

ALASKA CHAPTER OF THE WILDLIFE SOCIETY

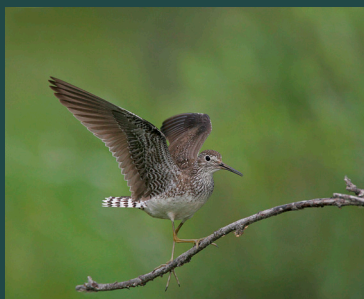
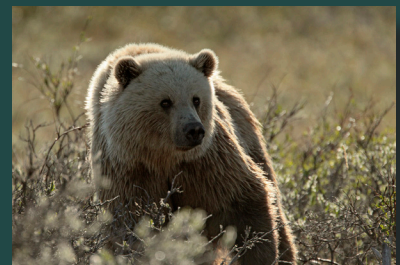
2019 ANNUAL MEETING

FOREST-WILDLIFE RELATIONSHIPS



Elizabeth Peratrovich Hall
Juneau, Alaska

February 26 - 28, 2019



Alaska Chapter of the Wildlife Society 2019 Annual Meeting

*Elizabeth Peratrovich Hall
320 West Willoughby Ave.
Juneau, Alaska
February 26 – 28, 2019*

MEETING PLANNING COMMITTEE

Organization: Kim Jochum, Nathan Svoboda, Scott Brainerd, Susannah Woodruff, Kerry Nicholson, Kim King Jones, Bonnie Bennetsen, Amanda Droghini, Kaiti Ott, Marci Johnson, Cade Kellam (UAF Student Chapter), Yasaman Shakeri, Valentina Melica (UAF Student), Jeff Wagner (UAA Student), and Kim Titus.

Program: Kim Jochum, Nathan Svoboda, Scott Brainerd, Susannah Woodruff, Kerry Nicholson, Kim King Jones, Bonnie Bennetsen, Amanda Droghini, Kaiti Ott, and Cade Kellam.

Logistics: Kim Jochum, Nathan Svoboda, Susannah Woodruff, Kerry Nicholson, Kim King Jones, Bonnie Bennetsen, Amanda Droghini, Marci Johnson, Dave Gregovich, Valentina Melica, Cade Kellam, Yasaman Shakeri, Valentina Melica, and Jeff Wagner.

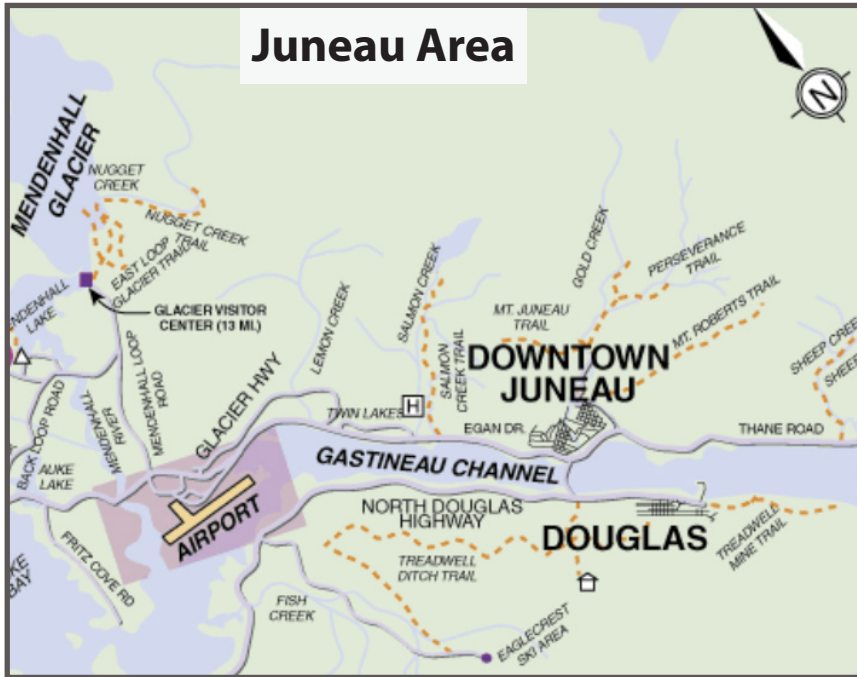
Website and Registration: Kim Jochum, Heidi Hatcher, Nathan Svoboda, Susannah Woodruff, Kim King Jones, Bonnie Bennetsen, Kaiti Ott.

Workshops: Dave Gregovich, Mark Lindberg, Kim Jochum, Cade Kellam, and Jason Waite.

Awards Committee: Layne Adams, Kim Jochum, Tom Paragi (chair), Kevin White, Dave Yokel.

Cover and Program Design: Kaiti Ott.

Cover Photos: Cow moose, Ermine, Musk Oxen, Dall's Sheep, and Collared Pika - Jared Hughey (National Park Service), Red Fox - Kimberley Maher (ADNR), Grizzly Bear, Northern Goshawk, and Solitary Sandpiper - Ted Swem (U.S. Fish and Wildlife Service).

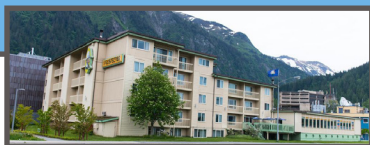
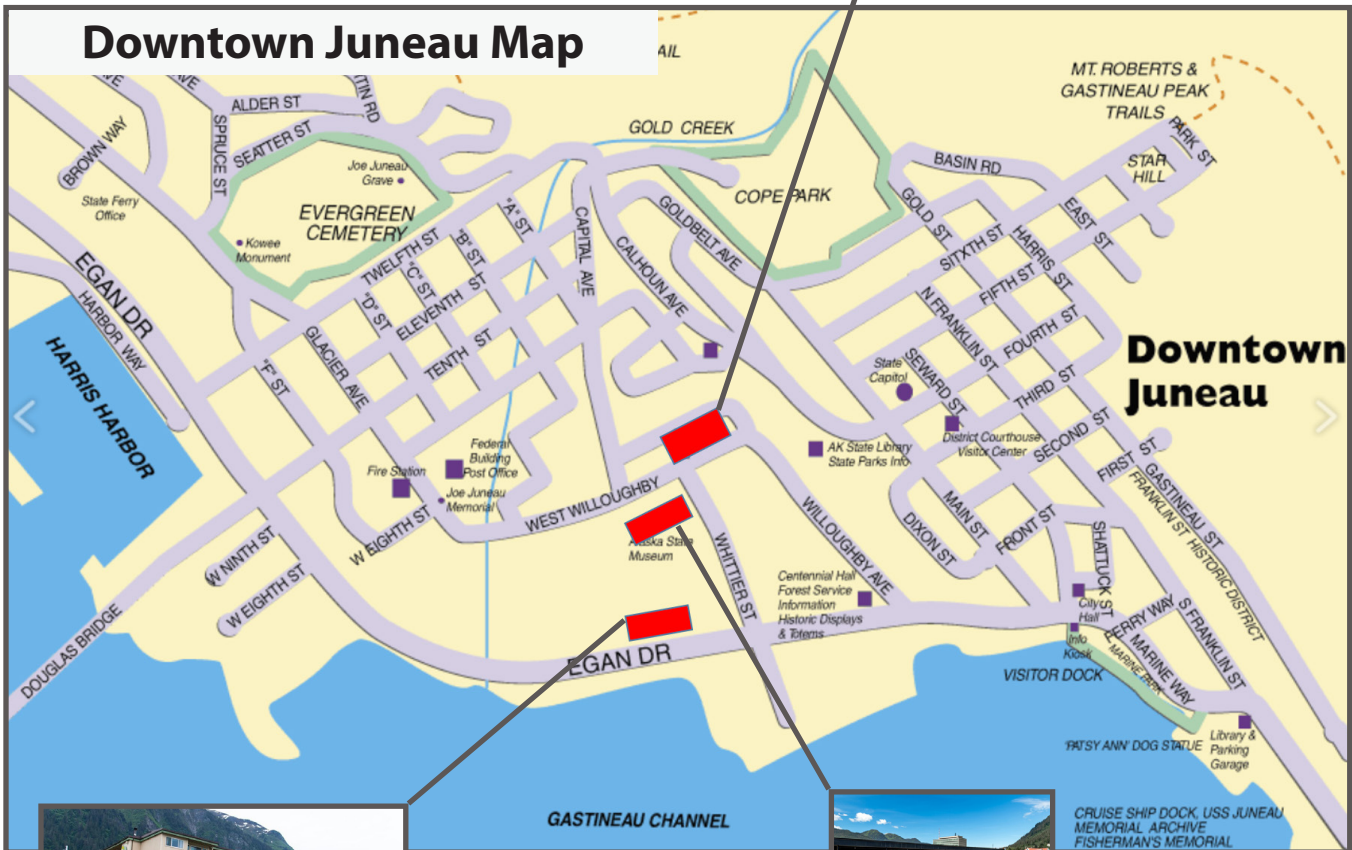


ELIZABETH PERATROVICH HALL
320 W. Willoughby Ave



*On-street parking is limited near EPH. Other nearby options include:

- Shopper's Lot (Corner of Main and Egan Drive) - \$5/day.
- North Franklin Lot (Corner of North Franklin and Second Street) - \$5/day.
- Downtown Transportation Center Parking Garage (100 Main Street) - \$20/7 day permit.

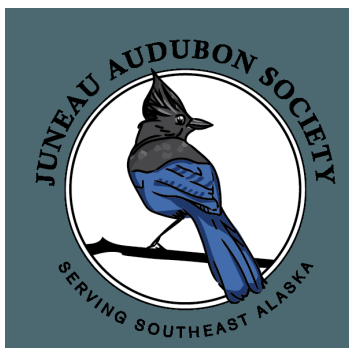


Prospector Hotel
375 Whittier Street



Driftwood Hotel
435 W. Willoughby Ave

Sponsors



Conference-at-a-Glance		
Tuesday, February 26, 2019		
9:00 am	GIS Workshop - Elizabeth Peratrovich Hall, Room 3	
9:00 am	Mark-Recapture Workshop - Elizabeth Peratrovich Hall, Room 4	
6:00 pm	Student/Professional Mixer at Devil's Club Brewing Co. - 100 N Franklin Street	
Wednesday February 27, 2019		
8:00 am	Welcome & Opening Remarks - Elizabeth Peratrovich Hall, Room 2	
8:15 am	Plenary Session	Forest-Wildlife Relationships
9:45 am		<i>Break (sponsored by Juneau Audubon Society)</i>
10:30 am	Special Session	Forest - Wildlife Relationships (continued)
12:00 pm	Lunch and Business Meeting - Elizabeth Peratrovich Hall, Room 2	
1:30 pm	Spark Session	Spark Presentations
2:15 pm		Q&As
2:45 pm		<i>Break</i>
3:00 pm	Poster Presentations and Judging	
4:00 pm	Session A	Paper Presentations
5:00 pm		Wrap Up & Announcements
6:00 pm	Banquet and Quiz Bowl - Elizabeth Peratrovich Hall, Room 2	
Thursday, February 28, 2019		
8:00 am	Welcome & Opening Remarks - Elizabeth Peratrovich Hall, Room 2	
8:15 am	Session B	Paper Presentations
9:00 am		Alaska Roadless Rule - R. Dale (USFS)
9:45 am		<i>Break</i>
10:15 am	Session C	Paper Presentations
11:45 am	Lunch	Small Mammal Working Group Meeting - Room 2
12:45 pm		Bat Working Group Meeting - Room 2
1:45 pm	Session D	Paper Presentations
3:30 pm		<i>Break</i>
3:45 pm	Session E	Paper Presentations
5:00 pm		Wrap up and Announcements
5:15 pm	Student Meeting with Alaska TWS Board	
Friday March 1, 2019		
9:30 am - 3:00 pm	Mendenhall Glacier Field Trip	

Tuesday, February 26

- 9:00 am - 4:30 pm **WORKSHOP** - A PRACTICAL INTRODUCTION TO GIS FOR WILDLIFE BIOLOGISTS—DISPLAYING, PROCESSING, AND ANALYZING WILDLIFE LOCATION DATA
Elizabeth Peratrovich Hall, Room 3
D. Gregovich
- 9:00 am - 4:30 pm **WORKSHOP** - DESIGN AND ANALYSIS OF CAPTURE-MARK-RECAPTURE STUDIES WITH A FOCUS ON OCCUPANCY MODELING
Elizabeth Peratrovich Hall, Room 4
M. Lindberg and J. Waite
- 6:00 am - 8:00 pm STUDENT/PROFESSIONAL MIXER
Devil's Club Brewing Co. - 100 N. Franklin Street

Wednesday, February 27

Elizabeth Peratrovich Hall, Room 2

8:00 am - 9:45 pm: **PLENARY SESSION: FOREST-WILDLIFE RELATIONSHIPS**

Susannah Woodruff, Moderator

- 8:00 WELCOME AND OPENING REMARKS
Nathan Svoboda
- 8:15 THE TONGASS IN TRANSITION: A LOOK TO THE PAST
M. Kirchhoff
- 9:00 THE TONGASS OF TOMORROW: EMERGING TRENDS AND NEEDS FOR RESEARCH IN CHANGING SOUTHEAST ALASKA
S. Gilbert
- 9:45 BREAK (sponsored by Juneau Audubon Society)

10:30 am - 12:00 pm: **SPECIAL SESSION: FOREST-WILDLIFE RELATIONSHIPS**

Bonnie Bennetsen, Moderator

- 10:30 WOLF DIETARY SHIFTS IN A CHANGING LANDSCAPE: LINKING MARINE AND TERRESTRIAL FOOD WEBS IN SOUTHEAST ALASKA
G. Roffler
- 10:45 UNDERSTORY PLANT DEVELOPMENT IN ARTIFICIAL CANOPY GAPS IN AN 81-YEAR-OLD FOREST STAND ON CHICHAGOF ISLAND, SOUTHEAST ALASKA
S. Harris*
- 11:00 FOREST MANAGEMENT, HABITAT CONSERVATION PLANNING AND MONITORING NORTHERN GOSHAWKS IN SOUTHEAST ALASKA
K. Titus

- 11:15 YOUNG AND RICH: OLIVE-SIDED FLYCATCHERS IN SOUTHEAST ALASKA NEST NEAR RECENT CLEARCUTS AND PRODUCTIVE WETLANDS
C. Pohl
- 11:30 HABITAT USE AND SEASONAL BEHAVIOR OF BATS ON U.S. ARMY LAND IN INTERIOR ALASKA
K. Testerman
- 11:45 SPATIAL SEGREGATION OF MARTENS AND ERMINES IN SOUTHEAST ALASKA DEPENDS ON SMALL MAMMAL AVAILABILITY
M. Ben-David
- 12:00 LUNCH
BUSINESS MEETING
Elizabeth Peratrovich Hall, Room 2

Wednesday, February 27 (continued)

1:30 pm - 2:45 pm: SPARK SESSION

Kim Jochum, Moderator

- 1:35 HOW MIGHT HARVEST MANAGEMENT ACCOUNT FOR DYNAMIC ENVIRONMENTAL CONDITIONS?
T. Brinkman
- 1:42 DOES PLACE-BASED CONSERVATION MATTER? MARINE ASSOCIATED BIRD AND MAMMAL HABITAT USE AT THE FIVE FINGER LIGHT
L. Beraha*
- 1:49 LiDAR AND THE NEXT GENERATION OF WILDLIFE HABITAT MODELS IN SOUTHEAST ALASKA
C. Shanley
- 1:56 THE ANATOMY OF AN INFOGRAPHIC: USING ARTISTIC TOOLS TO ENGAGE STAKEHOLDERS
M. Perra
- 2:03 SAMPLING FOR eDNA NOW COULD SAVE EFFORT LATER
J. Smith
- 2:10 USING FECES TO BETTER UNDERSTAND LITTLE-KNOWN SPECIES: EXPLORING DNA METABARCODING AS A RESEARCH AND CONSERVATION TOOL IN ALASKA
P. Schuette
- 2:15 Q&As - ALL SPEAKERS
- 2:45 BREAK

3:00 pm - 4:00 pm: POSTER SESSION AND JUDGING

Elizabeth Peratrovich Hall, Room 2

PRELIMINARY 16 YEAR RESULTS FROM EXPERIMENT 2 OF THE TONGASS-WIDE YOUNG GROWTH STUDIES
Jeff Barnard

POLAR BEAR (*URSUS MARITIMUS*) BEHAVIORAL RESPONSE TO VESSEL PRESENCE IN THE CHUKCHI AND
BEAUFORT SEAS
Malie Branson, Willow Hetrick, and Sheyna Wisdom

SPATIAL AND TEMPORAL VARIATION OF FORAGE AVAILABILITY FOR SITKA BLACK-TAILED DEER IN PRINCE
WILLIAM SOUND, ALASKA
Nicole DeLuca*

CAUSE-SPECIFIC MORTALITY OF KNOWN-AGE MOOSE IN INTERIOR ALASKA
Graham Frye and Rodney Boertje

UNTANGLING THE DEMOGRAPHIC AND ECOLOGICAL FACTORS AFFECTING STALLION QUALITY OF
FERAL PONIES
Molly Garner*

CONTAMINANTS RESEARCH TAKES FLIGHT: EMERGING CONCERNS FOR YELLOW-BILLED LOONS (*GAVIA
ADAMSII*) IN NORTHERN ALASKA
Patrick Knavel, Will Caldwell, Sarah Swanson, Delaney Vinson, Briana Kremer, Jenna DiFalco, Angela Matz,
Debbie Nigro, and Melanie Flamme

OXIDATIVE STRESS AND GLUTATHIONE PEROXIDASE IN STELLER SEA LIONS: ASSOCIATIONS WITH
MERCURY AND SELENIUM STATUS.
Marianne Lian*, Margaret Castellini, Tom Kuhn, Mandy Keogh, Louise Bishop, L.D. Rea, B. Fadely, J. Maniscalco,
and T.M. O'Hara

LABORATORY CONCORDANCE STUDY FOR THE DETECTION OF *MYCOPLASMA OVIPNEUMONIAE*
Camilla Lieske, Kimberlee Beckman, and Margaret Highland

SHOREBIRD ABUNDANCE ESTIMATES ON MILITARY LANDS IN INTERIOR ALASKA
Ellen Martin, Kim Jochum, Calvin Bagley, and Paul Doherty

DIFFERENT METHODS FOR MEASURING PLASMA PROTEIN CONCENTRATIONS PRODUCE DIFFERENT
RESULTS: A STUDY COMPARING THE BRADFORD ASSAY AND REFRACTOMETRY IN THREE ALASKAN
SPECIES
Shelby McCahon*, Claire Montgomerie, Fisher Gandel, Sadie Sands, Todd O'Hara, and Marianne Lian

NON-BREEDING SEASON SURVIVAL AND MOVEMENTS OF MALLARDS (*ANAS PLATYRHYNCHOS*) IN
ANCHORAGE, ALASKA
Grey Pendleton, Michael Petrula (PI), Kyle Smith, and Tasha DiMarzio

HABITAT SELECTION OF RUSTY BLACKBIRD OCCUPANCY ON FORT WAINWRIGHT, ALASKA
Geneva Preston, Justin Smith, and Garrett Savory

POSTER SESSION AND JUDGING (continued)

BEHAVIORAL RESPONSE OF CARIBOU TO UNMANNED AERIAL VEHICLE TRAFFIC

Gwendolyn Quigley* and Todd Brinkman

DEVELOPING PROCEDURES TO ESTABLISH BASELINE ENVIRONMENTAL CONTAMINANT LEVELS FOR SMALL MAMMALS IN ALASKA PARKLANDS

Sarah Swanson, Jenna DiFolco, Delaney Vinson, Patrick Knavel, Briana Kremer, William Caldwell, Andrew Hope, Angela Matz, and Melanie Flamme

4:00 pm - 5:00 pm: SESSION A

Jeffrey Wagner, Moderator

- 4:00 CHANGING SIGNALS OF NUTRITIONAL CONDITION IN FORTYMILE CARIBOU FOLLOWING 40 YEARS OF HERD GROWTH
T. Bentzen
- 4:15 *MYCOPLASMA OVIPNEUMONIAE* DISCOVERIES IN ALASKAN WILDLIFE
K. Beckmen
- 4:30 EXPLORING HUNTER ENGAGEMENT IN THE REGULATORY PROCESS FOR WILDLIFE MANAGEMENT IN ALASKA
S. Leorna*
- 4:45 USING THE ALASKA SPECIES RANKING SYSTEM TO IDENTIFY SPECIES OF CONSERVATION CONCERN
A. Droghini
- 5:00 WRAP UP AND ANNOUNCEMENTS
Nate Svoboda
- 6:00-10:00 BANQUET AND QUIZ BOWL

Thursday, February 28

Elizabeth Peratrovich Hall, Room 2

8:00 am - 9:45 am: SESSION B

Cade Kellam, Moderator

- 8:00 WELCOME AND OPENING REMARKS
Nate Svoboda
- 8:15 MOOSE-VEHICLE COLLISION RISK FACTORS IN THE MATANUSKA-SUSITNA BOROUGH OF ALASKA
L. McDonald*
- 8:30 MOOSE POPULATION GENETIC STRUCTURE ACROSS THE ALASKA RANGE AND IN SOUTHCENTRAL ALASKA
K. Colson

- 8:45 QUANTIFYING EFFECTS OF ENVIRONMENTAL FACTORS ON MOOSE HUNTING SUCCESS IN INTERIOR ALASKA
T. Hasbrouch
- 9:00 ALASKA ROADLESS RULE
R. Dale (USFS)
- 9:45 BREAK

10:15 am - 11:45 am: SESSION C
Amanda Droghini, Moderator

- 10:15 LONG-TERM BEHAVIORAL RESPONSES OF CARIBOU TO ENERGY DEVELOPMENT IN THE ARCTIC
H. Johnson
- 10:30 INTRINSIC AND EXTRINSIC FACTORS RELATED TO MIGRATION DESTINATION AND TIMING FOR THE PARTIALLY-MIGRATORY TESHEKPUK CARIBOU HERD
T. Fullman
- 10:45 NUTRITIONAL LANDSCAPES OF ARCTIC CARIBOU: OBSERVATIONS, EXPERIMENTS, AND MODELS PROVIDE PROCESS-LEVEL UNDERSTANDING OF FORAGE TRAITS AND TRAJECTORIES
J. Welker
- 11:00 GENETIC DIFFERENTIATION OF SMALL CARIBOU HERDS IN NORTHERN ALASKA
K. Mager
- 11:15 ALASKA GEOSPATIAL COUNCIL VEGETATION TECHNICAL WORKING GROUP: OPPORTUNITY TO MAKE AN UPDATED STATE VEGETATION MAP RELEVANT FOR WILDLIFE SCIENCE
J. Osnas
- 11:30 INDIVIDUALLY-VARYING, NICHE-BASED GRADIENTS QUANTIFY PATTERNS OF VEGETATION FOLIAR COVER IN ARCTIC ALASKA
T. Nawrocki*
- 11:45 - 12:45 LUNCH SMALL MAMMAL WORKING GROUP MEETING
Room 2
- 12:45 - 1:45 BAT WORKING GROUP MEETING
Room 2

Thursday, February 28 (continued)

1:45 pm - 3:30 pm: SESSION D

Kim Jones, Moderator

- 1:45 REDUCING THE RISK OF RESPIRATORY DISEASE IN WILD CAPRINAE IN ALASKA – A RECOMMENDED SOLUTION
R. Schwanke
- 2:00 BIOACCUMULATION OF MERCURY IN NORTHERN FUR SEALS RELATIVE TO ROOKERY FIDELITY AT ST. PAUL ISLAND, ALASKA
M. Quillin*
- 2:15 BIOMARKERS FOR REPRODUCTION AND METABOLISM IN LARGE WHALES FROM THE NORTH PACIFIC
V. Melica*
- 2:30 URBAN MUSKOXEN IN NOME, ALASKA
E. Zayon*
- 2:45 MEW GULL NESTING BEHAVIOR IN AN ALASKAN URBAN LANDSCAPE
E. Richmond
- 3:00 ASSESSING DALL'S SHEEP HORN MORPHOMETRICS AS A MANAGEMENT TOOL
B. Wendling
- 3:15 ALPINE AERIAL SURVEYS AS A METHOD OF ESTIMATING RELATIVE ABUNDANCE OF DEER IN SOUTHEAST ALASKA
P. Valkenburg
- 3:30 BREAK

3:45 pm - 5:00 pm: SESSION E

Valentia Melica, Moderator

- 3:45 COLLARED PIKA POPULATION ECOLOGY IN ALASKA: A COLLABORATIVE APPROACH
K. Christie and J. Wagner*
- 4:00 TRACKING BATS TO LOCATE ROOSTING HABITAT IN INTERIOR ALASKA
G. Savory
- 4:15 DETECTING REPRODUCTIVE AND STRESS-RELATED HORMONES IN FUR AND CLAWS OF HARVESTED AMERICAN MARTEN
M. Keogh
- 4:30 EVALUATION OF TECHNIQUES FOR DETECTION OF NORTH SLOPE GRIZZLY BEARS
R. Shideler
- 4:45 USE OF FORWARD LOOKING INFRARED FOR BEAR DEN DETECTION IN ALASKA'S ARCTIC
N. Pedersen*

5:00 WRAP UP AND ANNOUNCEMENTS
Nate Svoboda

5:15 STUDENT MEETING WITH ALASKA TWS BOARD

FRIDAY, MARCH 1

9:30 am - 3:00 pm: Mendenhall Glacier Field Trip

Participation at your own risk. No liability covered through the TWS AK Chapter nor field guides.

- **9:30am:** Meet in town to shuttle to visitor center (people with cars who are willing to give rides to those without cars); in town pickup location will be announced during the meeting.
- **10:00 am:** Start visitor center tour
- **11:00am-3:00pm:** Hike on trails on the east or west side of lake, or on frozen lake (condition dependent)

Sign-up sheet will be available at the registration desk.

There are no costs associated with attending this field trip.

We will meet at the Visitor Center for a short walk and hear about the glacier and local wildlife. Local specialists will lead this tour. After about an hour, those who want to do a longer hike will convene. The length of the hike will depend on conditions. To be safe, a 4 hour block is set aside. If the lake is frozen, hiking across the lake is a fast way to get to other side and closer to the glacier. If it is warm, then we can take a longer route via trail. If it is a weird freeze/thaw in between state then options will be limited. We will announce the plan and conditions the day prior at the conference. (FYI - If snow conditions are perfect there is a cross country/skate ski track set by the Juneau Nordic Ski Club on the lake.)

Suggested gear: Prepare for the possibility of both cold and wind (down to around zero F is potential) or as warm as the 40's F and wet - it could realistically even be raining. Some kind of ice cleats/chains traction (e.g., Microspikes are popular in Juneau); heck you might even need them downtown. Trekking poles or ski poles might be helpful.

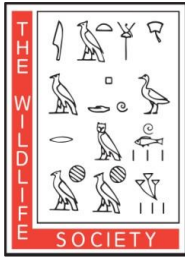
We plan to shuttle as many folks as possible depending on availability of volunteers with cars. *Please indicate your need for a ride or available spaces if you have a car for others on the sign-up sheet at the registration desk.* Taxi vans cost about \$25 each way but probably hold up to 6 folks if they wanted to share. The visitor center is 12 miles from downtown Juneau.

Tour guides: Gwen Baluss (cell phone 907-500-2771) and Marci Johnson.

Additional details will be provided during the meeting.



Mendenhall Glacier in 2004. At present in 2019, the glacier has receded about 3/4 mi and is much smaller in mass and height - photo by Kim Titus.



**ALASKA CHAPTER OF THE WILDLIFE SOCIETY
2019 ANNUAL MEETING AND WORKSHOPS**

Elizabeth Peratrovich Hall
Juneau, Alaska
February 26th – 28th, 2019



WORKSHOP ANNOUNCEMENT

**A Practical Introduction to GIS for Wildlife Biologists—
Displaying, Processing, and Analyzing Wildlife Location Data**

Wildlife biologists commonly collect data regarding the spatial location of animals. An array of products based on these locations is typically sought, including:

- 1) Maps displaying the data for informal communications or for publication
- 2) Home ranges
- 3) Movement metrics
- 4) Environmental data associated with each location, oftentimes to feed into habitat selection analyses

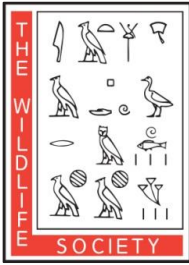
In this basic GIS workshop, we will illustrate introductory GIS concepts through workflows that produce such outputs. Starting with a .csv file obtained from a GPS collar, we will recreate common workflows, starting with mapping the data in ArcGIS and in Google Earth. We will explore the data by using combinations of filtering, sorting, and alternative mapping symbologies. We will create a home range polygon based on the data and obtain output metrics characterizing the animal's home range. We will obtain movement metrics such as distance, rate, and turning angles from the data. We will extract environmental data (elevation, slope, and land cover class) to both the GPS locations and the home range polygon and summarize this data. We will upload the data to a handheld Garmin GPS unit to assist in visiting the animal locations in the field.

The workshop will target users with limited or no GIS experience who are interested in expanding their knowledge. While performing these practical GIS tasks, we will encounter GIS concepts including:

- 1) Importing data into ArcGIS
- 2) Projecting the data
- 3) Feature and Raster data
- 4) Symbology for use in maps
- 5) Making maps for publication
- 6) Common 'ArcToolbox' tasks: clipping, buffering, extracting values to points
- 7) Using the ArcGIS 'raster calculator'
- 8) Importing the data for further analysis in other software
- 9) Other GIS software to consider

Participants are required to bring a laptop loaded with ArcGIS 10.3+ and Google Earth. It is strongly recommended that users ensure that remote use of ArcGIS (i.e., without a network-accessible license) is possible on their computer before the workshop.

For questions contact Dave Gregovich: dave.gregovich@alaska.gov 907-465-4291



**ALASKA CHAPTER OF THE WILDLIFE SOCIETY
2019 ANNUAL MEETING AND WORKSHOPS**

Elizabeth Peratrovich Hall
Juneau, Alaska
February 26th – 28th, 2019



WORKSHOP ANNOUNCEMENT

Design and Analysis of Capture-Mark-Recapture Studies with a focus on Occupancy Modeling

This one-day workshop will introduce biologists to broad concepts of inference using Capture-Mark-Recapture (CMR) approaches. Morning topics will include an overview of the suite of models for CMR studies, likelihood theory, frequentist and Bayesian inference, model fit, and model selection. Following this overview, we will apply these concepts to Occupancy modeling, first with design and sample size considerations, and then analysis and inference. We will start with analysis of example datasets and then spend time on your own datasets. We will use program MARK, RMARK, and PRESENCE for analysis. Participants should bring a laptop computer with the most recent version of these softwares loaded (download at <http://www.phidot.org/software/mark/>, <http://www.phidot.org/software/mark/rmark/>, and <https://www.usgs.gov/software/presence>). Participants are also encouraged to bring their data sets formatted (we don't want to do data management at the workshop) for analysis using occupancy modeling or related CMR models. Don't worry if you don't have a dataset we will pair you with someone who does.

This workshop targets biologists who will apply CMR approaches, but will still want to work with a biometrician to do so. Our goal is to make you fluent enough in CMR approaches, particularly design, so you can understand what is possible and how it is done, so you can collect data and work with biometricians effectively. Contact Mark Lindberg (mrlindberg@alaska.edu) with questions.

There is no charge to participate in this workshop. The course limit is 30 participants and participation will be on a first-come first-served basis, open only to TWS meeting participants at this time. If we have not filled all seats by February 1, we will open participation also to those not attending the TWS meeting. **Sign up for the workshop by registering for the conference** (you will be promoted to choose workshop participation), or by sending an email to twسالaska@gmail.com.



Sharp-tailed grouse - photo by Kimberley Maher.

PLENARY SPEAKERS

MATTHEW KIRCHHOFF



Matt Kirchhoff spent 25 years working as a wildlife biologist in Southeast Alaska, working first for the U.S. Forest Service, Forestry Sciences Lab, and soon after for ADF&G where he eventually headed the Department's deer research program. His research interests focused on deer habitat relationships in managed and old-growth landscapes, effects of single-tree selection logging on habitat, and effects of forest management on deer-wolf interactions. He also studied Marbled Murrelets, a seabird that nests in the canopy of old-growth trees. After retiring from ADF&G, he went to work for Audubon Alaska as the Director of Bird Conservation. He is currently a senior advisor at The World Parrot Trust. Matt is the recipient of the Olaus Murie award for professional achievements in wildlife conservation. He has a Bachelor's degree from the College of Environmental Sciences and Forestry, and a Masters degree from The University of Maine. He lives in Anchorage.

SOPHIE GILBERT



Dr. Gilbert is a wildlife ecologist interested how animals respond to their changing environment, including animal behavior, population, and community ecology, as well as linkages between wildlife and humans. Her research lab at the University of Idaho asks how wildlife behavior, populations, and communities respond to environmental change. The goal of their work is to improve conservation management of wildlife in a modern world. They work closely with management agencies, non-governmental organizations, and stakeholders to identify wildlife research questions that are important for society and ecosystem health. They answer these questions in a diverse array of habitats and systems, from Alaska's temperate rainforest to Canada's boreal forest, and the rugged landscapes of the Mountain West.

ABSTRACTS

Wednesday, February 27

PLENARY SESSION: FOREST-WILDLIFE RELATIONSHIPS

(8:00 AM - 9:45 AM)

Session Moderator: Susannah Woodruff

8:15 am

THE TONGASS IN TRANSITION: A LOOK TO THE PAST

M. Kirchhoff

Alaska Department of Fish and Game - retired

Abstract: The Tongass National Forest in Southeast Alaska is the nation's largest, and arguably, the most contentious. Public concerns over the effects of clearcutting on wildlife and fish led to pitched legal and legislative battles that have, over the last 50 years, slowly shifted the balance from logging to conservation. Those "transitions" have occurred partly due to economics, and partly due to growing ecological awareness—a credit to the excellent wildlife and habitat related research conducted by scientists like yourselves. The Wildlife Society at both state and National levels has played a major role in this shift, being a forceful advocate and bringing sound science to bear on national policy. I will paint a picture of historical management on the Tongass, and identify some of the individuals and studies that girded major legal, legislative, and administrative initiatives. Each had an out-sized impact on management direction. I hope that story instills not only a sense of pride in our collective efforts, and in our professional society, but that it will remind us the job is not yet done.

8:45 am

THE TONGASS OF TOMORROW: EMERGING TRENDS AND NEEDS FOR RESEARCH IN CHANGING SOUTHEAST ALASKA

S. Gilbert

University of Idaho

Abstract: The Tongass, like many other parts of the world, is changing rapidly due to the direct and indirect actions of humans, from climate change and subsequent species' range shifts, to evolving social and economic patterns of natural resource use. As the ecological and human communities jointly using the Southeast Alaskan landscape continue to change, new challenges are emerging for natural resource managers and users alike. From less predictable salmon returns, to shifting tree species' composition and snowfall regimes, to the long ecological legacy of past timber harvest, to shifting economic incentives, the many faces of change on the Tongass are complex and likely to interact with each other. As wildlife scientists and managers in this dynamic landscape, we can provide critical insights into how wildlife communities will respond now and in the future. The Wildlife Society's members can play a key role in anticipating these changes and designing research to inform management and conservation that is robust and adaptive as we move into the no-analog future.

SPECIAL SESSION: FOREST-WILDLIFE RELATIONSHIPS

(10:30 AM - 12:00 PM)

Session Moderator: Bonnie Bennetsen

10:30 am

WOLF DIETARY SHIFTS IN A CHANGING LANDSCAPE: LINKING MARINE AND TERRESTRIAL FOOD WEBS IN SOUTHEAST ALASKA

Gretchen Roffler¹, Taal Levi², Jennifer Allen², and Aimee Massey²

¹Alaska Department of Fish and Game and ²Department of Fisheries and Wildlife, Oregon State University. Contact: gretchen.roffler@alaska.gov

Abstract: Understanding the response of wolves (*Canis lupus*) to changes in prey abundance is an important consideration for modeling predator-prey dynamics. In the coastal panhandle of southeast Alaska, management actions and succession patterns have resulted in changes in the abundance and spatial distribution of terrestrial and marine prey species of wolves. To gain a better understanding of variability in wolf feeding ecology across biogeographical regions we investigated wolf diets using 1) metabarcoding of amplified target DNA sequences of prey in wolf scats, and 2) analyses of stable isotope ratios in wolf muscle tissue and hair. We present examples of wolves in island and mainland systems that have demonstrated a dietary shift in primary prey from ungulates to sea otters concurrent with massive population growth following recolonization of sea otters (*Enhydra lutris*) in Glacier Bay. We discuss application of a novel method to assess wolf food habits, and the linking of marine and terrestrial food webs in a rapidly changing ecosystem..

10:45 am

UNDERSTORY PLANT DEVELOPMENT IN ARTIFICIAL CANOPY GAPS IN AN 81-YEAR-OLD FOREST STAND ON CHICHAGOF ISLAND, SOUTHEAST ALASKA

Scott Harris*¹ and Jeffrey Barnard²

¹Oregon State University and ²U.S. Forest Service - Pacific Northwest Research Station. Contact: scott.harris@oregonstate.edu

Abstract: We assessed the understory plant response and associated effects on forage resources available to Sitka black-tailed deer (*Odocoileus hemionus sitkensis*) following the creation of artificial canopy gaps in a young-growth forest stand in southeast Alaska. The forest stand was approximately 58 years old when gaps were created, and 81 years old at the conclusion of the study. Using vegetation cover estimates collected periodically over 23 years, we estimated the biomass trajectory of individual plant species and plant groups in the gaps and adjacent untreated forest. Using the Forage Resource Evaluation System for Habitat (FRESH) deer model, we found that plant biomass and "deer days" per hectare were significantly higher in the gaps than the adjacent untreated forest at 23 years following creation of the gaps, increasing the entire period with no apparent peak. Compared to three thinning studies from southeast Alaska, our results indicate that deer days per hectare for the no-snow scenarios were lower in the gaps than the thinning treatments, but greater for the winter scenario where low-lying forbs would likely be buried by snow. Data from the other thinning studies were available for only a few years following the treatments, so comparisons are not precise. Although the results from our un-replicated case study should not be considered representative for southeast Alaska because they are from only one stand, they do suggest that creating artificial canopy gaps in older young-growth stands is a viable option for increasing forage resources for deer.

* - student

11:00 am

FOREST MANAGEMENT, HABITAT CONSERVATION PLANNING AND MONITORING NORTHERN GOSHAWKS IN SOUTHEAST ALASKA.

Kim Titus

Contact: ktitus54@gmail.com

Abstract: Northern goshawks (*Accipiter gentilis*) were identified in Tongass National Forest planning as a species associated with old growth forest. Over the past three decades, various Endangered Species Act (ESA) petitions and lawsuits became entangled in Tongass forest planning associated with goshawks, wolves, and other wildlife. This resulted in the Tongass Conservation Strategy that included a network of old-growth reserves and other management guidelines within the matrix of managed landscapes. The result was to maintain habitats for old-growth associated wildlife – goshawks, wolves, flying squirrels, assure species viability, and keep species from being listed under the ESA. An interagency study of radiotagged (n = 68 adult) goshawks found that this bird is strongly associated with old-growth forest. Goshawks also have among the largest home ranges described for the species. 45% of these adult female goshawks moved >6km between years to different nesting areas and 0% of the adult males moved to different home ranges/territories. We also found that goshawks rely on a few prey such as red squirrels, Sooty Grouse, and mid-size passerines. Squirrels and grouse are absent from Prince of Wales Island (POW) and associated islands, suggesting that goshawk nesting on POW differs from other portions of Southeast Alaska. Results suggest that goshawks are a) likely conserved as a nesting bird by the conservation strategy, and b) monitoring goshawk nest stands and temporarily protecting known nest stands as part of timber sale preparation is likely not going to maintain those nesting areas or those are that never detected. This is because goshawks move frequently between years and the level of monitoring is insufficient to detect the birds.

11:15 am

YOUNG AND RICH: OLIVE-SIDED FLYCATCHERS IN SOUTHEAST ALASKA NEST NEAR RECENT CLEARCUTS AND PRODUCTIVE WETLANDS

Catherine Pohl¹, Juliette Koehler², Mary Hausler², Amy Courtney³, Richard Carstensen⁴, James Saracco⁵, Stephanie Harold, and Kassie Johnson

¹Catherine Pohl Biological Consulting, ²Juneau Audubon, ³Icy Straits Birding Tours, ⁴Discovery Southeast, and ⁵Institute for Bird Populations. Contact: catherine.pohl@outlook.com

Abstract: Little known and thinly distributed in the coastal rainforest of southeastern Alaska, Olive-sided Flycatchers (*Contopus cooperi*) are of conservation concern due to range-wide declines and threats to wintering habitat and insect prey. The species is regularly observed on several national Breeding Bird Survey routes in the region, particularly on NE Chichagof Island near Hoonah, where in 2014, we began a small mark-re-sight study to determine baseline return rates in preparation for migration research. Our observations indicate use of a complex mosaic of productive wetlands and snag- and stream-rich old forest edge, including steep regenerating clearcuts, sloping and pond-rich fens, and beaver-flooded areas. Many territories are at higher elevations, including montane valley heads. Adult captures proved possible despite tall trees, with a return rate of ~.6 from 2014 to 2017. In 2018, we attached geolocators (miniature light-level data loggers) to 11 individuals to gain information on migration, stopover and wintering areas. Blood and feather samples were collected for mercury, genetic, and stable isotope analysis. Seven nests were found, the first noted for southeast Alaska. All were near the top of mature mountain or western hemlock trees between clearcuts and fens. Fledge dates ranged from late June to early August. Nest provisioning included large dragonflies, hornets, mayflies, and bumblebees. Nests were lichen-lined yet cryptic, even from above, viewed via drone. A related citizen science data portal for Olive-sided Flycatcher and Greater Yellowlegs observations (CitSci.org, Raincoast Birdscape) will be shared with a Juneau/Hoonah winter resident bird study in 2019.

11:30 am

HABITAT USE AND SEASONAL BEHAVIOR OF BATS ON U.S. ARMY LAND IN INTERIOR ALASKA

Kyle Testerman¹, Kim Jochum¹, and Paul Doherty²

¹Colorado State University, CEMML and ²Colorado State University - Fish, Wildlife and Conservation Biology Department. Contact: kyle.testerman@colostate.edu

Abstract: The U.S. Army Garrison Alaska is interested in mitigating possible impacts of military training to bats due to the possible listing of the little brown bat (*Myotis lucifugus*), the only known bat species to occur in interior Alaska, under the Endangered Species Act. Our objectives were to determine habitats used by bats, model factors important to bat habitat use and detectability and determine seasonal and spatial activity patterns of bats across Donnelly Training Area East (DTA-East) and Gerstle River Training Area (GRTA), both part of Fort Wainwright, Alaska. We deployed bioacoustic recorders (SM4s) to detect bat presence across 200 sites from April to October 2016 and 2017. We deployed detectors bi-weekly in a spatially balanced sampling design, and analyzed habitat and environmental factors impacting bat habitat use with an occupancy model in program MARK. Bats were only detected from early July through late September with the highest detection probability in August. Bat detectability at a site increased when detectors were within 50 meters of a water body, in an area with mixed forest, with greater canopy closure, and most importantly, if the survey took place between late July and early September. These factors did not affect the probability of use, but rather led to more bat activity during the season resulting in higher detectability at sites with those qualities. Understanding seasonal behavior of bats and habitat use is necessary to develop meaningful bat management conservation plans for interior Alaska.

11:45 am

SPATIAL SEGREGATION OF MARTENS AND ERMINES IN SOUTHEAST ALASKA DEPENDS ON SMALL MAMMAL AVAILABILITY

Merav Ben-David¹, R. Keith Mayes¹, Carolyn Eckrich², and Elizabeth Flaherty³

¹University of Wyoming, ²Oregon Department of Fish and Wildlife, and ³Purdue University. Contact: bendavid@uwyo.edu

Abstract: Spatial segregation is a well-recognized mechanism leading to co-existence of similar species. In many cases, spatial segregation results from evolutionary divergence; in others from competitive interactions on an ecological time scale. We investigated habitat use and population trends of ermine (*Mustela erminea*), a dietary specialist and habitat generalist, and American marten (*Martes americana*), a dietary generalist with high affinity to closed-canopy habitats, on Prince of Wales Island, Alaska, USA. We used capture-recapture methods to quantify small mammal abundance, and live-trapping and non-invasive genetic sampling to estimate numbers of the mesocarnivores. In addition, we assessed habitat segregation and the degree of dietary overlap and shifts from 2010–2012, during which Keen's mice (*Peromyscus keeni*) populations peaked (2011) and then crashed (2012). At high densities of Keen's mice, martens and ermines exhibited spatial segregation with ermines found in open-canopy refugia. Both mesocarnivores exhibited high dietary overlap when mice densities were high, although marten diets were more variable. When mice densities sharply declined, martens expanded their use of open-canopy habitats while ermines increased consumption of dusky shrews (*Sorex monticolus*). These results suggest the spatial segregation we documented is temporally dynamic and depends on fluctuations in prey abundance. Expanding management of young-growth forests through increased thinning treatments on Prince of Wales Island would benefit the endemic ermine populations through temporally increasing the availability of habitat refugia.

SPARK SESSION

(1:35 PM - 2:45 PM)

Session Moderator: Kim Jochum

1:35 pm

HOW MIGHT HARVEST MANAGEMENT ACCOUNT FOR DYNAMIC ENVIRONMENTAL CONDITIONS?

Todd Brinkman¹, Scott Leorna¹, Julie McIntyre¹, Laura Prugh², and Tessa Hasbrouck¹

¹University of Alaska - Fairbanks and ²University of Washington. Contact: tjbrinkman@alaska.edu

Abstract: Volumes of research have been conducted on factors that affect hunter harvest rates. Most of these studies have focused on effects of wildlife abundance, distribution, habitat, hunter characteristics, or accessibility. Although numerous studies have assumed and implied that weather conditions influence harvest rates to some extent, few have quantified the impact on hunter opportunities. Agreeing with recent hunter testimony (e.g., Board of Game proposals) and reports from wildlife managers in Alaska, our research on Dall sheep and other big game shows that weather and environmental conditions do have a statistically significant impact on hunter success. With amplified climate change at high latitudes generating more environmental noise and potentially new weather norms during hunting seasons, our Spark talk explores how wildlife researchers and managers might account for an increasingly dynamic environment when researching and managing harvest. We pose several questions to elicit discussion on this topic, and then offer a few thoughts on how to address novel challenges to harvest management related to environmental conditions.

1:42 pm

DOES PLACE-BASED CONSERVATION MATTER? MARINE ASSOCIATED BIRD AND MAMMAL HABITAT USE AT THE FIVE FINGER LIGHT

Lori Beraha*

University of Alaska Fairbanks. Contact: Lberaha@alaska.edu

Abstract: In summer 2017, I studied the abundance and distribution of marine associated birds and mammals at the Five Finger Lighthouse in southeast Alaska. My objectives were 1) to identify the areas of highest habitat use by species of conservation concern, 2) to make recommendations for an ecosystem-based management plan for the island, and 3) to initiate a citizen science project. I found higher relative abundance and greater biodiversity of both birds and marine mammals on the south and west facing sectors of the island compared to the north and east facing sectors. I attribute this to the greater habitat complexity on the south and west facing sectors that comprise a near-shore reef, a mixed kelp forest, and a channel between the reef and rocky cliffs, areas used extensively for foraging, nesting, traveling, socializing, and resting by many of the documented species. These findings provided the basis for recommendations to avoid development and to minimize anthropogenic disturbance on the southern and western portions of the island including the adjacent reef and channel. As both the Five Finger Lighthouse ecosystem and management continue to evolve in response to changing environmental conditions and human interests, this research project also established a baseline for future study that will inform future adaptive management, document changes over time, and engage community stakeholders in science and conservation.

* - student

1:49 pm

LIDAR AND THE NEXT GENERATION OF WILDLIFE HABITAT MODELS IN SOUTHEAST ALASKA

Colin Shanley¹, Conor Reynolds¹, and Bob Christensen²

¹The Nature Conservancy and ²Sustainable Southeast Partnership. Contact: cshanley@tnc.org

Abstract: Modeling forest-wildlife relationships has been limited by coarse vegetation mapping in southeast Alaska. Recent LiDAR acquisitions for Hoonah (2015), Prince of Wales Island (2017), and Kake (2018) are an opportunity to decidedly improve wildlife habitat models used for conservation and management planning. Field calibration plots (n = 145) and forest metric modeling has been completed for 205,000 acres surrounding Hoonah, Alaska on northern Chichagof Island. Regression modeling with the 'leaps' package in R suggests LiDAR can consistently and continuously predict forest habitat metrics such as Quadratic Mean Diameter (r = 0.75), Stand Density (r = 0.82), and Crown Competition (r = 0.72) at a 30-meter resolution. The results of this study suggest LiDAR will reshape the future of modeling forest-wildlife relationships in southeast Alaska.

1:56 pm

THE ANATOMY OF AN INFOGRAPHIC: USING ARTISTIC TOOLS TO ENGAGE STAKEHOLDERS

Megan Perra, Todd Brinkman, Nils Pedersen, and Scott Leorna

University of Alaska - Fairbanks. Contact: meperra@alaska.edu

Abstract: Researchers often need to share their work with a diversity of audiences, and it can be challenging to present complex, technical information to the general public. Infographics can remedy this by bridging the gap between research and public understanding, allowing wildlife scientists to educate stakeholders about their work and promote informed discussion. The visual narratives in such graphics help to contextualize research results within different ecosystems or processes, so that viewers better understand the big picture. By using basic artistic tools (e.g., movement, symmetry and balance) to draw in the viewer, infographics act as an engaging and efficient method of communication and outreach.



Common raven - photo by Kimberley Maher.

2:03 pm

SAMPLING FOR eDNA NOW COULD SAVE EFFORT LATER

Justin Smith, Garrett Savory, and Kim Jochum

Colorado State University, CEMML. Contact: j.smith@colostate.edu

Abstract: Researchers are increasingly turning to Environmental DNA (eDNA) to evaluate species' spatial and temporal distribution, which can be a cost-effective way to conduct future targeted sampling. Evidence of species presence requires collection of physical specimens (traditional field sampling), which is time and resource intensive if little is known of a species' spatial or temporal distribution. eDNA can be applied directly to resource allocation decisions to narrow future targeted sampling. Collecting eDNA demands less time to sample sites than traditional field sampling, does not require a permit or Institutional Review Board approval because no animals are being handled, and requires less gear. Through a well-planned design, eDNA can be used to determine areas with the highest likelihood of presence of a species, and therefore can reduce time spent surveying for physical specimens. For example, we used eDNA to investigate juvenile salmon habitat use in the winter on Fort Wainwright training lands in interior Alaska. In a known salmon stream, we identified eight of twenty sites with salmon DNA in the water. While these results do not confirm conclusive evidence of presence, we can now target specific locations and habitats for physical specimens in the winter. There are many more examples of eDNA techniques that can help managers more effectively allocate resources, which include: assessing a suite of aquatic species through next generation sequencing, describing all DNA diversity in water-body (metagenomics), estimating species density, and estimating terrestrial species distribution in the winter filtering snow samples.

2:10 pm

USING FECES TO BETTER UNDERSTAND LITTLE – KNOWN SPECIES: EXPLORING DNA METABARCODING AS A RESEARCH AND CONSERVATION TOOL IN ALASKA

Paul Schuette, Amanda Droghini, and Jeskia Reimer

University of Alaska - Anchorage. Contact: paschuette@alaska.edu

Abstract: For many of Alaska's species, little information exists on their population distribution, status, and trends. Research and monitoring strategies are hindered by the remote location in which many species occur, the difficulty in detecting individuals, and the costs associated with research and monitoring efforts. These constraints are particularly evident for species with restricted distributions, as well as species that are widely distributed, but rare, elusive, or difficult to study. Here, we explore the use of DNA metabarcoding as a tool for evaluating diets of two mammal species. First, we attempted to indirectly detect the Unalaska collared lemming (*Dicrostonyx unalascensis*), an island endemic whose distribution is uncertain, by identifying vertebrate diet items in red fox (*Vulpes vulpes*) scat collected on Umnak and Unalaska islands. Second, we extracted and analyzed fecal samples of the northern bog lemming (*Synaptomys borealis*) from specimens preserved at the University of Alaska Museum of the North to evaluate the dietary breadth of a species that has been proposed for listing under the Endangered Species Act. This research is ongoing, however, we aim to use this forum to stimulate discussion on the use of DNA metabarcoding as a tool for filling information gaps on Alaska's lesser known species. In particular, we are eager to discuss whether other researchers are using this technique in Alaska, and the potential for building capacity for this genetic technique to provide high resolution information on animal diets in Alaska.

SESSION A

(4:00 PM - 5:00 PM)

Session Moderator: Jeffrey Wagner

4:00 pm

CHANGING SIGNALS OF NUTRITIONAL CONDITION IN FORTY MILE CARIBOU FOLLOWING 40 YEARS OF HERD GROWTH

Torsten Bentzen

Alaska Department of Fish and Game. Contact: torsten.bentzen@alaska.gov

Abstract: Peak caribou numbers are frequently short-term occurrences preceded by lowered birth rates and overgrazing of calving and summer range, followed by a decline in numbers. However, in herds with high levels of consumptive use it may be possible to increase human harvest to limit herd growth before density dependent effects precipitate prolonged declines. Because nutritional condition of individuals is an important determinant of productivity identifying signals of stress in increasing caribou herds is a critical step in managing these herds for sustained yield. The Fortymile caribou herd (FCH) has increased steadily from the population low of 6,000 in 1975 to over 80,000 caribou in 2017. The population is likely at or above the most recent previous high observed during the early 1960s. Despite range size expansion during this recovery period, caribou densities remain high, especially on the core calving and summer range. Although newborn calf weights, adult survival, and adult parturition rates all appear to be stable, statistically significant declines in four-month-old calf weights ($P = 0.03$, $SE = 0.133$) and the proportion of cows producing their first calf at three years of age ($P = 0.006$, $SE = 0.03$) point to potential signs of nutritional stress. I evaluate the long-term change in three-year-old parturition rate relative to other caribou herds in Alaska and re-examine using three-year-old parturition as a signal of changing nutritional status of the Fortymile Caribou herd.

4:15 pm

MYCOPLASMA OVIPNEUMONIAE DISCOVERIES IN ALASKAN WILDLIFE

Kimberlee Beckman¹, Camilla Lieske¹, and Margaret Highland²

¹Alaska Department of Fish and Game, ²U.S. Department of Agriculture. Contact: kimberlee.beckmen@alaska.gov

Abstract: *Mycoplasma ovipneumoniae* is a bacterial pathogen associated with multifactorial respiratory disease in members of the subfamily Caprinae. This bacterium is reported in high mortality bighorn sheep and muskoxen (*Ovibos moschatus*) pneumonia outbreaks and recently in association with bronchopneumonia in mountain goat (*Oreamnos americanus*) kids. Lack of both detection of this bacterium and mortality events in Dall's sheep, or other free-ranging wildlife in Alaska, led to the misconception that this bacteria was not present in Alaska. In the course of studies to characterize respiratory pathogens including *Mycoplasma* spp. in Alaskan wildlife, we detected *M. ovipneumoniae* in Dall's sheep (*Ovis dalli dalli*), mountain goats, moose (*Alces alces gigas*), and caribou (*Rangifer tarandus tarandus*) from nasal swabs collected 2012-2017. A larger survey of hunter-harvested and live-capture released ungulate species in 2018 sought to determine host species and geographic distribution of exposure to this potential pathogen. We describe the detection of *M. ovipneumoniae* in wildlife, including non-Caprinae species previously believed to be unable to carry the pathogen. Since published reports regarding bighorn sheep pneumonia outbreaks indicate a lack of cross protection between different genotypes/strains of *M. ovipneumoniae*, the current presence of this bacterium in wild populations in Alaska does not equate to tolerance or immune protection to other genotypes/strains of this bacterium. Therefore, it is critical to further understand the distribution, prevalence, and potential adverse health (individual and population level) impacts of *M. ovipneumoniae* in Alaskan wildlife and domestic small ruminants.

4:30 pm

EXPLORING HUNTER ENGAGEMENT IN THE REGULATORY PROCESS FOR WILDLIFE MANAGEMENT IN ALASKA

Scott Leorna*¹, Todd Brinkman¹, Gary Kofinas¹, Jeffrey Welker², Knut Kielland¹

¹University of Alaska Fairbanks and ²University of Alaska Anchorage. Contact: sleorna@alaska.edu

Abstract: Rapid decline of the Central Arctic Caribou (*Rangifer tarandus*) Herd (CACH) has affected hunting opportunities for this relatively accessible North Slope herd. The CACH peaked in 2010 at roughly 70,000 animals and has precipitously declined to a current population size of 22,000. Reasons for the decline are uncertain. Hunters' knowledge may provide insight on causes and effects of the decline and generate critical feedback on current and future management of the CACH. Limited research explores hunter utilization of the open public process intended to facilitate the inclusion of public comments in the decision-making process. Therefore, we conducted a survey to: 1) Document hunters' insights on recent changes in the CACH population, 2) Characterize hunter involvement in Alaska Department of Fish & Game's (ADFG) conceptual model for public involvement in the regulatory process, and 3) Understand how hunter behaviors and perceptions influence involvement in the regulatory process. Hunters report shifts in caribou movement and predation as contributing factors accounting for the CACH's decline, revealing alignment and departure from factors presented in management reports. Generally, hunters' evaluation of management and the regulatory process is positive, though we find hunters are utilizing engagement strategies inconsistent with ADFG's conceptual model. We identify that a substantial proportion of hunters are not actively engaging in the regulatory process. We also provide an alternative conceptual model to summarize hunter involvement in the regulatory process based on our key findings. Our results suggest management of wildlife in Alaska may benefit from building more robust stakeholder engagement strategies.

4:45 pm

USING THE ALASKA SPECIES RANKING SYSTEM TO IDENTIFY SPECIES OF CONSERVATION CONCERN

Amanda Droghini, Rachel Kelty, and Paul Schuette

Alaska Center for Conservation Science. Contact: adroghini@alaska.edu

Abstract: Several agencies and institutions publish lists of species that are of conservation concern. These lists can influence allocations of funds and research efforts, yet it isn't always clear why some taxa appear on a particular list or why they received a certain rank. The Alaska Species Ranking System (ASRS) is meant to be an objective and defensible way of assessing the conservation status of vertebrate taxa in Alaska. Taxa are evaluated on 16 questions across three categories: 1) Population & Distribution Trends, 2) Biological Characteristics, and 3) Research & Action Needs. Taxa that are in decline, are ecologically specialized, and have not been the focus of any research receive the highest scores. We provide a brief overview of the ranking system and highlight its applicability by comparing scores between two taxonomic groups: waterfowl and small mammals. Population trends were available for 85% of waterfowl taxa, but less than 30% small mammals. Biological Characteristics scores were low but highly variable within groups. Small mammals had higher Research Needs than waterfowl, and this difference was largely driven by a question that evaluated the efficacy of population monitoring programs. Both groups require additional research to identify factors that limit population growth rates. We discuss final steps in this project and encourage feedback from organizations to make this product most useful to them.

* - student

Thursday, February 28

SESSION B

(8:00 AM - 9:45 AM)

Session Moderator: Cade Kellam

8:15 am

MOOSE-VEHICLE COLLISION RISK FACTORS IN THE MATANUSKA-SUSITNA BOROUGH OF ALASKA

Lucian McDonald*, Terry Messmer, and Michael Guttery

Utah State University. Contact: luke.mcdonald@aggiemail.usu.edu

Abstract: Human-wildlife conflicts are increasing as human populations continue to grow and encroach into wildlife habitat. Increased trends in the number of wildlife-vehicle collisions (WVC) reported provide tangible evidence of anthropogenic impacts on wildlife and human-health and safety. Managers will require better information about the WVC risk factors to mitigate the impacts on humans and wildlife. We collected local and regional scale habitat and road geometry data at moose-vehicle collision (MVC) sites throughout the Matanuska-Susitna Borough of Alaska, USA between August 2016 and November 2018 to identify risk factors that contribute to the occurrence of MVCs. Similar habitat and road geometry data were collected at random locations near documented MVC sites and where moose, fitted with global-positioning system (GPS) necklace-style transmitters, crossed the highways we monitored. The probability of moose presence, motorist presence, and driving conditions were modeled in R using binomial logistic regression to identify MVC risk factors.

8:30 am

MOOSE POPULATION GENETIC STRUCTURE ACROSS THE ALASKA RANGE AND IN SOUTHCENTRAL ALASKA

Kassidy Colson

Alaska Department of Fish and Game. Contact: Kassidy.colson@alaska.gov

Abstract: Genetic population structure has implications for how species are managed; population connectivity and therefore population identity and disease transmission risk can be understood from examining the genetics of animals in a region. Here I examine moose population genetic structure in central, southcentral, and interior Alaska in order to understand the spatial scale of populations and disease transmission risk in an important game species. I hypothesized that the Alaska Range, Knik Arm, and Turnagan Arm would create major barriers to dispersal for moose. Results indicated significant inter-regional genetic structure ($F_{RT} = 0.019$, $P \leq 0.001$; $F_{ST} = 0.039$, $P \leq 0.001$). Pairwise differentiation was moderate, with pairwise F_{ST} values varied from not significantly different from 0 to 0.052, while values of Jost's D varied from not significantly different from 0 to 0.138. Multiple lines of evidence suggest strong isolation by distance within regions. Finally, number of effective migrants per-generation (N_{em}) between population pairs were low; no N_{em} values had credible intervals that did not encompass zero, while the upper credible interval was typically less than 11 effective migrants per-generation.

* - student

8: 45 am

QUANTIFYING EFFECTS OF ENVIRONMENTAL FACTORS ON MOOSE HUNTING SUCCESS IN INTERIOR ALASKA

Tessa Hasbrouck¹, Todd Brinkman¹, Erin Trochim¹, Glen Stout², and Knut Kielland¹

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

Abstract: Climate change is causing rapid changes to the environment in Alaska. Hunters have expressed concern that moose (*Alces alces*) harvest is being challenged by warmer temperatures, delayed leaf drop decreasing sightability, and low water levels limiting access to hunting areas. We assessed annual changes in 1) temperature, 2) leaf drop date, 3) Yukon River water level, and 4) impacts of these changes on local and non-local moose hunter effort and success in Interior Alaska. We used satellite imagery, weather station data, and river gauging station data to assess changes in environmental factors, plus Alaska Department of Fish and Game's moose harvest records from 2000-2016. We found no relationship between leaf drop and local or non-local hunter harvest ($p = 0.61$, $p = 0.81$ respectively). We estimated a positive relationship between daily water level and non-local harvest 6 - 10 Sept ($p = 0.02$), 11- 15 Sept ($p = 0.02$), and 16 - 20 Sept ($p < 0.1$), and an inverse relationship between mean daily temperature and non-local hunter harvest for the same dates ($p < 0.01$, $p = 0.02$, $p < 0.01$), respectively. Local harvest had a positive relationship with water levels from 16 - 20 Sept ($p < 0.01$). This research provided information on previously untested hypotheses regarding the impacts of environmental conditions on moose hunter harvest.



Bull moose - photo by Jared Hughey.

9:00 am

THE ALASKA ROADLESS RULE

Robin Dale

U.S. Forest Service. Contact: 907-586-9344

The USDA Forest Service has announced it will develop a state-specific roadless rule focused on the Tongass National Forest. The rule would amend the 2001 Roadless Area Conservation Rule which establishes prohibitions with some exceptions on road construction, road reconstruction, and timber harvest on 58.5 million acres of inventoried roadless areas on National Forest System lands. The intent of the 2001 Roadless Rule is to provide lasting protection for inventoried roadless areas within the National Forest System in the context of multiple-use management.

A state-specific roadless rule would determine which currently designated roadless areas in the Tongass National Forest would require a different management designation to further Alaska's economic development or other needs, while still conserving roadless areas for generations to come. Inventoried roadless areas covered by the 2001 Roadless Rule comprise 9.2 million acres (55 percent) of the Tongass National Forest (16.8 million acres).

The USDA Forest Service plans to finalize an Alaska roadless rule by June 2020. The rulemaking process will involve National Environmental Policy Act (NEPA) environmental review and disclosures, gathering public feedback, conducting public outreach, consultation with Alaska Native tribes and corporations, and cooperation with the State of Alaska. Throughout our work on the Alaska Roadless Rule, the USDA Forest Service will uphold our mission to sustain the health, diversity, and productivity of the nation's forests and grasslands to meet the needs of present and future generations. For more information, please visit: <https://www.fs.usda.gov/roadmain/roadless/alaskaroadlessrule>



Southeast Alaska - photo by Kim Titus.

SESSION C

(10:15 AM - 11:45 AM)

Session Moderator: Amanda Droghini

10:15 am

LONG-TERM BEHAVIORAL RESPONSES OF CARIBOU TO ENERGY DEVELOPMENT IN THE ARCTIC

Heather Johnson¹, Trevor Golden¹, Layne Adams¹, David Gustine², Elizabeth Lenart³, and Lincoln Parrett³

¹U.S. Geological Survey, ²National Park Service, and ³Alaska Department of Fish and Game. Contact: heatherjohnson@usgs.gov

Abstract: Increasing demands for energy have generated interest in expanding oil and gas production on the North Slope of Alaska, raising questions about the resilience of barren-ground caribou to new development. Although the amount of habitat lost directly to development in the Arctic will likely be relatively small, there are significant concerns about habitat that may be indirectly lost due to caribou avoidance. Wildlife avoidance of energy development has been well documented, but it is often assumed to dissipate over time, despite scant information on the ability of animals to habituate. To understand the long-term effects of energy development on barren-ground caribou we investigated the behavior of the Central Arctic Herd, which has been exposed to oil development on their summer range for ~40 years. Using recent (2015-2017) location data from GPS collared females, we conducted a zone of influence analysis to quantify caribou responses to development across the summer (calving, post-calving and mosquito periods) and under different levels of mosquito harassment (low, moderate and high). Despite the long-term presence of development within their range, caribou exhibited strong avoidance responses to infrastructure for most periods and levels of harassment. Caribou reduced their use of habitat within 6 km of development during the calving period and within 2 - 8 km during the post-calving period (depending on harassment). During the mosquito period, caribou did not avoid infrastructure when harassment was low, but reduced their use of habitat within 6 km when harassment was high. Our results corroborate a growing body of evidence suggesting that habituation to development in Arctic caribou is likely to be weak or absent.



Caribou - photo by Jared Hughey.

10:30 am

INTRINSIC AND EXTRINSIC FACTORS RELATED TO MIGRATION DESTINATION AND TIMING FOR THE PARTIALLY-MIGRATORY TESHEKPUK CARIBOU HERD

Timothy Fullman¹, Lincoln Parrett², Brian Person³, and Alexander Prichard⁴

¹The Wilderness Society, ²Alaska Department of Fish and Game, ³North Slope Borough - Department of Wildlife Management, and ⁴ABR, Inc. Contact: tim_fullman@tws.org

Abstract: The Teshekpuk Caribou Herd is unique among Arctic Alaskan caribou in that most of the herd overwinters on the northern coastal plain, while other individuals migrate hundreds of kilometers to overwinter in the foothills and mountains of the Brooks Range. GPS collar data from 79 female caribou between 2004 - 2016 was used to identify migration behavior and timing using First-Passage Time and Net-Squared Displacement analyses. We then used mixed effects models to regress the probability of using coastal plain versus mountain winter areas, as well as patterns of migration timing and duration, against both intrinsic (e.g., age, parturition status) and extrinsic (e.g., vegetation productivity, temperature) factors. Migration destination was influenced by both intrinsic and extrinsic factors, with older caribou and those that were pregnant less likely to migrate to the mountains, while those that experienced higher summer vegetation productivity and population size more likely to migrate away from the coastal plain. In contrast, migration timing seemed only to be affected by extrinsic factors. Migration destination strongly influenced start and end dates of both fall and spring migration, while other factors like temperature, precipitation, and vegetation productivity varied between spring and fall migration. The Arctic is undergoing rapid climate change as well as experiencing increasing human activity and development. Our findings provide a baseline for exploring how migration behavior of a key subsistence species responds to rapidly changing environments in northern Alaska.

10:45 am

NUTRITIONAL LANDSCAPES OF ARCTIC CARIBOU: OBSERVATIONS, EXPERIMENTS, AND MODELS PROVIDE PROCESS-LEVEL UNDERSTANDING OF FORAGE TRAITS AND TRAJECTORIES

Jeff Welker^{1,2}, Josh Leffler³, Kathy Kelsey¹, Stine-Hojland Pedersen^{4,1}, Donald Spalinger¹, Glen Liston, Joe Sexton, Gary Kofinas, Scott Leorna, Torsten Bentzen, Todd Brinkman, Jessica Richard, Heidi Becker, and Kaj Lynoe

¹University of Alaska Anchorage, ²UARctic, ³South Dakota State University, and ⁴Colorado State University. Contact: jmwelker@alaska.edu

Abstract: Today, the Arctic system is in the midst of transformational climate change resulting in new vegetation assemblages, changes in the nutritive value of plant tissues, and ultimately the diets of migratory caribou and the humans that depend on them. This project examines the nutritional landscape of the Central Arctic Caribou Herd (CACH) as a unifying concept in Arctic System Ecology. Collectively this program may provide additional insight as to the underlying processes that may be responsible in part for the changes in the CACH population. We are using 6 main approaches to address the systems ecology of the CACH by: 1) Quantifying the year-long forage nutritional landscapes (~170 miles N to S and ~30 miles east to west), 2) Measuring weekly forage nutritional properties of tussock tundra in a future CACH home range representative of northern Alaska's winters and summers of 2030 - 2050 using our long-term ITEX experiment, 3) Carrying out high definition measurements of winter snow properties, vegetation and winter caribou diet in the CACH home range, 4) Quantifying the interconnectedness of winter snow attributes with growing season NDVI over the past 20 years to resolve the underlying mechanisms that control rates of spring vegetation growth, peak and late season forage nutrition, 5) Undertaking citizen science activities including hunter and outfitter interviews and perceptions of herd decline indicators and harvest successes, and 6) Use educational documentaries to share our approach, field research and discoveries with young and adult learners.

11:00 am

GENETIC DIFFERENTIATION OF SMALL CARIBOU HERDS IN NORTHERN ALASKA

Karen Mager

Earlham College. Contact: magerka@earlham.edu

Abstract: Alaska is home to many small caribou herds that are relatively understudied. Though these herds contribute little to caribou harvest, their more sedentary and forest-based habits are intriguing. Small herds are often assumed to be “remnant” subpopulations of large source herds nearby, yet our earlier research using very limited sample sizes hinted at greater genetic differentiation among source and remnant herds than expected. Here, I use bolstered sample sizes and 18 microsatellite markers to more fully assess genetic relationships among the Galena Mountain, White Mountains, Hodzana Hills, and Ray Mountains caribou herds in northern Alaska. My objective was to determine whether small herds show unexpected genetic differentiation from herds nearby. Preliminary results suggest that the Galena Mountain herd is strongly differentiated from other herds in the state, including from the Western Arctic Herd whose range margins it historically overlapped. The White Mountains and Fortymile herds are also more differentiated than we might expect given their range overlap and opportunities for exchange. Divergence due to genetic drift in small populations may help to explain these patterns, however questions remain about the factors preventing interbreeding with neighboring herds that could counteract such divergence. By examining these findings in the context of demographic history, space use, and behavior, I aim to suggest future directions for research and management of northern Alaska’s smallest herds.

11:15 am

ALASKA GEOSPATIAL COUNCIL VEGETATION TECHNICAL WORKING GROUP: OPPORTUNITY TO MAKE AN UPDATED STATE VEGETATION MAP RELEVANT FOR WILDLIFE SCIENCE

Jeanne Osnas^{1,2}, Elizabeth Powers³, Parker Martin⁴, Sue Rodman⁵, Aaron Wells⁶, and Alaska Geospatial Council Vegetation Technical Working Group

¹University of Alaska Anchorage, ²Alaska Center for Conservation Science, ³U.S. Geological Survey, ⁴National Park Service, ⁵Alaska Department of Fish and Game, and ⁶ABR, Inc. Contact: jlosnas@alaska.edu

Abstract: The Alaska Geospatial Council (AGC) Vegetation Technical Working Group (VTWG) was founded in 2017 with the broad goal to concretely improve the state’s vegetation map and to coordinate vegetation mapping activities across agencies and organizations. Working group participants hail from multiple federal agencies, ADFG, the University of Alaska, the Alaska Center for Conservation Science, and private companies. The VTWG has reviewed existing Alaskan vegetation map products and approaches and is currently working to articulate consistent statewide vegetation classification and mapping standards for use in future state vegetation mapping endeavors. The VTWG is reviewing available data and is exploring opportunities to revise statewide spatial vegetation data. VTWG strives to be a unified regional voice to promote and achieve collaborative vegetation mapping in Alaska. The technical work of the statewide vegetation map revision is in its early stages. The VTWG encourages input from stakeholder groups who might benefit from an updated statewide vegetation map, including wildlife researchers and managers. The statewide revision need not be monolithic and may include a variety of hierarchical vegetation data at different spatial scales. The VTWG wishes to improve its understanding of wildlife professionals’ vegetation data needs and solicits dialogue about integrating quantitative and qualitative vegetation data in the service of understanding wildlife resources. The VTWG would like to inform The Wildlife Society about its progress and goals and foster further dialogue and collaboration for improving the utility of the updated statewide vegetation map.

11:30 am

INDIVIDUALLY-VARYING, NICHE-BASED GRADIENTS QUANTIFY PATTERNS OF VEGETATION FOLIAR COVER IN ARCTIC ALASKA

Timm Nawrocki*¹, Matthew Carlson¹, Jamie Trammell², Jeanne Osnas¹¹Alaska Center for Conservation Science and ²Southern Oregon University

The ability to quantify spatial patterns and detect change in terrestrial plant communities across large landscapes depends on linking ground-based measurements of vegetation distribution, abundance, and trend to remote sensed and environmental spatial data. Unlike non-overlapping discrete vegetation types (i.e., typical vegetation and land cover maps), species-level gradients of foliar cover are consistent with the ecological theories of individualistic response and niche space. Species-specific cover estimates represent vegetation pattern without introducing bias from subjective determination of map classes. We collected plant species cover data in National Petroleum Reserve Alaska from 2012 to 2017. To map the species-level patterns of foliar cover for six dominant and widespread vascular plant species in arctic Alaska, we associated ground-based measurements of species distribution from fourteen vegetation survey datasets and ground-based measurements of species foliar cover from our data to environmental features and multi-season spectral features using stochastic gradient boosting ensembles tuned in a bayesian framework. For five of the six modeled species, the composite models predicted 35% to 65% of the observed species-level variation in foliar cover. The composite model for one species, *Eriophorum angustifolium*, failed to predict any of the observed species-level variation in foliar cover. With the exception of *E. angustifolium*, the continuous gradient predictions for modeled species outperformed the predictions of an existing non-overlapping discrete vegetation type map. Our analysis of vegetation pattern will enable quantitative inference of the forage and physical habitat relationships between terrestrial vegetation and wildlife.

SESSION D

(1:45 PM - 3:30 PM)

Session Moderator: Kim King Jones

1:45 pm

REDUCING THE RISK OF RESPIRATORY DISEASE IN WILD CAPRINAE IN ALASKA – A RECOMMENDED SOLUTION

Rebecca Schwanke and Kevin Kehoe

Alaska Wild Sheep Foundation. Contact: becky99588@yahoo.com

Abstract: Alaska wild Caprinae are considered naïve and susceptible to respiratory pathogens commonly carried by domestic sheep and goats. While no widespread respiratory disease has been reported in northern wild Caprinae, epizootic pneumonic events in bighorn sheep and Rocky Mountain goats in the western U.S. often following contact with domestic sheep have raised the awareness of the possibility in Alaska and western Canada. A growing body of evidence suggests that a majority of these pneumonic populations are persistently infected with *Mycoplasma ovipneumoniae* (*Movi*) along with a variable suite of other pathogens. Following confirmatory reports of *Movi* in Alaskan domestic sheep and goats, we set out to assess possible options to reduce the risk of *Movi* transmission to wild Caprinae. One possible solution to reduce the risk is to attempt to control the pathogen in the primary known reservoir. To this end, we developed a protocol to help owners move towards *Movi* Free flocks/herds. In the absence of an available antibiotic treatment option, we developed a *Movi* Free process protocol. By using a combination of PCR and serology testing, quarantine and culling, we have achieved *Movi* Free status in an Alaskan domestic test herd. Given the severity of the risk *Movi* poses to wild Caprinae, we recommend our government agencies work closely with Alaskan livestock owners to implement this strategy on a statewide basis taking measurable steps towards elimination of *Movi* in domestic sheep and goats.

* - student

2:00 pm

BIOACCUMULATION OF MERCURY IN NORTHERN FUR SEALS RELATIVE TO ROOKERY FIDELITY AT ST. PAUL ISLAND, ALASKA

Michelle Quillin*¹, Stephanie Crawford, Lorrie Rae

¹University of Alaska Fairbanks. Contact: maquillin@alaska.edu

Abstract: Mercury, a heavy metal, tends to bioaccumulate in marine organism tissues and biomagnifies throughout the food web. Northern fur seals (*Callorhinus ursinus*) are an important food resource for Alaskan natives living on the Pribilof Islands. Furthermore, seals feed at high trophic levels, sharing a variety of fish species with humans as food. This overlap in prey selection indicates the dietary needs of seals and humans and raises concerns about local impacts of mercury exposure in northern fur seals in a One Health context. Additionally, the population of fur seals on St. Paul Island is on a decline. Mercury is known to cause adverse health effects in other fish-eating mammals including humans, with particular concern over impacts to immune function, survival and reproductive rates. Examining mercury concentration in fur samples from three rookeries on St. Paul Island will determine if northern fur seals bioaccumulate higher levels of mercury when foraging in some regions of the southern Bering Sea compared to others. Utilizing stable isotope analysis will assess whether relative trophic position and foraging habitats are related to mercury concentration in these animals. More than 100 fur samples were collected from Vostochni, Polovina, and Zapadni rookeries from live adult females and deceased pups in 2017. This information can be utilized by traditional subsistence hunters, those involved in regulation and management of fish and marine mammals, and other studies investigating mercury concentration in northern fur seals or pathways of heavy metals in the marine ecosystem.

2:15 pm

BIOMARKERS FOR REPRODUCTION AND METABOLISM IN LARGE WHALES FROM THE NORTH PACIFIC

Valentina Melica*¹, Shannon Atkinson¹, John Calambokidis², and Diane Gendron³

¹University of Alaska Fairbanks, ²Cascadia Research Collective, and ³Cientro Interdisciplinario de Ciencias Marina. Contact: vmelica@alaska.edu

Abstract: The goal of this project is to define the interaction among stress response, metabolic status, and reproduction using hormones as biomarkers in blue (*Balaenoptera musculus*) and gray (*Eschrichtius robustus*) whales from the Eastern North Pacific Ocean. Recovered from commercial whaling, both species feed on lower trophic levels and migrate between the Eastern Tropical and the Eastern North Pacific Ocean. As the number of whales increases, their health status can be significantly affected by changes in oceanographic conditions and by increasing human-whale interactions (e.g., vessel traffic and underwater noise). Physiological parameters regarding reproduction and metabolic status, used as a proxy for stress-response, are fundamental for assessing long-term effects and can complement photo-identification and behavioral studies as tools to determine population status and well-being. Using hormones as biomarkers we aim to evaluate existing relationships among environmental conditions, anthropogenic activities and reproduction. Progesterone, testosterone and cortisol were measured in blubber samples of live and stranded blue whales collected from the U.S. West Coast and the Gulf of California. Results indicated that progesterone can be used as indicator of pregnancy, with concentrations being significantly higher (ANOVA $p < 0.05$) in pregnant whales compared to non-pregnant animals. Testosterone concentrations were higher in males sampled off the U.S. West Coast, potentially indicating the onset of breeding behavior. Cortisol was higher in stranded individuals and showed variation across reproductive states. This same approach is being applied to blubber of gray whales in order to develop an interspecies comparison for reproductive and metabolic profiles.

* - student

2:30 pm

URBAN MUSKOXEN IN NOME, ALASKA

Emma Zayon*¹, Claudia Ihl², Zach Nicholson¹, and Hannah Beutler³

¹University of Alaska Fairbanks, ²University of Alaska - Northwest Campus, Nome, and ³Stanford University.

Contact: cihl@alaska.edu

Abstract: The city of Nome in northwestern Alaska is increasingly facing troubles created by close proximity of muskoxen to roads and residences during the summer. While muskox populations on the Seward Peninsula overall are steady, muskox numbers in and near Nome have increased in recent years. At least 25 dogs have been killed by muskoxen. Airport traffic has been interrupted by the presence of muskoxen on the runway. Conversely, the presence of muskoxen close to roads allows for increased opportunities in local wildlife viewing and tourism. The needs of different citizen groups have to be weighed when searching for a solution to Nome's urban muskox problem. This long-term study aims to uncover some of the reasons why muskoxen are attracted to habitats within the city. During summers of 2016-2018, we assessed vegetation cover, forage quality, phenology changes and diet selection at muskox feeding sites within the city and at the airport runway, as well as in outlying tundra habitats. We conducted behavioral observations to assess the level of disturbance muskoxen experience while foraging in the city. We hypothesize that recently disturbed former mining areas within the Nome city limits offer preferred foraging habitat because early successional stages of regrowth offer more preferred foraging species at potentially higher nutritional value and earlier phenology in spring.

2:45 pm

MEW GULL NESTING BEHAVIOR IN AN ALASKAN URBAN LANDSCAPE

Emily Richmond and Garrett Savory

Colorado State University, CEMML. Contact: erichmond711@gmail.com

Abstract: Mew gulls (*Larus canus*) nest seasonally within the Main Cantonment of Fort Wainwright, Alaska each year. They often place nests on top of buildings and equipment, and near active runways, provoking negative and hazardous human-wildlife interactions with residents and military personnel. Because mew gulls can live 20 plus years and recall nesting sites from previous years, the nesting behavior on Fort Wainwright will likely persist unless a data-based management plan is put in place to change their nesting behavior. Our goal was to explore mew gull nesting behavior to find out how the colony exists in this urban environment. Our objectives were to i) estimate mew gull nest abundance, ii) determine how mew gull nests are spatially distributed, and iii) determine mew gull nest survival and the affecting variables. We collected nest data by field surveys and multiple nest visits. Between the two breeding seasons of May - July 2016 and 2017, a total of 159 nests were surveyed. We identified a mean mew gull nest abundance of 80 (64 - 95; 95% CI) nests for both years. Most gulls nested in clusters, near buildings, away from buildings with dogs, and near waterbodies. Daily nest survival was highest when a nest was on a structure, near a neighboring nest, and away from a waterbody but decreased as the nest aged. Mew gulls have proven to nest successfully in various conditions amidst consistent disturbance from humans and predators. A long-term management plan is required to change how they interact with the landscape.



* - student

Mew gull - photo by Ted Swem33

3:00 pm

ASSESSING DALL'S SHEEP HORN MORPHOMETRICS AS A MANAGEMENT TOOL

Brad Wendling, Joe Want, and Chris Brockman

Alaska Department of Fish and Game. Contact: brad.wendling@alaska.gov

Abstract: The Alaska Board of Game has been inundated with public proposals aimed at altering Dall's sheep (*Ovis dalli*) management. Proposals are directed at reducing a perceived level of competition between hunters, and to address a possible lack of legal rams available for harvest. Many hunters believe that all legal rams are harvested each year and want to increase availability by reducing hunting opportunities to non-residents. Generally, Alaska sheep hunting is managed under a full-curl strategy. In 2016, we began to study horn morphometrics as a tool to inform management decisions. We measured and photographed ~60% of harvested rams in 2016 (474 of 783), 2017 (483 of 798), and 2018 (471 of 788). For each horn, we quantified age, total horn length, total degree of curl, distance between consecutive annuli, and degree of curl by annulus segments. The relationship between horn length and degree of curl was significant ($p < 0.01$; $r^2 = 0.37$). Age and degree of curl was not significant ($p = 0.3$). The mean age at which rams achieved 360° curl was 8.5 years (range 5 - 12 years). For 2016 and 2017, 19% and 16% of harvested rams were legally taken on criteria other than 360° of curl, while 28% and 27% of rams were harvested in the first year they became legal based on degree of curl. Conversely, 53% and 57% of harvested rams were available for harvest during at least one previous hunting season after their horns grew through 360° curl. Preliminary analyses indicate hunters are removing less than half of all legal rams each year statewide.

3:15 pm

ALPINE AERIAL SURVEYS AS A METHOD OF ESTIMATING RELATIVE ABUNDANCE OF DEER IN SOUTHEAST ALASKA

Patrick Valkenburg¹ and Richard Lowell²

¹WRAM and ²Alaska Department of Fish and Game. Contact: patvalkenburg@gmail.com

Abstract: In 2013, we began experimenting with a new aerial survey technique to estimate relative deer abundance in southeast Alaska. In 2014, we settled on doing 3 - 4 replicate evening surveys of approximately 1.5 - 2.2 hours each in alpine habitat. Surveys were designed to end approximately at sunset and results were expressed as deer observed/hour of survey time. From 2013 to 2018, in cooperation with ADF&G Area and Research staff, and contract pilots, we conducted a total of 101 evening surveys with 5 Supercubs in 10 survey areas ranging from low (5 deer/hour) to very high (294 deer/hour) relative deer abundance. Areas surveyed included northeast Chichagof, southern Admiralty, northern Kuiu, western Kupreanof, Lindenberg Peninsula of Kupreanof, southern Etolin, central Prince of Wales, northern Prince of Wales/Kosciusko, Douglas Island, and Horn Cliffs/Thunder Mountain (Unit 1B mainland). During these surveys, we recorded information on the following covariates that may affect deer observed/survey hour: temperature at 3000', cloud cover, wind speed, survey end time in relation to sunset, and days after rain. In this presentation, we present results of these surveys and discuss advantages and disadvantages of using aerial alpine deer surveys over traditional pellet group surveys, DNA capture/recapture, and harvest reports as indicators of relative deer abundance. We also discuss other considerations, such as, accuracy, timeliness, weather constraints, and cost.

SESSION E

(1:45 PM - 3:30 PM)

Session Moderator: Valentina Melica

3:45 pm

COLLARED PIKA POPULATION ECOLOGY IN ALASKA: A COLLABORATIVE APPROACH

Jeff Wagner*¹, Katie Christie², Paul Schuette¹, and Amanda Droghini¹

¹University of Alaska Anchorage, Alaska Center for Conservation Science and ²Alaska Department of Fish and Game. Contact: jawagner5@alaska.edu

Abstract: The collared pika (*Ochotona collaris*) is known to inhabit alpine talus and boulder fields across northwestern Canada and Alaska and is considered to be an important indicator species for the health of alpine ecosystems. Alpine ecosystems in Alaska are undergoing rapid changes including the expansion of shrubs and warmer winter temperatures. Information on the status of pika populations in Alaska is currently lacking and the impacts of climate change on survival and abundance are currently unknown. In the summer of 2018, the Alaska Department of Fish and Game (ADF&G), the Alaska Center for Conservation Science (ACCS), and the University of Idaho (UI) initiated a joint research project investigating the demography, foraging ecology, and abundance of collared pikas in southcentral and interior Alaska. ADF&G and UI captured and tagged a total of 58 pikas for a mark-recapture study, deployed cameras and temperature loggers in pika territories, and conducted 11 cafeteria trials to determine food preferences. ACCS surveyed 26 sites in 4 different regions throughout the state. At each site, field crews searched talus patches within a 500-m radius area using a double-observer approach. We are currently developing methods to estimate pika occupancy based on haypile detection/non-detection data and local abundance using distance sampling data, and identify the ecological and environmental variables associated with observed variation in our estimates across our study area. Collectively, the information obtained over the course of this study will enhance our knowledge of how pika occupancy, abundance, survival, and diet are influenced by environmental change in Alaska.

4:00 pm

TRACKING BATS TO LOCATE ROOSTING HABITAT IN INTERIOR ALASKA

Garrett Savory, Kim Jochum, Jacob Pelham, Gerrid Greenwood, and David Hejna

Colorado State University, CEMML. Contact: garrett.savory@colostate.edu

Abstract: In interior Alaska, at the northwestern edge of their range in North America, the natural history of bats is not well understood. In the near future, due to population declines caused by white-nose syndrome, the potential listing of little brown bats (*Myotis lucifugus*) under the Endangered Species Act will likely impact land users such as the military, including Fort Wainwright. From prior surveys we know that bats are distributed throughout Fort Wainwright lands but we do not know much about their life history requirements in this region, such as natural maternity roost habitat. The objectives of our study were to identify species, identify sensitive habitat areas for bats, locate and describe natural maternity roosts and document other important life history information. We captured 77 bats in 2017 and 2018 at 13 unique sites on Fort Wainwright land. We attached VHF telemetry devices to 20 bats to locate roosts. All bats we captured appeared to be little brown bats from physical appearance; we will conduct genetic analysis in 2019 to confirm. We tracked bats to several roosts in both trees and buildings. We found three confirmed natural maternity roosts located in balsam poplar (*Populus balsamifera*) and paper birch (*Betula neoalaskana*) snags in a > 100 year-old closed canopy mixed forest in the Chena River flood plain on Fort Wainwright land, and suspect additional maternity roost to exist in this area. This information can be used by resource managers to develop bat conservation plans and to facilitate further bat research in interior Alaska.

* - student

4:15 pm

DETECTING REPRODUCTIVE AND STRESS-RELATED HORMONES IN FUR AND CLAWS OF HARVESTED AMERICAN MARTEN

Mandy Keogh, Ross Dorendorf, and Kerry Nicholson

Alaska Department of Fish and Game. Contact: mandy.keogh@alaska.gov

Abstract: American marten (*Martes americana*) are highly valued and sought-after furbearer species in Alaska; however, there has been limited research identifying indices that trappers and managers can use for population assessment prior to, or during the trapping season. Measuring reproductive and stress-related hormones of marten may allow managers to link local stressors that influence reproduction and fitness. As part of a long-term study on reproductive rates of marten in Interior Alaska (2007-2017), carcasses were donated by trappers and we used female samples from 2012, 2014, and 2016. We determined pregnancy by presence of blastocysts and removed fur and claws from 59 paws. We extracted hormones from the fur and claws and used standard methods for laboratory validations for cortisol, progesterone, and testosterone enzyme immunoassays. Progesterone concentrations in fur were lower in 2016 (11.1 ± 4.7 pg/mg, $p = 0.038$) compared to 2012 (15.8 ± 5.4 pg/mg) and 2014 (14.5 ± 9.4 pg/mg), but there was no difference between reproductive status. Whereas cortisol concentrations in fur were higher in 2014 (9.6 ± 9.0 pg/mg; $p < 0.001$) compared to 2012 (4.1 ± 2.0 pg/mg) and 2016 (6.5 ± 9.5 pg/mg). Further, pregnant females had lower fur cortisol concentrations (5.2 ± 3.3 pg/mg; $p = 0.019$) compared to nonpregnant females (8.2 ± 9.9 pg/mg). Testosterone concentrations in fur did not differ between years or with reproductive status but there was a significant year:pregnancy interaction ($p = 0.020$). This pilot study demonstrates the utility of trapper harvested tissues to measure multiple reproductive and stress-related hormones in marten. Future studies are needed to explore what factors might be contributing to the differences observed in these hormones between years and across locations.

4:30 pm

EVALUATION OF TECHNIQUES FOR DETECTION OF NORTH SLOPE GRIZZLY BEARS

Richard Shideler¹ and Craig Perham²

¹Alaska Department of Fish and Game and ²Bureau of Ocean Energy Management. Contact: dick.shideler@alaska.gov

Abstract: Oil industry and off-road activities in the North Slope oilfield region coincide with grizzly bear denning. Disturbance from these activities can cause premature den emergence, and create concerns about both bear conservation and human safety. State and federal land use agency stipulations require that such activities must avoid active dens by 0.5 miles. However, this stipulation presupposes that the actual den location is known. Therefore, early detection of dens is important. We evaluated 3 methods of detection: 1) airborne Forward Looking Infrared (FLIR) imagers, 2) handheld thermal imagers, and 3) trained scent dogs. After bears had entered dens each fall we flew radio-tracking surveys of bears radio-marked as part of an ongoing grizzly bear study in the region, and used these locations as the test population. We then conducted helicopter-borne FLIR imagery surveys and ground-based thermal imaging surveys between, and scent dog surveys over the winter between 2000 and 2013. Because most den locations were based on radio signal attenuation rather than visible confirmation there was some locational error. Therefore, we ground-truthed the locations the following summer to calculate precision of the location by each detection method. We found that dogs were the most successful detector. However, operational constraints prevented us from obtaining sufficient sample size for adequate power analysis for the other 2 methods. We will discuss management implications and further research recommendations.

4:45 pm

USE OF FORWARD LOOKING INFRARED FOR BEAR DEN DETECTION IN ALASKA'S ARCTIC

Nils Pedersen*¹, Todd Brinkman¹, Richard Shideler², and Craig Perham³

¹University of Alaska Fairbanks, ²Alaska Department of Fish and Game, and ³Bureau of Ocean Energy Management. Contact: njpedersen@alaska.edu

Abstract: Winter industrial activity overlap polar (*Ursus maritimus*) and grizzly bear (*U. arctos*) winter denning habitat in the North Slope oilfields of Alaska. To prevent disturbance of dens, managers have used Forward Looking Infrared (FLIR) to locate dens, but FLIR's effectiveness under different environmental conditions is unresolved. To evaluate FLIR techniques and optimize their use for den detection, we equipped an Unmanned Aircraft System (UAS) with FLIR and conducted routine observations of artificial polar (APD) and grizzly (AGD) bear dens from horizontal and vertical perspectives, ≤ 100 m, from December 2016 - April 2017. We recorded the physical characteristics of artificial dens and weather conditions at each observation. We captured 291 images and classified them as a detection, or non-detection based on the number of image pixels representative of a bear den "hot spot." We used logistic regression to model effects of weather conditions on probability of detection vs. non-detection. Results indicate that FLIR detects APDs 2 times better than AGDs, vertical detections are 4 times better than horizontal, and weather affects detection probability between 50 and 100 m. Decrease in air temperature, wind speed, and the absence of precipitation and solar influence increased detection probability for artificial dens. UAS-FLIR den detection is optimized by surveying in early November (AGD) and January (APD), on cold, clear days, with calm winds, during hours of low solar influence. We "ground truthed" our technique on actual bear dens. FLIR den detection is best interpreted by experts in this field and should be confirmed by a secondary method.

Poster Session Abstracts (Wednesday, 3:00 pm - 4:00 pm)

Elizabeth Peratrovich Hall, Room 2

PRELIMINARY 16-YEAR RESULTS FROM EXPERIMENT 2 OF THE TONGASS-WIDE YOUNG GROWTH STUDIES

Jeff Barnard

USFS Forestry Sciences Laboratory, Juneau. Contact: jbarnard@usda.gov

Abstract: The Tongass-wide Young Growth Studies (TWYGS) are four independent, large scale, long-term experimental silvicultural treatments on Tongass National Forest young growth stands. Each experiment involves a different age class of stands and includes an untreated control. In Experiment 2, stands were pre-commercially thinned to 14 and 18 foot spacing 15 to 25 years after harvest. Understory and overstory response for each experiment is measured on an approximately 5 year rotation. We report some preliminary results from this summer's (2018) re-measurement of Experiment 2 stands with data pertinent to black-tailed deer, *Odocoileus hemionus*, habitat. Understory vegetation cover was at its highest level at 5 years post-treatment for treated and control stands, for all species. It declined for the 10 and 16 year measurements. We converted the understory cover data into biomass estimates. We used the single-stand version of FRESH deer to calculate deer days per hectare estimates for two summer, and two winter scenarios, summer maintenance (no fawns), summer with one fawn, winter no snow, and winter with 20 cm snow for each of the three measurements. The results were similar to understory cover, with deer days highest at 5 years for each of the treatments and scenarios, declining at 10 and 16 years after treatment. We noted presence/absence of evidence of browse on the understory vegetation. For all treatments, browse was very low at the 5-year measurement. At the 10-year measurement, browse substantially increased in the treated stands.

* - student

POLAR BEAR (*URSUS MARITIMUS*) BEHAVIORAL RESPONSE TO VESSEL PRESENCE IN THE CHUKCHI AND BEAUFORT SEAS

Malie Branson, Willow Hetrick, and Sheyna Wisdom.

Fairweather Science. Contact: mailebranson@gmail.com

Abstract: Polar bears (*Ursus maritimus*) were observed in the Chukchi and Beaufort seas from 2008-2014, and 2016 data were recorded during vessel-based marine mammal line-transect surveys in the summer and fall of 2008-2014 as part of the Chukchi Sea Environmental Studies Program (CSESP), and during anchor handling operations in summer of 2016. Polar bear behavioral response data were recorded during all survey years. A total of 602.7 hours of observations were recorded. Overall, 116 individual animals were observed. This included 19 juveniles and 97 adults, ten of which were confirmed as females due to the presence of young. Data were analyzed to consider behavioral responses by polar bears with regard to several independent parameters, including; distance from vessel, sex/presence of cubs, date, vessel type, and location on ice vs. in water. In total, bears exhibited more energetic reactions (11%) on fewer occasions than less energetic reactions (89%), particularly when vessels were within 1000 m.

SPATIAL AND TEMPORAL VARIATION OF FORAGE AVAILABILITY FOR SITKA BLACK-TAILED DEER IN PRINCE WILLIAM SOUND, ALASKA

Nicole DeLuca*

Alaska Pacific University and Alaska Department of Fish and Game. Contact: nalaska2@yahoo.com

Abstract: Sitka black-tailed deer (*Odocoileus hemionus sitkensis*) are an introduced species to Alaska's Prince William Sound, where they have thrived and now exist at the northernmost latitude of their range. Sitka black-tailed deer inhabit old-growth forests where environmental heterogeneity is abundant, and understory plant communities are diverse, productive, and rich in forage species. Nutritional requirements of deer and the availability of forage fluctuate seasonally, and deer use a variety of habitat types to exploit this variability. In order to sustain productive deer populations, effective management of these herbivores requires a practical understanding of the variability of forage productivity with different habitat types. Using field-measured data collected from 55 sampling plots, I estimated the availability of forage species known to be seasonally selected by Sitka black-tailed deer within different habitat types for two islands in Prince William Sound. I compared the amount of forage available in plots during summer and winter by habitat type to test for differences in forage availability for deer between seasons and across habitats within seasons. Finally, I used environmental variables derived from remote sensing data to develop seasonal models to predict available forage biomass for the major habitat types. The results of this study will be used to create GIS layers of available biomass, which can then be used to calculate deer carrying capacity for a given area.



Sitka black-tailed deer - photo by Kim Titus.

* - student

CAUSE-SPECIFIC MORTALITY OF KNOWN-AGE MOOSE IN INTERIOR ALASKA

Graham Frye and Rodney Boertje

Alaska Department of Fish & Game. Contact: graham.frye@alaska.gov

Abstract: To manage ungulate populations, managers should understand the importance of specific sources of mortality. We contrasted timing and causes of mortality for 226 female and 164 male moose (*Alces alces gigas*) radio-collared at 9–10 months of age and followed through life. The oldest female lived 18 years and the oldest male 13 years. Excluding human-caused mortality, we documented 28% annual mortality for male yearlings versus 17% for female yearlings, then low annual mortality rates (0–4%) to 84 months of age for males and 96 months of age for females, and gradually increasing annual mortality rates thereafter. Yearlings of both sexes died primarily from wolf predation, and wolves killed a disproportionate number of male versus female yearlings. In this intensively managed moose population, most (83%) male moose ≥ 24 months of age died from human causes, with minor causes including wolves (8%), malnutrition (5%), grizzly bears (2%), rut injuries (1%), and falling from a cliff (1%). Most female moose ≥ 24 months of age died from wolves (37%) or human causes (35%), followed by malnutrition, problems at birth, and other nonpredation (15%), grizzly bears (10%), and accidents (4%). Total hunter kill, which included unreported harvest and unrecovered kills, was 1.48 times reported harvest. Based on age-specific mortality patterns, we concluded that restricting hunters to harvesting prime-age and older male moose with antler spreads > 127 cm spreads did not appreciably reduce harvest of adult males, because 2- to 4-year-old male moose with small, illegal antler spreads rarely died from non-human causes and were eventually largely harvested at older ages.

UNTANGLING THE DEMOGRAPHIC AND ECOLOGICAL FACTORS AFFECTING STALLION QUALITY OF FERAL PONIES

Molly Garner*

The University of Manchester. Contact: molly.garner2295@gmail.com

Abstract: Individuals of a species are exposed to differential social and ecological environments across their habitat range. Variation in environmental pressures can result in different levels of fitness at both the individual and population level. Environmental pressures can range from intrasexual competition to poor climatic conditions. For male members of polygynous species, fitness can play a huge role in reproductive success with a large skew towards a small number of individuals. Understanding what factors have the biggest influence on fitness can be difficult as they can co-vary in a highly complex manner. Endocrine markers are increasingly used to gain insight into the way an animal's environment influences its physiology. Here we show that, for Carneddau pony stallions (*Equus ferus caballus*); social pressures prove more stressful than differences in the ecological environment. Glucocorticoid and androgen concentrations were found to be higher in lowland stallions with more mares in their harem bands. Testosterone concentrations were consistent with past literature on free ranging mammals, as higher levels are associated with a number of factors that result in increased reproductive success; though concentrations did not increase on approach to the breeding season. Glucocorticoid concentrations, however, were higher in better quality habitat; despite their common association with ecological stress and lack of resources. Therefore, lowland stallions may have more mares and higher reproductive success, but it appears that the stress associated with larger band maintenance outweighs that imposed by environmental pressures placed on less successful stallions.

* - student

CONTAMINANTS RESEARCH TAKES FLIGHT: EMERGING CONCERNS FOR YELLOW-BILLED LOONS (*GAVIA ADAMSII*) IN NORTHERN ALASKA

Patrick Knavel¹, Will Caldwell¹, Sarah Swanson¹, Delaney Vinson¹, Briana Kremer¹, Jenna DiFolco¹, Angela Matz², Debbie Nigro³, and Melanie Flamme¹

¹U.S. National Park Service, ²U.S. Fish and Wildlife Service, ³Bureau of Land Management. Contact: patrick_knavel@nps.gov

Abstract: The Yellow-Billed Loon (*Gavia adamsii*), an international species of concern, is facing a multifaceted set of threats. One such issue is exposure to environmental contaminants, both on and off their breeding grounds. These birds are particularly susceptible to contaminant biomagnification due to their high trophic level, piscivorous diet, and migration paths that take them through contaminated waters in Asia. The U.S. Fish and Wildlife Service, U. S. Geological Survey, and Bureau of Land Management partner with the National Park Service to monitor the types and levels of environmental contaminants present in Yellow-billed Loons nesting in Alaska. With assistance from a Murie Science and Learning Center and Alaska Geographic grant, six young professionals participated in laboratory training and an environmental internship to learn about contaminants in wildlife. The interns prepared Yellow-Billed Loon eggs from Bering Land Bridge National Preserve and Cape Krusenstern National Monument for contaminant analyses including: methyl mercury, PCBs, PFOS/PFOA, and POPs. Each of these contaminants pose particular biological challenges for the species.

OXIDATIVE STRESS AND GLUTATHIONE PEROXIDASE IN STELLER SEA LIONS: ASSOCIATIONS WITH MERCURY AND SELENIUM STATUS.

Marianne Lian^{1*}, Margaret Castellini¹, Tom Kuhn¹, Mandy Keogh², Louise Bishop¹, L. D. Rea, B. Fadely, J. Maniscalco, T. M. O'Hara¹

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

Abstract: In the endangered Steller sea lion (*Eumetopias jubatus*, SSL), one third of the sampled pups in the central and western Aleutian Islands have total Hg concentrations ([THg]) in hair above levels of concern (>20 µg/g) for increased risk of fetal neurological effects. The marine diet of pinnipeds supports high levels of systemic Se, and relatively high levels of antioxidants as an adaptation to reperfusion injury subsequent to long term dives (hypoxia). However, relatively low molar ratios of TSe:THg are documented for some SSL pups with relatively high [THg] (possible Hg dependent Se deficiency), leading to a possible overall antioxidant deficiency. Pinnipeds may experience similar oxygen- and oxidative-dependent physiological challenges during capture and anesthesia as occurs during diving, including oxidative stress. We captured and anesthetized newborn SSL pups at Agattu, Ulak, Ugamak (Aleutian Islands) and Chiswell (Gulf of Alaska) Islands, to assess the interactions between [THg] and [TSe] and the oxidative stress response in these four groups of SSL with documented relatively high to low [THg]. Here we present data showing regional differences in [THg], [TSe], oxidative stress and antioxidant biomarkers, and associations between animals with relatively high and low [THg], varying TSe:THg molar ratios, GPx levels, and oxidative damage. These results may help elucidate how the SSL populations in the western Aleutian Islands are affected by relatively high mercury exposure relative to a key antioxidant.

* - student



LABORATORY CONCORDANCE STUDY FOR THE DETECTION OF *MYCOPLASMA OVIPNEUMONIAE*

Camilla Lieski¹, Kimberlee Beckman¹, and Margaret Highland²

¹Alaska Department of Fish and Game, ²U.S. Department of Agriculture. Contact: clieske@gmail.com

Abstract: As part of a survey for *Mycoplasma ovipneumoniae* in Alaskan wildlife, we evaluated detection concordance for Polymerase Chain Reaction (PCR) assays at two different laboratories. Split samples (N = 374) from nasal swabs collected from both live captures and hunter harvested wild ungulates were analyzed at Washington Animal Disease Diagnostic Laboratory (WADDL) and the USDA, ARS, Animal Disease Research Unit (USDA). At WADDL, all samples were analyzed using the universal mycoplasma PCR (UM-PCR). A subset of samples was tested using the *M. ovipneumoniae* specific real-time PCR. All detections using the UM-PCR and sequencing were also detections using the *M. ovipneumoniae* specific test, and no additional detections were found. At USDA, all samples were analyzed using the LM40-PCR, and a subset of the sequenced positive or mixed (*Mycoplasma* spp.) results were analyzed by additional PCR assays (IGS and LM-MGSO). For concordance calculations we compared results for UM-PCR, LM40, and IGS. We found that concordance was good, depending on the test used. The highest concordance was between UM-PCR and IGS (overall concordance = 99%, positive agreement 75%, negative agreement 99%). Concordance between the LM40 and UM-PCR and the LM40 and IGS assays were similar (overall 93% for both comparisons, with a positive agreement of 39% and 36% and a negative agreement of 96% and 97%). The LM40-PCR assay detected *M. ovipneumoniae* in more individuals than the other tests. Differences in limit of detection, sensitivity, and specificity of the different assays likely accounts for the differences in results.

SHOREBIRD ABUNDANCE ESTIMATES ON MILITARY LANDS IN INTERIOR ALASKA

Ellen Martin¹, Kim Jochum², Calvin Bagley², and Paul Doherty¹

¹Colorado State University and ²Colorado State University, CEMML. Contact: ecmartin33@gmail.com

Abstract: Interior Alaska is the least studied region in Alaska for breeding shorebirds. Currently, no shorebird sites of importance, such as those designated by the Western Hemisphere Shorebird Reserve Network (WHSRN), have been identified in interior Alaska and little is known about associated shorebird distribution and abundance. The Department of Defense (DoD) is a major land manager in interior Alaska and a partner in avian conservation. This study is the first design-based comprehensive shorebird survey to estimate shorebird population sizes on DoD lands in interior Alaska. I modified Arctic PRISM protocol to address the increased diversity of habitat types and low density of shorebirds in the boreal forest. From April 2016 to August 2017, I used a probability-based sampling design to survey 78 and 142 400 x 400 m plots respectively. Each plot was surveyed twice, with two dependent observers walking transects within plots to estimate detection probability and abundance. I estimated abundance using Huggins closed captures models in Program MARK. I estimated shorebird abundance for Lesser Yellowlegs, Wilson's Snipe, all lowland shorebirds, and all upland shorebirds. In 2017, abundances of all lowland shorebirds and all upland shorebirds were 42,239 (SE = 13,431) and 3,523 (SE = 494), respectively. Shorebirds are using military lands in interior Alaska in high abundances (45,762; SE = 13,925). Although densities of shorebirds are low, the military lands in interior Alaska are so large that they contain large numbers of breeding shorebirds as defined by the WHSRN (>20,000 shorebirds annually) and therefore should qualify as a WHSRN regionally important site.

DIFFERENT METHODS FOR MEASURING PLASMA PROTEIN CONCENTRATIONS PRODUCE DIFFERENT RESULTS: A STUDY COMPARING THE BRADFORD ASSAY AND REFRACTOMETRY IN THREE ALASKAN SPECIES

Shelby McCahon*, Claire Montgomerie, Fisher Gandel, Sadie Sands, Todd O'Hara, and Marianne Lian

University of Alaska Fairbanks. Contact: smccahon2@alaska.edu

Abstract: Plasma protein concentration is a useful biomarker measured for health assessments, nutritional status and for quantifying protein damage. Protein concentrations are adequately measured in plasma with a Bradford assay or a refractometer, but we have observed some discrepancies in total protein concentrations between these methods. Because both methods are widely used to quantify protein concentrations, it is important to consider how precise these assays are for wildlife research and management decisions. In this study we compare plasma total protein concentrations in three mammalian models that include snowshoe hares (*Lepus americanus*), reindeer (*Rangifer tarandus*), and Steller sea lions (*Eumetopias jubatus*) using two different methods: refractometry and a Bradford protein assay. Reindeer (N = 8) samples were collected at the Large Animal Research Station, Steller sea lion pups (N = 40) were sampled at three rookeries in the Aleutian Islands: Ugamak, Ulak, and Agattu, and snowshoe hare samples (N = 49) were collected near the middle fork of the Koyokuk River. For all three species, we found a significant ($p < 0.01$) difference in plasma protein concentrations between the two methods. However, we note significant correlations between the two assays ($p < 0.05$) for snowshoe hares and reindeer, but not for Steller sea lions. Our findings demonstrate that these two methods cannot be used interchangeably when measuring plasma protein concentrations in these three species, and additionally, that results are not comparable between the Bradford protein assay and the refractometer.

NON-BREEDING SEASON SURVIVAL AND MOVEMENTS OF MALLARDS (*ANAS PLATYRHYNCHOS*) IN ANCHORAGE, ALASKA

Grey Pendleton, Michael Petrula, Kyle Smith, Tasha DiMarzio

Alaska Department of Fish and Game. Contact: grey.pendleton@alaska.gov

Abstract: We banded mallards (*Anas platyrhynchos*) at 8 locations in Anchorage beginning in February 2014; most were banded with colored plastic leg bands with unique alphanumeric codes (some had only metal leg bands). We resighted the color-banded birds 2-4 times per non-breeding season month (i.e., Sept. – Apr.) from February 2014 through December 2018 at 22 locations; resight effort was low during summers (i.e., May-Aug.), because few mallards remain in Anchorage in summer. Cuddy Park, which had the most birds, was surveyed almost every time, with other sites that had fewer birds or were unknown at the start of the study surveyed less often. From preliminary analyses, we estimate that monthly survival varied from 0.69-1. Most estimates were between 0.89 and 0.96. Some estimates in September and April were between 0.69 and 0.83; these lower survival estimates could reflect dispersal prior to or just after the breeding season, rather than actually lower survival. We found little evidence that sex or age affected winter survival at these urban locations. We will present survival estimates adjusted for movement as well as movement probabilities among sites, and discuss dispersal away from the Anchorage area (revealed from band recoveries) and how that might affect our estimates.

* - student

HABITAT SELECTION OF RUSTY BLACKBIRD OCCUPANCY ON FORT WAINWRIGHT, ALASKA

Geneva Preston, Justin Smith, and Garrett Savory

Colorado State University CEMML. Contact: genevaspreston@gmail.com

Abstract: Strengthening our understanding of habitat use by declining species such as the Rusty Blackbird (*Euphagus carolinus*) could contribute to planning effective management strategies for military training lands near Fort Wainwright, Alaska. Military land managers require the characterization of Rusty Blackbird habitat use to balance training objectives with management regulations such as the Migratory Bird Treaty and Sikes Acts. We used occupancy analysis to describe Rusty Blackbird habitat use on Fort Wainwright lands to provide this information to land managers and mitigate potential conflict between the execution of Fort Wainwright's mission to train soldiers in a natural environment and Rusty Blackbird ecology. We conducted auditory point count surveys at 268 randomly selected sites and performed a single season, single species, occupancy analysis to estimate habitat used by Rusty Blackbirds during the nesting seasons in 2016 and 2017, with year designated as a detection and occupancy covariate. On average, Rusty Blackbirds were detected at 19% of possible survey points across two years, and occupancy increased with increasing percentage of standing water and herbaceous vegetation. This characterization of Rusty Blackbird habitat use can be anticipated when planning high impact land use or development. Neither Rusty Blackbirds, nor the habitats they occupy, are limited exclusively to Tanana Flats Training Area, and the models presented here can be extended to other boreal landscapes within the Alaskan interior to inform management decisions regarding Rusty Blackbird habitat in the future.

BEHAVIORAL RESPONSE OF CARIBOU TO UNMANNED AERIAL VEHICLE TRAFFIC

Gwendolyn Quigley* and Todd Brinkman

University of Alaska Fairbanks. Contact: gmquigley@alaska.edu

Abstract: Anthropogenic expansion on the North Slope has dramatic impacts on the ecosystem. As oil and gas development, Arctic research, and tourism opportunities have expanded in the region, so has aircraft activity to support these efforts. Indigenous communities have conveyed a deep concern that increased manned aerial traffic is affecting their subsistence practices. Specifically, residents have reported that caribou (*Rangifer tarandus*) harvest opportunities are being impacted by low-flying aircraft. Concerned hunters have suggested that drones might be used in place of manned aircraft when possible to reduce aircraft-subsistence conflict. For efficiency, economic, and logistic reasons, researchers in a variety of fields (e.g., wildlife biology) also are interested in exploring the utility and expanded applications of drones. One key assumption associated with the interest in the use of drones is that unmanned aircraft are less likely to disturb wildlife species such as caribou. Currently, there is limited literature regarding the behavioral response of wild ungulates to drones. In collaboration with Alaska Department of Fish and Game, we plan to evaluate the behavior and flight initiation distance (FID) of caribou when subjected to drone stimulus. More broadly, our goal is to enhance positive and mitigate negative human-wildlife interactions.

* - student

DEVELOPING PROCEDURES TO ESTABLISH BASELINE ENVIRONMENTAL CONTAMINANT LEVELS FOR SMALL MAMMALS IN ALASKA PARKLANDS

Sarah Swanson¹, Jenna DiFolco¹, Delaney Vinson¹, Patrick Knavel¹, Briana Kremer¹, William Caldwell¹, Andrew Hope², Angela Matz³, and Melanie Flamme¹

¹U.S. National Park Service, ²Kansas State University, and ³U.S. Fish and Wildlife. Contact: sarah_swanson@nps.gov

Abstract: Heavy metal contamination has been shown to have adverse effects on living organisms. These include impaired development and organ function in animals and disruption of metabolic processes leading to stunted growth in plants. Impacts on lower trophic levels are magnified farther up the food chain, so foundational species can serve as effective indicators of overall ecosystem health. We developed a protocol for testing contaminants using hair samples taken from small mammal specimens collected in three parks: Gates of the Arctic National Park and Preserve (GAAR), Kobuk Valley National Park (KOVA) and Denali National Park (DNA). Results of heavy metal contaminant analysis will provide contaminant baselines for natural, undisturbed environments in Alaska. These metrics allow for assessment of potential variation in metals concentrations within healthy ecosystems, while also providing a pre-development threshold for areas subject to future industrial projects. This will be particularly useful for KOVA and GAAR, which may soon be traversed by a proposed access road to the Ambler Mining District. Results can be used to inform future management decisions and monitor contaminant exposure in parklands.



Arctic ground squirrel - photo by Kimberley Maher.

NOTES