ALASKA CHAPTER OF THE WILDLIFE SOCIETY
2023 ANNUAL MEETING

A One Health Approach to Human Interactions with, and uses of, Wildlife

Westmark Fairbanks
In Person and Virtual

April 10 - 14, 2023

Alaska Chapter of the Wildlife Society
2023 Annual Meeting

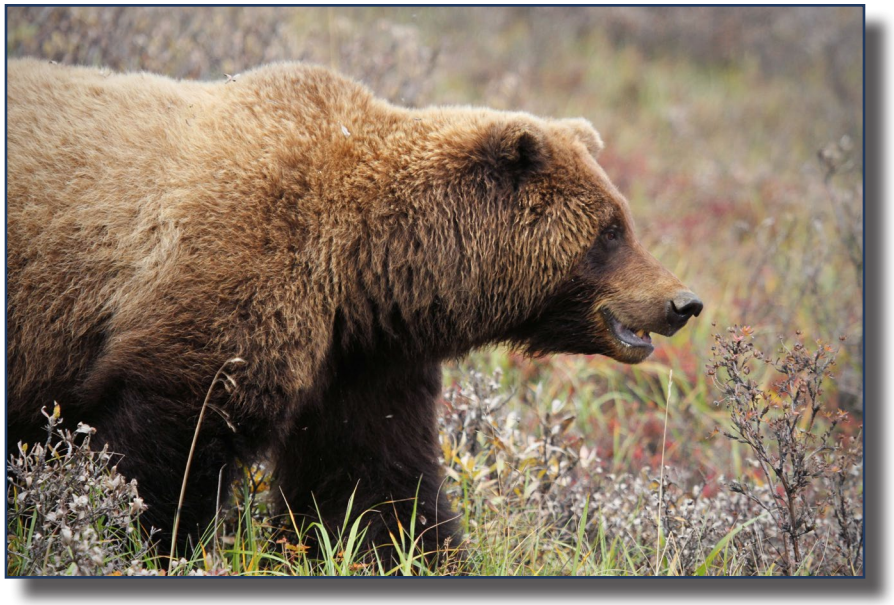
Westmark Fairbanks
Hotel and Conference Center
813 Noble Street
Fairbanks, Alaska
April 10 – 14, 2023

MEETING PLANNING COMMITTEE

Organization: Alexandra Lewis, Alex Pavlinovic, Alex Prichard, Amanda Zuelke, Anthony Crupi, Christi Heun, Cyndi Wardlow, Elise Stacy, Jeff Stetz, Jeff Wagner, Kaiti Ott, Kerry Nicholson, Kim Jochum, Kimberlee Beckmen, Kristin Denryter, Luke Rogers, Max Goldman, Nick Fowler, Roy Churchwell, Ryan Mollnow, Shawn Crimmins, Sophia Bracio, Tessa Hasbrouck, Tim Peltier, Tom Paragi, Nate Svoboda, and Vanessa Mulenbruch.

Workshops: Elise Stacy, Jeff Stetz, Karen Mager, Kimberlee Beckmen, Lisette Waits, Sarah Rauchenstein, Sterling Spilinek, and Susannah Woodruff.

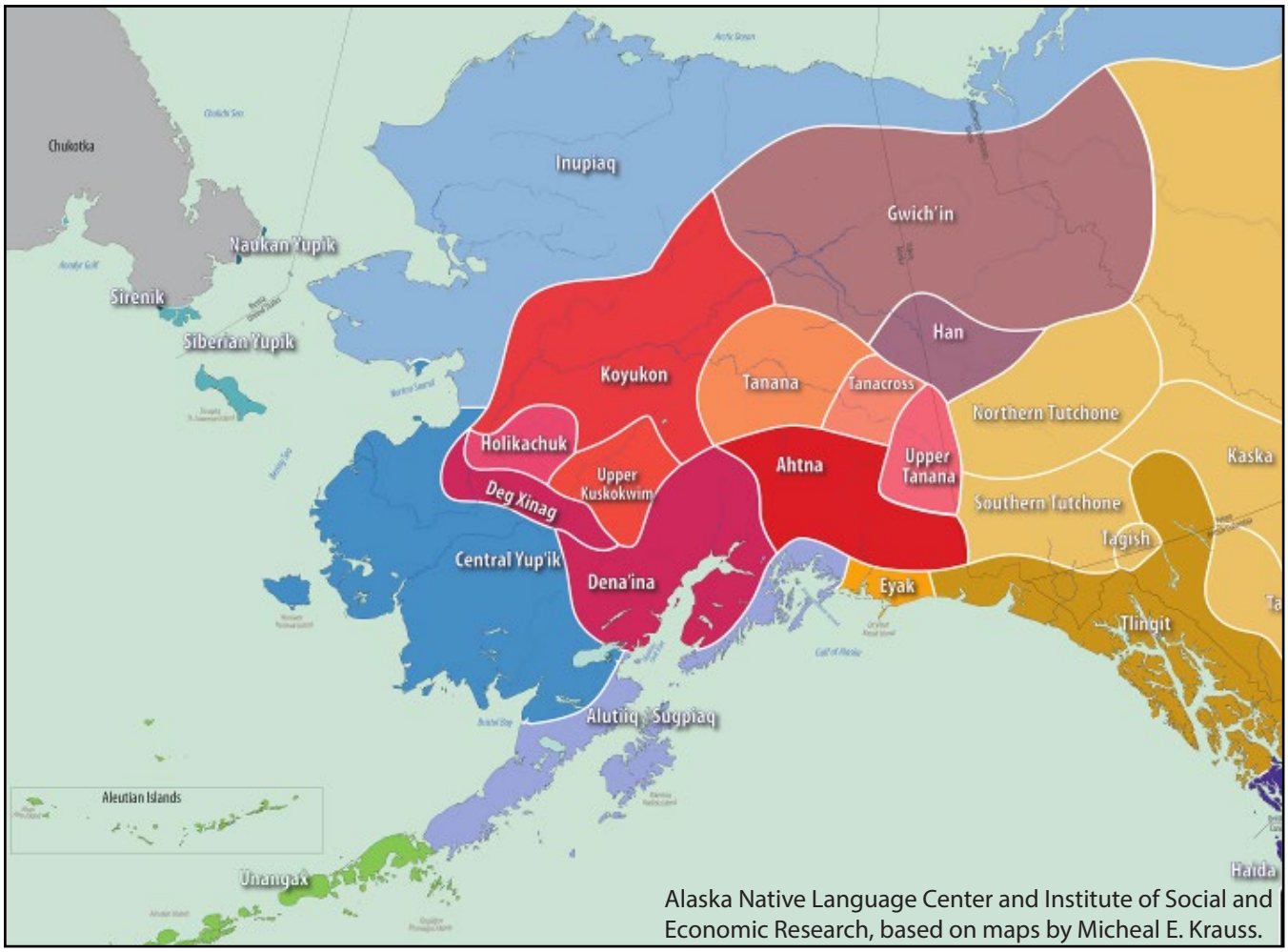
Cover Photos: Red-backed Vole and Caribou - Ted Swem (U. S. Fish and Wildlife Service, retired); Red Fox and Black Bear - Jeff Wagner (U of Wyo); Moose and Mew Gull - Jared Hughey (NPS).



Grizzly bear photo by Jared Hughey.

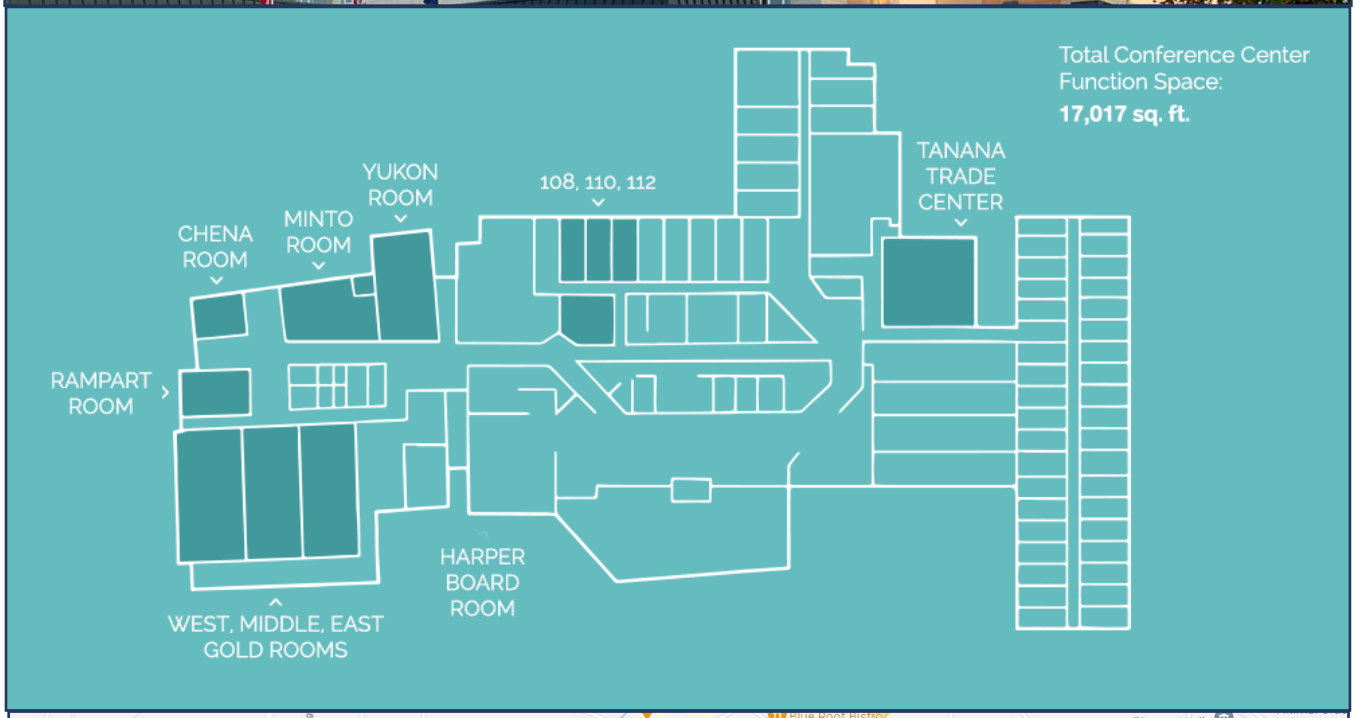
Land Acknowledgment

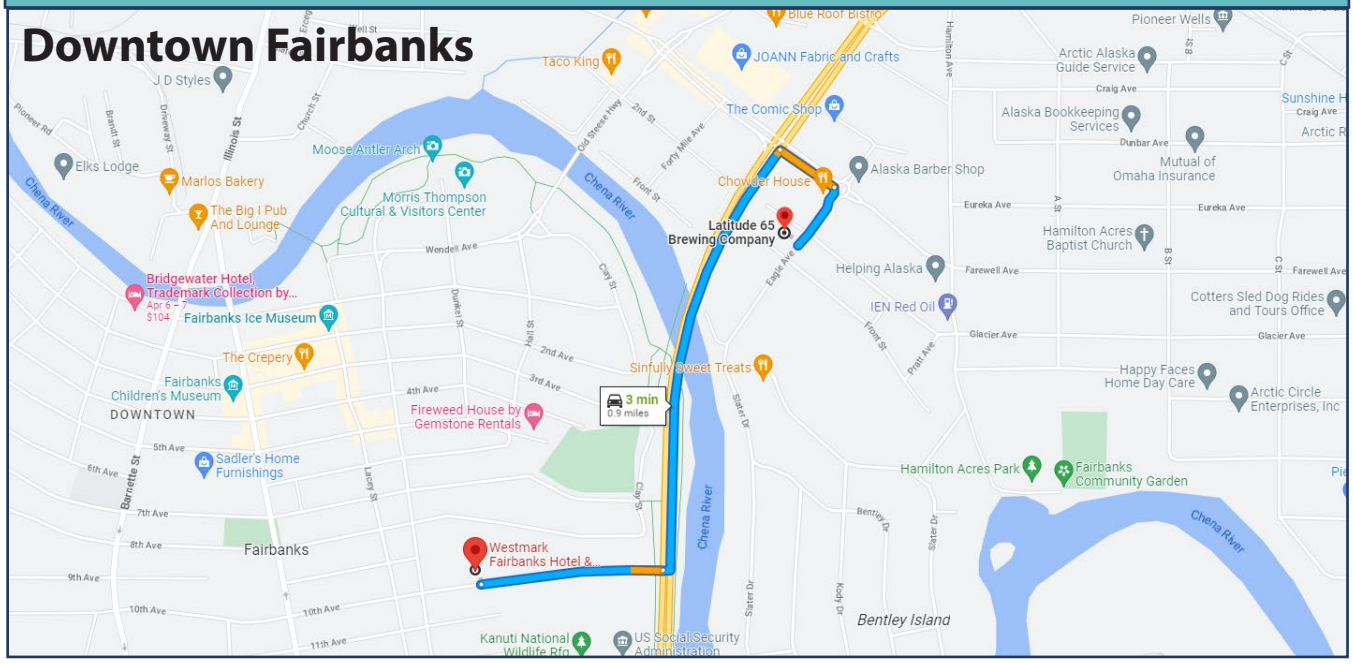
The Alaska Chapter of The Wildlife Society would like to acknowledge that we are gathered on traditional lands where indigenous peoples have cared for Alaska's land, water, and wildlife for over ten thousands years. Their intimate knowledge of, and connection to, the land and its animals continues to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



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

Denali Panorama photo by Jeff Wagner.


Total Conference Center Function Space:
17,017 sq. ft.
YUKON ROOM
108, 110, 112
TANANA TRADE CENTER
CHENA ROOM
MINTO ROOM
RAMPART ROOM
HARPER BOARD ROOM
WEST, MIDDLE, EAST GOLD ROOMS


Downtown Fairbanks
Blue Roof Bistro
Taco King
JOANN Fabric and Crafts
Pioneer Wells
Arctic Alaska Guide Service
J D Styles
The Comic Shop
Alaska Bookkeeping Services
Moose Antler Arch
Elks Lodge
Marlos Bakery
Chowder House
Alaska Barber Shop
Mutual of Omaha Insurance
The Big I Pub And Lounge
Morris Thompson Cultural & Visitors Center
Latitude 65 Brewing Company
Hamilton Acres Baptist Church
Bridgewater Hotel, Trademark Collection by...
Helping Alaska
Fairbanks Ice Museum
IEN Red Oil
Cotters Sled Dog Rides and Tours Office
The Crepery
Sinfully Sweet Treats
Happy Faces Home Day Care
Fairbanks Children's Museum
DOWNTOWN
3 min
0.9 miles
Fireweed House by Gemstone Rentals
Arctic Circle Enterprises, Inc
Sadler's Home Furnishings
Hamilton Acres Park
Fairbanks Community Garden
Fairbanks
Westmark Fairbanks Hotel &...
Chena River
Bentley Island
Kanuti National Wildlife Rfg
US Social Security Administration

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

Title Sponsors

Plenary/Workshop Sponsors

Genetics Workshop

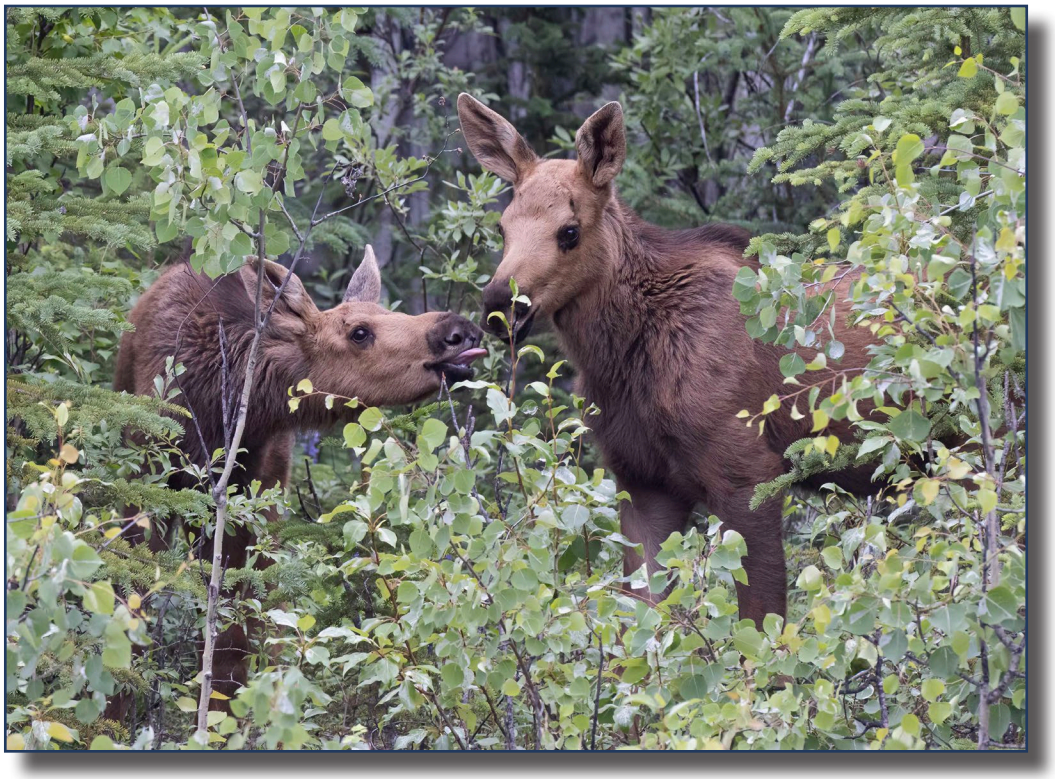
Break Sponsor

Conference-at-a-Glance		
Monday, April 10, 2023		
1:00 pm 5:00 pm	Sample Collection in the Field Workshop - ADF&G Fairbanks Lab, 1300 College Rd.	
Tuesday April 11, 2023		
8:30 am	Welcome and Opening Remarks - Westmark Gold Room	
9:00 am	Plenary Session Wildlife and One Health	Providing a healthy place for wildlife in a changing Alaska environment G. Juday (University of Alaska Fairbanks, Professor Emeritus)
9:30 am		Zoonotic Diseases and One Health L. Castrodale (Alaska State Section of Epidemiology)
10:00 am	Break	
10:30 am	Session A	Oral Presentations
12:00 pm	Lunch	
1:30 pm	Business meeting	Updates from Executive Board, Active Committees and Working Groups, Elections
2:30 pm	Session B	Oral Presentations
3:30 pm		Break
4:00 pm		Oral Presentations
5:00 pm	Wrap up and announcements	
5:15 pm	Evening Social at Latitude 65 Brewing Co. - 150 Eagle Ave. (directions on page 3)	
Wednesday, April 12, 2023		
8:30 am	Welcome and Opening Remarks - Westmark Gold Room	
8:45 am	Plenary Session Wildlife and One Health	Alaska's One Health Approach: Managing Domestic Animal, Wildlife, Environmental and Public Health B. Gerlach (Alaska Department of Environmental Conservation)
9:30 am	Session C	Oral Presentations
10:30 am		Break
11:00 am		Oral Presentations
12:00 pm	Lunch	
1:30 pm 3:30 pm	Student Session	Oral Presentations
4:00 pm	Poster Session	
5:00 pm	Wrap up and announcements	
6:00 pm	Banquet and Awards Ceremony - Westmark Gold Room What Can we Learn from Food Security? J. Magdanz (Alaska Department of Fish and Game)	

Conference-at-a-Glance Continued		
Thursday April13, 2023		
9:00 am	Welcome & Opening Remarks - Westmark Yukon Room	
9:15 am	Session D	Oral Presentations
10:15 am		Break
10:45 am		Oral Presentations
11:15 am	Wrap up and closing announcements	
11:30 am	Lunch	
1:00 pm 5:00 pm	Workshop - Do the Genetics, Part 1, Westmark Yukon Room	
1:00 pm 4:00 pm	Field Trip - Large Animal Research Station (see group sign up schedule at registration desk)	
Friday April 14, 2023		
8:00 am 12:00 pm	Workshop - Do the Genetics, Part 2, University of Alaska Fairbanks, Murie Rooms 103/105	

NEW THIS YEAR: TWS Swag Swap Table

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

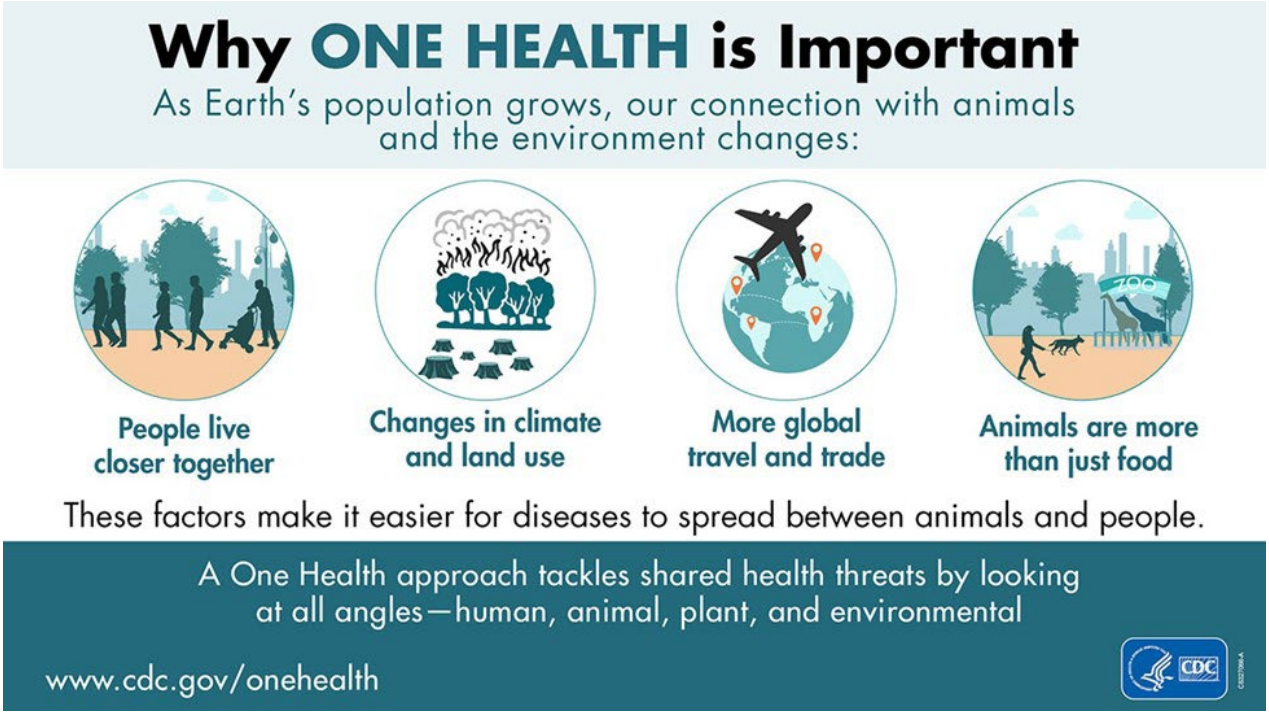


Moose calves photo by Ted Swem.

What is One Health? www.cdc.gov/OneHealth

One Health is a collaborative, multisectoral, and transdisciplinary approach — working at the local, regional, national, and global levels — with the goal of achieving optimal health outcomes recognizing the interconnection between people, animals, plants, and their shared environment. The One Health approach recognizes that the health of people is closely connected to the health of animals and our shared environment. One Health is not new, but it has become more important in recent years. This is because many factors have changed interactions between people, animals, plants, and our environment.

- Human populations are growing and expanding into new geographic areas. As a result, more people live in close contact with wild and domestic animals, both livestock and pets. Animals play an important role in our lives, whether for food, fiber, livelihoods, travel, sport, education, or companionship. Close contact with animals including wildlife and their environments provides more opportunities for diseases to pass between animals and people.
- The earth has experienced changes in climate and land use, such as deforestation and intensive farming practices. Disruptions in environmental conditions and habitats can provide new opportunities for diseases to pass to animals.
- The movement of people, animals, and animal products has increased, from international travel to trade. As a result, diseases can spread quickly across borders and around the globe.



One Health at the University of Alaska-Fairbanks:

What is One Health? | Center for One Health Research (uaf.edu)

Monday, April 10

Westmark Gold Room

10:00 am - 5:00 pm REGISTRATION AND CHECK-IN OPEN

1:00 pm - 5:00 pm **WORKSHOP - SAMPLE COLLECTION IN THE FIELD**
Kimberlee Beckmen, ADF&G Fairbanks Lab, 1300 College Rd.

Tuesday, April 11

Westmark Gold Room

8:30 am -10:00 am **PLENARY SESSION: WILDLIFE AND ONE HEALTH**
Kimberlee Beckmen, Moderator

8:30 WELCOME AND OPENING REMARKS
C. Wardlow

9:00 PROVIDING A HEALTHY PLACE FOR WILDLIFE IN A CHANGING ALASKA ENVIRONMENT
G. Juday

9:30 ZOONOTIC DISEASES AND ONE HEALTH
L. Castrodale

10:00 BREAK

10:30 am - 11:30 pm **SESSION A**
Kimberlee Beckmen, Moderator

10:30 HAS PASSIVE SURVEILLANCE DETECTED SYNDEMIC ZOONOSES IN WILDLIFE?
K. Beckmen

11:00 THAT'S MY MOOSE! KLEPTOPARASITISM BETWEEN TWO TOP CARNIVORES IN SOUTHEAST ALASKA
A. Lewis

11:30 IDENTIFYING INDIVIDUAL POLAR BEAR FROM DNA IN FOOTPRINTS
L. Waits

12:00 LUNCH

Tuesday, April 11 (continued)

1:30 pm **BUSINESS MEETING**
Updates from Executive Board, Active Committees and Working Groups, Elections

2:30 pm - 5:00 pm **SESSION B**
Jeff Stetz, Moderator

2:30 WILDLIFE HEALTH IN A CHANGING ARCTIC: PATHOGEN EXPOSURE AMONG CHUKCHI SEA POLAR BEARS
C. VanHemert

3:00 FECAL DNA METABARCODING REVEALS EXTENSIVE MARINE RESOURCE USE BY COASTAL WOLVES IN KATMAI NATIONAL PARK AND PRESERVE
K. Griffin

3:30 BREAK

4:00 FORTYMILE CARIBOU HERD INFLUENCES RATES OF VEGETATION CHANGE ACROSS ITS RANGE
M. Macander

4:30 INTERESTED IN SUPPORTING A GRADUATE STUDENT?
T. Brinkman

5:00 WRAP UP AND ANNOUNCEMENTS
C. Wardlow

5:15 pm **EVENING SOCIAL**
Latitude 65 Brewing Co., 150 Eagle Ave.

Wednesday, April 12

Westmark Gold Room

8:30 am - 9:30 am **PLENARY SESSION: WILDLIFE AND ONE HEALTH**
Christi Heun, Moderator

8:30 WELCOME AND OPENING REMARKS
C. Wardlow

8:45 ALASKA'S ONE HEALTH APPROACH: MANAGING DOMESTIC ANIMAL, WILDLIFE, ENVIRONMENTAL AND PUBLIC HEALTH
B. Gerlach

Wednesday, April 12 (continued)

9:30 am - 11:30 am

SESSION C

Kaiti Ott, Moderator

9:30 TEMPORAL AND SPATIAL PATTERNS OF ALASKA MOOSE HARVEST
T. Paragi

10:00 LOGGING EFFECTS ON WOLF HABITAT SELECTION AND MOVEMENT IN SOUTHEAST ALASKA
D. Gregovich

10:30 BREAK

11:00 THE "WHERE" OF MOOSE FOOD: A NOVEL METHOD TO MAP AVAILABLE FORAGE BIOMASS OF SPECIFIC PLANT SPECIES
T. Nawrocki

11:30 FACTORS INFLUENCING INCUBATION BEHAVIOR AND NESTING SUCCESS OF YELLOW-BILLED LOONS IN ARCTIC ALASKA
J. Parrett

12:00 LUNCH

1:30 pm - 4:00 pm

STUDENT SESSION

Alexandra Lewis, Moderator

1:30 POPULATION GENETIC STRUCTURE OF THE NORTH AMERICAN WOLVERINE USING MICROSATELLITE LOCI AND SINGLE NUCLEOTIDE POLYMORPHISMS
E. Stacy*

2:00 SEASONAL DRIVERS OF AMPLITUDE PATTERNS IN A VARIABLY CYCLIC POPULATION OF RED-BACKED VOLES (*MYODES RUTILUS*)
S. Swanson*

2:30 EXAMINING NATAL DISPERSAL OF EMPEROR GEESE (*ANSER CANAGICUS*) ON THE YUKON DELTA NATIONAL WILDLIFE REFUGE, ALASKA
M. Murphy*

3:00 NOWHERE TO RUN: CLIMATE INFLUENCE DENSITY OF AN ALPINE INDICATOR SPECIES IN THE ARCTIC-BOREAL REGION
J. Wagner*

3:30 EVIDENCE FOR A SURVIVAL MEDIATED TRAVELING WAVE IN CANADA LYNX (*LYNX CANADENSIS*) ACROSS ALASKA
D. Arnold*

** - student*

Wednesday, February 12 (continued)

Westmark Gold Room

4:00 pm - 5:00 pm **POSTER SESSION**

Nick Fowler, Moderator

POSTER SESSION

VALIDATING WOLF DETECTION AT HAIR TRAPS USING TRAIL CAMERAS
A. Lewis

A FECAL SURVEY FOR *CYRPTOSPORIDIUM* SPP. AND *GIARDIA* SPP. IN ALASKA MOOSE (*ALCES ALCES GIGAS*)
F. Johnson

GEOGRAPHIC VARIATION IN GENETIC STRUCTURE AND MORPHOLOGY OF BROWN BEAR (*URSUS ARCTOS*) POPULATIONS IN SOUTHEAST ALASKA
A. Crupi

AN EXPLORATION OF MOOSE HABITAT SELECTION IN TOGIAK NATIONAL WILDLIFE REFUGE
S. Dempsey*

THE ROLE OF THE CECAL MICROBIOME IN ICELANDIC ROCK PTARMIGAN'S (*LAGOPUS MUTA*) POPULATION DYNAMICS
M. Ramirez*

BEHAVIORS, BELIEFS, AND BEARS; OH MY! WHAT'S BEHIND THE HUMAN-BEAR CONFLICT IN JUNEAU?
B. Wold*

5:00 WRAP UP AND ANNOUNCEMENTS
C. Wardlow

6:00 pm - 10:00 pm **BANQUET AND AWARDS CEREMONY -** Westmark Gold Room

Keynote Speaker J. Magdanz

What can we learn from food security?

Collared pika photo by Jeff Wagner.

** - student*

Thursday, April 13

Westmark Yukon Room

9:00 am - 11:30 am **SESSION D**

Shawn Crimmins, Moderator

9:00 WELCOME AND OPENING REMARKS
C. Wardlow

9:15 CARIBOU DISTRIBUTION AND MOVEMENTS NEAR A NEW GRAVEL ROAD IN A NORTHERN ALASKAN OILFIELD
A. Prichard

9:45 AERIAL NESTING SURVEYS FOR EAGLES AND OTHER RAPTORS ALONG THE DALTON HIGHWAY
J. Welch

10:15 BREAK

10:45 PRONOUNCED BROWN BEAR AGGREGATION ALONG ANADROMOUS STREAMS IN INTERIOR ALASKA
M. Sorum

11:15 WRAP UP AND CLOSING COMMENTS
C. Wardlow

11:30 LUNCH

1:00 pm - 5:00 pm **WORKSHOP - DO THE GENETICS 101, PART 1**

Westmark Yukon Room
Pre-registration required, limited capacity

1:00 pm - 4:00 pm **FIELD TRIP - LARGE ANIMAL RESEARCH STATION**

See group sign up schedule at registration desk

Friday, April 14

University of Alaska Fairbanks, Murie Room 103/105

8:00 am - 12:00 pm **WORKSHOP - DO THE GENETICS 101, PART 2**

ALASKA CHAPTER OF THE WILDLIFE SOCIETY
2023 ANNUAL MEETING
GENETICS WORKSHOP

April 13th 1 pm - 5 pm - Westmark Gold Room
April 14th 8 am - 12 pm - University of Alaska Fairbanks, Murie Rooms 103/105

The Wildlife Society's Molecular Ecology Working Group hosts the Do the Genetics 101 and other conservation genetics and genomics focused workshops at National and State Chapter meetings to teach molecular ecology techniques, applications and relevancies for wildlife and ecology researchers and managers. This workshop will have a focus on current methods being applied in conservation genetics and most common data sources we see in the literature. The workshop will stress data interpretation and relevance for managers. There will also be a shorter up and coming methods section to share the cutting edge of the field. Please fill out the linked survey so we can gauge interest in specific topics and get a sense of participant's background. We are lucky to have workshop leaders and materials developers who have done applied wildlife genetics work in Alaska and across the globe!

Genetics Workshop - Instructors

Lisette Waits is a Distinguished Professor in the Department of Fish and Wildlife Sciences in the College of Natural Resources at the University of Idaho. She has a BS in Genetics from University of Georgia and a PhD in Genetics from University of Utah where she studied the phylogenetics and population genetics of grizzly bears. Her research program is centered within the fields of conservation genetics and molecular ecology with particular focus on noninvasive genetic monitoring of wildlife and landscape genetics. Her research team has used genetic and genomic methods to study over 30 different species in North America, Central America, South America, Europe and Asia, and she has published over 240 papers. She has had the great joy of training 40 graduate students and 8 postdocs. She currently serves as an associate editor for Bioscience, Molecular Ecology and Molecular Ecology Resources and on the advisory board of Environmental DNA. She is an elected fellow of The Wildlife Society and the American Association for the Advancement of Science. She has served on four US endangered species recovery teams providing genetic expertise and assisting with population monitoring. She currently serves on the International Union for Conservation of Nature Conservation Genetics North American Working Group and the American Association of Zoos and Aquariums Molecular Data for Population Advisory Group. She is also the Past-President of the National Association of University Fish and Wildlife Programs.

Elise Stacy is a PhD Candidate at the University of Idaho advised by Lisette Waits working on population and landscape genetics of wolverines in Alaska and the Yukon, as well as assessing western range wide patterns of local adaptation across different environments, from the Arctic to the Rocky Mountains. She received her bachelor's degree in Wildlife Biology and Conservation from the University of Alaska, Fairbanks where she got experience in population genetics and environmental DNA methodology through undergraduate research opportunities and served as officer and student chapter president for the Wildlife Society. She worked four summer seasons with the Alaska Department of Fish and Game's Threatened, Endangered and Diversity program and worked as a specimen preparer in the UA Museum of the North Ornithology Lab. As a graduate student, Elise has taught the Wildlife Department's Conservation Genetics course and the Environmental Science program's field techniques lab. Outside of research, she enjoys skiing, white water sports, gardening, and endless crafts.

GENETICS WORKSHOP- INSTRUCTORS CONTINUED

Dr. Karen Mager is an Associate Professor of Environmental Science, Policy, & Sustainability and Biology at Southern Oregon University. Her research program focuses on the ecology and conservation of mammal populations, with an emphasis on research opportunities for undergraduates. Dr. Mager received her PhD in Biology with a focus in Wildlife Ecology from University of Alaska Fairbanks. Much of her research has focused on caribou conservation genetics, including how historical population dynamics and landscape features shape the genetic diversity and connectivity of caribou herds, with implications for designation of conservation units in Alaska and Canada. She has also incorporated TEK, historical, and ethnographic approaches to understand historical interactions of caribou and domestic reindeer. Beyond caribou, she loves to work with students on field research in a diversity of ecosystems. She is currently partnering with federal agencies, community organizations, and a team of undergraduates to document wildlife use of the Interstate 5 corridor in southern Oregon with camera traps, as part of an effort to implement and then monitor new wildlife crossing structures.

Born and raised in southcentral Alaska, **Sarah Rauchenstein** received her bachelor's in marine biology at UAS Juneau. Her primary interests include biochemical applications for wildlife and fishery science, and natural resource management. She enjoys tide pooling and cross-country skiing with her dogs, Max and Petunia.

Susannah Woodruff has worked as a wildlife biologist in the US Fish and Wildlife Service Polar Bear Program since 2019. Prior to this position, Susannah worked as a wildlife biologist in Alaska, Arizona, Idaho, and Wyoming on a variety of species from Sonoran pronghorn to wolves. Susannah has a Ph.D. in Wildlife Sciences from the University of Idaho and an MS in Wildlife Biology from Prescott College.

Sterling Spilinek is the Research Coordinator and Wildlife Biologist for Ahtna Intertribal Resource Commission (AITRC). Sterling attended Whitman College in Walla Walla Washington where he played on the baseball team and received a degree in Biology. After college Sterling moved back to Wyoming and worked for the Wyoming Game and Fish Department; working throughout Wyoming on projects involving landowner/hunter relations, ungulate migration habitat improvement, ungulate herd tracking, and large carnivore noninvasive sampling. Deciding to continue his education, Sterling enrolled in the Wildlife Ecology program at Texas State University. Sterling wrote his graduate thesis on the rumen morphology of white-tailed deer comparing the energy of diets. After graduate school Sterling moved to Billings Montana and worked for Pheasants Forever, as a partner biologist with the Natural Resource Conservation Service. In 2020 Sterling moved to Alaska and began working for AITRC where he has worked as a collaborative partner on the GMU 13 Bear Study.

For the past 20 years, **Jeff Stetz** has worked primarily on large-scale studies of abundance, population growth rates, and resource selection for large carnivores in the American intermountain West and Alaska using noninvasive genetic sampling methods. These projects have included the first population-wide abundance estimate for grizzly bears in northern Montana and the first density estimate for American black bears in Glacier National Park. He has also helped develop new population monitoring methods for mountain lions and river otters in North America and two bear species in the Russian Far East, as well as conducting a rigorous evaluation of numerous monitoring methods for black bears across northeastern North America. Jeff is currently the Research Coordinator for the Alaska Department of Fish and Game in south-central Alaska where he works on bear, wolf, caribou, and moose population studies. Jeff is also an Associate Editor at the Journal of Wildlife Management, a Certified Wildlife Biologist®, and an instructor at the Center for Wildlife Studies.

PLENARY SPEAKERS

DR. BOB GERLACH

Alaska's One Health Approach: Managing Domestic Animal, Wildlife, Environmental and Public Health

Dr. Gerlach works for the Alaska Department of Environmental Conservation as the Alaska State Veterinarian. He is responsible for animal health regulations, animal disease surveillance and response, in addition he manages the State's Fish Monitoring Program and is the State's Fish Advisory Program Coordinator. Dr Gerlach attended Pennsylvania State University and received his Veterinary Degree (VMD) from the University of Pennsylvania. Dr Gerlach worked in Pennsylvania, Maryland, and Delaware as a livestock veterinarian specializing in dairy practice. From 1984 to 1987, he was attending veterinarian and post-doctoral fellow at the Lovelace Respiratory Research Institute in Albuquerque, NM with research focused on respiratory pathophysiology and toxicology. In 1987, he moved to Alaska and worked in private practice until being hired by the state in 2001, to manage the State's Fish Monitoring Program and took on the position of State Veterinarian in 2003.

DR. LOUISA CASTRODALE

Zoonotic Diseases and One Health

Louisa Castrodale is a veterinary epidemiologist with the Alaska State Section of Epidemiology. She received a bachelor's degree in Anthropology from Yale University, a Doctor of Veterinary Medicine degree from Tufts University School of Veterinary Medicine, and a Master of Public Health degree from Johns Hopkins University School of Public Health. She practiced veterinary medicine in a small animal clinic outside of Baltimore before coming to Alaska in 1999, for a 2-year field epidemiology training program with the Centers for Disease Control and Prevention's Epidemic Intelligence Service. She became a State employee in 2001, and has continued to work in the Section's Infectious Disease Program. She has managed the Program since 2016.

Red fox photo by Jeff Wagner.

PLENARY SPEAKER - DR. GLENN JUDAY

Providing a Healthy Place For Wildlife In a Changing Alaska Environment

Glenn Patrick Juday, is Professor Emeritus of Forest Ecology in the Institute of Agriculture Natural Resources and Extension and the Natural Resources and Environment Department at the University of Alaska Fairbanks (UAF). He joined the faculty in 1981, and received Emeritus status in 2015. He maintains research in climate change, monitoring of boreal tree growth and forest health, science advising activity, and an active speaking schedule.

He received his B.S. *summa cum laude*, in 1972 in Forest Management from Purdue University, and his Ph.D. in 1976, in Plant Ecology from Oregon State University. He completed a Post-Doctoral Fellowship in Environmental Affairs, 1976-1977, and was on assignment as a Research Scientist in the USDA Forest Service at the Institute of Northern Forestry in Fairbanks from 1977-1981, working as Alaska Ecological Reserves Coordinator. Dr. Juday served as President of the Natural Areas Association from 1985 through 1988, and completed a sabbatical in the headquarters of The Nature Conservancy in Arlington Virginia in 1988. His professional work has taken him to 48 states and 15 nations outside the U.S.

Dr Juday taught graduate and undergraduate level university courses in natural resource decision making, forest management, conservation, wilderness management, climate change, and tree ring analysis over a 25-year period. His course in conservation biology was one of the earliest with that title in the U.S. Dr. Juday was a Senior Investigator in the NSF-supported Bonanza Creek Long-Term Ecological Research site in central Alaska until 2017. His research specialties include forest management, climate variability and change, forest development and tree regeneration following fire and forest harvest, tree-ring studies, and biodiversity and wilderness management. He was the Lead author of the chapter on Forests Land Management and Agriculture of the Arctic Climate Impact Assessment. Dr. Juday has served as science advisor for several television programs on climate warming, including the PBS series Scientific American Frontiers, and magazine articles including National Geographic. He has briefed and led trips for several committees and members of Congress, including presidential candidates.

Dr. Juday was recognized for outstanding accomplishments as Chairman of Forest Ecology Working Group of the Society of American Foresters in 2000, and received the 2021 George Fell Award from the Natural Areas Association, the 2022 Lifetime Achievement Award from the Purdue University Forestry and Natural Resources Department, and the Certificate of Distinction from the Purdue Ag Alumni Association. He is the author of 63 scientific peer-reviewed journal articles and book chapters including *Nature, Climatic Change, Global Change Biology, BioScience, Ecology Letters, Geophysical Research Letters, Forest Ecology and Management, Journal of Forestry,* and *Canadian Journal of Forest Research*, and over 100 other scientific or professional publications. He has authored book chapters published by *Oxford University Press, Cambridge University Press*, and *Annual Review of Ecology and Systematics*. His research is widely cited. He was one the early investigators on the subject of climate change and variability, which he began in 1980. Dr. Juday has also published on the geography and history of the Holy Land and the Parthenon. He has given over 360 presentations at scientific and

Continued from page 17

professional meetings in the U.S. and internationally, many of them invited or sponsored. He has been a contributor to more than 100 media products – newspaper and blog articles, TV and radio segments and others. Dr. Juday serves on the University Advisory Board for the Center for Legislative Energy and Environmental Research, supporting the work of The Energy Council.

Dr. Juday and his wife, Mary Beth, have lived in Alaska for 42 years and have 4 children and 4 grandchildren. He was a parishoner at Sacred Heart Cathedral for most of his time in Alaska, teaching the adult religious education program for a number of years, and is currently a member of the Latin Mass community.

KEYNOTE SPEAKER - DR. JIM MAGDANZ

What Can We Learn From Food Security?

In Alaska, where households harvest an estimated 45 million pounds of wild foods annually for their own and their families' use, resource managers are responsible not only for maintaining natural and healthy resource populations, they also share in the responsibility for maintaining healthy communities. In 1978, a new section in the Alaska Department of Fish and Game was charged by law with gathering information on all aspects of the role of subsistence hunting and fishing in Alaskans' lives. Staff in the Division of Subsistence developed a comprehensive community survey program, collecting household-level data on resource harvests, incomes, demographics, and other variables. In 2010, staff introduced a modified food security protocol to the existing survey program, providing a new outcome variable well suited to the mixed economies of rural Alaska. This talk will discuss the contested nature of the term "food security," the integration of food security into the Division of Subsistence's comprehensive community research program, and the complexities of rural community food production and distribution systems in Alaska from a wildlife management perspective.

Jim Magdanz studies contemporary hunter-gatherer economies in rural Alaska through four theoretical frames: network analysis, food security, political ecology, and resilience. His work emphasizes quantitative approaches and focuses on the period beginning about 1980, when hunter-gatherer activities in Alaska were recognized in state and federal law as "subsistence" and when data collection efforts expanded exponentially. He has worked primarily with Iñuit communities in northwest Alaska. He contributed to more than 30 technical papers during a 31-year career with the Division of subsistence in the Alaska Department of Fish and Game. He has published in A*merican Anthropologist, Ecology and Society, Nature Sustainability, PNAS*, and *PLoS ONE*. He has a Bachelors in Journalism from the University of Missouri-Columbia and a PhD in Natural Resources and Sustainability from the University of Alaska Fairbanks. He also studied at the University Washington and the Santa Fe Institute Complex Systems Summer School.

ABSTRACTS

Tuesday, April 11

PLENARY SESSION: WILDLIFE AND ONE HEALTH (9:00 AM - 10:00 AM)

Session Moderator: Kimberlee Beckmen

SESSION A (10:30 AM - 12:00 PM)

Session Moderator: Kimberlee Beckmen

10:30 am

HAS PASSIVE SURVEILLANCE DETECTED SYNDEMIC ZOONOSES IN WILDLIFE?

Kimberlee Beckmen

Alaska Department of Fish and Game. Contact: kimberlee.beckmen@alaska.gov

Abstract: A syndemic or synergistic epidemic is the aggregation of two or more concurrent or sequential epidemics or disease clusters in a population with biological interactions, which exacerbate the prognosis and burden of disease. Passive surveillance of wildlife has identified co-morbidities and sequential epizootics that suggests the potential for syndemic situations in Alaska. In 2020, concurrent outbreaks of rabies and canine distemper in dogs, red fox and arctic fox occurred in northern Alaska and the Bering Strait region. Then, 2022 led to the detection of co-infection of rabies and Highly Pathogenic Avian Influenza in a red fox. Subsequently HPAI encephalitis was diagnosed for the first time in a black bear cub in Alaska and then a found dead Kodiak brown bear cub, the latter being the first of that species ever found infected. Since these detections were the results of passive surveillance of just a few animals found or euthanized with clinical signs of disease, it is likely there were many more cases that went unnoticed. The heightened concern of wild mammals becoming reservoirs for SARS-CoV-2 and HPAI persistence, viral reassortment and increased pathogenicity leading to reverse zoonoses, has led to opportunities for active surveillance programs. However, the socioeconomic and environmental factors that may have contributed to these apparent syndemics have not yet been examined nor even considered in the enhanced and proposed active surveillance programs.

Black bear photo by Jared Hughey.

11:00 am

THAT'S MY MOOSE! KLEPTOPARASITISM BETWEEN TWO TOP CARNIVORES IN SOUTHEAST ALASKA

Alexandra Lewis[1], Tania Lewis[2] and Gretchen Roffler[1]

[1]Alaska Department of Fish and Game and [2]Glacier Bay National Park. Contact: alex.lewis@alaska.gov

Abstract: Interspecific competition over large, high-value prey between brown bears (*Ursus arctos*) and wolves (*Canis lupus*) occurs in Southeast Alaska where bears and wolves overlap. We collected trail camera images from eight moose carcasses of varying sex and age classes around Gustavus, Alaska and Berners Bay, Alaska from 2020 to 2021. Six of the trail cameras were placed during a period when wolves and bears could interact over a carcass and two trail cameras were placed before brown bears emerge from dens. From these cameras, we have accumulated 31,459 images when bears and wolves could interact and 6,294 images when wolves were the only top predator on the landscape. From our images, we found that bear and wolf activity overlap was greater at sites where the moose carcasses were near the known wolf pack's rendezvous site regardless of the cause of death and activity overlap was 15x greater at bear-cached moose carcasses. With these data, we can better understand the dynamics between these two top predators, what the circumstances might be that determine when one species successfully steals a carcass from the other, and how that interaction may affect other prey items.

11:30 am

IDENTIFYING INDIVIDUAL POLAR BEAR FROM DNA IN FOOTPRINTS

Lisette Waits[1], Andrew Von Duyke[2], Justin Crawford[3], Lori Quakenbush[3], and Jennifer Adams[1]

[1]University of Idaho, [2]North Slope Borough Department of Wildlife Management, and [3]Alaska Department of Fish and Game. Contact: lwaits@uidaho.edu

Abstract: Polar bears (*Ursus maritimus*) are listed as "threatened" under the ESA, and population monitoring has become much more challenging due to increasingly unreliable sea ice conditions. Further, animal welfare concerns have been expressed by Indigenous peoples and others over current invasive research methods. Thus, there is a need for less invasive research methods that are applicable to changing Arctic conditions. Previous studies have successfully identified carnivore species from mitochondrial DNA obtained from footprints, but attempts to amplify nuclear DNA for individual and sex identification have been unsuccessful. The goal of our study was to evaluate the feasibility of determining individual identity and sex from DNA extracted from polar bear footprints. In our 2021 pilot study, we collected and analyzed snow from 5-10 footprints of 13 polar bear tracks. In our 2022 study, we expanded our data set to include 47 additional samples and a larger number of footprints per sample. Snow samples were thawed and filtered to collect any cells captured from polar bear foot pads. Filters were stored in ethanol until DNA extraction using a Qiagen kit. Individual and sex identification was attempted by conducing 6 PCR replicates of 7 microsatellite loci and 1 sex locus. Individual identification was successful for approximately 50% of the samples, and success rates did not increase when using 20 footprints. Further refinement is needed to improve methods and establish best practices; however, this method holds promise for genetic population monitoring of polar bears and potentially other species that occupy habitats with snow.

SESSION B (2:30 PM - 5:00 PM)

Session Moderator: Jeff Stetz

2:30 pm

WILDLIFE HEALTH IN A CHANGING ARCTIC: PATHOGEN EXPOSURE AMONG CHUKCHI SEA POLAR BEARS

Caroline VanHemert[1], Karyn Rode[1], Ryan Wilson[2], and Susannah Woodruff[2]

[1]USGS Alaska Science Center and 2U.S. Fish and Wildlife Service. Contact: cvanhemert@usgs.gov

Abstract: In the Arctic, where warming is occurring rapidly, many wildlife and zoonotic diseases are expected to increase or expand. Environmental factors such as rising temperatures, higher precipitation rates, and increased runoff can directly affect pathogen persistence and transport. At the same time, wildlife species, including polar bears (*Ursus maritimus*) and others that occur at the marine-terrestrial interface, are experiencing pronounced shifts in range or habitat use, leading to novel community interactions and new opportunities for pathogen exchange. In this study, we present data from Chukchi Sea polar bears for a suite of parasitic, viral, and bacterial pathogens, all of which are considered high zoonotic and wildlife disease priorities. To assess changes over time, we screened serum samples collected from bears over two temporal periods: "historical" (1988–1994) and "contemporary" (2008–2017). In contemporary samples, we detected *Neospora caninum* (64.6%), *Fransicella tularensis* (30.8%), *Toxoplasma gondii* (12.1%), *Coxiella burnetii* (17.9%), *Brucella abortus/suis* (8.4%), and canine distemper virus (CDV; 62.3%). Of these , we observed significant increases in seroprevalence over the ~20 year interval for all except *C. burnetti*. Additionally, we identified relationships between pathogen exposure and relevant ecological parameters, including age, sex, diet, and land use. This study provides important baseline information about polar bear health, demonstrates evidence of increasing pathogen exposure, and offers insights about the influence of environmental and host factors on disease transmission in the rapidly changing Arctic. As apex predators vulnerable to multiple climate-related stressors, polar bears are of critical conservation concern and serve as important sentinels of ecosystem health.

Polar bear photo by Kaiti Ott.

3:00 pm

FECAL DNA METABARCODING REVEALS EXTENSIVE MARINE RESOURCE USE BY COASTAL WOLVES IN KATMAI NATIONAL PARK AND PRESERVE

Kelsy Griffin[1], Ellen Dymit[2], Gretchen Roffler[3], and Taal Levi[2]

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

Abstract: Wolves throughout most of their range are assumed to be obligate ungulate predators, but wolf populations with access to resource subsidies from the ocean may demonstrate incredible dietary flexibility. On the Katmai coast, moose occur at low density while sea otters, salmon, and other marine species are abundant. We hypothesize that these unique circumstances of prey availability drive coastal wolves to hunt and forage extensively in the marine system. In 2019, we began using noninvasive genetic sampling techniques and trail cameras to study wolf foraging ecology on the Katmai coast. The main objectives of this diet study were to reconstruct coastal wolf diet via fecal DNA metabarcoding and document wolves foraging and hunting in the marine system. In the summers of 2021 and 2022, we deployed trail cameras and collected approximately 900 wolf scat samples from seven distinct sites along Katmai's coastline. DNA metabarcoding results from 545 of these samples identified 67 unique vertebrate prey species, including a diversity of marine prey items. Sea otters were the most common prey species overall, with their DNA detected in 166 wolf scats (~30%). Salmon were detected in 151 scats (28%), while other oceanic fish species occurred in 72 scats (13%). Our findings demonstrate the importance of cross-boundary resource subsidies for large carnivores in coastal Alaska and indicate that sea otter recolonization of the Gulf of Alaska has likely restored a historically present food web linkage between a terrestrial and marine apex predator with potential cascading effects for the nearshore ecosystem.

Wolf photo by Ted Swem.

4:00 pm

FORTYMILE CARIBOU HERD INFLUENCES RATES OF VEGETATION CHANGE ACROSS ITS RANGE

Matthew Macander[1], Kathleen Orndahl[2], Torsten Bentzen[3], Michael Suitor[4], Kyle Joly[5], Jim Herriges[6], Logan T. Berner[2], and Libby P.W. Ehlers[7]

[1]ABR Inc.–Environmental Research & Services, [2]Northern Arizona University, [3]Alaska Department of Fish and Game, [4]Fish and Wildlife, Department of Environment, Yukon, [5]National Park Service, [6]Bureau of Land Management, and [7]University of Montana. Contact: mmacander@abrinc.com

Abstract: Changes in vegetation can have acute impacts on wildlife by altering habitat and forage availability. However, animals can also strongly influence vegetation through density-dependent foraging and, therefore, play an important role in determining ecosystem responses to climate change. To understand these impacts across large spatiotemporal scales, we mapped a 35-year time-series (1985–2020) of top cover (TC) for seven PFTs and three shrub genera (willows, dwarf birch, and alder) across a 1,770,000 km^2 study area in northern and central Alaska and northwestern Canada. The PFTs collectively include all vascular plants within the study area as well as light (forage) macrolichens. We identified net increases in deciduous shrubs, evergreen shrubs, broadleaf trees, and conifer trees, and net decreases in graminoids and light macrolichens over the full map area. Then, we assessed the impact of the Fortymile Caribou Herd on vegetation across its range from 1992–2020 by analyzing changes in PFT cover in relation to seasonal caribou density. We found lichen and graminoid cover in areas with high relative spatial density of caribou declined 14 and 2 times faster, respectively, compared to areas where caribou were absent. Caribou did not exert sufficient browsing pressure to halt deciduous shrub expansion but may have contributed to reductions in shrub forage quality through selective foraging. Concurrently, we observed increasing caribou density across all seasonal ranges and signs of range expansion across summer and post-calving range. This suggests density-dependent processes might have contributed to the subsequent population decline in this herd.

4:30 pm

INTERESTED IN SUPPORTING A GRADUATE STUDENT?

Todd Brinkman

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

Abstract: Recent research suggests a negative trend in the recruitment of future wildlife professionals. To replenish and sustain this critical pipeline, agencies and NGOs need to work with Universities to actively support wildlife graduate students. This talk provides information for wildlife professionals that are interested in recruiting, sponsoring, and mentoring a graduate student. More specifically, I will share details on the graduate student application process, costs (stipend, tuition, overhead), committee structure, timeline, and expectations (progress and products). I will also discuss different models or strategies of support. My goal is to provide wildlife professionals with the information they need to plan for and augment graduate student research within their agency or organization.

Photo by Jared Hughey.

Wednesday, April 12

PLENARY SESSION - WILDLIFE AND ONE HEALTH (8:30 AM - 9:30 AM)

Session Moderator: Christi Heun

SESSION C (9:30 AM - 12:00 PM)

Session Moderator: Kaiti Ott

9:30 am

TEMPORAL AND SPATIAL PATTERNS OF ALASKA MOOSE HARVEST

Tom Paragi, Nick Fowler, Graham Frye, Jen Roach, and John Skinner

Alaska Department of Fish and Game. Contact: tom.paragi@alaska.gov

Abstract: Moose is the most widespread ungulate in Alaska, and its harvest provides substantial meat yield. Game abundance is commonly assumed to be a major driver of harvest, but harvest is also affected by social and economic factors of participation. Moose populations are managed for sustained yield by Game Management Unit (GMU) or smaller areas with harvest opportunity constrained by regulations. Hunter choice of GMU and harvest success are affected by many factors including animal density, male-female ratio, legal and physical access, motivation (food, culture), hunting effort (e.g., days, distance traveled), competition, and weather. We examined trends and spatial patterns in moose harvest since consistent data formats began in 1983, to understand dynamics at statewide and regional scales that affect harvest in a particular GMU and year. The number of moose hunters, harvest, and per capita (resident) harvest have slowly increased statewide; however, kill varied substantially from one GMU to another, increasing in some and decreasing in others. We found the number of hunters strongly influenced harvest, suggesting the choice of where to hunt can confound assessment of treatments (e.g., predator or habitat management) intended to increase animal abundance and sustainable harvest in a given GMU. A survey to identify metrics of motivation and satisfaction associated with hunting and harvest (e.g., kill per unit effort, number of male moose observed, number of hunters encountered) could inform desired outcomes and study design for evaluating efficacy of treatments.

Moose photo by Jeff Wagner.

10:00 am

LOGGING EFFECTS ON WOLF HABITAT SELECTION AND MOVEMENT IN SOUTHEAST ALASKA

Dave Gregovich[1], Christina Prokopenko[2], and Gretchen Roffler[1]

[1]Alaska Department of Fish and Game and [2]University of British Columbia-Okanagan Campus. Contact: dave.gregovich@alaska.gov

Abstract: Human disturbance has ubiquitous but diverging effects on wolf habitat selection and movement across systems. Industrial-scale logging and associated roadbuilding has proceeded from the 1950's to present in Southeast Alaska, creating a patchwork of vegetative stages. We conducted integrated step selection analysis (iSSA) on seasonal data from 13 collared wolves during 2012–2017 in relation to logging and associated roads. We used landcover and LiDAR derived layers to describe habitat variation in young (≤ 30 yr) and old (> 30 yr) clearcuts versus canopy and brush cover) and considered human activity on roads (open versus closed to vehicle traffic). Overall, wolf habitat selection and movement were promoted by open terrain as detected by LiDAR. This is in contrast to the neutral or moderate influence of clearcuts defined by land cover on wolf habitat selection. Human activity did not seem to influence wolf response to roads. Generally wolves selected areas away from any road in summer (corresponding with denning and early life of pups) and were neutral in other seasons. This work can inform habitat management with respect to wolves and their main prey, Sitka black-tailed deer, in this and similar systems

11:00 am

THE "WHERE" OF MOOSE FOOD: A NOVEL METHOD TO MAP AVAILABLE FORAGE BIOMASS OF SPECIFIC PLANT SPECIES

Timm Nawrocki[1], Amanda Droghini[1], Donald Spalinger[2], Katie Anderson[3], Kristin Denryter[2], William Collins[2], and Jeff Stetz[2]

[1]Alaska Center for Conservation Science, University of Alaska Anchorage, [2]Alaska Department of Fish and Game, and [3]Washington State University. Contact: twnawrocki@alaska.edu

Abstract: During the growing season, forage quantity tends to be high where forage plant species occur at high abundance and where plant structures distribute current annual growth at heights within reach of herbivores. Yet total forage quantity is not sufficient to understand forage intake for wildlife species. For example, past research suggests that moose in boreal Alaska may be nutritionally limited by unique toxins in each forage species, which necessitates that moose balance consumption of multiple forage species rather than rely on a single highly available forage species. Therefore, species-level maps of forage biomass that vary by vegetation composition and structure could enable hypothesis testing related to species-toxin limitations. We tested a novel method to map species-level forage biomass for four forage plant species and one forage aggregate in the Alphabet Hills region of boreal Alaska. To improve cost and time efficiency, we paired a small set of biomass field data from our target region with a statewide quantitative vegetation map, the AKVEG Map. Maps of forage biomass performed variably, largely related to the number of non-zero field observations: predictive R^2 ranged from 0.19 to 0.69. To represent biomass distributions for less common forage species, we also developed a map of plant community types. Although challenges remain to increase the number of species for which we can directly map biomass, our combined quantitative and categorical vegetation mapping methods enable statistical sampling of biomass distributions for a complete diet specific to a particular wildlife species at landscape to regional scales.

11:30 am

FACTORS INFLUENCING INCUBATION BEHAVIOR AND NESTING SUCCESS OF YELLOW-BILLED LOONS IN ARCTIC ALASKA

Julie Parrett, Charles B. Johnson, Adrian Gall, and Alex Prichard

ABR Inc.–Environmental Research & Services. Contact: jparrett@abrinc.com

Abstract: Reductions in nest attendance can increase predation risk and, therefore, reduce nesting success of ground-nesting birds. We recorded the incubation behavior, nest predators, and nesting success of yellow-billed loons breeding in two adjacent study areas on the Arctic Coastal Plain of Alaska during 2008–2015 and 2019. Successful pairs had higher incubation constancies than failed pairs and took fewer and shorter recesses than failed pairs. Daily incubation constancy declined with the intrusion of conspecifics into territories and as the daily maximum temperature increased, especially during periods with little wind. Predation was the primary cause of nest failure, with gulls and jaegers accounting for 41% of nest failures. These predators took advantage of unattended nests, underscoring the consequence of disrupting incubation behavior. In both study areas, nest survival decreased as recess frequency increased. In the Colville Delta study area, loons with territories composed of separate nesting and brood-rearing lakes had lower nest survival than loons that used one lake for both activities. In the National Petroleum Reserve-Alaska study area, loons nesting on shorelines and peninsulas had lower nest survival than those nesting on islands and nest survival decreased as the proportion of days with intruders increased. Our results demonstrate the importance of nest attendance in warding off nest predators of yellow-billed loons.

Yellow-billed loon photo by Ted Swem.

STUDENT SESSION (1:30 PM - 4:00 PM)

Session Moderator: Alexandra Lewis

1:30 pm

POPULATION GENETIC STRUCTURE OF THE NORTH AMERICAN WOLVERINE USING MICROSATELLITE LOCI AND SINGLE NUCLEOTIDE POLYMORPHISMS

Elise Stacy*[1], Lisette Waits[1], Paul Hohenlohe[1], Thomas Jung[2], and Piia Kukka[2]

[1]University of Idaho and [2]Yukon Department of Environment. Contact: estacy@uidaho.edu

Abstract: North American wolverines (*Gulo gulo luscus*) are widely distributed across their northern boreal and Arctic range, where they are harvested for their valuable and culturally significant furs. However, population declines in their southern range, particularly the northwestern United States have prompted conservation concern. Wolverines are vulnerable to climate change and human development as they are adapted to cold environments and are impacted by human disturbance. Investigating gene flow patterns in relation to landscape features can give insight to wolverine sensitivity to landscape change. Identifying loci under selection across their western range will determine what environmental variables drive local adaptations. Collaboration with trappers, managers, and researchers provided dense sampling of individuals in Alaska and the Yukon (n=540) and clustered regional sampling from Alberta (n=3), British Columbia (n=7), Idaho (n=8), and Montana (n=22). We are comparing nuclear DNA microsatellite and single nucleotide polymorphism (SNP) loci identified via reduced representation sequencing (RADseq) for their ability to detect genetic structure. Alaska and Yukon wolverines (n=540) were genotyped at 12 microsatellite loci and a subset of samples (n=246) at thousands of SNPs. Clustering analyses on the two datasets reveal more population structure and genetic groups detected with SNPs than with microsatellites. Landscape genetic analyses will be used to evaluate isolation by resistance and environment hypotheses and genotype environment association will be used to identify loci under selection across their western range.

2:00 pm

SEASONAL DRIVERS OF AMPLITUDE PATTERNS IN A VARIABLY CYCLIC POPULATION OF RED-BACKED VOLES (*MYODES RUTILUS*)

Sarah Swanson*[1, 2], Knut Kielland[1],Josh Schmidt[2], Shawn Crimmins[1], and Melanie Flamme[2]

[1]University of Alaska - Fairbanks and [2]National Park Service. Contact: scswanson2@alaska.edu

Abstract: Northern red-backed voles (*Myodes rutilus*) are an important food source for many mammalian and avian predators in the Interior Alaska boreal forest ecosystem. However, they exhibit dramatic inter- and intra-annual population fluctuations, for which causes are not clear. Additionally, winter mortality is often very high, and altered weather conditions due to climate change may increase stress during an already difficult season. We studied red-backed voles in Denali National Park with the goal of assessing population dynamics over time and investigating how weather variables influenced patterns of mortality. Using 30-years of mark-recapture data, we applied spatially-explicit methods to calculate density estimates for autumn and early summer trapping sessions, then used post-hoc linear modeling to examine patterns in the amplitude and period of population fluctuations. We found that this microtine population appears to be cycling on a 2-4 year period, with some differentiation between plots. Models of autumn amplitudes suggested a linkage between white spruce (*Picea glauca*) seed mast, either as a food source during winter seasons, or a coincidental product of underlying multi-annual environmental patterns that promote high seed fall. We also found a negative effect of combined late snowfall and cold temperatures. Lastly, models of early summer density showed an apparent inverse density dependence, in which high autumn population densities were followed by low densities the next spring. Continued monitoring of voles, alongside more thorough assessments of snow conditions, habitat, diet, and predator status would assist further attempts to cast light upon this complex system.

** - student*

2:30 pm

EXAMINING NATAL DISPERSAL OF EMPEROR GEESE (*ANSER CANAGICUS*) ON THE YUKON DELTA NATIONAL WILDLIFE REFUGE, ALASKA

Mairin Murphy*[1], Dr. Ben Sedinger[1], Bryan Daniels[2], and Tyler Lewis[3]

[1]University of Wisconsin - Stevens Point, [2]U.S. Fish and Wildlife Service, and [3]Alaska Department of Fish and Game. Contact: mamurphy@uwsp.edu

Abstract: In waterfowl, the time period between hatch and independence from adults is difficult to study, generally due to constraints in the ability to tag or observe the young while they travel and learn from their parents. When examining population declines, understanding this time period becomes relevant as the success of broods directly contributes to population numbers. The emperor goose (*Anser canagicus*) is a medium-sized goose that is endemic to the Bering Sea region, and breeds primarily on the subarctic Yukon-Kuskokwim Delta in western Alaska. Undulations of population size of emperor geese has prompted a need to study post-hatch survival and foraging. Movements of emperor geese have historically been recorded using coarse collection technologies such as geolocators or internal satellite transmitters, primarily due to low survival probabilities of emperor geese with external attachment techniques (e.g., neck collars) and the challenges presented by working in rural Alaska. Moreover, because the species overwinters in non-populated and remote regions of Alaska, using more advanced data-collection technologies such as cellular or GSM transmitters are largely unrealistic. Here we present preliminary results from a study initiated during summer 2022 where we deployed 6 Argos equipped backpack transmitters on adult female emperor geese to examine fine-scale movements during the post-hatch. We compare these results to 86 internal transmitters deployed from 2019–2022. We present foraging movements and start dates of fall migration for emperor geese outfitted with backpack versus internal transmitters. The analysis of this data will aid in producing effective management strategies that promote brood survival.

3:00 pm

NOWHERE TO RUN: CLIMATE INFLUENCES DENSITY OF AN ALPINE INDICATOR SPECIES IN THE ARCTIC-BOREAL REGION

Jeff Wagner*[1], Paul Schuette[2,3], David Christians[1], and Katie Christie[4]

[1]University of Wyoming, [2]Alaska Center for Conservation Science, [3]U.S. Fish and Wildlife Service, [4]Alaska Department of Fish and Game. Contact: jeff.wagner@uwyo.edu

Abstract: Alpine and high-latitude species evolved in cool climates but now face the fastest rates of climate warming. Collared pika (*Ochotona collaris*) are indicators of ecosystem stability found only in isolated patches of high-elevation habitat throughout the subarctic. Decades of research on their southern cousins, American pika, suggest collared pika populations should be highly sensitive to climate, yet they remain understudied. We sought to evaluate how climate affects pika population densities in the core of their range. We conducted surveys at 47 alpine sites in Alaska and fit novel Bayesian hierarchical distance-sampling models to estimate population densities. We identified a strong negative effect of summer warmth, a strong negative effect of winter snow depth, a slight positive effect of annual snow melt cycles on pika density. These results suggest that collared pika are likely experiencing heat stress, but infrequent cold-related mortality. We identified a strong positive effect of growing season NDVI, suggesting pikas thrive in areas with higher productivity, while deep snow may pose a barrier to forage and reproduction. Finally, our models provide the first density estimates for the species. Monitoring climatic forces driving this indicator species may inform our understanding of how climate change threatens alpine ecosystems more generally.

** - student*

3:30 pm

EVIDENCE FOR A SURVIVAL MEDIATED TRAVELING WAVE IN CANADA LYNX (*LYNX CANADENSIS*) ACROSS ALASKA

Derek Arnold*[1], Greg Breed[1], Jared Laufenberg[2], and Knut Kielland[1]

[1]University of Alaska - Fairbanks and [2]U.S. Fish and Wildlife Service. Contact: darnold10@alaska.edu

Abstract: Lynx and snowshoe hare populations are known to experience synchronous population cycles across North America, however less is known about the landscape scale patterns of these cycles. Recent snowshoe hare data suggests that these cyclic population booms begin in central North America and expand outward toward the coasts in a traveling wave. We examined location data from GPS collared lynx to evaluate the degree to which dispersal, survival, and reproduction data support a similar dynamic in lynx populations. The lack of directional bias in dispersal data did not support a purely dispersal driven traveling wave; however, reproductive rates and survival data did support the traveling wave hypothesis. We found that reproductive rates declined annually, along with populations, but that these declines were detected earliest in the eastern study sites with a noticeable wave of reproductive decline moving westward across the state. Concurrently, survival was lower for individuals dispersing east, as compared to resident or west dispersal. Survival rates of east dispersing lynx continued to decrease as the population crashed, while west dispersing and resident lynx stabilized after an initial drop. The combination of these results provides evidence for a wave of population decrease (and subsequent increase) driven by survival mediated dispersal and accentuated by localized declines in reproduction. This study provides support for the traveling wave hypothesis as the driver of population cycles sweeping across Alaska.

Canada lynx photo by Jeff Wagner.

** - student*

Thursday, April 13

SESSION D

(9:00 AM - 11:30 AM)

Session Moderator: Shawn Crimmins

9:15 am

CARIBOU DISTRIBUTION AND MOVEMENTS NEAR A NEW GRAVEL ROAD IN A NORTHERN ALASKAN OILFIELD

Alex Prichard, Joe Welch, and Matt Macander

ABR Inc.–Environmental Research & Services. Contact: aprichard@abrinc.com

Abstract: During the winter of 2019–2020, a new 18 km gravel road was constructed northwest of the Kuparuk Oilfield as part of the Pikka oil development project. We studied the distribution and movements of caribou from the Central Arctic Herd near the new Pikka Road during 2021–2022, a period of low traffic volume, using a combination of GPS collar data, road surveys, and time-lapse cameras. We also analyzed 93 collar-years of GPS data from 2014–2022 to examine movements of female caribou before and after road construction using integrated step-selection analysis (iSSA) with locations 30 minutes apart. Road surveys and camera traps showed that small groups of caribou were frequently in the area around the Pikka Road from June to September, but large groups of caribou moved through the area in July. Caribou movements during mid-summer were related to landcover class, surface wetness, topography, and insect severity, but selection of the area within 1 km of the Pikka Road did not change significantly after construction. During the mosquito season (26 June–15 July) collared caribou crossed the road alignment less after road construction and moved faster and more directionally when near the road. During the oestrid fly season (16 July–7 August) caribou selected gravel roads and pads for fly relief, tended to cross the road alignment more after road construction, and did not exhibit large changes in speed or directionality when near the road. Future research can assess changes with increasing levels of traffic and human activity.

Caribou photo by Jared Hughey.

9:45 am

AERIAL NESTING SURVEYS FOR EAGLES AND OTHER RAPTORS ALONG THE DALTON HIGHWAY

Joe Welch

ABR Inc.–Environmental Research & Services. Contact: jwelch@abrinc.com

Current information on the distribution, abundance, and nesting of eagles and other raptors assists the Bureau of Land Management (BLM) in complying with federal laws protecting these birds. We assisted the BLM in designing and conducting a repeatable, systematic, helicopter-based survey for golden eagle and other raptor nests along the Dalton Highway. In 2021, we flew a 4-km-wide survey area centered on the Dalton Highway from the Yukon River to the northern extent of the Brooks Range. We conducted the survey in 5 days and recorded 136 nesting sites, including 96 golden eagle nests, 35 nests of other species, and 4 gyrfalcon or peregrine falcon nest-ledges. Golden eagle nest density in the study area was 19.6 km^2/nest. We estimated 17 occupied and 3 possibly-occupied golden eagle territories within the 4-km corridor. Nest density and density of occupied territories in the mountainous portions of our study area were similar to or higher than those observed in portions of the Central Alaska Range using similar survey methods. Results of these surveys are being used to assess the environmental effects of possible management actions, minimize impacts of mining and other land use on golden eagles, and model suitable nesting habitat.

Gyrfalcon photo by Ted Swem.

10:45 am

PRONOUNCED BROWN BEAR AGGREGATION ALONG ANADROMOUS STREAMS IN INTERIOR ALASKA

Mathew Sorum[1], Matthew Cameron[1], Anthony Crupi[2], Kyle Joly[1], George Sage[3], Sandra Talbot[3], and Grant Hilderbrand[1]

[1]National Park Service, [2]Alaska Department of Fish and Game, and [3]Far Northwestern Institute of Art and Science. Contact: mathew_sorum@nps.gov

Abstract: Aggregated use along salmon-bearing (*Oncorhynchus* spp.) streams is common for coastal brown bears (*Ursus arctos*); however, it is much less common in non-coastal (interior) environments, especially in the Arctic. A concurrent study of GPS-collared brown bears in the interior Brooks Range mountains, northern Alaska, revealed that salmon-bearing streams and their use by brown bears were more prevalent than previously known. Our goal was to estimate the number, gender, and species of bears (*Ursus* spp.) using anadromous streams while salmon were present in an area of northern, interior Alaska. We deployed single-catch breakaway hair snares on heavily-used bear trails along 7 km sections of two anadromous streams to identify individual animals through DNA genotypes. We collected 119 hair samples from August and September in 2016 and 2017, which revealed 31 unique brown bears and five American black bears (*Ursus americanus*) across both streams. Using a capture-with-replacement analysis, we estimated 24 (95% CI: 22 – 27) brown bears used 7 km of one stream and 15 (95% CI: 9 – 35) brown bears used 7 km of the other. Across both streams, we detected a higher proportion of females than males, more brown bears than black bears, and greater relatedness among bears that used the same stream. The high number of brown bears estimated along these streams belies their overall low densities in the region, while relatedness patterns suggest that bears obtain behavioral specialization through social learning.

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

Westmark Gold Room

VALIDATING WOLF DETECTION AT HAIR TRAPS USING TRAIL CAMERAS

Alexandra Lewis, Tessa Hasbrouck, Ross Doredorf, and Gretchen Roffler

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Abstract: In 2012, the Alaska Department of Fish and Game (ADF&G) and the U.S. Forest Service (USFS) began a project to use hair samples and spatially-explicit capture-recapture (SECR) methods to estimate wolf abundance on Prince of Wales (POW) Island. Though SECR is a reliable method to estimate abundance and densities of wildlife populations, it is important to validate its continued use in Game Management Unit (GMU) 2. Therefore, we began a project using trail cameras to validate the detection probability of wolves at lured hair collection stations. We deployed 60 video-capable trail cameras across 30 stations to collect behavioral data in September and October 2021 and 2022. Trail cameras were set to take still images every 5 minutes and to take video when the infrared motion detector was triggered. Cameras were left at hair stations until December 2021 and 2022, respectively, and collected over 2 million images and videos between the two seasons. Images and videos are interpreted by species and behavioral class. Behavioral classes used are: engaged with board, engaged with site, traveling, scent marking, feeding, and stationary. The duration of each behavior is recorded, and behaviors can be mutually inclusive (e.g., engaged with site and scent marking). These data will allow us to evaluate the detection probability of hair stations by documenting wolf interactions with hair stations (e.g., leaving hair or not), but also allows us to evaluate other species behavior around stations (i.e., deer and black bear) to gain better understanding of species co-occurrence around these stations.

A FECAL SURVEY FOR *CYRPTOSPORIDIUM* SPP. AND *GIARDIA* SPP. IN ALASKA MOOSE (*ALCES ALCES GIGAS*)

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Abstract: A retrospective survey was conducted to determine the prevalence of the zoonotic endoparasites *Cryptosporidium* spp. and *Giardia* spp. in Alaska moose (*Alces alces gigas*). During 2010–2021, fecal samples were collected opportunistically from 245 free-ranging and captive moose across Alaska. Enzyme-linked immunosorbent assay (ELISA), fecal fluorescent antibody, and real-time PCR genotyping were used to detect antigen, antibody, or DNA associated with either parasite in 248 samples. *Cryptosporidium* spp. were detected in 3.6% of samples (n = 9, only detected in calves), *Giardia* spp. were detected in 7.7% of the samples, and both *Cryptosporidium* spp. and *Giardia* spp. were detected in 6.4% of sampled calves. Genotyping of *Cryptosporidium* positives identified 3 distinct genotypes, W17:WH33, W9, and W13. Genotyping of *Giardia* from 1 calf and 1 adult matched A subgroup 1. Most detections of either parasite were associated with captive facilities and urban moose calves. Due to the solitary lifestyle of moose, these low detection prevalences are plausible compared to other wild ungulates or livestock living in higher densities. This survey has provided insights into 2 gastrointestinal parasites with zoonotic potential infecting Alaska moose populations while contributing to baseline data for future monitoring and human health risk assessment.

Moose calf photo by Jeff Wagner.

GEOGRAPHIC VARIATION IN GENETIC STRUCTURE AND MORPHOLOGY OF BROWN BEAR (*URSUS ARCTOS*) POPULATIONS IN SOUTHEAST ALASKA

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Abstract: Glacially carved landscapes isolated by water and mountains help shape population genetic structure, and understanding the influence of these processes on brown bear population genetics and morphology is important to species conservation and management. Using 21 microsatellite DNA loci we investigated the genetic structuring of brown bear (*Ursus arctos*) populations in Southeast Alaska. Biological specimens, including blood, hair, and tissue were collected between 1999–2021, from 930 brown bears sampled in eight study areas either during research or collected from bears harvested in adjacent game management units during mandatory sealing. Morphological measurements were collected from 696 immobilized brown bears handled during 929 research capture events conducted between 1981–2022 in seven study areas. We predicted that brown bear population variation would be spatially clustered with isolated island populations depicting more profound morphological differences than mainland populations. We found that brown bears in these geographically divided sampling regions of Southeast Alaska were genetically subdivided into eight distinct populations. Observed heterozygosity in brown bears was higher and genetic distances and inbreeding coefficients were lower on the mainland compared to the island populations. Mean brown bear body size was also greater along the mainland compared to island populations. The selective genetic pressures from island biogeography and greater cost distances to genetic diversity corridors likely explain our finding of smaller body sizes on islands compared to mainland populations. We suspect that Baranof and Chichagof islands have experienced lower levels of immigration and admixture during recent geologic time than other more genetically diverse populations. These findings reveal that morphological variation has resulted from genetic structuring within the region.

THE ROLE OF THE CECAL MICROBIOME IN ICELANDIC ROCK PTARMIGAN'S (*LAGOPUS MUTA*) POPULATION DYNAMICS

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Abstract: Rock Ptarmigan (*Lagopus muta*) have multiannual cycles that tend to fluctuate and peak every 10-12 years, although in recent years, there has been an overall negative trend in their cyclic patterns. Rock ptarmigans in Iceland are essential to its main predators, the gyrfalcon (*Falco rusticolus*) and small game hunters, which both influence its population cycles. Ptarmigan health may also contribute to their lifespan due to the scarcity of nutrient-rich food and digestion of toxic plant secondary metabolites. The ceca play a significant role in the ptarmigan's digestive system by breaking down organic matter and understanding these microbial communities within may establish a relationship to their health and population dynamics. The fermentation process of the cecum is understudied especially in birds, particularly in understanding its multifunctionality beyond digestion. This longitudinal study was conducted over 11 years with approximately 100 cecal content samples collected per year. 16s rRNa amplicon sequencing was used, and metrics like cecum length, weight, diet, demographic, and phase collection period were recorded for comparison to further investigate the role of cecal microbiome functionality in ptarmigan health. Early findings of data analysis suggest that annual shifts of the cecal microbial community structure are related to changes in diet and body condition. These results may create a better understanding of the functionality of the gut microbiome and how diet contributes to the changing population dynamics of ptarmigan.

** - student*

BEHAVIORS, BELIEFS, AND BEARS; OH MY! WHAT'S BEHIND THE HUMAN-BEAR CONFLICT IN JUNEAU?

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Abstract: Hundreds of bears are breaking into trash, vehicles, and garages every year in Juneau, Alaska. The number of bears euthanized annually has quadrupled since the 80s. But what do the people of Juneau think? We want to find out. We will hold focus groups this summer, and send a survey to a representative sample of Juneau residents. Our objectives are to quantify the extent and perception of human-bear conflict in Juneau; to identify what human attitudes, behaviors, motivations, and barriers might influence this conflict; to discover how these conflicts and the factors that influence them are distributed spatially; and to identify acceptability and preference for various management strategies and solutions within the community.

AN EXPLORATION OF MOOSE HABITAT SELECTION IN TOGIAK NATIONAL WILDLIFE REFUGE

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Abstract: Large herbivore maternal care can affect calf survival, which is a driving force of population dynamics. Maternal care not only varies over the lifetime of an individual, but also between individuals of a population. We sought spatial patterns in calf survival to understand if lifetime calf survival rates of cow moose (*Alces alces*), and thus maternal care, could be explained by their choice of habitat. We conducted model selection in a Resource Selection Function (RSF) framework using calf survival calculated from 106 radio-collared cow moose in southwest Alaska. We used distance from major water bodies, ruggedness, and land cover data as explanatory variables. Analysis is still in progress. If the RSF returns a statistically significant interaction between our spatial covariates and lifetime calf survival, we can deduce that maternal care follows spatial patterns. However, if there are not statistically significant interactions, it would imply that maternal care is unrelated to habitat selection.

Rock ptarmigan photo by Ted Swem.

** - student*

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