2023 North American Caribou Workshop & Arctic Ungulate Conference

Anchorage, Alaska

NACW-AUC 2023 Workshops – Monday, 8 May

Analysis of Caribou Movements and Geospatial Covariates with the TuktuTools R Package and Google Earth Engine

Instructors: Elie Gurarie (SUNY College) and Opheile Couriot (SUNY College)

Cost: $55

Max Attendance: 40

Time: Full Day (TuktuTools Package in morning, and Google Earth Engine in afternoon)

Description: We are offering a full-day workshop on analyzing remotely sensed movement and environmental data. In the morning, we will be introducing a new R package, TuktuTools, designed specifically to facilitate visualization and analysis of caribou movement data from GPS collars, including identifying calving times, migration timing, and social interactions. In the afternoon, we will conduct a workshop on using Google Earth Engine, a powerful, free tool for obtaining and working with weather and climate variables such as temperature, wind, precipitation, snow, and land-cover types, with emphasis on Arctic and sub-Arctic regions, and linking those environmental variables to movement data.

Implementing Boreal Caribou Habitat Restoration in Practice: A Practical Approach for Indigenous Communities

Instructors: Susan Leech (Firelight Group), Jesse Tigner (SwampDonkey), Katherine Wolfenden (Fort Nelson First Nation), and Anne Hervieux (Firelight Group)

Cost: $55

Max Attendance: 40

Time: Full Day

Description: This one-day training session will walk through all steps involved in restoring impacted woodland caribou habitat, from inception and planning to delivery and monitoring. We will provide real-world advice, developed from 5 years of on-the-ground experience, to successfully undertake these complex projects in challenging habitats and regulatory regimes. Designed in particular for Indigenous communities interested in implementing regional scale habitat restoration, participants at all phases of project development are encouraged to attend. We aim to share and build knowledge to foster better restoration outcomes for everyone. Workshop attendees will gain practical advice for each step of caribou habitat restoration planning and implementation, and will come away from the session ready to move forward with implementing caribou habitat restoration in their area, through five modules:

- Module 1: Landscape-level planning: Where to restore? What factors should be considered? What data do you need?;
- Module 2: Making a site-level plan: access and hazards, determining extent of regrowth, identifying and working around industrial encumbrances, permitting;
- Module 3: Treatment types and trade-offs: hummock transplants, mounding, planting, seasonal considerations;
- Module 4: Monitoring results and adaptive management: importance of monitoring success, scales and components to monitor, trade-offs between operational efficiencies and costs and ecological efficacy;
- Module 5: Implementing field treatments: reviewing the yearly cycle for field work and what needs to be considered at each stage, including sourcing materials and equipment, identifying equipment requirements and trade-offs, key roles and training requirements).

The workshop will include speakers involved in all aspects of ongoing caribou habitat restoration in Fort Nelson First Nation's territory, including Fort Nelson First Nation's lands and resource coordinator, ecologists and GIS specialists who are supporting the project, machine operators involved in implementing treatments and Guardians involved in data management and monitoring.

Snow Field Measurements for Ungulate Research

Instructors: Stine Højlund Pedersen (Colorado State University, University of Alaska Anchorage), Adele Reinking (Colorado State University), Kelly Elder (US Forest Service, Rocky Mountain Research Station), and Glen Liston (Colorado State University)

Cost: $65

Max Attendance: 22

Time: Full Day

Description: This workshop will introduce you to snow-related field measurements that can be incorporated into your research to better address your snow-ungulate interaction questions. We've designed it for a wide audience, and no prior snow knowledge or snow measurement

experience is required! By the end of this workshop, you will have gained tools that will help you to (1) better understand and quantify the role of snow in your system of interest and (2) design and execute your own snow field sampling efforts, given the unique logistics, resources, and questions of your project. Ultimately, our goal is to help you collect more relevant, informative, and high-quality snow information to improve your study-system understanding and help elevate the quality of your research. We will provide information about snow properties that are often relevant for ungulate studies, such as depth, strength, stratigraphy, wind and rain crusts, and others. We will also discuss basic snow mechanical properties; common measurement techniques and tools used to make those measurements; guidance on winter field equipment, clothing, and safety; and sampling designs for different types of research or management questions. We will provide hands-on experience in using snow measurement tools outdoors in the snow. Finally, we will discuss how you can combine your field measurements with modeling tools and/or other snow datasets to better understand snow conditions that are dynamic across space and time. Proper clothing and gear is required; we will provide a detailed equipment list in advance. We will both be highly active (e.g., hiking, digging snow pits, carrying equipment) and standing still for extended periods of time, so you will need to be able to add or remove layers throughout the day. You will also need to bring food, water, and other essentials, but a sack lunch will be provided. The workshop is limited to 22 students. We look forward to spending a day playing in the snow with you!

Storytelling & Science **Workshop**

Instructor: Arran Forbes (Arctic Entries)

Cost: $40

Max Attendance: 100

Time: Half Day (afternoon)

Description: Stories are a powerful way to share diverse knowledge and experiences related to the ecology, management, use, and importance of Arctic ungulates. Join volunteers from Anchorage's popular storytelling show, Arctic Entries*, for a workshop to craft your most memorable stories from the field (or anywhere else!) into a 5-7 minute tale ready for a conference stage, theater, meeting, or social gathering. This workshop will include a review of what makes stories land with their audience, breaking down how successful storytellers share an experience on stage, discussing how science/research can be relayed to the general public through storytelling, and an opportunity to share and offer feedback on stories from our own conference goers. A portion of the workshop will be led by Arctic Entries, and a portion will be split into smaller groups to workshop individual stories. This workshop will culminate in a live storytelling show on the evening of Wednesday, May 10!

*Arctic Entries is an all-volunteer run Alaskan 501(c)(3) nonprofit that hosts monthly storytelling shows in Anchorage, with spinoffs in Juneau (Mudrooms) and Fairbanks (Dark Winter Nights). For more information: https://arcticentries.org/

Structured Decision Making as a Model to Integrate Different Knowledge Systems and Achieve Collaborative Conservation

Instructors: Tuula Hollmen (University of Alaska-Fairbanks, Alaska Sealife Center) and Erik Osnas (U.S. Fish and Wildlife Service)

Cost: $55

Max Attendance: 24

Time: Full Day

Description: Wildlife management is fundamentally about making decisions. In a co-management context, this involves collaboration across stakeholders who act together. This shared process may bring about confusion or misunderstandings when stakeholders vary in cultural background, knowledge, or knowledge systems. Here we use a decision analysis framework to help clarify roles and how differing values and knowledge systems can be incorporated into the decision process in an inclusive, equitable, and transparent manner. Topics include when and why to use a formal decision process, the structure of decision problems, eliciting objectives, developing performance measures, creating alternatives, estimating consequences and uncertainty associated with each alternative, exploring trade-offs, choosing a preferred alternative, and when to seek more information. Focus will be on non-technical tools and how to combine stakeholder values, science, and traditional knowledge into the process. We will illustrate each step using hands-on examples and case studies from work in Alaska and across the Arctic.