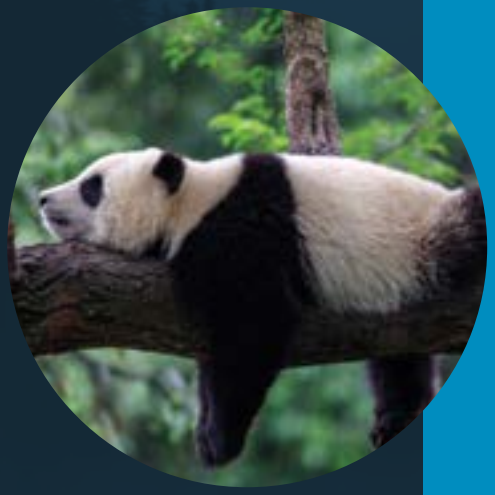
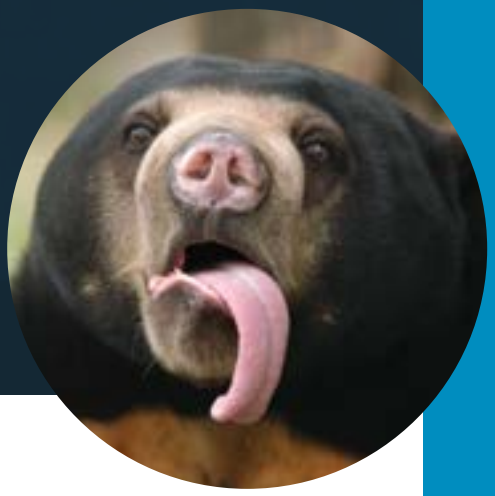
28TH IBA CONFERENCE

Co-existing with Bears on Dynamic Landscapes





IBA 2024

INTERNATIONAL ASSOCIATION FOR BEAR RESEARCH AND MANAGEMENT

EDMONTON, ALBERTA, CANADA SEPTEMBER 2024

In an effort to reduce our carbon IBA is not bill printing the schedule or book of abstracts. An online schedule with real time updates is available on the IBA conference website. Scan this QR code to access. You can star presentations of interest for easy viewing on your mobile device.

WIFI - Encore

Password BEAR2024

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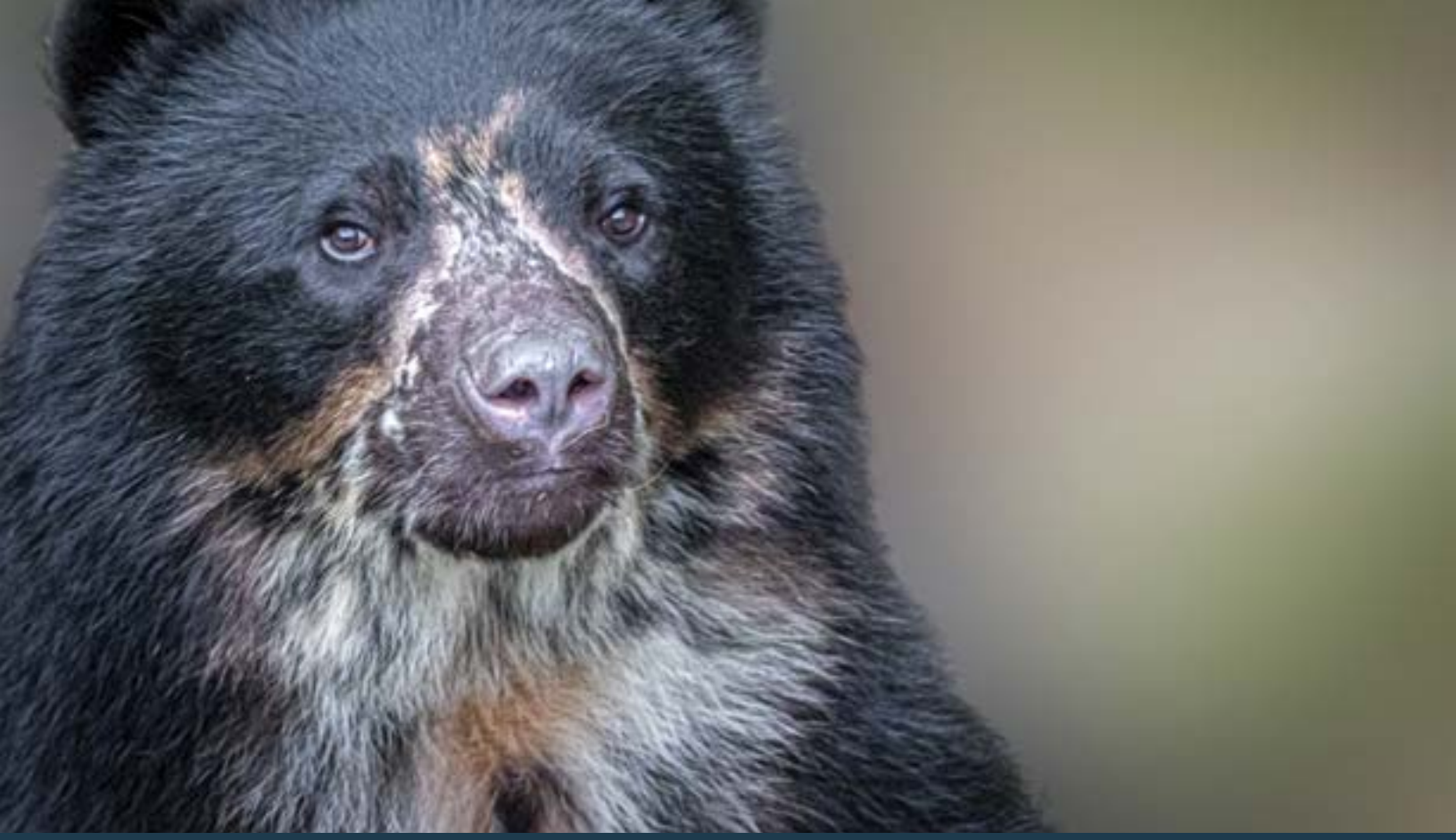

Gordon B. Stenhouse

Conference Chairman 28th International Association for Bear Research and Management.

On behalf of the conference committee, I would like to welcome you to Edmonton, Alberta and to the 28th IBA Conference. Our conference team has been working for many months to try to make this a great conference and having seen the many abstracts for presentations and posters I want to commend everyone for bringing forward the latest developments and advances in the world of bear conservation and management.

I also want to thank our many generous sponsors who have made this conference possible and for their tremendous support of the IBA and our goals.

Finally, since this is the first in-person conference we have had in some time I want to urge everyone to spend time away from your electronic devices and engage in conversation with delegates from around the world and make new friends, establish new partnerships and collaborations and most importantly enjoy the conference!

CONFERENCE ORGANIZING COMMITTEE

Gordon Stenhouse, Conference Chair

Jennapher Teunissen van Manen, IBA Director of Operations and Programs

Fran Hanington, Agenda/Program Coordinator

Sara Parsons, Social Media/Volunteer Coordinator

Kim Titchener, Media Relations/Volunteer Coordination

Jack Beardsley, Website Design/Development

Mark Edwards, Scientific Program Committee Chair

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- Cam McClelland
- Darío Fernández-Bellon
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- Ramona Maraj
- Scot Nielsen
- Sterling Miller
- Terry Larsen

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- Terry Larsen

Martyn Obbard, IBA Conference Travel Grant Committee Chair

IBA Conference Travel Grant Committee Members:

- Greg Thiemann
- Jennapher Teunissen van Manen

IBA Conference Liason Committee Co-Chairs

- Frank T. van Manen
- Martyn Obbard

IBA COUNCIL

Elected Voting Members

President: John Hechtel (United States of America)
john.hechtel@bearbiology.org

Vice President Eurasia: Agnieszka Sergiel (Poland)
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Ex-Officio Council – Non-Voting Members

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A special thank you to our sponsors. Without them the conference would not have been possible.

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Wildlife Genetics International

MATSON'S LABORATORY

Alberta Forest Products Association

ACKNOWLEDGEMENTS

Thank you to Corkbeard Wine Co. for their generous donation of their wines to the banquet.

- Corkbeard Chardonnay I United States I Edmonton owned, grown in California

Flavours of starfruit, sweet cream butter I grapefruit and green apple finish I full-bodied I sold exclusively in Alberta

- Corkbeard Cabernet Sauvignon I Edmonton owned, grown in California

Flavours of black cherries and sugar plums I hint of vanilla finish I full bodied I sold exclusively in Alberta

Matson's Lab and the AFPA have sponsored the conference coffee breaks.

Winisk Research and Consulting and Yellowstone to Yukon Conservation Initiative (Y2Y), with in-kind support from the IBA, are partnering to complete a social network analysis (SNA) for grizzly bears across their range in Alberta, British Columbia, Northwest Territories, Yukon, Montana, Idaho, Wyoming and Washington. SNA is a tool that allows us to understand how people organize and share information, and how this can influence behaviour change pertaining to grizzly bears. We are seeking input and participation from individuals involved in grizzly bear management, research and/or policy, and are hoping to connect with folks at the IBA conference. Scan the QR code and check out the presentation by Courtney Hughes at the conference to learn more about this project! You can also connect via email at grizzly.bear.social.network@gmail.com.

AGENDAS

Saturday, September 14, 2024

IBA Council Meeting: All day – 9:00 AM to 4:00 PM

Edmonton Convention Centre, 9797 Jasper Avenue, Salon 1

09:00	12:00	Morning Session
12:00	**13:00**	**LUNCH**
13:00	16:00	Afternoon Session

Sunday, September 15, 2024

Workshops

Chateau Lacombe Hotel, 11101 Bellamy Hill, workshop rooms 3rd floor

09:00	12:00	Workshop 1 - Bear Capture and Handling Best Practices	Nigel Caulkett and Owen Slater
09:00	12:00	Workshop 2 - Engagement with Indigenous knowledge in polar bear research in Canada's north	Doug Clark and Dana Reiter
12:00	**1:00**	**LUNCH (for all workshop attendees)**	
13:00	16:00	Workshop 1 – Bear Capture and Handling Best Practices	Nigel Caulkett and Owen Slater
13:00	16:00	Workshop 3 - UnBEARable or BEARable captivity? Perspectives and solutions for wild bears entering lifetime keeping	Bernd Nonnenmacher, Agnieszka Sergiel, Koen Cuyten

Sunday, September 15, 2024

Registration

Edmonton Conference Centre, 9797 Jasper Avenue, Assembly Foyer

12:00	19:00	Registration Opens
19:00	21:00	Ice Breaker Reception

Monday, September 16, 2024

Hall C

Edmonton Conference Centre, 9797 Jasper Avenue

07:00	**07:45**	**BREAKFAST – ASSEMBLY FOYER**	
07:45	08:05	Introduction and Welcome	Gordon B. Stenhouse, Conference Chairman 28th International Association for Bear Research and Management
08:05	08:15	Welcome from Government of Alberta	Todd Loewen, Minister of Alberta Forestry and Parks
08:15	09:00	Keynote Address: Ecology, Hunting, and Politics	Dr. Mark Boyce, Professor of Ecology, Department of Biological Sciences, University of Alberta
INVITED PRESENTATIONS – Session Chair Gord Stenhouse 09:00 – 11:40			
09:00	09:15	Stein Nahatlatch Grizzly bears: Their Story is written on the Land	Chief Michelle Edwards, St'a'tmic Chiefs Council; Cheryl Amber Marie Blair, MSc. RPBio, Senior Biologist/Wildlife Biologist, Splitrock Environmental Sekw'el'was
09:15	*09:20*	*Transition*	
09:20	09:35	Abstract Cultural and spiritual perspectives of the Andean Bear in South America	Santiago Molina, Coordinator of the Research, Education and Communication Commission of the Choco Andean Biosphere Reserve, and member of International Bear Association Executive Council
09:35	*09:40*	*Transition*	
09:40	09:55	Sacred Connections and beliefs: Bears in Cultural and Religious Ceremony" in Nepal	Bhupendra Prasad Yadav, Director of National Zoological Garden, Ministry of Forests and Environment, Kathmandu, Nepal
09:55	**10:20**	**COFFEE BREAK**	
10:20	10:35	The Grizzly Cultural Study in Kananaskis: Continuing to Understand Grizzly Bears from a Cultural Perspective.	William (Bill) Snow, Acting Director of Consultation, Stoney Tribal Administration, Stoney Nakoda Traditional Territory
10:35	*10:40*	*Transition*	
10:40	10:55	Traditions of Mongolians related to bears	Bayasgala Amgalan, UNDP Biodiversity Advisor, Mongolia
10:55	*11:00*	*Transition*	
11:00	11:15	The relationship between European Brown Bear and Reindeer in Sweden	Peter Andersson, Reindeer Herder, Eajran Sïjte Sami Community, Sweden
11:15	*11:20*	*Transition*	
INVITED PRESENTATION: ALBERTA FORESTRY and BEAR MANAGEMENT			
11:20	11:35	Applying Science: Collaborative Research & Bear Management in the Alberta Forestry Sector	Emily Cicon, Hinton Wood Products, West Fraser Mills Ltd.
11:35	*11:40*	*Transition*	
MANAGEMENT - Session Chair Mark Edwards 11:40 – 16:05			

Monday, September 16, 2024

Hall C

Edmonton Conference Centre, 9797 Jasper Avenue

11:40	11:55	Abstract 119 - Integrating health assessments into at-risk species' conservation planning: Polar bears as a case study	Karyn Rode, US Geological Survey
11:55	**13:30**	**LUNCH**	
13:30	13:45	Abstract 174 - Maintaining bears' adaptive potential: monitoring and assessing genetic indicators in Ursidae	Emily Puckett, University of Memphis
13:45	*13:50*	*Transition*	
13:50	14:05	Abstract 200 - Bridging conservation technology with Indigenous land stewardship for identifying and managing important grizzly bear habitat	Melanie Clapham, Nanwakolas Council
14:05	*14:10*	*Transition*	
14:10	14:25	Abstract 206 - Assessing Temporal Changes In Grizzly Bear Reproductive Characteristics Under Fluctuating Pacific Salmon Returns	Sophie Fowler, University of Guelph Student
14:25	*14:30*	*Transition*	
14:30	14:45	Abstract 236 - Population sex structure and recolonization in the Norwegian brown bear	Pierre Dupont, Norwegian University of Life Sciences
14:45	**15:10**	**COFFEE BREAK**	
15:10	15:25	Abstract 250 - The rise and fall? of the Swedish brown bear population	Jonas Kindberg, Scandinavian Brown Bear Research Project
15:25	*15:30*	*Transition*	
15:30	15:45	Abstract 313 - New non-invasive method with camera trapping provide data on wild Andean bear body size in Peru	Denisse Mateo, San Diego Zoo Wildlife Alliance / University of San Francisco Quito Student
15:45	*15:50*	*Transition*	
15:50	16:05	Abstract 323 - Building a biometric: Leveraging pose-aware imagery to develop a robust photo-identification for an unmarked species (Ursus arctos)	Beth Rosenberg, Alaska Pacific University Student
HABITAT RELATIONSHIPS – Session Chair Lorraine Scotson 16:10 – 16:45			
16:05	*16:10*	*Transition*	
16:10	16:25	Abstract 278 - Structural connectivity of Sloth bears in Western Maharashtra India ***	Neelu Soni, Sant Gadge Baba Amravati University Student
16:25	*16:30*	*Transition*	
16:30	16:45	Abstract 283 - Huckleberry habitat and its importance to Cabinet-Yaak and Selkirk Ecosystem grizzly bears (Ursus arctos)	Justin Teisberg, US Fish and Wildlife Service

Tuesday, September 17, 2024

Concurrent Sessions - Hall C

Edmonton Conference Centre, 9797 Jasper Avenue

07:00	**08:00**	**BREAKFAST – ASSEMBLY FOYER**	
HUMAN-BEAR CONFLICTS & COEXISTENCE - Concurrent Session Chair Rob Gau			
08:00 – 11:35			
08:00	08:15	Abstract 12 - Managing Bear Attack Incidents in Canadian National Parks	Steve Michel, Parks Canada Agency
08:15	*08:20*	*Transition*	
08:20	08:35	Abstract 112 - Identifying the drivers of polar bear-human interactions using remote cameras	Douglas Clark, University of Saskatchewan
08:35	*08:40*	*Transition*	
08:40	08:55	Abstract 57 - Ecology of conflict between baiting-dependent bear tourism and reindeer husbandry	Ilpo YJ Kojola, Natural Resources Institute Finland
08:55	*09:00*	*Transition*	
09:00	09:15	Abstract 65 - Resource sharing between human and sloth bear in non-protected forests: A prime reason for human-sloth bear conflicts ***	Pratikkumar Desai, WCB Research lab, Department of Life Sciences, Hemchandracharya North Gujarat University Student
09:15	*09:20*	*Transition*	
09:20	09:35	Abstract 70 - Targeting 'Social Carrying Capacity' with Risk Preference Elicitation During Predator Recovery	Chandler Hubbard, University of Wyoming Student
09:35	*09:40*	*Transition*	
09:40	09:55	Abstract 78 - A forecast of human-wildlife incidents could help authorities anticipate risk and early react in Europe's largest brown bear (Ursus arctos) population	Ancuta Fedorca, National Institute for Research and Development in Forestry "Marin Dracea"
09:55	**10:20**	**COFFEE BREAK**	
10:20	10:35	Abstract 79 - Understanding ecological and anthropological determinant to devise effective human-sloth bear conflict mitigation strategies in Gujarat, India ***	Aditya Dharaiya, Department of Geology, Savitribai Phule Pune University Student
10:35	*10:40*	*Transition*	
10:40	10:55	Abstract 83 - Drones outperform dogs hazing bears: community-based carnivore scare tactics	Wesley Sarmento, Montana Fish, Wildlife and Parks
10:55	*11:00*	*Transition*	
11:00	11:15	Abstract 91 - Bear Management-Related Terms for Standardized Use	Carl Lackey, Nevada Department of Wildlife
11:15	*11:20*	*Transition*	

Tuesday, September 17, 2024

Concurrent Sessions - Hall C

Edmonton Conference Centre, 9797 Jasper Avenue

11:20	11:35	Abstract 338 - The Canine Conundrum: Is a Dog a Help or Hindrance in Bear Country?	Tom Smith, Brigham Young University, Provo, UT, USA
11:35	*11:40*	*Transition*	
MOVEMENT ECOLOGY – Session Chair Becky Zug 11:40 – 16:25			
11:40	11:55	Abstract 33 - Spatial Behavior of Grizzly Bears in the US Northern Rockies	Sarah Sells, U.S. Geological Survey, Montana Cooperative Wildlife Research Unit
12:00	**13:30**	**LUNCH (Student Mentor Lunch – Craft Brew House, 10013-101A Avenue, 10-minute walk)**	
13:30	13:45	Abstract 59 - Sloth Bear Long Distance Dispersal ***	Thomas Sharp, Wildlife SOS
13:45	*13:50*	*Transition*	
13:50	14:05	Abstract 121 - New insights into Andean bear movement ecology across the Ecuadorian Andes	Francisco Castellanos, Fundación Oso Andino Student
14:05	*14:10*	*Transition*	
14:10	14:25	Abstract 129 - Asiatic black bear responses to roads: Sex- and season-related variations in road proximity, movement, and crossing	Seungyun Baek, Tokyo University of Agriculture and Technology Student
14:25	*14:30*	*Transition*	
14:30	14:45	Abstract 131 - Grizzly bears change their behavior near recreation sites in a protected area	Elise Loggers, Montana State University Student
14:45	**15:10**	**COFFEE BREAK**	
15:10	15:25	Abstract 166 - Fine-Scale Behavioral Patterns of Newly Recolonizing American Black Bears in Texas	Nicole Dickan, Borderlands Research Institute Student
15:25	*15:30*	*Transition*	
15:30	15:45	Abstract 210 - Movement and survival of polar bears in relation to sea ice and harvest in Hudson Bay	David McGeachy, University of Alberta Student
15:45	*15:50*	*Transition*	
15:50	16:05	Abstract 309 - Sea ice dynamics influence movement patterns of adult female polar bears of the Southern Hudson Bay subpopulation	Martyn Obbard, Ontario Ministry of Natural Resources and Forestry Retired
16:05	*16:10*	*Transition*	
16:10	16:25	Abstract 320 - Fine-scale space use of female black bears across a fragmented landscape	Jacob Humm, Oklahoma State University Student
16:25	*16:30*	*Transition*	
16:30	18:00	IBA MEMBERS MEETING – SALON 4	

Tuesday, September 17, 2024

Concurrent Sessions - Salon 4

Edmonton Conference Centre, 9797 Jasper Avenue

07:00	**08:00**	**BREAKFAST – ASSEMBLY FOYER**	
POPULATION ESTIMATION-Concurrent Session Chair Mia Valtonen 08:00 – 09:35			
08:00	08:15	Abstract 67 - Developing new tools for population estimation: Insights from thermal imaging drones and Kodiak brown bears	Shannon Finnegan, Koniag Inc
08:15	*08:20*	*Transition*	
08:20	08:35	Abstract 102 - Genetic Diversity and Population Structure in Ecuadorian Andean Bears	María José Pozo, Universidad San Francisco de Quito
08:35	*08:40*	*Transition*	
08:40	08:55	Abstract 152 - 96 SNPs later – the harmonizing and augmenting of the DNA-based brown bear transnational monitoring in northern Europe	Alexander Kopatz, Norwegian Institute for Nature Research
08:55	*09:00*	*Transition*	
09:00	09:15	Abstract 154 - Demographic portrait of the brown bear population in the Western Carpathians	Nikola Tkáčová, Charles University Student
09:15	*09:20*	*Transition*	
09:20	09:35	Abstract 19 - Predicting the potential habitat of bears under a changing climate in Nepal	Rishi Baral, Hokkaido University, Laboratory of Wildlife Biology and Medicine, Sapporo, Japan Student
09:35	*09:40*	*Transition*	
HABITAT RELATIONSHIPS- Concurrent Sessions Session Chair Matthew Gould 09:40 – 13:45			
09:40	09:55	Abstract 157 - Population estimation of Gobi brown bear and their movement in the Great Gobi A Strictly Protected Area, Mongolia ***	Battogtokh Nasanbat, Czech University of Life Sciences Prague Student
09:55	**10:20**	**COFFEE BREAK**	
10:20	10:35	Abstract 25 - Brown bear occurrence along a proposed highway route in Romania's Carpathian Mountains	Csaba Domokos, Milvus Group Bird and Nature Protection Association
10:35	*10:40*	*Transition*	
10:40	10:55	Abstract 35 - Past and Present Distribution Ranges of the Asiatic Black Bear (Ursus thibetanus) ***	Unza Waqar, Pir Mehr Ali Shah Arid Agriculture University, Rawalpindi, Pakistan Student
10:55	*11:00*	*Transition*	
11:00	11:15	Abstract 42 - Summer diet and energetic balance in Arctic coastal grizzly bears relative to polar bears	Anthony Pagano, US Geological Survey

Tuesday, September 17, 2024

Concurrent Sessions - Salon 4

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11:15	*11:20*	*Transition*	
11:20	11:35	Abstract 50 - Black Bear Habitat Use and Movement in Response to Wind Energy	Tawnee Dupuis, University of Alberta Student
11:35	*11:40*	*Transition*	
11:40	11:55	Abstract 54 - Sloth bear den study with reference to their geo-morphology and den selection in the dry deciduous forests of Gujarat state, India ***	Sarthak Chaudhary, UGC-CAS Department of Biosciences, Saurashtra University Student
11:55	**13:30**	**LUNCH (Student Mentor Lunch – Craft Brew House)**	
13:30	13:45	Abstract 298 - Determining the importance of kokanee salmon to grizzly bears in central British Columbia	Shelley Marshall, Government of British Columbia
13:45	*13:50*	*Transition*	
BEAR BEHAVIOUR – Session Chair Thomas Sharp 13:50 – 16:25			
13:50	14:05	Abstract 14 - When Apex Predators Become Prey: Testing the Risk Allocation and Starvation-Predation Hypothesis in the American Black Bear	Emily Davis, University of Wyoming Student
14:05	*14:10*	*Transition*	
14:10	14:25	Abstract 53 - Non-social species are more social than we thought - understanding seasonal patterns in sociality in a solitary carnivore	Rick Heeres, University of South-Eastern Norway Student
14:25	*14:30*	*Transition*	
14:30	14:45	Abstract 58 - Males disperse, females remain: revealing the dispersal patterns of Asian black bears through genetic analysis	Naoki Ohnishi, Forestry and Forest Products Research Institute
14:45	**15:10**	**COFFEE BREAK**	
15:10	15:25	Abstract 61 - Modeling prey & predator: Using army cutworm moth seasonal occurrence to inform grizzly bear foraging	Erik Peterson, Washington State University Student
15:25	*15:30*	*Transition*	
15:30	15:45	Abstract 289 - Using anomaly detection with radio-collar activity data to determine the presence and timing of grizzly bear parturition	Lori Roberts, Montana Fish, Wildlife & Parks
1545	*15:50*	*Transition*	
15:50	16:05	Abstract 290 - Mitigation and compensation of brown bear predation on semi-domestic reindeer in Scandinavia	Ole Gunnar Støen, Norwegian Institute for Nature Research & Norwegian University of Life Sciences
16:05	*16:10*	*Transition*	

Tuesday, September 17, 2024

Concurrent Sessions - Salon 4

Edmonton Conference Centre, 9797 Jasper Avenue

16:10	16:25	Abstract 330 - How far is the female den	Slaven Reljic, Oikon Ltd.
16:25	*16:30*	*Transition*	
16:30	18:00	IBA MEMBERS MEETING – SALON 4	

Wednesday, September 18, 2024

Conference Day 3 - Field Tour

07:20	15:30	Meet at Edmonton Conference Centre for trip to Elk Island National Park, luncheon is included at Culina Restaurant Edmonton	

Thursday, September 19, 2024

Concurrent Sessions – Hall C

Edmonton Conference Centre, 9797 Jasper Avenue

07:00	**08:00**	**BREAKFAST – ASSEMBLY FOYER** ***NOTE: POSTERS CAN BE INSTALLED STARTING AT NOON TODAY – Salon 8/9***	
HABITAT RELATIONSHIPS – Session Chair Terry Larsen 08:00 – 10:55			
08:00	08:15	Abstract 127 - Comparison in the ecology of two polar bear populations experiencing sea ice loss	Karyn Rode, US Geological Survey
08:15	*08:20*	*Transition*	
08:20	08:35	Abstract 159 - Sea Ice Phenology and Polar Bear Habitat Selection at the Southern Extent of the Species' Range	Tyler Ross, York University Student
08:35	*08:40*	*Transition*	
08:40	08:55	Abstract 186 - A life-cycle based bioenergetic model can explain the decline of a polar bear population across four decades of sea-ice loss	Louise Archer, University of Toronto
08:55	*09:00*	*Transition*	
09:00	09:15	Abstract 215 - Camera trapping in southeast Peru shows no obvious evidence of seasonal habitat use by Andean bears	Russell Van Horn, San Diego Zoo Wildlife Alliance
09:15	*09:20*	*Transition*	

Thursday, September 19, 2024

Concurrent Sessions – Hall C

Edmonton Conference Centre, 9797 Jasper Avenue

09:20	09:35	Abstract 336 - Assessing Dietary Importance of Army Cutworm Moths to Grizzly Bears in the Greater Yellowstone Ecosystem	Jennifer Fortin-Noreus, US Fish and Wildlife Service
09:35	*09:40*	*Transition*	
09:40	09:55	Abstract 233 - Fundamental versus Realized Niche of Grizzly Bear Denning Habitat Across Canadian National Parks; Implications of Anthropogenic Disturbance	Ramona Maraj, Parks Canada
9:55	**10:20**	**COFFEE BREAK**	
10:20	10:35	Abstract 249 - Forestry practices influence black bear and grizzly bear occurrence and co-occurrence with prey species in harvest blocks	Tracy McKay, Parks Canada
10:35	*10:40*	*Transition*	
10:40	10:55	Abstract 344 - Space use of brown bears across Europe's human dominated landscape: Insights from a multi-population study	Anne Hertel, Ludwigs-Maximilians University Munich
10:55	*11:00*	*Transition*	
POPULATION ESTIMATION-Concurrent Session Chair Paul Frame 11:00 – 13:45			
11:00	11:15	Abstract 176 - A Unified Approach to Long-Term Population Monitoring of Grizzly Bears in the Greater Yellowstone Ecosystem	Matthew Gould, U.S. Geological Survey - Interagency Grizzly Bear Study Team
11:15	*11:20*	*Transition*	
11:20	11:35	Abstract 201 - Large-scale estimates of Arctic grizzly bear abundance using spatial capture recapture methods	John Boulanger, Integrated Ecological Research
11:35	*11:40*	*Transition*	
11:40	11:55	Abstract 252 - New opportunities for genetic sampling of ursids using snow tracks eDNA	Marta De Barba, Divja Labs Ltd.; University of Ljubljana
12:00	**13:30**	**LUNCH (BSG MEMBERS FORUM Salon 4)**	
Population Estimation Continued-Concurrent Sessions			
13:30	13:45	Abstract 172 - Results of a study of presence, population density, genetics and educational outreach of the Andean bear in the Cordillera del Condor, southeast of Ecuador	Santiago Molina, Independent Researcher
HUMAN-BEAR CONFLICTS & COEXISTENCE-Concurrent Session Chair Lana Ciarniello 13:50 – 16:25			
13:45	*13:50*	*Transition*	
13:50	14:05	Abstract 194 - Aversive conditioning of grizzly bears in Kananaskis Country, Alberta, Canada between 2000 and 2023	John Paczkowski, Government of Alberta
14:05	*14:10*	*Transition*	

Thursday, September 19, 2024

Concurrent Sessions – Hall C

Edmonton Conference Centre, 9797 Jasper Avenue

14:10	14:25	Abstract 125 - Aversive conditioning of grizzly bears produces high probabilities of retreat from human-bear conflict locations	Claire Edwards, University of Alberta/Parks Canada
14:25	*14:30*	*Transition*	
14:30	14:45	Abstract 182 - Integrating multiple tools to understand landscape connectivity, address threats, and support long-term conservation of Andean bears in northern Ecuador	Rebecca Zug, Universidad San Francisco de Quito
14:45	**1510**	**COFFEE BREAK**	
15:10	1525	Abstract 189 - Tracing the Social Network of an Umbrella Species: Uncovering Communication Dynamics to Inform Grizzly Bear Conservation and Management	Courtney Hughes, Winisk Research and Consulting
15:25	*15:30*	*Transition*	
15:30	15:45	Abstract 113 - Anthropogenic Disturbance on the Space Use of Locally Endangered Formosan Black Bear (Ursus thibetanus formosanus) in Taiwan	Fang Chen, University of Michigan Student
15:45	*15:50*	*Transition*	
15:50	16:05	Abstract 198 - Animal learning contributes to both problems and solutions for bear–train collisions	Colleen Cassady St. Clair, University of Alberta
16:05	*16:10*	*Transition*	
16:10	16:25	Abstract 163 - Indigenous Knowledge of Human-Polar Bear Coexistence in Churchill, Manitoba, Canada	KT Miller and Georgina Berg, Royal Roads University Student
17:00	**21:00**	**SALON 8/9 – POSTER SESSION/BEVERAGES AND FOOD RECEPTION**	

Thursday, September 19, 2024

Concurrent Sessions - Salon 4

Edmonton Conference Centre, 9797 Jasper Avenue

07:00	**08:00**	**BREAKFAST – ASSEMBLY FOYER**	
CAPTIVE BEARS, ZOOS, AND PHYSIOLOGY-Session Chair Dong-Hyuk Jeong 08:00 – 11:55			
08:00	08:15	Abstract 40 - Vitek® analysis of sloth bear scats from wild and captive populations reveals differences in their gut microbiota and antibiotic resistance ***	Sakhi Dabhi, WCB Research lab, Hemchandracharya North Gujarat University Student
08:15	*08:20*	*Transition*	

Thursday, September 19, 2024

Concurrent Sessions - Salon 4

Edmonton Conference Centre, 9797 Jasper Avenue

08:20	08:35	Abstract 44 - Using photographs from remote cameras to estimate bear body condition	Garth Mowat, University of British Columbia
08:35	*08:40*	*Transition*	
08:40	08:55	Abstract 72 - Successfully returning American black bear (Ursus americanus) cubs-of-the-year to the wild after being orphaned and raised in captivity	Paul Frame, Government of Alberta
08:55	*09:00*	*Transition*	
09:00	09:15	Abstract 96 - Species-specific validation of commercial immunoassays for accurate hormone quantification in polar bear serum	Erin Curry, Cincinnati Zoo & Botanical Garden
09:15	*09:20*	*Transition*	
09:20	09:35	Abstract 107 - Ending Bear Bile Farming in Vietnam by 2026 as a conservation measure to protect Asiatic black bears	Tuan Bendixsen and Jill Robinson, Animals Asia Foundation
09:35	*09:40*	*Transition*	
09:40	09:55	Abstract 293 - Insight on the inside: histomorphological study of brown bear adrenal glands	Agnieszka Sergiel, Institute of Nature Conservation of Polish Academy of Sciences
09:55	**10:20**	**COFFEE BREAK**	
10:20	10:35	Abstract 126 - Validation of a hair-hormone toolkit for long-term monitoring of grizzly bears	Abbey Wilson, Government of Northwest Territories
10:35	*10:40*	*Transition*	
10:40	10:55	Abstract 147 - Forest skill patterns of rehabilitant sun bears (Helarctos malayanus) at the Bornean Sun Bear Conservation Centre, Sabah, Malaysia	Laura Sanders, University of Portsmouth Student
10:55	*11:00*	*Transition*	
11:00	11:15	Abstract 180 - American black bear cub rehabilitation and release: Jurisdictional practices across North America	Andrea Morehouse, Winisk Research and Consulting
11:15	*11:20*	*Transition*	
11:20	11:35	Abstract 192 - The ultimate driver of parturition timing in grizzly bears: synchronized cues or energetic tradeoff?	Cecily Costello, Montana Fish, Wildlife & Parks
11:35	*11:40*	*Transition*	
11:40	11:55	Abstract 251 - Evidence for density-dependent effects on body composition of grizzly bears in a changing Greater Yellowstone Ecosystem	Andrea Corradini, Fondazione Edmund Mach
12:00	**13:30**	**LUNCH (BSG MEMBERS FORUM) SALON 4**	

Thursday, September 19, 2024

Concurrent Sessions - Salon 4

Edmonton Conference Centre, 9797 Jasper Avenue

EMPLOYING IUCN'S SPECIES CONSERVATION CYCLE for BEARS: EXAMPLES FROM AROUND THE WORLD Session Chair: Dana Morin 13:30 – 15:00			
13:30	13:36	Abstract 992 – Introduction to Session	David Garshelis, IUCN SSC Bear Specialist Group Retired
13:36	13:50	Abstract 986 - State of Knowledge about Human-Andean Bear Conflicts: Gaps and Opportunities to Inform Conservation Actions	Roxana Rojas-VeraPinto, Ecology and Evolutionary Biology, School of Biological Sciences, University of Reading, Reading, UK, IUCN SSC Bear Specialist Group Student
13:50	14:04	Abstract 987 - Pioneering Innovative Collaborations that Link Region-wide Forestry Decisions with Conservation of Grizzly Bears	Karine Pigeon, British Columbia Ministry of Water, Lands, & Resource Stewardship – Skeena Region, Smithers, B.C., Canada; University of Northern British Columbia, IUCN SSC Bear Specialist Group
14:04	14:18	Abstract 990 - European Brown Bear Conservation: A Continent-wide Assessment of Bear Intervention Teams	Djuro Huber, Faculty of Veterinary Medicine, Zagreb, Croatia, IUCN SSC Bear Specialist Group
14:18	14:32	Abstract 991 - Conservation Actions Towards Human–Sloth Bear Conflict Mitigation in Central Gujarat ***	Nishith Dharaiya, Director, Centre of Excellence for Wildlife and Conservation Studies, BKNM University, Junagadh (Gujarat) India; IUCN SSC Bear Specialist Group
14:32	14:46	Abstract 988 - Educational Materials for Non-professionals Raise Conservation Awareness for Bears	Zsuzsa Petró, Sóstó Zoo, Nyíregyhaza, Hungary; IUCN SSC Bear Specialist Group; European Association of Zoos and Aquaria, Bear Taxon Advisory Group
14:46	15:00	Abstract 989 - Sun Bear Conservation Action Plan: A Mid-term Assessment	Matt Hunt, Free the Bears, Luang Prabang, Laos; IUCN SSC Bear Specialist Group
15:00	**15:20**	**COFFEE BREAK**	
BEAR BEHAVIOUR-Concurrent Session Chair Andrea Corradini 15:20 – 16:35			
15:20	15:35	Abstract 81 - Brown bears escape from overcrowded road infrastructure by utilizing Ceausescu's existing underpasses	Mihai Fedorca, National Institute for Research and Development in Forestry Marin Dracea, Transilvania University of Brasov
15:35	*15:40*	*Transition*	
15:40	15:55	Abstract 88 - Using a behavioural classification of accelerometry data to evaluate effects of hunting risk on Scandinavian brown bear behaviour	Jeanne Clermont, Université de Sherbrooke Student
15:55	*16::00*	*Transition*	
16:00	16:15	Abstract 99 - Factors Influencing Duration of Behaviors in American Black Bear (Ursus americanus) Adult Females and Their Cubs Surrounding Hibernation	Brogan Holcombe, Virginia Tech, Department of Fish & Wildlife Conservation Student
16:15	*16:20*	*Transition*	
16:20	16:35	Abstract 169 - Main drivers of brown bears' circadian activity: a global assessment	Aurora Donatelli, Sapienza University of Rome Student
17:00	**21:00**	**SALON 8/9 – POSTER SESSION/BEVERAGE AND FOOD RECEPTION**	

Friday, September 20, 2024

Conference Day 5 – Hall C

Edmonton Conference Centre, 9797 Jasper Avenue

07:00	**08:00**	**BREAKFAST – ASSEMBLY FOYER**	
HUMAN-BEAR CONFLICTS & COEXISTENCE - Session Chair Tom Smith 08:00 – 10:35			
08:00	08:15	Abstract 199 - Does Destroying Wildlife Reduce Human-Wildlife Conflict? Evidence from Black Bears in British Columbia	Felix Pretis, University of Victoria
08:15	*08:20*	*Transition*	
08:20	08:35	Abstract 232 - A combination of aerial damage detection and in situ DNA sampling in crop fields for genetic monitoring of problem brown bears in Hokkaido, Japan	Yuri Shirane, Hokkaido Research Organization
08:35	*08:40*	*Transition*	
08:40	08:55	Abstract 306 - Bears, watch your step: a study of fine-scale individual bear movement through an urban landscape in Colorado	Cassandre Venumière-Lefebvre, Colorado State University Student
08:55	*09:00*	*Transition*	
09:00	09:15	Abstract 325 - Factors affecting forest road use in Eurasian Brown Bears	David Blount, University of Utah Student
09:15	*09:20*	*Transition*	
09:20	09:35	Abstract 337 - Human-Bear Conflicts in Southwest Montana: Mapping Attractants and Prevention Efforts in Missoula and Ravalli Counties	Jessica Reyes, University of Montana, College of Forestry Student
09:35	*09:40*	*Transition*	
09:40	09:55	Abstract 341 - Characteristics of Grizzly Bear Observations in the North Slope Oilfields, Alaska	Nils Pedersen, Wind River Bear Institute
9:55	**10:20**	**COFFEE BREAK**	
10:20	10:35	Abstract 317 - Bearing with it: impacts of human activities on American black bear space use and home range size in southeastern Oklahoma's recolonizing population	Courtney Dotterweich, Oklahoma State University Student
10:35	*10:40*	*Transition*	
DEMOGRAPHICS - Session Chair Kate Kendall 10:40 – 14:25			
10:40	10:55	Abstract 264 - Invitation to Participate: An experimental comparison of expert elicitation data and empirical data of American black bears	Darcy Doran-Myers, University of Florida Student
10:55	*11:00*	*Transition*	

Friday, September 20, 2024

Conference Day 5 – Hall C

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11:00	11:15	Abstract 274 - Participatory assessment of Aklak (grizzly bear) abundance and distribution in the Kivalliq Region, Nunavut	Lauren Harding, University of Northern British Columbia
11:15	*11:20*	*Transition*	
11:20	11:35	Abstract 277 - Demography of a poorly-known large carnivore population at the range edge: Andean bears in the equatorial dry forest of north-western Peru	Alexander More, Spectacled Bear Conservation Society Peru
11:35	*11:40*	*Transition*	
11:40	11:55	Abstract 296 - Estimating bear density using non-invasive genetics: Importance of linking subsampling methods to modeling approaches	Nathan Hostetter, U.S. Geological Survey, North Carolina Cooperative Fish and Wildlife Research Unit, North Carolina State University
12:00	**13:30**	**LUNCH**	
13:30	13:45	Abstract 316 - Tales from a Polar Bear Genetic Mark-Recapture Survey in the Canadian Beaufort Sea	Faye d'Eon-Eggertson, Faye d'Eon-Eggertson
13:45	*13:50*	*Transition*	
13:50	14:05	Abstract 329 - Demography of American black bears (Ursus americanus) in a semiarid environment	Brenden Orocu, Brigham Young University Student
14:05	*14:10*	*Transition*	
14:10	14:25	Abstract 331 - Spatiotemporal changes in genetic diversity and structure of Asian black bear (Ursus thibetanus) over 30 years in Nagano, Japan	Ririko Koido, University of Tsukuba Student
14:25	*14:30*	*Transition*	
CAPTIVE BEARS, ZOOS, AND PHYSIOLOGY - Session Chair Abbey Wilson 14:30 – 16:05			
14:30	14:45	Abstract 282 - Metabolic rates of two co-existing Ursidae species: Asiatic black bears and sun bears	Zachary David, Old Dominion University Student
14:45	**15:10**	**COFFEE BREAK**	
15:10	15:25	Abstract 292 - Evaluating hemoglobin A1c for use as a nutritional and reproductive biomarker for free-ranging polar bears (Ursus maritimus)	Sarah Teman, University of Washington Student
15:25	*15:30*	*Transition*	
15:30	15:45	Abstract 110 - Humming of a captive polar bear cub in the maternity den	Homare Yamamoto, Osaka University Student
15:45	*15:50*	*Transition*	

Friday, September 20, 2024

Conference Day 5 – Hall C

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15:50	16:05	Abstract 311 - Death and all its friends: mortality-based monitoring of health status in Croatian part of Dinaric-Pindos brown bear population	Djuro Huber, Faculty of Veterinary Medicine, University of Zagreb
5:30	**11:59**	**BANQUET/AWARDS AND IBA STUDENT GROUP SILENT AUCTION – HALL B**	

Thursday, September 20, 2024, 5:00 – 9:00 PM

Conference Day 5 – Salon 8/9 – Poster Session and Reception

Edmonton Conference Centre, 9797 Jasper Avenue

CAPTIVE BEARS, ZOOS, AND PHYSIOLOGY	
Abstract 8 - Milk Effects on Bornean Sun Bear Cub Mass in Malaysia	Ellen Wieczorek, Corresponding Author, Unity Environmental University, North American Coordinator for Bornean Sun Bear Conservation Centre, Sabah, Malaysia Self-Employed
Abstract 120 - Hair, hormones and disturbance; a pilot study using a non-invasive approach to assess physiological function in free-ranging grizzly bears	Kristenn Magnusson, Government of Yukon Professional
Abstract 122 - Assessing polar bear body condition via histological image analysis of adipose tissue	Gregory Thiemann, York University Professional
Abstract 128 - Age estimation based on blood DNA methylation: A simple method applicable to multiple bear species	Michito Shimozuru, Hokkaido University Professional
Abstract 139 - Non-invasive age estimation based on DNA methylation using hair in brown bears	Shiori Nakamura, Hokkaido University Student
Abstract 143 - First Trial of Semen Microbiome Analysis by Next-Generation Sequencing in Asiatic black bear	Nari Kim, Chungbuk National University Student
Abstract 148 - BEARing with endocrine disruptors: potentially toxic metal(loid)s exposure in European brown bears	Agnieszka Sergiel, Institute of Nature Conservation of Polish Academy of Sciences, Krakow, Poland Professional
Abstract 151 - Development of Assisted Reproduction Techniques for the Successful Restoration of the Asiatic Black Bear in Korea	Eui-beom Kyeong, Korea National Park Service Professional
Abstract 185 - Ending a centuries-old tradition of bear keeping in Czech castles	Eva Filipczykova, Czech University of Life Sciences in Prague Student
Abstract 188 - Polar Bear Maternal Care and Cub Development	Danielle James, San Diego Zoo Wildlife Alliance Professional
Abstract 197 - Arachidonic and docosahexaenoic fatty acids in brown bears brain tissue	Slaven Reljić, University of Zagreb, Croatia Professional
Abstract 205 - Using Polar Bear (Ursus maritimus) Diet Estimates to Model the Effect of Climate Change on Arctic Marine Predator Body Condition	Griffin Finkbeiner, York University Student
Abstract 208 - Japanese black bears are highly exposed to lead (Pb)	Koji Yamazaki, Tokyo University of Agriculture Professional
Abstract 209 - The effect of season and latitude on the body mass of eight bear species in human care	Russell Van Horn, San Diego Zoo Wildlife Alliance Professional
Abstract 237 - A time-series analysis of dynamic changes in the gut microbiome of the giant panda traveling to Japan	Xueying Wang, Hokkaido University Student
Abstract 269 - Engaging the Zoo and Aquarium Population of Polar Bears in Scientific Studies	Wynona Shellabarger, Detroit Zoological Society Professional
Abstract 280 - Wild sun bears (Helarctos malayanus) exhibit aseasonality in parturition	Zachary David, Old Dominion University Student

Thursday, September 20, 2024, 5:00 – 9:00 PM

Conference Day 5 – Salon 8/9 – Poster Session and Reception

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HUMAN-BEAR CONFLICT & COEXISTENCE	
Abstract 27 - Bearly Guilty: Understanding Human–Andean Bear Conflict Regarding Crop Losses	Viviana Albarracín, Independent Professional
Abstract 51 - The Absent Shrine: Arctolatry in the Japanese Archipelago	David Laichtman, Sophia University Student
Abstract 55 - Bear Awareness Gardiner: Grizzly Bear Conflict Mitigation Work In the Greater Yellowstone Ecosystem, Montana	Evan Stout, Bear Awareness Gardiner Professional
Abstract 84 - The Untold Biblical and Early Christian History of Bear	Gerald Hodge, Appalachia Georgia Friends of the Bears, Inc. Professional
Abstract 106 - Conditioned Food Aversion with Odor Association: An Ethological Approach to Reducing Crop Damage and Bear-Human Conflict	Heather Havelock, Washington State University Student
Abstract 141 - Modify ethology in bear high densities area in Romania	Georgeta Ionescu, National Institute for Research and Development in Forestry Marin Dracea Professional
Abstract 177 - Influence of human disturbance on black bear (Ursus americanus) habitat selection	Erin Henderson, University of Saskatchewan Student
Abstract 181 - Effects of human activities on the denning behavior and reproductive success of brown bears	Baptiste Brault, University of Sherbrooke Student
Abstract 204 - Being a female bear biologist in South America: The context and challenge for "osologas"	Roxana Rojas VeraPinto, Proyecto Isnachi Student
Abstract 216 - Human dimensions influencing brown bear attractant securing behavior in suburban kitchen gardens in Sapporo, Japan	Taiki Ito, Hokkaido University Student
Abstract 257 - Coexistence at the top of the food chain: anthropogenic risk primarily drives brown bear space use and resource selection in the Italian Alps	Francesca Cagnacci, Fondazione Edmund Mach Professional
Abstract 273 - Wary bears are scary bears…. Key strategies to support habituated bears and create "Wildsmart" humans, near areas of high human use	Bill Hunt, retired from Parks Canada Self-Employed
Abstract 285 - EUROBEAR: Collaborative science for spatial brown bear ecology	Andrea Corradini, Fondazione Edmund Mach Professional
Abstract 287 - Challenges Associated with Bear Viewing Opportunities on Public Land in Montana	Blakely Adkins, Greater Yellowstone Coalition Professional
Abstract 314 - Virtual Bear Viewing as a Conservation Tool	Alysa McCall, Polar Bears International Professional
Abstract 315 - Developing Effective Polar Bear Safety Educational Materials in a Changing Climate	Alysa McCall, Polar Bears International Professional
Abstract 339 - Transcriptome changes of peripheral blood related to delayed implantation in brown bears and polar bears	Asuka Nishijima, Hokkaido University Student

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Abstract 999 - Unravelling Intersecting Paths: Conflict, Livelihood, and Coexistence with Asiatic Black Bear in Diamer, Gilgit-Baltistan, Pakistan	Zeeshan Khalid, World Wide Fund for Nature-Pakistan (WWF-Pakistan) Professional
HABITAT RELATIONSHIPS	
Abstract 28 - Conservation of the Elusive Andean Bear in Inquisivi and Quime region, Department of La Paz, Bolivia	Viviana Albarracín, Independent Professional
Abstract 29 - Current status of Andean Bear in the municipalities of Samaipata and Mairana department of Santa Cruz, Bolivia	Viviana Albarracín, Independent Professional
Abstract 31 - Evaluation of local ecological knowledge as a method to collect data on occupancy and probability of detection of Tremarctos ornatus, in the Apolobamba National Integrated Management Natural Area	Viviana Albarracín, Independent Professional
Abstract 74 - Documenting Bear Dens using Light Detection And Ranging (LiDAR) Technology	Tyler Brasington, National Park Service Professional
Abstract 164 - A Study on the status and distribution of Himalayan Brown Bears (Ursus arctos isabellinus) in Kashmir Valley, India using camera traps and GPS collaring	Aaliya Mir, Wildlife SOS Professional
Abstract 196 - Assessing the habitat selection and distribution of polar bears (Ursus maritimus) and ringed seals (Pusa hispida) in the Last Ice Area using infrared video and aerial imagery	Roxanne MacLean, York University Student
Abstract 247 - Using Video Camera Collars to Investigate Free-Living American Black Bear (Ursus americanus) Diet Composition	Brogan Holcombe, Virginia Tech, Department of Fish & Wildlife Conservation Student
Abstract 256 - Sloth bear as a key contributor to forest heterogeneity in India through seed dispersal	Ashutosh Anand, Department of Forestry, India Student
Abstract 275 - Assessing polar bear (Ursus maritimus) denning habitat vulnerability to wildfires in Manitoba, Canada	Stephen Petersen, Assiniboine Park Conservancy Professional
Abstract 300 - American Black Bears in Lowland Desert: Assessing Habitat Use with Hydrogen Isotopes	Sydney Stephens, University of Utah Student
Abstract 301 - Partitioning Human and Brown Bear Niches: Transboundary Connectivity and Human Disturbance in the Alpine Region (PartNiche)	Sydney Stephens, University of Trento Student
Abstract 326 - A more complete view: understanding black bear and grizzly bear spatial and temporal niche partitioning in two contrasting Yukon landscapes	Jodie Pongracz, Government of Yukon Professional
Abstract 993 - Assessing the risk of climate maladaptation for Canadian polar bears	Ruth Rivkin, Polar Bears International and San Diego Zoo Wildlife Alliance Professional

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MANAGEMENT	
Abstract 100 - North Cascades Joint Nations Grizzly Bear Initiative: Weaving Together Indigenous Knowledge and Western Science to Restore and Protect Grizzly Bear Populations	Mackenzie Clarke, Okanagan Nation Alliance Professional
Abstract 130 - Introducing the Bornean Sun Bear Conservation Research Project	Laura Saunders, Bornean Sun Bear Conservation Centre Student
Abstract 140 - Sustainable management vs. bear conservation in Romania	Ovidiu Ionescu, Transilvania University of Brasov Professional
Abstract 146 - The use of Karelian Bear Dogs (KBD's) as a management tool to mitigate human-bear conflicts	Nanna Borgen, Inland Norway University of Applied Sciences Student
Abstract 203 - Explaining recent increases of grizzly bears in central Alberta: Habitat dynamics, demographics, and translocation	John Boulanger, Integrated Ecological Research Professional
Abstract 212 - Occupancy monitoring of Andean bears in the North Tiquipaya Municipal Wildlife Reserve in Cochabamba, Bolivia	Andrea Fuentes, Vida Silvestre NGO Student
Abstract 213 - The Efficacy of Locating and Monitoring Arboreal Black Bear Dens with a Hand-Held Thermography Camera	Craig Perham, US Bureau of Land Management, Alaska State Office Professional
Abstract 241 - The brown bear (Ursus arctos arctos) in Romania - coexistence and sustainable management, a real challenge in a dynamic of habitat modification	Ramon Jurj, National Institute for Research and Development in Forestry Marin Dracea - Romania Professional
Abstract 268 - Female grizzly bear dispersal and range expansion in the Yaak River of northwest Montana	Wayne Kasworm, US Fish and Wildlife Service Professional
Abstract 272 - Novel design for a live-capture polar bear trap	Lyle Walton, Ontario Ministry of Natural Resources and Forestry Professional
Abstract 284 - Categorizing the research effort across the family Ursidae	Zachary David, Old Dominion University Student
Abstract 286 - Low-stress herding reduces cattle predation by grizzly bears	Matt Barnes, Northern Rockies Conservation Cooperative Professional
Abstract 299 - Using hair snares and camera traps in community-led polar bear research: insights on polar bear genetics, distribution and body condition in the Eeyou Marine Region (James Bay, Canada)	George Natawapineskum, Cree Trappers' Association, Eeyou Marine Region Wildlife Board Student
Abstract 304 - Population Dynamics and Feeding Ecology of Recolonizing American Black Bears (Ursus americanus) in the Beaver Hills Biosphere	Sandra MacDougall, Red Deer Polytechnic Professional

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BEAR BEHAVIOUR	
Abstract 80 - Active or inactive - through the eyes of the camera and accelerometer	Tomasz Zwijacz-Kozica, Tatra National Park Professional
Abstract 89 - A collaborative evaluation of multispecies interactions in Scandinavia: Brown bears, wolves, moose, and red deer in a human-dominated landscape	Beth Stacey, Norwegian Institute for Nature Research Professional
Abstract 98 - An analysis of American black bear (Ursus americanus) spring diet to assess predation risk of neonate wood bison (Bison bison athabascae)	Molly Sharp, University of Alberta Student
Abstract 132 - What can we learn about bear ecology using animal-borne video systems? A case study of Asiatic black bears in Japan	Shinsuke Koike, Tokyo University of Agriculture and Technology Professional
Abstract 133 - The role of Asiatic black bears as a scavenger in a Japanese temperate forest	Akino Inagaki, Tokyo University of Agriculture and Technology Student
Abstract 134 - Temporal Dynamics of Canine Breakage and Intraspecific Injuries in Western Hudson Bay Polar Bears (Ursus maritimus)	Simonne Tremblay, University of Alberta Student
Abstract 137 - Current status of accidentally captured Asiatic black bears in traps for sika deer and wild boar in Nagano, Japan	Rumiko Nakashita, Forestry and Forest Products Research Institute Professional
Abstract 190 - Andean bear tree selectivity for scent-marking in Ecuadorian cloud forests	Eva Filipczykova, Czech University of Life Sciences in Prague Student
Abstract 214 - Mating behavior and site selection of Asian black bear in Japan	Tomoko Naganuma, Obihiro University of Agriculture and Veterinary Medicine Professional
Abstract 217 - Aversive conditioning increases short-term wariness but does not change habitat use in black bears associated with conflict	Colleen Cassady St. Clair, University of Alberta Student
Abstract 222 - Do animals use bear marking sites? A potential role for inter- and intra-specific communication by non-bear mammals	Hinako Katsushima, Hokkaido University Student
Abstract 228 - Verification of the relationship between testosterone and behavioral changes in male Asian black bear (Ursus thibetanus)	Naoki Takekoshi, Tokyo University of Agriculture Student
Abstract 254 - Exploring Bear Attacks Through an Evolutionary Lens	Tom Smith, Brigham Young University, Provo, UT, USA Professional

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POPULATION ESTIMATION	
Abstract 95 - Straddling bears: transboundary populations in Ukraine	Andreas Zedrosser, University of Freiburg, University of South-Eastern Norway Student
Abstract 183 - Effectiveness of different methods for non-invasive monitoring of grizzly bears	Darío Fernández-Bellon, fRI Research Professional
Abstract 202 - Genetic diversity, gene flow, and effective population size of the Selkirk and Cabinet-Yaak grizzly bear populations	Justin Teisberg, US Fish and Wildlife Service Student
Abstract 265 - Invitation to Participate: An experimental comparison of expert elicitation data and empirical data of American black bears	Darcy Doran-Myers, University of Florida Student
MOVEMENT ECOLOGY	
Abstract 108 - Behavioral Characteristics of Autumn Migration in Solitary Terrestrial Mammals	Tamako Makino, Tokyo University of Agriculture and Technology Student
Abstract 123 - Driving change: How do change-points in grizzly bear movement behaviour and measured landscape productivity correlate?	Jessa Marley, University of British Columbia, Okanagan Student
Abstract 136 - Movement patterns of brown bears in a desert environment	Andreas Zedrosser, Mongolian Academy of Sciences, Institute of Biology Student
Abstract 267 - Landscape connectivity modelling for the long-term conservation of the Karelian brown bear population	Daniele Falcinelli, University of Rome La Sapienza Student
Abstract 156 - Boundary effects on Black bear (Ursus americanus) in Elk Island National Park	Fletcher Elliot, Parks Canada Professional
Abstract 160 - American black bear habitat selection and movement in a gradient of industrial disturbance within the Athabasca Oil Sands Region of Alberta, Canada	Rebecca Paton, University of Alberta Professional
Abstract 161 - Performance of fur- and ear-mounted satellite tags for evaluating the movement and behaviour of polar bears	Tyler Ross, York University Student
Abstract 162 - A country divided: how barriers affect the gene flow of apex predator in Slovakia	Jana Šrutová, Charles University Student
Abstract 318 - Analyzing dispersal behavior of juvenile black bears in a recolonizing population in east-central Oklahoma to identify potential barriers to population expansion	Jacob Humm, Oklahoma State University Student
Abstract 328 - Effectiveness of individual-based activity analysis and hidden markov models at predicating animal activity of a wild Eurasian brown bear	David Blount, University of Utah Student

Thursday, September 20, 2024, 5:00 – 9:00 PM

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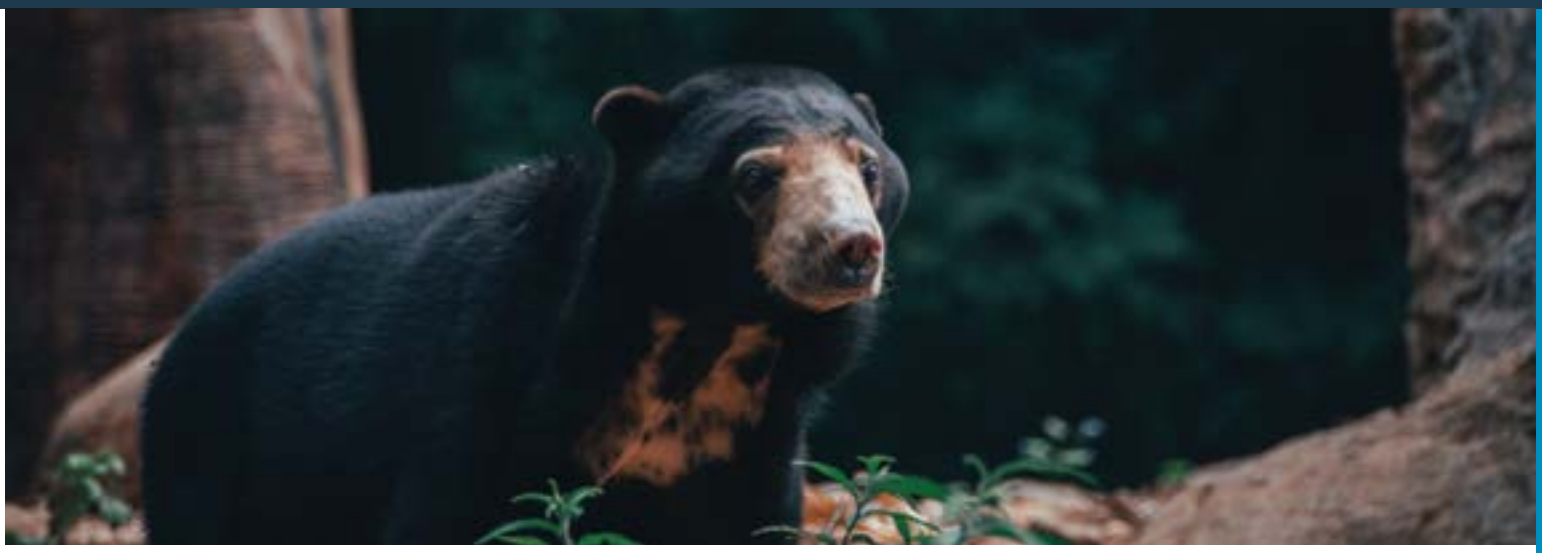
Edmonton Conference Centre, 9797 Jasper Avenue

EMPLOYING IUCN'S SPECIES CONSERVATION CYCLE FOR BEARS: EXAMPLES FROM AROUND THE WORLD

Abstract 994 - Mapping Asian Bears — a Novel Approach for Large-scale Species Range Mapping to Inform Conservation	Chengcheng Zhang, Conservation Ecology Center, Smithsonian's National Zoo and Conservation Biology Institute; Sapienza University, Rome, Italy Student
Abstract 995 - Assessing Changes in Distribution of Formosan Black Bears over the Past Decade	Mei-Hsiu Hwang, Institute of Wildlife Conservation, National Pingtung University of Science & Technology; Taiwan Black Bear Conservation Association; IUCN SSC Bear Specialist Group Professional
Abstract 997 - Steps Toward Conserving Asiatic Black Bears at the Westernmost Extent of their Range: Preparing an Action Plan for Conflict Management in Kerman Province, Iran	Nahid Ahmadi, Borderless Wildlife Conservation Society, Iran; IUCN SSC Bear Specialist Group Student
Abstract 998 - Conservation Implications of the Reintroduction of Two Confiscated Himalayan Brown Bears in Pakistan	Fakhar-i-Abbas, IUCN SSC Bear Specialist Group Professional
Abstract 68 - Role of Protected areas in the conservation of Asiatic black bear in Pakistan	Muhammad Naeem, IUCN/SCC/ Bear Specialist Group Professional

INVITED SPEAKERS



Day: Monday **Time:** 08:15 – 09:00 **Room:** Hall C

Keynote Address

Ecology, Hunting, and Politics

Dr. Mark Boyce, Professor of Ecology, Department of Biological Sciences, University of Alberta

Biography

Mark S. Boyce is professor of ecology in the Department of Biological Sciences at the University of Alberta and holds the Alberta Conservation Association Chair in Fisheries and Wildlife. He has been a professor for 48 years following a PhD from Yale University and a NATO Postdoctoral Fellowship at the University of Oxford. His research in ecology and conservation is widely recognized with over 44,000 citations and an h-index of 100. In November 2016 he was awarded the Mirowsław Romanowski Medal by the Royal Society of Canada for using science to resolve environmental problems. In 2017 he received the C. Hart Merriam Award from the American Society of Mammalogists for outstanding research contributions in mammalogy.

Day: Monday **Time:** 09:00 – 09:15 **Room:** Hall C

Invited Presentation

Stein Nahatlatch Grizzly bears: Their Story is written on the Land

Chief Michelle Edwards, St'a'tmic Chiefs Council; Cheryl Amber Marie Blair, MSc. RPBio, Senior Biologist/Wildlife Biologist, Splitrock Environmental Sekw'el'was

Day: Monday **Time:** 09:20 – 09:35 **Room:** Hall C

Invited Presentation

Abstract Cultural and spiritual perspectives of the Andean Bear in South America

Santiago Molina, Coordinator of the Research, Education and Communication Commission of the Choco Andean Biosphere Reserve, and member of International Bear Association Executive Council

Day: Monday **Time:** 09:40 – 09:55 **Room:** Hall C

Invited Presentation

Sacred Connections and beliefs: Bears in Cultural and Religious Ceremony" in Nepal

Bhupendra Prasad Yadav, Director of National Zoological Garden, Ministry of Forests and Environment, Kathmandu, Nepal

INVITED SPEAKERS

Day: Monday **Time:** 10:20 – 10:35 **Room:** Hall C

Invited Presentation

The Grizzly Cultural Study in Kananaskis: Continuing to Understand Grizzly Bears from a Cultural Perspective

William (Bill) Snow

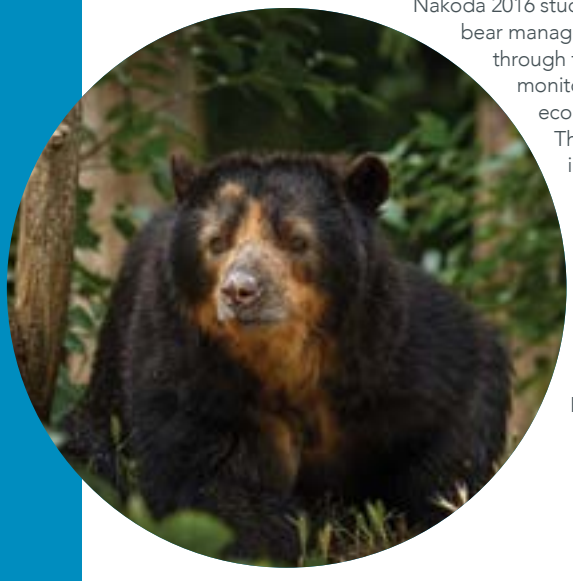
Biography:

William (Bill) Snow (Goodstoney Nakoda / Yuma Quechan) is the Acting Director of Consultation at Stoney Tribal Administration. This work involves the assessment of industrial resource projects within Stoney Nakoda Traditional Territory, of Southern Alberta, that involve consultations with government and industry.

Bill is a graduate of the University of Lethbridge, Business Administration program, and since 2012 has been an advisor to the University of Alberta on the "Thinking Mountains" conference, the "Mountains 101" online program, and Canadian Mountain Network. Since 2014, Bill has been an advisor to the University of Calgary Graduate Students Union Chiniki Lecture series. From 2018 to 2024, Bill was a "Director at Large" for Alberta with Canadian Wildlife Federation, and Chair of the Indigenous Relations Committee. In 2022, Bill helped to complete the "Bison Cultural Study" that offers Traditional Knowledge regarding the Bison Reintroduction to Banff National Park. In 2023, Bill was a recipient the Queen Elizabeth II Platinum Jubilee medal, and in 2023 a recipient of the Fulbright Canada / Honouring Nations Canada Cultural Revitalization award regarding the Bison Cultural Study.

Abstract:

The Grizzly Bear is culturally significant species to the Stoney Nakoda people. "Wartanga" are our kinsmen, our teachers, and the guardians of many medicines. The Stoney Nakoda people have traditional stories, songs and teachings from Grizzly Bears, that are still followed in our communities today. Through the principle of "Biculturalism," and an Indigenous Methodology of "Cultural Monitoring," we are able to share some of the cultural teachings about Grizzly Bears that are meant to be added to our existing western science understanding. The Grizzly Cultural Study of Kananaskis, is meant to supplement the Stoney Nakoda 2016 study "Enhancing grizzly bear management programs through the inclusion of cultural monitoring and traditional ecological knowledge." The 2024 study includes information on the Cultural Importance of Grizzly Bears, the Cultural Importance of the Kananaskis area, Elder Interviews, project area maps, and recommendations for managing Grizzly Bears in the Kananaskis.



Day: Monday **Time:** 10:40 – 10:55 **Room:** Hall C

Invited Presentation

Traditions of Mongolians related to bears

Bayasgala Amgalan, UNDP Biodiversity Advisor, Mongolia

Biography:

Bayasgalan graduated from the National University of Mongolia as a biologist and began working as a mammal researcher at the World Bank GEF project. The project lasted six years, during which researchers studied climate change and biodiversity around Lake Hovsgol. After this project, Bayasgalan joined the UNDP project group as a research officer, where he focused on issues related to the Gobi bear and other important and endangered biodiversity of the Mongolian Gobi.

The UNDP Gobi project ended in 2007, and Bayasgalan then joined the Ministry of Nature and Environment as a biodiversity specialist. He worked in this role until 2018, during which time he was responsible for developing and implementing national-level policies for biodiversity. Since 2018, Bayasgalan has been serving as a UNDP biodiversity advisor.

Bayasgalan has been involved in the Gobi Bear project for over twenty years and is recognized as a researcher of the Gobi Bear.

Bayasgalan has dedicated his career to researching and protecting Mongolia's diverse wildlife. His work with the World Bank GEF project and the UNDP has contributed to understanding climate change and biodiversity and helped conserve important and endangered species like the Gobi bear. His commitment to biodiversity continued as he played a crucial role in shaping national-level policies. Bayasgalan's dedication over the past twenty years as a Gobi Bear researcher is a testament to his passion for wildlife conservation.

Day: Monday **Time:** 11:00 – 11:15 **Room:** Hall C

Invited Presentation

The relationship between European Brown Bear and Reindeer in Sweden

Peter Andersson, Reindeer Herder, Eajran Sijte Sami Community, Sweden

Biography:

Peter Andersson is a reindeer herder from Eajran Sijte Sami Community in Sweden. He grew up in a Sami family and has been a reindeer herder for all of his life. Hes the Chairman of the board of Eajran Sijte Sami community and has been active in various Sami councils over the years. Outside of being a reindeer herder, him and his wife are together running a business company called "Renbiten", where they among other things teach people about the Sami culture and the different ways the indigenous people live with connection to the nature.

INVITED SPEAKERS

Day: Monday **Time:** 11:20 – 11:35 **Room:** Hall C

Invited Presentation Alberta Forestry and Bear Managment

Applying Science: Collaborative Research & Bear Management in the Alberta Forestry Sector

Emily Cicon, Habitat/Wildlife Biologist, West Fraser Mills Ltd., Hinton, Alberta

Biography:

Emily Cicon, MSc, PBiol., is a Habitat / Wildlife Biologist with West Fraser Mills Ltd. During her MSc project with the University of Alberta, she was introduced to West Fraser who were co-funders of her study on grizzly bears in the Alberta foothills. Throughout her career she has worked across sectors on environmental and wildlife research and public education and communications. In her current role with West Fraser, Emily enjoys the challenges of working across operational scales (from forest stand to landscape) and finding solutions to the complex problems.

Abstract:

The forestry industry in Alberta operates on a shared landscape and must manage for a number of values, including species at risk such as grizzly bear. To ensure management practices are evidence-based and effective, collaborative research with subject-matter experts is essential. For almost three decades, West Fraser has partnered with fRI Research to investigate important questions about grizzly bears in Alberta and test practical tools which bridge research into operations. These studies have influenced forest management planning practices at the provincial scale and have contributed substantially to the understanding of grizzly bear recovery. The works completed to date showcase the merit of cross-sector collaboration as an effective means of answering wildlife questions.

ORAL PRESENTATIONS

Day: Monday **Time:** 11:40 – 11:55 **Room:** Hall C

Theme: Management

Abstract Number: 119
Presentation Type: Oral Presentation
Presentation Title: Integrating health assessments into at-risk species' conservation planning: Polar bears as a case study
Presenter Name: Karyn Rode
Presenter Affiliation: US Geological Survey
Presenter Email: tatwood@usgs.gov
All Authors: Todd Atwood
Primary Author Occupation: Professional

Abstract:

Species recovery plans typically list the set of factors considered when determining conservation status, along with clearly defined objectives and actions to meet recovery criteria. For example, species are afforded federal protection under the Endangered Species Act (ESA) when they are deemed to be "threatened" or "endangered" because of any of five factors representing habitat threats, overutilization, inadequate regulatory mechanisms, other natural or man-made factors, and disease and predation. The consideration of "disease and predation" as a factor is acknowledgment that sound conservation efforts require an understanding of health issues that affect populations. However, few species recovery plans include health-oriented objectives or criteria. We present a case study of polar bears (Ursus maritimus) to illustrate how health assessments can be used to evaluate population vulnerability and develop related recovery criteria. Animal health assessment and monitoring has been transitioning to a characterization of health in the context of vulnerability. This transition is conducive to identifying causal links between a changing environment and physiological and population-level processes, which may be valuable for informing efforts to conserve species deemed vulnerable to rapid environmental change.

Day: Monday **Time:** 13:30 – 13:45 **Room:** Hall C

Theme: Management

Abstract Number: 174
Presentation Type: Oral Presentation
Presentation Title: Maintaining bears' adaptive potential: monitoring and assessing genetic indicators in Ursidae
Presenter Name: Emily Puckett
Presenter Affiliation: University of Memphis
Presenter Email: Emily.Puckett@memphis.edu
All Authors: Emily Puckett and Alexander Kopatz
Primary Author Occupation: Professional

Abstract:

Habitat loss and fragmentation have impacted populations of all bear species, and often contribute to population decline. This direct loss can be further influenced through lost genetic diversity. Genetic diversity is the basis for bears' resilience to perturbations such as disease and environmental change. If population genetic diversity decreases, fitness may also decrease leading to reductions in census population size over time, and thus lower adaptive capacity. A danger especially to small, isolated, and threatened bear populations.

Biodiversity preservation efforts have largely focused on species and ecosystems, but recent momentum from the 2022 Kunming-Montreal CBD (Convention of Biodiversity) meeting specifically emphasized protection of genetic diversity within wild populations as a new goal. Thus, all parties need to assess and report on genetic diversity in the future. Reporting should preferably be done in a standardized way and three genetic indicators have been proposed. Genetic analyses require substantial resources of both time and money. Therefore, two genetic indicators to measure the adaptive potential by proxy have been developed that enable assessing the genetic diversity without having DNA-data. The third indicator relies on genetic data. These indicators include: the proportion of populations for a species with large census size (>500 individuals), proportion of extant populations over time, and if species are being monitored using genetic data.

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Our aim is to organize the global bear community to apply these indicators to their focal populations for all eight species. This will aid regional, national, and international policy, management and other stakeholders in decision making for maintaining adaptive potential, and conservation of bears. We present the scientific basis for the importance of adaptive potential and the CBD metrics used to assess, outline current data gathering approaches, and issue a call to action.

Day: Monday **Time:** 13:50 – 14:05 **Room:** Hall C

Theme: Management

Abstract Number: 200
Presentation Type: Oral Presentation
Presentation Title: Bridging conservation technology with Indigenous land stewardship for identifying and managing important grizzly bear habitat
Presenter Name: Melanie Clapham
Presenter Affiliation: Nanwakolas Council
Presenter Email: melanie@bearid.org
All Authors: Melanie Clapham, Emily Doyle-Yamaguchi, Gina Thomas, Caelan McLean, Stanley Beans, Chip Mountain, Shane Pollard, Anthony Roberts, Jordan Benner
Primary Author Occupation: Professional

Abstract:

Tasked with the huge challenge of conserving nature in a changing world, decision makers are turning to new technologies to better understand wildlife and monitor trends. Simultaneously, it is now understood that monitoring programs combining multiple knowledge systems improves the management and conservation of wild species and places. Our project works within this capacity, advancing bear conservation through the development and application of advanced technologies, coupled with grizzly bear (Ursus arctos) research and monitoring, informed by local and Indigenous Knowledge. We are using camera traps, machine learning, and local knowledge to map the spatiotemporal distribution of individual grizzly bear movements in the Great Bear Rainforest South (BC, Canada), within the territories of the Tlowitsis, K'ómoks, Da'naxda'xw/Awaetlala, Mamalilikulla, We Wai Kai, and Wei Wai Kum First Nations. A network of 55 cameras monitored grizzly bear activity at targeted features (wildlife trails, forest service roads, riverbanks) in 2019-2023 across an area of ~1,000km2. Camera trap footage was processed manually and then run through BearID individual recognition software. Spatial data on individual bear detections were analysed using kernel density estimates (KDE), identifying individual-specific activity areas. We assessed overlaps in KDE across individuals and temporal scales to highlight hotspot areas of grizzly bear activity across First Nation territories. Results from this project are intended to provide candidate areas for consideration by First Nations' leadership in Landscape Reserve Design for the Great Bear Rainforest South and to understand trending habitat requirements for a population currently impacted by fluctuating food availability (e.g. Pacific salmon, Oncorhynchus spp.). Therefore, results will directly inform grizzly bear conservation in the largest tract of contiguous coastal temperate rainforest left on the planet, and of global significance.

Day: Monday **Time:** 14:10 – 14:25 **Room:** Hall C

Theme: *Management*

Abstract Number: 206
Presentation Type: Oral Presentation
Presentation Title: Assessing Temporal Changes In Grizzly Bear Reproductive Characteristics Under Fluctuating Pacific Salmon Returns
Presenter Name: Sophie Fowler
Presenter Affiliation: University of Guelph
Presenter Email: sfowle03@uoguelph.ca
All Authors: Sophie Fowler
Primary Author Occupation: Student

Abstract:

Using a long-term camera trap dataset collected over the past 14 years with >5,000 independent grizzly bear detections, this project aims to analyze how Pacific salmon (Oncorhynchus spp.) returns affect grizzly bear (Ursus arctos) reproductive characteristics, including recruitment into an ecologically and economically important watershed (Glendale Creek, Knight Inlet, BC). The study will examine the presence and relative abundance of dependent young in contrasting years across a gradient of high and low years of Pacific salmon returns. A new year of data will be collected in 2023 using twenty camera traps, following salmon habitat restoration efforts in previous years. Understanding the link between coastal grizzly bear recruitment and food source (i.e., Pacific salmon) insecurity may provide insight for sustaining future populations of both species. The findings from this study may be influential in informing updates to the Glendale Bear Viewing Management Plan, new information on the local bear population, mitigation strategies, further understanding of bear-salmon-forest ecosystem processes and contributing to the sustainability future of nature-based economies. Methodologies used in this study are generalized and adhere to camera trapping standards of data organization and analysis. The results of this study are relevant to current environmental questions such as fluctuation in salmon returns and can be applied at a small or large scale, regionally, or from a global lens.

Day: Monday **Time:** 14:30 – 14:45 **Room:** Hall C

Theme: Management

Abstract Number: 236
Presentation Type: Oral Presentation
Presentation Title: Population sex structure and recolonization in the Norwegian brown bear
Presenter Name: Pierre Dupont
Presenter Affiliation: Norwegian University of Life Sciences
Presenter Email: pierre.dupont@nmbu.no
All Authors: Pierre Dupont, Cyril Milleret, Richard Bischof
Primary Author Occupation: Professional

Abstract:

1. Population recovery can be a drawn-out process, characterized not only by growing abundance and expanding range, but also changes in demographic structure. Due to sex differences in vital rates and dispersal propensity, we expect significant changes in the population sex structure during population recovery.

2. In Scandinavia, intensive persecution brought the brown bear population to the brink of extinction in the 1920s. Since then, protective measures and sustainable management have allowed the brown bear to reclaim much of its former range. In Norway, recolonization started around the 1970s from areas with higher bear densities in neighboring Sweden, Finland, and Russia.

3. Using an extensive long-term monitoring dataset and a spatially-explicit population dynamic model, we estimate and map sex-specific brown bear densities in Norway over the last 11 years. We show how sex ratio evolved over time and demonstrate the decades-long delay in recovery of this important demographic variable.

4. Due to female philopatry and primarily male-driven dispersal, male-biased sex-ratio characterized the early stages of the recovery, which was followed by an increase in female abundance. The speed by which balanced sex-ratio was reached depended strongly on the distance from the population source.

5. Our findings reveal the important role that of sex differences dispersal and life history play in shaping the demographic structure and spatio-temporal dynamics of recovering wildlife populations.

Day: Monday **Time:** 15:10 – 15:25 **Room:** Hall C

Theme: Management

Abstract Number: 250
Presentation Type: Oral Presentation
Presentation Title: The rise and fall? of the Swedish brown bear population
Presenter Name: Jonas Kindberg
Presenter Affiliation: Scandinavian Brown Bear Research Project
Presenter Email: jonas.kindberg@nina.no
All Authors: Jonas Kindberg, Matthew Grainger, Erlend Nilsen
Primary Author Occupation: Professional

Abstract:

Effective conservation of the Swedish brown bear population has led to a significant increase in population size and distribution. Estimates indicate a growth from 130 individuals a century ago to 3300 individuals in 2008. Consequently, there has been a notable rise in hunting quotas and protective measures to mitigate depredation. For instance, the number of bears targeted for hunting has increased from fewer than 100 two decades ago to 750 in 2023, constituting over 25% of the total population.

This rapid escalation has sparked discussions among managers implementing population reduction strategies without compromising the future conservation status of the population.

Leveraging demographic insights gleaned from research and monitoring, we have developed an online harvest model specifically tailored for female bears to aid decision-making processes. This model, constructed as an age-structured population model, features a user-friendly interface powered by Shiny. This interface empowers managers to input key parameters such as the population size of females, with 95% confidence intervals from the latest survey, as well as data on harvested individuals since the last survey and setting a quota for the forthcoming period. The model outputs projections of female population size for up to five years into the future.

The rationale behind deploying a web-based model, as opposed to traditional report dissemination, is to foster greater engagement and understanding of monitoring practices among stakeholders, thereby enhancing awareness of the repercussions of harvest quotas on future population dynamics. To facilitate effective utilisation of the model, introductory seminars and workshops are conducted to address enquiries and solicit feedback for ongoing refinement of the methodology.

Analysis of model results underscores the need to reassess the sustainability of current harvest quotas, as they are projected to precipitate a population crash within a few years.

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Day: Monday **Time:** 15:30 – 15:45 **Room:** Hall C

Theme: Management

Abstract Number: 313
Presentation Type: Oral Presentation
Presentation Title: New non-invasive method with camera trapping provide data on wild Andean bear body size in Peru
Presenter Name: Denisse Mateo
Presenter Affiliation: San Diego Zoo Wildlife Alliance / University of San Francisco Quito
Presenter Email: denisse.mateochero@gmail.com
All Authors: Denise Mateo, Russell C. Van Horn, Rebecca Zug
Primary Author Occupation: Student

Abstract:

Individual bears vary in body size and condition, which reflect habitat quality, and can influence their ability to reproduce. Most reports of body size and condition are from direct manipulation of black bears, brown bears, and polar bears. However, Andean bears are challenging to capture, and hunting is banned, so there are few direct measures of wild Andean bears. We present a new non-invasive method to collect body measurements of wild bears from camera trap photos and videos using horizontal and vertical visual size guides. We demonstrate this method using data from imagery collected from December 2021 - May 2022 at 3300-3453 masl in the Manu Biosphere Reserve of SE Peru. As paired cameras were installed there, grid guides were photographed. In a subset of 149 photo/video sequences, we identified 19 individuals; 13 sequences provided data of known bears of known sex (n=8): 7 males and 1 female. Using the program ImageJ, we measured 10 body dimensions and repeated each measurement 5 times, to assess user error. Of those dimensions, we here present one index of body size, horizontal body length (HBL), and one index of body condition, dorsal-ventral height (DVH), for male and female bears. Males were on average 17% longer than the female: male HBL averaged (±SD) 127cm (±27.3, 86.8-155.5cm), while the female's HBL was 105cm (±0.9). Bartareau's (2017) data measured directly from American black bears showed that males were on average 11% larger than females (163.4cm vs 146.1cm) but were 23% longer than the males in our data. The DVH of male Andean bears was on average 32% larger than the female's: 40cm (±7.51, 28.9-46.8) versus 27cm (±1.2), suggesting that males may have been in better condition. We continue to collect data in this landscape, and in other areas of Peru, to compare data from bears within and among populations. This method also illustrates a potential use of photos from other mammal species that are difficult to capture.

Day: Monday **Time: 15:50 – 16:05** **Room: Hall C**

Theme: Management

Abstract Number: 323
Presentation Type: Oral Presentation
Presentation Title: Building a biometric: Leveraging pose-aware imagery to develop a robust photo-identification for an unmarked species (Ursus arctos)
Presenter Name: Beth Rosenberg
Presenter Affiliation: Alaska Pacific University
Presenter Email: brosenberg@alaskapacific.edu
All Authors: Beth Rosenberg, Mu Zhou, Nathan Wolf, Bradley P. Harris, Alexander Mathis
Primary Author Occupation: Student

Abstract:

The importance of distinguishing between individuals of a species is critical for answering a range of biological and ecological questions. Despite current success in identifying individuals with patterns or intra-species markings, numerous species exist for which the use of visual individual identification is restricted or prevented by a lack of obvious uniqueness (e.g. a non-patterned species in which a readily observable individual identifier is not apparent). Alaskan coastal brown bears (Ursus arctos) are an example of a species for which the development of successful and practicable visual individual identification methods is hindered by a lack of obvious unique or permanent biometric traits. In addition to lacking intra-species markings, individuals undergo weight gain, fur shed, and scarring which alters appearance and makes identifying a non-patterned brown bear even more challenging. Robust individual identification of this species requires the development of a novel technique or the building of a new biometric. In this study, we take into consideration the physiology, morphology, and behavior of the species to place conditions on an image dataset, mainly using a pose-aware framework. We formulate a conditional neural network to provide "permanence" through a multiplicity of image comparisons, utilizing images and postures that might otherwise be unusable. The images required for individual brown bear identification are not limited to any one pose or view, and can handle both occlusions, as well as unknown individuals. Leveraging a large number of known individual brown bears over time in a unique data set, we demonstrate that an individual ID for brown bears can be successfully predicted not only over time, but also across the landscape at locations other than where a bear was first observed or where the dataset was compiled.

ORAL PRESENTATIONS

Day: Monday **Time:** 16:10 –16:25 **Room:** Hall C

Theme: Habitat Relationships

Abstract Number: 278
Presentation Type: Oral Presentation
Presentation Title: Structural connectivity of Sloth bears in Western Maharashtra India
Presenter Name: Neelu Soni
Presenter Affiliation: Sant Gadge Baba Amravati University
Presenter Email: neelusoni26@gmail.com
All Authors: Neelu Soni, Kaushal Patel, Aniruddha Dhamorikar, Prachi Thatte Prashant Thakare
Primary Author Occupation: Student

Abstract:

Landscape level connectivity is only possible by conserving corridors. For a species like Sloth bear whose distribution has become very patchy and fragmented, such measures will be very effective. Hence, identification of area used by Sloth bears and challenges faced by them is very important. Here we present an important corridor profile used by sloth bear between Melghat Tiger Reserve (MTR) and Yawal Wildlife Sanctuary (YWS). Sign survey for sloth bear was conducted and 200 scat samples of Sloth bears were collected from MTR to YWS including the non-protected area forming part of this corridor indicating the use of the corridor by Sloth bears. An easily accessible and dynamic corridor profile with all the information of the corridor was then made with Coalition for Wildlife Corridors CWC) a network of individuals and organizations working on corridors across India. A crude delineation of the corridor boundary using a circuit-theory based modelling approach was done which is around 11241 km2. All the information available in news articles, literature, and forest department management and working plans were then collected and reviewed. The information was then arranged in a designed format for a corridor profile having sections like corridor significance, corridor characteristics (Physical and Biological), stakeholders and management. We also identified linear infrastructure as one of the major challenges in the corridor. The corridor is a mosaic landscape of ~69.23% of agricultural land and ~29.27% forest with some interspersed villages with nearly 269 persons/km2. Using GIS, the GPS coordinates of scats were used to map their location to understand the area utilized by them and we identified 4 critical areas as a priority region in the corridor. This profile highlights the need to declare it as a wildlife corridor and will provide in depth knowledge to the stakeholders and will also be helpful for planned development and policy interventions for Sloth bear conservation.

Day: Monday **Time: 16:30 – 16:45** **Room: Hall C**

Theme: Habitat Relationships

Abstract Number: 283
Presentation Type: Oral Presentation
Presentation Title: Huckleberry habitat and its importance to Cabinet-Yaak and Selkirk Ecosystem grizzly bears (Ursus arctos)
Presenter Name: Justin Teisberg
Presenter Affiliation: US Fish and Wildlife Service
Presenter Email: justin_teisberg@fws.gov
All Authors: Justin Teisberg, Wayne Kasworm, Michael Proctor, Thomas Radandt, Jennifer Fortin-Noreus, Hilary Cooley
Primary Author Occupation: Professional

Abstract:

Huckleberries (Vaccinium spp.) are a food of nutritional importance to grizzly bears (Ursus arctos) within interior populations of North America, providing sugar-rich calories in the late summer and fall seasons prior to denning. We developed a resource selection function of high-quality huckleberry habitat important to Cabinet-Yaak and Selkirk grizzly bears, using field-verified huckleberry foraging radiolocations acquired during prime months of huckleberry fruiting (July 15 – September 15, 2010–2019, from 22 female grizzly bears). Stepwise logistic regression analysis identified 12 significant variables in predicting huckleberry habitat important to female grizzly bears; all were included in a predictive model (Somers' D = 0.729; K-S statistic = 0.570, P < 0.00001). Most influential variables (P < 0.00001; positive [+] or negative [-] relationship) include canopy closure (-), moisture deficit (-), time since last wildfire (-), solar radiation (+), snow water equivalent (-), and growing degree days above 5°C (-). On average, 28 percent of an adult female annual home range includes predicted huckleberry habitat ($\bar{x}$ = 61 ± 6.4 [SE] square kilometers). Seasonal ranges of females overlap extensively within predicted huckleberry habitat, and degree of overlap trends with quality of habitat. Mothers and daughters display similar selection patterns for predicted huckleberry habitat, suggesting huckleberries are an important component to range expansion of these populations. Using energetic predictions of huckleberry foraging in these areas, we find that a smaller average body size of Cabinet-Yaak and Selkirk adult females ($\bar{x}$ = 94 kilograms lean body mass) lessens the energetic constraints of a huckleberry-dominant diet and may be a direct outcome of huckleberries being a primary food resource for these populations.

Day: Tuesday **Time:** 08:00 – 08:15 **Room:** Hall C

Theme: Human-Bear Conflicts & Coexistence

Abstract Number: 12
Presentation Type: Oral Presentation
Presentation Title: Managing Bear Attack Incidents in Canadian National Parks
Presenter Name: Steve Michel
Presenter Affiliation: Parks Canada Agency
Presenter Email: steve.michel@pc.gc.ca
All Authors: Steve Michel, Sonia Nicholl, Claire Edwards, David Gummer
Primary Author Occupation: Professional

Abstract:

Injurious bear incidents occur infrequently in Parks Canada's protected areas (n=154; n=184 total human victims). From 1900-2023, human fatalities were caused by grizzly bears (Ursus arctos, n=10) and black bears (U. americanus, n=1). Additional non-fatal injuries (n=147) were caused by grizzly bears (n=50), black bears (n=91), polar bears (U. maritimus, n=2) and unidentified bear species (n=4). Bear attacks in Canada's national parks are extremely rare (approximately one attack per 13.5 million visits). Bear attack rates have declined by 80%; from an average of 5.5 attacks/year (1970-79) to 1.1 attacks/year (present). Before garbage management measures were enacted (circa 1981) human food and garbage were freely accessible to bears. Most attacks were from black bears in front-country areas (n=55), that were predominantly food conditioned. Since 1981, bear attacks are more commonly attributable to grizzly bears in backcountry locations (n=21), including all recorded human fatalities (n=4). Defense of offspring caused a significant number of bear attacks (n=32); predatory

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behaviour was less frequent (n=11). Parks Canada employs emergency procedures to respond to incidents, prevent further escalation and evaluate contributing factors. Responses ensure: 1) personnel safety; 2) exclusion of people from incident area; 3) rapid victim evacuation and treatment; 4) determining attack circumstances; 5) management of animals involved; 6) collection and documentation of evidence and response actions; 7) accurate and timely information for agency communications. Staff expertise, supporting agencies, the private sector, and internal coordination ensure emergency response objectives are achieved. Staff are trained in Incident Command System wildlife attack response procedures via multi-agency training courses and tactical response training scenarios. Implementing a national human-wildlife coexistence strategy will improve agency policy, procedures, and emergency response capacity.

Day: Tuesday **Time:** 08:00 – 08:15 **Room:** Salon 4

Theme: Population Estimation

Abstract Number: 67
Presentation Type: Oral Presentation
Presentation Title: Developing new tools for population estimation: Insights from thermal imaging drones and Kodiak brown bears
Presenter Name: Shannon Finnegan
Presenter Affiliation: Koniag Inc
Presenter Email: shannonfinnegan8@yahoo.com
All Authors: Shannon Finnegan, Peter Olsen, William Wall
Primary Author Occupation: Professional

Abstract:

Estimating wildlife population densities remains one of the biggest challenges in wildlife management and conservation. Many species are widely dispersed and occur in remote areas, making assessments of population sizes and trends very difficult. Without repeated quantitative estimates of populations, management bodies may face difficulty setting harvest quotas reflective of realized population sizes. Kodiak brown bears (Ursus arctos middendorffi) are an important environmental, economic, and cultural resource throughout the Kodiak Archipelago. Recently, concerns have been raised about potential population declines of brown bears in the Southern portion of the Archipelago. However, current population estimates were derived from Intensive Aerial Surveys (IAS) which are expensive and subject to limitations. Financial constraints result in only small areas of the island surveyed each year, while the ability to detect bears during aerial surveys can be greatly reduced by vegetation, plane disturbance, weather conditions and observer experience. Drones (Unmanned aerial vehicles) may provide a new efficient and cost-effective tool for estimating populations, while overcoming some of the limitations associated with traditional IAS. Using a thermal imaging drone, we carried out brown bear surveys along the Sturgeon and Karluk River sheds on Kodiak Island during 2023 and 2024. We explored the use of artificial intelligence for subsequent image processing and analysis. We discuss the benefits and limitations of this emerging technology for brown bear management.

Day: Tuesday **Time:** 08:20 – 08:35 **Room:** Hall C

Theme: Human-Bear Conflicts & Coexistence

Abstract Number: 112
Presentation Type: Oral Presentation
Presentation Title: Identifying the drivers of polar bear-human interactions using remote cameras
Presenter Name: Douglas Clark
Presenter Affiliation: University of Saskatchewan
Presenter Email: d.clark@usask.ca
All Authors: Danielle Rivet, Ryan Brook, Alex Crawford, Corey Kramer, Michel P. Laforge, Julienne Stroeve, Douglas Clark
Primary Author Occupation: Professional

Abstract:

Polar bear-human conflicts have increased across the Arctic as a warming climate diminishes their sea ice habitat. However, the mechanisms driving such conflicts remain unclear. Using remote cameras we observed 580 polar bear visits to three intermittently-occupied fixed camps and a research station occupied year-round, all near the Hudson Bay coast, from 2011-2021. We quantified the influence of the timing of sea ice break-up, bear body condition, and human activity on frequency of polar bear visitation to those four sites. Time since ice breakup drives polar bear visits but neither poor body condition, which is a known risk for polar bear attacks on humans, nor human activity, have a significant effect. The likelihood of polar bear-human interactions was therefore governed by sea ice but independent of nutritional stress. Consequently, below-average body condition may only mediate which polar bear-human interactions escalate into conflicts rather than causing the interactions themselves. These insights resolved discrepancies in previous studies and between scientific and Indigenous explanations for polar bear-human conflicts. Moreover, the polar bear-sea ice system could be a useful model for understanding the broader emergent phenomenon of climate change as a new driver of human-bear conflicts.

Day: Tuesday **Time:** 08:20 – 08:35 **Room:** Salon 4

Theme: Population Estimation

Abstract Number: 102
Presentation Type: Oral Presentation
Presentation Title: Genetic Diversity and Population Structure in Ecuadorian Andean Bears
Presenter Name: María José Pozo
Presenter Affiliation: Universidad San Francisco de Quito
Presenter Email: mpozo@usfq.edu.ec
All Authors: Maria de Lourdes Torres, María José Pozo, Dario Cueva, Rebecca Zug, Santiago Molina, Rodrigo Cisneros, Martín Bustamante
Primary Author Occupation: Professional

Abstract:

Despite their rich biodiversity and high levels of endemism, Andean countries struggle with wildlife conservation due to limited resources, hindering conservation effectiveness. Focusing on charismatic species

like the Andean bear (Tremarctos ornatus) has become a strategic priority, serving as a flagship species for Ecuador and other highly biodiverse countries. This species is the last living member of the ursid Tremarctinae subfamily and the only bear native to South America. It plays an important ecological role in maintaining healthy ecosystems by dispersing seeds and renewing vegetation layers. However, the IUCN classifies it as vulnerable with a declining population. Genetic studies on threatened species are crucial for understanding their ecology and resilience to environmental and anthropogenic pressures. Few previous studies report low genetic diversity in the Andean bear and suggest that populations are well connected. The results from these studies might be attributed to ascertainment bias as they were performed with heterologous molecular markers. Our research focuses on three Ecuadorian populations of Andean bears using species-specific markers. Seven mtDNA markers and ten microsatellite markers were designed to analyze non-invasive samples from Andean bears. Our findings reveal a higher genetic diversity in the Andean bear populations studied than previously reported. Additionally, a population structure was found, suggesting that Andean bears in Ecuador are not a single, homogenous group but genetically distinct populations. This highlights the need for addressing habitat fragmentation and promoting connectivity to ensure long-term survival. The genetic differentiation identified in the three populations from this study underscores the importance of tailoring conservation strategies to the specific needs of each population.

Day: Tuesday **Time:** 08:40 – 08:55 **Room:** Hall C

Theme: Human-Bear Conflicts & Coexistence

Abstract Number: 57
Presentation Type: Oral Presentation
Presentation Title: Ecology of conflict between baiting-dependent bear tourism and reindeer husbandry
Presenter Name: Ilpo YJ Kojola
Presenter Affiliation: Natural Resources Institute Finland
Presenter Email: ilpo.kojola@luke.fi
All Authors: Ilpo YJ Kojola, Ville Hallikainen, Samuli Heikkinen, Mikko Jokinen, Jouko Kumpula, Vesa Nivala
Primary Author Occupation: Professional

Abstract:

Feeding brown bears by ecotourism enterprises has evoked criticism by some local resident communities. In Finland where feeding is practiced also in reindeer husbandry region, reindeer herders are worried about its potentially negative impacts on their livelihood. One relevant aspect we examined in three-years project (2020-2022) was herders' concern for loosing parts of traditional summer ranges owing to spatial avoidance of bear clusters by reindeer. We estimated that ca. 75-80 bears (68 identified from DNA in scat samples) visited 11 feeding sites within 3 herding cooperatives in 2021, and 90% of these bears were visitors of 7 sites established for tourism purposes. All these commercial feeding sites were located at the edge of a high-density Russian bear population. Statistical analyses provided evidence that GPS-collared female reindeer avoided Finland-Russia border zone area and, also feeding sites up to ca. 10 km distance. Avoidance was positively related to the site-specific number of visiting bears and appeared to have an effect because only a few bear-killed reindeer were found within this avoidance zone. Genetic analyses indicated that visiting bears moved mostly east (Russia) – west (Finland) direction because sites locating >12 km from each other did not share same bear individuals. We propose re-evaluation of the present, very liberal decrees concerning feeding large carnivores in Finland.

Day: Tuesday **Time:** 08:40 – 08:55 **Room:** Salon 4

Theme: Population Estimation

Abstract Number: 152
Presentation Type: Oral Presentation
Presentation Title: 96 SNPs later – the harmonizing and augmenting of the DNA-based brown bear transnational monitoring in northern Europe
Presenter Name: Alexander Kopatz
Presenter Affiliation: Norwegian Institute for Nature Research
Presenter Email: alexander.kopatz@nina.no
All Authors: Alexander Kopatz, Anita J. Norman, Helena Johansson, Mia Valtonen, Ilpo Kojola, Jouni Aspi, Øystein Flagstad, Oddmund Kleven, Jonas Kindberg, Göran Spong
Primary Author Occupation: Professional

Abstract:

Brown bears (Ursus arctos) in Fennoscandia comprise two subpopulations, the Scandinavian (Sweden, Norway) and the Karelian (Finland, northeastern Norway), with roughly 2,700 bears in each. Isolated in the recent past, their connectivity is now restored. Concurrently, government bodies of Finland, Norway, and Sweden have increased their transboundary monitoring and research of brown bear. DNA-based monitoring has long been a crucial component of this work, but the expanded population range now necessitate method alignment between the two subpopulations. For more than a decade, the monitoring between Norway and Sweden has been largely harmonized, but not for the Karelian subpopulation. Our primary objective was to create an effective and flexible genetic resource that supports management, research, and law enforcement across multiple countries. We previously tested the established Scandinavian SNP-panel across the three countries. Results show high resolution for individual identification and relatedness estimation in Finland, but with signs of ascertainment bias, which can affect many types of analyses. We therefore sequenced individuals across the target range to identify markers that provide good resolution at the individual and population level. Based on the screening, we developed a new SNP panel, including sex chromosome markers. Here we present lessons learned from more than a decade of DNA-based, transnational monitoring, including challenges when expanding the range and populations assessed. For wide-ranging species, such as the brown bear, the appropriate spatial scale for robust inferences often traverse administrate boundaries, calling for harmonized methods and joint analyses.

Day: Tuesday **Time:** 09:00 – 09:15 **Room:** Hall C

Theme: Human-Bear Conflicts & Coexistence

Abstract Number: 65
Presentation Type: Oral Presentation
Presentation Title: Resource sharing between human and sloth bear in non-protected forests: A prime reason for human-sloth bear conflicts
Presenter Name: Pratikkumar Desai
Presenter Affiliation: WCB Research lab, Department of Life Sciences, Hemchandracharya North Gujarat University
Presenter Email: pratikdesai825@gmail.com
All Authors: Pratikkumar Desai and Nishith Dharaiya
Primary Author Occupation: Student

ORAL PRESENTATIONS

Abstract:

Sloth bear is considered among the most unpredictable large mammal and on an encounter, in an attempt of self-defence attacks on humans. People living in and around the forest, share resources with sloth bear which often resulting into conflicts and causing human casualties. A rise in anthropogenic activities in the non-protected forests has led to degradation of habitat, reduced forest cover and food broadly supporting our finding that most of the sloth bear attacks are due to penetration of sloth bears in human dominated areas for food and water. A total of 234 incidents of sloth bear attacks in last twelve years (2008-2020) from central Gujarat were recorded. Out of these, more than 80% of attacks caused minor injuries suggesting the attacks were in response to attempt of self-defence by a bear. The analysis of data reveals three key reasons for the sloth bear attacks: sharing of resources, fragmented bear habitat and bear movement near the village. However, the highest conflict occurred due to resource sharing (47%) followed by fragmentation (33%) and movement of sloth bear near villages (20%). We found that the conflicts are more significant due to resource sharing compare to habitat fragmentation and sloth bear movement. Most of these areas are used by local people for common resources, as they are depended on the forest products and water being a limiting factor in summer forcing the bear to visit the villages. Chi2 test shows significant difference between these groups (X2=10.96; df=4; p=0.027). A thorough study of spatio-temporal overlap between locals and bears helps to identify the areas for regulating human activities to reduce the sloth bear encounter. Creating the water accumulation points inside the forest area can also help regulating bear movement in the summer. Maintaining the remaining forest cover and restricting anthropogenic pressure may enhance the harmonious living with the neighbouring sloth bears in this important sloth bear corridor.

Day: Tuesday **Time:** 09:00 – 09:15 **Room:** Salon 4

Theme: Population Estimation

Abstract Number: 154
Presentation Type: Oral Presentation
Presentation Title: Demographic portrait of the brown bear population in the Western Carpathians.
Presenter Name: Nikola Tkáčová
Presenter Affiliation: Charles University
Presenter Email: tkacovani@natur.cuni.cz
All Authors: Nikola Tkáčová, Jana Šrutová, Barbora Černá Bolfíková, Veronika Kornová, Mária Apfelová, Michal Kalaš, Vladimír Antal, Slavomír Finďo, Marián Hletko, Pavel Hulva
Primary Author Occupation: Student

Abstract:

In recent years, ecology has undergone a paradigm shift, recognizing the crucial role of large mammals including bears, as keystone species. The Western Carpathian population of brown bear (Ursus arctos) represents a phylogeographic lineage split from the continental lineage, which differs from populations in the rest of the Carpathians. The Present study aimed to assess the population size and genetic diversity of this population. A total of 2172 samples were collected within Slovakia between 2019 and 2021. A combination of non-invasive genetic and closed model capture-mark-recapture methods was utilized. Eight microsatellite loci and one sex marker (SRY gene) were amplified, with 48% of genotypes meeting the quality criteria ensuring sufficient statistical power of the dataset. The Slovak brown bear population demonstrates a comparable level of heterozygosity (Ho = 0.69) to that observed in regions characterized by robust conservation efforts and pristine landscapes. The sex ratio was skewed in favor of females after modeling. Population size estimates were determined using several approaches, yielding consistent results, and respective hypotheses were tested through simulation procedures. For instance, employing the TIRM model yielded estimates ranging from 1012 to 1275 individuals. Population density was determined utilizing the resulting abundance estimates and the total area of confirmed bear occurrence. The resultant value is approximately 10 individuals per 100 km². The effective population size was estimated using the linkage disequilibrium method to be 144—230 individuals. This value does not exceed commonly reported recommendations for minimum viable population size, so it is important to consider also potential future scenarios involving loss of genetic variation due to inbreeding, genetic drift and genetic erosion.

Day: Tuesday **Time:** 09:20 – 09:35 **Room:** Hall C

Theme: Human-Bear Conflicts & Coexistence

Abstract Number: 70
Presentation Type: Oral Presentation
Presentation Title: Targeting 'Social Carrying Capacity' with Risk Preference Elicitation During Predator Recovery
Presenter Name: Chandler Hubbard
Presenter Affiliation: University of Wyoming
Presenter Email: chubba12@uwyo.edu
All Authors: Chandler Hubbard, Ian Fletcher, Todd Cherry, Jacob Hochard, David Finnoff
Primary Author Occupation: Student

Abstract:

Large predators worldwide are returning to landscapes where they have been extirpated for centuries. In communities intolerant of recovery, the ``Social Carrying Capacity" is often more restrictive that its biological analogue and diverse human preferences complicate traditional conservation approaches. Yet, wildlife managers often lack formal preference elicitation training and the social carrying capacity concept tends to be used as an academic metaphor, rather than a pragmatic management tool. We evaluate individual risk preferences in a nationwide context where federal agencies have published management guidelines for responding to property-damaging and human-threatening grizzly bears (Ursus arctos horribilis). Respondents ($n=2,433$) reveal a desire for more management tolerance following both violent and non-violent encounters than is currently afforded. Unfamiliarity with federal guidelines leads respondents to believe that grizzly bear encounters are managed more consistently with their own desires than occurs in reality. We offer a nationwide prediction of risk management preferences across all contiguous United States zip codes using social, geographic, landscape and demographic indicators. The general approach holds promise for identifying new predator reintroduction and recovery sites, modernizing place-based guidance for predator management and predicting the intensity of human-wildlife conflict and its associated management costs from natural predator dispersal.

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Day: Tuesday **Time:** 09:20 – 09:35 **Room:** Salon 4

Theme: Population Estimation

Abstract Number: 19
Presentation Type: Oral Presentation
Presentation Title: Predicting the potential habitat of bears under a changing climate in Nepal
Presenter Name: Rishi Baral
Presenter Affiliation: Hokkaido University, Laboratory of Wildlife Biology and Medicine, Sapporo, Japan
Presenter Email: right.rishi1@gmail.com
All Authors: Rishi Baral, Rajan Prasad Paudel, Binaya Adhikari, Rabin Kadariya, Naresh Subedi, Bed Kumar Dhakal, Michito Shimozuru, Toshio Tsubota
Primary Author Occupation: Student

Abstract:

In Nepal, the distributions of three bear species vary: sloth bears (Melursus ursinus) in the lowlands, Asiatic black bears (Ursus thibetanus) in the mid-hills, and brown bears (Ursus arctos) in the high Himalayas. We utilized 179 occurrence points for sloth bears, 199 for Asiatic black bears, and 41 points for brown bears to construct a habitat model incorporating climate and topographic variables. Employing various species distribution modeling algorithms in BIOMOD2, the model predicts suitable habitats spanning 10,971.75 km2 for sloth bears, 29,470.75 km2 for Asiatic black bears, and 6,152.97 km2 for brown bears. Within protected areas, the habitat for sloth bears is 4,120.56 km2, that for Asiatic black bears is 9,688.67 km2, and that for brown bears is 4,538.67 km2. Chitwan National Park emerged as the prime sloth bear habitat with a core area of 918.55 km2 and a buffer zone of 726.485 km2. The Annapurna Conservation Area was deemed suitable for Asiatic black bears and brown bears, covering 2,802.23 km2 and 2,795.91 km2, respectively. The models projected a significant reduction in the habitat of these bear species both inside and outside protected areas. As predicted under the Shared Socioeconomic Pathways (SSP)2-4.5 scenario, sloth bears may experience 54.9% (2050) and 44.7% (2070) losses, respectively, of habitat; Asiatic black bears, 11.2% (2050) and 16.8% (2070); and brown bears, 68.41% (2050) and 82.20% (2070) losses. The overlap between sloth bears and black bears spans 38.7 km2, and that between brown bears and black bears is 26.6 km2. Notably, all three bear species exhibited suitability correlations with the intermediate temperature of the driest quarter. Examining current and projected habitats provides essential information for guiding conservation strategies and ensuring the conservation of these bear species in the face of climate change.

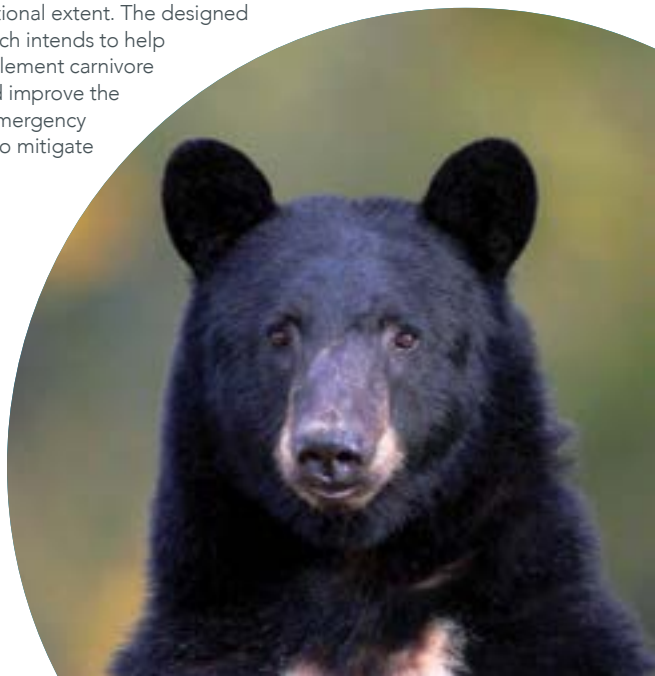
Day: Tuesday **Time:** 09:40 – 09:55 **Room:** Hall C

Theme: Human-Bear Conflicts & Coexistence

Abstract Number: 78
Presentation Type: Oral Presentation
Presentation Title: A forecast of human-wildlife incidents could help authorities anticipate risk and early react in Europe's largest brown bear (Ursus arctos) population
Presenter Name: Ancuta Fedorca
Presenter Affiliation: National Institute for Research and Development in Forestry Marin Dracea
Presenter Email: ancutacotovelea@yahoo.com
All Authors: Ancuta Fedorca, Pino Maria Sanchez, Mihai Fedorca, Marius Popa, Georgeta Ionescu, Ovidiu Ionescu, Ramon Jurj
Primary Author Occupation: Professional

Abstract:

Human-wildlife coexistence is one of the central concerns in species conservation worldwide. The increasing interactions between large carnivores and humans directly impact social development strategies, which resonates in the public perception of these species and unleashes negative consequences on ecological connectivity. In recent years, the increased brown bear population within the Romanian Carpathians calls for urgent action to address conflict management. We applied a holistic approach combining theoretical and practical grounds to spatially predict the risk of human-bear conflict at Romania's regional and national levels. Two-fold analyses were performed based on i) the maximum entropy algorithm, analysing data collected from emergency calls that reported brown bear incidents from 2017 to 2023, and ii) circuit theory, using practitioners' knowledge to assign resistances to features that characterize the hunting grounds. In addition, we analysed bear movement pathways connecting conflict hotspots with the surrounding landscape. Higher risk indicators of human-bear conflict correlate to human settlements in mountain valleys, agroforestry systems and broadleaved forest patches adjacent to localities with significant fragmentation levels, reaching 0.9-0.8 rates. The results outline that medium and low-risk areas surrounding small towns and communes are top-priority areas for prevention measures before conflict reaches high-risk points, covering 15% area of the national extent. The designed spatial approach intends to help managers implement carnivore deterrents and improve the efficiency of emergency interventions to mitigate conflict.



ORAL PRESENTATIONS

Day: Tuesday **Time:** 09:40 – 09:55 **Room:** Salon 4

Theme: Habitat Relationships

Abstract Number: 157
Presentation Type: Oral Presentation
Presentation Title: Population estimation of Gobi brown bear and their movement in the Great Gobi A Strictly Protected Area, Mongolia
Presenter Name: Battogtokh Nasanbat
Presenter Affiliation: Czech University of Life Sciences Prague
Presenter Email: nasanbat@ftz.czu.cz
All Authors: Battogtokh Nasanbat, Francisco Ceacoero, Petr Matějů, Ariunbuyan Khurelbaatar, Barbora Černá Bolfíková, Samiya Ravchig
Primary Author Occupation: Student

Abstract:

Robust population estimation of rare or elusive threatened species lacking distinct identifiable features poses a challenge in the field of conservation and management. The Gobi brown bear (Ursus arctos) is one of such species living in geographically isolated and inaccessible harsh desert areas of Great Gobi A Strictly Protected Area. Population size is one of the primary parameters determining urgency of conservation action, and it provides baseline data against which to measure progress toward recovery. We designed a camera-based approach to estimate population during period of greater activity of the bear from June to September at the main 13 natural springs in the whole protected area based on our previous study and also combined with meta-barcoding analysis based on hair samples 2022 and 2024. We used criteria to identify individual Gobi brown bears based on shoulders-mark patterns and tested the level of congruence among 3 independent observers using a set data of photographs collected in 2018, 2020, 2022 and 2024.

We grouped the main 13 natural springs into three mountain ranges: Tsagaan Bogd, Shark Khulst, and Atas Inges mountains. In 2018, 4451 pictures were evaluated by the researchers, and average congruence among observers resulted in 33-36 individuals. Only 4 males and 1 female were observed in more than one mountain ranges. In 2020, 1094 pictures of the brown bear have been evaluated and average congruence among observers resulted in 27-31 individuals: 10-12 adult males, 6-8. Only 3 males were observed in more than one mountain ranges. In 2022, the average congruence among observers resulted in 22-25 individuals. Only 1 male was observed in more than one mountain ranges. We will carry out similar survey this year (2024) and will also collect hair samples. The molecular biological analyses on the hair samples are still in progress and results will be presented at the conference combining different sampling techniques

Day: Tuesday Time: 10:20 – 10:35 Room: Hall C

Theme: Human-Bear Conflicts & Coexistence

Abstract Number: 79
Presentation Type: Oral Presentation
Presentation Title: Understanding ecological and anthropological determinant to devise effective human-sloth bear conflict mitigation strategies in Gujarat, India
Presenter Name: Aditya Dharaiya
Presenter Affiliation: Department of Geology, Savitribai Phule Pune University
Presenter Email: adiradhu@gmail.com
All Authors: Aditya Dharaiya, Pratikkumar Desai, Nishith Dharaiya
Primary Author Occupation: Student

Abstract:

The burgeoning human-wildlife conflicts, particularly those involving sloth bears, underscore the pressing need to understand the intricate interplay between human activities and wildlife habitats. Sloth bear attacks in Gujarat, India, are on the rise due to expanding human populations encroaching into sloth bear habitats, a thorough assessment on the relationships between these ecological and anthropological determinants to understand and develop effective conflict mitigation strategies. The study aims to focus on the sloth bear distribution with respect to the change in land cover and land use over 30 years, alongside the impact of anthropogenic activities over sloth bear habitat, might lead to conflict will be taken into account through census and field surveys. This research adopts a multifaceted approach, leveraging remote sensing data from satellite sensors like LANDSAT, SENTINEL, and CARTOSAT through which, the extent of forest fragmentation, overlaid on the conflict locations and bear presence data. Overlaying conflict data and human population onto these spatial analyses offers crucial insights into the relationship between habitat fragmentation, human presence and the emergence of conflict hotspots. In these 30 years (1993 – 2023), more than 500 conflict cases have been recorded and the total human population has been increased from ~9 million to 17 million alongside, the sloth bear population have also increased ~60%. We found that, the dense forest has been decreased by ~35% with increase in Builtup area (7%) and open forest and barren land (10%). Here we will present how the habitat fragmentation have accelerated conflict issues and the science-based mitigation measures. Our results were used in identifying potential sloth bear corridors, we delineate pathways crucial for their movement and dispersal, thereby aiding in the formulation of a robust conflict mitigation plan tailored to the Gujarat context.

Day: Tuesday **Time:** 10:20 – 10:35 **Room:** Salon 4

Theme: Habitat Relationships

Abstract Number: 25
Presentation Type: Oral Presentation
Presentation Title: Brown bear occurrence along a proposed highway route in Romania's Carpathian Mountains
Presenter Name: Csaba Domokos
Presenter Affiliation: Milvus Group Bird and Nature Protection Association
Presenter Email: csaba.domokos@milvus.ro
All Authors: Csaba Domokos, Sebastian Collet, Carsten Nowak, Ferenc Jánoska, Bogdan Cristescu
Primary Author Occupation: Professional

Abstract:

Major road developments are planned or ongoing throughout the range of the Romanian brown bear (Ursus arctos) population, which is numerically the largest in the European Union. The planned A8 (Tîrgu Mureș–Iași–Ungheni) highway crosses the Romanian Eastern Carpathians on their entire width, posing a risk to the Romanian and broader transfrontier Carpathian bear population. In the summers of 2014, 2017 and 2020, we surveyed an 80 km-long section of the planned highway using baited hair traps (n = 68 throughout all sessions, with three additional traps active only in 2020) mounted in pairs along the route. We aimed to assess bear occurrence, movement, and to estimate the minimum number and sex ratio of bears present in the area. With an effort of 3,519 hair trapping days (17 days / trap / session), we identified 24 individuals from the collected hair samples (n = 45), with a higher prevalence of female bears (male:female sex ratio of 1:1.3). We did not document individual bears crossing the planned highway, but detected functional connectivity across the planned highway through parent-offspring (4 cases), full-sib (2 cases) and half-sib (24 cases) genetic relationships among sampled individuals. We analyzed habitat characteristics and human-related covariates associated with hair trap locations to identify influences on bear presence and found that terrain ruggedness and longitude were the most important predictors of bear occurrence. Bears consistently occurred in rugged terrain in the Western part of the study area, and were often detected close (< 1 km) to human settlements. Even before the construction of the A8 highway, connectivity is likely already limited by the existing extensive network of settlements, being restricted to a few important linkage areas still free of developments. Additional threats to bears and other wildlife in the area include poaching and large numbers of free-ranging dogs. We provide recommendations to mitigate these threats.

Day: Tuesday **Time:** 10:40 – 10:55 **Room:** Hall C

Theme: Human-Bear Conflicts & Coexistence

Abstract Number: 83
Presentation Type: Oral Presentation
Presentation Title: Drones outperform dogs hazing bears: community-based carnivore scare tactics
Presenter Name: Wesley Sarmento
Presenter Affiliation: Montana Fish, Wildlife and Parks
Presenter Email: wsarmento@gmail.com
All Authors: Wesley Sarmento
Primary Author Occupation: Professional

Abstract:

Human-wildlife conflict can result in harm to people, their livelihoods, and frequently ends in reduced tolerance for species and/or removal of animals. Preventing conflicts is essential for conserving carnivore populations. Here I conduct a six-year study of the efficacy of a hazing methods to prevent conflicts at deterring grizzly bears (Ursus arctos) away from people on the prairies of North-Central Montana. I tested a burgeoning technology, drones, and traditional methods of hazing bears including dogs, projectiles, and vehicular pursuit. Hazing stopped undesirable behaviors and caused a significant increase in avoidance behavior and distance to human infrastructure. Results suggest aversive conditioning occurred over longer time scales as older bears required less hazing and hazing events decreased over each calendar year. Drones outperformed other hazing techniques where the odds of a pursuit being possible increased 122 times relative to vehicular chasing due to accessibility issues. Dogs required high maintenance and had an 85% reduction in the odds a hazing event would be successful relative to vehicular pursuit. Grizzlies selected for flight locations further from roads and closer to waterways. To broaden our understanding of deterrence techniques I conducted a systematic literature search of peer-reviewed studies assessing hazing efficacy on predators globally.

Day: Tuesday **Time:** 10:40 – 10:55 **Room:** Salon 4

Theme: Habitat Relationships

Abstract Number: 35
Presentation Type: Oral Presentation
Presentation Title: Past and Present Distribution Ranges of the Asiatic Black Bear (Ursus thibetanus)
Presenter Name: Unza Waqar
Presenter Affiliation: Pir Mehr Ali Shah Arid Agriculture University,Rawalpindi,Pakistan
Presenter Email: unzawaqar99@gmail.com
All Authors: Unza Waqar, Tariq Mahmood, Muhammad Mushtaq, Muzna Kashaf, Shehar Bano, Ayesha Sheraz, Kainat Zamir, Syeda Qanitah Ayesha, Nuzhat Naseem
Primary Author Occupation: Student

Abstract:

The Asiatic black bear, Ursus thibetanus, is a species of ecological importance, yet our understanding of its historical distribution remains limited. While its current distribution is available on the IUCN Red List of Threatened Species, there is a lack of information regarding its past range. Our study aimed to address this gap by investigating the historical distribution of the Asiatic black bear, mapping its total range, and comparing it with the current distribution. Additionally, we analyzed protected areas within both historical and current ranges to assess changes over time.

Using Geographic Information System (GIS) software, we reconstructed the historical range, utilizing published records of the species' occurrence throughout history. The results revealed a significant contraction in the Asiatic black bear's range, with the historical span covering approximately 15.86 million km², compared to the current distribution of about 7.85 million km² – indicating a reduction of approximately 49.5% (8.02 million km²).

Furthermore, the study explored the network of protected areas, noting a decrease of 27.5% in the number of protected areas within the historical range, emphasizing the urgent need for conservation efforts. The total

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protected area in historical ranges was 9,933, covering 0.946 million km², while the current range comprises 6,580 areas, totaling 0.667 million km².

This research contributes valuable insights into the historical dynamics of the Asiatic black bear's distribution, providing a foundation for more effective conservation strategies. The utilization of GIS tools allows for a comprehensive exploration of factors influencing the species' decline, emphasizing the importance of proactive management and conservation measures. These findings underscore the critical need for conservation efforts to safeguard the Asiatic black bear's population and its habitat for the present and future.

Day: Tuesday **Time:** 11:00 – 11:15 **Room:** Hall C

Theme: Human-Bear Conflicts & Coexistence

Abstract Number: 91
Presentation Type: Oral Presentation
Presentation Title: Bear Management-Related Terms for Standardized Use
Presenter Name: Carl Lackey
Presenter Affiliation: Nevada Department of Wildlife
Presenter Email: clackey@ndow.org
All Authors: Carl Lackey, Dave Telesco, Hillary Cooley, Kim Annis, Dave Battle, Paul Frame, Lindsey Mangipane, Colleen Olfenbuttel, Mark Vieira, Tammy Waldrop
Primary Author Occupation: Professional

Abstract:

The ability of North American wildlife agencies to accurately define and share information about human-wildlife conflict is important for agency conservation efforts, interagency communications, and public education. To manage human-bear conflict, it is essential that interagency communication and public messaging be effective and consistent. Yet, defining human-bear conflicts can be difficult and application is inconsistent. Further, some commonly used terms used in agency messaging and often repeated by the public are subjective and can have negative connotations for bears. The International Association for Bear Research and Management's (IBA) Management Committee, with members representing nine jurisdictions in North America, conducted a literature search of terms and definitions used in bear management and bear research to: (1) identify terms and definitions that were clear, concise, and used consistently among jurisdictions; (2) identify terms that were inconsistently used and defined; and (3) identify terms that should be removed from written and verbal agency messaging that lead to mischaracterization of bears. Here we present ten terms and definitions that will facilitate clear and consistent communications and allow jurisdictions to better compare databases. We also identify five terms that should be removed from professional wildlife management vernacular and publications on human-bear conflicts.

Day: Tuesday **Time:** 11:00 – 11:15 **Room:** Salon 4

Theme: Habitat Relationships

Abstract Number: 42
Presentation Type: Oral Presentation
Presentation Title: Summer diet and energetic balance in Arctic coastal grizzly bears relative to polar bears
Presenter Name: Anthony Pagano
Presenter Affiliation: US Geological Survey
Presenter Email: apagano@usgs.gov
All Authors: Anthony Pagano, Karyn D. Rode, Kerry L. Nicholson, Nicholas J. Lunn, David McGeachy, William B. Leacock, Charles T. Robbins
Primary Author Occupation: Professional

Abstract:

Climate warming is increasing polar bear land use across much of their range. While on land polar bears are without access to their primary seal prey and have been shown to lose body mass potentially making them vulnerable to starvation. Yet, in some areas, polar bear land use overlaps with Arctic grizzly bear habitat, where terrestrial foods are sufficient to sustain grizzly bears. We measured the energy expenditure, changes in body mass, behavior, diet, movements, and activity of 12 Arctic grizzly bears on the North Slope of Alaska over 17 – 22 days between August to September to compare to similar measures collected from 20 polar bears on land in Manitoba, Canada. Across 4 age and sex classes, Arctic grizzly bears largely gained mass over 3 weeks (mean = 0.2 kg/day, range: -0.20 – 0.65 kg/day), while polar bears lost mass with the exception of one individual (mean = -0.9 kg/day, range: -1.7 – 1.6 kg/day). On average, Arctic grizzly bears moved 2.8× greater distances. The mean mass-specific energy expenditure of two Arctic grizzly bears was 2.7× greater than the mean energy expenditure of 20 polar bears on land and similar to the mean energy expenditure of polar bears on the spring sea ice. Grizzly bears consumed waterfowl, vegetation, berries, fish, moose, and caribou, while polar bears consumed waterfowl, vegetation, berries, seal, and beluga. Our findings indicate that the smaller body size of Arctic grizzlies (50% lower body mass than the polar bears we sampled) allows them to more efficiently forage on terrestrial foods relative to polar bears. Nevertheless, although terrestrial foods largely compensated for the energy expended to acquire them, they provided relatively small energetic surpluses during a period when grizzlies are typically building fat deposits in advance of winter hibernation. These findings reinforce the hypothesis that most terrestrial foods within the polar bear's range are inadequate to prolong the period they can survive on land.

Day: Tuesday **Time:** 11:20 – 11:35 **Room:** Hall C

Theme: Human-Bear Conflicts & Coexistence

Abstract Number: 338
Presentation Type: Oral Presentation
Presentation Title: The Canine Conundrum: Is a Dog a Help or Hindrance in Bear Country?
Presenter Name: Tom Smith
Presenter Affiliation: Brigham Young University, Provo, UT, USA
Presenter Email: tom_smith@byu.edu
All Authors: Tom Smth, Stephen Herrero, Hank Hristienko, Lana Ciarniello, Linda Wiggins
Primary Author Occupation: Professional

Abstract:

In 2023, a tragic incident occurred in Canada's Banff National Park where two people and their dog died as a result of a grizzly bear attack. This occurrence revived discussions first reported by Hristienko and Herrero (2014) as to the potential dangers and benefits of bringing one's dog(s) into areas inhabited by bears. To address these questions, we analyzed more than 300 human-bear conflicts, between 1901 and 2023, that involved dogs and the three North American bear species (Ursus americanus, U. arctos, U. maritimus). This database is currently being finalized but preliminary results suggest that most of the time, the dog triggered the attack and when this happened the victims were at least slightly injured. Interestingly, we also recorded multiple attacks where the dog saved the owner, or at the least lessened the severity of the attack. Contrary to this finding, there appear to be few attacks where the owner actually saved the dog. Although the status of the dog being leashed or unleashed is unreported in the majority of encounters, preliminary results suggest that unleashed incidents outnumber those involving leashed dogs 4:1. This work will help to inform data-driven guidelines on humans and dogs in bear country.

Day: Tuesday **Time:** 11:20 – 11:35 **Room:** Salon 4

Theme: Habitat Relationships

Abstract Number: 50
Presentation Type: Oral Presentation
Presentation Title: Black Bear Habitat Use and Movement in Response to Wind Energy
Presenter Name: Tawnee Dupuis
Presenter Affiliation: University of Alberta
Presenter Email: tawnee@ualberta.ca
All Authors: Tawnee Dupuis, Jaclyn Comeau, Katherina Gieder, Mark S. Boyce
Primary Author Occupation: Student

Abstract:

The American black bear (Ursus americanus) is the most widely distributed bear species in North America. Historically, black bears occupied the majority of forested areas on the continent. However, with the growth of the human footprint, the quality and quantity of forested habitats available to bears has declined substantially. To prevent human-bear conflicts while maintaining a sustainable black bear population, preserving high-quality habitats is essential. An emerging threat to habitat quality is wind power development. While the impacts of wind energy projects on bats, migratory birds, and raptors are well-documented, there is little research on the potential effects that these developments have on terrestrial mammals, such as bears.

The objective of this project is to quantify changes in black bear habitat use in response to the construction and operation of a wind energy facility. Between 2011 and 2020, 40 black bears were collared and equipped with GPS transmitters in southwestern Vermont, USA, where the first industrial-sized wind project within a National Forest was built in 2017. This construction footprint overlapped with areas of previously intact black bear habitat. Geospatial satellite-derived data from collared bears was collected during all three phases of the wind project development: before construction, during construction, and during subsequent operation. We compared used bear locations between the different construction phases using a mixed effect latent selection difference function. Additionally, step selection functions to describe movement and habitat selection during the different construction phases. This project aims to quantify the magnitude and extent to which habitat use is impacted by wind development. These findings will direct future wind energy development plans to mitigate impacts on black bears and other terrestrial mammals.

Day: Tuesday **Time:** 11:40 – 11:55 **Room:** Hall C

Theme: Movement Ecology

Abstract Number: 33
Presentation Type: Oral Presentation
Presentation Title: Spatial Behavior of Grizzly Bears in the US Northern Rockies
Presenter Name: Sarah Sells
Presenter Affiliation: U.S. Geological Survey, Montana Cooperative Wildlife Research Unit
Presenter Email: sarah.sells@umontana.edu
All Authors: Sarah Sells, Cecily Costello, Paul Lukacs, Lori Roberts, Milan Vinks
Primary Author Occupation: Professional

Abstract:

Once-contiguous grizzly bear (Ursus arctos) populations remain largely isolated in the western US. Research has been needed to understand habitat use and assess potential corridors that could promote genetic and demographic connectivity among recovery ecosystems. Accordingly, our objective was to model grizzly bear habitat use, movements, and population connectivity. We employed GPS data from male and female grizzly bears in Montana's Northern Continental Divide Ecosystem (NCDE) and an integrated step selection function approach to test hypotheses of habitat selection and simulate movements. Results demonstrated highly individualistic behaviors, with some individuals avoiding and others preferring various features like forest edge, riparian areas, and secure habitat. Such individualism supported the need for an individual-based modeling approach to understand and predict grizzly bear behavior. Simulation of movements using each individual's model within and near the NCDE produced habitat maps with high predictive power. Simulated pathways from the NCDE to nearby recovery areas revealed pathways bears may use under varying levels of exploratory versus optimal movements. The predicted habitat and pathways identified by our study can be targeted for proactive conservation efforts such as conservation easements, conflict prevention, and road mitigations to help recover grizzly bears in western Montana and beyond.

ORAL PRESENTATIONS

Day: Tuesday **Time:** 11:40 – 11:55 **Room:** Salon 4

Theme: Habitat Relationships

Abstract Number: 54
Presentation Type: Oral Presentation
Presentation Title: Sloth bear den study with reference to their geo-morphology and den selection in the dry deciduous forests of Gujarat state, India
Presenter Name: Sarthak Chaudhary
Presenter Affiliation: UGC-CAS Department of Biosciences, Saurashtra University,
Presenter Email: sarthakchaudhary76@gmail.com
All Authors: Sarthak Chaudhary, Nishith Dharaiya, Suresh Chovatiya, Thomas Sharp
Primary Author Occupation: Student

Abstract:

Sloth bear denning ecology is complex and largely unknown. We located maternal and resting sloth bear den in the forests of central Gujarat, at the western edge of sloth bear range and collected data on den locations and other physical characteristics. The study area, though patchy and fragmented and surrounded by agricultural lands with substantial anthropogenic pressure, acts as a corridor linking two protected areas namely Ratanmahal and Jambughoda Wildlife Sanctuaries and is a home to roughly 100 sloth bears. Dens were located by gathering information from the local forest staff and forest dwellers. These dens were then authenticated by visiting the den site and documenting sign as well as setting up camera traps to collect photographs of bears using the dens. Out of 62 dens identified, 21 maternal dens and 41 were confirmed as resting dens. All the dens were found in the naturally occurring caves. Maternal dens were found at a higher elevation (330 ± 57.64m) and steeper slopes (14.01° ± 4.41) than resting dens (288.78 ± 51.02m, 12.78° ± 5.16). No significant differences were found in regard to aspect or ruggedness. The mean distance from water sources to both maternal and resting dens was closer than the forest boundaries, human settlements, and roads. Resting dens were observed in open, moderate, and moderately dense forest. Maternal dens tended to be located close to forest boundaries but far from human settlements. The resulting information of sloth bear denning in this study area will help with regional sloth bear habitat management as well as giving further insight into the overall complexity of sloth bear denning across their range. It may also be useful in mitigating human-sloth bear conflicts by restricting human activities in identified denning locations.

Day: Tuesday Time: 13:30 – 13:45 Room: Hall C

Theme: Movement Ecology

Abstract Number: 59
Presentation Type: Oral Presentation
Presentation Title: Sloth Bear Long Distance Dispersal
Presenter Name: Shanmugavelu Swaminathan
Presenter Affiliation: Wildlife SOS
Presenter Email: swaminathan@wildlifesos.org
All Authors: Shanmugavelu Swaminathan, Thomas Sharp, Arun Sha, Kartick Satyanarayan, Geeta Seshamani
Primary Author Occupation: Professional

Abstract:

Long distance dispersal is requisite to the health and long-term survival of wild bear populations. Habitat loss and fragmentation as well as human activity and land use make long distance dispersal more dangerous to bears and other wildlife, due to the possibility of falling victim to anthropogenic risks such as roads and open wells. We know from DNA studies conducted in Central India that sloth bears disperse across areas that are not well forested, however, until now there has been no documentation of a sloth bear long-distance dispersal across a fragmented landscape. Here we describe the longest documented dispersal journey of a sloth bear across a fragmented habitat. In 2022 we fitted ten sloth bears with GPS iridium collars in two Sloth Bear Sanctuaries, Daroji and Gudekote, in the southern state of Karnataka, India. In 2023 a collared 3–4-year-old female, which we named Bindhu, left her home range in Gudekote Sloth Bear Sanctuary and traveled 162 kms (139 km straight line distance) over an 11-day period to eventually settle in Gangapalli Reserve Forest in the neighboring state of Andra Pradesh. We analyzed movement metrics, directionality, and space use during three behavioral stages of dispersal, 1) pre-dispersal, 2) dispersal and 3) post-dispersal. We compared movement during the day to movement during the night as well as how the bear used different habitat types. We looked at major barriers, such as roads, and any peculiarities in crossing those barriers. Additionally, we looked at other interesting factors that may have played a role in Bindhu dispersing from her natal area. Including the fact that while Bindhu dispersed, her female sibling (Cindhu) stayed in her natal area. Before Bindhu's dispersal the home ranges of these two sisters overlapped to a large degree.

Day: Tuesday **Time:** 13:30 – 13:45 **Room:** Salon 4

Theme: Habitat Relationships

Abstract Number: 298
Presentation Type: Oral Presentation
Presentation Title: Determining the importance of kokanee salmon to grizzly bears in central British Columbia
Presenter Name: Shelley Marshall
Presenter Affiliation: Government of British Columbia
Presenter Email: shelley.marshall@gov.bc.ca
All Authors: Shelley Marshall, Dexter Hodder, Matt Scheideman, Kara MacAulay, Clayton Lamb, David Breault, Adrian Batho, Morgan Anderson
Primary Author Occupation: Professional

Abstract:

Conservation and stewardship of wildlife requires an understanding of how landscape and climate change influence the interactions between wildlife and their environment. Grizzly bears (Ursus arctos) in central B.C. rely primarily on plant-based foods and terrestrial meat sources to meet their energetic requirements though are known to sometimes consume kokanee salmon. Abnormal weather patterns can vary food availability through late spring green-up, berry crop failures, or droughts constraining fish movement. Climate and landscape change can accentuate effects on temperatures, water flow, and precipitation. Given the effects of landscape and climate change on fish spawning, managers must understand if kokanee are important to these grizzly bears to consider appropriate actions to maintain this food source. Through five years of non-invasive hair sampling along three kokanee streams, we quantified the use of kokanee by grizzly bears. As predicted, spawning kokanee were an important

food source in our study area. We detected 89 individual grizzly bears at these streams which reside in two of the lowest density population units of grizzly bears in B.C. Isotope and mercury analysis demonstrated the importance of this kokanee resource given its relatively short availability (~30 days). Mark-recapture analysis found a positive relationship between berry abundance and bear use of the kokanee streams. This may be an example of macronutrient optimization as the habitat in and around these kokanee spawning streams was a mosaic of riparian retention and cutblocks supporting both berry production and kokanee spawning habitat. We recommend protection measures to maintain the integrity of the spawning grounds, identification of nearby kokanee spawning streams and similar protections considered, and continued monitoring to provide additional insights into the importance of kokanee beyond the variability in conditions (drought, fires, high water) captured during this study.

Day: Tuesday **Time:** 13:50 – 14:05 **Room:** Hall C

Theme: Movement Ecology

Abstract Number: 121
Presentation Type: Oral Presentation
Presentation Title: New insights into Andean bear movement ecology across the Ecuadorian Andes
Presenter Name: Francisco Castellanos
Presenter Affiliation: Fundación Oso Andino
Presenter Email: xacfran@gmail.com
All Authors: Francisco Castellanos, David Jackson, Stefano Mezzini, Jorge Brito, Armando Castellanos
Primary Author Occupation: Student

Abstract:

The Andean bear (Tremarctos ornatus) is a charismatic yet shy mammal that plays a key role in maintaining ecosystems along the Andes. Ever since the first trapping and tagging of specimens with VHF or GPS collars, research on their behavior has heavily relied on home range data as a proxy to report behavior patterns, often drawn from biased datasets. This study reports the first GPS-based investigation into the movement ecology and autocorrelated home range estimates of a metapopulation consisting of 6 female and 3 male Andean bears spanning various ages, inhabiting the northern and central Ecuadorian Andes. Over a decade, our research and conservation project has tracked these animals for periods ranging from 5.5 months to 2.8 years, collecting a total of 26,884 unbiased GPS fixes. Remarkably, home range sizes were considerably variable, ranging from 16.4 – 143.1 km2 in females, and 183.9 – 242.3 km2 in males. Continuous-time movement speeds showcased significant diurnal disparities, fluctuating between 5.43 – 9.03 km/h during the day versus 0.85 – 2.70 km/h at night. Ongoing analyses suggest nocturnal movements may be driven by environmental factors like temperature and precipitation, though further investigation is needed to elucidate these dynamics. These findings expand our knowledge of female home range occupancy, revealing sizes up to 10 times larger, and 2 – 4 times larger in males than previously reported. These differences may be related to the age of the animal, type of habitat, food availability, or estrus cycles in females. The incorporation of this knowledge into the species' biology and ecology will foster protection efforts for this majestic and iconic mammal species native to South America. Consecutively, safeguarding the protection of larger areas of paramos, cloud forests, and high grasslands, all habitats that are increasingly threatened by deforestation and livestock farming.

Day: Tuesday **Time:** 13:50 – 14:05 **Room:** Salon 4

Theme: Bear Behaviour

Abstract Number: 14
Presentation Type: Oral Presentation
Presentation Title: When Apex Predators Become Prey: Testing the Risk Allocation and Starvation-Predation Hypothesis in the American Black Bear
Presenter Name: Emily Davis
Presenter Affiliation: University of Wyoming
Presenter Email: edavis22@uwyo.edu
All Authors: Emily Davis, Daniel Bjornlie, Ryan Kindermann, Daniel Thompson, Joseph Holbrook
Primary Author Occupation: Student

Abstract:

Tradeoffs between risk and reward aid in understanding and predicting behavioral responses within predator-prey systems. Prey species must balance the risk of predation while acquiring key resources for survival and reproduction. This balancing act has established key ecological concepts such as the risk allocation hypothesis and the starvation-predation hypothesis, which suggests prey temporally avoid risk when spatial avoidance is unattainable and individual nutritional state modulates anti-predator behavior, respectively. While these foundational concepts are classically studied in predator-prey systems, and more recently between meso-predators and apex predators, dynamic sources of risk in human-dominated landscapes have indicated the importance of extending the classic predator prey-model to a human-prey model. Mortality risk generated by hunter harvest of American black bears (Ursus americanus) provides an unconventional system to test and extend foundational hypotheses in predator-prey ecology. We assessed if black bears balanced mortality risk with the spatially coincident reward of food-laden bait. According to the risk allocation hypothesis, we assessed if black bears selected for bait differently according to time of day, sex, and age. We additionally determined if season, alternative forage around bait, and body fat affected selection of bait to test the starvation-predation hypothesis. Black bears temporally avoided risk associated with daytime hunting hours and altered risk taking behavior based on age, sex, and body condition. We provided support for both hypotheses, and suggest that risk is disproportionally distributed among individuals. Extending foundational predator-prey understandings to a human-predator system provided empirical evidence of how large carnivores contend with risk, and supports management implications of hunter preference when hunting bears over bait.

ORAL PRESENTATIONS

Day: Tuesday **Time:** 14:10 – 14:25 **Room:** Hall C

Theme: Movement Ecology

Abstract Number: 129
Presentation Type: Oral Presentation
Presentation Title: Asiatic black bear responses to roads: Sex- and season-related variations in road proximity, movement, and crossing
Presenter Name: Seungyun Baek
Presenter Affiliation: Tokyo University of Agriculture and Technology
Presenter Email: altaica09@gmail.com
All Authors: Seungyun Baek, Andreas Zedrosser, Tomoko Naganuma, Koji Yamazaki, Shinsuke Koike
Primary Author Occupation: Student

Abstract:

Animals commonly avoid roads and areas close to roads due to the high risk of vehicle collisions and encountering humans. However, animals can cross roads and/or use roads as well as areas close to roads to access resources or facilitate movement efficiency. In particular, apex consumers living in human-modified landscapes must be able to deal with roads due to their large home range requirements. Understanding how apex consumers respond to roads is crucial for sustainable human-wildlife coexistence. In this study, we used an integrated step selection analysis to investigate the selectivity and movement patterns of Asiatic black bears (Ursus thibetanus) in the Ashio-Nikko Mountains, Japan, in relation to roads (main and minor roads) and crossing of main roads. During the mating season, adult males preferred areas near all types of roads but preferred areas further from roads during the day compared to the night. Adult males also displayed slower movements as well as avoided less dense vegetation near main roads and showed faster movement near minor roads. Furthermore, adult males generally avoided crossing of main roads, but this avoidance was lower during the night compared to the day. In contrast, adult females avoided areas near main roads and preferred areas near minor roads. In addition, adult females preferred areas further from minor roads during the day compared to the night. We never observed crossing the main roads by adult females in the mating season. During the hyperphagia season, neither sex exhibited any selectivity in relation to roads, but preferred areas further from all types of roads during the day compared to the night. Moreover, both sexes generally avoided crossing of main roads, but this avoidance was less pronounced during the night. Our results suggest that Asiatic black bears generally perceive roads as a risk and that the probability of road crossing and use areas near roads differed in relation to sex, season, and human activity level.

Day: Tuesday **Time:** 14:10 – 14:25 **Room:** Salon 4

Theme: Bear Behaviour

Abstract Number: 53
Presentation Type: Oral Presentation
Presentation Title: Non-social species are more social than we thought - understanding seasonal patterns in sociality in a solitary carnivore
Presenter Name: Rick Heeres
Presenter Affiliation: University of South-Eastern Norway
Presenter Email: rick.heeres@usn.no
All Authors: Rick Heeres, Martin Leclerc, Shane Frank, Fanie Pelletier, Andreas Zedrosser
Primary Author Occupation: Student

Abstract:

The social system of a species describes the pattern of relationships between and among individuals and social groups, and how these individuals and social groups are distributed across the landscape. Sociality is the interplay between the spatial and social environment in which animal populations persist. Using long-term movement data to investigate social associations is a critical advancement to study sociality in solitary species. We examined the frequency and main-driver of social associations in a hunted brown bear population using individual-based movement data of 153 GPS-collared individuals (2003-2022). We used social network analysis to investigate if inter- and intra-sexual associations are occurring non-randomly during the entirety of the active period of brown bears based on annual and seasonal social networks. We found that bears are associating throughout their active period with seasonal distinctive frequencies. Reproduction was established as the main driver regarding sociality in the population. Our results show that associations are occurring non-randomly and at a higher frequency than expected both during and outside the mating season. The results go against the general assumptions of bears being "non-social" or "solitary-living" species, suggesting that bears may have a higher degree of sociality then previously acknowledged.

Day: Tuesday **Time:** 14:30 – 14:45 **Room:** Hall C

Theme: Movement Ecology

Abstract Number: 131
Presentation Type: Oral Presentation
Presentation Title: Grizzly bears change their behavior near recreation sites in a protected area
Presenter Name: Elise Loggers
Presenter Affiliation: Montana State University
Presenter Email: elise.loggers@montana.edu
All Authors: Elise Loggers, Andrea Litt, Mark Haroldson, Kerry Gunther, Frank T. van Manen
Primary Author Occupation: Student

Abstract:

Outdoor recreation is growing, increasing the importance of understanding how animals respond to low-intensity recreation (i.e., hiking). Bear Management Areas (BMA) in Yellowstone National Park were established in 1982 as areas important to bears. In BMAs (~21% of the park), human access is restricted for 2–7 months every year, to protect bears and people, providing an opportunity to test how low-intensity backcountry recreation influences behavior of grizzly bears (Ursus arctos). Our objectives were to determine whether grizzly bears select for, and if greater densities of bears exist in, BMAs. We also explored how bears change their behavior near trails based on restrictions to human access and time of day. We used GPS locations of 19 male and 16 female grizzly bears to develop step-selection models to test our hypotheses. Males were 1.8 (95% CI = 1.3–2.4, summer) and 1.9 (1.1–3.1, hyperphagic) times more likely to be in a BMA but not while restrictions were in place. Females selected for BMAs, regardless of human access, during the mating season (1.3 times, 1.0–1.8). Bear density increased by 0.31 (0.1–0.8) individuals for every 10-km2 increase in area covered by BMAs. Females moved faster near trails in unrestricted areas and slower in restricted areas during night and crepuscular hours. Females avoided trails at night in restricted areas (3.1 times, 1.1–9.4). Males moved faster near trails during all times and

selected for trails during night and crepuscular hours. Although individual bears differed in their responses, bears changed their movement and selection in response to low-intensity recreation, even within a protected area. Restricting recreation likely reduces human-bear conflict in areas with greater densities of bears and reduces displacement of bears from important food resources. Restriction of trail use during certain times (i.e., night) would likely further reduce human-bear interactions.

Day: Tuesday **Time:** 14:30 – 14:45 **Room:** Salon 4

Theme: Bear Behaviour

Abstract Number: 58
Presentation Type: Oral Presentation
Presentation Title: Males disperse, females remain: revealing the dispersal patterns of Asian black bears through genetic analysis
Presenter Name: Naoki Ohnishi
Presenter Affiliation: Forestry and Forest Products Research Institute
Presenter Email: bigwest70@gmail.com
All Authors: Naoki Ohnishi, Kahoko Tochigi, Tomoko Naganuma, Shinsuke Koike, Koji Yamazaki, Takeshi Osawa
Primary Author Occupation: Professional

Abstract:

It is commonly believed that about 95% of mammal species exhibit male-biased dispersal and females' philopatry, but few species have been studied to confirm this difference in dispersal systems, especially in large species where it is difficult to track their movements or obtain sufficient sample sizes. This presentation introduces our genetic studies that used genetic methods to elucidate the dispersal patterns and seasonal movements of Asian black bears (Ursus thibetanus).

We estimated parentage using DNA from 550 captured individuals and found that there was a 3.6-fold difference in mean dispersal distance between males and females. Also, 96% of males dispersed from their natal area, while half of females remained in their mother's home range. Furthermore, we found that the timing of male dispersal was at 3 years of age.

The female's site fidelity results in a geographic cluster of matrilines, which disappears temporarily during autumn when there is a shortage of acorns but re-establishes the same structure the following spring.

As Asian black bears breed during the summer, any temporary autumnal movements are not expected to affect the genetic structure of the next generation. Female site fidelity is also suggested by landscape genetic analysis. Not only anthropogenic environments such as farmland and residential areas, but also natural open areas such as wetlands and bare land, impede female movement and create a "landscape of fear" for female bears.

Day: Tuesday **Time:** 15:10 – 15:25 **Room:** Hall C

Theme: Movement Ecology

Abstract Number: 166
Presentation Type: Oral Presentation
Presentation Title: Fine-Scale Behavioral Patterns of Newly Recolonizing American Black Bears in Texas
Presenter Name: Nicole Dickan

Presenter Affiliation: Borderlands Research Institute
Presenter Email: ndickan@gmail.com
All Authors: Nicole Dickan, Justin T. French, Dana L.Karelus, Matthew O. Hewitt, Amanda M. Veals Dutt, Louis A.Harveson
Primary Author Occupation: Student

Abstract:

American black bears (Ursus americanus) began recolonizing western Texas, U.S.A. in the 1980s after being extirpated from the state. However, recolonization has been slow in this sky island-desert ecosystem and black bears remain a threatened species in Texas today. Despite their protected status, little is known about this population and information on their behavioral patterns is severely lacking. Therefore, we collared 22 bears with GPS collars programmed with 2-hour fix rates. Using hidden Markov models, we segmented the movement paths of 17 bears (11 M, 6 F) into 4 behavioral states based on probability distributions of step lengths (SL), turning angles, residence times (RS), and revisitation rates (RV). We found evidence of four states, consistent with resting, foraging, and dispersive movements, as well as a distinctive behavior when using point attractants (e.g. deer feeders). The resting and attractant states both represented localized movement behaviors (x̄SL = 8.2 ± 0.1(SE), 151.4 ± 5.0) but the attractant state was distinguishable by disproportionally high revisitation rates and residence times (x̄RT = 41.1 ± 0.6, x̄RV = 6.6 ± 0.1). There were daily and seasonal patterns in the proportions of fixes in each state. Traveling was most prevalent during early morning, evening, and in summer. The attractant state was most prevalent in fall during hyperphagia. We then examined the influence of environmental covariates on the transition probabilities between states to investigate which abiotic and biotic factors influenced where bears made specific behavioral decisions. Understanding drivers of bear behaviors can improve our ability to predict future behaviors in novel environments as they continue recolonization and allow us to predict future conflict areas. Additionally, understanding habitat characteristics associated with these behavioral processes will be crucial for identifying key areas in need of protection for long-term population viability.

ORAL PRESENTATIONS

Day: Tuesday **Time:** 15:10 – 15:25 **Room:** Salon 4

Theme: Bear Behaviour

Abstract Number: 61
Presentation Type: Oral Presentation
Presentation Title: Modeling prey & predator: Using army cutworm moth seasonal occurrence to inform grizzly bear foraging
Presenter Name: Erik Peterson
Presenter Affiliation: Washington State University
Presenter Email: erik.d.peterson@wsu.edu
All Authors: Erik Peterson, John S. Waller, Don White Jr., James R. Pierce, Daniel H. Thornton
Primary Author Occupation: Student

Abstract:

Migratory army cutworm moths (Euxoa auxiliaris; ACM) are one of the most calorie-rich food resources for grizzly bears (Ursus arctos horribilis) in the Rocky Mountains. Due to the inaccessible nature of the alpine talus slopes where ACMs reside in summer, the magnitude of the grizzly bear-ACM relationship is unclear. We undertook a two-part study to better understand the seasonal significance of this fat and protein-packed food resource for grizzly bears within 4000 km2 Glacier National Park, Montana, USA. We first conducted ground surveys of potential ACM habitat to develop presence-absence models of ACM occurrence. We found that, in particular, geological characteristics (namely dominant geological formation, surficial talus rock size and talus depth) influenced ACM occurrence. Our model predicted ACM occurrence across a total area of 12 km2, just 0.3% of the park. Second, we conducted aerial surveys to map grizzly bear use within potential ACM habitat and develop presence models of grizzly bear foraging suitability. Using predicted ACM occurrence as a single variable bear foraging model, we found ACM occurrence drove predicted patterns of grizzly bear foraging. Spatially, our models showed the overlap of ACM occurrence and grizzly bear foraging for ACMs was 69%. And temporally, grizzly bear moth consumption aligns with their crucial period of overeating to sustain winter hibernation. A grizzly has the capacity to consume ~20,000 kcal in ACMs per day, so individuals could potentially acquire ≥ 50% of their seasonal energy needs by foraging for moths. Given the significance of this predator-prey relationship and increasing off-trail human recreation, we recommend Glacier National Park implement site-level access management strategies at ACM occupied talus slopes to limit grizzly bear disturbance and minimize impacts to the energy budgets of individual bears utilizing this seasonal, concentrated food resource.

Day: Tuesday **Time:** 15:30 – 15:45 **Room:** Hall **C**

Theme: Movement Ecology

Abstract Number: 210
Presentation Type: Oral Presentation
Presentation Title: Movement and survival of polar bears in relation to sea ice and harvest in Hudson Bay.
Presenter Name: David McGeachy
Presenter Affiliation: University of Alberta
Presenter Email: mcgeachy@ualberta.ca
All Authors: David McGeachy, Nicholas J. Lunn, Joseph M. Northrup, Vicki Trim, Evan S. Richardson, Alyssa M. Bohart, Amélie Roberto-Charron, Guillaume Szor, Corey S. Davis, Andrew E. Derocher
Primary Author Occupation: Student

Abstract:

We estimated movement and survival rates between two neighbouring subpopulations of polar bears, Western Hudson Bay (WH) and Southern Hudson Bay (SH), in relation to sea ice and harvest using multistate live/dead recovery models to determine if recent changes in abundance between WH and SH were due to distributional shifts or different demographic processes. We collected skin samples from 2667 free-ranging polar bears (WH, 2017-2023, n=1748; SH, 2021-2023, n=919) and 360 harvested 2017-2023 (WH, n=182; SH, n=178). Our models included 3 separate geographical states where bears were sampled (A1, Nunavut border to the Nelson River; A2, Nelson River to the SH/WH boundary; and A3, SH/WH boundary to James Bay) and the location (western or eastern half of Hudson Bay) of remnant ice when sea ice extent reached 10% of the winter maximum. Harvest data was used to assess harvest vulnerability for each state. We found high interannual variability in the spatial distribution of remnant ice within Hudson Bay which influenced polar bear distribution. In 2021, remnant ice occurred in the east and 25% of the bears sampled in SH were identified as WH bears. In 2022, remnant ice occurred in the west and 28% of the bears sampled in SH in 2021 were resampled in WH. Movement continued from A3 into A2 in 2023 with movements rates higher for adult males (0.28, 95%CI 0.18 to 0.39) than adult females (0.23, 95% CI 0.13 to 0.37). Movement rates between the two subpopulations were similar to the increase in SH and decrease in WH abundance derived from aerial surveys in 2021. Harvest vulnerability was not equal among the states with A2 having a lower rate of harvest resulting in higher survival rates for bears in this area. We conclude that the movement of bears between A2 and A3 is influenced by patterns of remnant ice resulting in distributional shifts that likely influenced abundance estimates and that variation in harvest vulnerability impacts survival for polar bears in Hudson Bay.

Day: Tuesday **Time:** 15:30 – 15:45 **Room:** Salon 4

Theme: Bear Behaviour

Abstract Number: 289
Presentation Type: Oral Presentation
Presentation Title: Using anomaly detection with radio-collar activity data to determine the presence and timing of grizzly bear parturition
Presenter Name: Lori Roberts
Presenter Affiliation: Montana Fish, Wildlife & Parks
Presenter Email: LRoberts@mt.gov
All Authors: Lori Roberts, Cecily M. Costello, Milan A. Vinks, Daniel D. Bjornlie, Matthew D. Cameron, Justin G. Clapp, Mark A. Haroldson, Grant V. Hilderbrand, Kyle Joly, Wayne Kasworm, Jeremy Nicholson, Tom Radandt, Mathew S. Sorum, Justin Tiesberg, Frank T. van Manen
Primary Author Occupation: Professional

Abstract:

Documenting natality of radio collared grizzly bears (Ursus arctos) is a key component of many population monitoring programs. Because grizzly bears give birth during hibernation, observation of litters is not possible until den exit and detection of cubs can be compromised by low sightability. Using activity data from dual-axis motion sensors, previous researchers developed methods to confirm parturition based on characteristic changes in activity between pregnancy and

postpartum periods. Unable to replicate their results with data from 3-axis accelerometers, we developed an alternative technique to detect births by the presence of spikes in activity likely triggered by prolonged postpartum licking by mothers. Using a test sample of daily activity counts during 25 Dec–7 Mar (n = 22 known parturient females), we applied the R routine anomolize and developed presence criteria. To test performance, we applied the technique to a blind sample of time-series obtained from females in 4 populations in interior North America (n = 296). We assigned predicted status and compared assignments to observed status at first visual observation. The true positive rate was 94% (n = 47 observed parturient females). The false positive rate was 14% (n = 65 females observed with older offspring). Births were predicted for 47% of females that were never observed (n = 49), 21% of females observed without offspring (n = 114), and 10% of females considered too young to reproduce (n = 21). Dates of predicted births varied from 27 Dec to 28 Feb. Our anomaly detection technique was successful at estimating parturition events, and despite some error, indicated that a number of litters were born but not observed, likely because of mortality in the den or shortly after den exit. This technique may provide an additional tool for supplementing visual observations for natality monitoring and population modeling, provided that potential biases stemming from increased detection rates are considered.

Day: Tuesday **Time:** 15:50 – 16:05 **Room:** Hall C

Theme: Movement Ecology

Abstract Number: 309
Presentation Type: Oral Presentation
Presentation Title: Sea ice dynamics influence movement patterns of adult female polar bears of the Southern Hudson Bay subpopulation
Presenter Name: Martyn Obbard
Presenter Affiliation: Ontario Ministry of Natural Resources and Forestry
Presenter Email: martynobbard@gmail.com
All Authors: Martyn Obbard and Kevin R. Middel
Primary Author Occupation: Retired

Abstract:

To access seals, polar bears (Ursus maritimus) move large distances over the sea ice in winter. Already documented declines in ice duration for Hudson Bay are predicted to continue, likely affecting polar bear movement patterns. Using data from GPS collars, 2007-2011, we describe movement patterns of adult female polar bears of the Southern Hudson Bay (SH) subpopulation. We tested effects of season and reproductive class on movement rates, distance travelled, displacement distance and direction, and home range size. Except for denning females, reproductive class had no effect on movement rates, which were greatest during freeze-up and least during summer. Across all reproductive classes and seasons, mean hourly movement rate was 0.63 km/h. Mean annual distance moved by non-denning females was 4771 km. During freeze-up, bears moved north-easterly from the Ontario coast towards the Belcher Islands and Québec following the forming ice edge. During breakup, bears moved southerly towards the Ontario coast and away from the residual ice that occurs north of the Ontario coast. In fall, denning females moved southerly and inland to den. Mean annual minimum convex polygon (MCP) home range size was 153, 866 km2, with no effect of reproductive class nor change over time. Home range estimates from kernel density estimators and Brownian bridge movement models (BBMM) varied by reproductive class and were smaller than MCP ones. BBMM estimates likely yield more realistic patterns of space use by polar bears. Using data from satellite collars, 1997-2003, we compared travel distance and home range size between periods (1997-2003; 2007-2011). We found weak evidence of a difference in distance moved between periods, perhaps due to a period of ice stability in the 2000s. Our results identified patterns of use of extensive areas of Hudson Bay by SH bears in winter..

Day: Tuesday **Time:** 15:50 – 16:05 **Room:** Salon 4

Theme: Bear Behaviour

Abstract Number: 290
Presentation Type: Oral Presentation
Presentation Title: Mitigation and compensation of brown bear predation on semi-domestic reindeer in Scandinavia
Presenter Name: Ole Gunnar Støen
Presenter Affiliation: Norwegian Institute for Nature Research & Norwegian University of Life Sciences
Presenter Email: ole.stoen@nina.no
All Authors: Ole Gunnar Støen, Peter Andersson, Peter Segerström, Jonas Kindberg
Primary Author Occupation: Professional

Abstract:

The brown bear population in Scandinavia has tripled over the last three decades. However, due to hunting, bears remain classified as near-threatened (NT) in Sweden and endangered (EN) in Norway. Sámi reindeer husbandry is essential to Sámi culture in Scandinavia, and compensation is provided for reindeer losses. Due to the increased bear population, the extent of this compensation is disputed, prompting both countries to revise the compensation system. Amidst the ongoing controversy, there is a lack of data on bear predation on reindeer.

With funding from the governments of both countries and the Sámi Parliament in Sweden, we initiated a unique collaborative research project with three Sámi reindeer herding communities in Sweden to quantify the annual brown bear kill rate on reindeer.

We monitored > 60 GPS-collared bears and > 2500 adult female reindeer over a span of 9 years. Using proximity collars and a 'virtual fence,' the GPS collars tracked the bear's position every 1 or 5 minutes as they traversed reindeer calving grounds. Field teams, consisting of a bear scientist and a Sámi reindeer herder, systematically visited all locations where bears spent more than 3 or 10 minutes. This allowed the teams to identify freshly killed reindeer carcasses, enabling a precise assessment of kill rates for both calves and adult reindeer.

Brown bears primarily targeted reindeer calves, especially during the peak of calving. The estimated kill rate of 0.3-0.5 calves per day during calving in May to mid-June suggests that brown bears might account for most of the annual calf losses in the reindeer herding districts. Adult reindeer were infrequently preyed upon, with a rate one-tenth of that of calves. After mid-July, when berries become abundant, bear predation on reindeer ceased.

Our result indicates effectiveness of localized mitigation strategies, such as increased hunting quotas within confined calving grounds or selectively culling during calving.

ORAL PRESENTATIONS

Day: Tuesday **Time:** 16:10 – 16:25 **Room:** Hall C

Theme: Movement Ecology

Abstract Number: 320
Presentation Type: Oral Presentation
Presentation Title: Fine-scale space use of female black bears across a fragmented landscape.
Presenter Name: Jacob Humm
Presenter Affiliation: Oklahoma State University
Presenter Email: jhumm@okstate.edu
All Authors: Jacob Humm and W. Sue Fairbanks
Primary Author Occupation: Student

Abstract:

The spatial distribution of resources on the landscape strongly affects black bear home range size, structure, and location. Larger home ranges and changes in foraging behavior are observed in more heavily fragmented areas due to lack of available food resources, physical barriers to movement, spatiotemporal avoidance of humans, or hunting pressure. Oklahoma's east-central black bear population occupies a patchy, fragmented landscape characterized by disjunct habitat patches surrounded by anthropogenic disturbance. Previous research using the kernel density estimator (KDE) suggested average home range sizes of adult females in the east-central population may be larger than those of adjacent populations due to habitat fragmentation. However, within-home range movement in highly fragmented habitat may not be accurately represented by traditional home range estimators such as the kernel density (KDE) and minimum convex polygon (MCP) estimators.

With Brownian Bridge movement modelling (BBMM), utilization distributions (UDs) that account for temporal autocorrelation can be estimated. As such, UDs can provide a more accurate representation of movement and resource utilization within a home range, i.e., 3rd order resource selection. My objectives were 1.) to compare female UDs derived from dynamic BBMM to UDs derived from the KDE method to show how they differ as a function of habitat fragmentation and resource availability, and 2.) to estimate how 3rd order selection is altered as a function of habitat fragmentation.

Day: Tuesday **Time:** 16:10 – 16:25 **Room:** Salon 4

Theme: Bear Behaviour

Abstract Number: 330
Presentation Type: Oral Presentation
Presentation Title: How far is the female den
Presenter Name: Slaven Reljic
Presenter Affiliation: Oikon Ltd
Presenter Email: slaven.reljic@gmail.com
All Authors: Slaven Reljic, Goran Guzvica, Lidija Sver, Gaja Hana Francky, Laura Schulte, Ratko Popovic, Djuro Huber
Primary Author Occupation: Professional

Abstract:

If you see a bear family with newborn cubs, the typical question is: How far away is their den? The answer is particularly important if new infrastructure (such as wind turbines) is planned in the area. The Environmental impact assessment is expected to determine the minimum safe construction exclusion zone. We know that bears tend to choose remote areas with no human influence, which are usually difficult to access and/or at higher altitudes. It is of utmost importance to preserve the brown bears' denning areas. In Croatia, the construction of wind farms in these areas has been rising in recent years.

In this study, we wanted to answer the question of how far a female bear, alone, with cubs of the year (COYs) or yearlings, moves away from the den in the moment of the observation (with an automatic camera or by a human). In this way, we can make the best possible estimate of the minimum distance at which the wind turbine can be built. We collected the telemetry data of 11 female brown bears tracked in Croatia in a period from 2010 to 2024. For each of the females, we have verified data on their reproductive status. We analyzed the GPS data for four standard seasons and compared the size (MCP 100%) of the females' seasonal ranges in terms of the presence or absence of COYs or yearlings. We also measured the greatest distance from the den to the edge of the range in certain seasons. The smallest home ranges and the smallest distance from the den occurred in spring after females had emerged from the den with cubs of the year, on average 6.5 km2 and 3.9 km, respectively. The seasonal range size of females with COYs increased in summer (22 km2; 5.7 km) The largest range and the greatest distance from the den was in the autumn (females with COYs making excursions; 349 km2 and 47 km, respectively). Excursions occurred mostly in September or October, except for one female who made it in the spring season. The length of the trips ranged from 10 to 38 km.

Day: Thursday **Time:** 08:00 – 08:15 **Room:** Hall C

Theme: Habitat Relationships

Abstract Number: 127
Presentation Type: Oral Presentation
Presentation Title: Comparison in the ecology of two polar bear populations experiencing sea ice loss
Presenter Name: Karyn Rode
Presenter Affiliation: US Geological Survey
Presenter Email: krode@usgs.gov
All Authors: Karyn Rode, Todd Atwood, Ryan Wilson, Jeff Bromaghin, Anthony Pagano, Dave Douglas
Primary Author Occupation: Professional

Abstract:

Polar bears are recognized in 19 populations across the circumpolar Arctic. Across their range they occupy habitats that vary in annual sea ice dynamics, ecology, and rates and degrees of sea ice loss. Over the past decade, a wide range of studies have been conducted that shed light on polar bear ecology and their limits to adapting to environmental change. The two adjacent populations with ranges in Alaska have provided informative case studies. Both populations occupy habitats in which sea ice is available year-round but retreats northward in the summer. As sea ice loss has occurred, both populations have increasingly summered on land. In the southern Beaufort Sea (SBS), bears come onshore in northern Alaska where most bears feed on the remains of subsistence-harvested bowhead whales. In the Chukchi Sea (CS), the majority of bears that summer on land come to Wrangel and Herald islands as sea ice retreats, the northernmost land masses. In contrast to SBS bears, CS bears largely rest along the immediate coastline. However, despite access to a consistent and predictable food resource on shore in the SBS, the population declined in recent years whereas the CS population has appeared stable. Studies

of bear behavior and ecology on the sea ice suggest that SBS bears had a series of years with poor access to prey over the narrow continental shelf leading to low cub survival and subsequent population decline. In contrast, polar bears in the CS occupy habitat over a vast, shallow continental shelf that appears to support higher densities, abundance, and wider distribution of bearded and ringed seals. As summer and spring sea ice loss have occurred in the CS, bears appear to have maintained access to their prey. This presentation will synthesize multiple studies conducted in the two populations that suggest that differences in regional ecology and geography play important roles in determining polar bear sensitivity to sea ice loss.

Day: Thursday **Time:** 08:00 – 08:15 **Room:** Salon 4

Theme: Captive Bears, Zoos, and Physiology

Abstract Number: 40
Presentation Type: Oral Presentation
Presentation Title: Vitek® analysis of sloth bear scats from wild and captive populations reveals differences in their gut microbiota and antibiotic resistance
Presenter Name: Sakhi Dabhi
Presenter Affiliation: WCB Research lab, Hemchandracharya North Gujarat University
Presenter Email: sakhidabhi291@gmail.com
All Authors: Sakhi Dabhi and Nishith Dharaiya
Primary Author Occupation: Student

Abstract:

Sloth bear is considered as one of the largest myrmecophagous mammals. In addition to their consumption of ants and termites, they also consume a large variety of plant food. The present study compared the presence of selected bacterial species within the wild and captive sloth bear populations, and investigated the incidence of antimicrobial resistance for both populations. The antibiotic susceptibility test would be helpful for veterinary care protocols, but will also indicate any presence of resistance in the wild population. The study was conducted using a non-invasive method, by isolating microorganisms from fresh scat samples collected from Jessore Wildlife Sanctuary of Gujarat (wild) and Bannerghatta Bear Rescue Centre and Bannerghatta Zoo (captive). Standard microbiological techniques were used for isolation, growing bacteria on differential media, followed by Gram staining. The Vitek 2 compact system (bioMerieux®) was used to identify the isolated microorganisms and to determine their antibiotic susceptibility. A total of 19 and 22 colonies were isolated from wild and captive sloth bear scats respectively. Of these colonies, eight microorganisms from the wild and nine from the captive sloth bear scats were identified. Further, two organisms were found in common for both populations. Apart from the bacteria, one scat collected from the wild was found to contain Candida albicans fungi. The antimicrobial susceptibility test revealed that ten out of 22 organisms from captive population are resistant to 38 different antibiotics, whereas, in case of wild population, only two out of 19 organisms were found resistant to 34 different antibiotics. It is therefore recommended that susceptibility should be tested before antibiotic treatment is given. In addition, the significant daily use of Jessore Wildlife Sanctuary by livestock and local villagers, our finding of little antibiotic resistance is reassuring, though further studies in this area would be helpful.

Day: Thursday **Time:** 08:20 – 08:35 **Room:** Hall C

Theme: Habitat Relationships

Abstract Number: 159
Presentation Type: Oral Presentation
Presentation Title: Sea Ice Phenology and Polar Bear Habitat Selection at the Southern Extent of the Species' Range
Presenter Name: Tyler Ross
Presenter Affiliation: York University
Presenter Email: tyler.robert.ross@gmail.com
All Authors: Tyler Ross, Gregory W. Thiemann, Martyn E. Obbard, Kevin R. Middel, Joseph M. Northrup
Primary Author Occupation: Student

Abstract:

Accounting for differences in habitat use among individuals within sympatric populations is important for identifying appropriate scales of management, particularly in the context of climate change, which may differentially impact wildlife based on their spatial distribution. This is especially relevant in the Arctic where temperatures are warming faster than the global average. For sea-ice-dependent species such as polar bears (Ursus maritimus), understanding regional differences in habitat use is essential for crafting adaptive conservation strategies that reflect the different scales at which climate change may be affecting the species across its range. Here, we examined long-term trends in sea ice phenology, and habitat selection of polar bears in James Bay, the southern-most continuously occupied area of the species' range. Between 1979-2022, duration of the ice-free season increased at a rate of 2.9 days decade-1, slower than the broader Southern Hudson Bay area, which experienced an increase of 4.7 days decade-1 over the same period. Polar bears equipped with GPS-satellite collars between 2012-2015 varied in the extent of their geographic home ranges, ranging from 23,596-263,679 km2. The population-level home range encompassed 121,338 km2, and included areas extending from the Belcher Islands to southern James Bay. Polar bears exhibited seasonal variation in selection of finer-scale habitat characteristics within their home range. Bears routinely selected areas with higher sea ice concentration, and appeared to prefer areas further from the coast during the early winter, then switched to areas closer to shore during spring when prey availability peaks. Documenting sea ice conditions and patterns of polar bear habitat selection is important to establish baseline information against which future changes can be compared. This is particularly important for polar bears at the southern extent of their range where near-term changes are expected to be greatest.

ORAL PRESENTATIONS

Day: Thursday **Time:** 08:20 – 08:35 **Room:** Salon 4

Theme: Captive Bears, Zoos, and Physiology

Abstract Number: 44
Presentation Type: Oral Presentation
Presentation Title: Using photographs from remote cameras to estimate bear body condition
Presenter Name: Garth Mowat
Presenter Affiliation: University of British Columbia
Presenter Email: garth.mowat@gov.bc.ca
All Authors: Garth Mowat, Troy Malish, Laura Smit, Bruce McLellan
Primary Author Occupation: Professional

Abstract:

Body condition of individual large mammals is a highly labile parameter that is influenced by the recent nutritional plane, the seasonal hormonal cycle, intrinsic traits such as age and reproductive status, food availability and quality, and extrinsic stress factors such as predation risk, social dominance or human disturbance. Body condition thus integrates many population and individual level factors into a single measure of performance which makes it ideal for long-term population monitoring. Long-term longitudinal studies are often the best way to learn about how the vagaries of the environment affect population performance because they can contrast short-term fitness with interesting covariates across time. In temperate environments climate and weather interact to create good and bad periods for animals that are often autocorrelated. Large mammals in temperate environments bet-hedge against future stress periods by storing energy, usually as fat. We measured body condition of bears using remote cameras and compared this data to live capture derived measures from the same study area. We found that photograph derived measures of body condition were similar to weight per length measures derived from bears in hand; both metrics were seasonally different from measures of body fat. Photographs allow the comparison of body condition among individuals, seasons, and populations through time, while also considering the variation within the sample. The option to collect many samples should enable the examination of novel aspects of the dynamics of population fitness of bears, and perhaps other species.

Day: Thursday **Time:** 08:40 – 08:55 **Room:** Hall C

Theme: Habitat Relationships

Abstract Number: 186
Presentation Type: Oral Presentation
Presentation Title: A life-cycle based bioenergetic model can explain the decline of a polar bear population across four decades of sea-ice loss
Presenter Name: Louise Archer
Presenter Affiliation: University of Toronto
Presenter Email: louise.archer@utoronto.ca
All Authors: Louise C Archer, Stephen N Atkinson, Nicholas J Lunn, Stephanie R Penk, Péter K Molnár
Primary Author Occupation: Professional

Abstract:

The Arctic is the fastest warming region on Earth, threating the persistence of Artic species. Polar bears are particularly vulnerable because warming leads to declines in their essential sea-ice foraging habitat. Longer ice-free periods have been linked with declining metrics of population health, but a data-validated framework quantifying the processes linking sea-ice dynamics to polar bear vital rates is lacking, limiting our ability to quantify risk and proactively manage populations. To determine the quantitative links between physiology, population dynamics, and environmental change, we developed an individual-based bioenergetic model that incorporates key energetic processes across a polar bear's lifecycle. We used the model to reconstruct the dynamics of polar bears in Western Hudson Bay across four decades under observed sea-ice conditions. We then compared outputs from model hindcasts to long-term population monitoring data (1979-2016) and found that the model was able to successfully capture empirical trends in individual morphometrics, reproduction metrics, and overall population size. The modelling framework demonstrates that an observed decline in a sentinel population of polar bears can be mechanistically explained by the effects of sea-ice loss on individual energy budgets, which scale up to influence population vital rates.

Day: Thursday **Time:** 08:40 – 08:55 **Room:** Salon 4

Theme: Captive Bears, Zoos, and Physiology

Abstract Number: 72
Presentation Type: Oral Presentation
Presentation Title: Successfully returning American black bear (Ursus americanus) cubs-of-the-year to the wild after being orphaned and raised in captivity
Presenter Name: Paul Frame
Presenter Affiliation: Government of Alberta
Presenter Email: paul.frame@gov.ab.ca
All Authors: Paul Frame
Primary Author Occupation: Professional

Abstract:

Prior to spring 2018, provincial policy in Alberta prohibited the captive rearing and release (CRR) of orphan black bear (Ursus americanus) cubs (OBBC), a practice referred to as rehabilitation. Even with black bear populations reported to be stable or increasing range-wide in North America, Alberta responded to public pressure and officially allowed CRR of OBBCs by developing the Alberta Orphan Black Bear Cub Rehabilitation Protocol. This protocol guides details around the intake, care, and release of OBBCs in Alberta. The preferred strategy described in the protocol is to release cubs-of-the-year (COY) in late October of their first year, thus allowing them to den in the wild and emerge in spring as free-living bears. This strategy has met resistance from the public, who raise concerns about the age of self-sufficiency in black bears. In Alberta, all CRR OBBC released since 2018 (n= 18) have been monitored with GPS tracking collars to evaluate over-winter survival. To date, 12 COY have been released in late October (average 157 days in captivity, range 93-204 days), and all 12 successfully denned and emerged in spring. Cubs denned an average of 7 days (range 3-19 days) after release. The denning period of CRR cubs averaged 166 days (range 154-184 days), similar to that reported for all age and reproductive classes in Maine (Range 134-197). Although our sample is small and the cubs were artificially fed and in abnormally good body condition, all 12 COY released in late October successfully overwintering without their mother provides some insight to the age of self-sufficiency in black bears. These results also support the Alberta strategy to release COYs in late October and may be relevant to other jurisdictions facing similar pressures.

Day: Thursday **Time:** 09:00 – 09:15 **Room:** Hall C

Theme: Habitat Relationships

Abstract Number: 215
Presentation Type: Oral Presentation
Presentation Title: Camera trapping in southeast Peru shows no obvious evidence of seasonal habitat use by Andean bears
Presenter Name: Russell Van Horn
Presenter Affiliation: San Diego Zoo Wildlife Alliance
Presenter Email: rvanhorn@sdzwa.org
All Authors: Russell Van Horn, Denisse Mateo Chero, Fernando Hancco Pacha, Flynn B Vickowski, Ronald R Swaisgood, Mathias W Tobler, Megan A Owen
Primary Author Occupation: Professional

Abstract:

It is not well known what determines the Andean bear's current habitat use. Thus, we cannot predict its future habitat use, because Andean forest composition is shifting under climate change. In addition, although seasonal habitat use has been predicted for Andean bears, there have been few data to test this prediction. To begin addressing these questions, we installed camera traps at 102 locations within the Manu Biosphere Reserve of SE Peru, descending from treeline (~3750masl) to the Amazon rainforest (532masl). From 2016–2022, across 84,266 camera-days (c-d), we recorded 597 independent detections of ³25 adult bears. Although 21% of sampling effort (18,223 c-d) was below 1500 masl, <1% of bear detections (n=4) were recorded at that elevation. To begin evaluating seasonal shifts in habitat use, we split data into the dry season (May Oct; 42,115 c-d) and the wet season (Nov Apr; 42,151 c-d). We recorded 249 independent detections of bears in the dry season (0.59 detections/100 c-d), at an average elevation of 2992 masl (839-3586, SD=664.7). We also recorded 348 independent detections of bears in the wet season (0.83 detections/100 c-d), at an average elevation of 3031 masl (811-3586, SD=628.5). Neither the rate of detections (p=0.49), nor their elevations (p=0.46), varied between seasons. Thus, unless future individual-based analyses show the contrary, we see no seasonal changes in elevation by bears in this landscape. The entire forested gradient above 1500masl appears to be year-round bear habitat, possibly due to the high diversity and heterogeneity of these forests. In contrast, although lowland Amazonian forests are more biodiverse, they appear unsuitable for bears, possibly due to the presence of jaguars, or due to an unknown combination of abiotic factors. Without knowing what factors restrict these bears, we cannot predict how their distribution will change, or suggest interventions. Future collaborative large-scale analyses may guide mitigation plans.

Day: Thursday **Time: 09:00 – 09:15** **Room: Salon 4**

Theme: Captive Bears, Zoos, and Physiology

Abstract Number: 96
Presentation Type: Oral Presentation
Presentation Title: Species-specific validation of commercial immunoassays for accurate hormone quantification in polar bear serum
Presenter Name: Erin Curry
Presenter Affiliation: Cincinnati Zoo & Botanical Garden
Presenter Email: erin.curry@cincinnatizoo.org
All Authors: Erin Curry, Emily Virgin, Adrianna Tompros, Jessye Wojtusik
Primary Author Occupation: Professional

Abstract:

Although steroid and thyroid hormones are frequently studied in polar bears, there is growing interest in evaluating less commonly investigated protein hormones and their roles in reproduction, health, and metabolism. Due to limited availability of antibodies specific to polar bear analytes, commercial assays designed to quantify hormones in domestic species may be considered; however, it is crucial to validate these assays using polar bear samples to ensure cross-species accuracy and reliability. Utilizing sera (n=435) collected from zoo polar bears (n=91) of both sexes, a range of ages (0-31y), and across seasons, antibodies (n=80) from commercial single-plex and multiplex enzyme-linked immunoassays targeted to canine (n=25), feline (n=15), human (n=22), mouse (n=13), or rat (n=5) analytes were evaluated. Validation steps included parallelism of serially diluted pooled samples to the assay standard curve, dilution linearity, and recovery of spiked analyte. Of the 80 antibodies analyzed, only 27 (34%) met validation criteria in polar bear serum; these included hormones involved in reproduction (AMH, FSH, LH, oxytocin, prolactin), immunity/inflammation (IFN gamma, IL-2, IL-10, IP-10) and metabolism (growth hormone, leptin, ghrelin), among others. Assays targeting canine analytes resulted in 80% successful validation, followed by mouse (31%), rat (20%), human (9%), and feline (0%). Preliminary data from individual samples revealed expected differences in hormone trends between sexes, by age, and across seasons, indicating biological validation. Additionally, several inflammatory markers were higher in individuals with known pathology compared to healthy individuals, suggesting they may serve as biomarkers of health. These findings underscore the critical importance of performing species-specific assay validations and have resulted in a suite of tools that may be incorporated into polar bear monitoring surveys, both ex situ and in situ.

Day: Thursday **Time:** 09:20 – 09:35 **Room:** Hall C

Theme: Habitat Relationships

Abstract Number: 336
Presentation Type: Oral Presentation
Presentation Title: Assessing Dietary Importance of Army Cutworm Moths to Grizzly Bears in the Greater Yellowstone Ecosystem
Presenter Name: Jennifer Fortin-Noreus
Presenter Affiliation: US Fish and Wildlife Service
Presenter Email: HYPERLINK "mailto:jennifer_fortin-noreus@fws.gov" jennifer_fortin-noreus@fws.gov
All Authors: Jennifer Fortin-Noreus, Dan Tyers, Andy Pils, Justin E.

ORAL PRESENTATIONS

Teisberg, Joy Erlenbach, Hilary Cooley
Primary Author Occupation: Professional

Abstract:

Grizzly bears in the Greater Yellowstone Ecosystem (GYE) are opportunistic omnivores that move seasonally within their home ranges depending on food abundance. While grizzly bears supplement their diet with lower-caloric foods that tend to be widely distributed and readily available (vegetation, insects, fungi, berries, small mammals), the availability

and distribution of high-caloric foods in the GYE (e.g., ungulates, army cutworm moths, whitebark pine seeds) has the potential to influence seasonal movements of grizzly bears. Previous studies have investigated grizzly bear use of whitebark pine seeds and ungulates, yet little is known about grizzly bear use and availability of army cutworm moths. Some grizzly bears whose home ranges overlap with army cutworm moth aggregation sites appear to forage extensively on moths during mid-to-late summer when the moths aggregate on remote, high-elevation talus slopes, but many questions remain regarding the importance of this food source to the GYE grizzly bear population. The Interagency Grizzly Bear Study Team annually monitors trends in grizzly bear presence at confirmed moth sites through aerial observations, providing an indirect measure of the importance of moths in a given year. Using stable isotope analysis ($\bar{}$15N, $\bar{}$13C, $\bar{}$2H), we present a method to instead directly estimate the proportion of assimilated diet composed of army cutworm moths. Likely because of their migratory life history, the hydrogen isotopic ratio ($\bar{}$2H)

of army cutworm moths at confirmed aggregation sites is unique when compared to other food items in the GYE. Additionally, hair samples were collected and analyzed from 1) bears at or near confirmed moth sites and

2) collared bears with no GPS locations at confirmed moth sites. Moths, other dietary items, and hair samples will be collected from additional peaks during 2020 for expanded analysis.

Day: Thursday **Time:** 09:20 – 09:35 **Room:** Salon 4

Theme: Captive Bears, Zoos, and Physiology

Abstract Number: 107
Presentation Type: Oral Presentation
Presentation Title: Ending Bear Bile Farming in Vietnam by 2026 as a conservation measure to protect Asiatic black bears
Presenter Name: Tuan Bendixsen and Jill Robinson
Presenter Affiliation: Animals Asia Foundation
Presenter Email: jrobinson@animalsasia.org
All Authors: Tuan Bendixsen, Heidi Quine, Jill Robinson
Primary Author Occupation: Professional

Abstract:

Bear farming in Vietnam, fueled by the demand for bear bile for use in traditional medicine, has threatened bear conservation and raised significant concerns for the welfare of farmed bears. To end bear farming, strategies that address law enforcement, demand for bile, and provide lifelong care for rescued bears in sanctuaries are needed. This presentation describes Animals Asia's holistic approach in partnering with the Vietnamese government to close down bear farms and eliminate bear bile demand through public education and the promotion of herbal alternatives. Collaborative actions with the government in law enforcement and rescuing bears from bile farms have resulted in a gradual reduction of farmed bear numbers from 4349 in 2006, to 3000 in 2010, to 1284 in 2014, to 916 in 2000, and to less than 250 in 2024. Education regarding the cruelty of bear farming, the illegality of bile extraction and trading, and the community's uptake of herbal alternatives to bear bile has caused a collapse of the bear bile market, where the price of one milliliter of bile dropped from $20 US in 2007 to less than $5 US in 2024. The partnership with the Vietnam Traditional Medicine Association has produced a herbal balm composed of extracts of herbal plants that are used in traditional medicine to replace bear bile. Public attitude surveys of this herbal balm in the most concentrated bear farming communities in Hanoi showed that 80% of the community was satisfied with the herbal alternative to bear bile, and 92% indicated that they would use the herbal balm again. Providing consumers of bear bile with a valid alternative is a long-term solution to end bear bile demand and eradicate the suffering and abuse of bears on farms. In summary, a combination of perseverance and sustained holistic approaches by Animals Asia has resulted in the government enacting a Directive that bear bile farming in Vietnam will end by the end of 2026.

Day: Thursday **Time: 09:40 – 09:55** **Room: Hall C**

Theme: Habitat Relationships

Abstract Number: 233
Presentation Type: Oral Presentation
Presentation Title: Fundamental versus Realized Niche of Grizzly Bear Denning Habitat Across Canadian National Parks; Implications of Anthropogenic Disturbance
Presenter Name: Ramona Maraj
Presenter Affiliation: Parks Canada
Presenter Email: ramona.maraj@pc.gc.ca
All Authors: Ramona Maraj, Nolan Waters, Emily Gavey, Peter Demontigny, Erin Henderson, Rachel Stapleton
Primary Author Occupation: Professional

Abstract:

Expansion of and increase in human modification between 1990 and 2015 resulted in 1.6 million km2 of natural land lost globally. We examined the implications of this on grizzly bear denning habitat in seven Canadian national parks. We used 417 den locations across seven western Canadian national parks, ranging through British Columbia, Alberta, the Northwest Territories and Yukon. Den locations were obtained from aerial sightings, staff or public sightings, and collared bears. We used MaxEnt to model the influence of 21 covariates on third order den site selection across the extent of the study area. To model the fundamental niche for den selection, we considered a model without any anthropogenic influence. We subsequently considered a realized niche den model that incorporated distance to linear features and global human modification as explanatory variables. Our fundamental niche model showed that across grizzly bear range, the visibility of the sky and solar radiation were important factors that drive den selection. Our models also showed that denning habitat availability decreases with latitude, until the Arctic coast, where availability becomes widespread again. Our realized niche model showed that anthropogenic influences were the most important factor influencing den site selection, with global human modification contributing almost 50% explanatory power to the model and creating a disproportional loss of denning habitat across all parks. At current rates of human modifications, availability of denning habitat may become limiting for bears, even in protected areas.

Day: Thursday **Time:** 09:40 – 09:55 **Room:** Salon 4

Theme: Captive Bears, Zoos, and Physiology

Abstract Number: 293
Presentation Type: Oral Presentation
Presentation Title: Insight on the inside: histomorphological study of brown bear adrenal glands
Presenter Name: Agnieszka Sergiel
Presenter Affiliation: Institute of Nature Conservation of Polish Academy of Sciences
Presenter Email: sergiel@iop.krakow.pl
All Authors: Agnieszka Sergiel, Abbey E. Wilson, Ewa Serwa, Joanna Macur, Łukasz Paśko, Bartosz Leszczyński, Andrzej Wróbel, Jerzy Wiater, Jumpei Tomiyasu, Heather Bacon, Robert Maślak, Slaven Reljić, Djuro Huber
Primary Author Occupation: Professional

Abstract:

Brown bear physiology is closely tied to seasonal changes. Hypothalamic-pituitary-adrenal (HPA) axis plays an important role in regulating physiologically distinct states related to those, and adrenal glands are the effectors. They produce and secrete glucocorticoid hormones (e.g., cortisol and corticosterone), which play a key role in regulating vital physiological processes. Morphologically the adrenal glands exhibit a high degree of variation, with significant asymmetry observed between the right and left glands within species and interspecifically. Adrenal gland variation is also related to the zonation of the cortex. Parameters related to its shape and size have been used as a principal criterion for differentiating a normal gland from adrenal hyperplasia. Our objectives were to describe histomorphology of brown bear adrenal glands, establish reference measurements to estimate adrenal size, and to assess the effects of season, body mass, structural body size, age, and sex of individuals on adrenal parameters. We used 325 formalin-preserved adrenal glands collected from 173 individuals of the Dinaric-Pindos brown bear population. The mass, length, width, thickness, and volume of glands were measured and allometric scaling was examined. Adrenal length, width and thickness showed negative allometry with total body length (univariate allometric coefficients: 0.76, 0.63 and 0.8 for the right gland, and 0.64, 0.74 and 0.73 for the left gland, respectively). On average, the mass of adrenal glands was 0.006% of the individual body mass. Additionally, we conducted histological analysis of 21 freshly collected adrenals of 16 individuals. Eight pairs of adrenal glands were also micro-CT-scanned, resulting in visualizations of size, shape and surface, virtual cross-sections, and volumetric analysis. Our study presents the first database of normal physiological, anatomical, and histological values of adrenal glands for this species for use in health assessments.

Day: Thursday **Time: 10:20 – 10:35** **Room: Hall C**

Theme: Habitat Relationships

Abstract Number: 249
Presentation Type: Oral Presentation
Presentation Title: Forestry practices influence black bear and grizzly bear occurrence and co-occurrence with prey species in harvest blocks
Presenter Name: Tracy McKay
Presenter Affiliation: Parks Canada
Presenter Email: tracy.mckay@pc.gc.ca
All Authors: Tracy McKay and Laura Finnegan
Primary Author Occupation: Professional

Abstract:

Forest harvesting is a primary agent of change across the boreal forest of Canada, altering black bear and grizzly bear habitat. Silviculture practices applied after forest harvesting directly impact forage availability for bears, but there is limited research on how specific silviculture treatments (preparation, planting, tending) influence bear use of harvest blocks and co-occurrence with other species. We used camera detections, silviculture data, landscape characteristics, and vegetation data from 117 harvest blocks sampled in Alberta, Canada during 2018-2020 to assess the influence of silviculture practices, block characteristics, surrounding habitat, and forage abundance on black bear and grizzly bear occurrence and co-occurrence with prey species. We found black bear occurrence was higher in blocks that had been planted, and grizzly bear occurrence was higher in blocks that had been stand tended and with higher tree-planting densities. Black bear occurrence was higher in smaller blocks, and grizzly bear occurrence was higher in blocks where the surrounding area had lower densities of linear disturbances and harvest blocks. Black bear occurrence was higher in blocks with greater availability of fireweed, and both black and grizzly bear occurrence was higher in blocks with greater availability of rose. Co-occurrence analysis indicated that black bear occurrence was higher in blocks where white-tailed deer were detected, and grizzly bear occurrence was higher where mule deer were detected. Our study indicates that bear use of harvest blocks is driven by fine-scale block characteristics and silviculture practices as well as the habitat surrounding the block, and harvest blocks may directly influence predator-prey dynamics. The results of our study may be used to inform sustainable forest management that considers the impacts of forest harvesting practices on black bears, grizzly bears, and their prey species.

Day: Thursday **Time:** 10:20 – 10:35 **Room:** Salon 4

Theme: *Captive Bears, Zoos, and Physiology*

Abstract Number: 126
Presentation Type: Oral Presentation
Presentation Title: Validation of a hair-hormone toolkit for long-term monitoring of grizzly bears
Presenter Name: Abbey Wilson
Presenter Affiliation: Government of the Northwest Territories
Presenter Email: abbey_wilson@gov.nt.ca
All Authors: Abbey Wilson, Sarah A. Michaud, Jun Han, Gordon Stenhouse, Kristenn Magnusson, Karen Graham, Darío Fernández-Bellon
Primary Author Occupation: Professional

Abstract:

Population surveys using non-invasive grid-based DNA hair-snag sampling are a common tool for managers to determine density, distribution, and sex ratios of bear populations. Measuring hormones in hair samples may complement this approach by providing biomarkers indicative of physiological state that cannot be addressed by genetic methods alone. This study aimed to determine if an established targeted hormone profile measured in hair samples collected from live captured grizzly bears (Ursus arctos) in Alberta, Canada can assist in population monitoring and support management decisions. We hypothesized that the concentration of hormones can be used to determine demographic parameters for grizzly bear populations, including age-class ratios and rates of pregnancy and lactation. Approximately 25mg of hair (equivalent to about 80 guard hairs) was washed with methanol, homogenized, and extracted for liquid chromatography-mass spectrometry analyses. We detected and quantified

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15 hormones with high precision and accuracy that were classified by biosynthesis pathway: progestogens, mineralocorticoids, glucocorticoids, androgens, estrogens, and thyroid hormones. We compared individual hormone concentrations and individual hormone ratios to identify biomarkers of demographic parameters. We further calculated biosynthesis pathway group means and group ratios to create a metric that represented the entire profile. Preliminary analysis revealed that multiple hormones, hormone ratios and group ratios may be indicators of age class. These results aligned with previous research completed on captive bears, where reproductive and stress hormones were identified as predictors of age class. Androgens and mineralocorticoids were found to be related to pregnancy and lactation, respectively. By applying this metabolomic approach to hair samples collected from captured grizzly bears, we demonstrate the potential use of this method in non-invasive monitoring of grizzly bear populations.

Day: Thursday **Time:** 10:40 – 10:55 **Room:** Hall C

Theme: Habitat Relationships

Abstract Number: 344
Presentation Type: Oral Presentation
Presentation Title: Space use of brown bears across Europe's human dominated landscape: Insights from a multi-population study Presenter Name: Anne Hertel
Presenter Affiliation: Ludwigs-Maximilians University Munich
Presenter Email: HYPERLINK "mailto:anne.g.hertel@gmail.com" anne.g.hertel@gmail.com
All Authors: Anne G. Hertel, Aida Parres, Shane C. Frank, Julien Renaud, Nuria Selva, Andreas Zedrosser, Niko Balkenhol, Luigi Maiorano, Ancuta Fedorca, Trishna Dutta, Neda Bogdanović, Silviu Chiriac, Duško Ćirović, Paolo Ciucci, Csaba Domokos, Mihai Fedorca, Stefano Filacorda, Claudio Groff, Miguel de Gabriel Hernando, Djuro Huber, Georgeta Ionescu, Klemen Jerina, Alexandros A. Karamanlidis, Jonas Kindberg, Ilpo Kojola, Yorgos Mertzanis, Santiago Palazon, Mihai I. Pop, Maria Psaralexi, Pierre Yves Quenette, Agnieszka Sergiel, Michaela Skuban, Diana Zlatanova, Tomasz Zwijacz-Kozica, Marta De Barba
Primary Author Occupation: Professional

Abstract:

Species often occupy wide-geographical ranges with contrasting environmental conditions that shape intraspecific variation in space use. Three-quarters of the planet's land surface have been altered by

humans with consequences for animal movement and related ecosystem functioning. Yet, limited data availability across species' ranges has constrained our understanding of intraspecific movement variation in highly anthropized landscapes. Leveraging a unique dataset of 751 brown bear (Ursus arctos) GPS-movement trajectories that included almost the entire geographical range of this species in Europe, we investigated intraspecific variation in space use along a gradient of human impact

and resource availability. We quantified individual space use at different temporal scales, from home range sizes to 10-day and 1-day displacement distances. We found large intraspecific variation in space use across all temporal scales, with males roaming farther than females. This variation was profoundly affected by human activity (i.e., human footprint index) and resource availability (i.e., annual vegetation productivity and forest disturbances). Bears occupied smaller home ranges and moved less in more anthropized landscapes and in areas of higher resource availability. Bear home ranges overlapped little with protected areas, e.g., only 8 bears had their entire home ranges within protected areas, demonstrating that protected areas in Europe are too small to sustain brown bear populations. On a population level, bears from the Carpathian, Dinaric Pindos, and Eastern Balkan moved most, followed by bears from Fennoscandia,

while bears from the Alpine and Apennine moved most. Restricted bear movements in areas of high human footprint hinders connectivity among some populations in south-central Europe which are close in proximity. In areas of high human footprint, such as the Italian Alps or Serbia, establishing and maintaining movement corridors is essential to promote connectivity.

Day: Thursday **Time:** 10:40 – 10:55 **Room:** Salon 4

Theme: Captive Bears, Zoos, and Physiology

Abstract Number: 147
Presentation Type: Oral Presentation
Presentation Title: Forest skill patterns of rehabilitant sun bears (Helarctos malayanus) at the Bornean Sun Bear Conservation Centre, Sabah, Malaysia
Presenter Name: Laura Saunders
Presenter Affiliation: University of Portsmouth
Presenter Email: laura.saunders@port.ac.uk
All Authors: Laura Saunders, Elvia Chong Qi Ern, Leanne Proops, Ana Gheorghiu, Augustine Tuuga, Siew Te Wong, Marina Davila-Ross
Primary Author Occupation: Student

Abstract:

Rehabilitant bears undergo behavioural and ecological rehabilitation to help them acquire the skills necessary to adapt to the forest and survive independently. An important set of skills for sun bears to attain is the ability to climb trees, build nests or burrows, and forage for natural resources. Although these skills may improve with time and experience, through increasing exposure to a forest environment, additional factors, including orientation to humans and personality traits, have shown to hinder rehabilitant individuals' improvement in such skills. To identify exact patterns of rehabilitant bear's forest skills, it is important to have a method which can capture these behavioural aspects and be readily available to rehabilitation centres. Rating instruments can be deployed quickly, easily, and thus may also be optimal to identify improvement in skills over time. In this study, we adapted (Rocque et al. 2022; Saunders et al. in prep) a questionnaire to capture sun bear forest skills (climbing, nest building and foraging) but also personality and human oriented behaviours. Part one of the study aimed to examine the reliability and validity of the questionnaire, which was tested through inter-rater reliability, test retest and correlations between questionnaire and observational scores. So far, the questionnaire has demonstrated predominant reliability and validity. The second part of the study aimed to analyse the scores from the questionnaire to understand how sun bear forest skills may improve. To observe this and account for additional factors, we modelled forest skills with sun bear age, years undergoing rehabilitation, and rehabilitation stages. Follow up models also considered personality and human orientation scores. Gathering this information and identifying trends in rehabilitant sun bear forest skills could help to inform future release decisions, through identifying capable independent individuals and appropriate timings for their release.

Day: Thursday **Time:** 11:00 – 11:15 **Room:** Hall C

Theme: Population Estimation

Abstract Number: 176
Presentation Type: Oral Presentation
Presentation Title: A Unified Approach to Long-Term Population Monitoring of Grizzly Bears in the Greater Yellowstone Ecosystem
Presenter Name: Matthew Gould
Presenter Affiliation: U.S. Geological Survey - Interagency Grizzly Bear Study Team
Presenter Email: mgould@usgs.gov
All Authors: Matthew Gould, Justin G. Clapp, Mark A. Haroldson, Cecily M. Costello, J. Joshua Nowak, Hans W. Martin, Michael R. Ebinger, Daniel D. Bjornlie, Daniel J. Thompson, Justin A. Dellinger, Matthew A. Mumma, Paul M. Lukacs, Frank T. van Manen
Primary Author Occupation: Professional

Abstract:

A challenge for long-term wildlife research and monitoring programs is maintaining a cohesive monitoring system. Interruptions or changes in data collections can reduce compatibility of data sets. Integrated population models (IPMs) can address these limitations by combining data sources that may be temporally disjointed into a unified statistical framework while providing a holistic view of population dynamics. We developed an IPM in a Bayesian framework for grizzly bears (Ursus arctos) in the Greater Yellowstone Ecosystem. We coupled demographic data with multiple, independent, and temporally disjoint population count data to link annual changes in population size with vital rates over 4 decades (1983–2022). Parameter estimates indicated survival of bears ≥2 years of age was high, contributing to robust population growth during the 1980s and 1990s (= 1.030–1.058). A slowing of population growth started around 2000 (2000s: = 1.023) and continued into the 2010s (= 1.009), due primarily to reductions in survival of bears <2 years of age. These findings corroborate previous research that identified density-dependent effects as a likely cause. The IPM framework provided greater certainty and understanding regarding the dynamic demographic characteristics of the grizzly bear population and serves as a powerful monitoring tool for this long-lived species. Through implementation of the IPM, we can now disseminate timely information and inference to help inform adaptive management strategies and policy decisions necessary for the continued management and conservation of this population. This robust and flexible monitoring system allows us to investigate the effects of a changing ecosystem on population dynamics, incorporate new data sources and statistical models, and respond to changes in monitoring needs for the population.

Day: Thursday Time: 11:00 – 11:15 Room: Salon 4

Theme: Captive Bears, Zoos, and Physiology

Abstract Number: 180
Presentation Type: Oral Presentation
Presentation Title: American black bear cub rehabilitation and release: Jurisdictional practices across North America
Presenter Name: Andrea Morehouse
Presenter Affiliation: Winisk Research and Consulting
Presenter Email: amorehouse@winiskresearch.com
All Authors: Andrea Morehouse, Mark Mallory, Andrew Derocher, Mark Edwards, Tricia Fleming, Martyn Obbard
Primary Author Occupation: Self-Employed

Abstract:

Rehabilitation and release back to the wild of orphaned American black bear (Ursus americanus) cubs is a management option used across North America. We reviewed the literature and surveyed wildlife managers and biologists within North America to gather information on their policies and practices regarding rehabilitation and release of orphaned black bear cubs. We define cubs as bears <1 year old but note that most releases happen when the animals are yearlings. The literature suggests that when rehabilitation follows science-based protocols, it is a feasible management option, and rehabilitated cubs survive at rates similar to those of their wild counterparts, die of similar causes, and generally have low rates of conflicts with humans. Repeatedly mentioned within both the literature and survey results was the importance of minimizing human contact and selecting appropriate release sites that consider habitat, food availability, proximity to humans, and the age structure, genetics, and density of black bears in the release area. We received 99 responses from 63 different jurisdictions. Rehabilitation of orphaned black bear cubs was allowed in 72.5% of surveyed jurisdictions with a breeding black bear population. In 82.3% of jurisdictions, a government agency was responsible for selecting release sites. The most common causes identified by our survey for cubs being orphaned were vehicle collisions (50 of 63 responses) and removal of mothers because of conflict behavior (35 of 63 responses). Almost all (96.9%) jurisdictions required rehabilitation centers to be licensed. On average, over the past 5 years (2018–2022), most (70.8%) jurisdictions rehabilitated <25 orphaned cubs. Lack of rehabilitation centers following strict, science-based protocols was a frequently mentioned challenge, as was managing public expectations. Despite these challenges, most (61%) respondents said rehabilitation of orphaned black bear cubs was either somewhat or very successful.

Day: Thursday **Time:** 11:20 – 11:35 **Room:** Hall C

Theme: Population Estimation

Abstract Number: 201
Presentation Type: Oral Presentation
Presentation Title: Large-scale estimates of Arctic grizzly bear abundance using spatial capture recapture methods.
Presenter Name: John Boulanger
Presenter Affiliation: Integrated Ecological Research
Presenter Email: boulange@ecological.bc.ca
All Authors: John Boulanger, Murray Efford, Malik Awan, Kim Poole
Primary Author Occupation: Professional

Abstract:

One of the challenges of estimating grizzly bears is obtaining estimates of abundance for large regional areas given the low densities and wide-ranging movements of bears. Traditionally, practitioners have extrapolated estimates from smaller grid-based sampling areas to larger regions, which can create uncertainty in how well the smaller area represents the region. This challenge is very apparent in the Arctic where grizzly bears have large ranges and occur at low densities, making it problematic to obtain regional estimates given that all sampling areas require helicopter

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access. In this study, we developed a sub-grid cluster sampling method to estimate grizzly bear abundance across a 156,500 km2 regional area (approximately the size of Illinois) in the Kitikmeot Region, Nunavut, using DNA-based spatially explicit capture recapture methods. In the initial phase of the study optimization methods were used to estimate sub-grid dimension, numbers of sub-grids, and number of sampling sessions required to equal the precision of previous grid-based estimates (2008-09) in a smaller area (54,200 km2) near Kugluktuk. Estimates from the initial study in 2021 demonstrated that estimates of comparable precision could be derived using subgrids with savings in effort employed. The subgrid approach has now been expanded to the larger survey area allowing estimates of abundance for the entire regional area (156,500 km2) with sampling occurring in 2022 and 2023. The results of our study illustrate the use of optimization methods as a means to evaluate and design larger-scale surveys. We discuss strengths and weaknesses of this approach with suggestions on how it may be applied to other areas.

Day: Thursday **Time:** 11:20 – 11:35 **Room:** Salon 4

Theme: Captive Bears, Zoos, and Physiology

Abstract Number: 192
Presentation Type: Oral Presentation
Presentation Title: The ultimate driver of parturition timing in grizzly bears: synchronized cues or energetic tradeoff?
Presenter Name: Cecily Costello
Presenter Affiliation: Montana Fish, Wildlife & Parks
Presenter Email: cecostello@mt.gov
All Authors: Cecily Costello, Lori L. Roberts, Daniel D. Bjornlie, Matthew D. Cameron, Justin G. Clapp, Mark A. Haroldson, Grant V. Hilderbrand, Kyle Joly, Wayne Kasworm, Jeremy Nicholson, Tom Radandt, Mathew Sorum, Justin Tiesberg, Frank T. van Manen, Milan A. Vinks
Primary Author Occupation: Professional

Abstract:

In grizzly bears, timing of parturition during hibernation has been explained by ancestral traits (delayed implantation, altricial young, and obligate maternal denning), but the ultimate driver for more precise timing has not been fully explored. Capitalizing on latitudinal and denning-period variation among 4 populations in interior North America, we tested two alternative hypotheses. First, we hypothesized that birth timing results from a physiological cue that synchronizes implantation with the onset of hibernation, allowing females to forgo reproduction should they lack adequate fat stores. Alternatively, we hypothesized that parturition is optimally timed relative to den exit to balance the energetic trade-off between minimizing lactation time to protect the mother's fitness and maximizing developmental time to increase cub survival. Based on anomaly detection in activity data, we predicted 114 parturition dates and classified females according to litter survival at first visual observation: 58% successful (with cubs); 22% unsuccessful (alone); and 20% unknown (not observed). Estimated birth dates were 27 Dec–28 Feb. With each increasing degree of latitude, model-predicted day of birth increased by 1.00 and number of days between den entry and birth increased by 2.48 ($P < 0.001$), but number of days between birth and den exit showed no trend ($P = 0.43$). Implantation dates were not centered on den entry dates ($P < 0.001$; range -15 to 91 days). The period from birth to den exit averaged 103 days for successful females but only 76 days for unsuccessful females, owing to later births and earlier emergence by unsuccessful females. Evidence supports that birth timing is governed by an energetic trade-off to maximize lifetime fitness in this long-lived species. We conclude that natural selection has favored a relatively consistent number of days between birth and den exit under normal body conditions, and a shift toward later births under poorer body conditions.

Day: Thursday **Time:** 11:40 – 11:55 **Room:** Hall C

Theme: Population Estimation

Abstract Number: 252
Presentation Type: Oral Presentation
Presentation Title: New opportunities for genetic sampling of ursids using snow tracks eDNA
Presenter Name: Marta De Barba
Presenter Affiliation: DivjaLabs L.t.d; University of Ljubljana
Presenter Email: marta.debarba@gmail.com
All Authors: Marta De Barba, Frédéric Boyer, Luca Fumagalli, Marjeta Konec, Elena Pazhenkova, Tomaž Skrbinšek, Pierre Taberlet
Primary Author Occupation: Professional

Abstract:

Genetic sampling, particularly through the so called noninvasive genetic techniques based on the collection of scats, hair, etc., have been widely applied to ursids playing a key role for understanding of their ecology and for solving management and conservation issues. Continued advancements in molecular ecology research have allowed to retrieve organismal DNA from environmental samples (e.g. soil, water, snow) expanding the wildlife genetic sampling toolbox. DNA traces in the environment (eDNA), in fact, can be used to genetically sample animals in their natural setting even without finding any visible biological material left by them. Most eDNA studies have focused on species detection and derived applications via mitochondrial DNA analysis, but recent progress in the field now enable recovery also of nuclear eDNA suitable for population level analysis, including individual genotyping.

We will present successful individual genotyping of eDNA obtained from brown bear (Ursus arctos) snow tracks. Snow samples were collected from tracks of brown bears in Slovenia during winter, eDNA was extracted and genotyped using high-throughput sequencing of microsatellites plus a sex marker, and individual identification was achieved for 71% of the samples. We will discuss our results in relation to the new opportunities offered by snow track eDNA for DNA based surveys and monitoring of ursids but will also outline the new challenges inherent to field sampling and genotyping and provide recommendations for optimal application of the method. Species of conservation concern and difficult to study, such as the polar bear, as well as other bear species in ecosystems with a snowy season for which ecological data are still lacking will benefit from the additional information acquired through snow track eDNA.

Day: Thursday **Time:** 11:40 – 11:55 **Room:** Salon 4

Theme: Captive Bears, Zoos, and Physiology

Abstract Number: 251
Presentation Type: Oral Presentation
Presentation Title: Evidence for density-dependent effects on body composition of grizzly bears in a changing Greater Yellowstone Ecosystem
Presenter Name: Andrea Corradini
Presenter Affiliation: Fondazione Edmund Mach
Presenter Email: corradini.andre@gmail.com
All Authors: Andrea Corradini, Mark A. Haroldson, Francesca Cagnacci, Cecily M. Costello, Daniel D. Bjornlie, Daniel J. Thompson, Jeremy M. Nicholson, Kerry A. Gunther, Katharine R. Wilmot, Frank T. van Manen
Primary Author Occupation: Professional

Abstract:

The Greater Yellowstone Ecosystem, although recognized as one of the world's least impacted temperate ecosystems, has undergone environmental alterations over the last decades. During this period, concerted management efforts have allowed the grizzly bear population to increase significantly. As a result, the range and density of the bear population have also increased, despite a decline of some high-calorie foods. This study investigated the intraspecific processes driving bear population demographics in the face of climatic and human impacts affecting the availability of some key food resources. We examined lean body mass and percent body fat from >400 grizzly bears over two decades and in relation to a temporally and spatially explicit index of grizzly bear density, individual traits, and geographic areas. Specifically, we hypothesized that individual lean body mass declined as population density increased, and that density had an age-dependent effect. Further, we hypothesized that the ability to gain body fat during the active season was independent of population density and environmental changes, as omnivory helped buffer energy intake from fluctuation in high-calorie food sources. We found that lean body mass was negatively related with grizzly bear population density, particularly in young females. Although higher bear densities had a more negative impact on female bears, they still reached their typical total body mass as they matured (>7 years of age), which may be due to delaying reproduction or dispersal to areas with fewer bears. In contrast, we found that the seasonal rate of body fat gain remained constant as grizzly bear population density increased, despite recent environmental changes, possibly by shifting feeding tactics. Our study shows that individual performance is influenced more by intraspecific competition than landscape-level food changes, highlighting a notable resilience of Yellowstone grizzly bears to environmental alterations.

Day: Thursday **Time:** 13:30 – 13:36 **Room:** Salon 4

Theme: Employing IUCN's Species Conservation Cycle for Bears: Examples from Around the World

Abstract Number: 992
Presentation Type: Oral Presentation
Presentation Title: Intro to session: Employing IUCN's Species Conservation Cycle for Bears: Examples from Around the World
Presenter Name: David Garshelis
Presenter Affiliation: IUCN SSC Bear Specialist Group
Presenter Email: dgarshelis.bsg@gmail.com
All Authors: David Garshelis
Primary Author Occupation: Retired

Abstract:

The IUCN network includes ~10,000 volunteer experts within more than 160 Specialist Groups under the Species Survival Commission (SSC). The IUCN sets goals and appoints or reappoints leaders and volunteer experts on a quadrennial schedule, coincident with meetings of the World Conservation Congress. During the 2017–2020 quadrennium, the SSC established the "Species Conservation Cycle" as the conceptual framework for Specialist Group activities. As such, the Bear Specialist Group (BSG) created quadrennial targets categorized by the 5 components in this conservation cycle. The first 3 components occur sequentially (the cycle), while the other 2 are transversal: Assess – Measure status and trends of populations, threats to populations, adherence to goals of a plan, or effectiveness of conservation actions. Assessments are evidence-driven, both at the start of the cycle, and then starting again, after planning and acting. Plan – Develop conservation strategies and policies to reduce threats and improve conservation status of species or populations. This component relies on findings from the assessment stage, and considers technical, spatial, and socio-political aspects. Act – Carry out actions outlined in the plan aimed at directly improving conservation status. Actions are often conducted in concert with parties that helped develop the plan. Network – Create collaboration, partnerships, and capacity building to more effectively implement the Assess–Plan–Act conservation cycle. These collaborations include both direct participants, as well as people or organizations that can facilitate or enhance accomplishments. Communicate – Disseminate information to enhance conservation. Communication should highlight each aspect of the cycle (results from the assessment; goals of the plan; ongoing actions), targeted at various specific audiences. This short talk introduces this BSG session, which will highlight activities of some individual BSG members or teams employing these components to conserve bears on all 4 continents.

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Day: Thursday **Time:** 13:30 – 13:45 **Room:** Hall C

Theme: Population Estimation

Abstract Number: 172
Presentation Type: Oral Presentation
Presentation Title: Results of a study of presence, population density, genetics and educational outreach of the Andean bear in the Cordillera del Condor, southwest of Ecuador.
Presenter Name: Santiago Molina
Presenter Affiliation: Independent researcher
Presenter Email: santimolinap@gmail.com
All Authors: Santiago Molina, Carlos Urgiles, Darío Cueva, Ma. José Pozo, Rodrigo Cisneros, Rebecca Zug, Gabriela Arevalo, Martin Bustamante
Primary Author Occupation: Student

Abstract:

The Cordillera del Cóndor is a mountain range south west of Ecuador whose geological origins are older than the formation of the Andes. This mountain range forms unique and particular ecosystems with high diversity and endemism and with the presence of mature foothill forests and tepuis. In the 1980s, this area witnessed a war between Ecuador and Peru, and in the following years until today, large-scale mining projects are being developed.

Between the years 2016-2021, a first study of the Andean bear population present in the area was carried out. The study was implemented in two mining concessions and a protected area. Camera traps were used with designs to determine the presence of bears in one of the concessions and the protected area, and population density in the other concession. A study on genetic variability was also carried out together with an educational outreach with habitants of the village of Río Blanco.

The monitoring effort involved 18,691 camera trap/days. In the cameras, the presence of 10 bears was recorded in one of the concessions, and 22 bears in the other. A population density of 7.49/100 km2 was estimated with an abundance of 45 bears for the area. During monitoring, a particular overlap in habitat use was identified between bears and two other mammal species in particular: Lowland Tapir and Puma, one acting as potential prey and the other as potential predator.

The genetic analysis revealed that there is a population genetic structure in Ecuador and that its variability could be greater than previously thought. During the study, 26 species of medium to large mammals belonging to 14 families were also recorded, of which 4 are endangered and 13 species are in some state of conservation. Some of the records were new contributions to the ecology of species in the country, opening new research opportunities.

The area where this Andean bear population occurs belongs to one of the priority areas for the conservation of the species ident

Day: Thursday **Time:** 13:36 – 13:50 **Room:** Salon 4

Theme: Employing IUCN's Species Conservation Cycle for Bears: Examples from Around the World

Abstract Number: 986
Presentation Type: Oral Presentation
Presentation Title: State of Knowledge about Human-Andean Bear Conflicts: Gaps and Opportunities to Inform Conservation Actions
Presenter Name: Roxana Rojas-VeraPinto
Presenter Affiliation: Ecology and Evolutionary Biology, School of Biological Sciences, University of Reading, Reading, UK, IUCN SSC Bear Specialist Group
Presenter Email: roxyrvp@gmail.com
All Authors: Roxana Rojas-VeraPinto, Rubén Bernardo-Madrid, Manuela González-Suárez
Primary Author Occupation: Student

Abstract:

Crop damage and cattle predation by Andean bears may pose a threat to people's livelihoods. This leads to negative perceptions about bears, and consequent retaliatory killing, which hinders twwhe conservation of this threatened species. Here we examine the severity of this problem by summarizing the current knowledge regarding human–bear conflicts in South America, examining the magnitude and spatial trends in conflict reporting as well as the mitigation actions proposed. This research highlights the "Assess" component of the Species Conservation Cycle. A systematic review was conducted using Spanish and English keywords to collect scientific publications and gray literature published since 1980. From each source, we compiled information on the locations, methodology applied, and characteristics of conflict events. We identified 84 references reporting more than 400 individual conflict events in over 300 locations; of these, 34 references focused on conflicts with Andean bears, most of which were from Ecuador and Colombia. The most common method used to collect data on conflict events was interviews with local people and authorities; only 9 studies included primary sources with detailed field inspections. It is apparent from this review that documentation of human–Andean bear conflict events is very limited and incomplete. To identify actions to address conflicts, we reviewed available conservation plans and conflict manuals (n=22 and 6, respectively). Most conservation plans were from Colombia (n=11). Most plans and manuals recommended improving monitoring conflicts events, promoting compensation programs, and supporting better agricultural practices. Manuals for the recording of predation events (mainly on cattle) offer a good guide to verify bear damage, but the short-term recommended solutions (generally deterrents) have not actually been tested. Our review underscores multiple gaps and opportunities for improvement in reporting human–Andean bear conflicts. We urge more efforts towards adopting standardized protocols for conflict reporting, which can be done in collaboration with others working in Andean bear research and management.

Day: Thursday **Time:** 13:50 – 14:05 **Room:** Hall C

Theme: Human-Bear Conflict & Coexistence

Abstract Number: 194
Presentation Type: Oral Presentation
Presentation Title: Aversive conditioning of grizzly bears in Kananaskis Country, Alberta, Canada between 2000 and 2023.
Presenter Name: John Paczkowski Presenter Affiliation: Government of Alberta Presenter Email: HYPERLINK "mailto:John.Paczkowski@gov.ab.ca" John.Paczkowski@gov.ab.ca
All Authors: John Paczkowski, Claire Edwards, Jay Honeyman, Derek Ryder
Primary Author Occupation: Professional

Abstract:

Aversive conditioning is a grizzly bear management tool which has been employed in the Parks and Protected areas of Kananaskis Country, Alberta, Canada for over 20 years. The aversive conditioning program involves applying different conditioning stimuli to grizzly bears in an effort to change their behaviour and maintain public safety. We will discuss the context, evolution and operational requirements of the program. We

reviewed and summarized over 10,000 grizzly bear aversive conditioning records collected between the 2000 and 2023. Most of the over 50 grizzly bears involved in the program were habituated female grizzly bears that demonstrated a strong fidelity to the facility zone, an area of high human visitation and recreational infrastructure. Juvenile and young bears, typically required more aversive conditioning actions, while conditioning frequency diminished with age. None of the bears involved in the aversive conditioning program were involved in a serious human wildlife conflicts causing human injury or death. The aversive conditioning program has also reduced the need for local facility closures and management removals of bears. Survival and reproductive success of bears involved in the aversive conditioning program were relatively high, which may contribute to a locally stable to grizzly bear population. Bears that left the operational area of the aversive conditioning program, specifically protected areas, were often subject to a higher frequency of management actions and removals. We will also discuss the efficacy of different noise, projectile and contact projectile stimuli as well as the use of Karelian Bear dogs. The Kananaskis Country aversive conditioning program is a model of how management actions can achieve both public safety and conservation objectives in a high recreational use landscape specifically parks and protected areas.

Day: Thursday **Time:** 13:50- 14:04 **Room:** Salon 4

Theme: Employing IUCN's Species Conservation Cycle for Bears: Examples from Around the World

Abstract Number: 987
Presentation Type: Oral Presentation
Presentation Title: Pioneering Innovative Collaborations that Link Region-wide Forestry Decisions with Conservation of Grizzly Bears
Presenter Name: Karine Pigeon
Presenter Affiliation: British Columbia Ministry of Water, Lands, & Resource Stewardship – Skeena Region, Smithers, B.C., Canada; University of Northern British Columbia, IUCN SSC Bear Specialist Group
Presenter Email: Karine.pigeon@gov.bc.ca
All Authors: Karine Pigeon, Kevin Koch, Maciej Jamrozik, Carolyn King
Primary Author Occupation: Professional

Abstract:

Indigenous self-governance is needed in forest landscape planning. Forest planning should consider resilience to natural and human-caused disturbances including climate change, and to be most effective, should recognize indigenous cultural recovery and stewardship. Forest activities that impact our landscape need to take into consideration (1) the ability of Indigenous peoples to meet their food, social, and ceremonial rights, and (2) cumulative effects on ecosystems, wildlife, and their habitat. We aim to align forestry practices, wildlife stewardship, and Indigenous-led cultural recovery in modernized land-use plans that preserve and create healthy, diverse, and resilient forests. In a partnership between Nations, provincial governments, and forest licensees, we co-created grizzly bear-focused guidance, a decision key, for authorization managers who are responsible for the approval of harvest activities in northwest British Columbia, Canada. This decision key considers cumulative effects on grizzly bear populations and their habitat by proposing 5 scenarios that range from high restrictions (i.e., no new harvest), to three levels of habitat enhancement, restoration, and monitoring, and a final, low restrictions scenario (i.e., current best management practices). The proposed scenarios are linked to present grizzly bear conservation concerns and landscape conditions around the proposed harvest blocks. This project highlights our shared decision-making process with an emphasis on the "Plan" and "Network" components of the Species Conservation Cycle that led to the implementation of our decision key. I will share aspects of the collaborations that were necessary to arrive at a useful product aimed at guiding effective conservation of wildlife and their habitat. Because grizzly bears have an important role in cultural traditions and philosophies of many Indigenous groups, and because they are seen to reflect the overall health of the ecosystem they inhabit, stewardship of grizzly bears and their habitat is pioneering new ways of approaching forest landscape planning.

Day: Thursday **Time:** 14:04 – 14:18 **Room:** Salon 4

Theme: Employing IUCN's Species Conservation Cycle for Bears: Examples from Around the World

Abstract Number: 990
Presentation Type: Oral Presentation
Presentation Title: European Brown Bear Conservation: A Continent-wide Assessment of Bear Intervention Teams
Presenter Name: Djuro Huber
Presenter Affiliation: Faculty of Veterinary Medicine, Zagreb, Croatia, IUCN SSC Bear Specialist Group
Presenter Email: djuro.huber@gmail.com
All Authors: Djuro Huber, Aleksandra Majić-Skrbinšek, Jon Swenson, Linas Balčiauskas, Tomasz Zwijacz-Kozica, Gerard Baars, Klemen Jerina, Duško Ćirović, Michael Schneider, Ovidiu Ionescu, John Linnell, Alexandros A. Karamanlidis, Michal Haring, Aleksandar Stojanov, Diana Zlatanova, Maryna Shkvyria, Claudio Groff, Andres Ordiz, Jānis Ozoliņš, Sven Signer, Aleksander Trajce, Peep Mannil, Ilka Reinhardt, Javier Naves, Peter Sunde, Mateja Blažič, Julien Steinmetz, Luigi Boitani, Robin Rigg, Javier Naves, Martin Duľa, Haris Hadžihajdarević, Aleksandra-Anja Dragomirović, Konstantin Tirronen, Dejan Radošević, Miradije Gerguri, Aleksandar Perović, Agnieszka Sergiel, Marek Pasiniewicz, Ioan Mihai Pop,

ORAL PRESENTATIONS

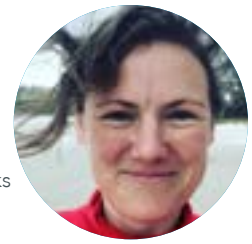
Slaven Reljić, Ilpo Kojola
Primary Author Occupation: Professional

Abstract:

We present findings from a comprehensive survey conducted in November 2023, engaging 40 experts from 30 European countries, to explore the operational landscape of Bear Intervention Teams (BITs). BITs are specialized groups trained to manage bear-related incidents, including conflicts between humans and bears, as well as situations where bears are in distress. Among the surveyed countries, 18 reported having operational BITs, albeit with variations in their jurisdiction and protocols. Notably, only 9 countries reported having an approved protocol for BIT operations. The organizational structure of BITs varied widely, with governmental agencies, forest management authorities, environmental NGOs, police-hunter collaborations, and national parks all playing roles in different contexts. Compensation for BIT members ranged from full-time employment to voluntary service. Mandates of BITs primarily focused on surveying, reporting, and acting in bear-related incidents, with interventions ranging from non-lethal methods (e.g., rubber bullets) to euthanasia as a last resort. The frequency of interventions varied significantly, with some units handling only a few cases annually while others managed thousands, indicating the diverse nature and intensity of bear-related issues across regions. Common reasons for BIT interventions included bears entering human settlements, traffic accidents involving bears, as well as cases of injured, sick, or orphaned bears. Additionally, BITs addressed a vast array of challenges, from bears feeding on garbage to illegal killings. In administrative units without a designated BIT, bear-related issues were typically resolved on a case-by-case basis by people with less training. Public acceptance of bears is often influenced by whether local people see prompt and professional response to an incident, or they are left alone to cope with the situation. BITs appear to be very useful in fostering human–bear coexistence through 3 key components of the Species Conservation Cycle: "Assessing" the situation, "Communicating" locally and nationally, and "Acting" on spot.

Day: Thursday **Time:** 14:10 – 14:25 **Room:** Hall C

Theme: Human-Bear Conflict & Coexistence



Abstract Number: 125
Presentation Type: Oral Presentation
Presentation Title: Aversive conditioning of grizzly bears produces high probabilities of retreat from human-bear conflict locations.
Presenter Name: Claire Edwards
Presenter Affiliation: University of Alberta/Parks Canada
Presenter Email: claire.edwards@pc.gc.ca
All Authors: Claire Edwards, John Paczkowski, Colleen Cassady St. Clair
Primary Author Occupation: Professional

Abstract:

Protected areas provide important refugia for populations of grizzly bears (Ursus arctos), which are threatened in Alberta. Many protected areas address human-bear conflict with a suite of non-lethal tools including aversive conditioning and hazing. These tools apply negative stimuli to bears with the goal of increasing wariness and reducing proximity to people. In Kananaskis Country from 2000-2019, teams of technicians conducted aversive conditioning on 48 marked grizzly bears in 6,539 conditioning events. Bears were conditioned using 20 different stimuli, grouped by modality into: approach (vehicle or foot), noise (vehicles or humans), projectiles (contact or non-contact), and pursuit (with or without Karelian bear dogs). When bear identity was known, conditioning was over 50 times more likely to target adult females than adult males, and in 99% of events where females were accompanied by cubs, cubs were young of year or yearlings. Frequency of conditioning events significantly declined with bear age. When a bear response to technician arrival was recorded, the average likelihood of retreat was 32%. Retreat probability increased with the number of actions in the previous event, the number of conditioning events in the preceding two weeks, and presence of cubs. When a response to conditioning was recorded, bears almost always retreated from conditioning technicians (93%) and rarely approached, either upon technician arrival (1%) or after conditioning commenced (<0.001%). Bears were more likely to retreat from entire conditioning events when pursuit tools were used, when there were more actions in the event and with increasing distance to cover. These results suggest that bears in Kananaskis Country learned to retreat from aversive conditioning and that this tool can help to reduce conflict-associated behaviour, supporting long-term residency by bears in this protected area..

Day: Thursday **Time:** 14:18 – 14:32 **Room:** Salon 4

Theme: Employing IUCN's Species Conservation Cycle for Bears: Examples from Around the World

Abstract Number: 991
Presentation Type: Oral Presentation
Presentation Title: Conservation Actions Towards Human–Sloth Bear Conflict Mitigation in Central Gujarat
Presenter Name: Nishith Dharaiya
Presenter Affiliation: Director, Centre of Excellence for Wildlife and Conservation Studies, BKNM University, Junagadh (Gujarat) India; IUCN SSC Bear Specialist Group
Presenter Email: nadharaiya@gmail.com
All Authors: Nishith Dharaiya and Marcel Alaze
Primary Author Occupation: Professional

Abstract:

Human–wildlife conflict is an international issue that involves a host of wildlife species across most regions of the world. Conflicts may lead to property damage, livestock casualties, and human injuries, creating increased antagonism and retaliation towards specific wildlife species in the local community; this may pose a significant challenge to conservation of these conflict-prone species. The sloth bear is known for attacking people, and sometimes damaging their crops, and as such, often has a negative reputation in local communities living near this species. As India's human population rises, there has been an increase in humans using the same resources as sloth bears, resulting in more negative interactions (including killing of bears). Here we address the rising conflict between humans and sloth bears in the state of Gujarat, at the westernmost extent of sloth bear range. We have been concerned over a shift towards negative community perspectives towards sloth bears over time. The government and other organizations have launched several community awareness campaigns, but the majority of them have been ineffective in changing people's attitudes about sloth bears. According to our research, the majority of awareness campaigns employ reading materials, picture books, and audiovisuals as awareness tools; however, they rarely result in concrete action. Since 2020, we have conducted over 50 outreach and awareness programs in 56 villages in central Gujarat, focussing on places

with a significant recent surge in sloth bear populations and human attacks. We started action-based conservation programs in 2023, including bear safety education demonstrations, distribution of bear deterrent-sticks (to ward off attacks), building water accumulation sites (so sloth bears do not enter villages to hydrate), village consultation meetings (advising how to reduce sloth bear encounters and gaining their ideas to deal with the situation), planting fruit trees, and developing a standard operating procedure (SOP) for handling conflict situations. We believe that our conservation initiatives and their implementation have been remarkably successful in reshaping the local community's mindset and fostering greater tolerance for coexisting with sloth bears. Our work has involved 3 of the 5 components of the Species Conservation Cycle: "Acting", "Networking" and "Communicating" to conserve the sloth bears in India.

Day: Thursday **Time:** 14:30 – 14:45 **Room:** Hall C

Theme: Human-Bear Conflict & Coexistence

Abstract Number: 182
Presentation Type: Oral Presentation
Presentation Title: Integrating multiple tools to understand landscape connectivity, address threats, and support long-term conservation of Andean bears in northern Ecuador
Presenter Name: Rebecca Zug
Presenter Affiliation: Universidad San Francisco de Quito
Presenter Email: rlzug@usfq.edu.ec
All Authors: Rebecca Zug, Santiago Molina, José León
Primary Author Occupation: Professional

Abstract:

Habitat loss and fragmentation are the primary threats to Andean bears (Tremarctos ornatus) in Ecuador. A significant portion of the population occurs outside of protected areas on private lands. When landowners are tolerant of bears, threats are minimized, and native habitat is present, these lands can serve as corridors between protected areas, connecting fragmented landscapes and maintaining ecosystem services. Our project uses a multifaceted approach to understand and improve the connectivity of Andean bear habitat on private lands in the buffer zones of Antisana Ecological Reserve and Cayambe-Coca National Park, 50 km northeast of Quito. Since 2020 we have identified > 20 individuals, both resident and transient, at sites where we also found domestic dogs, livestock, and people. Camera trap data confirmed that bears cross roads and move seasonally outside of the study area. In 2023-24, we began capturing bears and using GPS collars to understand habitat use and movement patterns. These data will be used to focus conservation and outreach efforts toward the priority areas and the protection of corridors. Preliminary results have identified an important feeding zone located along a major highway, between agricultural lands and communities. Traditional cowboys have large herds of cattle in this zone, making bear-livestock conflict another important threat. In 2022-23, we installed electric fencing in two communities as a first step toward improving livestock husbandry and preventing conflicts. Proximity to Quito and the frequency of bear sightings also make this area a tourist destination. When visitors bring dogs, hike off trails, leave trash, or approach wildlife, tourism can have negative impacts. In 2023 we began promoting responsible tourism through education and outreach and the development of a Best Practices Manual for Andean bear and wildlife viewing. This multi-scale approach addresses a variety of threats and supports long-term bear conservation.

Day: Thursday **Time:** 14:32 – 14:46 **Room:** Salon 4

Theme: Employing IUCN's Species Conservation Cycle for Bears: Examples from Around the World

Abstract Number: 988
Presentation Type: Oral Presentation
Presentation Title: Educational Materials for Non-professionals Raise Conservation Awareness for Bears
Presenter Name: Zsuzsa Petró
Presenter Affiliation: Sóstó Zoo, Nyíregyhaza, Hungary; IUCN SSC Bear Specialist Group; European Association of Zoos and Aquaria, Bear Taxon Advisory Group
Presenter Email: zoozsuzsa@gmail.com
All Authors: Zsuzsa Petró, Amelia Griep, Eliza Bányácskai, Lydia Költer
Primary Author Occupation: Professional

Abstract:

Zoos have millions of visitors annually. They can reach a broad audience and communicate accurate and powerful messages to the public, which may influence people's understanding of and attitudes about many species of wildlife; consequently, people may be moved toward actions that may aid conservation. All 8 bear species are kept in zoos of the European Association of Zoos and Aquaria (EAZA). One of the key roles of the EAZA Bear Taxon Advisory Group (TAG) is to raise awareness of bears through education, thereby fostering more attention to their conservation. Educational packages have been created for zoos and sanctuaries to communicate information to visitors from a wide range of social, cultural, ethnic, and economic backgrounds, aiming to influence people's attitudes based on the "see it, sense it, save it" principle. Educational material is available for different age groups. Here, we highlight the "Communication" component of the Species Conservation Cycle by focusing on three recently developed educational products. For preschool and elementary school groups, "The Bear Book" conveys messages mainly by drawings. Information covering all bear species is embedded in a fairy tale. Games at the end of the book help to recap and tighten the learned content in a playful manner. For adolescents and adults, the EAZA Bear TAG created Educational Guidelines, called "All About Ursidae". This is an extensive and detailed compilation (~250 pages) of up-to-date information about each of the 8 species as well as relevant topical areas. Concise text is profusely illustrated with drawings and photos. It starts with bear ancestry, and then covers morphology and ecology of each species, followed by chapters about hibernation, reproduction, and communication. There is considerable focus on status and threats with reference to the IUCN Red List. It also includes reports on conservation projects contributed by invited bear biologists/conservationists mainly from the BSG. It culminates with a section about "what can you do?" Thirdly, we developed a leaflet/poster titled the "Bear is Not a Toy" which can be downloaded in 7 languages to help hikers stay safe in European regions with brown bears. The hope is that both people and bears suffer fewer tragic encounters. All of these materials are freely available. Educational Guidelines: https://www.eaza.net/assets/Uploads/CCC/BPG-2024/Bear-Educational-Guidelines.pdf Bear Book for kids (video): www.youtube.com/watch?v=cR9YrcFE28w Bear is Not a Toy: nmjwww.drive.google.com/drive/folders/1nS44EEsMylH2EV4cltdeFYYSQU_pD63F?usp=sharing

ORAL PRESENTATIONS

Day: Thursday **Time:** 14:46 – 15:00 **Room:** Salon 4

Theme: Employing IUCN's Species Conservation Cycle for Bears: Examples from Around the World

Abstract Number: 989
Presentation Type: Oral Presentation
Presentation Title: Sun Bear Conservation Action Plan: A Mid-term Assessment
Presenter Name: Matt Hunt
Presenter Affiliation: Free the Bears, Luang Prabang, Laos; IUCN SSC Bear Specialist Group
Presenter Email: matt@freethebears.org
All Authors: Matt Hunt, Brian Crudge, Caroline Lees
Primary Author Occupation: Professional

Abstract:

Sun bears face significant threats from hunting and habitat loss, leading to declines in wild populations across their range. Populations are predicted to continue to decline unless the threats to this species are adequately addressed by conservation actions. In June 2019, the Sun Bear Conservation Action Plan was launched. This 10-year plan was developed in a collaborative and iterative process over several years, following the IUCN SSC Conservation Planning Specialist Group's One Plan Approach to integrate in-situ and ex-situ species conservation planning. Prior to this initiative, of the 8 bear species, a global action plan had been created only for the polar bear, making the sun bear the first terrestrial bear species with a range-wide plan. The Sun Bear Conservation Action Plan details 19 objectives and 63 actions aimed at attaining 5 overarching goals: (1) eliminating illegal exploitation; (2) protecting and restoring habitats and populations; (3) devising and employing reliable monitoring methods; (4) maximising ex-situ contributions to conservation; and (5) increasing cross-sectoral support and collaboration for sun bear conservation. Implementation during 2019–2028 is coordinated by a Sun Bear Action Plan Implementation Task Force, under the IUCN SSC Bear Specialist Group. At this mid-point of the plan, we will assess progress against the indicators identified in the plan. This project involves the "Assess" component of the Species Conservation Cycle. The action plan included a status assessment of the species, and here, after planning and acting, we start the second round in the cycle: measuring adherence to the plan's goals, and effectiveness of conservation actions. We will provide a critical evaluation of the Sun Bear Conservation Action Plan, highlighting successful elements and identifying challenges hindering the implementation of certain actions. The IUCN SSC is committed to ensuring that all Threatened species on the Red List are covered by an effective conservation action plan (currently 41,200 species). Despite being a small family of charismatic megafauna, challenges remain in developing species conservation action plans for other Ursidae. This assessment of progress midway through the Sun Bear Conservation Action Plan will help to refine expectations about the feasibility and value of various conservation actions, contributing not only to sun bear conservation but also to the broader goal of ensuring effective action plans for threatened species worldwide.

Day: Thursday **Time:** 15:10 – 15:25 **Room:** Hall C

Theme: Human-Bear Conflict & Coexistence

Abstract Number: 189
Presentation Type: Oral Presentation
Presentation Title: Tracing the Social Network of an Umbrella Species: Uncovering Communication Dynamics to Inform Grizzly Bear Conservation and Management
Presenter Name: Courtney Hughes
Presenter Affiliation: Winisk Research and Consulting
Presenter Email: ckhughes@ualberta.ca
All Authors: Courtney Hughes, Andrea Morehouse, Devin Holterman, Hannah Rasker
Primary Author Occupation: Professional

Abstract:

The ways people organize in social networks to share information and influence behaviours is a fundamental aspect of conservation and management. Social network analysis is a tool that allows us to understand these networks and the information exchange within them. Leveraging this information can help design, implement, and evaluate conservation efforts. Our project proposes to understand the social network for grizzly bears – a charismatic species that elicits varying opinions, given that differing values can lead to governance and policy challenges, rendering conservation efforts difficult to successfully implement. Understanding the social network of conservation researchers and practitioners will help inform and enhance grizzly bear conservation and management throughout its range, from Yellowstone to the Yukon. Our overall objective is to understand how people organize, share information, and influence behaviour change related to grizzly bear conservation with an additional emphasis on human-bear conflicts. This information can help implement more successful conservation, management, and policy interventions. Our results will identify ways to leverage, strengthen and mobilize the social network for grizzly bears. This includes informing engagement strategies that identify key players in grizzly bear conservation/management, and areas of disconnect and/or knowledge gaps; measuring diversity of expertise and skills within and across the network; encouraging inclusivity and interconnectedness to optimize information sharing; and, identifying communication channels and areas requiring knowledge transfer and transitions. Further, these data can help build skills and capacity for organizations to successfully participate in grizzly bear conflict reduction. ear conflict reduction.

Day: Thursday **Time:** 15:20 – 15:35 **Room:** Salon 4

Theme: Bear Behaviour

Abstract Number: 81
Presentation Type: Oral Presentation
Presentation Title: Brown bears escape from overcrowded road infrastructure by utilizing Ceausescu's existing underpasses
Presenter Name: Mihai Fedorca
Presenter Affiliation: National Institute for Research and Development in Forestry Marin Dracea, Transilvania University of Brasov
Presenter Email: mihai.fedorca@yahoo.com
All Authors: Mihai Fedorca, Ancuta Fedorca, Georgeta Ionescu, Ovidiu Ionescu Dracea, Ramon Jurj
Primary Author Occupation: Professional

Abstract:

Roadkill and habitat loss are two of the main threats to biodiversity, and both people and wildlife could be injured, and many times, both lose their lives. Road ecology has evolved as a tool to reduce these encounters and the damages, but unfortunately, in areas where the road infrastructure is already overcrowded and impossible to cross, the costs to mitigate these conflicts are very high and often hard to obtain. Our study aims to demonstrate that wildlife species, especially brown bears, are crossing busy roads by using existing bridges built in the past to regulate the water flow to pass under the road. The study is in Romania (Eastern Europe) – Brasov County, where we have monitored 30 bridges in the period starting from March 2022 till August 2023, using photo trap cameras. In this period, more than 1500 crossings have been recorded by the cameras, which can be translated into the same number of accidents being avoided. The maximum number of crossings was registered in the summer months (July and August), correlated with the holiday period when the traffic volume in the area was the highest.

Day: Thursday **Time:** 15:30 – 15:45 **Room:** Hall C

Theme: Human-Bear Conflict & Coexistence

Abstract Number: 113
Presentation Type: Oral Presentation
Presentation Title: Anthropogenic Disturbance on the Space Use of Locally Endangered Formosan Black Bear (Ursus thibetanus formosanus) in Taiwan
Presenter Name: Fang Chen
Presenter Affiliation: University of Michigan
Presenter Email: chenfang7691@gmail.com
All Authors: Fang Chen, Neil Carter, Mei-Hsiu Hwang
Primary Author Occupation: Student

Abstract:

Anthropogenic impacts, such as habitat degradation and overhunting, pose significant threats to wildlife populations globally. In Taiwan, alongside habitat loss due to urban development, the proliferation of snare traps has escalated threats to the locally endangered Formosan black bear (Ursus thibetanus formosanus), leading to increased mortalities and physical injuries. Despite the severity of these issues, there is limited information that can inform conservation strategies regarding the preferred habitat characteristics of the bears and the long-term behavioral impacts of snare trap-derived injuries. In this study, we used integrated resource selection functions (iRSFs) and integrated step selection functions (iSSFs) to analyze the habitat selection patterns of 15 bears (6 injured, 9 healthy) inhabiting Yushan National Park, Taiwan. Further, we generated a predictive map to visualize habitat suitability and compared the habitat selection patterns between healthy bears and those injured by snare traps. Population-level results indicated that bears prefer habitats characterized by rugged terrain with a preference for broad-leaved forests over other land cover types. However, injured bears exhibited diminished preferences for terrain ruggedness and different human avoidance patterns compared to healthy bears. These results suggested that the ability of injured bears to access high-quality habitat patches could be constrained, potentially increasing the encounters and risks from humans and impacting their energy gain in the long term. This study highlights that the impacts of snare traps extend beyond mortality and physical injury, possibly influencing the behavioral and energetic dynamics of bear populations. Conservation efforts must prioritize the preservation of high-quality habitats and regulations on snare trap usage to protect this locally endangered species.

Day: Thursday **Time:** 15:40 – 15:55 **Room:** Salon 4

Theme: Bear Behaviour

Abstract Number: 88
Presentation Type: Oral Presentation
Presentation Title: Using a behavioural classification of accelerometry data to evaluate effects of hunting risk on Scandinavian brown bear behaviour
Presenter Name: Jeanne Clermont
Presenter Affiliation: Université de Sherbrooke
Presenter Email: jeanne_clermb@hotmail.com
All Authors: Jeanne Clermont, Andreas Zedrosser, Ludovick Brown, Frank Rosell, Gunn Elisabeth Sydtveit Rekvik, Jonas Kindberg, Fanie Pelletier
Primary Author Occupation: Student

Abstract:

Predation may indirectly influence prey's fitness and population dynamics through behavioural adjustments in response to perceived predation risk. These non-consumptive effects of predation can also arise from hunting by humans, but they remain less understood compared to those arising from natural predators. Advances in biologging allow detailed assessments of the activity budgets of elusive wildlife, increasing the potential to uncover the non-consumptive effects of human activities on animals. We used tri-axial accelerometry to record the daily activity of 24 Scandinavian brown bears from a heavily hunted population in Sweden (29 bear-years, 2015-2022). We used a supervised machine learning algorithm trained with observations of captive brown bears to classify the accelerometry data into four behaviours, i.e., running, walking, feeding, and resting, with an overall precision of 95%. We then evaluated changes in bear activity budgets before and during the hunting season. We found that bears exhibit a bimodal daily activity pattern, being most active at dusk and dawn, and resting around midday and midnight. However, during the hunting season, females showed a higher probability of being active during the day than before the hunting season, while males showed the opposite pattern by becoming more nocturnal. Since legal hunting occurs mostly during daylight hours, these results suggest that bears modify their activity level as an anti-predator response to hunting risk, but that tactics differ between sexes. Additionally, daily number of running bouts did not vary between

seasons in both sexes, but females' proportion of running bouts occurring during legal hunting hours was higher during the hunting season than prior to it, suggesting they may use running as a tactic to avoid hunters. More detailed assessments of wild animal behaviours have the potential to increase our understanding of the impacts of human activity on wildlife and help guide conservation decisions.

Day: Thursday **Time:** 15:50 – 16:05 **Room:** Hall C

Theme: Human-Bear Conflict & Coexistence

Abstract Number: 198
Presentation Type: Oral Presentation
Presentation Title: Animal learning contributes to both problems and solutions for bear–train collisions
Presenter Name: Colleen Cassady St. Clair
Presenter Affiliation: University of Alberta
Presenter Email: cstclair@ualberta.ca
All Authors: Colleen Cassady St. Clair
Primary Author Occupation: Professional

Abstract:

Transportation infrastructure frequently causes an ecological trap for bears that are attracted to roads and railways for foraging and travel opportunities, but these attractants increase the risk of mortality from collisions. This situation occurred for a threatened population of grizzly bears (Ursus arctos) in Banff National Park, Canada, where train strikes became a leading cause of mortality. Several students, collaborators, and I explored this problem by studying rail-associated food attractants, habitat use of GPS-collared bears, and patterns of past mortality. Bears appeared to be attracted to grain spilled from rail cars, enhanced growth of adjacent vegetation and train-killed ungulates with rail use that increased in spring and autumn, and in areas where trains slowed, topography was rugged, and human density was low. Across multiple species, mortality was best predicted by higher train speeds, with contributions from track curvature and proximity to water bodies. Rapid learning by bears may have increased collision vulnerability via reductions in lethal bear management, changes in ungulate distribution and abundance, and changes in human activity, but that same learning capacity might prevent train strikes in future via simple warning devices, such as the one we invented, that signal approaching trains. Emerging technology associated with electric vehicles might also contribute to better safety by amplifying and directing engine noise as an audible warning to reduce strike vulnerability for bears and other wildlife.

Day: Thursday **Time:** 16:00 – 16:15 **Room:** Salon 4

Theme: Bear Behaviour

Abstract Number: 99
Presentation Type: Oral Presentation
Presentation Title: Factors Influencing Duration of Behaviors in American Black Bear (Ursus americanus) Adult Females and Their Cubs Surrounding Hibernation
Presenter Name: Brogan Holcombe
Presenter Affiliation: Virginia Tech, Department of Fish & Wildlife Conservation
Presenter Email: brogan@vt.edu
All Authors: Brogan Holcombe, J. Bernardo Mesa-Cruz, Marcella J. Kelly
Primary Author Occupation: Student

Abstract:

Hibernation behavior is understudied in American black bears (Ursus americanus), with most knowledge stemming from post-hibernation emergence studies. Temperature and photoperiod have been identified as potential drivers of the timing of hibernation but are also linked to food availability. We explore drivers of bear activity surrounding hibernation using a unique video-recorded data set of four temporarily captive female bears with cubs in a food-controlled environment. We subset 22,000+ hours of video into two interval cycles to 1) analyze adult behavior from September 2015 to May 2016 and 2) analyze mother-cub interactions post-birth, including whether mothers showed bias towards biological vs. foster cubs. We consolidated 58 behaviors into three broad classifications (active, passive alert, passive) and found that the hibernation stage, time of day, and interaction between photoperiod and temperature were associated with changes in adults' activity levels. During hyperphagia, post-birth, and emergence stages, increased activity levels were driven by both higher temperature and photoperiod, but the onset of hibernation was primarily driven by temperature only. We further found that mother bears did not spend significantly more time with either cub group, indicating no bias toward biological vs. foster cubs. Additionally, cubs did not show more dominant (i.e., bullying) behaviors toward foster than biological siblings, providing evidence of successful foster cub litter integration, which is promising for orphan cub fostering programs. Finally, our results indicate that rising temperatures regionally could be responsible for increased active behaviors, especially during hibernation onset, which could lead to increased human-bear interactions on the landscape.

Day: Thursday **Time:** 16:10 – 16:25 **Room:** Hall C

Theme: Human-Bear Conflict & Coexistence

Abstract Number: 163
Presentation Type: Oral Presentation
Presentation Title: Indigenous Knowledge of Human-Polar Bear Coexistence in Churchill, Manitoba, Canada
Presenter Name: KT Miller and Georgina Berg
Presenter Affiliation: Royal Roads University
Presenter Email: ktmillerphoto@gmail.com
All Authors: Katharina M. Miller, Georgina Berg, Indigenous Knowledge Keepers of Churchill (as a collective) Michael Lickers, Dominique A. Henri
Primary Author Occupation: Student

Abstract:

Polar bears (wapusk; nanuq; sas; loor blaan; Ursus maritimus) and people have shared northern coastlines for time immemorial, yet concerns about polar bears coming into communities is increasing. As the Arctic warms and sea ice habitat declines due to climate warming, coexistence strategies between people and polar bears have become increasingly important. This study uses community-based participatory research; coproduction of knowledge; hands back, hands forward; and storytelling to document Indigenous knowledge of human–polar bear coexistence with Swampy Cree, Sayisi Dene, Caribou Inuit, and Métis people of Churchill, Manitoba, Canada. By coupling deductive time-based themes with inductive thematic analysis, this research documents Indigenous knowledge and provides recommendations as future visions for human–polar bear coexistence in Churchill, Manitoba: protect tourism as an important industry and economy, support proactive management and less

invasive research, elevate Indigenous knowledge, improve education and safety awareness, and cultivate a culture of coexistence.

Funding for this research was provided by Polar Bears International and Environment and Climate Change Canada..

Day: Thursday **Time:** 16:20 – 16:35 **Room:** Salon 4

Theme: Bear Behaviour

Abstract Number: 169
Presentation Type: Oral Presentation
Presentation Title: Main drivers of brown bears' circadian activity: a global assessment.
Presenter Name: Aurora Donatelli
Presenter Affiliation: Sapienza University of Rome
Presenter Email: aurora.donatelli@uniroma1.it
All Authors: Aurora Donatelli, Dusko Cirovic, Mark Haroldson, Djuro Huber, Jonas Kindberg, Ilpo Kojola, Josip Kusak, Gianluca Mastrantonio, Andres Ordiz, Slaven Reljic, Luca Santini, Frank T. van Manen, Paolo Ciucci
Primary Author Occupation: Student

Abstract:

The scope of our study was to evaluate effects of anthropogenic pressure, land productivity, and ambient temperature on circadian activity rhythms of brown bears (Ursus arctos) at a transcontinental scale. We quantified activity through hourly movement rates and used this as the currency to compare activity of bears from the Central Apennines, Dinaric-Pindus, Greater Yellowstone Ecosystem, Karelian, and Scandinavian populations. Based on a Bayesian modeling approach, activity rhythms of bears in all populations were best represented by a bimodal curve with crepuscular peaks. Bears at northern latitudes (i.e., Sweden and Finland) generally display higher activity levels compared to the other populations, while bears in Yellowstone exhibit slightly lower nocturnal activity, and higher diurnal and crepuscular activity compared to various study areas in Europe. The overall effect of human disturbance is to increase crepuscular/nocturnal activity and/or decrease diurnal activity in all study areas, with slight differences across seasons. However, the magnitude of this effect is stronger for bears residing in less disturbed landscapes, as they may be less habituated to human activity. In addition, all populations tend to increase nocturnal activity and decrease diurnal activity, as a response to higher daily maximum temperatures. Lastly, the effect of the Normalized Difference Vegetation Index on circadian activity is much more variable across study areas and seasons, depending on the key foods that characterize each population's diet. Future research should focus on possible effects of modifications in activity rhythms on survival and reproduction. Whereas flexibility in large carnivores' circadian activity is a key component of their adaptive strategies for co-habiting with humans, drastic changes in activity may occur at the expense of the individual's fitness, with potentially cascading effects across ecological communities.

Day: Friday **Time:** 08:00 – 08:15 **Room:** Hall C

Theme: Human-Bear Conflicts & Coexistence

Abstract Number: 199
Presentation Type: Oral Presentation
Presentation Title: Does Destroying Wildlife Reduce Human-Wildlife Conflict? Evidence from Black Bears in British Columbia
Presenter Name: Felix Pretis
Presenter Affiliation: University of Victoria
Presenter Email: fpretis@uvic.ca
All Authors: Felix Pretis, Jason Hicks, Sara Wray Enns, Sumeet Gulati, Prasun Ghimire
Primary Author Occupation: Professional

Abstract:

The destruction of wildlife is a common intervention in response to human-wildlife conflict. However, it is uncertain how effective such lethal interventions are in reducing future conflict. Here we assess whether the destruction of wildlife reduces human-wildlife conflict by assembling a novel dataset on all recorded human-black bear conflicts in British Columbia, Canada from 2013 until 2021. The data spans more than 66,000 conflict events leading to more than 3,000 bears having been destroyed. We estimate the response of conflict to destroyed bears using panel regressions and local projections controlling for weather, settlement density, seasonal effect, as well as salmon abundance. We find little evidence that the destruction of black bears leads to significant long run reductions in future human-bear conflict. Our results show a small temporary fall in conflict in response to destroyed bears, with a rebound to pre-intervention levels of conflict after 12 months. These results are consistent with human-black bear conflict being driven by circumstances rather than problematic bears and cast doubt around the practice of destroying wildlife to reduce human-wildlife conflict.

Day: Friday **Time:** 08:20 – 08:35 **Room:** Hall C

Theme: Human-Bear Conflicts & Coexistence

Abstract Number: 232
Presentation Type: Oral Presentation
Presentation Title: A combination of aerial damage detection and in situ DNA sampling in crop fields for genetic monitoring of problem brown bears in Hokkaido, Japan.
Presenter Name: Yuri Shirane
Presenter Affiliation: Hokkaido Research Organization
Presenter Email: yuri.shirane456@gmail.com
All Authors: Yuri Shirane, Mami Kondo, Hino Takafumi, Kazuki Miura, Tsutomu Mano, Hifumi Tsuruga
Primary Author Occupation: Professional

Abstract:

Human-wildlife conflict in agricultural lands is a serious global issue that affects the survival of wildlife populations and human safety. Previously, wildlife damage to crops has been investigated by radio telemetry to track animal movements and measure habitat selection, and by diet analysis using stable isotope analysis of biological samples. However, these methods are difficult to obtain a profile of problem individuals involved in crop damage within an area and to continuously survey damaged

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fields on a detailed spatial and temporal scale. Here, we attempted to combine unmanned aerial survey and ground-based genetic sampling to determine if a large number of bears in the vicinity of the agricultural lands were causing damage or if the same individuals were causing damage repeatedly in brown bears of Hokkaido, Japan. In Yakumo Town, located in southwestern Hokkaido, where dent corn is widely cultivated every year, we conducted drone flights to take aerial photographs of cornfields. By photographing for two to five consecutive days from late June to September in 2015–2019 and 2021–2022, fresh damaged patches of each field were identified based on the unique textural characteristics of healthy and damaged patches in the field. Then, we visited each damaged spatches to collect fresh genetic samples (e.g., hair, feces, and residual saliva on partially-consumed corn) of brown bears, and examined 9 loci of microsatellites for individual identification. Results revealed that most of the individuals causing damage are males, and that same individuals repeatedly caused damage to the one corn field over multiple years. In addition, some individuals were causing damage in a different corn field than the previous year. Our individual-based methods for analyzing crop damage can be used to better understand the relationship between the number of problem individuals, the area damaged, and the landscape, leading to more efficient management to reduce human-bear conflict.

Day: Friday **Time:** 08:40 – 08:55 **Room:** Hall C

Theme: Human-Bear Conflicts & Coexistence

Abstract Number: 306
Presentation Type: Oral Presentation
Presentation Title: Bears, watch your step: a study of fine-scale individual bear movement through an urban landscape in Colorado.
Presenter Name: Cassandre Venumière-Lefebvre
Presenter Affiliation: Colorado State University
Presenter Email: cvenumiere.lefebvre@gmail.com
All Authors: Cassandre Venumière-Lefebvre, Heather Johnson, Mat Alldredge, Stewart Breck, Kevin Crooks
Primary Author Occupation: Student

Abstract:

For wildlife, developed areas can bring access to novel sources of food and increased mortality risk. For American black bears, anthropogenic refuse in urban areas alters activity patterns and time budgets and leads to increased rates of human-bear conflict. Reducing anthropomorphic food sources reduces conflict, but it is unclear how this type of management strategy influences bear ecology (e.g., their movement patterns). Colorado Parks and Wildlife, US Department of Agriculture, the City of Durango, and Colorado State University collaborated on a large-scale experiment that tested the effectiveness of wildlife-resistant garbage containers to reduce human-bear conflict in Durango, Colorado. In 2010, an ordinance required residents to secure attractants. In 2013, wildlife-resistant containers were distributed in two treatment areas, while residents of two control areas continued to use mostly regular containers. Between 2011 and 2016, bears were captured around the city and fitted with GPS collars. The quantity of natural foods available annually and the consistency of residents in properly locking their containers were also monitored. We applied an integrated step-selection analysis to bear movements through the area to investigate the efficacy of bear-resistant containers in modifying bear behavior. Specifically, we examined the effect of treatment, resident compliance, and natural food availability on bear resource selection and speed when moving through the urban landscape. Our results inform whether bear-resistant containers can change how bears move and use the landscape, and whether this strategy can be used to promote human-carnivore coexistence.

Day: Friday **Time:** 09:00 – 09:15 **Room:** Hall C

Theme: Human-Bear Conflicts & Coexistence

Abstract Number: 325
Presentation Type: Oral Presentation
Presentation Title: Factors affecting forest road use in Eurasian Brown Bears
Presenter Name: David Blount
Presenter Affiliation: University of Utah
Presenter Email: david.blount@utah.edu
All Authors: David Blount, Mark Chynoweth, Josip Kusak, Cagan Sekercioglu
Primary Author Occupation: Student

Abstract:

Of all anthropogenic disturbances, none are quite as ubiquitous as roads. Over 20% of all Earth's terrestrial landmass is located within 1 km of a road, and the remaining landmass greatly fragmented (Ibisch et al. 2017). More developed continents, like Europe, have even higher concentration of roads, with 50% of its land within 1.5km of a road (Torres et al., 2016). Roads have been shown to be ecological traps for many carnivores, including brown bears, offering food (Roever et al., 2008) and movement corridors (Roever, Boyce & Stenhouse 2010) at a cost of increased mortality from cars and humans (Northrup et al. 2012). This relationship is complex, and traffic volume may be more important than road density in determining how bears use roads and their survival outcomes (Northrup et al. 2012). Roads with limited traffic have actually been shown to be selected for in resource selection functions and used more frequently (Northrup et al., 2012; Blount et al., in review). In this study we used 40 GPS collared bears and camera traps on forest roads to understand what factors affect unpaved forest road use in Eurasian brown bears in northeastern Türkiye. We measured brown bear activity across the year using accelerometer data from GPS collars to understand when bears were active. We then paired this data with a large camera trap array to understanding forest road use by bears in relation to bear activity. Combining these techniques, we were able to understand when bears use roads, how road use patterns change across seasons, and what factors may affect forest road use. As brown bears colonize human populated areas across Europe, understanding when and how bears use roads is vital to decreasing human caused mortality, and limiting human-wildlife conflict.

Day: Friday **Time:** 09:20 – 09:35 **Room:** Hall C

Theme: Human-Bear Conflicts & Coexistence

Abstract Number: 337
Presentation Type: Oral Presentation
Presentation Title: Human-Bear Conflicts in Southwest Montana: Mapping Attractants and Prevention Efforts in Missoula and Ravalli Counties
Presenter Name: Jessica Reyes
Presenter Affiliation: University of Montana, College of Forestry
Presenter Email: jessica@beardogs.org
All Authors: Jessica Reyes, Carrie Hunt, Nils Pedersen, James Jonkel
Primary Author Occupation: Student

Abstract:

This project evaluates the impact of human development on land cover changes in Missoula and Ravalli Counties, MT (USA), and the influence it has had on the spatial and temporal aspects of reported human-bear conflicts (conflicts) to Montana Fish Wildlife & Parks (MFWP) from 2017-2022. Understanding the characteristics of conflicts is crucial for targeted and proactive bear management and community development strategies as both grizzly bears and human populations expand and will enhance safety for both bears and people while promoting public acceptance of grizzly bears. These southwestern Montana counties consist of over 50% of public lands and serve as critical linkage zones between the Grizzly Bear Recovery Ecosystems for both Montana and Wyoming. Ravalli and Missoula Counties have large black bear populations with chronic conflicts that are increasing. Documented grizzly bear observations have been increasing in these counties in the last 5 years and subsequent grizzly bear conflicts are predicted where black bear conflicts have previously been reported. This project will produce maps detailing attractant types that lead to conflicts, conflict-reduction infrastructure, and annual land use/land cover changes in each county respectively, and analyze development growth patterns and geographical features that are correlated with reported conflicts. Mapping results will be used to establish "bear buffer zones" as conflict mitigation areas that promote safety for both bears and people in the wildland-urban interface in Ravalli County and focus conflict prevention resources supporting "Bear Smart Community" initiatives in both counties. These bear buffer zones will be designated on the map in collaboration with James Jonkel (MFWP, R2), Wind River Bear Institute, and supporting organizations. This project is an M.Sc. thesis at the University of Montana scheduled for defense in December 2024. These maps will also be made available to the public through social media.

Day: Friday **Time:** 09:40 – 09:55 **Room:** Hall C

Theme: Human-Bear Conflicts & Coexistence

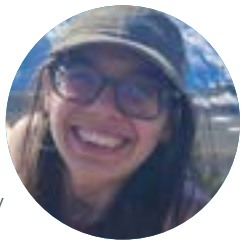
Abstract Number: 341
Presentation Type: Oral Presentation
Presentation Title: Characteristics of Grizzly Bear Observations in the North Slope Oilfields, Alaska
Presenter Name: Nils Pedersen
Presenter Affiliation: Wind River Bear Institute
Presenter Email: nils@beardogs.org
All Authors: Nils Pedersen, Todd J. Brinkman, Richard T. Shideler, Mark S. Lindberg, Scott M. Brainerd
Primary Author Occupation: Professional

Abstract:

Managing the risk of unsafe human-bear interactions in the North Slope oilfields of Alaska (USA) requires an understanding of where they occur and how to prevent them. To reduce negative interactions, oilfield operators prepared bear interaction plans that included systematic collection of grizzly bear (Ursus arctos) observations. Between 1990 and 2014, Oilfield Security Officers recorded 1,207 marked bear sightings using the Alaska Department of Fish and Game's (ADF&G) Grizzly Bear Sighting and Hazing Report (GBSHR) forms. Based on previous research, ADF&G identified each marked bear and classified it as either food conditioned (FC) or dependent on natural food (NF). Prior to deployment of bear-resistant garbage containers around infrastructure between 1999 and 2001, bear access to food waste was common within the area. We used spatial coordinates from GBSHRs to estimate changes in mean distance between FC and NF bears and landscape features (facilities, roads, rivers, landfill) before (1990–2000) and after (2001–2014) changes in waste management treatments. Bear access to the landfill remained intermittent post treatment. We compared distances in sightings between time periods using effect-size estimates and generated "hot spot" maps to visualize changes in spatial distribution of sightings pre- and post-treatment. The waste treatment increased the mean distance of bear sightings from facilities and roads and concentrated FC-bear sightings around the landfill, where bear access to food waste persisted post treatment. The treatment had a minimal effect on the mean distance of NF-bear sightings near the landfill. Our study provides new information on the effects of waste management on bear behavior and human-bear interactions within a large industrial complex. Our study also demonstrates the utility of a systematic and active bear sighting report system for monitoring bear activity in developed areas.

Day: Friday **Time:** 10:20 – 10:35 **Room:** Hall C

Theme: Human-Bear Conflicts & Coexistence



Abstract Number: 317
Presentation Type: Oral Presentation
Presentation Title: Bearing with it: impacts of human activities on American black bear space use and home range size in southeastern Oklahoma's recolonizing population
Presenter Name: Courtney Dotterweich
Presenter Affiliation: Oklahoma State University
Presenter Email: HYPERLINK "mailto:courtney.dotterweich@okstate.edu" courtney.dotterweich@okstate.edu
All Authors: Courtney Dotterweich and W. Sue Fairbanks
Primary Author Occupation: Student

Abstract:

Once extirpated from eastern Oklahoma due to extensive overharvest and habitat loss, American black bears are now recolonizing areas now altered by human activities and presence. While human population density is rather low throughout southeastern Oklahoma (7.196 people/km2), this region is dominated by agriculture, timber plantations, and recreational areas, all of which have been shown to contribute to shifts in bear movement. Understanding this, the objective of this study is to identify the human, landcover, and temporal factors that influence bear home range size and resource selection to better determine how these variables influence recolonization in this region. We will utilize GPS data collected from 84 individual female black bears from 2014 – 2023 to understand how human activities and areas of impact influence black bear home range

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size and resource selection in a still recolonizing population. Preliminary analyses using autocorrelated kernel density estimates (AKDE) to estimate home range size indicated black bear home ranges varied widely within the study area and were influenced by reproductive status, season, and contiguous forest cover. Future work will use resource selection functions under a use versus availability design to identify whether bears spatially or temporally avoid areas of human activity. This research can provide insights into the recolonization potential for bears in this region, as well as identify the current impacts humans have on this population..

Day: Friday **Time:** 10:40 – 10:55 **Room:** Hall C

Theme: Demographics

Abstract Number: 264
Presentation Type: Oral Presentation
Presentation Title: Invitation to Participate: An experimental comparison of expert elicitation data and empirical data of American black bears
Presenter Name: Darcy Doran-Myers
Presenter Affiliation: University of Florida
Presenter Email: ddoranmyers@ufl.edu
All Authors: Darcy Doran-Myers and Conor McGowan
Primary Author Occupation: Student

Abstract:

Expert elicitation is increasingly used in ecology to fill data gaps. The reliability of expert elicitation as a source of data is seldom verified, but it is pivotal for credible research results. This presentation is an invitation to participate in a USFWS-backed study designed to test the accuracy and precision of expert judgments in ecology. The goal is to externally validate the reliability of expert judgments and to investigate the factors affecting data accuracy. The American black bear and its species experts is an ideal study system for this purpose because of the bear's extensive range, decades of empirical research using consistent methods, and the availability of numerous knowledgeable experts (you all!).

Invitation #1: I am compiling a large dataset of existing black bear genetic mark-recapture datasets. I ask willing conference attendees to contribute data to this effort. By aggregating existing datasets, I aim to generate comprehensive estimates of key parameters, such as population abundance and survival rates, informed by various environmental factors. These estimates will serve as a benchmark to evaluate the performance of expert judgments.

Invitation #2: I am recruiting black bear experts across the species range to serve on expert panels. The call for participation extends to the broad spectrum of black bear specialists, at all career levels, to ensure a diverse and representative sample. Experts will be asked to share their expertise and provide estimates of local, regional, and range-wide parameters through an initial survey, two rounds of online elicitation, and one round of online discussion.

Your participation will help to enhance our understanding of expert elicitation data in ecology, thereby influencing the future of ecological research methods. You may personally benefit through data acknowledgement, co-authorship where appropriate, and a better understanding of black bear populations at large scales and your own species knowledge.

Day: Friday **Time:** 11:00 – 11:15 **Room:** Hall C

Theme: Demographics

Abstract Number: 274
Presentation Type: Oral Presentation
Presentation Title: Participatory assessment of Aklak (grizzly bear) abundance and distribution in the Kivalliq Region, Nunavut
Presenter Name: Lauren Harding
Presenter Affiliation: University of Northern British Columbia
Presenter Email: lauren.harding@unbc.ca
All Authors: Lauren Harding, Emil Arnalak, Russell Toolooktook, Malik Awan, Tayyab Shah, Michaela Sidloski, Douglas Clark
Primary Author Occupation: Professional

Abstract:

Aklak (grizzly bear, Ursus arctos) are viewed by communities of the Kivalliq region, Nunavut, as increasing in abundance. We used semi-structured interviews and participatory mapping exercises in two communities, Arviat and Baker Lake (Qamani'tuaq), to elicit narratives of encounters, estimates of spatial distribution and abundance, and knowledge of aklak ecology from Inuit hunters and Elders. Inuit observations documented on maps during the interviews were digitized and used along with reported harvest data (2008 to 2023) to estimate current aklak abundance across the region using multiple spatial interpolation techniques. Validation was conducted at workshops in each community in February 2023. Participants uniformly emphasized an increase in the relative abundance of aklak across the Kivalliq region since the beginning of the twentieth century, with rare encounters prior to the 1960s but frequent encounters from the 1990s onward. Participants emphasize that aklak were not historically abundant in the Kivalliq, suggesting a range expansion rather than a population recovering from depletion. The distribution of aklak was primarily inland, with frequent encounters along lakes and rivers, but with encounters in coastal areas increasing. Using Empirical Bayesian Kriging and Inverse Distance Weighting to interpolate total aklak abundance based on the interview data, we calculated a conservative density estimate of 2.91–4.07 aklak per 1000km2. The socio-ecological context of the Kivalliq is not analogous to other regions in Canada, and study participants emphasized that management policies and practices for aklak should be distinctive to the region's situation.

Day: Friday **Time:** 11:20 – 11:35 **Room:** Hall C

Theme: Demographics

Abstract Number: 277
Presentation Type: Oral Presentation
Presentation Title: Demography of a poorly-known large carnivore population at the range edge: Andean bears in the equatorial dry forest of north-western Peru.
Presenter Name: Alexander More
Presenter Affiliation: Spectacled Bear Conservation Society Peru
Presenter Email: alex@sbc-peru.org
All Authors: Robyn Appleton, Alexander More, Mathias Tobler
Primary Author Occupation: Professional

Abstract:

We report for the first time estimated survival, reproduction, and population growth rates for individually-identified Andean bears (Tremarctus ornatus) in equatorial dry forests of northern Peru, an area recorgnized as a global biodiversity hotspot. We used 15 years of re-sighting data to parameterize spatial capture-recapture (SCR) models and population viability analyses (PVA) to identify the demographic rates most influential of population growth and extinction risk. To do so, we collated 8,262 observations of 73 bears from 2008 to 2022 within our 350 km2 study area, using camera trap grid to estimate density (SCR), and repreated observations at focal waterholes and dens to estimate age-specific survival and fecundity. We estimated bear density at 7.1 (± 1.3) / 100 km-2, and annual survival probabilities for cubs (<12 months) (0.40 ±), juveniles (1-2 years) (0.72 ±) and subadults (2-3 years) (0.82 ±), and adult (³4 years) females (0.88 ±), and adult males (0.90 ±). Model estimates of lambda (0.88 ±) and mean time ot extinction (18.6 yrs ±) therefore suggest an urgent need to enhance demographic performance and/or facilitate continued immigration into this range-edge population. Sensitivity analyses indicated that female survival had the largest influence on estimated population growth. Because female and cub survival and reproductive success were low relative to other bear populations globally, our results suggest population growth may be limited by the effects of food quality or quantify on maternal condition and exacerbated by anthropogenic factors limiting access to food resources in the dry season. Our findings underscore an urgent need for landscape-level planning aimed at conserving and restoring habitats essential to the persistence and movement of large carnivores in this global biodiversity hotspot.

Day: Friday **Time:** 11:40 – 11:55 **Room:** Salon 4

Theme: Demographics

Abstract Number: 296
Presentation Type: Oral Presentation
Presentation Title: Estimating bear density using non-invasive genetics: Importance of linking subsampling methods to modeling approaches
Presenter Name: Nathan Hostetter
Presenter Affiliation: U.S. Geological Survey, North Carolina Cooperative Fish and Wildlife Research Unit, North Carolina State University
Presenter Email: njhostet@ncsu.edu
All Authors: Nathan Hostetter, Caitlin K. Brett, Fabian Jimenez, Colleen Olfenbuttel, Daniel U. Greene, Joseph D. Clark, Ben Augustine, Dana J. Morin
Primary Author Occupation: Professional

Abstract:

Non-invasive genetic sampling has revolutionized the collection of individual-level data to investigate survival, abundance, and density of bear populations at large spatial scales. Non-invasive genetic studies typically use mark-recapture study designs, where researchers place multiple hair snares across a study area, then check and collect hair at regular intervals. Subsequent genetic analysis of hair samples results in an encounter history for each individual (i.e., where and when an individual was detected) that can be used for abundance and density estimation. A large number of hair samples are often collected during these studies, which creates a need to subsample and reduce the number hair samples for genotyping. Herein, we investigate how different subsampling approaches lead to important modeling considerations and inferences on density and spatial variation in density. Motivated by a large-scale study of black bears in eastern North Carolina, USA, we use computer simulation studies to identify conditions where subsampling methods can lead to biased density estimates and modeling approaches to reduce those biases. Subsampling methods can include selecting a fixed number of hair samples per site per occasion (e.g., 1 sample per site per week), random selection, and selections weighted towards areas with greater samples; all of which can have a fixed total number of samples for genotyping based on costs. Preliminary results indicate important tradeoffs among subsampling methods that involve cost, statistical power, bias, and modeling considerations. Importantly, selection of subsampling methods should consider study objectives and inform the modelling approach. Results of this work provide important information for researchers and managers interested in using non-invasive genetic sampling to investigate landscape-scale abundance, density, and spatial variation in these processes.

Day: Friday **Time:** 13:30 – 13:45 **Room:** Hall C

Theme: Demographics

Abstract Number: 316
Presentation Type: Oral Presentation
Presentation Title: Tales from a Polar Bear Genetic Mark-Recapture Survey in the Canadian Beaufort Sea
Presenter Name: Faye d'Eon-Eggertson
Presenter Affiliation: Government of the Northwest Territories
Presenter Email: faye_d'eon-eggertson@gov.nt.ca
All Authors: Faye d'Eon-Eggertson, Steven Baryluk, Jodie Pongracz, Mike Suitor
Primary Author Occupation: Professional

Abstract:

Polar bears are a high-profile species of international concern, which are classified as vulnerable due to sea ice habitat loss resulting from climate change. Of the 19 polar bear subpopulations worldwide, 13 occur within Canada. These subpopulations are periodically assessed to evaluate if there have been changes to their abundance, distribution, and demographic parameters. The purpose of this study is to provide updated abundance estimates for the Southern Beaufort Sea and Northern Beaufort Sea polar bear subpopulations, which were last estimated in 2006 as having 1,215 and 1,291 bears respectively. This presentation recaps four years of collaborative field efforts between 2019-2023, coordinated across the Yukon, Nunavut, and Northwest Territories in Canada as well as Alaska in the United States. Coordinating across jurisdictions should improve our population estimates of these highly mobile animals. For this study, Canadian crews flew more than 95,000 km over the frozen Beaufort Sea and conducted a genetic mark-recapture survey using biopsy darting. The data from this survey will be combined with estimates of demographic and reproductive parameters, spatiotemporal distribution, and environmental covariates into an integrated population model to generate a population estimate for these subpopulations. The results of this study will inform Inuit, governments and co-management partners about current population status and trends of these subpopulations, which can help inform decisions about polar bear management and ensure the long-term conservation of this species.

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Day: Friday **Time:** 13:50 – 14:05 **Room:** Hall C

Theme: Demographics

Abstract Number: 329
Presentation Type: Oral Presentation
Presentation Title: Demography of American black bears (Ursus americanus) in a semiarid environment
Presenter Name: Brenden Orocu
Presenter Affiliation: Brigham Young University
Presenter Email: borocu@byu.edu
All Authors: Brenden Orocu, Cambria Armstrong, Janene Auger, Hal L. Black, Randy T. Larsen, Brock R. McMillan, Mark C. Belk
Primary Author Occupation: Student

Abstract:

American black bears (Ursus americanus) have a widespread distribution in North America. However, demography of American black bears in semiarid environments, which compose a significant portion of the geographic range, is poorly understood. Our objective was to characterize fecundity and survival rates and to estimate population growth rate (?), stable stage distribution and reproductive value for black bears in semiarid environments, and to compare these vital rates to populations in mesic environments where most of our current understanding lies. We conducted a long-term mark-recapture study of black bears in semiarid eastern Utah. We monitored fecundity and survival rates of 5 life stages (cub; yearling; subadult, 2–4 years old; prime-aged adult, 4–14; and old adult, 15+) from 1991 to 2017. We used a matrix transition model to estimate ?, reproductive value, and stable age distribution. We performed sensitivity and elasticity analyses to determine which parameters were most influential to ?. Average annual survival rate was 0.62 (95% CI: 0.54–0.70), 0.56 (0.46–0.66), 0.80 (0.68–0.92), 0.87 (0.79–0.95), 0.87 (0.69–1.0), for cub, yearling, subadult, prime-aged adult, and old adult, respectively. Our estimate of ? was 0.96 (0.82–1.10), indicative of a stable population and comparable to black bears in mesic areas. Cub and yearling survival are relatively low and adult survival is relatively high compared to other populations. Adults make up the majority of the population and have the highest reproductive value, and survival of adults had the highest elasticity contribution to our estimated ?. Population dynamics of black bears in our semiarid environment appear to function within the range of bears in other ecozones, but bears in our study exhibit relatively higher survival of adults and greater longevity compared to other populations. It is not clear if this pattern of adult dominance in the life history is due to the semiarid environment or a different factor.

Day: Friday **Time: 14:10 – 14:25** **Room: Hall C**

Theme: Demographics

Abstract Number: 331
Presentation Type: Oral Presentation
Presentation Title: Spatiotemporal changes in genetic diversity and structure of Asian black bear (Ursus thibetanus) over 30 years in Nagano, Japan
Presenter Name: Ririko Koido
Presenter Affiliation: University of Tsukuba
Presenter Email: ririko0719@gmail.com
All Authors: Ririko Koido, Misako Kuroe, Ryosuke Kishimoto, Yoshiaki Tsuda
Primary Author Occupation: Student

Abstract:

As genetic structure of species is formed in space and time, it is important to evaluate spatiotemporal patterns of genetic diversity not only for understanding the species' distribution and dispersal history but also to propose conservation management programs. However, since most genetic diversity studies are conducted at a single time point, genetic monitoring of species over time is crucial in conservation biology. In Japan, the highest number of human-bear accidents and culling occurred in 2023, requiring bear monitoring and reliable conservation management strategies. In order to monitor the bear populations and evaluate the potential risk of management on genetic diversity, we conducted a spatiotemporal genetic analysis of 617 black bears from 6 regions throughout Nagano, Japan. In particular, by collecting not only genetic samples but also tooth samples and estimating the birth year for each individual, we evaluated temporal patterns in spatial genetic structure based on individual's birth year over 30 years from 1986. Based on the analysis of 16 microsatellites and mitochondrial DNA variations, although the STRUCTURE analysis detected 17 genetic clusters in the 6 regions, clear temporal patterns were not detected in the cluster frequencies. The largest genetic differentiation among 6 regions was maintained over 30 years across the Chikuma River which is the longest river in Japan, acting as a genetic and geographic barrier. Only in Yamanouchi town out of 6 regions, significant correlations between pairs of pairwise genetic distance and birth year difference, and relatedness and geographic distance among individuals were detected. Furthermore, although temporal change of genetic diversity was revealed, we have not yet clarified the impact of current bear management on genetic diversity because of the effect of spatiotemporal dispersal. This study demonstrated that combining genetic data and age estimation can be useful for wildlife monitoring and management.

Day: Friday **Time:** 14:30 – 14:45 **Room:** Hall C

Theme: Captive Bears, Zoos, and Physiology

Abstract Number: 282
Presentation Type: Oral Presentation
Presentation Title: Metabolic rates of two co-existing Ursidae species: Asiatic black bears and sun bears
Presenter Name: Zachary David
Presenter Affiliation: Old Dominion University
Presenter Email: zdavi008@odu.edu
All Authors: Zachary David, Megan Owen, Barbara Durrant, Vuthy Choun, Nev Broadis, Kirsty Officer, Michael Griego, John Whiteman
Primary Author Occupation: Student

Abstract:

Metabolic rate (MR) is a fundamental property that reflects the total energy demand for all aspects of organismal function, from immune performance to reproduction. As a result, understanding metabolic rate is a key aspect of bear conservation. Asiatic black bears (Ursus thibetanus) and sun bears (Helarctos malayanus) are considered "Vulnerable"; however, little is known about their metabolism. Resting metabolic rate (RMR) is a measurement of the total amount of energy necessary for self-maintenance and therefore is an essential component of field metabolic rate (FMR). We measured RMR of captive individuals at the Cambodian Bear Sanctuary supported by Free the Bears and located within the Phnom Tamao Wildlife Rescue Center, Cambodia. Using positive reinforcement, bears were trained to rest in a custom-built metabolic chamber connected

to sensors which continuously recorded O2, CO2, and water vapor concentration. Measurements for sun bears in July were 0.55 – 0.78 ml O2 g-1 hr-1 (mean = 0.63) and in January/December were 0.42 - 1.24 ml O2 g-1 hr-1 (mean = 0.83). RMR for Asiatic black bears in July ranged from 0.26 – 0.48 ml O2 g-1 hr-1 (mean = 0.35) and in January/December ranged from 0.29 – 0.55 ml O2 g-1 hr-1 (mean = 0.35). Analysis is currently ongoing to assess the influence of activity and nutritional state of measured individuals and comparability to previously measured Ursidae species.

Day: Friday **Time:** 15:10 – 15:25 **Room:** Hall C

Theme: Captive Bears, Zoos, and Physiology

Abstract Number: 292
Presentation Type: Oral Presentation
Presentation Title: Evaluating hemoglobin A1c for use as a nutritional and reproductive biomarker for free-ranging polar bears (Ursus maritimus)
Presenter Name: Sarah Teman
Presenter Affiliation: University of Washington
Presenter Email: steman@uw.edu
All Authors: Sarah Teman, Erin Curry, Todd Atwood, Emily Virgin, Karyn Rode, Louisa Rispoli, Victoria Hope, Kristin Laidre
Primary Author Occupation: Student

Abstract:

For polar bears (Ursus maritimus), access to prey is important for nutritional health and reproductive success. Polar bears in Alaska and western Canada's southern Beaufort Sea (SB) have been adversely affected by the loss of sea ice habitat needed to hunt their seal prey. Springtime foraging is critical for SB bears to gain mass prior to the summer sea-ice retreat, when access to seals is reduced, and is especially significant for adult females (AF) with cubs-of-the-year (COY), as they recently emerged from a maternal den and underwent a months-long fast. During spring field research, it is visually difficult to discern whether a female observed without cubs was nonreproductive or had denned and experienced litter loss (LL); however, fasting can be used to infer LL. The current method to assess fasting, the urea-to-creatinine (UC) ratio, references a temporal window of at least 1-2 weeks. By contrast, hemoglobin A1c (HbA1c) is a measure of average blood glucose over recent months and may have value as a longer-term indicator of fasting or nutritional stress. Our objective was to evaluate HbA1c in fasted vs. non-fasted polar bears. We hypothesized that fasted AF would have greater HbA1c due to insulin resistance during fasting. We validated a commercial ELISA kit (Human Hemoglobin A1c: Abcam) using whole blood samples from zoo polar bears. Assay validation included assessing parallelism between the sample and standard curve, linearity of dilution, and spike-and-recovery. We compared HbA1c between SB bears that recently fasted (spring-captured [SC] AF with COY; n=30) to those that did not fast (SC AF with 1- or 2-year-old cubs; n=36). Preliminary results indicate no difference in HbA1c between the groups (non-fasted: 1.92x106 ± 9.7x104 ng/mL vs. fasted: 1.94x106 ± 1.3x105 ng/mL; Welch's t-test: p= 0.90). To our knowledge, this is the first validation of HbA1c for ursids. This study may enhance our understanding of insulin resistance in fasting polar bears.

Day: Friday **Time:** 15:30 – 15:45 **Room:** Hall C

Theme: Captive Bears, Zoos, and Physiology

Abstract Number: 110
Presentation Type: Oral Presentation
Presentation Title: Humming of a captive polar bear cub in the maternity den
Presenter Name: Homare Yamamoto
Presenter Affiliation: Osaka University
Presenter Email: otyaotya1600ih@gmail.com
All Authors: Homare Yamamoto, Yusuke Sano, Kenji Aburaya, Sakura Ito, Aoi Maruyama, Maki Yamazaki, Noriko Katsu, Kazunori Yamada
Primary Author Occupation: Student

Abstract:

Animals rear their young in a variety of places, some of which are challenging for researchers to observe. Wild and captive polar bears (Ursus maritimus) rear their cubs in dens for about four months after their birth. In zoos, keepers often set up cameras in the maternity den during this period. However, the cubs are rarely seen on camera because the mother's body hides them. It is known that cubs produce humming when they are suckling on their mother's nipples. We examined developmental changes in humming to comprehend the growth of cubs in dens, which were difficult to observe directly. The subjects were a polar bear mother and her female cub at Tennoji Zoo, Japan. A camera was set up on the ceiling of the maternity den, and video was continuously recorded for four months after birth. The total observation time was 720 h. To investigate the acoustic structure, we analyzed the spectrogram. A pulse (< 0.1 s) was produced in rapid succession, and pulses composed a pulse train (range: 1.0–8.0 s). A series consisted of two or more pulse trains, with a short inhalation after each pulse train. We compared the frequency, duration, and interval time of series among each cub's age in months. The proportion of series (< 10 s) was significantly lower at ages 2 and 3 months than at ages 0 and 1 months ($p < 0.01$). The frequency of series per hour decreased significantly with age of the month ($p < 0.01$). The inter-series time increased significantly with age of the month ($p < 0.01$). Polar bear's humming changed with its development. In 2023, three polar bears were born in Japan, but all of them died. We compare the humming of surviving and deceased cubs and examine whether humming can be used as an indicator of the physical condition of the cubs.

Day: Friday **Time:** 15:50 – 16:05 **Room:** Hall C

Theme: Captive Bears, Zoos, and Physiology

Abstract Number: 311
Presentation Type: Oral Presentation
Presentation Title: Death and all its friends: mortality-based monitoring of health status in Croatian part of Dinaric-Pindos brown bear population
Presenter Name: Djuro Huber
Presenter Affiliation: Faculty of Veterinary Medicine, University of Zagreb
Presenter Email: djuro.huber@gmail.com
All Authors: Djuro Huber, Nikica Prvanović Babić, Doroteja Huber, Ewa Serwa, Joanna Macur, Łukasz Paśko, Jerzy Wiater, Lana Pađen, Maja Lazarus, Bartosz Leszczyński, Slaven Reljić, Agnieszka Sergiel
Primary Author Occupation: Professional

ORAL PRESENTATIONS

Abstract:

Free-living wildlife, including bears, in most cases go through disease and eventually die without it being directly observed. Only the most obvious cases e.g., human-induced death (hunting, traffic kills) are recorded. However, the bodies of dead animals may reveal a wide spectrum of pathologies at different stages, and its careful examination might give an important insight into population health status. We conducted a limited but intensive survey of 72 human-induced brown bear mortalities in Croatia from 2021 through 2023. Most of mortalities (67) were the result of hunting, and the remaining five individuals were traffic-killed. Each bear was measured, aged and necropsied. Most organs were inspected on site and multiple samples taken for further laboratory analyses, including on fatty acids, trace elements, stress and reproductive hormones concentration in tissues, and histopathology. Reproductive organs were also examined for its activity and eventual pathologies. One case of bilateral polycystic ovary syndrome was recorded (out of 24 females in the sampled cohort). The histological analysis of stomach walls revealed gastritis at various stages (from mild to moderate chronic) in nine of 24 samples analysed. In one individual (of nine analysed) we recorded severe fibrosis of left ventricle affecting 40% of myocardium and extending into the heart muscle, and multifocal, moderate areas of cartilage metaplasia. Additionally, in case of three individuals, mild myocardial fibrosis was found. The adrenal glands exhibited unilateral cortical micronodules in case of nine individuals (out of 71 examined) that is 12,67% of bears under study. All these examples illustrate the importance of mortality surveys, the information load they carry on population health and warn about short-term and long-term threats. We also propose that consistent, systematic, and extensive monitoring of mortalities additionally facilitates surveying of contaminants and diseases.

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

Theme: Captive Bears, Zoos, and Physiology

Abstract Number: 8
Presentation Type: Poster Presentation
Presentation Title: Milk Effects on Bornean Sun Bear Cub Mass in Malaysia
Presenter Name: Ellen Wieczorek
Presenter Affiliation: Corresponding Author, Unity Environmental University, North American Coordinator for Bornean Sun Bear Conservation Centre, Sabah, Malaysia
Presenter Email: esw78@comcast.net
All Authors: Ellen Wieczorek, Siew Te Wong, Boon Nie Yeoh
Primary Author Occupation: Self-Employed

Abstract:

This study analyzes milk formulation impacts on Bornean sun bear (Helarctos malayanus euryspilus) cub mass and feeding data collected at the Bornean Sun Bear Conservation Centre in Sabah, Malaysia. We use generalized linear mixed model with random effects to assess disparities between sun bear cub (n = 10) mass gain ($\bar{x}$ = 13.09 kg, s = 4.66 kg, Range [4.40-27.45 kg]) and differences between male and female hand-reared cubs based on >1000 daily or semi-weekly measurements recorded since 2013. We found lower mass gain in females ($\bar{x}$ = 11.8 kg), compared to males ($\bar{x}$ = 16.1 kg), and model results suggested sexual dimorphism as the cause between male and female average mass. The model identified significant variables as the individual bear, age, and the percentage of body mass fed. Milk formulation was varied by individual health metrics, and feedings were calculated using ml/kg. Additional research should assess sun bear milk composition to more closely simulate milk.

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

Theme: Human-Bear Conflict & Coexistence

Abstract Number: 27
Presentation Type: Poster Presentation
Presentation Title: Bearly Guilty: Understanding Human–Andean Bear Conflict Regarding Crop Losses
Presenter Name: Viviana Albarracín
Presenter Affiliation: Independent
Presenter Email: vivialbarracindavalos@gmail.com
All Authors: Viviana Albarracín and Enzo Aliga Rossel
Primary Author Occupation: Professional

Abstract:

Conflicts between wildlife and humans are increasing worldwide, especially in areas where they coexist and share resources. To investigate attitudes and opinions of the human population towards human-Andean bear (Tremarctos ornatus) conflicts in two indigenous Aymara communities, Chuñavi and Lambate, Bolivia, semi-structured interviews were directed to an adult member of families in the communities. Simultaneously, we registered, monitored, and evaluated 70 farm plots to record evidence of Andean bear and other wildlife damage to the maize crops and plants. We found that the locals thought the bear caused the most damage when, in actuality, the most harmful issues identified for maize crops were environmental factors, followed by parrots and birds. Knowledge of the interactions between wild animals and productive systems can contribute to an understanding of Andean bear-human coexistence.

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

Theme: Habitat Relationships

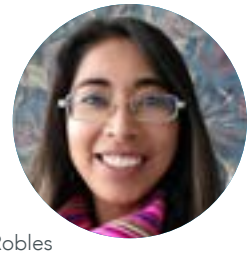
Abstract Number: 28
Presentation Type: Poster Presentation
Presentation Title: Conservation of the Elusive Andean Bear in Inquisivi and Quime region, Department of La Paz, Bolivia.
Presenter Name: Viviana Albarracín
Presenter Affiliation: Independent
Presenter Email: vivialbarracindavalos@gmail.com
All Authors: Viviana Albarracín
Primary Author Occupation: Professional

Abstract:

From April 2021 to April 2022, we conducted surveys along field routes established in 20 quadrants of 16 km2 each. Our sampling effort was concentrated on ridges and paramo. The routes were georeferenced, as well as the location of each sign detected, to set camera-trap stations. We found bear sign in each of 10 studied quadrats. A particularly large number of sign locations associated with feeding events were found in the paramo. We observed differences in the signs found in the cloud forest by season and altitude. The presence of bears seems to be influenced by the fruiting season of certain species, particularly at lower altitudes in the portion of the clouded forest, coinciding with the start of the rainy season We reported 18 new records of bear sign, and once those were obtained we set several camera traps in 2022 in an area that the project is promoting to consolidate as a possible Municipal Protected Area and Integrated Management Natural Area. This proposed protected area includes clouded forests and Andean paramo, which could be a key addition to Andean bear habitat since this project confirmed the presence of bears during the wet and part of the dry season in the area.

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

Theme: Habitat Relationships



Abstract Number: 29
Presentation Type: Poster Presentation
Presentation Title: Current status of Andean Bear in the municipalities of Samaipata and Mairana department of Santa Cruz, Bolivia
Presenter Name: Viviana Albarracín
Presenter Affiliation: Independent
Presenter Email: vivialbarracindavalos@gmail.com
All Authors: Viviana Albarracín and Ana Belen Robles
Primary Author Occupation: Student

Abstract:

The elusive Andean or spectacled bear; it is categorized as Vulnerable (VU) species at the national level as well by the IUCN. The Andean bear is an enigmatic flagship species for the clouded forests and adjacent Andean meadows of the Tropical Andes. However, habitat loss and human-animal conflict issues severely threaten the Andean bear across much of its Bolivian range, increasing the threats over the species.

Given the importance of the Andean bear for conservation efforts across the Tropical Andes and yet the lack of systematized information regarding distribution and ecology, it's a must to gather and collectively analyze existing Andean bear data for the department of Santa Cruz. This area was

not studied for 30 years, so it is possible that this place supports a good population of bears. This species it is associated with habitat (cloud forest) very important for the climate and water regulation at the regional level and that is why it is considered as a good indicator of the health status of these forests. This research describes the presence of the Andean bear in the Department of Santa Cruz in the municipalities of Mairana and Samaipata, which are within the limits of the Andean Bear Conservation Units (UCO) proposed for Bolivia and Peru. With the help of local inhabitants, we registers different signs of the presence of the Andean bear, determining the occupancy of the bear as well in the area. Threats, in particular conflict with humans. Involving the locals in this type of study is to recognize the opinion and its knowledge in addition to considering it in making decisions that is increasingly important.

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

Theme: Habitat Relationships

Abstract Number: 31
Presentation Type: Poster Presentation
Presentation Title: Evaluation of local ecological knowledge as a method to collect data on occupancy and probability of detection of Tremarctos ornatus, in the Apolobamba National Integrated Management Natural Area
Presenter Name: Viviana Albarracín
Presenter Affiliation: Independent
Presenter Email: vivialbarracindavalos@gmail.com
All Authors: Viviana Albarracín
Primary Author Occupation: Professional

Abstract:

Between May 2017 and June 2019, interviews were held in the Apolobamba National Integrated Management Natural Area to study the sites that are prioritized for conservation of the Andean bear. The little information on the presence and distribution of this species is particularly notable in remote areas, despite the fact that they are usually places rich in biodiversity.

The use of interviews with the local population to replace traditional methodologies (such as transects or camera traps) when estimating the distribution of species and at the same time being able to monitor them. Each interview at a study site serves as a replicate for the location, thus making it possible to construct a detection history (using interview responses of whether a species is present or absent at that site) for each site in the study area. This method is seen as a useful approach to monitor and evaluate the presence of the species that occupies large geographic areas due to its high effectiveness at the cost-benefit level. In this sense, working with people's local knowledge that can provide relevant biological information for conservation efforts.

This novel alternative of models based on interviews allows us to identify parameters with a strong influence on the presence of the species that allow us to generate a baseline for monitoring, a requirement to determine the effectiveness and efficiency of conservation plans.

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

Theme: Human-Bear Conflict & Coexistence

Abstract Number: 51
Presentation Type: Poster Presentation
Presentation Title: The Absent Shrine: Arctolatry in the Japanese Archipelago
Presenter Name: David Laichtman
Presenter Affiliation: Sophia University (□□□□)
Presenter Email: DLaichtman@Gmail.com
All Authors: David Laichtman
Primary Author Occupation: Student

Abstract:

"The Absent Shrine" is an analysis of bear worship in the Japanese archipelago. It contends with the apparent paradox of A. Irving Hallowell's boreal arctolatric ubiquity premise and the lack of institutionalized ursine religion in Japan. A document and artifact based survey provides the historical context of bear religion for Ainu, Okhotsk, and Mountain Reverence groups in the archipelago. A Lived Religion ethnographic approach undertaken via participant observation and semi-structured interviews of hunters, conservationists, photographers, and camera-trappers is the basis of an evaluation of contemporary bear worship, allowing for a description of how the modern and historical practices differ. By then engaging with the praxis/doxis dialectic in Japanese religious studies, the work concludes that despite its incongruence with institutionally-predicated religious complexes, bear worship persists as an archipelago-spanning numinous qualia. By constructing a novel spectrum for use as a metric of religious adherence, and applying this conclusion thereto, "The Absent Shrine"reframes not just bear worship, but the religious experience in the archipelago, as a mechanism for reckoning with the kinetic triangular relationship between humans, animals, and environmental spaces.

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

Theme: Human-Bear Conflict & Coexistence

Abstract Number: 55
Presentation Type: Poster Presentation
Presentation Title: Bear Awareness Gardiner: Grizzly Bear Conflict Mitigation Work In the Greater Yellowstone Ecosystem, Montana
Presenter Name: Evan Stout
Presenter Affiliation: Bear Awareness Gardiner
Presenter Email: evanlstout@me.com
All Authors: Evan Stout
Primary Author Occupation: Professional

Abstract:

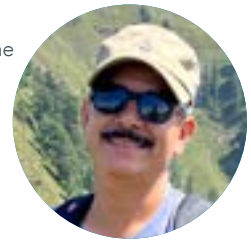
Gardiner Montana sits on the northern boundary of Yellowstone Park, and is surrounded by a patchwork of Federal, State and private lands. Seasonally, grizzly bears migrate through the Gardiner Basin, and often come into conflict with humans while gaining access to attractants such as fruit trees, garbage, grease traps, pet foods and chicken coops. Our mission at Bear Awareness Gardiner is to create greater human safety and reduce bear conflicts by securing attractants and unnatural food sources from the bears. We work in partnership with the State of Montana, Fish Wildlife and Parks, the National Park Service, The National Forest Service and several other NGO's to accomplish our goal.

My poster presentation will cover our history of conflict issues in Gardiner, our current strategies with on the ground work, the complications of cross boundary management between agencies, program funding, building community participation, successes and challenges, and the future work of Bear Awareness Gardiner. This may be helpful for any other similar communities working to reduce human and bear conflicts.

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

Theme: Management

Abstract Number: 68
Presentation Type: Poster Presentation
Presentation Title: Role of Protected areas in the conservation of Asiatic black bear in Pakistan
Presenter Name: Muhammad Naeem
Presenter Affiliation: IUCN/SCC/ Bear Specialist Group
Presenter Email: ajkwildlife@gmail.com
All Authors: Muhammad Naeem Awan
Primary Author Occupation: Professional



Abstract:

Improving the management effectiveness of protected areas is essential for the successful protection of species, necessitating a focus on refining management practices. The Asiatic black bear is one such globally significant species in need of robust conservation strategies for its protection. Within Pakistan, the inquiry arises: do the existing protected areas within its habitat genuinely contribute to its conservation efforts? Have the conservation plans for these protected areas integrated actions for the Asiatic black bear's conservation? Additionally, an exploration of the threats facing the bear within PAs, the extent of its habitat both inside and outside PAs, and the evaluation of its situation in protected areas encompassing its Pakistani range are all pivotal questions. Consequently, this undertaking aims to address these inquiries, offering valuable insights into the conservation of a species like the Asiatic black bear. The resulting data will be of equal significance in assessing the status of the species within protected areas situated within its Pakistani range and appraising the efficacy of these areas in its conservation.

The project's findings will help advocate for the adoption of adaptive management to fine-tune strategies in light of emerging data and shifting scenarios. By embracing the core tenets of adaptive management, a continuous process of adjustments can be fostered, ultimately enhancing the management effectiveness of protected areas efforts in safeguarding species and their respective habitats.

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

Theme: Habitat Relationships

Abstract Number: 74
Presentation Type: Poster Presentation
Presentation Title: Documenting Bear Dens using Light Detection And Ranging (LiDAR) Technology
Presenter Name: Tyler Brasington
Presenter Affiliation: National Park Service
Presenter Email: brasington.tyler@gmail.com
All Authors: Tyler Brasington, Jessica M. Hadley, Justin K. Schwabedissen
Primary Author Occupation: Professional

Abstract:

During hibernation, American black bears (Ursus americanus) and grizzly bears (Ursus arctos horribilis) in the Greater Yellowstone Ecosystem (GYE) create dens for protection from harsh winter environments and to give birth to cubs. Previous studies have acquired den site characteristics through physical measurements recorded by researchers in the field. Using the light detection and ranging (LiDAR) sensor onboard an Apple iPad Pro, we scanned the interior of bear dens (n = 9) located in the GYE to generate point clouds of den structure. We then generated a three-dimensional digital model of each den by processing the point clouds using a combination of available software packages. Computer-generated LiDAR dimensions from the three-dimensional LiDAR models were compared to physical den measurements of the dens recorded by field personnel. The LiDAR generated measurements were within 2% of the physical measurements for every bear den surveyed. Tablet-based LiDAR technology exhibits easy operability and can be readily integrated into den site surveys. The resulting three-dimensional digital models can be catalogued for future studies and provide the advantage of a more robust dataset compared to traditional measurements. This is the first known use of LiDAR to measure bear den characteristics in the field.

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

Theme: Bear Behaviour

Abstract Number: 80
Presentation Type: Poster Presentation
Presentation Title: Active or inactive - through the eyes of the camera and accelerometer
Presenter Name: Tomasz Zwijacz-Kozica
Presenter Affiliation: Tatra National Park
Presenter Email: tzwijacz@tpn.pl
All Authors: Tomasz Zwijacz-Kozica
Primary Author Occupation: Professional

Abstract:

Activity level is important information about an animal's biology and ecology. In the case of brown bears, knowing the activity pattern also allows to take appropriate measures to prevent conflicts with humans. However, obtaining data on this subject is not an easy task. Direct observations, if possible at all, are most often of a very random nature. Therefore, attempts are made to validate the accelerometer data and identify specific behaviors. Most often, direct observations of animals in captivity are used for this purpose. In the case of free-living animals, this is most often possible in relation to non-shy individuals who often roam in open spaces near people. However, telemetry collars equipped with a video camera allow to look at the behavior of animals leading a secretive lifestyle, e.g. wild brown bears. The aim of the work is to compare information collected by an accelerometer and a video camera deploon the same collar deployed on a young brown bear in the Tatra Mountains.

POSTERS

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

Theme: Human-Bear Conflict & Coexistence

Abstract Number: 84
Presentation Type: Poster Presentation
Presentation Title: The Untold Biblical and Early Christian History of Bear
Presenter Name: Gerald Hodge
Presenter Affiliation: Appalachia Georgia Friends of the Bears, Inc.
Presenter Email: gerald@agfriendsofthebears.com
All Authors: Gerald Hodge
Primary Author Occupation: Professional

Abstract:

History has not necessarily been kind to bears. The historiography of bears has only begun to grow in the last 30 years. Few historians have ventured to objectively analyze the bear through the Judeo-Christian prism.

The Holy Bible mentions bears 14 times. Twice in these accounts, bears were "Agents of God," and controversy. The first and most awkward is the story of Elisha, the 2 she-bears, and the 42 "little boys." Theologians have reexamined the original Hebrew and context; they have found that these were not youths at all. In my research, no theologians nor wildlife biologists have put together the fact that adult bears, minus the Sloth bear, have 42-teeth. This has meaning.

Another fascinating missed bear controversy was the Fourth Egyptian Plague. When the Christian Holy Bible was established in 382 CE they used the Septuagint, written in Koine Greek by Jewish scholars. The Fourth Plague was recorded as flies. However, in the book of Wisdom, written in the 1st Century BCE, bears and lions were used by God to punish the Egyptians. Jewish scholars debated at the time what the Fourth Plague was or was not and it continues to this day.

Rome had an insatiable appetite for violent entertainment, and they coupled this with their judicial system. They used big cats, bulls, bears, and elephants in the amphitheaters to entertain and punish. I have found 30 Christian Saints that bears were at least in part involved in their martyrdom. Many of the bears refused to engage them. In addition, as Christianity spread throughout the European continent in the 1st Millenium CE, 30 future Saints have amazing bear stories as part of their narratives.

Bears are threatened worldwide because of habitat loss, the illegal wildlife trade, climate change, and Human-Bear conflict. There are 85 Patron Saints for 33 specific animals. There is no Patron Saint for bears, a creation that certainly could use divine intervention today.

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

Theme: Bear Behaviour

Abstract Number: 89
Presentation Type: Poster Presentation
Presentation Title: A collaborative evaluation of multispecies interactions in Scandinavia: Brown bears, wolves, moose, and red deer in a human-dominated landscape
Presenter Name: Beth Stacey
Presenter Affiliation: Norwegian Institute for Nature Research
Presenter Email: bethany.stacey.20@ucl.ac.uk
All Authors: Aimee Tallian, Jonas Kindberg, Håkan Sand, Wiebke Neumann, Fredrik Stenbacka, Jenny Mattisson, Anders Johannson, Beth Stacey
Primary Author Occupation: Professional

Abstract:

Here we present a new research initiative from the Scandinavian Brown Bear Research Project (SBBRP). This study takes advantage of the convergence of research efforts in the Ljusdal Municipality which represents a unique opportunity to explore multispecies interactions; this is the first time brown bears, wolves, moose, and red deer will be simultaneously collared in Sweden. The study has three core goals: a) quantify bear and wolf predation rates on moose and red deer, b) explore and quantify various drivers of bear kill rates, and c) explore multispecies interactions and behavior. This new study is particularly important in the context of the shifting paradigm from single species to multispecies management. For example, quantifying the combined effect of bears and wolves on Scandinavia's moose and red deer populations is fundamental for the management of all four species and will improve our understanding of wildlife ecology in Europe's human-dominated landscapes. Clarifying the main drivers of bear kill rate and quantifying their effect, including the introduction of novel prey into the ecosystem, is important for understanding the impact of bears on moose populations under varied environmental conditions. Furthermore, understanding the nature of competition between predators is important for managers, who need to know how multiple recovering carnivores within their ecosystem affect both predator behavior and prey population dynamics. This project is a collaborative effort between the SBBRP, the Scandinavian Wolf Research Project, and the Moose Research Project at the Swedish University of Agricultural Sciences, with multiple local and national stakeholders involved within the projects reference group. Together, our three projects envision a long-term collaborative effort in the Ljusdal area with the aim of long-term multi-species monitoring and research to facilitate scientific advancement and adaptive wildlife management in Sweden.

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

Theme: Population Estimation

Abstract Number: 95
Presentation Type: Poster Presentation
Presentation Title: Straddling bears: transboundary populations in Ukraine
Presenter Name: Andreas Zedrosser
Presenter Affiliation: University of Freiburg, University of South-Eastern Norway
Presenter Email: andreas.zedrosser@usn.no
All Authors: Svitlana Kudrenko, Teresa Berezowska-Cnota, Agnieszka Sergiel, Maciej Konopinski, Andrii-Taras Bashta, Serhii Gashchak, Denys Vyshnevskyi, Serhii Obrizan, Michael Wood, Andreas Zedrosser, Nuria Selva
Primary Author Occupation: Student

Abstract:

The Carpathian brown bear (Ursus arctos) population is the largest in Europe and extends over six countries. In the Ukrainian Carpathians, brown bears are now mainly inhabiting protected areas and population estimates remain unprecise compared to neighboring countries. The region provide a crucial movement corridor linking north-western components of the Carpathian population in Poland and Slovakia with the numerous bear population in Romania. We have conducted the first systematic study on bears in the north-western part of the Ukrainian Carpathians. Our main goal was to predict habitat suitability for the species and apply genetic monitoring methods (noninvasive hair and scat collection between April and October 2021) to investigate local population size. Overall, we collected 148 hair and 50 faecal samples and further subsampled 107 samples for genetic analysis. As the number of follicles found was sometimes small, DNA extraction was performed for the entire subsampled group, even for samples consisting of a single guard hair follicle. So far, we have identified 17 adult individuals. Our results revealed the overestimation of bear numbers in the region as well as poorly restricted human activities (logging, recreation, gathering wild resource) both inside and outside the protected areas. This project was the first step towards understanding the brown bear distribution and population dynamics in the Ukrainian part of the Carpathians since no systematic genetic bear studies have so far been conducted in this region. In addition to the Carpathians, we have conducted identical research in the Ukrainian part of the Chornobyl Exclusion Zone (CEZ). Bears were extirpated from the area for more than a century. We were the first to detect a female bear in the area and by using bear presence data in the CEZ during 2014-2022, conducted habitat suitability modelling for the species.

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

Theme: Bear Behaviour

Abstract Number: 98
Presentation Type: Poster Presentation
Presentation Title: An analysis of American black bear (Ursus americanus) spring diet to assess predation risk of neonate wood bison (Bison bison athabascae)
Presenter Name: Molly Sharp
Presenter Affiliation: University of Alberta
Presenter Email: msharp2@ualberta.ca
All Authors: Molly Sharp, Scott Nielsen, Mark Edwards
Primary Author Occupation: Student

Abstract:

American black bears (Ursus americanus) are generalist omnivores, with a diet primarily composed of vegetation and some animal matter. Black bears are noted as potential predators for a number of ungulate species, particularly neonates due to their limited mobility. In this study, we analyzed the diet of black bears occupying the late spring and early summer range of a small, threatened wood bison (Bison bison athabascae) herd in the Ronald Lake area of northeast Alberta to determine the predation risk to neonate bison. In the spring of each year, the Ronald Lake bison herd (RLBH) migrates to an upland meadow near the base of the Birch Mountains. During this time, bison calves are dependent on cows and vulnerable to predation. Camera traps have shown that black bear activity in the meadow increases when bison are present in the spring, which may suggest that black bears are preying on neonate bison. We used scat analysis and DNA metabarcoding to describe black bear spring diet and quantify consumption rates of bison. We hypothesized that herbaceous plants would dominate black bear diet in the spring and berries would dominate at the start of summer, with supplemental protein achieved through predation or scavenging. Black bear diet was predominantly composed of herbaceous and fruiting plants. Bison DNA was found in 1 of 79 scat samples. Our preliminary results suggest that neonate bison are not an important component of black bear spring diet and that predation risk to the Ronald Lake bison herd from black bears is likely to be minimal.

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

Theme: Management

Abstract Number: 100
Presentation Type: Poster Presentation
Presentation Title: North Cascades Joint Nations Grizzly Bear Initiative: Weaving Together Indigenous Knowledge and Western Science to Restore and Protect Grizzly Bear Populations
Presenter Name: Mackenzie Clarke
Presenter Affiliation: Okanagan Nation Alliance
Presenter Email: mclarke@syilx.org
All Authors: Mackenzie Clarke
Primary Author Occupation: Professional

Abstract:

First Nations in southwest B.C. have long revered the grizzly bear as a steward of the landscape and a vital resource for their communities. Indigenous people, maintain a close relationship with these bears based on respect and reciprocity, recognizing their ecological, cultural, and spiritual significance. Grizzly bears are seen as guardians of the land, playing a crucial role in maintaining ecosystems and supporting other species as an 'umbrella species.'

Historical factors, including overhunting and isolation, have contributed to the decline of the North Cascades grizzly bear population. To address these challenges, inclusive and adaptive stewardship practices must be developed in partnership with Indigenous communities. British Columbia's commitment to the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) provides a framework for building genuine reconciliation and collaboration in grizzly bear conservation efforts.

The North Cascades Joint Nation Grizzly Bear Initiative aims to promote interconnectedness, respect, and cooperation among governments, Indigenous nations, municipalities, industry, and individuals. By improving relationships and coordination, this initiative seeks to exemplify reconciliation and collaboration toward conserving grizzly bears and their

habitat. This initiative recognizes the importance of integrating Indigenous and Western knowledge systems, emphasizing stakeholder cooperation and coordination. By fostering a collaborative and inclusive approach, the initiative seeks to promote sustainable stewardship of grizzly bears and their habitat, serving as a model for effective conservation efforts.

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

Theme: Human-Bear Conflict & Coexistence

Abstract Number: 106
Presentation Type: Poster Presentation
Presentation Title: Conditioned Food Aversion with Odor Association: An Ethological Approach to Reducing Crop Damage and Bear-Human Conflict
Presenter Name: Heather Havelock
Presenter Affiliation: Washington State University
Presenter Email: heather.havelock@wsu.edu
All Authors: Heather Havelock, Jazmin Gonzalez, Charles Robbins, Heiko Jansen
Primary Author Occupation: Student

Abstract:

Nutrient-dense and convenient foods in crop fields represent well-known areas of conflict for attracted bears. Human-bear conflict is imminent as weight gain is essential for bears entering hibernation when sows produce cubs. Conditioned food aversion (CFA) is a form of behavior modification based on a temporary yet unpleasant physiological response like nausea resulting from ingesting adulterated food and an aversion to that food subsequently. CFA has been combined with supporting stimuli such as odor (CFAO) to strengthen aversion in badgers but not in bears. We hypothesized that CFAO could be effective in bears due to their reliability on olfaction and memory when foraging. We tested CFAO in captive brown bears at Washington State University using the aversive agent thiabendazole (TBZ) and odorant (lemon oil). Findings showed that aversion was retained even after two hibernation periods with stronger aversion in wild-born bears compared to captive-born bears, thus prompting proposed application in a field setting. Testing stations containing apples, TBZ, and lemon oil will be placed on the perimeter of Washington apple orchards and monitored via trail cameras and site visits. Similar camera footage will be analyzed at control sites containing only apples and lemon oil. Line transects of trees of orchards before testing station placement and after will be used to quantify apple loss and tree damage. This nonlethal style of management for deterring bears from specific food sources may result in fewer bear mortalities from conflict and reduce economic loss for farmers.

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

Theme: Movement Ecology

Abstract Number: 108
Presentation Type: Poster Presentation
Presentation Title: Behavioral Characteristics of Autumn Migration in Solitary Terrestrial Mammals
Presenter Name: Tamako Makino
Presenter Affiliation: Tokyo University of Agriculture and Technology
Presenter Email: kieiropitamasirasu@gmail.com
All Authors: Tamako Makino, Seungyun Baek, Akino Inagaki, Naoki Takekoshi, Koji Yamazaki, Shinsuke Koike
Primary Author Occupation: Student

Abstract:

Migration is the periodic seasonal movement between remote areas of activity and there are some differences depending on internal factors' characteristic of individuals. About energy spent, the movement between areas("commuting phase")is more demanding compared with movement within the area("wandering phase"), especially for terrestrial mammals. Thus, gregarious mammals that make annual migrations between fixed locations apply social learning and memory for selecting energy-efficient(linear) paths. However, for solitary species, or for species whose migratory behavior varies, the behavioral characteristic of migration is likely to vary among individuals or years. Some black bears(Ursus thibetanus) ("bears")migrate from late summer to fall in years when locally hard masts are poor. This study aims to elucidate the behavioral characteristic of autumn migration of bears. We used three factors: aging, number of poor masting during the subadult period, and sex, to determine whether experience affects the energy efficiency of commuting phase. 18 years of migration data obtained by attaching GPS collars to bears in Ashio and Nikko mountains in Japan and 29 years of masting data on Quercus crispula were used in this study. Analysis of data from 43 bear years(29 male individuals)and 53 bear years(25 female individuals)demonstrated that bears migrated faster and more linearly during the commuting phase than during the wandering phase and that males migrated more linearly than females. In addition, with increasing age and the number of poor masting experienced, the commuting paths of bears were more linear. One reason for this is that with age, bears accumulate memory, thereby increasing the number of areas they have traveled to and from. We think the experience acquired during the subadult period contributes specifically to memory. A possible reason for the more linear migration of males compared with females is that males are larger than females and as have greater mobility.

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

Theme: Captive Bears, Zoos, and Physiology

Abstract Number: 120
Presentation Type: Poster Presentation
Presentation Title: Hair, hormones and disturbance; a pilot study using a non-invasive approach to assess physiological function in free-ranging grizzly bears.
Presenter Name: Kristenn Magnusson
Presenter Affiliation: Government of Yukon
Presenter Email: kristenn.magnusson@yukon.ca
All Authors: Kristenn Magnussom, Jodie Pongracz, Piia Kortsalo, Abbey Wilson, Sarah Michaud, Karen Graham, Darío Fernández-Bellon, Gordon Stenhouse, Marc Cattet

Primary Author Occupation: Professional

Abstract:

Understanding how environmental drivers affect physiological processes in individual animals is germane to forecasting how wildlife populations will tolerate environmental change. When environmental conditions are within preferred ranges, physiological processes function without excess energy demands. Beyond range thresholds, energy demands increase, tolerance becomes time limited, and impairment of physiological

processes is inevitable. As more individuals exceed their thresholds, productivity and survival decrease at the population level and eventually lead to a commensurate decline in abundance. In this pilot study, we are measuring and comparing steroid and thyroid hormone levels in hair as an assessment of physiological function in grizzly bears (Ursus arctos), using samples collected non-invasively from two study areas, one with high anthropogenic disturbance in Alberta (36 bears) and other from a relatively undisturbed, remote area in the Yukon Territory (41 bears). Our objectives are to determine and compare hormone levels indicative of physiological processes (specifically stress, reproduction, and energy metabolism) between study areas, and to evaluate specific environmental variables as potential drivers of physiological processes. We identified unique individuals and their sex by analyzing DNA extracted from hair follicles. Using a liquid chromatography-multiple reaction monitoring/mass spectrometry metabolomics assay, we determined the concentrations of 27 hormones in hair samples weighing as little as six milligrams (20-30 hairs). Concentrations of specific hormones within five major hormone classes differed significantly between study areas and between sexes. Temporal trends were also evident for some hormones. For the next phase of our study, we are evaluating a suite of landscape composition and disturbance measures as potential determinants of steroid and thyroid hormone levels in hair and, more generally, physiological function in grizzly bears.

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

Theme: Captive Bears, Zoos, and Physiology

Abstract Number: 122
Presentation Type: Poster Presentation
Presentation Title: Assessing polar bear body condition via histological image analysis of adipose tissue
Presenter Name: Gregory Thiemann
Presenter Affiliation: York University
Presenter Email: thiemann@yorku.ca
All Authors: Gregory Thiemann, Melissa P. Galicia, Alyssa M. Bohart, Amélie Roberto-Charron, Evan S. Richardson
Primary Author Occupation: Professional

Abstract:

Polar bear body condition (i.e., stored energy) is a crucial link between ecological conditions and population demography. Reliable estimates of polar bear body condition are thus central to understanding and predicting the consequences of climate warming. Many condition metrics (e.g., isotopic dilution, body condition index (BCI), energy density) require live-capture and immobilization. A subjective fatness index (FI, 1-5 scale) can be applied non-invasively, but yields relatively coarse data. Adipose lipid content (ALC) is a condition metric based on the understanding that fat cells (adipocytes) expand as fat is stored, increasing the proportion of lipid in adipose tissue. It can be applied to live-captured and harvested bears and thus provide data across large scales. However, ALC requires specialized equipment, expertise, and potentially harmful chemicals. We developed and tested an image analysis protocol to directly measure the size of adipocytes in polar bear adipose tissue. The process used standard histological preparation and a widely available software platform. We compared histological measurements of adipocyte size with other metrics of body condition for both live-captured (tissue biopsied) and harvested bears. For all bears, adipocyte size was a better predictor of body condition (assessed by FI) than was ALC. For captured bears, adipocyte size was a better predictor of BCI than was ALC. Our results indicate that histological measurements of adipocyte size provide a useful and reliable indicator of overall body condition in polar bears. Given that samples can be prepared and analyzed relatively rapidly and inexpensively in commercial laboratories, this approach offers a cost-effective method of monitoring body condition in polar bears and likely other ursids. In jurisdictions where live-capture work is limited, harvest-based sampling may offer the best means of detecting ecological changes in polar bears prior to population decline.

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

Theme: Movement Ecology

Abstract Number: 123
Presentation Type: Poster Presentation
Presentation Title: Driving change: How do change-points in grizzly bear movement behaviour and measured landscape productivity correlate?
Presenter Name: Jessa Marley
Presenter Affiliation: UBC Okanagan
Presenter Email: jesmmarley@gmail.com
All Authors: Jessa Marley, Rebecca Tyson, Michael Noonan
Primary Author Occupation: Student

Abstract:

In animal movement ecology, studies often look first at the qualities of the environmental landscape to interpret changes in movement behaviour patterns, for example by using step selection analysis. But this method starts with the environment and looks for behaviour switches second. Due to limitations in GPS data collection, the two or three dimensional nature of movement, and impacting missing values, there is a gap in ecology for identifying change points for movement strategies. We attempt to first identify points in time where animals change their movement behaviour, and then look at the environment for characteristics that maybe correspond to such changes and resulting patterns. The methods described are applied to grizzly bear (Ursus arctos horribilis) telemetry data in south-western Alberta from 2001 to 2018. Such techniques could allow deeper insight into many species and the hidden forces behind movement decisions.

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

Theme: Captive Bears, Zoos, and Physiology

Abstract Number: 128
Presentation Type: Poster Presentation
Presentation Title: Age estimation based on blood DNA methylation: A simple method applicable to multiple bear species
Presenter Name: Michito Shimozuru
Presenter Affiliation: Hokkaido University
Presenter Email: shimozuru@vetmed.hokudai.ac.jp
All Authors: Michito Shimozuru, Shiori Nakamura, Jumpei Yamazaki, Yojiro Yanagawa, Nobutaka Sato, Yusuke Honda, Hideyuki Ito, Toshio Tsubota
Primary Author Occupation: Professional

POSTERS

Abstract:

Age is an essential information for understanding the ecology and management of bears. Age estimation has been conducted by counting cementum annuli of the teeth, however, this method is highly invasive as it requires tooth extraction. Recently, we have established age estimation method based on blood DNA methylation levels in brown bears. The purpose of this study was to clarify whether this method is applicable to other bear species. We collected blood and extracted DNA from captive bears of known ages, including polar bears (17 bears, 20 samples), sun bears (8 bears, 10 samples), and Asian black bears (16 bears; 14 Japanese black bears and 2 Himalayan black bears). We performed bisulfite pyrosequencing to obtain DNA methylation levels at 4 cytosine-phosphate-guanine (CpG) sites adjacent to a single gene, SLC12A5. High positive correlation between age and methylation levels of all 4 CpGs was found in all three bear species. The application of brown bear age estimation model revealed that mean absolute errors (i.e., the mean absolute values of the difference between the estimated age and the actual age) was 2.22, 2.19, and 1.40 years, for polar bears, sun bears, and Asian black bears, respectively. These values were comparable to those in brown bears (average absolute error was 1.30 years), suggesting that the age estimation model established for brown bears is commonly applicable to different bear species. The current study will contribute to ecological research, conservation, and management of bear species.

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

Theme: Management

Abstract Number: 130
Presentation Type: Poster Presentation
Presentation Title: Introducing the Bornean Sun Bear Conservation Research Project
Presenter Name: Laura Saunders
Presenter Affiliation: Bornean Sun Bear Conservation Centre
Presenter Email: laura.sanders@port.ac.uk
All Authors: Laura Saunders and Siew Te Wong
Primary Author Occupation: Student

Abstract:

The Bornean Sun Bear Conservation Centre (BSBCC) located in Sabah, Malaysia operates through five pillars: animal welfare, rehabilitation, education and outreach, ecotourism and research. Although the centre offers optimal settings for research across multiple disciplines, it has not yet been utilised. The Bornean Sun Bear Conservation Research Project aims to create and deploy research projects across the remaining four pillars of BSBCC, to encapsulate important social and behavioural information and to inform on-going conservation action of sun bears in sabah. We aim for this project to be sustainable and include the centre's own staff members who will plan, participate and conduct research practices, as a step towards recognising ground researchers in research and authorship. Social research will look to understand local Sabahan perceptions and folklore of sun bears which may advise future education and outreach programmes. In addition, tourist perceptions of sun bears will be examined across nationalities and may support future development of this and other eco-tourism centres. Behavioural research will look to monitor the long-term progress of bears across both the hard and soft rehabilitation methods, collaborating with the Tabin Sun Bear Project, and will consider the role of personality, rescue background and human orientation to observe such progress. Implications from such background research could help inform which ages and years of undergoing rehabilitation may be optimal for successful soft releases. In addition there will be behavioural research looking into captive bear feeding patterns, enclosure utilisation and stereotypical behaviour, which will support the welfare maintenance of non-releasable bears. Overall, the project aims to collect data across multiple disciplines to gather enough information about Bornean sun bears to inform future conservation action decisions in Sabah, Malaysia.

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

Theme: Bear Behaviour

Abstract Number: 132
Presentation Type: Poster Presentation
Presentation Title: What can we learn about bear ecology using animal-borne video systems? A case study of Asiatic black bears in Japan
Presenter Name: Shinsuke Koike
Presenter Affiliation: Tokyo University of Agriculture and Technology
Presenter Email: koikes@cc.tuat.ac.jp
All Authors: Prof. Shinsuke Koike, Tomoko Naganuma, Seung-Yun Baek, Kahoko Tochigi, Naoki Takekoshi, Akino Inagaki, Koji Yamazaki
Primary Author Occupation: Professional

Abstract:

In recent years, animal-borne video cameras have been used to clarify the ecology of many animal species. Over the past six years, we have fitted camera collars to several Asiatic black bears. Here, we introduce two cases that were revealed using camera collars for four bears (two males and two females) in early summer.

The first case is to compare the video analysis of foraging behavior with fecal analysis. We found that using video analyses was advantageous for recognizing foods, such as leaves or mammals, that were physically crushed or destroyed while bears chewed and digested foods, which are difficult to identify to species using fecal analyses. In contrast, we found that camera collars are less likely to record food items that are infrequently or quickly ingested. In addition, food items with a low frequency of occurrence and short foraging time per feeding were less likely to be detected when we increased the time between recorded clips.

The second case is to record the activities of wild bears during the mating season. All bears were found to interact with other uniquely identifiable bears for some time (range 9–22 days) during the deployment period (range 36–45 days), and multiple mating in males was documented. Males and females exhibited different behaviors on social days (i.e., days when the bear interacted with conspecifics) compared with solitary days (i.e., days with no observed interactions with conspecifics). Compared with solitary days, the bears spent a lower proportion of time on foraging activities and a higher proportion of time on resting activities on social days.

Asiatic black bear inhabit in forests, so direct observation is not possible in almost situations. Furthermore, the fields in Japan are steep and rainy, making field research difficult. Camera collars are an effective tool for uncovering the unknown ecology of bears that inhabit such environments.

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

Theme: Bear Behaviour

Abstract Number: 133
Presentation Type: Poster Presentation
Presentation Title: The role of Asiatic black bears as a scavenger in a Japanese temperate forest
Presenter Name: Akino Inagaki
Presenter Affiliation: Tokyo University of Agriculture and Technology
Presenter Email: akino.inagaki@gmail.com
All Authors: Akino Inagaki, Maximilian L. Allen, Kahoko Tochigi, Tetsuya Maruyama, Shinsuke Koike
Primary Author Occupation: Student

Abstract:

Animal carcasses are an ephemeral but nutritionally rich resource. Large carcasses attract various vertebrate scavengers, and the interactions among scavenger species on or around carcasses can influence the composition of the scavenger guild and its ecological functions (e.g., carrion consumption rates). Dominant scavengers, including American black bears (Ursus americanus) and brown bears (U. arctos), usurp prey from predators and monopolize carcasses. Despite Asiatic black bears (U. thibetanus) are one of the most frequent scavengers of sika deer (Cervus nippon) carcasses in the temperate forests of Japan, their scavenging behavior remains poorly understood. The aim of this study was to investigate the effect of Asiatic black bear presence and seasonal variation (summer and autumn) on carrion consumption —specifically, the number of visits and duration of feeding on deer carcasses— by other omnivorous scavengers (wild boars [Sus scrofa], raccoon dogs [Nyctereutes procyonoides], red foxes [Vulpes vulpes], and Japanese martens [Martes melampus]). We found that Asiatic black bears had limiting effects on carrion consumption by all other scavengers, suggesting that bears create a landscape of fear among scavengers as well as diminish available carrion largely. Additionally, the potential probability for carcass visitation of bears decreased from summer to autumn, suggesting a shift in carcass preference as bears transition their primary food source to acorns. This shift may alter the magnitude of the limiting effect exerted by bears on other scavengers according to seasonal variations. We highlight the importance of Asiatic black bears' role in structuring the scavenger guild in this system.

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

Theme: Bear Behaviour

Abstract Number: 134
Presentation Type: Poster Presentation
Presentation Title: Temporal Dynamics of Canine Breakage and Intraspecific Injuries in Western Hudson Bay Polar Bears (Ursus maritimus)
Presenter Name: Simonne Tremblay
Presenter Affiliation: University of Alberta
Presenter Email: sstrembl@ualberta.ca
All Authors: Simonne Tremblay, David McGeachy, Nicholas J. Lunn, Evan Richardson, Andrew E. Derocher
Primary Author Occupation: Student

Abstract:

Canine teeth are essential components of carnivore anatomy as they are utilized in prey apprehension and behavioural displays; however, this tooth type has high incidences of injury which may reduce survival. Polar bears (Ursus maritimus) typically have polygynous mating systems where males compete for access to females. Injuries, especially to the canines, are frequent in these encounters and can be used as proxies for mating system dynamics. The western Hudson Bay (WHB) subpopulation has been experiencing decline in recent decades which may impact characteristics of their mating system. We examine the overall patterns of canine breakages and its temporal dynamics within the WHB using field data from 1981-2023 (n=3493) through non-parametric statistical analyses and linear mixed effect models. We found differing rates of mean breakage and coinciding intraspecific injury between males and females; proportions of maximum breakage are similar between the sexes until approximately ten years of age, where males then begin accruing more serious damage to their canines. The interactive effect between the age of an individual and the year of observation was a significant predictor in mean breakage suggesting that breakage is beginning to increase over time. The comparative results of canine breakage occurrences and related injuries between the sexes reveal WHB males to be under more intensive intraspecific pressures than females within the subpopulation, which aligns with previous research regarding canine breakage and its use in understanding mating systems of polar bears. The presence of a relationship between year and canine breakage in both sexes suggests that there may be increased intraspecific competition occurring within the subpopulation, however continued investigation into the temporal dynamics is required as stronger causal relationships are likely to arise as decline continues in the subpopulation.

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

Theme: Movement Ecology

Abstract Number: 136
Presentation Type: Poster Presentation
Presentation Title: Movement patterns of brown bears in a desert environment
Presenter Name: Andreas Zedrosser
Presenter Affiliation: Mongolian Academy of Sciences, Institute of Biology
Presenter Email: delgerchimegd@mas.ac.mn
All Authors: Delgerchimeg Dawaaasuren, Amgalan Luvsanjamba, Harry Reynolds, Jerrold Belant, Andreas Zedrosser
Primary Author Occupation: Student

Abstract:

The Gobi brown bear lives in the Great Gobi Strictly Protected Area A (GGSPAA), Mongolia, and is considered the most endangered bear population in the world with a population size of ~40 individuals. The Gobi Desert has very few water access points, the shortest distance between neighboring water points is ~100 km. The climate is harsh with very cold winters and very hot summers (temperature range -31 to +40C) and very little precipitation. The main goal of this study was to understand the activity patterns of bears living in a desert environment. We captured and GPS-collared 19 bears (4 females, 15 males, 3-21 years old) in the core area of the GGSPAA during 2005-2018. We defined activity as the straight-line distance between two consecutive 24-hour GPS locations. Compared to the fall months, male bears were significantly more active from March until the beginning of July, which coincides with the mating season. In

comparison, female activity was significantly higher during the period end of May until August, which overlaps partly with the mating season but also with the onset of hyperphagia.

The mean monthly movement activity was similar among the sexes. The longest mean day distances recorded in males ranged from 177 to 839 meters. The longest mean daily distances recorded moved were over 42km during the mating season. Females showed mean daily movement distances from 304 to 847 meters, and the longest mean daily movement distances were over 26 km during the mating season.However, the home range size significantly differed between the sexes, and male home range sizes increased from April to June, while female home range remained the same during this time period. To our knowledge, these are the first data on activity patterns of bears living in an extreme desert environment.

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

Theme: Bear Behaviour

Abstract Number: 137
Presentation Type: Poster Presentation
Presentation Title: Current status of accidentally captured Asiatic black bears in traps for sika deer and wild boar in Nagano, Japan
Presenter Name: Rumiko Nakashita
Presenter Affiliation: Forestry and Forest Products Research Institute
Presenter Email: nakashita@affrc.go.jp
All Authors: Rumiko Nakashita, Akiko Takii, Hayato Iijima, Toshiaki Yamamoto, Hiroo Tamatani, Misako Kuroe, Ryosuke Kishimoto, Shigeyuki Izumiyama
Primary Author Occupation: Professional

Abstract:

In recent years, the number of culled sika deer (Cervus nippon) and wild boar (Sus scrofa) has increased as their abundance increased.The increased culling effort simultaneously resulted in a rise in the accidental capture of non-target mammal species via snare traps and box traps. In Japan, the protocol mandates the release of accidentally captured animals. However, for some mammals, especially Asiatic black bears (Ursus thibetanus), this poses a serious problem due to the potential risks against workers being injured during the release of the captured bear and the bear itself also being injured by the trap. Nagano Prefecture is one of the regions experiencing an increase in accidentally captured bears. However, the frequency of accidental capture and behaviour of captured bears has not been properly understood by localities. In this study, we examined the actual situations of Asiatic black bears caught by accidental trapping in two areas in Nagano (Ina and Karuizawa) in recent years, and investigated attributes ofindividuals which were accidentally captured. For those bears for which samples were available, carbon and nitrogen stable isotope ratio analyses were conducted to determine the diet of each bear. In the Ina area, many bears were trapped in box traps targeting wild boar near corn-fields at the foot of the mountains, but only a few bears were found to be dependent on crops. In the Karuizawa area, many bears were trapped in snare traps targeting sika deer in national forests, and some of the individuals were captured repeatedly. Our study observed the consumption of snared sika deer by bears, suggesting a potential link between bears learning to eat snared sika deer and the accidental capture of bears in snare traps.

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

Theme: Captive Bears, Zoos, and Physiology

Abstract Number: 139
Presentation Type: Poster Presentation
Presentation Title: Non-invasive age estimation based on DNA methylation using hair in brown bears
Presenter Name: Shiori Nakamura
Presenter Affiliation: Hokkaido University
Presenter Email: shiori-nakamura@eis.hokudai.ac.jp
All Authors: Shiori Nakamura, Jumpei Yamazaki, Naoya Matsumoto, Kyougo Hagino, Hideyuki Sakamoto, Masami Yamanaka, Mina Jimbo, Yojiro Yanagawa, Hideyuki Ito, Toshio Tsubota, Michito Shimozuru
Primary Author Occupation: Student

Abstract:

Age is a crucial factor in elucidating the ecology and management of bears. Recently, it has been discovered that DNA methylation levels of certain cytosine-phosphate-guanine (CpG) sites change with age, and they have begun to be used as indicators for age estimation in various animal species. Previously, we have established an age estimation method based on blood DNA methylation levels in brown bears. This method has the advantage of being less invasive and simpler than the conventional tooth method, but it requires the capture of bears. Therefore, in this study, we aimed to establish a novel age estimation method using non-invasively obtained hair samples by identifying DNA regions where methylation levels change with age. Hair samples were collected from captive and wild brown bears of known ages. The captive individuals, kept at the Noboribetsu Bear Park, consisted of 27 bears (16 males and 11 females) aged 2 to 31 years old, while the wild individuals included 8 female bears aged 8 to 25 years old captured alive on the Shiretoko Peninsula, Hokkaido, Japan. Through bisulfite pyrosequencing, we measured methylation levels of DNA extracted from hair roots in regions adjacent to 12 genes. Positive correlations were observed between age and DNA methylation levels in three regions, and the best age estimation model was based on DNA methylation levels at two CpG sites. This model demonstrated high accuracy, with a mean absolute error of 2.7 years and a median absolute error of 2.4 years after leave-one-out cross-validation. These results suggest that the age of brown bears can be estimated using the methylation level of hair root-derived DNA as an indicator. Combining this novel tool with hair trapping survey, widely used for population estimation, could allow us to non-invasively determine the age structure of wild bear populations.

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

Theme: Management

Abstract Number: 140
Presentation Type: Poster Presentation
Presentation Title: Sustainable management vs. bear conservation in Romania
Presenter Name: Ovidiu Ionescu
Presenter Affiliation: 2Transilvania University of Brasov
Presenter Email: o.ionescu@unitbv.ro
All Authors: Ovidiu Ionescu, Georgeta Ionescu, Mihai Fedorca, Marius Popa, Ramon Jurj, Ion Mirea, Ancuta Fedorca
Primary Author Occupation: Professional

Abstract:

Romania has the largest population of brown bears in Europe and the Carpathians (more than 6700 individuals). The species is considered by low public good of national and international interest, administered by Romanian Ministry (MMAP). The management of the species is ensured by the managers and game keepers of the wildlife management areas. Till 2007 when Romania became member of UE the bear was a game species. From 2007 under Habitat Directive bears became totally protected. Till to 2016, Romania hunted a maximum of 500 bears/year (<7% of the population) Important conflicts and compensations were reported in 5-7 counties. After 2016, preventing harvesting was prohibited, and conflict and compensation increased and were reported in 23 counties out of 26 with bear. The number of traffic accidents increased more than 10 times in the last 8 years. The value of the compensations increased dramatically as well as the number of people attack by bears. In recent years, the acceptance of coexistence with the bears has decreased at the national level. The rate of acceptance decreased mainly in the counties which were considered an example of good management and have a high bear density.

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

Theme: Human-Bear Conflict & Coexistence

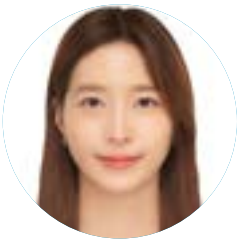
Abstract Number: 141
Presentation Type: Poster Presentation
Presentation Title: Modify ethology in bear high densities area in Romania
Presenter Name: Georgeta Ionescu
Presenter Affiliation: 1National Institute for Research and Development in Forestry Marin Dracea
Presenter Email: titi@icaswildlife.ro
All Authors: Georgeta Ionescu, Ovidiu Ionescu, Marius Popa, Ramon Jurj, Mihai Fedorca, Ion Mirea, Ancuta Fedorca
Primary Author Occupation: Professional

Abstract:

In Romania is one of highest bear densities in the world. The average is 11 individuals/100km2, of favourable habitats. 54% of the favorable habitat has bear densities higher than the national average. The bear population in Romania registers a favorable conservation status, densities that place it on the first places in the world, well above the optimal density, an exceptional genetic variability similar to that of northern Canada and Alaska, and a productivity well above the European average. It occupies all favorable natural habitats, moreover it is now found in many completely artificial habitats and increasingly uses human food sources (domestic animals, grains, fruit from orchards or backyards and honey from apiaries, along with household scraps. Before 2016 about 90% of harvest consist of males. In 2016 preventing hunting was stopped and only bears which were creating important economic damages or attack people were removed from the population (killed or relocated). After 2016 bear densities increased in the natural habitat and it was more and more difficult for the females to protect the cubs. In our research area females with cubs where quite rare in high densities male zones. In order to protect the cubs' females were using anthropized habitats like agriculture fields, villages and urban areas. Garbage, cornfields, orchards or livestock became important in their diet. Cubs grow knowing that it is more food available in this zone and easier to be procure. Practically they grow being habituated to human food resources. More and more individuals appear in human dominated landscapes and out of their national habitat. They were much more bold towards human presences and number of conflicts increase dramatically

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

Theme: Captive Bears, Zoos, and Physiology



Abstract Number: 143
Presentation Type: Poster Presentation
Presentation Title: First Trial of Semen Microbiome Analysis by Next-Generation Sequencing in Asiatic black bear.
Presenter Name: Nari Kim
Presenter Affiliation: Chungbuk National University
Presenter Email: africabear@cbnu.ac.kr
All Authors: Nari Kim, Kyung-Hyo Do, Ki-Yoon Kim, Kwang-Won Seo, Jeong-Jin Yang, Eui-Beom Kyeong, Seung-Hyo Lim, Dong-Hyuk Jeong
Primary Author Occupation: Student

Abstract:

Captive breeding, a global practice for endangered species conservation, faces challenges due to reduced fertility among many captive individuals. While the reproductive microbiome has been studied in animals like bulls and stallions to enhance fertility, no research has been conducted on bears for conservation purposes. Therefore, this study aims to establish a protocol for analyzing sperm microbiomes in Asiatic black bears (Ursus thibetanus) bred for conservation in Korea and confirm their microbiome profiles through 16S Sequencing.

A total of 100μL semen was obtained via urethral catheter from an Asiatic black bear bred at Korea National Park Research Institute. DNA extraction was performed individually using aliquots of 5μL, 10μL, 15μL, and 50μL of semen. 16S V3–V4 amplicon libraries were prepared, followed by sequencing on the Illumina MiSeq platform. The acquired sequences were processed and analyzed using QIIME 2.

The 5μL, 10μL, and 15μL aliquots showed a total number of sequence reads exceeding 70,000, which is sufficient for further analysis. The predominant phylum among semen bacteria was Firmicutes (42.1%), followed by Bacteroidetes (35.0%). The most abundant genera were Barnesiella, Eisenbergiella, Bacteroides, and Rothia, comprising approximately 45.7% of the total semen microbiome.

Based on the results, we found that only a small amount of semen (5–15μL) is required for microbiome analysis in Asiatic black bear. Given the challenge of extracting sufficient amounts of semen in bears, the protocol has proven to be efficient for practical application. The bacterial compositions of the three samples were aligned, demonstrating the protocol's stability for analysis.

This study represents the first attempt to establish a protocol for semen microbiome analysis in bears. The application of this protocol to compare the reproductive microbiome of captive and wild bears holds promise for enhancing Asiatic black bear fertility and species restoration.

POSTERS

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

Theme: Management

Abstract Number: 146
Presentation Type: Poster Presentation
Presentation Title: The use of Karelian Bear Dogs (KBD's) as a management tool to mitigate human-bear conflicts
Presenter Name: Nanna Borgen
Presenter Affiliation: Inland Norway University of Applied Sciences
Presenter Email: nanna.sofija@online.no
All Authors: Nanna Borgen Scott Brainerd, Todd J. Brinkman, Nils Pedersen
Primary Author Occupation: Student

Abstract:

Problem bears are often euthanized following multiple relocation attempts, even though non-lethal bear management methods such as aversive conditioning (AC) can reduce human-bear conflicts. Since the 1990s, a specialized aversion protocol based on principles of animal training and conditioning has been used by wildlife managers in North America and Japan. The protocol was developed by the Wind River Bear Institute and utilizes the Karelian Bear Dog (KBD), a specialized dog breed traditionally used for hunting brown bears (Ursus arctos) in Finland. The dogs shepherd wild bears by barking and chasing them and so conditions the bears to move around or avoid human occupied space. Although this approach might be successful, conflicting evidence suggest that the long-term efficacy might be conditional on variables such as time, bear species or location.

The aim of this graduate project is to evaluate the effectiveness of the WRBI's non-lethal approach to mitigate human-bear conflicts from the perspective of KBD handlers. In collaboration with a select experienced KBD handlers we will develop a questionnaire that will be distributed to a large sample of practitioners. The questionnaire will gather the handler experiences of bear management before and after employing KBD's for AC. In particular, we will assess if the application of KBD's has reduced the need for lethal control of bears, and the extent to which conditioned bears permanently have changed their behaviour.

This is the first study to evaluate the WRBI protocol as a non-lethal management tool from a handler perspective. Conditioning bears to avoid conflict areas can have great conservation benefits and as a non-lethal approach, it has the potential to benefit conservation efforts wherever bears are present. Teaching bears to avoid human settlements and activities is only one part of the equation, and public education on preventative measures may be equally important in reducing human-bear conflicts.

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

Theme: Captive Bears, Zoos, and Physiology

Abstract Number: 148
Presentation Type: Poster Presentation
Presentation Title: BEARing with endocrine disruptors: potentially toxic metal(loid)s exposure in European brown bears
Presenter Name: Agnieszka Sergiel
Presenter Affiliation: Institute of Nature Conservation of Polish Academy of Sciences, Krakow, Poland
Presenter Email: sergiel@iop.krakow.pl
All Authors: Maja Lazarus, Agnieszka Sergiel, Maja Ferenčaković, Ankica Sekovanić, Slaven Reljić, Lana Pađen, David M. Janz, Ena Oster, Tomasz Zwijacz-Kozica, Filip Zieba, Nuria Selva, Djuro Huber
Primary Author Occupation: Professional

Abstract:

Research addressing potential adverse effects of environmental pollutants on hypothalamic-pituitary-thyroid (HPT) axis in ursids is crucial in assessing risk of adverse health effects. A recent study reported alterations in circulating thyroid hormones in polar bears exposed chronically to inorganic and organic pollutants. We obtained blood from 53 free-ranging European brown bears (Ursus arctos; Carpathian and Dinara-Pindos populations) trapped between 2014 and 2019 in order to investigate interrelationships among cadmium, lead, and mercury, metals with known endocrine disrupting potential, other trace metal(loid)s, free triiodothyronine (fT3), and free thyroxine (fT4). Ecological, physiological and sampling variables were taken into consideration while building generalized linear models explaining hormonal variation. The best model was validated using the corrected Akaike´s Information Criterion (AICc). Chemiluminescent enzyme immunoassays quantified fT3 and fT4, which ranged <1-3.54 and <30-304 pg/mL, respectively. In top-ranked models, positive contributions of thallium, sampling year and trap type explained 59-67% of fT3 concentration variation. Models describing fT4 variation (44-66%) were explained by a positive effect of lead and negative contributions of copper, selenium and capture day. Furthermore, age group and population were shown to improve interpretation of fT4 concentrations. Based on these results and established mechanisms of toxicity, we suggest that lead and thallium might indirectly affect HPT axis of bears, potentially through enhanced production of reactive oxygen species, depletion of thiol-rich proteins, or immune suppression. This study suggests that both essential and non-essential trace metal(loid)s are important variables to be considered when studying alterations in endocrine physiology in terrestrial wildlife.

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

Theme: Captive Bears, Zoos, and Physiology

Abstract Number: 151
Presentation Type: Poster Presentation
Presentation Title: Development of Assisted Reproduction Techniques for the Successful Restoration of the Asiatic Black Bear in Korea
Presenter Name: Eui-beom Kyeong
Presenter Affiliation: Korea National Park Service
Presenter Email: africabear@cbnu.ac.kr
All Authors: Eui-beom Kyeong, Sook-jin Lee, Seung-hyo Lim, Ji-sang Yu, Ann-Na Lee, Min Kim, Da-in Lee, Ho-nam Kang, Jeong-jin Yang, Dong-Hyuk Jeong
Primary Author Occupation: Professional

Abstract:

The Asiatic black bear (Ursus thibetanus) has been undergoing restoration in South Korea since 2004. Acquiring seed animals remains a challenge, hindering systematic project management. Although population growth has occurred, limited genetic diversity is a concern due to restricted male breeding participation. To address this, a combined approach of Ex-situ breeding programs and in-situ reproduction was implemented to facilitate more strategic population management and enhance genetic diversity. And here we describe what we have done so far to establish artificial reproduction technology for Asiatic black bear. In females, we analyze estrus patterns using ultrasonography, urinary hormones, and other biological indicators. Urinary progesterone is a reliable predictor of ovulation. Indicators like external genital size, follicular development, and vaginal cytology positively correlate with the estrus cycle. Based on these indicators, we determine optimal timing for artificial insemination (AI) using a ureteroscope for uterine semen injection. In males, we use ultrasound-guided urethral catheterization to collect high-quality semen (concentration: 4,718.9 ± 1,526.1 x106/ml; viability: 98.2 ± 2.3%). Five cubs were successfully born via AI from four females and released into the wild. This represents a global breakthrough in Asiatic black bear artificial insemination. Importantly, assisted reproduction technology (ART) extends beyond its scientific merits, directly facilitating the conservation of endangered species through the release of ART-produced offspring into their natural habitat. This study also provides one of the approaches to address the difficulties of importing bears and increasing genetic diversity, which will aid the restoration project and contribute to a sustainable bear population.

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

Theme: Movement Ecology

Abstract Number: 156
Presentation Type: Poster Presentation
Presentation Title: Boundary effects on Black bear (Ursus americanus) in Elk Island National Park
Presenter Name: Fletcher Elliot
Presenter Affiliation: Parks Canada
Presenter Email: fletcher.elliott07@gmail.com
All Authors: Fletcher Elliott, Ramona Maraj, Erin Henderson, Rachel Stapleton, Nolan Waters, Mary McConnell, Emily Gavey, Michelle Hoang
Primary Author Occupation: Professional

Abstract:

Habitat loss and fragmentation is a major driver of ecological change. Protected areas of pristine habitat with minimal human disturbance can become increasingly isolated through habitat fragmentation to a point of unsuitability for wildlife. Elk Island National Park is the only fully fenced national park in Canada. The fence was established to protect the elk and bison herds from disease transmission and human-wildlife conflict outside the park boundaries. However, it presents challenges to the many other species that use the park. While the fence fully contains and prevents the movement of bison, elk and moose, we were interested to understand the impact of the fence on a species that is vagile and capable of climbing. GPS data was collected across two years from collars fitted to 11 individual black bears (Ursus americanus), to investigate the effects of boundaries on the species movement. A model of space use was developed, examining the effect of the fence and other linear features on the black bears in the park. The different types of linear features (i.e., fence, parkway, highway or township road) that was closest had a significant effect on the space use of black bears ($F= 27.3494$, $p < 0.001$), however the distance to the nearest boundary did not affect space use regardless of barrier type ($F = 2.0850$, $p = 0.15$). Model fit and sampling bias are possible limitations of the study that can be improved with further analysis and sampling effort. Understanding the movement of black bears in an isolated patch of protected habitat such as Elk Island is crucial to understanding the impact of the fence to landscape connectivity and the preservation of the local population

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

Theme: Movement Ecology

Abstract Number: 160
Presentation Type: Poster Presentation
Presentation Title: American black bear habitat selection and movement in a gradient of industrial disturbance within the Athabasca Oil Sands Region of Alberta, Canada
Presenter Name: Rebecca Paton
Presenter Affiliation: University of Alberta
Presenter Email: rpaton1@ualberta.ca
All Authors: Rebecca A. Paton, Paul F. Frame, Scott E. Nielsen, Mark A. Edwards
Primary Author Occupation: Student

Abstract:

Anthropogenic disturbances are expanding, which can affect wildlife species' movement and behaviour. Some wildlife species avoid anthropogenic disturbance while others adapt their behaviour to coexist. The American black bear (Ursus americanus) is a highly adaptable bear species that habituates to anthropogenic disturbance and capitalizes on human foods within the urban-wildland interface. Bears alter their movement and behaviour in response to anthropogenic disturbance, resulting in changes to seasonal and diel patterns. Bears in the urban-wildland interface avoid more active disturbances, increase nocturnality, and reduce movement rates. Well managed industrial disturbances are unique due to mandatory workforce training and waste management practices that nearly eliminate common attractants that contribute to human-bear conflict in the urban-wildland interface. However, while industrial activities are also expanding in bear habitat, few studies have assessed bear behaviour in relation to industrial disturbances. We investigated black bear movement, habitat use, and activity patterns across a gradient of industrial disturbance in the Athabasca Oil Sands

Region of northeastern Alberta, Canada. Seventy-three black bears fitted with GPS collars were monitored for 1–2 years to assess the effect of industrial disturbances on seasonal and temporal movement rates, habitat use, and activity patterns by sex and reproductive class. We estimated individual bear home ranges seasonally and report their overlap with industrial disturbance, in addition to how movement and behaviour compared on and off disturbed sites. We present these results and discuss management implications, as well as comparisons with findings from urban-wildland interfaces.

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

Theme: Movement Ecology

Abstract Number: 161
Presentation Type: Poster Presentation
Presentation Title: Performance of fur- and ear-mounted satellite tags for evaluating the movement and behaviour of polar bears
Presenter Name: Tyler Ross
Presenter Affiliation: York University
Presenter Email: tyler.robert.ross@gmail.com
All Authors: Tyler Ross, Gregory W. Thiemann, BJ Kirschhoffer, Jon Kirschhoffer, Geoff York, Andrew E. Derocher, Amy C. Johnson, Nicholas J. Lunn, David McGeachy, Vicki Trim, Joseph M. Northrup
Primary Author Occupation: Student

Abstract:

The study of animal movement provides insights into underlying ecological processes and informs analyses of behaviour and resource use, which have implications for species management and conservation. The tools used to study animal movement have evolved over the past decades, allowing for data collection from a variety of species, including those living in remote environments. Satellite-linked radio and GPS collars have been used to study polar bear (Ursus maritimus) ecology and movements throughout the circumpolar Arctic for over 50 years. However, due to morphology and growth constraints, only adult female polar bears can be reliably collared for long durations. Further, collars have proven to be safe and reliable but there has been opposition to their use, resulting in a deficiency in data across much of the species' range. To bolster knowledge of movement characteristics and behaviours for polar bears other than adult females, while also providing an alternative to collars, we tested the use of fur- and ear-mounted telemetry tags that can be affixed to polar bears of any sex and age. We also used data collected from the tags to quantify the amount of time subadult and adult males spent resting versus traveling while on land. Our results show fur tags remained functional for shorter durations than ear tags, but had comparable positional error estimates and provided sufficient data to model different behavioural states. Further, as hypothesized, subadult and adult male polar bears spent the majority of their time resting while on land, likely as a means of conserving energy until the sea ice reforms in early winter. Fur tags provide promise as a shorter-term means of collecting movement data from free-ranging polar bears.

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

Theme: Movement Ecology

Abstract Number: 162
Presentation Type: Poster Presentation
Presentation Title: A country divided: how barriers affect the gene flow of apex predator in Slovakia
Presenter Name: Jana Šrutová
Presenter Affiliation: Charles University
Presenter Email: srutovaj@natur.cuni.cz
All Authors: Jana Šrutová, Nikola Tkáčová, Barbora Černá Bolfíková, Michal Kalaš, Mária Apfelová, Dušan Romportl, Kristýna Vlková, Marián Hletko, Vladimír Antal, Slavomír Finďo, Pavel Hulva
Primary Author Occupation: Student

Abstract:

The brown bear (Ursus arctos) is currently the largest apex predator in Europe. This species occupies an important position in ecological networks and is often referred to as a keystone, umbrella, and flagship species. Like populations of other large carnivores, the European brown bear population has been radically fragmented over the past centuries due to intensive hunting and lack of protection. Based on more than 2,000 mostly non-invasive samples collected mainly in the Western Carpathians between 2019 and 2021 and using a microsatellite panel, a population structure that includes several genetic clusters was determined. This may be related to the occurrence of refugia in isolated mountain ranges in Slovakia, which may have led to genetic diversification of individual subpopulations. By linking landscape genetic and geographic habitat modeling analyses, the main natural and anthropogenic barriers to gene flow were identified. Currently, Slovak bear populations face not only natural barriers to gene flow related to the sky island model, but also the increasing impact of anthropogenic barriers, which may facilitate genetic differentiation. Examples include the construction of linear infrastructure in valleys between orographic units and along major rivers. Populations that are geographically close are thus genetically relatively distant. These findings can also serve as a basis in the applied sphere for ensuring the viability of the population not only of the brown bear in Slovakia.

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

Theme: Habitat Relationships

Abstract Number: 164
Presentation Type: Poster Presentation
Presentation Title: A Study on the status and distribution of Himalayan Brown Bears (Ursus arctos isabellinus) in Kashmir Valley, India using camera traps and GPS collaring
Presenter Name: Aaliya Mir
Presenter Affiliation: Wildlife SOS
Presenter Email: aaliya@wildlifesos.org
All Authors: Aaliya Mir, Thomas Sharp, S. Swaminathan, A. Sha. Arun, Kartick Satyanarayan, Geeta Seshamani
Primary Author Occupation: Professional

Abstract:

Human-wild animal conflict has always been high in the Kashmir Valley, mostly involving black bears and leopards. However, recently human-

brown bear conflict has emerged as a new challenge in this region. There is little structured literature available on the ecology and status of brown bears in Kashmir valley. Therefore, we set out to assess the status, distribution and ecology of brown bear population in the Central Wildlife Division of Kashmir, India, using field techniques, camera trapping and GPS collaring with an ultimate goal of finding solutions that will benefit both people and wildlife. Brown bears in the study area were distributed in the alpine meadows with a specific elevational range (3000 to 5000 m). Direct sightings revealed congregations of bears in a few areas; especially in the North-Western (Sarbal) and Eastern region (Amarnath/ Baltal). The relative abundance of the brown bear was recorded to be around 0.12 ± 2/km. Camera trapping recorded bears in five locations, while as the density estimate of brown bears based on REM was 1.53/ km2. Brown bears were found heavily dependent on the grazing livestock and garbage sites. The scat analysis revealed that bears in the region fed upon garbage food items (75%), wild plant matter (16%), crop raiding (0.41%) and sheep hunting (0.31%) respectively. Out of 408 scat samples, 86 were found to have plastic carry bags, milk powder and chocolate covers. From July to September, 2023, we radio collared six brown bears (4 males and 2 females) with GPS iridium collars to understand habitat utilization and movement patterns. Initially, after collaring, the bears moved large distances away from the habituated open garbage dump areas, however, they eventually returned and tended to stay close to these dumps. All 6 collared bears went into hibernation in month of November, 2023.The information gathered in this project will be of vital importance in developing future conservation plans and management initiatives.

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

Theme: Human-Bear Conflict & Coexistence

Abstract Number: 165
Presentation Type: Poster Presentation
Presentation Title: Steps Toward Conserving Asiatic Black Bears at the Westernmost Extent of their Range: Preparing an Action Plan for Conflict Management in Kerman Province, Iran
Presenter Name: Nahid Ahmadi
Presenter Affiliation: Borderless Wildlife Conservation Society
Presenter Email: nahid.ahf@gmail.com
All Authors: Nahid Ahmadi, Ali T. Qashqaei, Pouria Ghelich Khani, Hamid Reza Heidari
Primary Author Occupation: Self-Employed

Abstract:

Human–bear conflicts are a serious obstacle for the conservation of Asiatic black bears. Iran is the westernmost range of this species, and conflicts are a major threat to both bears and people. Asiatic black bears exist in 3 southern provinces of Iran, of which Kerman Province has better habitats (food, water and cover) than Baluchistan or Hormozgan. With mounting human pressures on habitat, we aimed to create a conservation action plan that will help to reduce conflicts in Kerman Province. We collected data on conflicts between bears and people across Kerman Province using 2 data sources: (1) a questionnaire survey of local gardeners, beekeepers, shepherds and livestock owners (2019-2020); and (2) official reports registered with various governmental organizations (1961–2019), along with interviews of government managers and rangers. We could not verify or quantify the conflicts, but often local people showed proof that they were attributable to bears. We mapped the occurrence of bear attacks on humans, damage to orchards, damage to beehives, depredation of livestock, and killing of bears. We also reviewed international articles and reports for lessons learned about bear conflict mitigation elsewhere, and considered these with respect to the main stakeholder conflicts in Kerman. We created a plan for short-term, mid-term, and long-term activities in 3 arenas: participatory conflict management; education; and research. The plan includes detailed flow charts, showing priority activities tailored to specific types of conflicts, spatially matched to where they are most prevalent. The plan has been reviewed and accepted by the Department of Environment of Kerman Province.

This work so far has focused on the "assess", "plan" and "networking" components of the Species Conservation Cycle, as we prepare to launch into the "act" phase. The report has been approved by the Kerman Department of Environment. Of particular interest, the data collected so far revealed conflicts in some areas with no previous historical records of bear presence. We will investigate these areas to verify the authenticity of these new accounts and to understand what is occurring.

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

Theme: Human-Bear Conflict & Coexistence

Abstract Number: 177
Presentation Type: Poster Presentation
Presentation Title: Influence of human disturbance on black bear (Ursus americanus) habitat selection
Presenter Name: Erin Henderson
Presenter Affiliation: University of Saskatchewan
Presenter Email: Erin.henderson244@gmail.com
All Authors: Erin Henderson, Ramona Maraj, Emily Gavey, Nolan Waters, Michelle Hoang, Mary McConnell, Fletcher Elliott, Rachel Stapleton
Primary Author Occupation: Student

Abstract:

Black bears (Ursus americanus) were extirpated from their historical home range in southeastern Alberta, but have recently begun repopulating the area. Within the last 10 years, black bears returned to the Beaver Hills Biosphere (BHB) in east-central Alberta, one of the last remaining vestiges of the globally critically endangered aspen parkland ecosystem. The BHB is a highly fragmented landscape comprised of agricultural, residential, and protected lands, with a major east-west highway bisecting the Biosphere. Protected areas within the BHB have seen higher visitation rates and bear sightings in recent years. High densities of humans living, working, travelling, and recreating in the BHB alongside bears could lead to increased instances of human-bear conflict as the bear population grows.

We assessed black bears spatial and temporal response to human disturbance in the BHB using location data obtained from global positioning system collars deployed on 11 black bears from 2020-2023. We used a resource selection function to compare bear habitat use to nonanthropogenic and anthropogenic variables, including land-use type (residential, agricultural, protected), and intensity of road and trail use. We modelled diurnal and seasonal (hyperphagia vs. hypophagia) changes in habitat selection in relation to changes in human recreation use of protected areas. We also compared habitat selection within protected areas to that outside of the protected areas. Identifying bears response to human disturbance will allow partner agencies to develop and implement human-bear conflict management plans targeted to areas of high human and bear use.

POSTERS

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

Theme: Human-Bear Conflict & Coexistence

Abstract Number: 181
Presentation Type: Poster Presentation
Presentation Title: Effects of human activities on the denning behavior and reproductive success of brown bears
Presenter Name: Baptiste Brault
Presenter Affiliation: University of Sherbrooke
Presenter Email: baptiste.brault@usherbrooke.ca
All Authors: Baptiste Brault, Jeanne Clermont, Andreas Zedrosser, Fanie Pelletier
Primary Author Occupation: Student

Abstract:

Human activities have a profound effects on the environment, not only through their presence in the landscape but also through the human induced climate change. Human influence forces wildlife to modify their behavior, which can ultimately affect their fitness. For example, rising temperatures and increase in human presence can alter the hibernation behavior of species adapted to harsh winters, such as the Scandinavian brown bear (Ursus arctos). Changes in hibernation phenology can affect individuals' physical condition, reproductive success, population dynamics, and frequency of interactions with humans. The aim of this research project is to determine whether brown bears are adapting to environmental changes by modifying their habitat selection, their use of different den types, and by changing the timing and duration of denning. Ultimately, I will examine the effects of climate, human presence, den type, and denning phenology on litter size. This study will consider the sex, age, and reproductive status of bears tracked in Sweden over a 20-year period. This project will brin insights on the ability of long-lived animals to rapidly adapt to environmental changes over time and space while quantifying the importance of individual factors.

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

Theme: Population Estimation

Abstract Number: 183
Presentation Type: Poster Presentation
Presentation Title: Effectiveness of different methods for non-invasive monitoring of grizzly bears
Presenter Name: Darío Fernández-Bellon
Presenter Affiliation: fRI Research
Presenter Email: dfernandezbellon@friresearch.ca
All Authors: Darío Fernández-Bellon, Cameron McClelland, Gordon Stenhouse
Primary Author Occupation: Professional

Abstract:

Non-invasive sampling methods have long been a preferred approach for bear population monitoring and conservation programs across the world. Despite their widespread use, limited evidence is available on the effectiveness of different methodological approaches. In North America, hair snag corrals baited with cow blood as a non-reward attractant have been widely used as a means of non-invasive sampling for grizzly bears Ursus arctos. This method has proved successful for developing population estimates, but some challenges remain: snag effectiveness has not been quantified, the use of cow blood raises safety and logistic difficulties, and determining whether samples correspond to single or multiple individuals is challenging. Here we analyse data from two seasons (2023 and 2024) at 80 hair snag sites (monitored by trail cameras) distributed over an area of 18,000 km2 in the foothills of the Canadian Rocky Mountains. We tested (i) different hair snag site configurations, (ii) alternative non-reward attractants, and (iii) different sampling periods and assessed their effectiveness for both grizzly bears and black bears Ursus americanus. We found corral hair snag sites to have high effectiveness compared to other methods (e.g., rub trees). Of 6 alternative attractants tested, anise-based lures showed similar effectiveness to blood for attracting grizzly bears, while fish fertilizer was the most effective attractant for black bears. Trail cameras indicated that behaviours at the site also varied between species and across attractants. Temporal variability in detections may reflect seasonal activity which can help inform optimal sampling periods. Overall, these results can help optimize cost-effectiveness of ongoing and future monitoring efforts.

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

Theme: *Captive Bears, Zoos, and Physiology*

Abstract Number: 185
Presentation Type: Poster Presentation
Presentation Title: Ending a centuries-old tradition of bear keeping in Czech castles
Presenter Name: Eva Filipczykova
Presenter Affiliation: Czech University of Life Sciences in Prague
Presenter Email: eva.filipczykova@gmail.com
All Authors: Eva Filipczykova, Bernd Nonnenmacher, Christopher Schmidt, Žaneta Křišťanová, Aleš Vorel, Koen Cuyten
Primary Author Occupation: Student

Abstract:

The state of Czech Republic currently keeps seven bears at four castle moats (the castles of Český Krumlov, Konopiště, Náchod, and Točník), i.e. a tradition going back more than 500 years. Bears in some of these moats live in very limiting conditions. Tourists, both international and Czech, have been reporting a worrying state of the bears especially in moats of two castles, the Český Krumlov Castle and the Konopiště Castle. The Český Krumlov Castle has a moat of about 850 m2, composed mostly of concrete, and inhabiting three brown bears. The Konopiště Castle possesses a moat of about 150 m2 with one Asiatic black bear. Bears at these moats display signs of stress, such as bear pacing, display of stereotypic behavior and obesity. Since 2015, various international and local organizations have put pressure on the National Heritage Institute (NPÚ), a Czech state institution responsible for the management of these castles, to cease bear keeping in castle moats. In 2021, two NGO's, Stiftung für Bären (Foundation for Bears) and Bears in Mind, formed a coalition and started actively working towards a plan to end the suffering of the castle bears in the Czech Republic. In early 2023, Stiftung für Bären started a petition specifically addressing Český Krumlov Castle and UNESCO, which was signed almost 150,000 times. In June 2023, the coalition visited the Czech castle bears and had meetings with stakeholders, such as the management of the Český Krumlov Castle, the NPÚ, and the local NGO Obraz – Animal Defenders. The meeting with the Deputy Director of the NPÚ was successful and we agreed on further steps aiming at gradually moving bears from all the Czech castle moats to close-

to-nature sanctuaries. The further steps include signing a Memorandum of Understanding between the coalition and NPÚ, running a public education campaign, and performing a social survey on general public opinion about this project and effectiveness of the campaign.

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

Theme: Captive Bears, Zoos, and Physiology

Abstract Number: 188
Presentation Type: Poster Presentation
Presentation Title: Polar Bear Maternal Care and Cub Development
Presenter Name: Danielle James
Presenter Affiliation: San Diego Zoo Wildlife Alliance
Presenter Email: djames@sdzwa.org
All Authors: Danielle K. James, Jennifer R. Tobey, Lisa K. Lauderdale, Lance J. Miller, Megan A. Owen
Primary Author Occupation: Professional

Abstract:

Given the conservation challenges facing free-ranging polar bear populations, conservation breeding programs ex situ may become more relevant to the management of the species. Polar bear neonates are highly altricial, and in den maternal care is required for cub survival and as follows, population health. However, little is known about maternal care behavior and cub development in the den as currently the technology to observe polar bears inside dens in the wild does not exist, resulting in little baseline information about births and maternal care of cubs prior to emergence. Thus, study of maternal denning polar bears in managed care can provide valuable insights. We reviewed video recordings of polar bears in maternal dens from three participating zoos to monitor maternal behavior and cub development. The study subjects included three polar bear mothers with twin cubs, however each mother lost one cub. Two cubs died within a few hours after birth and one cub was hand-reared nine days postpartum. Only the remaining cubs were observed for this study. During a total of 366 observations, we collected behavioral data on both mother and cub during 30-minute observation sessions spaced every four hours for the first 30 days post-partum. We recorded mother-cub contact and individual behaviors for both the mother and cub including resting, nursing, grooming, and other active behaviors. During the first ten days postpartum, cubs spent 60% of the time on mother, usually in a cradled position, and this behavior decreased to 44% thereafter. Mothers and cubs spent most of the time resting, with mothers occasionally licking and attending to their cubs, and these behaviors did not change over the postpartum period. Cubs spent approximately 11% of the time nursing. More replicates from ex situ populations will refine our understanding of how the denning environment, maternal care behavior and cub development are correlated with cub survival, supporting population sustainability.

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

Theme: Bear Behaviour

Abstract Number: 190
Presentation Type: Poster Presentation
Presentation Title: Andean bear tree selectivity for scent-marking in Ecuadorian cloud forests
Presenter Name: Eva Filipczykova
Presenter Affiliation: Czech University of Life Sciences in Prague
Presenter Email: eva.filipczykova@gmail.com
All Authors: Eva Filipczykova, Melanie Clapham, Russell C. Van Horn, Owen T Nevin, Jorge Luis Armijos Barros, Aleš Vorel
Primary Author Occupation: Student

Abstract:

Olfactory signaling is the most efficient mode of animal communication when the interval between signaller and receiver is delayed. Scent-marking requires selective strategies to increase the likelihood that these signals persist in the environment and are successfully received. Bears are solitary, non-territorial carnivores, which scent-mark trees, substrate, and other objects to communicate with conspecifics. Signallers place scent-marks on trees to increase the detectability of their signals, possibly also to communicate their size and status. While we are starting to better understand chemical signaling in bears of the northern hemisphere, knowledge on tree selectivity for scent-marking and chemical signaling in general of bears from tropical regions remains limited. We assessed scent-marking tree selectivity of Andean bears, Tremarctos ornatus, in Ecuadorian cloud forests at two spatial scales: the individual-tree level and at a local scale. We recorded characteristics of marked and unmarked trees along bear trails (5.49 km in total) in the Eastern Cordillera of the Ecuadorian Andes, near the Sumaco Biosphere Reserve. To decrease dimensionality and multicollinearity before explanatory analyses, we performed Principal Component Analysis on data from 467 trees of 48 tree species. We then used Generalized Linear Models, model selection, and model averaging to discover that Andean bears preferred rubbing leaning trees, aromatic tree species, and hardwood trees with smaller and thicker leaves containing less nitrogen. Ten of 59 marking sites contained clusters of marked trees, but site-level data did not indicate why bears marked multiple trees at some sites but not others. We thus encourage further analyses of marked-tree cluster sites and their relationship to productive food resources and reproduction, which might present important communication hubs for ursids.

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

Theme: Habitat Relationships

Abstract Number: 196
Presentation Type: Poster Presentation
Presentation Title: Assessing the habitat selection and distribution of polar bears (Ursus maritimus) and ringed seals (Pusa hispida) in the Last Ice Area using infrared video and aerial imagery
Presenter Name: Roxanne MacLean
Presenter Affiliation: York University
Presenter Email: macleanroxanne@gmail.com

POSTERS

All Authors: Roxanne D. MacLean, Gregory W. Thiemann, Katie R.N. Florko, Steven H. Ferguson, Kelsey F. Johnson, Christine Michel, David J. Yurkowski
Primary Author Occupation: Student

Abstract:

The Arctic climate is warming roughly four times faster than the global average, causing a rapid decline in the thickness and duration of sea ice. For ice-dependent species like the polar bear (Ursus maritimus), the availability of suitable sea ice habitat is vital for important life processes including movement and hunting of their preferred prey. Ecological studies of polar bears and their prey in the Last Ice Area are limited due to the remote location, making it logistically challenging to carry out traditional telemetry studies. The objective of this research was to quantify the habitat use of polar bears and ringed seals (Pusa hispida) and model their distribution in the Last Ice Area. We conducted aerial surveys to collect infrared video and aerial imagery along transects, and used both remote sensing techniques to detect animals in infrared video and manual detection of tracks on sea ice in aerial imagery. We quantified the habitat selection of polar bears and ringed seals using resource selection functions to determine the relationship between observations and habitat characteristics such as sea ice cover, concentration, and distance from shore. Species distribution models were used to predictively model the distribution of polar bears and ringed seals in this region based on the observed locations and environmental covariates. This research is the first to quantify the habitat selection and distribution of polar bears and their prey in the Last Ice Area of the Canadian High Arctic, yielding novel insights into this understudied yet ecologically significant area of sea ice habitat.

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

Theme: Captive Bears, Zoos, and Physiology

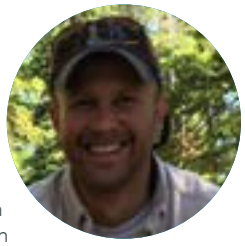
Abstract Number: 197
Presentation Type: Poster Presentation
Presentation Title: Arachidonic and docosahexaenoic fatty acids in brown bears brain tissue
Presenter Name: Slaven Reljić
Presenter Affiliation: University of Zagreb, Croatia
Presenter Email: lpaden@vef.unizg.hr
All Authors: Lana Pađen, Agnieszka Sergiel, Djuro Huber, Slaven Reljić, Ivan Berečki, Jasna Aladrović
Primary Author Occupation: Professional

Abstract:

The conditionally essential polyunsaturated fatty acids (PUFA), arachidonic acid (AA, 20:4n-6) and docosahexaenoic acid (DHA, 22:6n-3) are predominant n-6 and n-3 PUFA in the mammalian central nervous system. Since AA and DHA, as well as their respective shorter-chain precursors, linoleic acid (LA, 18:2n-6) and ⍰-linolenic acid (⍰-LNA, 18:3n-3), cannot be synthesized de novo, they must be obtained from diet. The main sources of these for the wild brown bear are various berries and nuts. Adequate brain concentrations of AA and DHA and interactions among them and their metabolites are important for brain structure, function, and metabolism. The amounts of AA and DHA, and whether they are changing seasonally in brown bears brain are unknown. We aimed at determining FA using samples collected from 36 free-ranging brown bears (11 females, 25 males) in Croatian part of Dinaric-Pindos population range during spring and autumn in 2022 and 2023, while attending to human-induced mortalities. Samples of medulla or pons regions were homogenized, total lipids extracted, and composition of FA was determined by gas chromatography. Brain tissue in females and males comprised 6.1±2% vs. 4.8±2.1% AA and 7.7±3.8% vs. 7.2±3.8% DHA, respectively. Females in spring 2022 had significantly lower levels of LA (4.95±0.06% vs. 10.9±1.8%) than in autumn samples of the same year. Females in autumn 2022 had significantly higher level of DHA (11.4±2.2% vs. 5.4±2.2%) than the same season in 2023. Male spring samples in 2022 had significantly higher LA (8.6±3.6% vs. 2.2±2.6%) and DHA (8.7±3.5% vs. 4.9±2.6%) and significantly lower ⍰-LNA (1.0±0.6% vs. 1.6±0.6%) and AA (3.2±1.2% vs. 6.4±2.0%) than males in the same season in 2023, while significantly lower AA (3.9±0.9% vs. 6.3±1.7%) in autumn 2022 than in 2023. This preliminary study suggests that season, especially autumn period with hyperphagia, affects AA and DHA levels and underline the importance of natural foods.

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

Theme: Population Estimation



Abstract Number: 202
Presentation Type: Poster Presentation
Presentation Title: Genetic diversity, gene flow, and effective population size of the Selkirk and Cabinet-Yaak grizzly bear populations
Presenter Name: Justin Teisberg
Presenter Affiliation: US Fish and Wildlife Service
Presenter Email: megan.wright3655@gmail.com
All Authors: Megan Turnock, Lisette Waits, Justin Teisberg, Wayne Kasworm, Matthew Falcy, Michael Proctor
Primary Author Occupation: Student

Abstract:

Genetic monitoring is important in fragmented populations, particularly in small populations that rely on gene flow to maintain genetic diversity. Grizzly bear (Ursus arctos) populations in the Selkirk (SE) and Cabinet-Yaak (CYE) ecosystems are the smallest in North America and are near the southernmost extent of the species' range. Both populations were isolated for generations but have recently experienced gene flow through natural migration and a population augmentation program. A long-term dataset of grizzly bear microsatellite genotypes from 1973-2021 presented a unique opportunity to examine genetic trends in the SE and CYE over time. We used this dataset of 464 bears to evaluate if gene flow affected observed heterozygosity, expected heterozygosity, allelic richness, and average pairwise relatedness in each of these populations. We also estimated effective population size using the temporal and linkage disequilibrium methods. Post gene flow, allelic richness increased in the Selkirk and Cabinet populations and r decreased in all three populations. We did not observe any changes in expected or observed heterozygosity, but expected heterozygosity values in our populations were significantly higher than those estimated in a model without gene flow. Our effective population size estimates were consistent between the temporal and linkage disequilibrium methods and ranged from 15.15-15.8, 15.35-19.3, and 5.6-8.7 for the Selkirk, Yaak, and Cabinet populations, respectively. Overall, our findings indicate that gene flow is increasing or maintaining genetic diversity in the SE and CYE. However, effective population size remains low and additional connectivity or augmentation may be needed, particularly in the Cabinet population.

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

Theme: Management

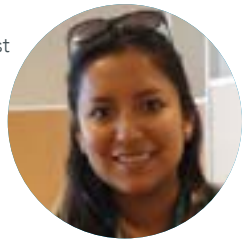
Abstract Number: 203
Presentation Type: Poster Presentation
Presentation Title: Explaining recent increases of grizzly bears in central Alberta: Habitat dynamics, demographics, and translocation
Presenter Name: John Boulanger
Presenter Affiliation: Integrated Ecological Research
Presenter Email: boulange@ecological.bc.ca
All Authors: John Boulanger, Gorden Stenhouse, Scott Nielsen
Primary Author Occupation: Professional

Abstract:

DNA-based inventories of 2 bear management areas in central Alberta (east of Jasper and Banff National Parks) conducted in 2004 and 2005 revealed low densities (<5 bears/1000 km2) of grizzly bears. This prompted conservation actions, including a moratorium on hunting, as well as research into demographic status and potential factors limiting these populations. DNA inventories for these 2 areas were repeated in 2014 and 2018 revealing increases of 6-7% per year in each area. We hypothesized that these increases were due to improvements in habitat, reduced mortality, and recipients (immigrants) from translocations of bears. We used open spatially explicit capture recapture models, demographic modelling, as well as modelling of change in habitat to test which mechanisms best explain local patterns of increase. Supported mechanisms include a net increase in ungulate habitat, higher survival rates, and transplants of bears into one of the survey areas. We identified hotspot areas of increase relative to areas of higher habitat value and potential mortality risk. We rank these mechanisms within the context of management objectives. Our results provide an assessment of the most likely factors influencing increases, as well as potential methodologies that can be used for continued monitoring of these populations.

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

Theme: *Human-Bear Conflict & Coexistence*



Abstract Number: 204
Presentation Type: Poster Presentation
Presentation Title: Being a female bear biologist in South America: The context and challenge for "osologas"
Presenter Name: Roxana Rojas VeraPinto
Presenter Affiliation: Proyecto Isnachi
Presenter Email: roxana.rojas@pucp.pe
All Authors: Roxana Rojas-VeraPinto, Viviana Albarracín, Adriana Reyes
Primary Author Occupation: Student

Abstract:

Women play an active role in the study and conservation of the Andean bear despite facing challenges during their work related to gender stereotypes and physiological process. Our research aims to promote the female bear community and their contribution to the knowledge of the Andean bear. In 2022, we conducted an online survey with the female Andean bear community. The questionnaire involved the characterization of this community and their work experience. Then, we summarized women authorship within the literature related to the Andean bear. We used bilingual keywords searches (English and Spanish) to find academic theses, journals and IBA News publications from the 20th century to 2023. References were classified according to the authorship gender and the publication themes. We received 13 replies which were principally women above 30 years old (n=11) with have at least one family member under their responsibility (n=8). The majority have a degree in ecology or biology (n=8) with a MS or PhD (n=8) and work principally for non-governmental institutions (n=8). Gender inequality was a disadvantage for most respondents (n=9), because of the chauvinistic perceptions or attitudes they received by local stakeholders. Despite these challenges in rural contexts, the majority (n=8) of female do not feel undervalued by their colleagues. From the literature review, we encountered 107 theses of which 65 (49 honor, 8 master and 8 doctorate dissertations) were developed by women. Of particular note is that most doctorate theses focused on Andean bears were developed by women (8 of 10) and the most common studied theme was human-bear interactions (n=16). Female authorship was present in 125 from 223 scientific publications, and specifically 48 from 83 IBA News publications since 2002. The most popular themes were captive bears in scientific publication (n=24) and conservation and environmental education (n=21), respectively. We need to continue inspiring new students, promoting the work of women, and tackling the significant challenges encountered in rural areas.

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

Theme: Captive Bears, Zoos, and Physiology

Abstract Number: 205
Presentation Type: Poster Presentation
Presentation Title: Using Polar Bear (Ursus maritimus) Diet Estimates to Model the Effect of Climate Change on Arctic Marine Predator Body Condition
Presenter Name: Griffin Finkbeiner
Presenter Affiliation: York University
Presenter Email: grifink@yorku.ca
All Authors: Griffin Finkbeiner, Gregory W. Thiemann, Melissa P. Galicia, Alyssa M. Bohart
Primary Author Occupation: Student

Abstract:

Arctic ecosystems have been disproportionately impacted by climate change, warming at a rate four times faster than the global average. Polar bears (Ursus maritimus) rely on annual ice as a platform to travel and hunt, and warming-driven loss of Arctic sea-ice represents a reduction in optimal foraging area with subsequent impacts on predator-prey relationships. Phenotypic responses to these environmental changes (i.e., phenotypic plasticity) may involve shifts in foraging strategy, including the degree of specialization an individual may demonstrate. Dietary specialization, where an individual demonstrates a narrower or altered foraging niche compared to the overall population, is the response of an individual altering foraging behaviour to maximize energy intake. The objective of this research is to develop a model for understanding the drivers and consequences of dietary specialization on Arctic marine predators in a warming climate. Using harvest-based sampling of two adjacent polar bear subpopulations—Foxe Basin and Davis Strait—we will study the effect of long-term climate warming on polar bear diet (composition and diversity) and body condition. Diet estimates will be created using quantitative fatty acid signature analysis (QFASA), with adipose tissue lipid content and subjective fatness index (SFI) scores being used as

body condition indicators. We hypothesized that environmental changes, including declining sea-ice levels, have promoted sex-specific responses in adult polar bears, with increased specialization among males, where females with better body condition will show a more generalized diet. The outcomes of this research will provide valuable insights into the ecological impacts of climate warming on Arctic marine predators, informing future conservation and management strategies. Moreover, changes in polar bear diet specialization may serve as an indicator of food web connectivity and health in the rapidly changing Arctic environment.

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

Theme: Captive Bears, Zoos, and Physiology

Abstract Number: 208
Presentation Type: Poster Presentation
Presentation Title: Japanese black bears are highly exposed to lead (Pb)
Presenter Name: Koji Yamazaki
Presenter Affiliation: Tokyo University of Agriculture
Presenter Email: yamako@j.email.ne.jp
All Authors: Koji Yamazaki, Mayumi Ishizuka, Shota Nakayama, Nelly Banda, Shinsuke Koike, Yusuke Goto, Kozo Yamazaki, Yui Nemoto, Boris Fuchs, Jon M. Arnemo
Primary Author Occupation: Professional

Abstract:

We collected blood samples from a total of 57 Asian black bears (Ursus thibetanus) that were live-trapped in two study areas. The Okutama Mountains are situated in the suburbs of Tokyo, a mega-city where the use of leaded gasoline was permitted until 1980s. The Ashio-Nikko Mountains are located near an old copper mine and smelter. In both areas, extensive sika deer (Cervus nippon) and wild boar (Sus scrofa) control programs and sport hunting using lead (Pb) ammunition have been ongoing for decades.

We found that blood Pb concentrations (mean±SD) were higher in the Ashio-Nikko Mountains (107.62 ± 29.94 µg/L) compared to the Okutama Mountains (54.27 ± 35.65 µg/L).

Pb levels of females with lactation were higher than other sex categories, and the increase in Pb levels was associated with a significant decrease in blood lymphocyte and monocyte counts. In bears sampled over multiple years, Pb levels showed an increasing trend.

Bears in central Japan are known to scavenge on carcasses and hunting remains of sika deer and other large-sized mammals. Pb from spent ammunition may constitute a significant portion of Pb exposure in the bears in both areas. In the Ashio-Nikko Mountains mining activities are likely a major source of environmental Pb, whereas the Okutama Mountains are more contaminated by Pb from leaded gasoline.

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

Theme: Captive Bears, Zoos, and Physiology

Abstract Number: 209
Presentation Type: Poster Presentation
Presentation Title: The effect of season and latitude on the body mass of eight bear species in human care
Presenter Name: Russell Van Horn
Presenter Affiliation: San Diego Zoo Wildlife Alliance
Presenter Email: rvanhorn@sdzwa.org
All Authors: Russell Van Horn, Anthony M Pagano, Mathias W Tobler
Primary Author Occupation: Professional

Abstract:

Many ursids exhibit significant changes in metabolism and body mass in response to environmental and seasonal factors. In some ursids, these seasonal effects can include extended and predictable periods of inactivity or torpor. In turn, those changes can affect the timing of challenges to these bears' management and conservation. Yet, in other ursids (e.g., sun bears, sloth bears), the existence or magnitude of such seasonality is poorly known. We used records of body mass from eight bear species in human care within the Species360 Zoological Information Management System (ZIMS) to evaluate the effects of season and latitude on overall body mass and change in body mass. This dataset encompassed 66,598 records from 1000 adult bears between 1980 – 2023 encompassing latitudes from -41 – 66°. Andean bears in human care of both sexes exhibited significant decreases in body mass with increasing latitudes (i.e., distances from the equator). Conversely, male Asiatic black bears and female polar bears exhibited significant increases in body mass with increasing latitudes. Female brown bears and giant pandas of both sexes exhibited significant increases in overall changes in body mass across months of the year with increasing latitudes. Other species and sex classes showed no relationship between overall body mass or changes in body mass with increasing latitudes. These data provide insight into the capacity of different ursids to seasonally vary their body mass and the influence of latitude on body mass. Additionally, Andean bears exhibited the most pronounced sexual dimorphism in body mass, followed by brown bears, black bears, and polar bears, with sloth bears exhibiting the least dimorphism. Such variation in dimorphism across species may reflect sexual selection, leading to variation in foraging requirements. Data from other bears in human care beyond Species360 would allow us to more thoroughly evaluate the influence of season and latitude among ursids.

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

Theme: Management

Abstract Number: 212
Presentation Type: Poster Presentation
Presentation Title: Occupancy monitoring of Andean bears in the North Tiquipaya Municipal Wildlife Reserve in Cochabamba, Bolivia.
Presenter Name: Andrea Fuentes
Presenter Affiliation: Vida Silvestre NGO
Presenter Email: andreafuentesarze@gmail.com
All Authors: Andrea Fuentes and Sara Flores
Primary Author Occupation: Student

Abstract:

Andean bears (Tremarctos ornatus) are the only bear species that lives in South America distributed throughout the Tropical Andes, one of the most diverse ecoregions and strongly threatened by constant population growth and habitat fragmentation. Although many protected areas in Bolivia align with the distribution of this species, most of them need effective tools to understand local dynamics between bear populations and human activities that could lead to human-bear conflict. This is the case of the North Tiquipaya Municipal Wildlife Reserve, located at the lower limit of Conservation Unit 5 of the Andean bear (Wallace et al., 2014). We present progress on monitoring the occupancy of Andean bears in the Municipal Reserve and key local factors that could affect the probability of occupancy of the species in the area. This information will contribute to greater efforts throughout the region to increase knowledge about Andean bear populations. In addition, it will help design effective livestock management interventions with local communities, since occupation has great power to detect changes.

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

Theme: Management

Abstract Number: 213
Presentation Type: Poster Presentation
Presentation Title: The Efficacy of Locating and Monitoring Arboreal Black Bear Dens with a Hand-Held Thermography Camera
Presenter Name: Craig Perham
Presenter Affiliation: US Bureau of Land Management, Alaska State Office
Presenter Email: cperham@blm.gov
All Authors: Craig Perham and Craig Townsend
Primary Author Occupation: Professional

Abstract:

Protocols for detecting and verifying arboreal black bear (Ursus americanus) dens using a hand-held, infrared (HH IR), thermography camera system were developed to understand black bear use of riparian habitat in an urban park in southcentral Alaska. We categorized descriptive characteristics of black cottonwood (Populus trichocarpa) trees to consider when identifying individual trees that could be used as arboreal bear dens. These included tree diameter, functional height, bear activity, and trunk shape (i.e., tapered).

We also documented thermal camera variables when using a HH IR camera system to identify active, arboreal black bear dens, such as appropriate environmental conditions, survey timing, and camera system limitations and advantages. Hand-held infrared camera systems can be used for initial den detection surveys as well as assessing current occupancy of historical den trees. HH IR camera systems can also be used to monitor occupied dens to help minimize potential human-bear interactions.

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

Theme: Bear Behaviour

Abstract Number: 214
Presentation Type: Poster Presentation
Presentation Title: Mating behavior and site selection of Asian black bear in Japan
Presenter Name: Tomoko Naganuma
Presenter Affiliation: Obihiro University of Agriculture and Veterinary Medicine
Presenter Email: tama.827dx@gmail.com
All Authors: Tomoko Naganuma, Seung-Yun Baek, Kahoko Tochigi, Naoki Takekoshi, Chinatsu Kozakai, Koji Yamazaki, Shinsuke Koike
Primary Author Occupation: Professional

Abstract:

The mating behavior of Asian black bear (Ursus thibetanus) has been limited on observations of captive populations. Hence, the habitat use and behavior during courtship of free-ranging bears are poorly understood. Animal-borne camera systems (i.e., cameras attached on animals) provide novel tools to study the behavior of elusive animals. Here, we used a video camera integrated with a GPS collar to record the behaviors of free-ranging bears during the mating season (May-July). During the mating season, collars were deployed on seven adult bears (five males and two females) captured in Ashio-Nikko Mountains and Okutama Mountains, central Japan. The video and GPS data were then downloaded from the collars and analyzed in terms of mating behavior. All the bears were found to interact with other uniquely identifiable bears for some of the times (range 9–26 days) during the deployment period (range 26–64 days), and multiple mating in males was documented. Both males and females exhibited different behaviors on social days (i.e., days when the bear interacted with conspecifics) compared with solitary days (i.e., days with no observed interactions with conspecifics). Compared with solitary days, the bears spent a lower proportion of time on foraging behaviors and higher proportion of time on resting behaviors on social days. Our findings suggest that Asian black bears reduce their foraging behaviors on social days and engaged more in social interactions. Also, we will show the results of habitat use analysis to elucidate the relationship between the characteristics of bear mating sites and their behavior, which may provide insights into the behavioral patterns related to the mating habitats.

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

Theme: Human-Bear Conflict & Coexistence

Abstract Number: 216
Presentation Type: Poster Presentation
Presentation Title: Human dimensions influencing brown bear attractant securing behavior in suburban kitchen gardens in Sapporo, Japan
Presenter Name: Taiki Ito
Presenter Affiliation: Hokkaido University
Presenter Email: banka67@eis.hokudai.ac.jp
All Authors: Taiki Ito and Tohru Ikeda
Primary Author Occupation: Student

POSTERS

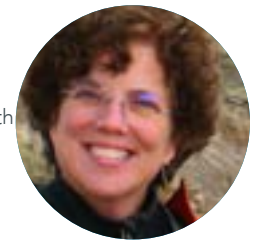
Abstract:

In Hokkaido, northern Japan, brown bears are appearing in urban areas and causing human-bear conflicts. One reason for bears to appear in human settlements is their attraction to anthropogenic food sources. Therefore, reducing bear access to anthropogenic food sources, especially kitchen gardens (KGs) is essential for effective urban bear management. However, the adoption of preventive measures, such as the use of electric fences, may be hindered by social and psychological factors among residents. This study explores the factors influencing the use of electric fencing through interview and questionnaire surveys conducted in KGs in Sapporo, Japan, which was selected as the study area due to the high incidence of human-bear interactions in its suburban regions. First, semi-structured interviews were conducted with KG owners to explore the factors influencing their decision to use or not to use electric fencing. The results highlighted many factors that led to non-use of electric fences, including cost considerations, the need for significant labor and concerns about the dangers posed by electric fencing. This was followed by direct observations to determine the prevalence of electric fencing in the KGs, which revealed that electric fencing was consistently used in 20.0% of the KGs observed. Finally, a questionnaire survey was conducted to investigate the social and psychological factors influencing the use of electric fencing in KGs. Our results showed a lower incidence of crop raiding by bears in the study area; however, many participants expressed concerns regarding potential crop raiding and bear encounters. Furthermore, negative attitudes toward electric fencing (cost, labor, danger of electric fences) can discourage and risk perceptions of bear can encourage the use of electric fences. Focusing on social and psychological factors may promote the introduction of electric fences in KGs to decrease human-brown bear conflicts around urban area in Sapporo city.

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

Theme: Bear Behaviour

Abstract Number: 217
Presentation Type: Poster Presentation
Presentation Title: Aversive conditioning increases short-term wariness but does not change habitat use in black bears associated with conflict
Presenter Name: Colleen Cassady St. Clair
Presenter Affiliation: University of Alberta
Presenter Email: rraymon1@ualberta.ca
All Authors: Lori Homstol, Sage Raymond, Claire Edwards, Anthony N. Hamilton, Colleen Cassady St. Clair
Primary Author Occupation: Student



Abstract:

Conflict between humans and black bears (Ursus americanus) occurs throughout North America with increasing public demand to replace lethal management with non-lethal methods, such as aversive conditioning (AC). AC aims to teach animals to associate negative stimuli with humans or their infrastructure. We sought to test the efficacy of AC using radiocollared black bears in Whistler, British Columbia, by monitoring individuals and assigning those in conflict with people to control or treatment groups. We measured wariness using overt reaction distance, displacement distance, and reaction to researchers before, during and after executing 3–5-day AC programs that consisted of launching projectiles at bears in the treatment group. We also assessed predictors of successful AC events (i.e., leaving at a run), changes in bear use of human-dominated habitat during the day and at night, and the effects of including a sound stimulus to signal the beginning and end of AC events. Among treated bears, overt reaction distance increased by 46.5% and displacement distance increased by 69.0% following AC programs, whereas both overt reaction distance and displacement distance decreased over time among control group bears. Each additional AC event during the previous 30 days increased likelihood of bear departure in response to researcher presence by 4.5%. The success of AC events varied among individuals, declined with distance to cover, and increased with exposure to previous AC events. Projectiles launched from guns were slightly more effective at causing bears to displace compared to those launched from slingshots, and sound stimuli decreased the likelihood of a successful AC event. AC did not alter diurnal use by bears of human-dominated habitat. Our results suggest that AC increases short-term wariness in black bears but does not alter bear use of human-dominated spaces, highlighting the importance of proactive attractant management and prevention of food conditioning.

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

Theme: Bear Behaviour

Abstract Number: 222
Presentation Type: Poster Presentation
Presentation Title: Do animals use bear marking sites? A potential role for inter- and intra-specific communication by non-bear mammals
Presenter Name: Hinako Katsushima
Presenter Affiliation: Hokkaido University
Presenter Email: hinako.katsushima@gmail.com
All Authors: Hinako Katsushima and Itsuro Koizumi
Primary Author Occupation: Student

Abstract:

Some mammals have conspicuous marking sites, such as rubbing trees of cheetahs and communal latrines of otters. While such marking sites are considered to play important roles in intraspecific communication, such odor or visual information may be used by other mammals as well, for example, to detect potential predators. To investigate the potential roles of bear marking sites for inter- and intra-specific communications by non-bear mammals, we evaluated their behaviors at marking and control sites by camera trapping survey in Hokkaido Island, northern Japan. During the study period, infra-red cameras set at brown bear rubbing trees and control trees recorded over 3000 movies of 8 non-bear mammal species. Sika deer, common prey species of brown bear, had fewer visiting events at the marking sites than control sites, but they often smelled bear marking points when they visited. This may be a behavior assessing the presence of potential predators and likely to reduce encounters with bears. Another interesting behavior was rubbing of bodies by red foxes, competitively subordinate carnivore species, at the same point as bear rubbing. They might have put bear's odors on their bodies for some reasons, like chemical camouflage. Foxes also made more sniffing and marking events at the marking sites than control sites, perhaps to use for intra- or inter-specific communication. Red squirrels made more sniffing event at bear marking sites than control sites. This may be an anti-predator strategy for gaining information about bears. Other competitively subordinate carnivore species that are rarely preyed by bears also marked at marking sites but at the same frequency as control sites. Therefore, their use of bear marking sites would not be particularly selected and the reason is likely for intra-specific communication rather than inter-specific communication. Collectively, we suggest that bear marking sites are used by many other mammals for inter- and intra-specific communication.

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

Theme: Bear Behaviour

Abstract Number: 228
Presentation Type: Poster Presentation
Presentation Title: Verification of the relationship between testosterone and behavioral changes in male Asian black bear (Ursus thibetanus)
Presenter Name: Naoki Takekoshi
Presenter Affiliation: Tokyo University of Agriculture
Presenter Email: armondmkdma@gmail.com
All Authors: Naoki Takekoshi, Jumpei Tomiyasu, Yojiro Yanagawa, Naoki Ohnishi, Tomoko Naganuma, Seungyun Baek, Miu Itoh, Tatsuhito Nishiwaki, Chinatsu Kozakai, Shinsuke Koike, Koji Yamazaki
Primary Author Occupation: Student

Abstract:

Sexual hormones play a crucial role in reproductive behavior of mammals. Testosterone, a type of sexual hormone in males, exhibited closely linked to competition among males for access to female in previous study, which applied direct observation and fecal samples containing testosterone metabolites. In case of the Asian black bear (Ursus thibetanus), males typically approach females and remain in proximity in a small area. While direct observation allows for accurate behavior recording, it is difficult to keep observing over extended periods. In this study, we investigated fecal testosterone metabolites (FTM) and behavior with global positioning system (GPS) collar of Asian black bears, to clarify the potential role of sexual hormones as behavioral factors for male bears. We hypothesized that FTM concentration in male bears would increase with (1) longer movement distance to encounter more females, or (2) shorter movement distance to ensure mating with limited females. We fitted GPS collars to males for calculating their daily distances. For collecting fresh feces for FTM assay, we targeted sample collection based on cluster of GPS points received via satellite in semi real-time. We gained GPS points from 5 males and collected a total of 297 feces from 2022 to 2023. FTM had temporary high concentration, mainly during the reproductive season (May-July), although some male bears elevated concentrations after the reproductive season (August-October). The movement distance was negatively related to FTM concentration but those were not significant in reproductive season. These findings do not exhibit the tendency clearly, but may seem that testosterone level rise when male bears engage courtship behaviors with females. This study provides the first insight of the relationship between movement distance and testosterone levels for males through bear active season.

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

Theme: Captive Bears, Zoos, and Physiology

Abstract Number: 237
Presentation Type: Poster Presentation
Presentation Title: A time-series analysis of dynamic changes in the gut microbiome of the giant panda traveling to Japan
Presenter Name: Xueying Wang
Presenter Affiliation: Hokkaido University
Presenter Email: xueying.wang.s6@elms.hokudai.ac.jp
All Authors: Xueying Wang, Ryoji Umemoto, Mizuki Kato, Takashi Hayakawa
Primary Author Occupation: Student

Abstract:

Giant panda (Ailuropoda melanoleuca) is one of the most famous mammals known for its unique biology. They phylogenetically belong to the family Ursidae (bears) and, therefore, have a carnivore-like gastrointestinal tract. However, bamboo is the principal dietary resource for giant pandas, which is highly fiber-rich and poorly nutritional. Giant panda genome has no homologs of the cellulase digestive gene, indicating that their bamboo diet may rely on the gut microbiome.

Giant panda is a vulnerable mammal according to the IUCN Red List of Threatened Species. They have an extremely narrow range of natural habitats. Human activity has drastically reduced and fragmented their habitat range. The restricted gene flow in wild populations made it difficult to maintain genetic diversity within small populations. For this reason, ex situ conservation of giant pandas has been important. The number of captive pandas now represents over one-quarter of the total number of worldwide pandas. Therefore, focusing on the gut microbiome of captive giant pandas will support their healthy condition and contribute to their successful reintroduction into the wild.

To expand the genetic diversity of captive populations, breeding loans have been implemented between breeding facilities, including Japanese zoos. Yet we have not sufficiently investigated the gut microbes in pandas traveling to Japan.

To understand how Japanese husbandry environments affects the gut bacteria in the giant panda, we continuously collected fecal samples from an adult panda at the Kobe Oji Zoo (Kobe, Japan) once a week from May 2021 to the present. The composition of the gut bacteria in giant panda was identified using the 16S ribosome RNA gene sequencing. A time series analysis of the gut bacteria dynamics in giant pandas over years will be conducted.

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

Theme: Management

Abstract Number: 241
Presentation Type: Poster Presentation
Presentation Title: The brown bear (Ursus arctos arctos) in Romania - coexistence and sustainable management, a real challenge in a dynamic of habitat modification
Presenter Name: Ramon Jurj
Presenter Affiliation: National Institute for Research and Development in Forestry Marin Dracea - Romania
Presenter Email: ramon@icaswildlife.ro
All Authors: Ramon Jurj, Georgeta Ionescu, Ovidiu Ionescu, Ancuta Fedorca, Mihai Fedorca, Marius Popa, Constantina Jurj
Primary Author Occupation: Professional

Abstract:

Romania, at European level, represents the country with one of the biggest challenges regarding the management of the brown bear species, a challenge consisting in excessively protecting the species (principle supported by non-governmental organizations and animal lovers in big cities) to the direct detriment of traditional anthropogenic activities or in preserving the species for sustainable use with social benefits, long-term ecological and economical environment (principle supported by wildlife managers and the majority of the rural population).

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A bear population has been steadily increasing over the past 50 years, both in number of individuals (from 3700 bears in 1974 to 8000 bears estimated in 2023) and in used habitat (from 28,000 km² to 71,850 km²), without active management based on sustainable use of brown bear species, we believe that the risk that human acceptance will be significantly reduced and that the long-term species will also suffer.

In the last 20 years, socio-economic development has grown in various sectors: transport, construction, tourism, forestry, and agriculture. The accelerated development of various activities and land use changes in some areas (land conversion, linear infrastructure, touristic and communication infrastructure) have led to a decrease of the bear's natural habitat while the expansion of anthropogenic activities have increased into the species' movement areas.

Analyzing the evolution of human-bear conflicts in the last 20 years (311 people injured, 28 people killed). In line with the evolution of distribution and the number of bears in Romania, we can say that the challenge remains in the hands of the decisions of the authorities that make environmental policies both at European and national level.

Our results showed that in areas where bear presence near human settlements was a historical habit, the communities tend to have a higher acceptance for bear species than the communities in which bear presence is new.

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

Theme: Habitat Relationships

Abstract Number: 247
Presentation Type: Poster Presentation
Presentation Title: Using Video Camera Collars to Investigate Free-Living American Black Bear (Ursus americanus) Diet Composition
Presenter Name: Brogan Holcombe
Presenter Affiliation: Virginia Tech, Department of Fish & Wildlife Conservation
Presenter Email: brogan@vt.edu
All Authors: Brogan Holcombe, Kevin Bayne, Robert Alonso, David McNitt, W. Mark Ford, Marcella J. Kelly
Primary Author Occupation: Student

Abstract:

American black bears (Ursus americanus) are the largest omnivores in the Appalachian Mountain landscape, yet few diet composition studies exist from the area. Previous studies generally determined diet composition from scat collection and subsequent macroscopic analysis to create diet profiles. While scat sampling may be effective for studying obligate carnivores, these methods are likely less accurate for omnivores as soft mast and fungi break down quickly in digestion, likely producing incomplete diet profiles from scat. We used video camera collars on 15 wild bears (8M, 7F) in 2018-2019 to determine diet composition by identifying items bears consumed on video in western Virginia to better understand diet and potential impact on the region's declining white-tailed deer (Odocoileus virginianus) populations. Each collar recorded 9-21 secs of video every 20 mins during the day (15-20 mins/day) for up to 17.5 hours per bear. Bears consumed 182 unique fungal or vascular plant species (including invasives), 7 insect types, 5 animal species, and 5 anthropogenic food items. We found previous studies had a lower proportion of fruit/seed soft mast (0.404) than we observed (0.659) and a lower proportion of herbaceous soft mast in spring (0.396) than in our study (0.558). We found high dietary overlap (0.958-0.984) between sexes but considerable variation within sexes by season (0.125-0.929). We further found lower diet breadth in spring (1.833) compared to fall (2.555) for all bears, and higher diet breadth values for females in summer (2.011) compared to fall (1.876). Males had more deer consumption events [adults & fawns], whereas females had higher fawn consumption in spring, potentially impacting deer recruitment. Using emerging technologies allowed us to provide increased resolution and accuracy in determining bear diet across seasons, individuals, and sexes, which is useful for better-informed bear management, including understanding bears' impact on deer populations.

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

Theme: Bear Behaviour

Abstract Number: 254
Presentation Type: Poster Presentation
Presentation Title: Exploring Bear Attacks Through an Evolutionary Lens
Presenter Name: Tom Smith
Presenter Affiliation: Brigham Young University, Provo, UT, USA
Presenter Email: tom_smith@byu.edu
All Authors: Tom Smith, Thomas Sharp, Vincenzo Penteriani, Russ Van Horn
Primary Author Occupation: Professional

Abstract:

In this paper we explore both the ultimate and proximate causes responsible for the ways in which the eight extant bear species respond in interactions with humans. A brief review of these bears' evolutionary histories is presented, with an emphasis on behavioral adaptations resulting from environmental forces including competitors, predators, and habitat. We also present each species' relationship to humans with respect to distance-dependent responses and predation. A better understanding of how bear behavior has been shaped over millennia helps us to create more effective policies for bear management and safety.

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

Theme: Habitat Relationships

Abstract Number: 256
Presentation Type: Poster Presentation
Presentation Title: Sloth bear as a key contributor to forest heterogeneity in India through seed dispersal
Presenter Name: Ashutosh Anand
Presenter Affiliation: Department of Forestry
Presenter Email: ashu.forestry@gmail.com
All Authors: Ashutosh Anand, Ajay Kumar Singh, Nishith Dharaiya
Primary Author Occupation: Student

Abstract:

Seed dispersal is a critical ecological process that influences the composition and heterogeneity of forest ecosystems. The sloth bear has emerged as an important species in maintaining forest heterogeneity through its role as a seed disperser. Here we review the literature on the role of sloth bears in seed dispersal and maintaining forest heterogenity, with a literature search in the online reference database such as scopus,

researchgate, google scholar etc. Overall, we found that sloth bears are prolific seed dispersers. Their diverse diets allow them to consume large volumes of over a twenty families of fruit and disperse large quantities of seeds across landscapes. We examined the prevalence of observed and potential endozoochoric seed dispersal by them. The wide-ranging habitat capabilities of sloth bears contribute to the colonization of new habitats and the establishment of diverse plant species. Selective feeding preferences further aid in the distribution of specific plant species, enhancing the heterogeneity of forest ecosystems. We found that several tree species benefit from the seed dispersal activities of sloth bears in different regions of India. Ficus spp., Cassia fistula, Diospyrous melanoxylon etc. are widely dispersed by sloth bears in central India aiding in its distribution across different forest regions of Marwahi, Satpura, Bandhavgarh. Ziziphus spp., Aegle marmelos, etc in eastern India and Syzizium cumini, Diospyrous melanoxylon, Madhuca indica etc in western India are dispersed by sloth bears, ensuring its presence in various forest ecosystems.

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

Theme: Human-Bear Conflict & Coexistence

Abstract Number: 257
Presentation Type: Poster Presentation
Presentation Title: Coexistence at the top of the food chain: anthropogenic risk primarily drives brown bear space use and resource selection in the Italian Alps
Presenter Name: Francesca Cagnacci
Presenter Affiliation: Fondazione Edmund Mach
Presenter Email: corradini.andre@gmail.com

All Authors: Andrea Corradini, Benjamin Robira, Luca Pedrotti, Clara Tattoni, Natalia Bragalanti, Claudio Groff, Marco Ciolli, Francesca Cagnacci
Primary Author Occupation: Professional

Abstract:

The Italian Alps are among the most anthropized mountain areas in the world. In a multi-use landscape where a variety of activities such as farming, livestock herding, hunting, and outdoor recreation take place, large mammals must adjust their behavior to carry out their daily activities. The brown bear, the largest carnivore in the Alps, was recently rescued from near extinction and must now find its place in a complex, human-dominated landscape. In this study, we use individual-based movement, activity and trait information (spanning from 2006 to 2019) to assess multi-scale behavioral decisions related to the perception of risk, the availability of habitat, and the proximity of food resources. Perceived risk from human activities was found to influence spatial and temporal patterns of selection across scales more than other attributes. Spatially, brown bears reduced risk exposure when selecting for home ranges and resources within those ranges by avoiding humans, at the cost of limiting their selection of high-quality habitats and high-calorie food sources. Temporally, intraspecific competition was identified as the main determinant of activity patterns and daily movement length over the years, while human disturbance had a major effect on movement behavior on a daily (day vs. night) scale. Brown bears in the Alps are slowly recovering, but competition for space with humans, lack of habitat connectivity, and human-caused mortality are hindering their recovery and the formation of a viable metapopulation throughout the Alps. In the increasingly crowded Alps, sustainable long-term coexistence can be achieved only if both bears and humans adjust their behaviors.

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

Theme: Population Estimation

Abstract Number: 265
Presentation Type: Poster Presentation
Presentation Title: Invitation to Participate: An experimental comparison of expert elicitation data and empirical data of American black bears
Presenter Name: Darcy Doran-Myers
Presenter Affiliation: University of Florida
Presenter Email: ddoranmyers@ufl.edu
All Authors: Darcy Doran-Myers and Conor McGowan
Primary Author Occupation: Student

Abstract:

Expert elicitation is increasingly used in ecology to fill data gaps. The reliability of expert elicitation as a source of data is seldom verified, but it is pivotal for credible research results. This presentation is an invitation to participate in a USFWS-backed study designed to test the accuracy and precision of expert judgments in ecology. The goal is to externally validate the reliability of expert judgments and to investigate the factors affecting data accuracy. The American black bear and its species experts is an ideal study system for this purpose because of the bear's extensive range, decades of empirical research using consistent methods, and the availability of numerous knowledgeable experts (you all!).

Invitation #1: I am compiling a large dataset of existing black bear genetic mark-recapture datasets. I ask willing conference attendees to contribute data to this effort. By aggregating existing datasets, I aim to generate comprehensive estimates of key parameters, such as population abundance and survival rates, informed by various environmental factors. These estimates will serve as a benchmark to evaluate the performance of expert judgments.

Invitation #2: I am recruiting black bear experts across the species range to serve on expert panels. The call for participation extends to the broad spectrum of black bear specialists, at all career levels, to ensure a diverse and representative sample. Experts will be asked to share their expertise and provide estimates of local, regional, and range-wide parameters through an initial survey, two rounds of online elicitation, and one round of online discussion.

Your participation will help to enhance our understanding of expert elicitation data in ecology, thereby influencing the future of ecological research methods. You may personally benefit through data acknowledgement, co-authorship where appropriate, and a better understanding of black bear populations at large scales and your own species knowledge.

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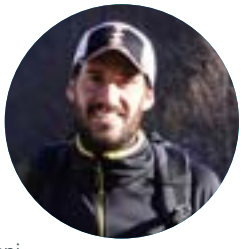
Day: Thursday **Time:** 17:00 – 21:00 **Room:** Salon 8/9

Theme: Movement Ecology



Abstract Number: 267
Presentation Type: Poster Presentation
Presentation Title: Landscape connectivity modelling for the long-term conservation of the Karelian brown bear population
Presenter Name: Daniele Falcinelli
Presenter Affiliation: University of Rome La Sapienza
Presenter Email: daniele.falcinelli@gmail.com
All Authors: Daniele Falcinelli, Vincenzo Penteriani, Maria del Mar Delgado, Paolo Ciucci, Ilpo Kojola, Samuli Heikkinen, Daniele De Angelis, Alexander Kopatz
Primary Author Occupation: Student

Abstract:

Landscape connectivity is a vital component of animal population dynamics. Conserving movement corridors for large carnivores is challenging due to their low densities, large dispersal distances, and high levels of human persecution. Indeed, for most of the previous two centuries, hunting decimated the once-continuous Fennoscandian brown bear (Ursus arctos) population, although both the Scandinavian and Karelian populations have increased and expanded in recent decades. During the recovery process, several studies have assessed their genetic structure showing a restricted and asymmetrical gene flow between Karelia and Scandinavia, but a comprehensive landscape connectivity analysis in that area has been lacking. Using long-term (2002-2015) GPS data from brown bears inhabiting the Finnish and Russian Karelia, jointly with a set of high-resolution remotely-sensed variables, we aim to identify movement corridors facilitating gene flow with the Scandinavian population. First, after retaining only those steps describing active bears' movements, we have performed an integrated step selection analysis. Karelian bears selected forests with higher vegetation, natural open areas and anthropogenic areas but did not appear to avoid proximity to roads. Next, we derived a resistance surface to model landscape connectivity by applying circuit theory in the Circuitscape software and an omnidirectional approach. Ultimately, the connectivity analyses for the transboundary Karelian population provide spatially explicit guidelines crucial for its long-term conservation and viability.

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

Theme: Management

Abstract Number: 268
Presentation Type: Poster Presentation
Presentation Title: Female grizzly bear dispersal and range expansion in the Yaak River of northwest Montana
Presenter Name: Wayne Kasworm
Presenter Affiliation: US Fish and Wildlife Service
Presenter Email: wayne_kasworm@fws.gov
All Authors: Wayne Kasworm, Thomas Radandt, Justin Teisberg, Tyler J. Vent, Michael F. Proctor, Jennifer Fortin-Noreus, Hilary S. Cooley
Primary Author Occupation: Professional

Abstract:

Abstract: Female grizzly bear (Ursus arctos) dispersal and range expansion is critical to recolonization of former habitat. Female dispersal is typically of shorter distance and therefore slower than males but necessary for establishment of reproducing populations. Telemetry and genetic detections in conjunction with trail camera photographs were the basis for establishing generational minimum convex polygons. We defined four generations of female grizzly bears arising from a single female in northwest Montana to determine amounts and rates of female dispersal and range expansion. The data set included detections from 24 individual female bears from 1986–2023. The single female that produced this matriline appears to be the only successful female in the area indicating a very low-density population in 1986. Female range expanded from 853 km2 to 4,146 km2 during the 38-year window of calculation. The eight cardinal and intercardinal directions from the initial female centroid to the perimeter of the cumulative convex polygon ranged from 23.8–50.1 km with a mean of 34.8 km. The rate of expansion based on the cardinal and intercardinal directions averaged 0.9 km per year and ranged from 0.6–1.3 km per year. Greatest rate of expansion appeared to be associated with least human habitation.

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

Theme: Captive Bears, Zoos, and Physiology

Abstract Number: 269
Presentation Type: Poster Presentation
Presentation Title: Engaging the Zoo and Aquarium Population of Polar Bears in Scientific Studies
Presenter Name: Wynona Shellabarger
Presenter Affiliation: Detroit Zoological Society
Presenter Email: wshellabarger@dzs.org
All Authors: Wynona Shellabarger, Hendrik Nollens, Thea Bechshoft, Anthony Pagano, Stephen D. Petersen, Sarah Teman, Erin Curry, Megan A. Owen, Amy Cutting
Primary Author Occupation: Professional

Abstract:

Due to inherent challenges associated with studying wild polar bears, bears in zoological institutions serve as a valuable resource for advancing scientific knowledge and providing opportunities to validate field techniques. To coordinate zoo participation in such studies and identify priority focus areas, the Polar Bear Research Council (PBRC) was formed in 2017 and includes leaders in polar bear conservation science representing zoological facilities, government agencies, and non-government organizations. Polar bears in human care are easily accessible for longitudinal bio-sampling and behavioral monitoring. Many bears are excellent participants in positive reinforcement training, which enables biological sampling (blood, urine, saliva, fur), placement of tracking collars/tags for monitoring trials, ultrasound examinations, and participation in behavioral bioassays or cognitive/sensory trials without sedation or anesthesia. In addition, most bears are anesthetized for preventative health care exams on a routine basis, presenting regular opportunities for approved bio-sample collection. Detailed medical records are maintained throughout an individual's lifetime and can be a valuable resource for data collection. Additionally, standardized necropsies are performed on all deceased captive polar bears; information obtained and biomaterials routinely collected are all resources for future investigational studies. In recent years, more than a dozen published studies have been

conducted in North American zoos that provide insight into the unique physiology and behavior of this species or helped optimize and validate field techniques. The PBRC's goal is to raise awareness of the unique contributions of polar bears in managed care and to assist field scientists with collaboration and implementation of studies in the zoological setting that could further our understanding of bears in the wild.

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

Theme: Management

Abstract Number: 272
Presentation Type: Poster Presentation
Presentation Title: Novel design for a live-capture polar bear trap.
Presenter Name: Lyle Walton
Presenter Affiliation: Ontario Ministry of Natural Resources and Forestry
Presenter Email: lyle.walton@ontario.ca
All Authors: Lyle Walton, Ashley Elliott, Jeremy Inglis, Alysa G. McCall, Joseph M. Northrup, Gordon B. Stenhouse, Gregory W. Thiemann, Geoff York
Primary Author Occupation: Professional

Abstract:

As the climate continues to warm, polar bears in Hudson Bay are being forced to spend more time on land, with limited food availability. This has led to continuing declines in polar bear body condition, survival, and potential population declines. The increased time on shore will lead to more polar bear interactions with people. Some of the northern Indigenous communities along the Ontario coast of Hudson Bay and James Bay have expressed concern about increasing interactions between bears and people. Further, in some cases they have reached out to Ontario's Ministry of Natural Resources and Forestry (MNRF) for assistance in developing and providing non-lethal tools to deal with increasing conflict with polar bears. The MNRF partnered with Polar Bears International (PBI), York University and three Ontario communities since 2022 to provide support.

One of the tools we provided was the design and fabrication of four live-capture traps for the three communities. Design objectives for the trap were: 1) to be lightweight and highly mobile to facilitate relocating captured bears by helicopter; 2) to minimize injuries to bears while held within the trap; 3) to provide multiple options for safely releasing bears from the trap without the need for bear immobilization; 4) to provide mechanical assistance to move an immobilized bear into the trap for relocation; and 5) to require minimum maintenance (e.g. all materials highly resistant to corrosion in a marine environment). The new traps offer these communities a tailored alternative to lethal control.

We based the design of the traps on the aluminum grizzly bear trap commonly used in western North America, increasing the size of the trap to accommodate use on adult male polar bears and then modifying to meet the five objectives. The last two traps are being delivered via winter road during March 2024. The traps have not yet been tested on bears. Engineered drawings will be available and we continue to seek input.

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

Theme: Human-Bear Conflict & Coexistence

Abstract Number: 273
Presentation Type: Poster Presentation
Presentation Title: Wary bears are scary bears…. Key strategies to support habituated bears and create "Wildsmart" humans, near areas of high human use.
Presenter Name: Bill Hunt
Presenter Affiliation: Retired from Parks Canada
Presenter Email: riverduckdesigns@gmail.com
All Authors: Bill Hunt and Steve Michel
Primary Author Occupation: Self-Employed

Abstract:

Common wildlife management strategies often focus on maintaining wary bears with the well accepted adage that "a fed bear is a dead bear". While most experts will agree that food-conditioned carnivores are dangerous in any ecosystem, the strategy of maintaining wary behaviour in all bears becomes unsustainable in areas of expanding human development and exponential growth in human use. In these situations, wariness in bears cannot be maintained because management efforts such as hazing and aversive conditioning have financial and personnel limitations, and are vastly outnumbered by benign encounters with people and infrastructure. Even if wariness could be achieved, wary bears are constrained from accessing critical habitats by the ever-increasing expansion of human use (both spatially and temporally). Furthermore, wary bears are, by definition, more likely to react to encounters with humans (either positively "flight" or negatively "fight") whereas habituated bears show a waning response to human use, learned through consistent, repeated neutral encounters with people and infrastructure. Indeed, in Canada's National Parks, it is primarily wary bears rather than habituated ones, that are responsible for human injuries during serious encounters. Therefore, in settings with moderate to high levels of human use, a better strategy may be to accept habituated individuals, learn their specific behaviour patterns, and implement "Wildsmart" strategies that will help keep people safe while allowing habituated bears to persist where home ranges abut areas of high human-use. The focus shifts to managing human behaviour and keeping bears out of built-up areas where there is a greater risk of habituation transitioning into food-conditioning. In this presentation, we will discuss key strategies for tolerating habituated wildlife near areas of high human use, identify some of the most common human behaviours that cause this strategy to fail, and suggest strategies to mitigate such failures.

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

Theme: Habitat Relationships

Abstract Number: 275
Presentation Type: Poster Presentation
Presentation Title: Assessing polar bear (Ursus maritimus) denning habitat vulnerability to wildfires in Manitoba, Canada
Presenter Name: Stephen Petersen
Presenter Affiliation: Assiniboine Park Conservancy
Presenter Email: spetersen@assiniboinepark.ca
All Authors: Adam Grottoli, Courtney Shuert, Stephen D. Petersen
Primary Author Occupation: Professional

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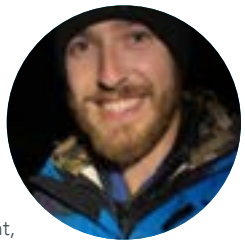
Abstract:

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

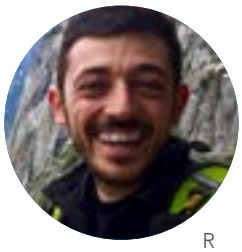
Abstract Number: 284
Presentation Type: Poster Presentation
Presentation Title: Categorizing the research effort across the family Ursidae
Presenter Name: Zachary David
Presenter Affiliation: Old Dominion University
Presenter Email: zdavi008@odu.edu
All Authors: Zachary David and John Whiteman
Primary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

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.

POSTERS

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

Theme: Management

Abstract Number: 299
Presentation Type: Poster Presentation
Presentation Title: Using hair snares and camera traps in community-led polar bear research: insights on polar bear genetics, distribution and body condition in the Eeyou Marine Region (James Bay, Canada)
Presenter Name: George Natawapineskum
Presenter Affiliation: Cree Trappers' Association, Eeyou Marine Region Wildlife Board
Presenter Email: alexandra.langwieder@mail.mcgill.ca
All Authors: Alexandra Langwieder, Angela Coxon, Natasha Louttit, Stephanie Varty, Felix Boulanger, George Natawapineskum, Sanford Diamond, John Lameboy, Murray Humphries
Primary Author Occupation: Student

Abstract:

Engaging Indigenous Peoples and their knowledge in wildlife monitoring is recognized to be important in conservation science but reconciling community support and leadership with the requirements of systematic wildlife monitoring can be challenging. Polar bears in James Bay, Canada, are the world's most southerly polar bears and already experience warming conditions expected for populations farther north but little is known about their ecology in this boreal system. Eastern James Bay Cree communities have observed changing polar bear distribution and abundance in the last decade and identified polar bear ecology as a high research priority.

Given this, our objective was to build a non-invasive polar bear research program with Cree communities to co-develop knowledge on polar bear ecology at the southern edge of their range. We used hair snares and camera trap sampling stations to gather information about polar bear genetics, diet, body condition and habitat use. Over three summers we deployed 40 sampling stations across 400km of eastern James Bay with four community field teams. We collected over 300 hair samples and hundreds of polar bear observations. Here we report the genetic, body condition and habitat use results of this project and demonstrate that these non-invasive methods are effective tools for delivering valuable information through community-based polar bear research. At a time when mainstream polar bear research methods are being questioned across the Arctic, we believe this approach could be widely used by communities to lead polar bear research in their regions.

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

Theme: Habitat Relationships

Abstract Number: 300
Presentation Type: Poster Presentation
Presentation Title: American Black Bears in Lowland Desert: Assessing Habitat Use with Hydrogen Isotopes
Presenter Name: Sydney Stephens
Presenter Affiliation: University of Utah
Presenter Email: sydney.rae1153@gmail.com
All Authors: Sydney Stephens, Christy J. Mancuso, Austin M. Green, Cagan H. Sekercioglu
Primary Author Occupation: Student

Abstract:

American black bears typically rely on forested land cover and are not expected to spend prolonged periods of time in shrub-dominated arid lands like the red rock deserts of southeastern Utah. While arid lands are known to be used as corridors between metapopulations (i.e. the La Sal Mountains, Tavaputs Plateau, Uncompahgre Forest), these areas are considered unsuitable for anything more than short-term occupation during dispersal. However, increases in the number of bear encounters near the Rio Mesa Field Station north of Castle Valley and Moab suggest bears may spend more time in arid systems than previously known. Camera traps and hair snares were used to investigate the residency of frequently visiting bears. Additionally, we received hair samples from bears in the La Sal (n=11) and San Juan (n=4) mountains from the Utah Division of Natural Resources. We measured hydrogen stable isotopes to examine bear land use at different elevations and to assess occupancy after short-scale dispersal events. While our hair snare samples were all gathered from only one individual at the low elevation area, the differences in their hydrogen values were still significantly different from higher elevation bears ($p=0.03$). Our findings suggest that bears were occupying these low-elevation deserts for time periods beyond temporary transit paths. Continued use of this area by other bears has been confirmed with camera trap and visual sightings. This case study provides preliminary evidence of desert habitat use being greater than previously thought, and shows the potential for using this O/H stable isotopes to assess similar situations as a more affordable, non-invasive, and random sampling technique than other current options.

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

Theme: Habitat Relationships

Abstract Number: 301
Presentation Type: Poster Presentation
Presentation Title: Partitioning Human and Brown Bear Niches: Transboundary Connectivity and Human Disturbance in the Alpine Region (PartNiche)
Presenter Name: Sydney Stephens
Presenter Affiliation: University of Trento
Presenter Email: sydney.stephens@fmach.it
All Authors: Sydney Stephens, Andrea Corradini, Natalia Bragalanti, Claudio Groff, Nina Gandl, Sybille Klenzendorf, Francesca Cagnacci
Primary Author Occupation: Student

Abstract:

The Alpine ecosystem in Europe, a region marked by both rich biodiversity and intensive human use, stands at the forefront of conservation challenges, particularly concerning the coexistence of humans and wildlife. This research, set within the mulit-national landscape of the Alps, aims to elucidate the complex interplay between human activities and the habitat use and connectivity of the brown bear (Ursus arctos), a species emblematic of both conservation success and social conflict. After reintroduction of brown bears to Trentino, Italy 25 years ago, the growing population allows for continued range expansion into former habitat throughout the Alps. Leveraging a multidisciplinary approach, the study designs models to analyze spatio-temporal patterns of bear movements and human-bear interactions, focusing on areas impacted by human infrastructure, recreational activities, and changing social acceptance of large carnivores.

Employing bio-logging, remote sensing technologies, and socio-ecological surveys, the research aims to produce dynamic, fine-scale representations of current bear distribution, connectivity to potential habitat within and outside the population range, and human-bear conflict zones stemming from both tangible and sociological human disturbance. Historical and sociological drivers of wildlife tolerance will also be investigated. Anticipated preliminary results include the identification of key areas of habitat, connectivity, and conflict hotspots. This research and its products such as interactive suitability maps, predicted areas of conflicts, and science-based conservation protocols, are done with the goal of contributing to the Conflict-to-Coexistence (C2C) Approach for mitigating human-wildlife conflicts through informed conservation strategies, and addressing the urgent need for a harmonized coexistence between humans and the recovering Alpine brown bear population.

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

Theme: Management

Abstract Number: 304
Presentation Type: Poster Presentation
Presentation Title: Population Dynamics and Feeding Ecology of Recolonizing American Black Bears (Ursus americanus) in the Beaver Hills Biosphere
Presenter Name: Sandra MacDougall
Presenter Affiliation: Red Deer Polytechnic
Presenter Email: sandra.macdougall@rdpolytech.ca
All Authors: Sandra MacDougall, Ramona Maraj, Erin Henderson
Primary Author Occupation: Professional

Abstract:

The population of American black bears (Ursus americanus) in North America has been growing and expanding in range, recolonizing previously extirpated ranges that have been altered by human activity. Just east of Edmonton, black bear sightings in Elk Island National Park and the Beaver Hills Biosphere region have increased steadily over the past five years. This population is right at the edge of the species' range expansion which has numerous implications for municipal, provincial, and federal agencies. How wildlife coexistence programs are delivered and what will potentially happen to ungulate populations that have existed without predation by bears for over a century are critical considerations. The objectives of this five-year study are to examine the feeding ecology and demographic characteristics of black bears within the Beaver Hills region to understand the potential for population growth and dispersal at the edge of a species' range and use this information to predict the impact black bear predation may have on ungulates inside and outside of core protected areas. To date, 10 black bears have been radio-collared to assess their movement, habitat selection, and feeding ecology. We will use a combination of approaches to determine regional bear diets; including DNA metabarcoding of bear scats collected through systematic transect surveys, isotopic and fatty acid analysis of bear tissues and movement data obtained from radio-collared bears. We will present preliminary analysis of food habits based on scat metabarcoding and bear movements during the 2023 active season.

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

Theme: Human-Bear Conflict & Coexistence

Abstract Number: 314
Presentation Type: Poster Presentation
Presentation Title: Virtual Bear Viewing as a Conservation Tool
Presenter Name: Alysa McCall
Presenter Affiliation: Polar Bears International
Presenter Email: amccall@pbears.org
All Authors: Alysa G. McCall, BJ Kirschhoffer, Candice Rusch, Brian Byrd, Mike Fitz, Geoffrey S. York, Krista Wright, Kieran McIver
Primary Author Occupation: Professional

Abstract:

Education and outreach can be powerful tools in wildlife conservation. Targeted outreach can increase support for conservation actions by impacting attitudes and furthering awareness about environmental issues or species, and may be especially effective when visual elements, like photos or videos, are incorporated.

Polar Bears International (PBI) first deployed live Polar Bear Cams near Churchill, Manitoba in 2007, allowing the public to view the annual polar bear gathering. After an initial success, PBI partnered with Explore.org to operate and grow the impact of these cams. We now virtually reach millions of people around the world each year who tune in to watch polar bears roam the tundra and to learn about the species. PBI also uses the Polar Bear Cam footage to complement educational programming and as a platform to inspire action on climate change.

Explore.org now has over 100 live wildlife cameras deployed around the world, including several at Brooks Falls in Katmai National Park in Alaska, where local brown bears feast during the annual salmon migration. These Brown Bear Cams allow viewers to closely follow individual bears and have led to the viral "Fat Bear Week" which has captured attention and created joy across the globe.

Many people will never get to see bears in the wild but by live-streaming incredible moments and incorporating key messaging into such outreach, we can help people build connections with bears, increase our organizations' impact, broaden conservation support, and turn awe into action.

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

Theme: Human-Bear Conflict & Coexistence

Abstract Number: 315
Presentation Type: Poster Presentation
Presentation Title: Developing Effective Polar Bear Safety Educational Materials in a Changing Climate
Presenter Name: Alysa McCall
Presenter Affiliation: Polar Bears International
Presenter Email: amccall@pbears.org
All Authors: Alysa G. McCall, Geoffrey S. York, Joanna Sulich, Clive Tesar, Joseph M. Northrup, Lyle Walton, Greg W. Thiemann
Primary Author Occupation: Professional

POSTERS

Abstract:

As the world warms and sea ice extent and duration decreases, polar bears are spending more time on land in more regions. Many people who live on or near northern coastlines have some knowledge of how to live with polar bears, but more and more communities are experiencing polar bears for the first time or in increasing numbers. More people from outside the polar bears' range are also coming into contact with them, whether as tourists or as transient workers. If we want polar bears to persist in the wild over the long-term, we have an obligation to help people live more safely with the world's largest land predator.

With various partners, Polar Bears International (PBI) has been supporting multi-pronged coexistence efforts Arctic-wide through deterrence trainings, testing non-lethal and less-lethal tools, providing equipment, and developing materials with input from communities. To date, we have developed a variety of educational materials tailored to different cultures, landscapes, languages, and topics. We illustrate how diverse media products (e.g., colouring books, handouts, video) can be used to communicate and educate residents and visitors on polar bear safety best practices.

We will continue to work with locals, communities, governments, and universities to support the development, printing, and distribution of materials where requested. Polar bear safety language is likely to be refined over time so materials may need to be updated regularly, especially as the polar bear's sea ice habitat continues to shift and decline.

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

Theme: Movement Ecology

Abstract Number: 318
Presentation Type: Poster Presentation
Presentation Title: Analyzing dispersal behavior of juvenile black bears in a recolonizing population in east-central Oklahoma to identify potential barriers to population expansion.
Presenter Name: Jacob Humm
Presenter Affiliation: Oklahoma State University
Presenter Email: hummbag@gmail.com
All Authors: Jacob Humm and W. Sue Fairbanks
Primary Author Occupation: Student

Abstract:

Immigration through dispersal is critical to population structure and recolonization success of small black bear populations. During the transient stage of black bear dispersal, juveniles face increased risk of predation by other species and conspecifics, higher energetic costs of travel, and risk of mortality from human-wildlife interactions. Habitat fragmentation from anthropogenic activities has been shown to limit bear recolonization success in populations across North America by barring dispersal into new areas, limiting gene flow among established populations, and increasing mortality risk among dispersing individuals. Oklahoma's east-central black bear population occupies a patchy, fragmented landscape characterized by disjunct habitat patches surrounded by anthropogenic disturbance. My objectives were to 1.) model juvenile dispersal movements through the landscape, 2.) develop predictive models of dispersal movements, and 3.) use these data to develop resistance models of movement to identify potential barriers to dispersal into habitat patches outside the core of the population.

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

Theme: Habitat Relationships

Abstract Number: 326
Presentation Type: Poster Presentation
Presentation Title: A more complete view: understanding black bear and grizzly bear spatial and temporal niche partitioning in two contrasting Yukon landscapes
Presenter Name: Jodie Pongracz
Presenter Affiliation: Government of Yukon
Presenter Email: jodie.pongracz@yukon.ca
All Authors: Jodie Pongracz, Kai Breithaupt, Patrick Gibeau
Primary Author Occupation: Professional

Abstract:

Grizzly bear (Ursus arctos) and black bear (Ursus americanus) distributions overlap in much of the Yukon Territory, however, little is known regarding how these sympatric species coexist at the northern edge of their ranges. Black bears and grizzly bears have strong diet overlap, and similar life histories. Understanding how these species interact in space and time is essential to understanding how they coexist or potentially influence each other's existence.

We used detections of black bears and grizzly bears at two contrasting remote Yukon landscapes to better understand patterns of use. The Ogilvie Mountains study area contains pristine habitat, encompasses a territorial protected area, and is comprised of large U-shaped valleys and bare mountain ridges shaped by multiple glaciations. In contrast, the Klondike Plateau study area was unglaciated, is centralized on a quartz mine exploration complex, and is comprised of V-shaped valleys and upland areas of smooth topped ridges and boulder fields.

Remote cameras were positioned at scent-lured hair snag stations positioned in a gridded arrangement across the two study areas. Camera traps in the Klondike Plateau (n=150) were active between 18 June and 14 August 2022; those in the Ogilvie Mountains (n=154) were active between 20 June – 19 September 2023. We use photo detections of black bears and grizzly bears to 1) examine the level of spatial overlap and quantify how this relates to habitat variables, and 2) examine the temporal overlap at differing temporal scales (daily and berry season (pre-berry/berry/post-berry)).

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

Theme: Movement Ecology

Abstract Number: 328
Presentation Type: Poster Presentation
Presentation Title: Effectiveness of individual-based activity analysis and hidden markov models at predicating animal activity of a wild Eurasian brown bear
Presenter Name: David Blount
Presenter Affiliation: University of Utah
Presenter Email: David.Blount@utah.edu
All Authors: David Blount, Ryan Fregmen, Mark Chynoweth, Josip Kusak, Cagan Sekercioglu
Primary Author Occupation: Student

Abstract:

As GPS collars grow in popularity and decrease in price, many research

programs have incorporated these tools to understand temporal trends of their study animal. Specifically, activity patterns have been used to understand how animals persist on landscapes, what threats they face, and how they may avoid these threats by changing their temporal patterns. Changes in activity patterns can have drastic consequences, with animals navigating a matrix of risk and reward through time, affecting fitness, mortality risk, and risk of starvation. However, many of the analysis used to understand activity have only been tested in simulations or in captive populations. In this study we use a GPS collar with a camera to compare binomial activity estimates and activity states estimated with hidden Markov models to observational camera data from a wild Eurasian brown bear. We hope to show how well each of these activity analysis predict actual activity in the wild.

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

Theme: Captive Bears, Zoos, and Physiology

Abstract Number: 339
Presentation Type: Poster Presentation
Presentation Title: Transcriptome changes of peripheral blood related to delayed implantation in brown bears and polar bears
Presenter Name: Asuka Nishijima
Presenter Affiliation: Hokkaido University
Presenter Email: asukaram.academic@gmail.com
All Authors: Asuka Nishijima, Yojiro Yanagawa, Naoya Matsumoto, Kyogo Hagino, Hideyuki Sakamoto, Youichi Irie, Chihiro Sochi, Kanako Ushio, Hiroko Tanaka, Takashi Hayakawa
Primary Author Occupation: Student

Abstract:

Mating and giving birth in a suitable condition is essential for mammals, those living in seasonal areas. Embryonic diapause, which is known as delayed implantation in mammals, is a reversible embryo dormancy before implantation. This interesting phenomenon allows mammals to regulate the timing of mating and parturition. Ursids are one of the few families in which all species are most likely to have delayed implantation. Ursids also have other unique reproduction characteristics, such as pseudopregnancy, denning, and giving birth to unmatured cubs. However, those unique reproduction characteristics make it difficult to detect their pregnancy status. Our previous study showed that pregnant female brown bears' peripheral blood transcriptome was changed between estrus and delayed implantation period. In this study, we collected peripheral blood from five individual male brown bears and three individual pseudo-pregnant female brown bears in different periods. These bears' peripheral blood transcriptomes were compared with pregnant brown bears to identify pregnant female-specific transcriptome changes. Pregnant brown bears' peripheral blood transcriptome changes were also compared with pregnant polar bears to verify those changes were common in other bear species. Pregnant female-specific transcriptome changes related to delayed implantation could be used as markers for an early pregnancy test in bears. Pregnancy test in bears could improve their reproduction success in captives and contribute to ex-situ conservation.

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

Theme: Habitat Relationships

Abstract Number: 993
Presentation Type: Poster Presentation
Presentation Title: Assessing the risk of climate maladaptation for Canadian polar bears
Presenter Name: Ruth Rivkin
Presenter Affiliation: Polar Bears International and San Diego Zoo Wildlife Alliance
Presenter Email: Ruth.Rivkin@umanitoba.ca
All Authors: Ruth Rivkin, Evan Richardson, Colin Garroway
Primary Author Occupation: Professional

Abstract:

The Arctic is warming four times faster than the rest of the world, threatening the persistence of many Arctic species. It is uncertain if Arctic wildlife will have sufficient time to adapt to such rapidly warming environments. We used genetic forecasting to measure the risk of maladaptation to warming temperatures and sea ice loss in polar bears (Ursus maritimus) sampled across the Canadian Arctic. We found evidence for local adaptation to sea ice conditions and temperature. Forecasting of genome-environment mismatches for predicted climate scenarios suggested that polar bears in the Canadian high Arctic had the greatest risk of becoming maladapted to climate warming. While Canadian high Arctic bears may be the most likely to become maladapted, all polar bears face potentially negative outcomes to climate change. Given the importance of the sea ice habitat to polar bears, we expect that maladaptation to future warming is already widespread across Canada.

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

Theme: Employing IUCN's Species Conservation Cycle for Bears: Examples from Around the World

Abstract Number: 994
Presentation Type: Poster Presentation
Presentation Title: Mapping Asian Bears — a Novel Approach for Large-scale Species Range Mapping to Inform Conservation
Presenter Name: Chengcheng Zhang
Presenter Affiliation: Conservation Ecology Center, Smithsonian's National Zoo and Conservation Biology Institute; Sapienza University, Rome, Italy
Presenter Email: ZhangC@si.edu
All Authors: Chengcheng Zhang, William McShea, David Garshelis, Dana Morin, Nina Santostasi
Primary Author Occupation: Student

Abstract:

Mapping geographic ranges is an essential step in assessing species' status and threats. The first modern range maps for Asian bears were published by the Bear Specialist Group (BSG) in a Conservation Action Plan in 1999, and updated at a BSG workshop in 2006. These maps were created using an ad hoc process, melding scattered reports with "expert opinion" of BSG members, and were published online with Red List accounts of each species. In 2016–2017, the BSG updated these Red List maps, incorporating new information, and in some cases, computer modelling. Lacking metadata and involving a mixture of processes, it has

been difficult to assess the reliability of these maps.We designed a new mapping approach, which, during 2024–2027, will be used to revise the range maps for Asiatic black bears, sloth bears, sun bears, and brown bears in Asia. We will involve BSG members as well as other individuals with local knowledge of bear presence (or absence) in portions of each of the 33 bear range countries in Asia. This is not a crowdsourcing effort, but rather targeted participation of people with familiarity of bear presence. Contributors will draw polygons on a computer app, and may also submit "hard data" in the form of presence points (e.g., camera trapping records). Each presence/absence polygon and all presence points will be associated with metadata (who, when, how detected). This novel method recognizes that people who spend significant time in an area often are aware of bears even if they are not detected in formal surveys. Using this information helps ameliorate deficiencies in hard data (e.g., clumped in selected habitats, targeted at other species), which can cause computer models to produce misleading results (e.g., inclusion of good habitats where bears have been extirpated; exclusion of marginal habitats where bears are known to persist). The process will be fully transparent, yielding a revisable map, which can serve as a valuable tool for assessing conservation status (e.g., identifying small isolated populations or important corridors), and monitoring expansion or shrinkage of range. This project involves the "Assess" component of the Species Conservation Cycle using large-scale "Networking", and eventually "Communicating" the results widely, so they can be put to use.

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

Theme: Employing IUCN's Species Conservation Cycle for Bears: Examples from Around the World

Abstract Number: 995
Presentation Type: Poster Presentation
Presentation Title: Assessing Changes in Distribution of Formosan Black Bears over the Past Decade
Presenter Name: Mei-Hsiu Hwang
Presenter Affiliation: Institute of Wildlife Conservation, National Pingtung University of Science & Technology; Taiwan Black Bear Conservation Association; IUCN SSC Bear Specialist Group
Presenter Email: hwangmh@mail.npust.edu.tw
All Authors: Mei-Hsiu Hwang, He-Jie Shu, Fan-Yi Chan, Chin-Hao Chang, Chia-Chi Wang
Primary Author Occupation: Professional

Abstract:

Spatial distribution is a key element in assessing the status of wild populations of threatened species, and can be used to identify priority conservation areas, areas of fragmentation, and areas of expansion or contraction. We employed the "Assess" component of the Species Conservation Cycle to evaluate changes in distribution of the endemic, endangered Formosan black bear (Ursus thibetanus formosanus) on the island of Taiwan. We aimed to compare a distribution map for 2000–2010 to an updated map based on data collected during 2011–2023. Since 2011, we collected 1,838 bear presence records (ranging from 202–3,524 m in elevation), covering 706 1×1 km2 bear grids; 88% were located in natural forest areas, and 58% were within the protected area system of the Central Mountain Range Conservation Corridor. Bear presence data collected from camera traps (37%), sign (27%), and sighting reports (15%) reports showed consistent, widely-distributed patterns; whereas GPS telemetry data (19%) and bear rescue reports (2%) were limited to some specific areas. We used MaxEnt modeling, using natural and anthropological variables, to develop the distribution map. The model predicted a bear range encompassing one-third of the Taiwan area, mainly in the Central Mountain Range. Distance to protected areas, elevation, and distance to roads were the three most important factors predicting bear occurrence. Compared to the bear range during 2000–2010, recent data seemed to indicate a slight expansion, but regional differences were observed. We detected no recent bear presence or predicted distribution in the Coastal Mountain Range. Bear rescuing reports (public reports of bears caught in snares near villages) occurred mainly in lower elevations in a limited area, which may have caused the model to overestimate the range. Likewise, reports of illegal hunting (a main threat to the population) occurred mainly near villages, and may have had a similar effect on model predictions. We discuss relevant conservation and population monitoring strategies stemming from these results.

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

Theme: Employing IUCN's Species Conservation Cycle for Bears: Examples from Around the World

Abstract Number: 996
Presentation Type: Poster Presentation
Presentation Title: Collecting Scientific Knowledge to Initiate Strategies for the Long-term Conservation of Sloth Bears in Sri Lanka
Presenter Name: Chandima Fernando
Presenter Affiliation: Sri Lanka Wildlife Conservation Society (SLWCS); IUCN SSC Bear Specialist Group
Presenter Email: chandimaf@slwcs.org
All Authors: Chandima Fernando and Ravi Corea
Primary Author Occupation: Student

Abstract:

In Sri Lanka, there is a dearth of empirical knowledge of the ecology of sloth bears and their conservation status. Whereas some previous research has been conducted by Shyamala Ratnayaka in Wasgamuwa National Park, no conservation work has ever been planned or carried out to specifically address the conservation needs of this species in Sri Lanka. After the recent economic crisis, the Sri Lankan government decided to release more state forests for agriculture in the dry zone, threatening sloth bear habitats. Prompted by this, the Sri Lanka Wildlife Conservation Society initiated research aimed at better understanding some potentially growing conservation issues for sloth bears. The project involves the "Assess" component of the Species Conservation Cycle, leading to eventual planning for conservation actions. Our long-term study has multiple objectives that we are pursuing simultaneously: 1) assess specific resource needs and threats to sloth bears spatially and temporally, 2) assess human–bear interactions, and 3) prepare the first conservation action plan to conserve sloth bears in the Central Province of Sri Lanka. The main research techniques that we have been using to collect our scientific data are radiotelemetry, remote camera trapping, habitat surveys, and community surveys. Our initial results from camera traps revealed that some sloth bears reside in small, isolated forest patches close to human habitations and use them as stepping stones. Also, due to high hunting pressure in these forest patches, bears are threatened by snares, trap guns, and jaw bombs. Our studies reveal that bear attacks on humans are rare and only occur during the wild fruiting season when villagers go into the forest to collect wild fruits. Local people do not have a positive

attitude towards sloth bears: they consider bears harmful and dangerous animals. Our new GPS collar data indicated that sloth bears preferred mature forests and had a clear partitioning in their feeding habits, switching from a frugivorous diet in the dry season to an insectivorous diet in the wet season. With these findings and further research, we aim to initiate site-specific sloth bear conservation programs in collaboration with communities and government stakeholders.

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

Theme: Employing IUCN's Species Conservation Cycle for Bears: Examples from Around the World

Abstract Number: 997
Presentation Type: Poster Presentation
Presentation Title: Steps Toward Conserving Asiatic Black Bears at the Westernmost Extent of their Range: Preparing an Action Plan for Conflict Management in Kerman Province, Iran
Presenter Name: Nahid Ahmadi

Presenter Affiliation: Borderless Wildlife Conservation Society, Iran; IUCN SSC Bear Specialist Group
Presenter Email: nahid.ahf@gmail.com
All Authors: Nahid Ahmadi, Ali T. Qashqaei , Pouria Ghelich Khani, Hamid Reza Heidari
Primary Author Occupation: Student

Abstract:

Human–bear conflicts are a serious obstacle for the conservation of Asiatic black bears. Iran is the westernmost range of this species, and conflicts are a major threat to both bears and people. Asiatic black bears exist in 3 southern provinces of Iran, of which Kerman Province has better habitat (food, water, and cover) than Baluchistan or Hormozgan. With mounting human pressures on habitat, we aimed to create a conservation action plan that will help to reduce conflicts in Kerman Province. We collected data on conflicts between bears and people across Kerman Province that occurred during 1961–2019, using 2 data sources: (1) a questionnaire survey (2019–2020) of local gardeners, beekeepers, shepherds and livestock-owners; and (2) official reports registered with various governmental organizations, along with interviews of government managers and rangers. We could not verify or quantify the conflicts, but often local people showed proof that they were attributable to bears. We mapped the occurrence of bear attacks on humans, damage to orchards, damage to beehives, depredation of livestock, and killing of bears. We also reviewed international articles and reports for lessons learned about bear conflict mitigation elsewhere, and considered these with respect to the main stakeholder conflicts in Kerman. We created a plan for short-term, mid-term, and long-term activities in 3 arenas: participatory conflict management; education; and research. The plan includes detailed flow charts, showing priority activities tailored to specific types of conflicts, spatially matched to where they are most prevalent. The plan has been reviewed and accepted by the Department of Environment of Kerman Province.

This work so far has focused on the "Assess", "Plan" and "Networking" components of the Species Conservation Cycle, as we prepare to launch into the "Act" phase. Of particular interest, the data collected so far revealed conflicts in some areas with no previous historical records of bear presence. We will investigate these areas to verify the authenticity of these new accounts and to understand what is occurring.

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

Theme: Employing IUCN's Species Conservation Cycle for Bears: Examples from Around the World

Abstract Number: 998
Presentation Type: Poster Presentation
Presentation Title: Conservation Implications of the Reintroduction of Two Confiscated Himalayan Brown Bears in Pakistan
Presenter Name: Fakhar-i-Abbas

Presenter Affiliation: IUCN SSC Bear Specialist Group
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Primary Author Occupation: Professional

Abstract:

Some cultural practices, such as dancing bears in India and bear-baiting in Pakistan, typically using wild-caught bears, have contributed to population declines. Successful conservation programs have focused on eliminating the acceptability of these practices, targeting non-compliant individuals, and confiscating captive bears. In such a program in Pakistan, some confiscated bear cubs (both Asiatic black bears and brown bears) were deemed potentially suitable for release. This project involved the "Act" component of the Species Conservation Cycle, with repatriation of young rescued bears intended to improve conservation status by (1) motivating more confiscations, and (2) helping restore some depleted wild populations. During this program, aimed at ending bear baiting in Pakistan, two confiscated female Himalayan brown bear cubs (rescued at ~2 months old) were considered suitable for reintroduction. They were kept for 2 years, following a low-human contact protocol to prepare for a hard-release. In 2017, at the age of 26 months, the two females were released in Khunjerab National Park, a remote area bordering China, with considerable media attention. The selection of a release site was based on GIS-modeled habitat availability at a location between known brown bear populations, but with no resident bears. The released bears were tracked by resightings made possible by the open habitat in the region, and by identifiable physical markings (unlike previous releases of Asiatic black bears, which were harder to see and identify). After their initial release in the Uxcel valley at an elevation of 4500 m, they moved 20 – 70 km each year to different valleys, but generally favored ~4700 m elevation. Over 7 years of monitoring, they ultimately settled in a valley surrounded by snow-covered mountains and glaciers, but still with no other brown bears. Visible weight gain over these years indicated sustained health. The bears' experimental movements in diverse terrain emphasizes their resilience and adaptability, as well as the importance of selecting sites with room to roam. The project appears successful at this stage, but true success will be determined over time as we wait to see if the females eventually reproduce.

POSTERS

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

Theme: Human-Bear Conflict & Coexistence

Abstract Number: 999
Presentation Type: Poster Presentation
Presentation Title: Unravelling Intersecting Paths: Conflict, Livelihood, and Coexistence with Asiatic Black Bear in Diamer, Gilgit-Baltistan, Pakistan
Presenter Name: Zeeshan Khalid
Presenter Affiliation: World Wide Fund for Nature-Pakistan (WWF-Pakistan)
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All Authors: Zeeshan Khalida, Tehlu Singh Toorb and Muhammad Jamshed Iqbal Chaudhrya
Primary Author Occupation: Professional

Abstract:

Gilgit Baltistan (GB) is renowned for its biological and cultural diversity and covers an important part of the Asiatic black bear (Ursus thibetanus) habitat in Pakistan. Human–black bear conflict is an emerging issue in District Diamer, Western Himalaya, GB and the declining population status has become vulnerable. This study investigated the extent of human-bear conflict in district Diamer, GB (2021-2023) using semi-structured interviews and focus group discussions (FGDs). Three primary conflict types were identified: crop damage (most frequent - 80%), livestock depredation, and human injuries and the total estimated economic loss was US$16,000. Crop damage peaked in summer (June-September) during peak bear activity and crop production. We documented 12 human injuries (May-November), with a majority (55%) occurring at dusk and in crop fields (60%) during summer (40%). Livestock depredation (10 cases) was less frequent and occurred mainly in winter. Negative attitudes towards bears prevailed (65% actively disliked, 62.5% generally negative), especially among those residing near bear habitat. Anthropogenic activities (hunting, deforestation, infrastructure expansion, agricultural land conversion) were identified as primary conflict drivers. Participants expressed dissatisfaction with current conflict mitigation policies and the lack of government compensation schemes. Future research on population status, bear movement, and habitat use is crucial for developing effective conservation strategies. Considering the significant role of the Asiatic black bear in the GB region & ecosystem, we argue that more emphasis should be given to the protection of prioritized bear populations.

What is a Land Acknowledgement?

A Land Acknowledgement is a formal statement recognizing and respecting the enduring relationship that exists between Indigenous Peoples and their traditional territories and honouring the Indigenous People who have lived and worked on this land presently and historically.
To acknowledge traditional territories is to recognize its long history that reaches beyond European colonization and the establishment of colonies, as well as its significance to the Indigenous peoples who lived and continue to live there, and whose spiritual practices were tied to the land and continue to develop in relationship to the land and its other inhabitants today.

A Land Acknowledgement of the 28th International Conference on Bear Research and Management

It is the spirit of Reconciliation that we respectfully acknowledge that we are gathered on the traditional lands and territories of the Indigenous peoples. What became known as the Province of Alberta in 1905, is also the traditional and ancestral home to many Indigenous Peoples and for that we are honoured to have shared this land with them.
We are grateful for the traditional Knowledge Keepers and Elders who are still with us today and those who have gone before us. It is in the spirit of respect, reciprocity and truth, and the tradition for Indigenous and non-Indigenous to gather and exchange knowledge that we honor the land we are meeting on today.
We ask you to recognize the ongoing connections that indigenous peoples have to the land and the importance of cultural heritage to the wildlife species that we all reside with.
In keeping with the tradition of gathering, this conference provides an opportunity for us to gather to exchange knowledge on fascinating science about the 8 bear species of the world in an open learning and sharing environment. The hope is that through our dialogue we are all able to improve our awareness and understanding and put this knowledge into practice. wherever bears occur around the world.

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