

12:00 LUNCH **BUSINESS MEETING CONT. (PIZZA PROVIDED)**

1:00 pm - 2:20 pm **SESSION D: MOOSE ECOLOGY AND MANAGEMENT II**
C. Heun, Moderator

1:00 INTEGRATING PHYSIOLOGY AND NUTRITION INTO MOOSE RESEARCH AND MANAGEMENT
D. Thompson

1:40 CHANGING SNOW CONDITIONS ARE CHALLENGING MOOSE MONITORING TECHNIQUES IN ALASKA
A. Reinking*

2:00 DEMOGRAPHY AND DEMOGRAPHIC DRIVERS IN A SUBARCTIC MOOSE POPULATION
K. Colson

2:20 BREAK

2:40 pm - 4:00 pm **SESSION E: ANIMAL ECOLOGY AND MOVEMENT**
A. Underwood, Moderator

2:40 BEHAVIORAL RESPONSE OF POLAR BEARS TO AIRCRAFT ACTIVITY ON THE NORTHERN COAST OF ALASKA
G. Quigley*

** denotes student*
+ denotes virtual presentation

Wednesday, April 17 (continued)

3:00 CHARACTERIZING COASTAL WOLF FORAGING ECOLOGY IN THREE ALASKA NATIONAL PARKS
K. Griffin

3:20 TRACKING FALL MIGRATION OF BANK SWALLOWS (*RIPARIA RIPARIA*) FROM ACROSS NORTH AMERICA WITH AUTOMATED RADIO TELEMETRY
E. Allaby

3:40 DNA METABARCODING PROVIDES INSIGHT TO SPATIOTEMPORAL PATTERNS OF SITKA BLACK-TAILED DEER (*ODOCOILEUS HEMIONUS SITKENSIS*) DIET THROUGHOUT THE TONGASS NATIONAL FOREST
C. Goodfellow[+]

4:00 BREAK

4:20 pm - 5:00 pm **John Trent: In Memorium**
C. Wardlow

5:00 WRAP UP AND ANNOUNCEMENTS
R. Mollnow

Dall sheep (Jeff Wagner)

** denotes student*
[+] denotes virtual presentation

ALASKA CHAPTER OF THE WILDLIFE SOCIETY
2024 ANNUAL MEETING
MOVEAPPS WORKSHOP

The Nave
April 15th 9 am - 3 pm
Pre-registration required

MoveApps (www.moveapps.org) is a free, no-code data analysis platform designed to make sophisticated analytical tools more accessible. This half-day workshop will teach participants how to build workflows of multiple customizable Apps to analyze, visualize, and summarize animal tracking data. Hands-on sessions will incorporate recently-developed Apps and new functionality. The Apps are created by the MoveApps team and the broader community in R, R-Shiny, Python; other languages can be integrated. Types of analysis possible include; resource selection functions, kernel density estimations, continuous time movement models, estimating parturition and many more. This is a great tool for biologists looking to do some analysis and don't have such a strong coding background.

Instructor

Ashley Lohr, Movebank / North Carolina Museum of Natural Sciences

Ashley is a wildlife biologist turned project coordinator for Movebank and MoveApps, open platforms for animal tracking and bio-logging data management and analysis. She regularly engages with users, site developers, and partners to help improve the platforms' services and data quality. This includes user support; planning, testing, and documenting new features; and leading and coordinating communication and outreach efforts. She enjoys supporting conservation efforts by helping wildlife researchers and managers organize their data on Movebank, and by providing training in the various tools offered by Movebank.

GUEST SPEAKERS

Plenary Speaker

DR. JEREMY LITTEL

Alaska climate futures: common themes, regional differences, and potential surprises for assessment and adaptation

Jeremy Littell is a USGS climate impacts ecologist at the Alaska Climate Adaptation Science Center in Anchorage, Alaska. His research focuses on the effects of climate change on climate and ecosystems, including fire, forests, tree-growth and treelines. He also collaborates to create, translate, and provideclimate change information more useful to and used by decision makers, managers, and planners working on vulnerability and impacts assessments as well as adaptation planning.

Banquet Keynote Speaker

JESSICA KAAGYUGAQ LEWIS-NICORI

Kaagyugaugua, kassatun Jessica Lewis-Nicori, Caputnguarmiungunga, NNA-CO-mi calituunga Indigenous Engagement Coordinator-aulua Alaska Pacific University-m Community Extension Office-aani. Anglillruama Caputnguarmi, nunam arrcaqaullra nallunritaqa. Wildlife Biology and Conservation-amek-llu elitnaullruunga UAF-ami, cali-llu elitnauristengurtellrulua high school science-amek. Taukut eliitellrenka, cali-llu eliiqurallrenka aturluki ikayuutnguciiqua NNA-CO-mun.

Jessica Kaagyugaq Lewis-Nicori is Yup'ik from Chefornak and serves the Navigating the New Arctic Community Office (NNA-CO) as the Indigenous Engagement Coordinator. She supports the Community Extension Office at APU's goals using her background in Wildlife Biology and Conservation, secondary education, and gained knowledge of ecosystem workings, including the importance of the land, that come with growing up in a Yup'ik small community to support the NNA-CO.

ABSTRACTS

Tuesday, April 16

SESSION A: MOOSE ECOLOGY AND MANAGEMENT I (9:50 AM - 11:10 AM)

Session Moderator: Jeff Wagner

9:50 am

ANALYSIS OF HUNTER REPORTED DATA VERSUS SEALER COLLECTED DATA ON MOOSE ANTLERS IN THE KENAI PENINSULA DURING REGULATORY YEARS 2012-2022

Sarah M.D. Newberry, Nicholas L. Fowler, Jacob S. Pelham, Jeffrey S. Sellinger

Alaska Department of Fish and Game, Soldotna. Contact: sarah.newberry@alaska.gov

Abstract: Moose harvest in Alaska occurs via general season bull harvest hunts with variable antler point and configuration restrictions. In Game Management Units 7 &15, the Kenai Peninsula, the regulations surrounding general moose harvest have undergone a variety of changes since the regulatory year 2011. Legal animals were defined as having a spike or fork antler, or 50-inches width during 2001-2010; 2011- 2012 was defined as 50-inches width or 4 brow tines on at least one side; 2013-2018 regulations increased to include take of spikes, 50-inches width, or 4 brow tines. Current restrictions of spike antler, 50-inches width, or 3 brow tines were approved in the regulatory year 2019. The Alaska Board of Game required mandatory antler sealing by Departmental staff in 2012 and Moose Hunter Orientation requirements as of 2017 for GMUs 7 & 15. These actions were reportedly to reduce harvest of younger age bulls in response to declining bull to cow ratios, and concerns over sublegal take. The mandatory sealing period provided higher resolution harvest data and interference regarding commonly held assumptions surrounding moose harvest. We examined the following questions: is there a difference between hunter-reported and sealer-recorded antler widths? Were there trends in determining legality with regulation changes? Is there a difference between hunter-reported and sealer-recorded brow tine counts? Preliminary data shows there was no significant difference found between hunter and sealer recorded antler widths except during 2017 and 2020. Analysis of the sealing data shows a higher percentage of spikes harvested prior to the 3-brow tine restriction. Since 2019 at least half have been legal by brow tines. The proportion of brow tines does vary with time and slightly between hunter data and sealing data. These analyses provide insight into the efficacy of hunter reported data regarding resolution and accuracy.

Red-necked phalarope (Jeff Wagner)

** denotes student*
⁺ denotes virtual presentation

10:10 am

EVALUATING CONGRUENCY OF GEOSPATIAL POPULATION ESTIMATION OF MOOSE ABUNDANCE AND STOCHASTIC LEFKOVITCH MATRIX POPULATION INDICATORS

Nicholas L. Fowler[1], Daniel P. Thompson[2], Thomas McDonough[3], John Crouse[2], Ori Badajos[3]

Alaska Department of Fish and Game ([1]Soldotna, [2]Kenai Moose Research Center, [3]Homer,). Contact: nick.fowler@alaska.gov

Abstract: Enumerating moose abundance and density has practical value in administering hunting regulation, policy formulation, and population management as well as heuristic value in understanding ecological processes. Throughout much of Canada and Alaska, estimating moose abundance is typically performed via aerial survey data and modeled via kriging and extrapolation from surveyed areas employed within the geospatial population estimator (GSPE) protocol. However, aerial surveys are expensive, prone to a variety of latent potential biases, risky to aviators and observers, and when not regularly conducted provide only a snapshot of the population. As part of a two long-term research projects evaluating moose populations on the Kenai Peninsula, we established stochastic stage Lefkovitch matrices across two game management units and ten moose bio-years (years: 2012–2022, > 500 adult and calf moose survival and reproductive years). We evaluated accuracy of Lefkovitch matrices stable age distributions from two independent data sources: a localized cow harvest (n = 209) and sample of moose killed in motor vehicle accidents (n = 228). Projecting populations from historical GSPE abundances with bio-year specific lambda estimates indicates generalized trend agreement between these two methods providing not only abundance estimates but also population trajectory estimators in two separates subunits (GMU 15B, GMU 15C). Beyond evaluating accuracy of GSPE techniques with independent data sources, this investigation may be used to consider efficacy of techniques to evaluate moose populations and demography when resources are limited or aerial surveys are sporadically accomplished.

10:30 am

UTILIZING IMAGE-BASED METRICS TO ASSESS MOOSE ANTLER DEVELOPMENT

Jacob Pelham[1], Daniel P. Thompson[2], Jason Herreman[3], Nick Fowler[1], Jeff Selinger[1]

Alaska Department of Fish and Game ([1]Soldotna, [2]Kenai Moose Research Center, [3]Homer,). Contact: jacob.pelham@alaska.gov

Abstract: The Alaska Department of Fish and Game regulates moose harvest based on antler width, brow tine count, and spike or fork configuration. However, these antler metrics can vary within a moose population due to factors such as genetics and nutrition. Antler restrictions on the Kenai Peninsula were implemented in 1978 in response to a declining moose population. More recently, large-scale wildfires have changed the nutritional landscape for moose in the northern Kenai lowlands. To investigate how nutritional availability impacts antler development and determine the age at which a bull becomes eligible for harvest, we developed a non-invasive image-based measurement method to track antler growth as a nutritional metric. Over a span of 3 years (2020–2022), we photographed 224 hunter- harvested moose antlers with known measurements (antler and pedicle width) at distances of 7.62, 15.24, and 22.86 meters. Antler and pedicle width were measured (in pixels) on all photos to establish a correlation between known and estimated antler metrics. In 2018, we started weighing 10-month-old bull calves, and since 2020, we've fitted 88 with GPS collars. Each autumn, we utilize a helicopter to photograph collared bulls to estimate antler width and count brow tines from a height of approximately 20 meters. Presenting mid-study findings, we showcase how these methods deepen our understanding of the impact of forage quality on antler development and legal bull age structure. While it is commonly believed that 1.5-year-old bulls will exhibit a spike antler configuration, current analysis reveals that palm-palm configurations are predominant. Additionally, the (cont.)

** denotes student*
+ denotes virtual presentation

development rate is highest between 1.5- year-old and 2.5-year-old bulls, suggesting a high level of nutritional availability in the habitat being utilized. The information collected on antler development will contribute to the evaluation of other potential management strategies aimed at maintaining optimal herd quality and age structure.

10:50 am

IMMEDIATE EFFECTS OF WILDFIRE ON MOOSE HARVEST

Todd J. Brinkman[1], Jennifer I. Schmidt[2], Thomas F. Paragi[3]

[1]Institute of Arctic Biology, University of Alaska Fairbanks, [2]Institute of Social and Economic Research, University of Alaska Anchorage, [3]Alaska Department of Fish and Game .
Contact: tjbrinkman@alaska.edu

Abstract: Qualitative studies have suggested that forest changes following a wildfire can challenge a hunter's ability to harvest big game, such as moose (Alces alces). Quantitative effects have not been estimated. Given the increasing prevalence of wildfires, the strong linkages between wildfire and moose habitat, and the importance of moose to the people of the boreal region of North America, our goal was to assess if and how moose harvest patterns changed immediately following a wildfire. To address that goal, we used 36 years (1984-2019) of spatially-explicit wildfire and moose harvest data in Alaska to compare moose harvest variables the year before and year after a wildfire occurred. With a few exceptions, the number of hunters, kills, and success rates were similar ($P>0.05$, Effect size<0.3) between pre- and post-wildfire years. We estimated a weak to moderate effect on change in moose hunter numbers, kills, and success rate in only a small percentage (1.5%) of wildfires that burned a very large proportion (>38%) of a moose harvest reporting unit. Our findings suggest that hunter challenges related to recent wildfires have not yet elevated to a functional quantitative effect that may exceed hunters' ability to harvest moose.

Black bear (Jeff Wagner)

** denotes student*
+ denotes virtual presentation

SESSION B: ADVANCES IN TECHNOLOGY FOR WILDLIFE MANAGEMENT (1:30 PM - 3:50 PM)

Session Moderator: Alex Lewis

1:30 pm

INFERENCES ABOUT SUMMER DIETS OF BARREN-GROUND CARIBOU FROM DNA METABARCODING AND VIDEO CAMERA COLLARS

Heather Johnson[1], Gabrielle Coulombe[1], Layne Adams[1], Colleen Arnison[2], Perry Barboza[3], Martin Kienzler[4], William Leacock[5], Michael Suitor[4]

[1]USGS Alaska Science Center, [2]Parks Canada, [3]Texas A&M University, [4]Yukon Government, and [5] USFWS Arctic National Wildlife Refuge. Contact: heatherjohnson@usgs.gov

Abstract: Declines in several barren-ground caribou herds across the North American Arctic have raised concerns about the influence of climate change on caribou forage conditions. Forage is a primary driver of barren-ground caribou behavior and population dynamics, and variation in summer forage resources has been associated with shifts in caribou habitat-use patterns, distributions, and demographic rates. Despite the importance of summer forage for barren-ground caribou, there is limited recent information about the specific items they consume, and uncertainty about appropriate methods for identifying key food items. Wildlife biologists are increasingly using fecal DNA metabarcoding and video camera collars to assess the diets of large animals, but comparative studies of these two approaches are lacking. We used both fecal metabarcoding and video collars to identify the summer diet of the Porcupine caribou herd, which spans the Alaska – Yukon border. In 2021, we sampled the diets of adult females by concurrently collecting fecal samples and observing collar videos during 4 summer sampling occasions. We found that caribou exhibited strong preferences for specific forage items, and those items varied markedly across the Arctic growing season. Caribou predominantly consumed graminoids and lichens during early summer, and shrubs and forbs later in the season. Metabarcoding and video data provided significantly different estimates of the diet for all taxonomic levels we evaluated, and inferences from the two approaches were often disparate. Metabarcoding failed to detect some items frequently consumed in videos, such as lichens, and indicated high use of other items rarely consumed, such as mosses. We found that video data provided greater taxonomic diversity and resolution for vascular plants and lichens, yielded more reliable information about the relative use of different forage items, and more closely corroborated past research than data from fecal metabarcoding.

Lesser yellowlegs (Arin Underwood)

** denotes student*
+ denotes virtual presentation

1:50 pm

LEANING INTO NEW TECHNOLOGIES FOR WILDLIFE MANAGEMENT: COMPARISONS ON THE USE OF THERMAL DRONES AND CAMERA TRAPS FOR STUDYING SITKA BLACK-TAILED DEER.

Shannon P. Finnegan[1], Amael Hinojo[2], Sarah. Monod[2], William A. Wall[3], Peter Olsen[1], Maximilian L. Allen[4]

[1]Koniag Incorporated, [2]FauneNatur Sàrl, [3] Sustainability, Inc., and [4]Illinois Natural History Survey, Prairie Research Institute, University of Illinois.
Contact: sfinnegan@koniag.com

Abstract: Estimating wildlife population densities remains one of the biggest challenges in wildlife management and conservation. This is particularly true for wild game species, which are often subject to heavy harvest pressure and are an important food and economic resource to many remote communities. Currently no information exists on the population size and dynamics of Sitka black-tailed deer (*Odocoileus hemionus sitkensis*) on Afognak Island, Alaska. Commercial timber harvest has altered habitat structure across the island, and likely affected the availability of forage to deer. Predicted future reductions in browse quality are likely to reduce important habitat for deer, therefore understanding population trends over time is vital for adaptive deer management. We compared the use of thermal imaging drone surveys and camera traps for estimating deer population density. We deployed 26 camera traps on Afognak Island which remained in the field from 1 September until 6 October 2022. We conducted three drone surveys during the same period to obtain deer counts and identify sex composition. The estimated density from the spatial capture recapture (SCR) models was 3.7 males ± 0.8 (SE) males/km2 and 14.1 ± 3.1 adults/km2. Results from the drone surveys produced comparable estimates of 3.8 males/km2 and 15.2 adults / km2. The similarity in results suggests both methods converged on an accurate seasonal representation of the population in this logged habitat. We suggest drones are a useful tool in wildlife management and discuss the benefits and limitations of this advancing technology. We also discuss other applications of drones in wildlife management, such as for studying brown bear (*Ursus arctos*) populations.

2:10 pm

THE POWER OF SOUNDSCAPE MONITORING IN THE ARCTIC

Megan Perra*[1], Enis Çoban[2], Todd Brinkman[3], Natalie Boelman[4], Shawn Crimmins[3], Amanda Dumond[5], Amélie Roberto-Charron[6], Jan Adamczewski[7], Glen Liston[8], Adele Reinking[8], Michael Mandel[2], Ophélie Couriot[1], Eliezer Gurarie[1]

[1]State University of New York College of Environmental Science & Forestry, [2]City University of New York, [3]University of Alaska Fairbanks, [4]Columbia University, Yukon, [5]Kugluktuk Angoniatit Association, [6]Wildlife Preservation Canada, [7]Government of the Northwest Territories, and [8]Colorado State University.
Contact: mperra@syr.edu

Abstract: Soundscape monitoring is a valuable tool that can help quantify changes in land-use and wildlife activity. We present case studies from the Alaska/Yukon North Slope and the Bathurst Inlet area of Nunavut that demonstrate the utility of stationary acoustic recording units (ARUs). Along with our partners, we deployed over 50 ARUs across the Alaska/Yukon North Slope in spring 2019 and 90 ARUs in the Bathurst Inlet of Nunavut in spring 2021. These monitoring efforts generated approximately 30 TB of data that we processed using our own sound classification model. We accurately distinguished between the sounds of human and wildlife activity, and—using meteorological products from SnowModel and ERA5—identified the relationship these sounds have with each other and the environment around them. As wildlife sounds in all areas were almost entirely composed of bird calls, we chose to examine the factors responsible for variation in bird detections. We found a clear negative relationship between bird calls and human activity on the Alaskan North Slope, where we were less likely to detect birds when human activity also was (cont.)

** denotes student*
+ denotes virtual presentation

detected. Surprisingly, distance to human infrastructure appeared to have no significant impact on bird detections. These results suggest the acoustic footprint is more relevant than anthropogenic features to avian communities. In the Bathurst Inlet area there was little human activity, so no clear relationship could be identified; data from all regions showed that bird calls had a demonstrable relationship with climate variables, particularly air temperature, snow depth and cover, and volumetric soil water. Based on model results for each region, we used Integrated nested Laplace Approximation (INLA) to predict occurrence of human and bird sounds across the landscape. These predictions can help create comparative soundscape data layers to evaluate responses in less vocal, coincident species, such as caribou.

2:50 pm

ESTIMATING SPATIALLY EXPLICIT SURVIVAL AND MORTALITY RISK FROM TELEMETRY DATA WITH THINNED POINT PROCESS MODELS

Joseph M. Eisaguirre[1], Madeleine G. Lohman[2], Graham G. Frye[3], Heather E. Johnson[1], Thomas V. Riecke[4], Perry J. Williams[2]

[1]USGS Alaska Science Center, [2]University of Nevada Reno, [3]University of Alaska Fairbanks, and [4]University of Montana. Contact: jeisaguirre@usgs.gov

Abstract: Mortality risk and survival of animals often vary spatially and can be linked to how animals use landscapes. Numerous studies collect telemetry data on animals, but the focus is often on the periods when those animals are alive. We introduce a thinned spatial point process (SPP) modeling framework that couples relative abundance and space use with a mortality process to formally treat the occurrence of mortality events across the landscape as a spatial process. We show how this model can be embedded in a hierarchical statistical framework and fit to telemetry data to make inferences about how spatial covariates drive both space use and mortality risk. We apply the method to two data sets to study the effects of roads on spatially explicit mortality risk: (1) VHF telemetry data collected for willow ptarmigan in Alaska, and (2) hourly GPS telemetry data collected for black bears in Colorado. These case studies demonstrate the applicability of this method for different species and data types, making it broadly useful in enabling inferences about the mechanisms influencing animal survival, while formally treating survival as a spatial process, especially as the development and implementation of joint analyses continues to progress.

Fox kit (Jeff Wagner)

3:10 pm

ESTIMATING SPATIALLY EXPLICIT SURVIVAL AND MORTALITY RISK FROM TELEMETRY DATA WITH THINNED POINT PROCESS MODELS

Gabrielle Coulombe[+1], Heather Johnson[1], Michael Suitor[2], Martin Kienzler[2]

[1]USGS Alaska Science Center and [2]Yukon Goverment. Contact: gcoulombe@usgs.gov

Abstract: Changing climate conditions and human land use are rapidly altering arctic ecosystems, raising concerns about the future of barren-ground caribou populations. However, collecting detailed data on barren-ground caribou is difficult, due to the expansive and remote landscapes they inhabit. To better understand how caribou are responding to changing summer conditions, we deployed GPS video collars on caribou from the Porcupine Herd spanning the Alaska-Yukon border. The collars recorded 9-second videos throughout daylight hours from May to August 2018–2022. We developed a "Caribou Video App" to streamline data collection from the video footage by internal and external observers, enabling collaborators, technicians, and citizen scientists to score videos for caribou activity, insect avoidance behaviors, habitat conditions, and reproductive success. The app enables observer-specific access to assigned (pre-randomized) videos and includes a video player, data entry form, and link to the protocol and a reference video library. To ensure consistent data collection, observers completed a training and evaluation process, and were able to flag videos for expert review while scoring. Videos classified as "foraging" were then scored by experienced botanists to identify the food items consumed by caribou. We scored >42,000 videos from 89 caribou-years, and botanists have so far identified >12,000 food items consumed in >8,000 foraging videos. We will present key findings from the video data, highlighting the influence of summer and annual variation in habitat conditions on caribou behavior. We found that video collars prove a powerful tool for collecting a variety of data on a wide-ranging, remote, and otherwise largely inaccessible barren-ground caribou herd.

3:30 pm

REMOTE SENSING OF JUNIPER INTRUSION INTO SAGEBRUSH: UAS EFFICACY & LIMITATIONS

Steven Sullivan*[+]

Portland Community College. Contact: sullthalweg@gmail.com

Abstract: Greater sage grouse (*Centrocercus urophasianus*) populations in SE Oregon and across the intermountain west continue to decline. Causes include non-sustainable grazing practices, the creep of utility and communication infrastructure (that provides roosts for avian predators), and the intrusion of western juniper into sagebrush habitat due to fire suppression. Western juniper (Juniperus occidentalis) is highly effective at water and nutrient uptake, thus out-competing sagebrush, and provides roosts for raptors and ravens (Corvus corax), the latter of which is a primary predator of sage grouse, feeding on eggs. Removal funding is available through the Farm Bill and satellite imaging is currently used to monitor and prioritize sites for removal. Yet, the lower resolution of satellite imagery leaves two questions unanswered. (1) How many trees are there and of what size (critical for budgeting removal)? And (2) can smaller juniper be detected that would allow earlier and less-expensive intervention. This study analyzes a half BLM square (1/2 sq. mi.) five miles north of Brothers, Oregon. A DJI Mavic 3 Multispectral UAS was flown at 400' over a 20 acres test plot. 16-bit R,G,B, RE and NIR bands were recorded. Several image classification techniques where tested with object-based, supervised classification yielding the best results. 559 juniper were detection, most less than 2' tall, and otherwise obscured from human view by sage brush. Resolution sub-2".

** denotes student*
[+] denotes virtual presentation

Wednesday, April 17

SESSION C: MANAGEMENT, SUBSISTENCE, AND DISEASE IN A CHANGING WORLD

(8:40 AM - 11:20 AM)

Session Moderator: Shannon Finnegan

8:40 am

PATTERNS OF GENE FLOW IN HOARY MARMOTS (*MARMOTA CALIGATA*)

Natalie M. Hamilton[1], Nicholas J. Kerhoulas[2], Aren M. Gunderson[1], Link E. Olson[1]

[1]University of Alaska Museum, University of Alaska Fairbanks, and [2]Humboldt State University. Contact: nmhamilton2@alaska.edu

Abstract: Several species of marmots from North America's Pacific Northwest (PNW) are dependent on or associated with alpine habitats, which are considered especially vulnerable to climate change. The Hoary Marmot has the broadest range, with populations found throughout much of the PNW and Rocky Mountains. Previous studies using mtDNA recovered reciprocally monophyletic coastal and continental clades, which are thought to have originated from two different Pleistocene refugia. However, studies using nuclear DNA do not recover this pattern. Mito-nuclear discordance may be a result of sex-biased gene flow, introgression, or incomplete lineage sorting. As a first step in untangling the complex history of gene flow and mechanisms underlying this mito-nuclear discordance in Hoary Marmots, we used nine microsatellite loci and population genetics tools to examine patterns of gene flow among the two previously identified mitochondrial clades. Then to further explore factors impacting gene flow, we use species distribution modeling and a landscape genetics approach. Population structure analyses revealed gene flow among clades and a complex interaction between elevation, overwater dispersal, and geographic distance. This suggests that dispersal is limited by different factors depending upon scale and location. Evidence of gene flow, the discord between geographic distribution of mitochondrial clades, as well as the structuring of the nuclear data suggests mito-nuclear discordance is driven by male-biased gene flow. Overall, both our species distribution modeling and landscape genetics analyses emphasize the relationship between Hoary Marmot distribution and elevation across its range. Given the species' potential vulnerability to a warming climate, further investigation is warranted to clarify potential mechanisms behind this landscape-genetic relationship, and how this relationship changes at different spatial scales.

9:00 am

RECENT AVIAN MORTALITY EVENT IN THE NEAR ISLANDS: THE POTENTIAL ROLES OF ALGAL BIOTOXINS AND AVIAN INFLUENZA

Elizabeth Byrd*, Douglas Causey, Eric Bortz

Department of Biological Sciences, University of Alaska Anchorage. Contact: hebyrd@alaska.edu

Abstract: In our rapidly changing climate, harmful algal blooms (HABs) have emerged as a growing threat to the health of seabirds. The specific biotoxins produced by some algal species, such as saxitoxin (STX) and domoic acid (DA), are ultimately fatal at high concentrations. Due to the fact that biotoxins are often only detected in seabirds post-mortem, there is very little understood about what the sublethal effects of biotoxins may be in these organisms. Specifically, there is a lack of comprehensive understanding regarding symptoms the birds undergo before reaching the point of death. The process of how algal toxins bioaccumulate in seabirds, if at all, also remains unknown. Between late July and early August 2023, we conducted a comprehensive survey of land and waterbirds in the Near Islands (Agattu I, Attu I, (cont.)

Alaid-Nizki I, Shemya I) located in the far Western Aleutian Islands archipelago. In conjunction with population assessments of coastal breeding birds made by staff and volunteers of the Alaska Maritime NWR, we surveyed and collected target species as part of ongoing studies on their population genomics and disease ecology. During the expedition, we observed and collected specimens of several breeding species, including Common Murres, Glaucous-winged Gulls, Black-legged Kittiwakes, Pigeon Guillemots, and Tufted Puffins. Concurrently, there was a significant algal bloom. Some of these individuals were dead or in distress, exhibiting symptoms such as respiratory difficulties and uncoordinated muscular movements. In contrast, other breeding species (Pelagic and Red-faced Cormorants, Aleutian Terns, Marbled and Kittlitz's Murrelets, Whiskered Auklets, Horned Puffins, and Northern Fulmars) appeared unaffected, as did many individuals of the affected species. After collection and swabbing for avian influenza virus, which was present in many specimens, all were necropsied. We focused our analysis on liver and gastrointestinal contents and used enzyme-linked immunoassays (ELISA) to detect the presence of algal biotoxins. We will high-performance liquid chromatography (HPLC) to quantify the concentrations of different saxitoxin congeners and domoic acid. We present the preliminary results of an investigation into algal biotoxin as a potential cause of mortality, with plans to further analyze potential sublethal effects. The observation that not all species nor individuals were affected raises questions about whether this event represents a minor mortality occurrence, the beginning of a potentially escalating event, coincident with presence of AIV or HPAI, or variations in individual tolerance levels to biotoxin exposure if algal biotoxins are found to be the causative factor.

9:20 am

CHANGES IN SUBSISTENCE USES OF WILD GAME IN KODIAK COMMUNITIES

Jacqueline Marie Keating, Lauren Sill, Christian Woodard

Alaska Department of Fish and Game. Contact: jacqueline.keating@alaska.gov

Abstract: Wild foods have always been an integral component of life for communities across the Kodiak archipelago. The ADF&G Division of Subsistence has been working to update comprehensive subsistence harvest estimates for all Kodiak communities to understand changes in harvest composition over time. Notably, the Division conducted 269 comprehensive household harvest surveys for the Kodiak road system for the 2021 study year, which was last surveyed in 1993. This presentation will summarize findings from surveys in Larsen Bay, Akhiok, and Old Harbor (2018 study year), the Kodiak Road System (2021), and Port Lions and Ouzinkie (2022) to analyze changes in subsistence resource harvest and use. In particular, reliance on deer has surpassed the use of marine mammals in multiple remote Kodiak communities, suggesting changes in access, preference, and required hunting skills.

Northern wheatear (NPS/Jared Hughey)

** denotes student*
+ denotes virtual presentation

9:40 am

OPPORTUNITIES AND CHALLENGES OF USING CAMERA TRAPS TO MONITOR ARCTIC WILDLIFE

Scott Leorna, Todd Brinkman

Institute of Arctic Biology, University of Alaska Fairbanks. Contact: sleorna@alaska.edu

Abstract: Camera traps (i.e., remotely triggered cameras) have been used for decades to study wildlife around the world. However, their use in Arctic ecosystems has been limited. The Arctic presents several unique challenges to implementing a landscape-level camera trap study including extreme environmental conditions, remote and difficult to access field sites, and seasonal behavior and distribution of many wildlife species in this region. We present results from a multiyear camera trap project focused on exploring how camera traps can be used to monitor the impact of anthropogenic and environmental changes to wildlife, particularly caribou in Arctic Alaska. We deployed and monitored 40 cameras in Arctic Alaska active from May through August which generated ~1.5 million images per year. Our study area covered the summer ranges of the Central Arctic Caribou Herd in the Prudhoe Bay oilfield region and Porcupine Caribou Herd in the northern portion of the Arctic National Wildlife Refuge. Based on insights gained through our study, we present and evaluate new methods specifically tailored to the challenges of wildlife camera trapping in open landscapes and provide examples of how camera trap data can complement conventional wildlife monitoring strategies in the Arctic. Our project aligns with this year's theme, Science to Prepare for a Changing World by providing new insight on how camera traps can add capacity to landscape-level wildlife monitoring in the Arctic as it continues to experience amplified effects of global warming and increased human development.

10:20 am

ASSESSING ADAPTIVE GENETIC VARIATION OF WOLVERINES ACROSS WESTERN NORTH AMERICA

Elise Stacy*+1, Martin Robards[2], Thomas Jung[3], Piia Kukka[3], Kira Long[1], Jack Sullivan[1], Paul Hohenlohe[1], Lisette Waits[1]

[1]University of Idaho, [2]Wildlife Conservation Society, [3]Yukon Goverment. Contact: estacy@uidaho.edu

Abstract: North American wolverines (*Gulo gulo luscus*) inhabit cold, snowy environments, and threats from climate change and development have prompted conservation concern. Recently, the contiguous United States distinct population segment received protection as threatened under the U.S. Endangered Act (ESA). Genetic studies have assessed the connectivity and diversity of North American wolverine populations, finding fragmentation and low diversity at the southern periphery of their range in the contiguous U.S, while the northern range has high connectivity and high genetic diversity. These studies have only assessed neutral genetic diversity with relatively few genetic loci. With genomic methods, we can evaluate regions of the genome under selective pressure, i.e. adaptive loci. We are currently investigating the degree to which wolverine populations are adapted to local environmental conditions, from high elevation mountainous regions in their southern range to low elevation Arctic tundra in their northern range. We hypothesized that adaptive loci would be associated with elevation, temperature, precipitation, and vegetation, and would near genes related to oxygen transport, metabolism, reproduction, coat characteristics, and thermal regulation. We have genotyped 246 wolverines distributed across Alaska, the Yukon, British Columbia, Alberta, Montana, and Idaho via restriction-site associated DNA sequencing to produce the first single nucleotide polymorphism (SNP) dataset for North American wolverines. After quality filtering, 11,902 SNPs were retained for downstream analyses. Principal component analysis revealed strong population structure between the southern and the northern range. We employed redundancy analysis to evaluate the relationship between environmental predictors and genomic variation. Loci highly associated with environmental predictors (i.e. outlier loci) were used to assess potential differences in adaptive versus neutral population structure. Wolverines from northern Alaska grouped based on outlier loci, and the loci driving this structure were assessed. 3 loci were linked to genes involved in metabolism and oxygen transport.

** denotes student*
+ denotes virtual presentation

10:40 am

WOOD BISON RESTORATION PROJECT

Luke Rollie Rogers[+]

Alaska Department of Fish and Game. Contact: luke.rogers2@alaska.gov

Abstract: American bison (*Bison bison subspp.*), once on the verge of extinction, are recovering in their wild, free-ranging state across North America. The Alaska Department of Fish and Game Wood Bison Restoration Project is leading the reintroduction effort of the subspecies to its native habitat throughout interior Alaska. In this presentation, ADF&G biologists discuss the oral, archeological, and legislative history of the bison in Alaska before providing an update on current research and restoration efforts through videos and photos. Staff conclude with insight into potential future directions of the project and opportunities for interested parties to get involved in the restoration of America's National Mammal.

11:00 am

ACUTE PHASE RESPONSES IN FREE-RANGING CARIBOU (RANGIFER TARANDUS GRANTI) IN DIAGNOSIS OF A BRUCELLOSIS OUTBREAK

Emma R. Rovani-Rhoades[1], Craig S. McConnel[1], **Kimberlee B. Beckmen**[+2], Carolyn Cray[3], Lindsey M. Dreese[2]

[1]College of Veterinary Medicine, Washington State University, [2]Alaska Department of Fish and Game, and [3]University of Miami Miller School of Medicine. Contact: kimberlee.beckmen@alaska.gov

Abstract: Grant's caribou (*Rangifer tarandus granti*) are distributed throughout Alaska, USA and the Yukon, CAN and are an important resource for sustenance and cultural identity of the indigenous peoples of the north. Thus, understanding the drivers of caribou health are vital to maintaining resilient populations. The acute phase response (APR) is an innate immune response activated due to inflammatory stimulus, resulting in changing quantities of acute-phase proteins (APP), including haptoglobin (Hp) and serum amyloid A (SAA). In domestic animals, SAA has demonstrated utility in diagnosing and prognosticating inflammatory disease associated with infection with Brucella species compared to Hp. In this study, banked serum samples from apparently clinically normal free-ranging caribou (reference group) were used to establish reference intervals (RI) for Hp and SAA in caribou. These RIs were compared to additional samples from a caribou herd in known decline and with known Brucella suis biovar 4 infection. The RIs for Hp and SAA with 90% upper confidence intervals were 0.12-1.028 (1.27) mg/dL and 0.1-18.44 (31.00) mg/dL. Serum amyloid A levels in the declining herd which was experiencing signs of clinical disease from brucellosis, were found to be different from the reference group ($p=0.009$), while no difference was found in Hp levels between the two herds ($p=0.389$). Meanwhile, SAA and Hp levels in animals with B. suis biovar 4 complement fixation titers 1:80 were significantly different from the reference group (SAA $p<0.001$; Hp $p=0.178$). To our knowledge, this is the first analytical validation and establishment of reference values for SAA and Hp in caribou. The results of our study indicate that SAA and Hp hold promising utility in monitoring herd health of caribou in Alaska. Future studies should explore the effects of seasonal physiologic changes, capture methods, and various viral, bacterial, and parasitic infections on Hp and SAA in caribou.

Denali swallowtail
(NPS/Jared Hughey)

** denotes student*
[+] denotes virtual presentation

SESSION D: MOOSE ECOLOGY AND MANAGEMENT II (1:00 PM - 2:20 PM)

Session Moderator: Christi Heun

1:00 pm

INTEGRATING PHYSIOLOGY AND NUTRITION INTO MOOSE RESEARCH AND MANAGEMENT

Daniel P. Thompson[1], John Crouse[1], Thomas McDonough[2], Ori Badajos[2], Nick Fowler[3]

Alaska Department of Fish and Game ([1]Kenai Moose Research Center, [2]Homer, [3]Soldotna). Contact: dan.thompson2@alaska.gov

Abstract: Northern ungulates rely on somatic reserves accumulated during the growing season for energy and protein demands for survival, gestation, and lactation during winter, spring and early summer. We evaluated how somatic energy reserves, measured as ingesta free body fat, influenced moose (*Alces alces*) survival and reproduction on the Kenai Peninsula, Alaska from 2012–2023. We did not find any difference in somatic energy reserves in early or late winter, or rate of use of somatic energy reserves, by age in adult female moose (4–14 years old). Female moose in early winter with higher somatic energy reserves had a higher probability of being pregnant ($\chi^2 = 9.31$; $P = 0.002$) and having twins ($\chi^2 = 9.72$; $P = 0.002$) the following spring. Similarly, female moose with higher somatic energy reserves in early winter had a higher rate of somatic energy reserve use over winter ($F_{1,192} = 682.2$; $P < 0.001$; $R^2 = 0.70$), resulting in their offspring having a higher probability of being recruited into the population ($\chi^2 = 5.62$; $P = 0.018$) the following year. Furthermore, moose with higher somatic energy reserves in early winter had a higher probability of surviving through the winter ($\chi^2 = 4.57$; $P = 0.033$). Taking the population mean somatic energy reserves, we found a positive correlation with the intrinsic rate of increase (λ) for 3 moose populations on the Kenai Peninsula. Late winter ingesta free body fat of both females without a calf ($F_{1,23} = 12.6$; $P = 0.001$; $R^2 = 0.35$), and those with a calf ($F_{1,13} = 8.1$; $P = 0.014$; $R^2 = 0.39$), predicted the current year λ. With this method, we can estimate the nutritional carrying capacity and population trajectory of a moose population by assessing somatic energy reserves.

Black-capped chickadee (Jeff Wagner)

** denotes student*
[+] denotes virtual presentation

1:40 pm

CHANGING SNOW CONDITIONS ARE CHALLENGING MOOSE MONITORING TECHNIQUES IN ALASKA

Todd J. Brinkman[1], Kalin A. Kellie[1], **Adele K. Reinking*[2]**, Glen E. Liston[2], Natalie T. Boelman[3]

[1]Institute of Arctic Biology, University of Alaska Fairbanks, [2]Colorado State University, and [3]Columbia University. Contact: adele.reinking@colostate.edu

Abstract: Global snow conditions are changing rapidly, with important implications for wildlife managers. For example, the later arrival of snow is challenging managers' ability to conduct aerial Fall moose (Alces alces) surveys, because complete snow cover is required to reliably detect and count moose from an aircraft. With inadequate snow to help generate high-quality moose survey data, it is difficult for managers to determine if they are meeting population goals and optimizing hunting opportunities. We quantified past and future relationships between snow conditions and moose survey success across 7 moose management areas in Alaska using survey data and snow information produced by SnowModel. We found that during the period 1987–2019, mean snow depth was 15 cm (SD = 11) at survey initiation, and snow depths were greater ($P = 0.002$) in years when surveys were completed relative to years when surveys were canceled. Further, we found that mean snow depth during the middle of the survey season (15 November) was the best predictor of whether a survey was completed in any given year. Based on modeled conditions, the mean snow depth on 15 November declined ($P < 0.001$) during 1980–2020 and the magnitude of decline varied among survey areas from 3–10 cm of snow. Likewise, probability of surveying declined over the same period ($P < 0.001$) and the magnitude of the decline varied from 3–10% with the smallest declines occurring in study areas where snow was inherently deeper during the Fall survey season. These findings, coupled with future SnowModel projections, indicated that by 2055, the delayed onset of adequate snow accumulation will prevent completion of moose surveys over roughly 60% of Alaska's managed moose areas. Our findings can help guide management decisions related to future reliability of aerial Fall moose surveys and identify timelines for development of alternate monitoring methods.

2:00 pm

DEMOGRAPHY AND DEMOGRAPHIC DRIVERS IN A SUBARCTIC MOOSE POPULATION

Kassidy E. Colson[1], Amanda Droghini[2], Jeff Stetz[1]

[1]Alaska Department of Fish and Game and [2]Alaska Center for Conservation Science, University of Alaska Anchorage. Contact: kassidy.colson@alaska.gov

Abstract: Despite their cultural and economic importance, Moose (*Alces alces*) in subarctic tundra have received comparably less scientific attention than their boreal or arctic counterparts. In Game Management Units 17B and 17C, located adjacent to Bristol Bay, Alaska, a long-term decline in harvest prompted an in-depth analysis of the drivers of population change, which we present here. Between 2017 and 2021 we radio-marked random aged adult female moose (n = 258 moose years) as well 10-month-old female calves (n = 30) and determined reproductive output, age specific survival, and survival of their calves at heel. Observations of their calves found 11.0% (n = 264, 95% CI 7.7% – 15.3%) of calves were successfully recruited to one year of age, while survival of 3+ year old moose was generally high (Sadult = 91.5%, n = 258, 95% CI 87.4% – 94.3%) and typical of other moose populations not limited by predation on adults. Owing to the low calf survival rates, we radio marked 49 moose neonates in 2021, of which 23 died before June 1 while staff were present to examine mortality sites. All (100%) of those 23 deaths were ascribed to bear mortality. To determine the long-term trajectory of the population, we created a Leslie matrix model (Leslie 1945) structured as a pre-reproduction, female-only model between the ages of 0 and 21. Vital rates were permuted in the matrix model to incorporate uncertainties of those vital rates. Lambda was estimated as 0.979 (95% CI 0.937 – 1.020), representing an 83.8% probability that the population is declining.

** denotes student*
⁺ denotes virtual presentation

SESSION E: ANIMAL ECOLOGY AND MOVEMENT (2:40 PM - 4:00 PM)

Session Moderator: Arin Underwood

2:40 pm

BEHAVIORAL RESPONSE OF POLAR BEARS TO AIRCRAFT ACTIVITY ON THE NORTHERN COAST OF ALASKA

Gwendolyn Quigley*[1], Todd J. Brinkman[1], Ryan Wilson[2], Aaron Christ[2]

[1]Institute of Arctic Biology, University of Alaska Fairbanks and [2]U.S. Fish and Wildlife Service
Contact: gmquigley@alaska.edu

Abstract: The rapid loss of arctic sea ice is forcing a larger proportion of the Southern Beaufort Sea polar bear (*Ursus maritimus*) population to spend more time on land, increasing chances of negative interactions between people and bears. In the United States, the Marine Mammal Protection Act (MMPA) protects polar bears from incidental disturbance from human activities. For the remote and roadless areas of northern Alaska, USA, effective management of small aircraft activity is necessary to limit disturbance, but effects of overflights on polar bear behavior are largely unknown. During 2021 and 2022, we intentionally exposed polar bears (n = 115) to systematic aircraft activity (helicopter, fixed-wing) until we observed a disruption of behavior that qualified as a level B take response (e.g., abrupt change in activity or movement) under the MMPA. We used a Bayesian logistic regression to determine what factors influence and can be used to predict when a polar bear will exhibit a level B take response and estimate the probability of an aircraft eliciting a level B take response at different altitudes above the polar bear. Aircraft type, flight altitude, landscape (barrier islands vs. mainland), and bear behavior (active vs. inactive) upon initial aircraft encounter were all important predictors of take. Probability of take rapidly increased with a decrease in flight altitude starting at 450 m for helicopter and 300 m for fixed- wing aircraft. Active (e.g., standing, walking) polar bears on barrier-island landscapes were more likely to experience take than inactive (e.g., bedded) bears on mainland landscapes. Our findings can help with assessments and management plans by quantifying disturbance to polar bears from current and future human activity that involves aircraft use.

3:00 pm

CHARACTERIZING COASTAL WOLF FORAGING ECOLOGY IN THREE ALASKA NATIONAL PARKS

Ellen Dymit[1], **Kelsey Griffin[2]**, Tania Lewis[2], Gretchen Roffler[3], Buck Mangipane[2], Taal Levi[1]

[1]Oregan State University, [2]National Park Service, and [3]Alaska Department of Fish and Game.
Contact: kelsey_griffin@nps.gov

Abstract: Wolves throughout most of their range are assumed to be obligate ungulate predators, but wolf populations with access to marine resources may demonstrate incredible dietary flexibility. For wolves living on the Gulf of Alaska, unique circumstances of prey availability and geography incentivize foraging in marine environments, where they can capitalize on seasonal salmon pulses, vulnerable marine mammals, and other intertidal prey. We used non-invasive genetic sampling to study wolf foraging and population ecology in three Alaskan National Park and Preserves: Katmai, Lake Clark, and Glacier Bay. Our main objectives were to characterize coastal wolf diets via fecal DNA metabarcoding and to associate those data with individual wolf genetic identities obtained from scats by genotyping with single-nucleotide polymorphisms (SNPs). Our analysis included 1,225 fecal samples and identified ~70 vertebrate prey species consumed by 88 unique individual wolves. While ungulates remain the most common prey for wolves in Lake Clark, Katmai wolves are primarily consuming sea otters and fish, and Glacier Bay wolves are consuming a balance of ungulates and marine prey. These results demonstrate the importance of cross-boundary resource subsidies for (cont.)

terrestrial carnivores in coastal Alaska and showcase wolf dietary plasticity. We posit that sea otter recolonization of the Gulf of Alaska has likely restored a historically present food web linkage between two apex predators with potential cascading effects for both terrestrial and marine food webs.

3:20 pm

TRACKING FALL MIGRATION OF BANK SWALLOWS (*RIPARIA RIPARIA*) FROM ACROSS NORTH AMERICA WITH AUTOMATED RADIO TELEMETRY

Eva Allaby[1], Julie C. Hagelin[1], Sarah Endenburg[2], Jim Johnson[3], Callie Gesmundo[3]

[1]Alaska Department of Fish and Game, [2]Carleton University, and [3]U.S. Fish and Wildlife Service. Contact: eva.allaby@alaska.gov

Abstract: We studied the fall migration of Bank Swallows (*Riparia riparia*), a steeply declining aerial insectivore, in an effort to understand variable population trends and reduce losses across the breeding range. From 2022-2023, we radio tagged 890 birds (99 in Alaska) across 13 sites in Canada and Alaska. Preliminary results from at least 250 birds indicate different migration routes, and we also detected departure times for at least 480 individuals. Birds in Alaska, Yukon and Northern B.C. moved southeast across Alberta and Saskatchewan, while those in Eastern Canada followed Atlantic coast southward, before crossing the Gulf of Mexico into Central America. Birds in southern B.C. followed the Rocky Mountains southward through Montana and Idaho. Southernmost detections occurred in Costa Rica (n = 3). Mean fall departure date for Alaska was 20 July, but any strong latitudinal trend is currently unclear. Multiple migratory patterns may expose different breeding populations of Bank Swallows to different threats. This work represents initial steps towards informing and prioritizing spatially-explicit conservation actions to reverse decline.

3:40 pm

DNA METABARCODING PROVIDES INSIGHT TO SPATIOTEMPORAL PATTERNS OF SITKA BLACK-TAILED DEER (ODOCOILEUS HEMIONUS SITKENSIS) DIET THROUGHOUT THE TONGASS NATIONAL FOREST

Claire Goodfellow*+[1], Philip Manlick[2], Kristin Denryter[3], Taal Levi[1]

[1]Oregan State University, [2]USDA Forest Service, and [3]Alaska Department of Fish and Game. Contact: goodfelc@oregonstate.edu

Abstract: Sitka black-tailed deer (*Odocoileus hemionus sitkensis*) provide a critical food resource for both the local communities and endemic wildlife of Southeast Alaska. However, legacies of commercial logging and subsequent forest succession throughout the region can limit deer forage, and understanding the relationship between these habitat changes and the nutritional ecology of black-tailed deer has proved to be methodologically challenging; traditional methods of diet assessment such as direct observation and rumen analysis are often limited in geographic scope, while microhistological analysis of feces can be biased towards undigestible plant material. Here, we apply a new method, molecular metabarcoding of the DNA in feces, to non- invasively characterize the diets of Sitka black-tailed deer throughout Southeast Alaska's Tongass National Forest. We demonstrate that this method is a high-throughput alternative to traditional diet assessment techniques which can both identify new items in the diets of Sitka black-tailed deer and provide higher resolution taxonomic information about deer diet than was previously possible. Ultimately this work will be used to parameterize a spatiotemporally explicit foraging model for black-tailed deer in Southeast Alaska, refining our understanding of the effects of landscape change on ungulate population dynamics throughout the region.

** denotes student*
+ denotes virtual presentation

Poster Session Abstracts (Tuesday, 4:00 pm - 5:00 pm)

ALASKA DEPARTMENT OF FISH AND GAME – WILDLIFE HABITAT AND SPATIAL ANALYSIS PROGRAM (WHESAP) UPDATE

Ryan Adam, Miles Spathelf, and Doug Beattie

Alaska Department of Fish and Game, Fairbanks. Contact: ryan.adam@alaska.gov

Abstract: Since 2013, the WHESAP program has conducted and facilitated wildlife habitat enhancement and spatial analyses projects throughout Alaska. The Alaska Department of Fish and Game developed the program to provide expertise on wildlife habitat interactions and take on the significant administrative and logistic burdens of conducting prescribed burns, mechanical habitat treatments, and habitat assessments. Many of the methods used for wildlife habitat treatments in Alaska are intended to reset the seral stage of a section of forest to a highly productive early succession condition. This result is achieved by artificially replicating natural systems of forest disturbance. The goal of these treatments is an increase in the production of high-quality forage through vigorous regeneration of nutritious hardwood species and to provide a mosaic habitat that benefits a wide variety of wildlife. These projects also help mitigate the negative impacts from Alaska's history of aggressive wildland fire suppression that has resulted in artificially late seral stage forests. Recent projects have included roller-chopping of aspen in the area around Tok and Fairbanks for moose and ruffed grouse habitat, prescribed burns in Delta Junction for plains bison habitat, mulching of beetle-killed spruce with soil scarification on the Kenai Peninsula for improved access and moose habitat, plains bison habitat monitoring in Farewell. Current and future projects include Alphabet Hills prescribed burn, Delta Junction Bison Range prescribed burn, Palmer Moose Range prescribed burn, Caribou Lake beetle kill restoration, wood bison habitat assessment, Nelchina Caribou Herd movement analysis, brown bear spatially explicit capture-recapture, GIS support for Regions IV, V, Statewide programs, and digital data collection.

EXPLORING NOVEL TECHNOLOGIES TO ASSESS SPOTTED SEAL TERRESTRIAL ECOLOGY IN THE ALASKA CHUKCHI AND BEAUFORT SEAS

Maeghan Connor*[1], Donna Hauser[1], Todd Brinkman[1], Andrew Von Duyke[2]

[1]University of Alaska Fairbanks and [2]North Slope Borough. Contact: mrconnor@alaska.edu

Abstract: Climate-induced environmental change poses a significant threat to ice-associated marine mammal species. In recent years, Indigenous Knowledge (IK) holders in Arctic Alaska have observed shifts in foraging behavior, seasonal movement, and local abundance of harvested Arctic marine mammals. To assess the potential impacts of rapid ecosystem change on Arctic marine mammals, it is necessary to document trends in animal abundance, behavior, and health. However, baseline data are severely lacking for many Arctic species, including the spotted seal (Phoca largha). Challenging weather conditions, financial and logistical constraints, remote and inaccessible habitats, and the highly sensitive nature of this species pose a significant challenge to effective data collection via traditional survey methods including manned aircraft and boats. We plan to use minimally invasive technologies, namely camera traps and small, unmanned aircraft systems (sUAS, commonly referred to as drones), to assess spotted seal ecology at coastal haulouts in the Chukchi and Beaufort Seas. This will be accomplished by analyzing previously collected time-lapse footage (2020-2022) and conducting drone surveys from mid-July to mid-September in 2024 and 2025. This research aims to improve our understanding of how environmental factors, such as wind conditions, substrate availability, and time of day, affect spotted seal terrestrial haulout behavior during the open-water season while simultaneously assessing the feasibility of employing camera traps and drones for ice seal research. To deepen our understanding of spotted seal haulout behavior during the study period, results will be integrated with local environmental observations from IK holders from the nearby community of Utqiaġvik.

** denotes student*
+ denotes virtual presentation

POPULATION DYNAMICS OF CANADA LYNX IN AN URBAN ENVIRONMENT

Kiana Young[1], David T. Saalfeld[1], Colette Brandt[2]

[1]Alaska Department of Fish and Game and [2]Joint Base Elemdorf-Richardson. Contact: kiana.young@alaska.gov

Abstract: Canada lynx (*Lynx canadensis*) exist throughout northern North American and are a species of interest due to their close cyclic relationship with snowshoe hares (*Lepus americanus*) and concern for their population trajectory in the contiguous United States. While lynx are generally thought of as cryptic and avoidant of humans, they do venture into urban areas. In Anchorage, Alaska, lynx can be found within the bounds of the city which leads to increased human-wildlife conflicts. Here, we look at the movement patterns and survival rate of 37 lynx in the Anchorage Bowl that were equipped with GPS-collars. We assess the changes in home range size in accordance with the crash of the hare cycle and causes of mortality of these urban lynx. We determined that as hare populations crash, lynx increase their home range size. Additionally human-caused mortality was high with roadkill and humans killing lynx in Defense of Life and Property being the most common causes of death. While urban environments can act as refugia to lynx due to the lack of trapping, other anthropogenic factors impact lynx survival, ultimately decreasing their survival rate.

PREMATURE INCISOR EDENTULISM IN MOUNTAIN GOATS ON THE KENAI PENINSULA: FREQUENCY AND POTENTIAL CAUSES/CONSEQUENCES

Thomas McDonough

Alaska Department of Fish and Game, Homer. Contact: thomas.mcdonough@alaska.gov

Abstract: The shape and strength of incisor teeth in ungulates are adapted to meet the mechanical demands of food acquisition over time. Tooth loss or excessive wear reduces mastication efficiency and can result in poor body condition and lower reproductive success and subsequently increase risk of mortality due to predation or malnutrition. Tooth wear over a lifetime is expected and normal. However, edentulism (tooth loss) is not common in herbivores, especially for individuals that are not senescent. I documented cases of incisor edentulism in mountain goats (*Oreamnos americanus*) from the Kenai Peninsula, Alaska, from individuals that were below the typical age of senescence. A sample of 34 goats from the Kenai showed 71% missing at least one incisor and 38% were missing more than half of their incisors. I compare this frequency of edentulism to that of goats from other locations. This premature incisor loss is likely caused by trauma and/or infection matching descriptions in the domestic bovid literature as 'broken mouth'. The population impact of this pathology is unknown but warrants increased monitoring.

ASSESSING THE IMPACTS OF ANTHROPOGENIC NOISE ON CARIBOU BEHAVIOR: AN INNOVATIVE APPROACH COMBINING AI AND TRADITIONAL OBSERVATIONS

Max Plichta*[1], Todd Brinkman[1], Scott Leorna[1], Enis Çoban[2], Shawn Crimmins[1], Alex Prichard[3]

[1]University of Alaska Fairbanks, [2]City University of New York, and [3]ABR, Inc. Contact: mcplichta@alaska.edu

Abstract: The growing concern over anthropogenic noise underscores the need for comprehensive studies on its impact on wildlife, particularly on terrestrial Arctic mammals which have received limited research attention. This study aims to explore the effects of anthropogenic noise on the behavior of barren ground caribou (*Rangifer tarandus granti*) on Alaska's Arctic Coastal Plain (ACP). We combine soundscape data and millions of images collected from an array of 40 camera traps and acoustic recorders located on the ACP between 2019 and 2023. We processed acoustic data using Kaleidoscope software and processed images using Microsoft AI for Earth's MegaDetector to isolate photos of barren ground caribou. We manually recorded behaviors from images via TimeLapse2 photo tagging software to estimate activity budgets. We then explored relationships between activity budgets and anthropogenic noise. This study underscores the potential of integrating novel AI tools with established observational techniques to better understand the impacts of anthropogenic disturbances on wildlife, in hopes to better understand implications for the conservation and management of caribou.

** denotes student*
+ denotes virtual presentation

RED-TAIL HAWK AND SHORT-EARED OWL SPACE USE IN ALASKA

Jonah Rothleder*[1,2], Stephen B Lewis[3], Cassandra Schoofs[4], Amy Bishop[2], Douglas Causey[2]

[1]USDA Wildlife Services, [2]University of Alaska Anchorage, [3]U.S. Fish and Wildlife Service, and [4]U.S. Department of the Air Force. Contact: jnrothleder@alaska.edu

Abstract: In 1995, Joint Base Elmendorf-Richardson (JBER), located in Anchorage Alaska, experienced the deadliest military bird strike in U.S. history when a military aircraft ingested a flock of birds upon takeoff causing the aircraft to crash and 24 lives lost. Since that event a Bird/Wildlife Aircraft Strike Hazard mitigation plan for JBER has been in place, with one component involving capture, banding, and translocation of hawks and owls away from the airport environment. Of the translocated raptors at JBER short-eared owls (*Asio flammeus*) and red-tailed hawks (*Buteo jamanicensis*) are the most frequently captured and are the largest bodied, resulting in them being considered the highest hazard and risk to JBER's airframes. With the decreasing weight of global positioning system tags, we can determine a true return rate to the airfield environment and gain insights on seasonal movements for these three species by tagging them and tracking post translocation movement from the airfields. As all three species are present in the Arctic and breed in summer when resources are most abundant a deeper understanding of how they utilize the landscape to fulfill their needs during this season is necessary. Applying core area analysis, we will present a comparison of summer movements of the translocated red-tailed hawks (n=4) and short-eared owls (n=26) as well as a comparison of return rates. This research increases the understanding of how to make the skies safer for humans and wildlife, and how these species use the landscape in a time of a rapidly changing Arctic.

EVALUATING MECHANISMS OF DECLINE IN A BOREAL-BREEDING AERIAL INSECTIVORE USING INTEGRATED POPULATION MODELS

Jeff Wagner*[1,2], Julie C. Hagelin[2], Katie Christie[2], David Christianson[1]

[1]University of Wyoming and [2]Alaska Departmen of Fish and Game. Contact: jeff.wagner@alaska.gov

Abstract: Conservation strategies for vulnerable species hinge on an understanding of population dynamics and demographic drivers of decline. The Olive-sided flycatcher (*Contopus cooperi*) is a steeply declining Neotropical-Nearctic migrant with low annual adult survival rates, high reproductive success in boreal Alaska, and a known migratory path. Yet, we do not understand how recruitment, age-specific survival, and migration contribute to statewide population decline. We are employing Bayesian integrated population models (IPMs) to quantify factors associated with flycatcher losses. To estimate vital rates and understand population dynamics, we are in the process of integrating mark-recapture and reproductive data (from ADFG and USFWS), state- wide encounter data (e.g., ALMS, BBS, eBird), and environmental covariates to identify variables most closely associated with long-term population trends. Next, we will use simulations to quantify the sensitivity of population growth rate to changes in each vital rate and rank relative importance. Our analysis will identify the vital rate(s) with the greatest capacity to increase population growth, thereby directing where to focus conservation efforts.

Caribou
(NPS/Jared Hughey)

** denotes student*
[+] denotes virtual presentation

QUANTIFYING BEHAVIOR AND DIET IN GREY WOLVES USING VIDEO COLLARS

Julie Polasik[1], Amanda Droghini[1], Stine Pedersen[2], Jeff Stetz[3], Kassidy Colson[3]

[1]Alaska Center for Conservation Science, University of Alaska Anchorage, [2]Colorado State University, Cooperative Institute for Research in the Atmosphere, [3]Alaska Department of Fish and Game. Contact: jpolasik27@gmail.com

Abstract: In 2023, we equipped 3 grey wolves with video collars and obtained 10-second footage every 10 or 20 minutes. Video collars were active for 2-3 consecutive months from March to May. Two collars were successfully retrieved. We categorized behaviors apparent in the videos, with a specific interest in quantifying feeding behaviors and reproduction, including per-individual feeding rate, kill rate, scavenging rates, individual diet composition, and approximate dates at which pups emerged from the den. In this poster, we provide a summary of the methods we've developed, including an ethogram of behaviors, results from the more than 4,000 videos categorized so far, and a discussion of the advantages and limitations of using this technology. These analyses are part of a larger study on the winter ecology of wolves in the western Cook Inlet region (GMU 16); other aspects of this study include a habitat selection analysis and the creation of two mapping products that will be used as covariates: a snow depth model and a categorical vegetation map. Collectively, this information will further our understanding of predator-prey dynamics in western Cook Inlet, with implications for wolf management.

BULL MOOSE SEASONAL MOVEMENT & DISTRIBUTION IN INTERIOR ALASKA

Forrest Rosenbower*[1,2]

[1]University of Alaska Fairbanks and [2]Alaska Department of Fish and Game. Contact: farosenbower@alaska.edu

Abstract: Moose (*Alces alces*) play a crucial role in Interior Alaska's cultural, nutritional, economic, and ecological landscape. While much research has focused on female moose ecology, there is a notable gap in our understanding of adult male (i.e., bull) moose behavior and distribution. Our study seeks to explore this gap by investigating bull moose distribution during the hunting season (Sept) and how it relates to distribution when population surveys are conducted (Nov) by the Alaska Department of Fish and Game (ADF&G). Specifically, we aim to address ongoing hunter concerns over perceived discrepancies in distribution between hunting seasons and survey seasons. To achieve our objectives, we are creating one of the largest GPS collar databases to track bull moose locations and movements across three game management units in Interior Alaska. Through net squared displacement and home range analysis, we seek to categorize different types of moose movement and assess the extent of overlap of moose space use at different times. Our research goals include determining the proportion and timing of bull moose movements, the annual distances traveled, seasonal site fidelity, and estimation of covariates that may help to explain change. Our study aims to deepen our understanding of moose movement dynamics, hence providing valuable insights to inform management decisions regarding moose monitoring, hunting regulations, and conservation efforts.

Common mergansers (Jeff Wagner)

** denotes student*
+ denotes virtual presentation

HUMAN-BEAR CONFLICT IN JUNEAU, AK: DIFFERING DEFINITIONS, DRIVERS, AND DESIRED SOLUTIONS

Binta Wold*[1], Todd Brinkman[1], Roy Churchwell[2], Jen Schmidt[3]

[1]Institute of Arctic Biology, University of Alaska Fairbanks, [2]Alaska Department of Fish and Game, [3]Institute of Social and Economic Research, University of Alaska Anchorage. Contact: eawold@alaska.edu

Abstract: Human-bear conflict is a significant social and ecological problem facing the city of Juneau, AK. Many types of human-bear conflict can be reduced by eliminating bears' access to human food and garbage, but doing so requires changing human behavior. Social science theories suggest that if wildlife managers wish to change human behavior in a community, they must first investigate the attitudes and barriers to behavior change of people in the community. Additionally, a conflict can't be solved until managers know what people think the conflict is, and how much it is happening. Through focus groups and a survey sent to a stratified random sample of Juneau residents, we are working to define and quantify bear conflict in Juneau, understand key drivers of conflict, discover how residents would like to see conflict addressed, and learn about residents' attitudes and barriers to behavior change. We conducted 18 focus groups with Juneau residents from a cross-section of stakeholder groups, neighborhoods, perspectives, and housing types. Focus groups revealed the following key questions: Do residents in different housing types face different types and amounts of bear conflict (apartments vs. single family homes vs. mobile home parks)? What percentage of Juneau residents face barriers to effective garbage storage; such as prohibitive cost, lack of access to a garage, misunderstanding which garbage cans are bear-resistant, and lack of access to effective bear-resistant garbage cans? Do these barriers predict the amount of bear conflict each person experiences? What factors (demographics, attitudes about efficacy of interventions, attitudes about risk) influence a Juneau resident's personal definition of the conflict? We designed and tested a survey which we then sent to a stratified random sample of 5,000 Juneau residents. We hope to have preliminary findings from the survey by the time of the conference to share during this presentation.

RELATIONSHIPS BETWEEN HUMAN AND BEAR ABUNDANCE AT THE ANAN WILDLIFE OBSERVATORY IN SOUTHEAST ALASKA

Kayleigh McCarthy*

USGS Alaska Cooperative Fish and Wildlife Research Unit, University of Alaska Fairbanks. Contact: kmmcarthy4@alaska.edu

Abstract: Bear viewing is an important economic resource in Southeast Alaska. At the Anan Wildlife Observatory, concerts exist that increased human activity due to the construction of a new viewing platform could result in decreased bear activity and feeding, thus reducing the economic benefits of the observatory while also having deleterious effects on the system. We seek to quantify the effects of human visitation. At the observatory, scan surveys were conducted every ten minutes for two hours every day of the permit season between 2005 to 2023 to assess the number of humans and the number of bears present. A simple linear regression will be used to analyze the scan data to determine if there is a significant relationship between the number of people and the number of bears present during the scan. Human data is recorded continuously as visitors enter and exit at the viewing platform. Remote cameras were deployed in 2022 and 2023 and will be redeployed during the 2024 season. The cameras were placed at popular feeding sites along the creek during the permitted viewing season. The cameras were triggered by motion and took three photos per trigger event. The camera and human will be analyzed together in both binomial and poisson models.

NOTES