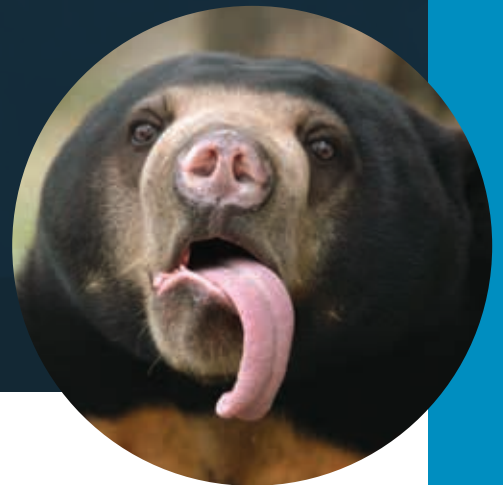# Co-existing with Bears on Dynamic Landscapes

IBA 2024

INTERNATIONAL ASSOCIATION FOR
BEAR RESEARCH AND MANAGEMENT

EDMONTON, ALBERTA, CANADA SEPTEMBER 2024

Abstract:

Polar bears rely on safe denning habitats for successful reproduction. Within the Manitoba range of the Western Hudson Bay sub-population, females den exclusively in terrestrial habitats utilizing banks and ridges near waterbodies that remain stable due to vegetation and permafrost. Following a wildfire, this habitat becomes unsuitable for denning. In a warming climate, wildfire disturbance may alter the habitat in ways that make it unsuitable for denning indefinitely. Understanding the scale and spatial distribution of wildfire risk to denning habitat is imperative for effective forest and wildlife management. Our study aims to identify where suitable denning habitat intersects with regions that are susceptible to wildfires. Denning data and habitat characteristics were compiled to create a habitat suitability model for denning polar bears in the Hudson Plains Ecozone of Manitoba. The habitat suitability model showed regions suitable for denning in the Wildlife Management Areas around Wapusk National Park. Using historical fire data, topographic features, and Landsat imagery, we developed a random forest machine learning model trained to predict where fires are most likely to burn given current environmental conditions. Validation of the random forest model using a subset of historical fire data showed it is highly reliable in assigning regions an accurate level of wildfire risk. Given the unique characteristics of wildfire in a region with discontinuous permafrost and with large amounts of peat, this model is critical to predicting where wildfire may burn. Combining the habitat and wildfire models highlights regions where polar denning habitat is susceptible to wildfires. Future efforts will refine wildfire models with additional data and investigate denning polar bear return periods post-fire. Insights into how polar bears use these denning habitats and their vulnerability to wildfires will facilitate informed conservation and management strategies in Manitoba.

Day: Thursday   **Time:** 17:00 – 21:00   **Room:** Salon 8/9

Theme: Captive Bears, Zoos, and Physiology

Abstract Number: 280
Presentation Type: Poster Presentation
Presentation Title: Wild sun bears (Helarctos malayanus) exhibit aseasonality in parturition
Presenter Name: Zachary David
Presenter Affiliation: Old Dominion University
Presenter Email: zdavi008@odu.edu
All Authors: Zachary David, Brian Crudge, Matt Hunt, Kirsty Officer, Vuthy Choun, Barbara Durrant, Megan Owen, Morokot Long, John Whiteman
Primary Author Occupation: Student

Abstract:

Seasonal reproduction can provide species with fitness advantages by allowing the birth of young to coincide with favorable environmental conditions, particularly in regions with highly seasonal temperature, precipitation, or other conditions. The family Ursidae is a useful system to study reproductive timing, as there are only eight extant species which are widely distributed, and which experience a large range of variation in environmental conditions. Seven of the bear species reproduce seasonally in both managed care and the wild; however, data for the eighth species, the sun bear (Helarctos malayanus), are unclear. Sun bears have reproduced throughout the year in managed care, yet currently there are no clear data of birth timing for wild sun bears. Here we investigate the seasonality of parturition of wild sun bears by utilizing body mass measurements from bears placed in the care of the wildlife conservation organization Free the Bears in Cambodia after interception by authorities for illegal removal from the wild. We selected body mass records for all rescued bears ≤ 5kg, and modeled growth rates with linear regressions for cubs with > 3 measurements. Assuming a mass of 300g at birth, these growth rates were used to estimate the birth date for each cub. Our results suggest that wild sun bears reproduce aseasonally in Cambodia, with estimated birth dates occurring in all 12 months of the year and all 4 of Cambodia's distinct seasons.

Day: Thursday   **Time:** 17:00 – 21:00   **Room:** Salon 8/9

Theme: Management

Abstract Number: 284
Presentation Type: Poster Presentation
Presentation Title: Categorizing the research effort across the family Ursidae
Presenter Name: Zachary David
Presenter Affiliation: Old Dominion University
Presenter Email: zdavi008@odu.edu
All Authors: Zachary David and John Whiteman
Primary Author Occupation: Student

Abstract:

Scientific research is critical for informing management and conservation plans for threatened species. An understanding of concepts such as life history, ecological interactions, human-wildlife conflict, and habitat and diet selection are essential for assessing species-specific threats. The distribution of research effort across threatened species is not uniform, with some species and topics receiving significantly more attention than others. The family Ursidae – bears – may exemplify this discrepancy; several species are global icons, while others are relatively unknown outside of wildlife studies. Bears are charismatic and draw a lot of public attention, are ecologically important due to their extensive geographical range and status as an umbrella species, and occupy a variety of biomes. Additionally, individual species within Ursidae exhibit a wide range of unique adaptations and dietary niches, from hypercarnivorous polar bears to herbivorous giant pandas. Using the Web of Science database, we collected all peer-reviewed papers published on Ursidae species between 1970-2021 and categorized studies into 28 distinct research disciplines, revealing a sharp discrepancy in both number of papers published and distribution of research topics across Ursidae. Analysis of research effort by species both temporally and spatially are currently ongoing.

Day: Thursday   **Time:** 17:00 – 21:00   **Room:** Salon 8/9

Theme: Management

Abstract Number: 285
Presentation Type: Poster Presentation
Presentation Title: EUROBEAR: Collaborative science for spatial brown bear ecology
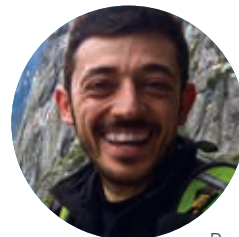**Presenter Name:** Andrea Corradini
Presenter Affiliation: Fondazione Edmund Mach
Presenter Email: corradini.andre@gmail.com
All Authors: Andrea Corradini, Sydney Stephens, Francesca Cagnacci
Primary Author Occupation: Professional

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Abstract:

The consequences of anthropogenic impacts on ecosystems are driving

species adaptation and persistence worldwide. While local studies can help unveil fine-scale processes, robust assessment of broader processes are possible when pooling ecological data from a variety of environmental contexts. This is especially important for wide-ranging species, which are exposed to a large variety of conditions and stressors in space and time. The brown bear, the most extensively distributed ursid, is a prime example: it occupies various ecosystems, including forests, deserts, and tundras, at elevations ranging from sea level to 5000 meters, and within a latitude range of approximately 25° to 70°N. Building on the Euromammals initiative, which has been pioneering collaborative science in spatial animal ecology since 2007, the aim of this project is to establish a network of interested parties and build a long-term, secure sharing platform for researchers and managers to investigate biological, ecological, and management questions for brown bears in Europe. This is achieved by analyzing data across populations and with the field knowledge gained by managers and researchers working with bears in different socio-ecological contexts. The initiative builds on previous EU-wide collaborations, such as Biodiversa+ BearConnect and EU co-funded LIFE+ projects, and cloud-based data management infrastructure at Euromammals. Eurobear relational spatial database ensures the collection, quality control, standardization, and sharing of data necessary to actualize the collaboration, while the Term of Use allows partners to join the network while maintaining full ownership and responsibility for their data.

Day: Thursday   Time: 17:00 – 21:00   Room: Salon 8/9

Theme: Management

Abstract Number: 286
Presentation Type: Poster Presentation
Presentation Title: Low-stress herding reduces cattle predation by grizzly bears
Presenter Name: Matt Barnes
Presenter Affiliation: Northern Rockies Conservation Cooperative
Presenter Email: matt@shininghorizons.com
All Authors: Matt Barnes
Primary Author Occupation: Professional

Abstract:

A conservationist partnered with two grazing permittees and the Shoshone National Forest on the Union Pass Allotment, in the Wind River Mountains of northwestern Wyoming, USA, to improve cattle management, and by extension maintain land health and reduce conflicts with wildlife,

particularly grizzly bears, which had killed several cattle each year, and gray wolves. The group-size effect is a well-known anti-predator behavior of many prey species, including ungulates. Strategic rotational grazing increases stock density (concentration), and low-stress livestock handling increases herd instinct--two parallel ways to facilitate the group size effect in livestock. The Forest Service developed a grazing plan that involved combining the two herds, and rotation through 7-9 grazing management units but only one cross-fence. Prior to the project, the cattle did not form a single herd, self-segregated into small social units, and in some cases repeatedly traveled down from the mountain allotment to their home ranch. We-cohosted training in low-stress livestock handling, and for 3 years the permittees applied low-stress herding to the best of their ability. The cattle formed larger groups but never formed a single cohesive herd. In the 3 years prior to the project, there was predation by grizzly bears every year; during the 3 years of the project, there was no confirmed predation. One herd reduced annual confirmed losses to bears from mean 2.6% (maximum 6.7%) to 0%; losses to unknown causes from 3.9%

(maximum 7.9%) to 2.0%; and total losses from 10.6% (maximum 19.1%) to 4.3% per year. (The other herd did not have adequate records of pre-project losses.) In this case study we cannot rule out other factors, but it appears likely that low-stress herding in a strategic rotation led to reduced bear-livestock conflict. Strategic grazing management and low-stress herding may be important aspects of a strategy for reducing livestock vulnerability to predation by large carnivores.

Day: Thursday   **Time:** 17:00 – 21:00   **Room:** Salon 8/9

Theme: Human-Bear Conflict & Coexistence

Abstract Number: 287
Presentation Type: Poster Presentation
Presentation Title: Challenges Associated with Bear Viewing Opportunities on Public Land in Montana
Presenter Name: Blakely Adkins
Presenter Affiliation: Greater Yellowstone Coalition
Presenter Email: badkins@greateryellowstone.org
All Authors: Blakely Adkins
Primary Author Occupation: Professional

Abstract:

I spent 11 seasons guiding for a bear viewing company on the Central Coast of British Columbia in a very remote location. More recently, I have been working in SW Montana and spend time working with community members in the Tom Miner Basin outside of Yellowstone National Park. The public frequents this community to view bears from the side of the county road every fall as they forage on caraway. There is a lot of differences between bear viewing on the BC coast, bear viewing in Yellowstone National Park, and bear viewing along side a community of ranchers off a public road. My presentation would be focused on these differences with a highlight on challenges the Tom Miner Basin community is faced with.

Caraway is an introduced species to the Tom Miner Basin of Montana. It is a desirable food source for grizzlies in the fall and late summer, and over the years bears have learned to come here to fatten up before hibernation. Some days you can watch 20 or more bears at a time digging up caraway on the same properties. The back of the basin has four working ranches where caraway is most abundant in the area. Recently, it is not uncommon to see close to 100 people watching bears in the evenings without any enforcement. People are going as far as to set up grills for hamburger dinners on their tailgates as they wait for bears to come into view. This behavior is a risk to attracting bears as well as a fire risk.

Bear behavior is also changing over time. Ranchers have noticed that some bears have become more habituated to humans and are less likely to leave the area when they are fixing fence and calling out "hey bear" as they were in the past which makes them worried. The community of Tom Miner is working with agency and NGO partners to find solutions to these challenges and more.