

03.14.22

03.18.22

wildlife

20 WITHOUT BORDERS 22

ACTWS ANNUAL CONFERENCE

VIRTUALLY -

TO YOU WHEREVER YOU MAY ROAM



ALBERTA CHAPTER OF
THE WILDLIFE SOCIETY

BREAKING DOWN BARRIERS
MOVING WILDLIFE SCIENCE FORWARD
CELEBRATING COLLABORATION

CONFERENCE PROGRAM

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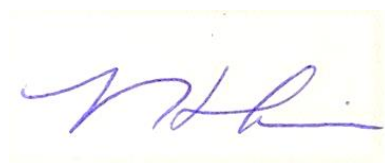


All photos in this program are entries in the 2022 Larry Comin Photo Contest. Thank you to all entrants.

PRESIDENT'S MESSAGE

Welcome to the 2022 Alberta Chapter of The Wildlife Society's 2nd Virtual Conference! The conference theme, "Wildlife Without Borders" arrives at a time that highlights the need for both humans and wildlife to function as global populations, not managed or bound by political borders. Our conference committee has worked hard to line up exciting events and speakers that share examples of how we can better conserve wildlife and their habitats through collaborative efforts, crossing various jurisdictions and disciplines. Many thanks to our conference committee and volunteers for organizing another creative and engaging virtual conference. Soak in all the presentations, posters, and panel discussions. Have some fun and test your knowledge at our Wildlife Jeopardy event. If you are a student, get your questions ready for the pros. Finally, take advantage of another year attending the conference from the comforts of your couch, or wherever you decide to plug in. We look forward to seeing you online and hope you shine up those dancing shoes for 2023.

Nikki Heim,



ACTWS President



CONFERENCE AT A GLANCE

All times in MST

Monday March 14	12pm – 1pm	All pre-recorded talks available for viewing Education and Outreach Committee meeting Online auction opens	FREE REGISTRATION
Tuesday March 15	1145am – 115pm 4pm – 5pm	Equity, Diversity and Inclusion Committee meeting Student and Pros Happy Hour	
Wednesday March 16	1145am – 115pm 7pm – 8pm	Conservation Affairs Committee Meeting Wildlife Jeopardy	
Thursday March 17	430pm – 630pm 730pm – 9pm	Annual General Meeting and Awards Ceremony Live Auction and Public Talk - Wolverines: The Myth, The Legend, The Science	
Friday March 18	830am – 845am 845am – 915am 930am – 2pm 215pm – 430pm 430pm – 500pm 530pm	Conference opening Keynote: Naomi Owen-Beek (Salteau First Nations) Concurrent sessions Panel discussions Closing comments and student presentation awards Online auction closes	



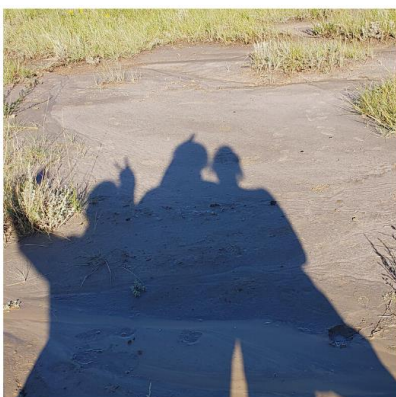
Photo: Ross Stevenson



ALBERTA CHAPTER OF
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Conference 2021 | *Wildlife Without Borders*

COMMITTEE MEETINGS



Education and Outreach
March 14 | 12-1pm MST



**Equity, Diversity,
Inclusion**
March 15 | 11:45am-1:15pm MST



Conservation Affairs
March 16 | 11:45am-1:15pm MST

ACTWS Committee Meetings

THE ACTION BEHIND THE SCENES

Our volunteer committees are essential to the functioning of the ACTWS as they implement various projects throughout the province that help advance our mission. Each committee meeting will share work conducted in 2021 and plans for 2022. This is a great opportunity for members and supporters of the ACTWS to share their perspectives and learn more about these committees. New members are always welcome.


The Equity, Diversity, and Inclusion Committee is excited to welcome Kyle Shanebeck from the University of Alberta as a guest speaker during the committee meeting.

"Surviving the leaky pipeline" – Kyle Shanebeck

2SLGBTQ+ people are underrepresented in STEM fields, which has been blamed on the "leaky pipeline", a series of inequalities that prevent us from getting into academia (before we even apply for a job). I will talk about my professional journey to a PhD, and the points at which I should have been ejected from the process in order to highlight, through anecdote, how many queer people are being left out.

**GUEST
SPEAKER:
KYLE
SHANEBECK**

Surviving the "leaky
pipeline"




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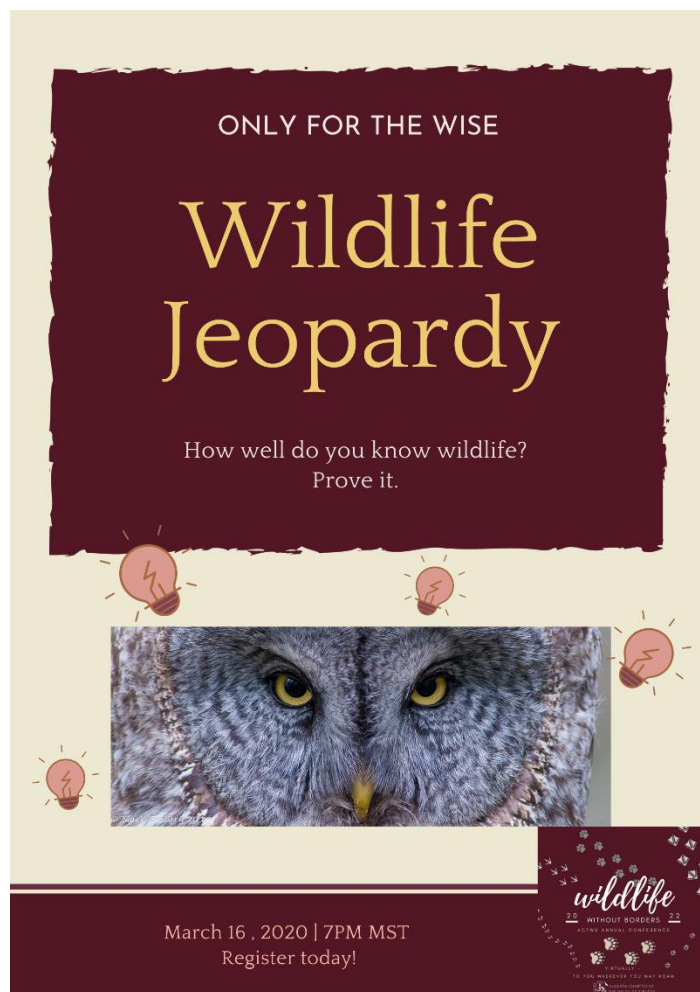
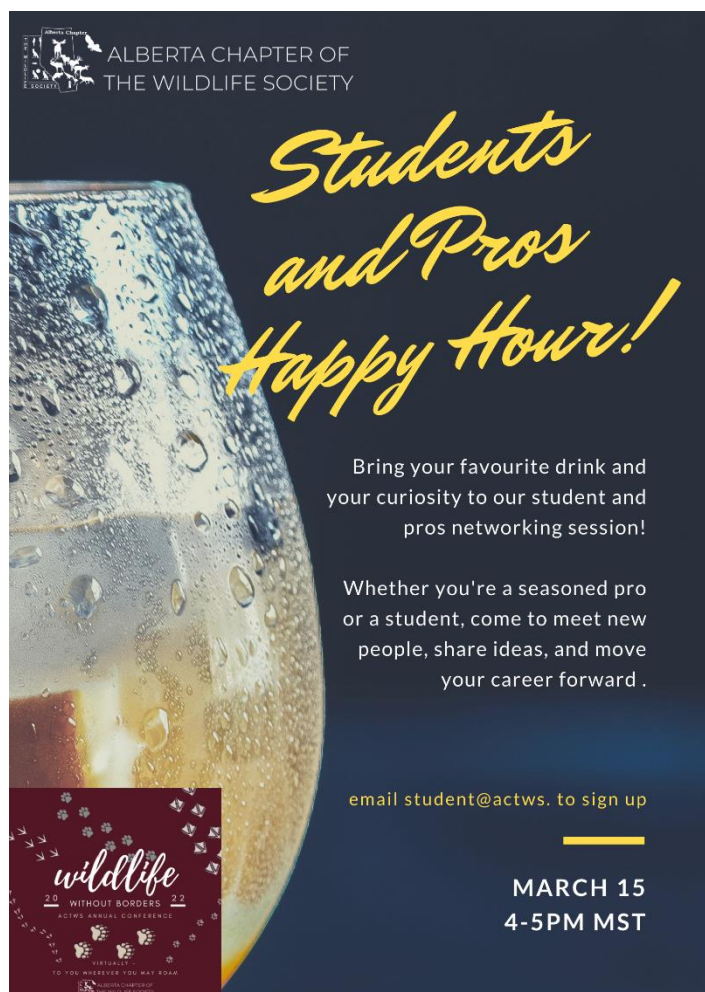
Conference 2021 | *Wildlife Without Borders*

EVENTS

Don't miss our networking events designed to bring deeper engagement and fun to this year's virtual conference. Register at www.actws.ca/conference

Student and Pros Happy Hour - March 15, 2022 | 4-5pm MST

Wildlife Jeopardy - March 16, 2022 | 7-8pm MST



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Conference 2021 | *Wildlife Without Borders*

ANNUAL GENERAL MEETING AND AWARDS CEREMONY

Thursday March 17, 2022 | 4:30pm – 6:30pm MST

The Annual General Meeting (AGM) shares ACTWS operations, successes, and challenges throughout 2021 and discusses the year ahead. Everyone is welcome, but only members can vote on matters of ACTWS business (e.g., moving motions).

After the AGM, we will be presenting our annual student and professional awards. There are four professional awards presented to ACTWS supporters whose contributions to wildlife and habitat conservation in Alberta are exemplary. We will also be awarding three scholarships to students who demonstrate commitment to their early wildlife career.

There is no need to register for this meeting. A link is posted on our website: www.actws.ca/events



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LIVE AUCTION AND PUBLIC TALK: WOLVERINES: THE MYTH, THE LEGEND, THE SCIENCE

Thursday March 17, 2022 | 7:30pm – 9:00pm MST

Dr. Jason T. Fisher, University of Victoria

Wolverines ignite imaginations. Fierce and resilient, they suffer no wildlife fools, face challenges undaunted. That is the legend: reality is more...realistic. Wolverines are indeed fierce, but definitely not resilient to the onslaught of changes humans continue to bring into their wilderness homes. The challenges they face are many, and certainly daunting: overtrapping, predator control, habitat loss, climate change, and newcomers to their mountain homes.

What do we really know about wolverines, though? Quite a bit. Recent leaps in wildlife technology have yielded many new insights. A team of wolverine biologists synthesized research from the last two decades and asked: What are the known drivers of wolverine populations? How can this knowledge inform wolverine conservation? We scoured the globe for wolverine research, from North America to Scandinavia, Russia to China. From over 150 works we peered into the lives of wolverines. We found these mysterious creatures are not so mysterious. From this lofty, global view – standing on the shoulders of wolverine giants – we can see clearly what challenges wolverines face, and how wildlife management and conservation can help them overcome these troubles. Wolverine conservation is no myth, if we use the best science to guide intelligent and difficult decisions.



Dr. Jason T Fisher is a wildlife ecologist specializing in the effects of landscape and climate change on mammal populations. He heads the Applied Conservation Macro Ecology (ACME) lab at UVIC; he was formerly Senior Research Scientist with Alberta Research Council and Big Game Wildlife Biologist with Newfoundland & Labrador's Wildlife Division. Jason has been researching wolverines since 2003, admittedly with mixed success at first, made better since he started working with other wolverine

researchers across North America. Jason and his teammates have published 54 papers in scientific journals on topics ranging from marine fishes to grizzly bears, and have been featured on TV, radio, news media, and textbooks, but no movies as of yet.

Don't be late because before Jason's amazing talk, we're welcoming **Matt Besko to live auction** a few items selected to make you laugh, have fun, and open your wallets!

Register at our website: www.actws.ca/events



ALBERTA CHAPTER OF
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CONFERENCE OPENING AND KEYNOTE

Friday March 17, 2022 | 8:30am – 9:15 am MST

Presenters: Sarah Elmeligi, John Paczowski

Opening Prayer: Myrna Yellowbird, Samson Cree First Nation

Keynote Speaker: Naomi Owen-Beek, Salteau First Nation

The Creation of the Klinse Za Maternal Pen

Caribou maternity pens have been discussed in several jurisdictions as a potential tool for caribou recovery. Naomi will discuss the Caribou Recovery Plan developed by Dr. Scott McNay, the Saulteau First Nations, and West Moberly First Nations Elders. Their goal for a stable population of 1000 caribou is a laudable one and their recovery plan contains objectives around predator management, habitat restoration, and a caribou maternal pen. Naomi will discuss the first maternal pen from planning to construction. Her presentation will discuss community involvement in the capturing and collaring of caribou, as well as the long-term monitoring and the development of a caribou guardians program.

Naomi Owens-Beek comes from the community of Moberly Lake, BC, she is a proud Cree, Dunne-Za and Canadian woman from the Saulteau First Nations (SFN) and is the honored mother of Spencer Ron Beek. She graduated from the Nicola Valley Institute of Technology and received a diploma in Natural Resources 1999. She then completed her Bachelor of Science from the University of Victoria, majoring in Biology 2008 and registered to the College of Applied Biology 2009 and is now a Registered Professional Biologist as of 2019. Naomi is currently the Treaty Rights and Environmental Protection (TREP) Manager for the Saulteau First Nations, she sits on the Board of Directors for the Twin Sisters Native Plant Nursery, a Society Director for the Nikanese Wahtzee Stewardship Society, a Board Member for the Fish and Wildlife Compensation Program, sits on the Regional Strategic Environmental Assessment Project Team, a part of BC's First Nations Wildlife Forum and subset to this is the Ministers Wildlife Advisory Council-research team and participates on SFN's Indigenous Guardian Committee.

Naomi's long-term goal is to make connections between biology's western science and First Nations values of the landscape. She holds high regard for the rights and Spirit and Intent of the Treaty 8 Nations.



CONCURRENT SESSION 1

March 18 | 9:30 am – 10:30 am

The Birds and The Bears

Full abstracts are available in Appendix 1A.

Glen Hvenegaard, University of Alberta

Title: How do nest box characteristics and landlord stewardship activities affect purple martin nest box occupancy?

Glen Hvenegaard, University of Alberta

Title: Age and sex influence natal and breeding dispersal of purple martins.

Camille Jodouin, University of Alberta

Title: Variation in movement and space use of Western Hudson Bay Polar Bears In Relation to Sex, Reproductive Status and Age Class.

Alyssa Bohart, Government of Alberta

Title: Grizzly bear (*Ursus arctos*) den site selection in a high use recreation area in Kananaskis Country, Alberta.

Landscape Disturbances

Full abstracts are available in Appendix 1B.

Lionel Leston, University of Alberta

Title: Comparing alternative methods of modelling cumulative effects of oil and gas footprint on boreal bird abundances.

Joshua Killeen, FORCORP Solutions

Title: Alternative Silvicultural Systems & Harvesting Techniques for Caribou Habitat.

Dylan Brassard, University of Lethbridge

Title: The effects of a severe, stand-replacing wildfire on black bear activity in a protected area in southwest Alberta.

Jason Fisher, University of Victoria

Title: Syntopic species synergistically affect large boreal mammals response to anthropogenic landscape change.

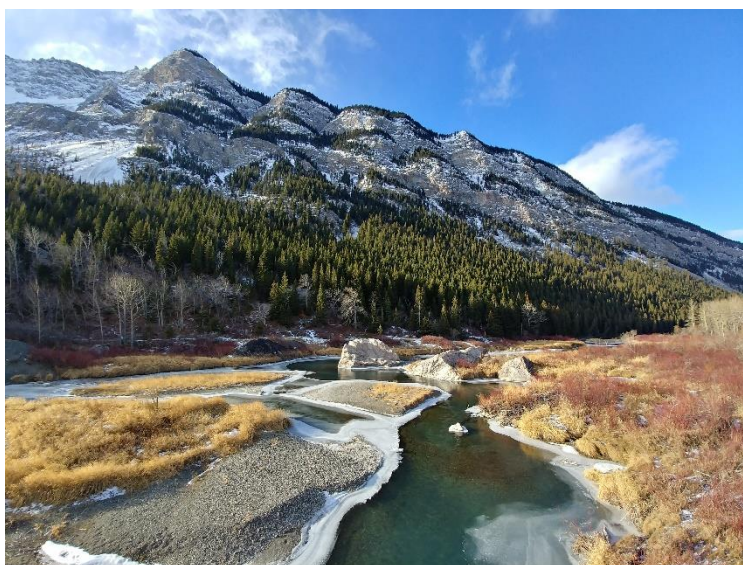


Photo: Layton McAndrew

CONCURRENT SESSION 2

March 18 | 10:45 am – 12:00 pm

Methods in Wildlife Research and Monitoring

Full abstracts are available in Appendix 2A.

Talia Vilalta, Yellowstone to Yukon Conservation Initiative

Title: Multiple spatial data sources improve mapping of recreation trails in western Alberta.

Sydney Toni, Alberta Biodiversity Monitoring Institute

Title: All together now: creating remote camera best practices and tools for Alberta.

Cassandra Stevenson, University of Alberta

Title: Using remote camera traps and small mammal track tube arrays to test ecological indices used in urban planning.

Joseph Litke, Fiera Biological Consulting

Title: Wildlife Track Identification: raising the bar in Alberta.

Ungulates and Speed Talks

Full abstracts are available in Appendix 2B.

Traditional Talks

Madeline Trottier, University of Alberta

Title: Disparity in elk (*Cervus canadensis*) vigilance behaviour following different migratory tactics on a sympatric winter range.

Phil Walker, University of Alberta

Title: Woodland caribou calving fidelity: Is it the spatial location, habitat, or both?



Photo: Everett Hanna

Speed Talks

Sarah Elmeligi and Edna Stobschinski, The Alberta Chapter and Lethbridge Student Chapter of The Wildlife Society

Title: Understanding equity, diversity, and inclusion in two Alberta Chapters of The Wildlife Society.

Annie Pumphrey, University of Northern British Columbia

Title: Roadside Bear Viewing in Kananaskis Country: Perceptions and Approaches to Mitigating Risk.

Shelagh Pyper, Fuse Consulting Ltd.

Title: Canadian Conservation and Land Management Knowledge Portal: Growing Through Collaboration.

Ellen Smith, University of Alberta

Title: Habitat selection by Columbian ground squirrels.

Anne Hubbs, Lethbridge College

Title: Managing disease risk for bighorn sheep.

Camille Roberge, Thompson Rivers University

Title: Does logging reduce the nutritional quality of moose forage?

Ashlyn Herron, Lethbridge College

Title: Determining if grassland restoration is effective at reducing edge effects on grassland birds.



Photo: Michael Schumacher

CONCURRENT SESSION 3

March 18 | 1:00 pm – 2:00 pm

Creatures of the Night

[Full abstracts are available in Appendix C1.](#)

Carrie Ann Adams, University of Alberta

Title: Is artificial light at night a boon or a burden for Common Nighthawks (*Chordeiles minor*)?

Camila Hurtado, University of Alberta

Title: Effects of Latitude on Bat Foraging Behaviour and Nightly Activity Patterns in Western Canada.

Emma Micalizzi, University of Calgary

Title: The importance of building roosts versus natural roosts to Little Brown Bats in the Canadian Rocky Mountains.

Grasslands

[Full abstracts are available in Appendix C2.](#)

Geoff Holroyd, Beaverhill Bird Observatory

Title: Conservation Needs of Burrowing Owls in Prairie Canada.

Geoff Holroyd, Beaverhill Bird Observatory

Title: Foraging habitats, annual movements and status of Alberta Prairie Falcons.

Jordan Vos, Lethbridge College

Title: Effects of cattle grazing on amphibian presence and habitat.

Allyson Carroll, Lethbridge College

Title: Grazing management impacts on grassland songbird habitat and diversity.

Wildlife Disease

[Full abstracts are available in Appendix C3.](#)

Anne Hubbs, Alberta Environment and Parks

Title: Harvest Management and Chronic Wasting Disease Prevalence Trends in Western Mule Deer Herds.

Kyle Shanebeck, University of Alberta

Title: Parasitic infections an energetic burden in river otter and mink in Western Canada.

Maria Dobbin, University of Alberta

Title: Risky Business: Relating Contact Locations with Risk of Chronic Wasting Disease.

Laurens Put, University of Alberta

Title: Chronic wasting disease in white-tailed deer in Alberta: Does genotype play a role in spatial risk?



PANEL DISCUSSION – HUMAN WILDLIFE CONFLICTS

March 18 | 2:15 pm – 3:15 pm

Talks associated with these discussions will be uploaded to the conference platform on Monday, March 14. Please view the talks prior to attending the panel discussion.

[Full abstracts are available in Appendix D.](#)

Brianna Lorentz, University of Alberta

Title: Efficacy of translocation as a management tool for Columbian ground squirrels in Jasper National Park.

Sage Raymond, University of Alberta

Title: Urban-Adapted Coyotes Select Cryptic Den Sites Near Human Development.

Claire Edwards, University of Alberta

Title: Aversive conditioning of grizzly bears in Kananaskis Country, Alberta, Canada.

Gabrielle Lajeunesse, University of Alberta

Title: Preliminary Results from a Community-Based Aversive Conditioning Program of Urban Coyotes (*Canis latrans*) in Edmonton.

Andrea Morehouse, Waterton Biosphere Reserve/ Winisk Research and Consulting

Title: Dealing With Deadstock: A Case Study of Carnivore Conflict Mitigation From Southwestern Alberta.



Photo: Nicholas Carbol

PANEL DISCUSSION – SOCIAL SCIENCE RESEARCH AND CONSIDERATIONS IN WILDLIFE MANAGEMENT

March 18 | 3:30 pm – 4:30 pm

Talks associated with these discussions will be uploaded to the conference platform on Monday, March 14. Please view the talks prior to attending the panel discussion.

[Full abstracts are available in Appendix E.](#)

Brian Joubert, Alberta Environment and Parks

Title: Hunters' and non-hunters' wildlife value orientations – Cooking Lake Blackfoot PRA visitors.

Howard Harshaw, University of Alberta

Title: Understanding and characterizing the potential for conflict between hunters and non-hunters in the Cooking Lake-Blackfoot PRA.

Annie Loosen, University of Northern British Columbia/ Yellowstone to Yukon Conservation Initiative

Title: Who, what, when, where: Evaluating recreational use from multiple data sources in western Alberta.

Matthew Pyper

Title: Conservation Success Stories - What makes them tick?



Photo: Layton McAndrew

CONFERENCE COMMITTEES – THANK YOU!

Conference Chair: John Paczkowski

General Planning Committee: John Paczkowski, Glynnis Hood, Sarah Elmeligi, Alyssa Bohart, Alex Beatty, Erin Miller, Robin Gutsell, Fauve Blanchard

Student Event: Phil Walker

EDI Meeting: Jenny Foca, Ashley Shaw

Professional Awards: Samantha Morris-Yasinski, Margo Pybus, Everett Hanna, Lee Foote

Student Presentation Awards: Alyssa Bohart, Alex Beatty, Lottie Lewis, Tina Watters, Lionel Leston, Corey Scobie, Annie Loosen, Glen Hvenegaard, Anne Hubbs, Nikki Heim, Talia Vilalta, Rachael Firminge,

Student Awards and Grants: Alex Beatty, Sarah Elmeligi, Jessica Melsted, Jacky Normandeau

Larry Comin Award Judges: Dragomir Vujnovic, Phil Walker, Nick Parayko

Indigenous Liaison Support: Dee Patriquin

Auction: Alyssa Bohart, Sarah Elmeligi, Peter Thompson

Sponsorship: Fauve Blanchard, John Paczkowski

Registration: Erin Miller, Layla Neufeld

Virtual conference support: Michaela Marchuk and Larissa Clayton

Website: Layla Neufeld, Lucas Habib

Communications and MC: Sarah Elmeligi

Program: John Paczkowski, Sarah Elmeligi, Alyssa Bohart



APPENDIX 1A: THE BIRDS AND THE BEARS ABSTRACTS

Glen Hvengaard, University of Alberta

Title: How do nest box characteristics and landlord stewardship activities affect purple martin nest box occupancy?

Abstract: Purple martins (*Progne subis*) are declining in North America and the eastern subspecies is almost fully dependent on human-provided nesting houses. Guidebooks anecdotally emphasize various nest box characteristics and stewardship practices, but little research has examined the effectiveness of management practices on martin occupancy. Thus, martin landlords manage nest boxes with varying levels of engagement and methods. Based on martin occupancy data from 86 nest boxes in Camrose, Alberta from 2006 to 2018, we explored relationships with: 1) nest box characteristics (e.g., color, building material, hole shape, height, presence of shrubs, vertical accessibility, and distances to trees, water bodies, human houses, and neighboring nest boxes) and 2) landlord stewardship practices (e.g., cleaning nests, removing competitors' nests, removing blowfly larvae, adding nest material, trapping competitor species, excluding predators, adding eggshells, and feeding martins). The key nest box characteristics were vertical accessibility, absence of shrubs at the base, and close proximity to water. The key stewardship practices were cleaning nests, removing blowfly larvae, frequently checking nests, removing competitor nests, and adding nest material. Purple martin landlords can build, locate, and manage nest houses with these characteristics in mind to promote greater nesting occupancy by purple martins, thus contributing to more effective purple martin conservation efforts.

Title: Age and sex influence natal and breeding dispersal of purple martins

Abstract: Dispersal patterns deepen our understanding of population dynamics. Dispersal by all age and sex classes enhances a species' ability to respond to environmental changes, such as in habitat availability, artificial nest sites, and climate. The migration dynamics of the eastern subspecies of the Purple Martin (*Progne subis subis*) are well known, but we know less about its patterns of annual dispersal. We compared the frequency, distance, and direction of dispersal by each age/sex cohort of martins in central Alberta, at the northwestern limit of their breeding range. We used two datasets: (1) adult martins banded in central Alberta as nestlings and encountered during the summers of 2017 and 2018, and (2) records of encounters of banded martins in Canada from 1935 to 2016 from the Canadian Wildlife Service's Bird Banding Office. In Alberta, 36% of birds dispersed from natal sites (by an average distance of 24 km), most commonly to the northeast. Across Canada, 29% of birds dispersed (by an average distance of 183 km), most commonly to the east and northeast. In Alberta, martins at least two years old dispersed less frequently than yearlings since some older martins returned to their natal site after first breeding elsewhere. Dispersal distances of after-second year martins, which represent natal plus breeding dispersal, were greater than dispersal distances of second-year birds, which represent natal dispersal alone. Thus, some martins continue to disperse after their second year and do not maintain complete fidelity to a breeding site, which is different from our current understanding.

Biosketch: Glen Hvenegaard is a Professor of Environmental Science at the University of Alberta's Augustana Campus in Camrose, Alberta. Glen's research examines human interactions with nature, with a focus on environmental interpretation, parks, birds, ecotourism, and rural sustainability.

Camille Jodouin, University of Alberta

Title: Variation in movement and space use of Western Hudson Bay Polar Bears In Relation to Sex, Reproductive Status and Age Class.

Abstract: Sex, age, and reproductive status affect size, experience, and energy requirements of animals. They are also thus expected to influence movement dynamics. We investigated whether these factors influenced speed, tortuosity, and seasonal home range size for polar bears (*Ursus maritimus*) on the sea ice in western Hudson Bay during the spring. We used location data from six classes of bears based on age, sex, and reproductive status (n=48) tracked in the spring of 2017 to 2019. Females with cubs and yearlings were tracked using GPS collars whereas adult males, subadults, and lone females were equipped with Doppler-shift eartags. While speed did not vary across groups, tortuosity was higher in females with offspring and subadult females; additionally, seasonal home ranges were larger in females with yearlings. Our results show that reproductive status and age seem to affect polar bear movement more than sex. Our study is the first to compare bears of different sexes, age classes and reproductive statuses simultaneously, and has the potential to improve energetics models for this vulnerable species.

Biosketch: Camille Jodouin is an M.Sc. candidate at the University of Alberta, working under the supervision of Dr. Andrew Derocher. She will be defending her thesis on the role of individual factors in polar bear movement dynamics in Early April. Outside of her thesis, she enjoys backpacking and playing Jazz piano.

Alyssa Bohart, Government of Alberta

Title: Grizzly bear (*Ursus arctos*) den site selection in a high use recreation area in Kananaskis Country, Alberta.

Abstract: We used 68 grizzly bear den sites collected between 1982-2021 to determine den site habitat selection using resource selection function models. Den site locations were identified using GPS-collar data and field surveys. We included topographic, land cover, anthropogenic features, and food resource variables to determine denning habitat selection by grizzly bears. Our top model identified priority denning habitat and potential effects of human recreation use on den site selection. We tested the prediction that bears would select high-elevation habitats and avoid areas near human recreation, including trails and facility areas. Further, we mapped relative probability of den site occurrence using the resource selection function top model. With recent increases in recreation activities in Kananaskis Country, especially in denning habitat, it is increasingly important to identify how this affects grizzly bear behavior, survival and reproduction. By better understanding the effects of human recreation on grizzly bear denning, we hope land managers will be better able to protect preferred habitat types and mitigate potential human-wildlife conflict.

Biosketch: Alyssa is a wildlife biologist with six years of experience working on bears and Species at Risk. She completed her Master's degree at the University of Alberta. Outside of her education,



Alyssa is passionate about connecting people with science through creating infographics and public outreach.

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Photo: Michelle Hoang

APPENDIX 1B: LANDSCAPE DISTURBANCES ABSTRACTS

Lionel Leston, University of Alberta

Title: Comparing alternative methods of modelling cumulative effects of oil and gas footprint on boreal bird abundances.

Abstract: Oil and gas activity is increasing in the western boreal forest. To manage the cumulative effects of this industry, a better quantification of footprint effects on boreal forest wildlife is needed. We evaluated how well dose-response and zone-of-impact models predicted the abundance of 48 bird species, respectively based on the amounts of and nearest distances to seismic line, pipeline, well site, road, and facility footprint near point count survey locations in Alberta, Canada. We developed models for each species, evaluating the best functional forms (linear, non-linear) for different footprint effects. We then evaluated the effect of model structure on goodness of fit and on estimates of regional population size. Nonlinear functional forms of footprint amount or distance were best at explaining observed abundances. Respectively 31, 23, 54, 46, and 15% of species associated with older coniferous forest decreased as seismic line, pipeline, road, well site, and facility footprint amount increased, while 38, 54, 69, 54, and 23% (respectively) of these species declined with proximity to these features. Zone-of-impact models had better model fit than dose-response models for 47 of 48 species by AIC and for 42 of 48 species by cross-validation. Total population estimates did not differ much. Nevertheless, both kinds of models are useful for assessing cumulative effects on wildlife and the mechanisms for these effects. Zone-of-impact models may indicate evidence of positive or negative edge effects while dose-response models may indicate bird habitat lost or gained within oil and gas footprint.

Biosketch: I have pursued a career in conservation biology and natural resource management, with a focus on birds, since my grad school days (2003-2013). I currently study cumulative effects of land use and climate change on wildlife.

Joshua Killeen, FORCORP Solutions

Title: Alternative Silvicultural Systems and Harvesting Techniques for Caribou Habitat.

Abstract: The careful selection and implementation of alternative harvesting and silviculture practices can potentially contribute to balancing the needs of Alberta's working landscape with the need for future woodland caribou habitat. However, to achieve this, industry and government managers must better understand the range of potential harvesting and silvicultural tools available to achieve woodland caribou goals. They must also better understand how these applications can potentially work together to produce not only habitat desirable to woodland caribou, but habitat less desirable to primary prey species like deer and moose. Managers also need to consider the economic implications of alternative harvesting and silviculture approaches to their current and future fibre needs. In a recent review conducted for the ARCKP (Alberta Regional Caribou Knowledge Partnership), FORCORP identified alternative silvicultural systems applicable to Alberta's forests using literature review and subject-matter expert interviews. These systems were carefully reviewed for their potential to alter post-harvest vegetation dynamics in ways that may be



beneficial to woodland caribou, relative to existing clearcutting systems. A number of case studies from both conifer-dominated and mixed wood-dominated landscapes were reviewed in this context, as well as in the context of access requirements and economics. This led to a number of recommendations, including for a large-scale harvest planning program in caribou range, utilising a multidisciplinary team including silviculturalists and biologists.

Biosketch: Josh is an analyst and biologist with the consultancy FORCORP Solutions, where he works primarily on caribou range planning initiatives. He completed his biology BSc at University College London in England, and a joint MSc at the University of Groningen, in the Netherlands, and the University of Montpellier, in France.

Dylan Brassard, University of Lethbridge

Title: The effects of a severe, stand-replacing wildfire on black bear activity in a protected area in southwest Alberta.

Abstract: Large stand-replacing wildfires are becoming increasingly frequent across the globe. Canada is not exempt from these changes and the past few years have seen an increase in the severity of fires in the conifer forests of the Rocky Mountains. These severe disturbance events raise questions about the impacts on animal populations. In late summer 2017, a lightning strike ignited the Kenow Wildfire, a particularly severe fire that burnt 50% of the vegetated area in Waterton Lakes National Park (WLNP). Taking advantage of animal activity images from trail cameras set across the park between the period of 2008 and 2021, we used a before-after control-impact design to examine the impacts of the fire, as well as the interaction of the fire with recreation, on black bear activity. Our analysis of 2843 black bear camera events suggests that black bear activity has decreased in the park following the fire both in burnt and unburnt regions of the park. We will discuss how human recreation and season interact with these results and the implications for the management of this important species.

Biosketch: Dylan is a current MSc student majoring in the Biological Sciences at the University of Lethbridge. After graduating in the summer of 2022 Dylan is looking forward to finding work in the fields of wildlife management, wildlife research, or ecological monitoring.

Jason Fisher, University of Victoria

Title: Syntopic species synergistically affect large boreal mammals response to anthropogenic landscape change.

Abstract: Landscape change alters species distributions, and understanding these changes is a key ecological and conservation goal. Niche theory and emerging empirical research suggests heterospecifics should entrain variability in distribution, perhaps synergistically with landscape features. Using three years of camera-trap data we tested for synergistic syntopy-habitat relationships in mammal communities in the Alberta oil sands. We competed multiple hypotheses about the roles of natural features, anthropogenic features, predators, competitors, and species-habitat interaction terms in explaining relative abundance of carnivores, herbivores, and omnivores / scavengers. Almost all large boreal mammal species distributions, especially carnivores were markedly affected by co-occurring species. Models including heterospecifics explained distribution

better than natural or anthropogenic landscape features alone. Dominant predator (wolf) occurrence was best explained by prey, while prey species were explained by apparent competitors and subdominant predators. Evidence for synergies as interactions between anthropogenic landscape features and heterospecifics was strong for coyotes and wolves but variable for other species. Boreal mammals spatial distribution is a function of heterospecific co-occurrence as well as landscape features, with synergistic effects observed for some species. Understanding species responses to ongoing global anthropogenic landscape change thus requires a multi-taxa approach that incorporates interspecific relationships, requiring a community approach to monitoring.

Biosketch: Jason T Fisher (PhD) heads the Applied Conservation Macro Ecology (ACME) lab at the University of Victoria. He has researched the effects of landscape change on boreal mammals for 25 years, with 55 peer-reviewed papers. He was formerly an ARC scientist and Government of Newfoundland biologist, now a free agent.

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Photo: Allyson Carroll

APPENDIX 2A: METHODS IN WILDLIFE RESEARCH AND MONITORING ABSTRACTS

Talia Vilalta, Yellowstone to Yukon Conservation Initiative

Title: Multiple spatial data sources improve mapping of recreation trails in western Alberta.

Abstract: Outdoor recreation is becoming more popular in Alberta and beyond, with more people going farther and faster into the backcountry. There are information gaps about patterns of human use, including the spatial footprint of trails and especially on non-designated (i.e., unofficial) trails. This information gap hampers management and planning, and can lead to increased wildlife disturbance, human-wildlife conflict, and conflicts among user groups. In the first stage of this multi-year project, we mapped trails and linear features used for motorized and non-motorized recreation in Kananaskis Country, the Ghost Public Land Use Zone, and the southern part of Banff National Park (12,500 km²). We compiled data from federal and provincial government and non-government databases, paper maps, and user-generated content. We categorized trails and linear features by activity type, season of use, government designation, and temporal restrictions. Starting with 9,854 km of trails and linear features from government sources, we added an additional 2,975 km (30% more) of trails from user-contributed data and 10,637 km (110% more) of linear features such as seismic lines, with the potential to provide recreation access (largely for motorized activities). These preliminary results indicate a considerable underestimation of the linear footprint of human recreation in our study area, with consequences for managers and planners tasked with maintaining and enforcing recreation and reducing negative impacts on wildlife. Our experience indicates that considering user-generated content can improve estimates of the recreation human footprint and provide additional information on trail characteristics.

Biosketch: I have been working at Y2Y on the Recreation Ecology project for just over a year. I graduated from the University of Calgary in ecology and zoology, and the University of Stirling with an MSc in Environmental Management. I have worked with ground squirrels, bighorn sheep and ducks.

Sydney Toni, Alberta Biodiversity Monitoring Institute

Title: All together now: creating remote camera best practices and tools for Alberta.

Abstract: Over the last decade, the use of cameras for wildlife monitoring has grown exponentially. While thousands of remote cameras are in use across Alberta, there is little coordination in how data is gathered and used. Differences in study design, deployment methods, and metadata have limited the ability for data to “talk” to each other and be used to answer large-scale questions. In 2019, a survey was sent to a group of remote camera users in western Canada to identify the greatest priorities for remote camera use in Alberta. A Remote Camera Steering Committee was formed to address the need for tools, standards, and opportunities for knowledge exchange with the wider community of practice. In this speed talk, you will learn about the committee’s work to develop and share recommendations on best practices (i.e., metadata; study design; data processing, analysis, and storage) and the tools available or in development for remote camera



research. This work ranges from a quarterly webinar series to collaboration with WildCAM, a network for remote camera users in western Canada, to analysis tools to provincial metadata standards. Consider joining the community of practice! Together, we can realize the full potential of remote cameras for wildlife conservation and management. For more information, see <https://wildcams.ca/>.

Bioskech: Sydney Toni is the acting Communications Manager for the Alberta Biodiversity Monitoring Institute (ABMI). One of the hats she wears is helping coordinate the Alberta Remote Camera Steering Committee, including organizing a webinar series with WildCAM and a bi-monthly blog on remote camera research and monitoring in Alberta.

Cassandra Stevenson, University of Alberta

Title: Using remote camera traps and small mammal track tube arrays to test ecological indices used in urban planning.

Abstract: Urbanization reduces, fragments, and degrades natural areas, which ultimately threatens biodiversity by reducing the number of species and changing the composition of species in the remaining natural areas of urban landscapes. In Edmonton, Alberta, urban ecological planners incorporate the needs of urban wildlife into land-use planning to support biodiversity by estimating the habitat quality of natural areas pre-development via two ecological indices, ecological connectivity and biodiversity potential. We tested the predictiveness of these indices using data from 70 remote cameras and 39 small mammal track tube arrays placed in natural areas throughout Edmonton. We calculated occurrence and detection rates for two urban mammal species and groups that comprise three ecological design groups used by the City and evaluated index fit using zero-inflated mixed models. We used the same statistical approach and a similar data set to model the occurrence and relative abundance of species using a combination of local-scale vegetation variables, remotely sensed data, and the presence of other species. Our preliminary results suggest high variability in the accuracy of indices in predicting the occurrence and abundance of individual species and groups. Further work will show whether habitat quality estimators could better encompass the needs of various urban mammals present in Edmonton by grouping urban biota based on sensitivity to environmental factors rather than body size as reflected in the current indices. Additional exciting details will be presented at the conference!

Biosketch: Cassie is an MSc student in the St. Clair lab (UofA), whose interests include understanding and mitigating human-wildlife conflict and contributing to proactive and sustainable urban conservation planning for the maintenance of urban biodiversity and the valuable ecological services provided by wildlife.

Joseph Litke, Fiera Biological Consulting

Title: Wildlife Track Identification: raising the bar in Alberta.

Abstract: The documentation of wildlife occurrence, distribution, and movement via observations of tracks and other sign is a longstanding practice in field biology and has a rich history in Alberta. However, the reliability of such information has always been limited by the abilities of those making the observations. Wildlife professionals frequently receive no, or very little, training in wildlife track and sign identification as part of their education, and where instruction does occur, the experience



and skill level of those instructing can be dubious. It's true that tracking has in recent times been widely replaced by technology such as remote cameras, however, it is still commonly in use in support of such technologies, and also as a method enabling citizen contributions to science through reporting of observations. On January 8 & 9, 2022, the first Wildlife Track and Sign Certification Evaluation was hosted in Alberta, with 11 participants and varying levels of certification achieved. In this presentation I will describe the evaluation and certification process and its benefits and offer some examples of evaluation questions with which audience members can test their own knowledge.

Biosketch: Co-founder and Sr. Biologist with Fiera Biological with 20 years of environmental research and management experience throughout western Canada. Joseph holds an internationally recognized certification in Wildlife Track and Sign interpretation and regularly leads tracking workshops throughout Alberta and Saskatchewan.

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Photo: Stephen Shikaze

APPENDIX 2B: UNGULATES AND SPEED TALKS ABSTRACTS

Traditional Talks

Madeline Trottier, University of Alberta

Co-authors: Mark Hebblewhite, Evelyn H. Merrill

Title: Disparity in elk (*Cervus canadensis*) vigilance behaviour following different migratory tactics on a sympatric winter range.

Abstract: Sociality incurs costs and benefits for group-living animals, resulting in behavioural trade-offs, such as dominance, that may drive patterns of association among group members. We examined interaction patterns among elk in the partially migratory Ya Ha Tinda (YHT) elk herd (*Cervus canadensis*) in Alberta following three migratory tactics (residents; eastern migrants; western migrants). Because familiarity may influence dominance and thus group interactions, we predicted that familiarity would be higher within versus among migrant tactics, and thus 1) spatial overlap will be lower among versus within tactics, 2) patterns of foraging area use will reflect social relationships on the winter range, and 3) rates of interaction and aggression will differ among tactics. At the home range scale, we used GPS telemetry data to document home range overlap of collared female elk on the sympatric range during the winters of 2015-2018. We determined the volume of intersection (VI) of 95% utilization distributions (UD) during the winter between all tactics (resident-resident, resident-eastern, resident-western). Mean overlap was high (0.78 ± 0.013 SE) among all pair types. At the foraging patch level, we used GPS locations to compare observed probabilities of patch use sequences to expected probabilities of sequences among all tactics. Eastern and western elk used areas following resident elk more than expected at random (2.9% and 4.5% higher, respectively). At the individual level, we evaluated dominance from direct observations of conspecific interactions during winters 2019-2020 relative to migrant tactic, age, density, and time of year. Preliminary results suggest differences in aggression rates among migrant tactics, but similar rates of interaction overall (range 0.0031 ± 0.0005 - 0.0035 ± 0.0004 interactions/min.). We discuss the differences in dominance among migratory tactics and the effect of this on forage acquisition and predation risk.

Biosketch: I'm a Master's student at the University of Alberta studying winter elk behaviour at the Ya Ha Tinda ranch, and I completed my BSc at Trent University in Ontario. My current research interests focus on behavioural ecology in large mammals.

Phil Walker, University of Alberta

Title: Woodland caribou calving fidelity: Is it the spatial location, habitat, or both?

Abstract: Managed landscapes are dynamic in what they offer woodland caribou during the calving period. Previous research of calving fidelity has focused on the spatial location of individuals; alternatively, individuals may express habitat fidelity (use of same habitat) during calving, therefore indicating more than one strategy for maximizing reproduction. Using GPS telemetry data, we determined if individuals expressing spatial and/or habitat calving fidelity and evaluated intrinsic and

extrinsic factors associated with expressing either fidelity. We identified 56 individuals with 2 predicted birth events, via a movement-based model, within 3 distinct regions in northern Ontario across 2010-2013. Individuals were classified as expressing 1) spatial fidelity by comparing sequential calving locations to a null spatial distribution of available calving locations, 2) habitat fidelity using a latent selection difference (LSD) model compared to a null LSD model, or 3) no fidelity (neither criterion met). Across all individuals, 49% expressed habitat fidelity, 34% expressed spatial fidelity, 17% expressed both habitat and spatial fidelity, and 34% expressed neither. Age and proportion of available calving habitat did not significantly influence individuals expressing either spatial or habitat fidelity. Seventy percent of individuals, which had their calf survive to 5-weeks postpartum in year 1, expressed either habitat or spatial fidelity in the following year. Understanding the mechanisms that influence caribou expressing calving fidelity in managed landscapes is crucial for the conservation of the species, especially given the role neonatal recruitment has on the population dynamics of caribou.

Biosketch: Phil Walker is a Ph.D. candidate at the University of Alberta studying woodland caribou. In his spare time he enjoys wildlife photography, skiing, mountain biking, and birding.

Speed Talks

Sarah Elmeligi, Alberta Chapter of The Wildlife Society

Co-authors: Edna Stobschinski

Title: Understanding equity, diversity, and inclusion in two Alberta Chapters of The Wildlife Society.

Abstract: Equity, Diversity, and Inclusion (EDI) is a social concept that aims to capture multiple dimensions of human diversity (including race, gender, sexual orientation, disability). The Wildlife Society (TWS) is an international organization comprised of wildlife/biology professionals and students with diverse backgrounds. TWS values programs that address the needs of their members in their professional development. As chapters of The Wildlife Society, the ACTWS and the LCCTWS conducted two member surveys to understand the diversity of their memberships, and the potential barriers that members of marginalized groups encountered. Surveys were conducted in the fall of 2020 (ACTWS) and 2021 (LLCTWS). Respondents in both surveys were mostly female (56% and 58% respectively) or members of the LGBTQIA2S+ community (12% and 50%, respectively). In both surveys, female respondents most commonly stated challenges to their professional success because of their gender. Respondents in both surveys reported feeling more included within their respective chapters than in the broader wildlife field. We recommend that Wildlife Society chapters collaborate on future member surveys to improve understanding of member diversity, as well as to identify and remove barriers to recruit future members and contribute to their professional success.

Biosketch: Sarah Elmeligi is the Executive Director of the Alberta Chapter of The Wildlife Society and a member of the ACTWS Equity, Diversity, and Inclusion committee. Edna Stobschinski is on the executive committee of the Lethbridge College Student Chapter of The Wildlife Society and a member of the ACTWS EDI Committee.

Annie Pumphrey, University of Northern British Columbia



ALBERTA CHAPTER OF
THE WILDLIFE SOCIETY

Conference 2021 | *Wildlife Without Borders*

Title: Roadside Bear Viewing in Kananaskis Country: Perceptions and Approaches to Mitigating Risk.

Abstract: The global pandemic has underscored the need for people to connect to nature, with outdoor recreation skyrocketing in recent years. However, poor recreation planning, management, or enforcement can have varying impacts on wildlife, such as displacement from winter home ranges or cause a switch from daytime to strictly nighttime movements. It can also create conflict among user groups, who possess different values about outdoor experiences. Yet, the appropriate tools to monitor recreational use have not been evaluated, particularly the strengths and weaknesses of different data sources at varying scales. In a 12,500 km² study area, we gathered five data sources for monitoring winter and summer, motorized and non-motorized recreation: remote trail cameras, trail counters, local recreation experts, social media including smartphone fitness applications, and aerial surveys. Our study area includes federally and provincially protected areas in the Rocky Mountains and Alberta Eastern Slopes, in addition to public and private lands. We are mapping the intensity of recreational use by data source and at different spatial scales to evaluate congruence, and identify areas of spatial overlap or disconnect. As well, we will correlate winter recreation data from aerial surveys and social media, a rapidly growing source of information about human-use. Next steps include developing comprehensive models of human use across seasons and activity types and developing functional models of disturbance of key wildlife species. The results of this research will help governments, conservation and recreation groups to identify which data source(s) are best suited to reach respective monitoring and management goals.

Biosketch: Annie has worked in a variety of roles in Parks over the past seven years. Annie is a candidate in the Natural Resources and Environmental Studies Masters program at UNBC and is interested in interdisciplinary Parks-related issues and improving public communications with the goal of increasing stewardship and engagement.

Shelagh Pyper, Fush Consulting Ltd.

Title: Canadian Conservation and Land Management Knowledge Portal: Growing Through Collaboration.

Abstract: The Canadian Conservation and Land Management (CCLM) Knowledge Network is a multi-stakeholder group that formed in 2019 to address the lack of a centralized place to share and exchange information and learnings about wetland and boreal caribou conservation and land management. Through collaboration and pooling their resources, they collectively developed the CCLM Knowledge Portal (www.cclmportal.ca), an accessible online platform for sharing resources and connecting practitioners across Canada.

Biosketch: This short presentation will be given by Shelagh Pyper, Director of Education and Outreach for Fuse Consulting and one of a team of steering committee members for the CCLM, which is governed by a Steering Committee with representation from all the collaborating organizations.



Ellen Smith, University of Alberta

Title: Habitat selection by Columbian ground squirrels.

Abstract: Columbian ground squirrels (*Urocitellus columbianus*) naturally occur in the Canadian Rockies, often choosing habitats close to human settlement. This increases human-wildlife conflict through disruptive burrowing activity and by drawing predators into proximity to people. One mitigation is to translocate squirrels from locations with conflict to new locations without adjacent human development, but this requires an ability to identify suitable vegetation communities and soil conditions. We advanced this ability in Jasper National Park, Alberta, by comparing locations where squirrels currently occur to nearby locations without active colonies. We did so by identifying nine paired sites near the Jasper townsite, one occupied by squirrels and one nearby site with apparently similar vegetative, topographical, and land use characteristics without squirrels. We sampled 153 plots and quantified soil characteristics, overhead cover, and proximity to anthropogenic features. We used ordination to compare vegetative communities and the products of ordination, along with soil characteristics and remotely-sensed variables, to construct resource selection functions that contrasted occupied and unoccupied sites. We will present the products of these analyses at the conference. We expect these results will assist managers to identify sites that are suitable for future translocation of Columbian ground squirrels throughout the mountain parks.

Biosketch: Ellen is a fourth-year undergraduate student majoring in Biology and Psychology at the University of Alberta. She has previously researched plant trait and diversity changes after disturbance. She is currently investigating the impact of visual perspective in memory on emotion, and predictors of habitat selection by Columbian ground squirrels.

Anne Hubbs, Alberta Environment and Parks

Title: Managing disease risk for bighorn sheep.

Abstract: The Western Association of Wildlife Agencies (WAFWA) considers pneumonia the single greatest threat to wild sheep herds. Population-level die-offs continue to occur in western jurisdictions, usually resulting in significant loss of all age and sex classes. A bacterium *Mycoplasma ovipneumoniae* (*M. ovi*) predisposes wild sheep to pneumonia. *M. ovi* is transmitted between infected individuals through direct or close physical contact. Domestic sheep and goats are carriers of *M. ovi*, and extensive scientific evidence shows that risk of pneumonia in wild sheep increases following contact with these domestics. Maintaining physical separation is key to minimizing risk to wild herds. In Alberta, domestic sheep and/or goats occur in some areas close to bighorn sheep range on crown and private lands. On crown lands, they are, in some cases, used for weed and vegetation management, as pack animals or grazed. No known pneumonia die-offs of bighorn sheep have occurred in the province since 2000; however, the risk remains high and inevitable unless preventative actions occur. In this speedtalk, we highlight some of the recent policy, testing and educational programs that the Alberta Government recently implemented or is considering. For more information on this issue, see <https://www.alberta.ca/pneumonia-and-bighorn-sheep.aspx>.

Biosketch: Anne has worked as a wildlife biologist for the Alberta Government for 20 years involving big game management, decision-making science, and population modeling. She has her Masters in Ecology and PhD in Zoology, and enjoys biking, cross country skiing and hiking in her spare time.



Camille Roberge, Thompson Rivers University

Title: Does logging reduce the nutritional quality of moose forage?

Abstract: Moose populations in BC's central interior have declined over the past 30 years, in tandem with a dramatic increase in logging. Logging is classically considered beneficial to moose, as cutblocks support growth of early seral species preferred by moose. However, plants in cutblocks have greater access to sunlight than plants in forests, and this energy can be used to create defensive secondary compounds, such as tannins. Tannins bind plant proteins, reducing the digestible protein available to herbivores. Female moose are often protein-limited in the summer when they are supporting lactation and replenishing stores depleted over winter. Plant nutritional quality is an important predictor of ungulate productivity; female moose in poor nutritional condition have lower pregnancy and twinning rates and smaller calves. We are investigating whether cutblocks provide lower plant nutritional quality than forests, and whether this affects moose condition and reproduction. We tracked a cohort of collared female moose near Logan Lake BC. We quantified their use of cutblocks during the summer and recaptured them the following winter to measure pregnancy and body condition. We sampled five key forage species at 145 moose foraging sites in and out of cutblocks throughout the summer. Samples are being analyzed by the BC Government's Analytical Chemistry Services Laboratory for crude protein and the protein-precipitating capacity of tannins. Digestible protein will then be calculated from these values. Results will help elucidate a potential driver in the moose population decline seen in our study area and in many other regions of BC.

Biosketch: Camille Roberge is a Registered Professional Biologist and a graduate student in Dr. Karl Larsen's lab at Thompson Rivers University. She is collaborating with the Nlaka'pamux Nation Tribal Council, the BC Government, and Teck to understand the effects of forestry on a declining moose population in BC's central interior.

Ashlyn Herron, Lethbridge College

Title: Determining if grassland restoration is effective at reducing edge effects on grassland birds.

Abstract: Restoration is used by conservation organizations to reduce habitat fragmentation in threatened grassland ecosystems. Avifauna are negatively affected by fragmentation, often showing edge avoidance in grassland habitats. However, additional research is required to better understand edge effects on birds throughout the process of grassland restoration. Thus, quantifying changes in edge effects over time, including determining when edges begin to return to matrix, was the focus of this project. The objectives were to 1) understand the effectiveness of grassland restoration in reducing edge effects on birds and 2) determine if edges of mid-reseed sites support more grassland obligate species than early reseed sites. Two properties in southeast Alberta being to native grassland were subclassified into one of three restoration categories based on year of reseeded (early = 2020, mid-reseed = prior to 2013, and native = undisturbed). Species occurrence was surveyed along edges of categories using eight autonomous recording units (ARUs) deployed on fences. ARUs collected 50 hours of acoustic data over five days in June 2021. Bird presence was quantified for each restoration category by analyzing acoustic data in Kaleidoscope Pro. Species were compiled into a contingency table based on presence/not



detected for each habitat category, and historic point count data were used to evaluate accuracy. Goodman and Kruskal Lambda was calculated to measure association based on the reduction in variation between chi-squared statistics for species presence in each category ($p=0.05$). Species richness models will be created to illustrate variations. Results will be presented at the conference.

Biosketch: Ashlyn Herron is currently completing her fourth and final year of her Bachelor of Ecosystem Management degree from Lethbridge College. Ashlyn is passionate about grassland conservation and the protection of species at risk found within them. When not busy with coursework, you can find her hunting, fishing, or birding.

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Photo: Madeline Trottier

APPENDIX C1: CREATURES OF THE NIGHT ABSTRACTS

Carrie Ann Adams, University of Alberta

Title: Is artificial light at night a boon or a burden for Common Nighthawks (*Chordeiles minor*)?

Abstract: Artificial light at night (ALAN) is increasing rapidly worldwide, as is evidence of its widespread biological impacts, which are usually negative. ALAN is likely to impact Common Nighthawks (*Chordeiles minor*) because they are crepuscular and travel over large home ranges, increasing their probability of encountering a light source. Nighthawks sometimes forage on insects attracted to artificial lights, but ALAN could contribute to declining insect populations in the surrounding landscape or expose ground nests to higher predation risk. Whether ALAN benefits or harms nighthawks may depend on whether they are foraging or nesting, the spatial scale at which light is measured, and landscape composition. We are investigating how artificial light affects patterns of relative abundance of Common Nighthawks across British Columbia using data from nearly 7000 point counts from the Canadian Nightjar Survey. We measured artificial light using the Earth Observation Group's remotely sensed Nighttime Lights products. Our preliminary results suggest that ALAN negatively affects the relative abundance of nighthawks at a local scale, with the strongest effect occurring as artificial light levels increase from none to moderate. Local-scale ALAN has a stronger negative effect on the relative abundance of nesting nighthawks than foraging nighthawks. We continue to investigate how landscape-scale light pollution affects relative abundance, and whether the response depends on urbanization levels. Patterns of relative abundance can provide the first indication of whether light pollution benefits or harms Common Nighthawks and identify the contexts in which mitigation of light pollution is most important for this species of special concern.

Biosketch: Carrie Ann Adams is a 5th year Ph.D. student at the University of Alberta studying the effects of artificial light on bird behavior and distributions. Her research uses evidence synthesis and analysis of extensive point count and bioacoustic datasets to study local and landscape-scale effects.

Camila Hurtado, University of Alberta

Title: Effects of Latitude on Bat Foraging Behaviour and Nightly Activity Patterns in Western Canada.

Abstract: For nocturnal animals, a key abiotic factor that determines activity levels is the amount of light present in the environment. For example, sunlight guides the peak activity times of nocturnal mammals, as their peak activity tends to align closely to the few hours after sunset and the hours before sunrise. Bats at high latitudes face unique challenges specifically associated with limited night length or a complete absence of darkness during the summer months. Some North American bat species have continental ranges that allow us to examine how timing and duration of darkness induced through latitude influence species-specific behavior. We are amid a two-year study that has recordings taken from Alberta, the Yukon and Northwest Territories. We acoustically sampled bats in a south (49°N) to north (65°N), 1930 km, transect at 114 different sites on 89 nights. Sampling



occurred from May to September 2021. Using acoustic recordings of bats, we are examining the effects of latitude, night length, and landscape cover on overall and species-specific nightly activity across our transect. We are testing the hypothesis that at more southern latitudes we would see a characteristic bimodal pattern of activity with a large peak after sunset and another peak before sunrise, and that further north there would be a unimodal pattern of activity with a single large peak happening after sunset. We acknowledge all our partners, and our land guardian partners of the Dene First Nations of Canada.

Biosketch: Camila is a Masters student at the University of Alberta focused on bat research using bioacoustics. Before joining the U of A, she worked with the Canadian Wildlife Service and Alberta Environment and Parks where she developed a strong passion for conservation ecology.

Emma Micalizzi, University of Calgary

Title: The importance of building roosts versus natural roosts to Little Brown Bats in the Canadian Rocky Mountains.

Abstract: Little Brown Bats are federally endangered in Canada as populations have been decimated by white-nose syndrome. Although not yet identified in Alberta or British Columbia, white-nose syndrome will almost certainly arrive in the next several years and protecting sites that enhance bat survival and reproductive success may help to mitigate the impact of this disease. However, despite its importance to bat populations, roosting habitat is poorly characterized in the Canadian Rocky Mountains. To better understand habitat requirements for mountainous Little Brown Bats, we radio-tagged and tracked 55 female bats over two summers in Banff and Yoho National Parks to identify and characterize their day-roosts.

Biosketch: I am a student at the University of Calgary currently finishing my MSc. I am presenting on the research that I conducted in collaboration with Parks Canada for my MSc thesis.

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Photo: Alicia

APPENDIX C2: GRASSLANDS ABSTRACTS

Geoff Holroyd, Beaverhill Bird Observatory

Title: Conservation Needs of Burrowing Owls in Prairie Canada.

Abstract: In Canada, the Burrowing Owl (*Athene cunicularia*) is listed as endangered under the Species at Risk Act. The number of breeding pairs declined 90% during the 1990's despite voluntary protection of over 37,000 hectares of the species habitat on private grasslands. Low recruitment exacerbates the Burrowing Owl's decline in response to habitat loss; typically only 3-4 young fledge from the average clutch size of 9 eggs. Food supplementation experiments indicated that the wild food supply was inadequate for this species to reach its reproductive potential in some years. Migration and dispersal are important ecological processes and understanding them is a requirement for species conservation efforts. Studies of movements of Burrowing Owls using banding, VHF telemetry, stable isotopes, geolocators, and satellite transmitters demonstrate that annual dispersal is a second factor driving the owl's decline in Canada. Supplemental feeding at nests in Grassland National Park has increased the production of nestlings in a cost-effective program. After 6 years the population in GNP is increasing. This talk summarizes 30 years of research into the population dynamics, breeding biology, migration and dispersal of this species in Canada, Texas and Mexico and recommends supplemental feeding of nests to be incorporated in recovery action plans and further research, alongside with protection of critical habitat. Greater international cooperation and direct conservation action are needed if this species is to remain on the northern Great Plains.

Title: Foraging habitats, annual movements and status of Alberta Prairie Falcons.

Abstract: Conservation of cliff nesting raptors requires an understanding of their key prey, their foraging habitats that are adjacent to limited suitable nest sites, and knowledge of their annual movements. The diet of Prairie Falcons on the Bow River in southern Alberta based on direct observations was 68% Richardson Ground Squirrel with sex based differences depending on the nestling stages. Since Prairie Falcons nest on cliffs the suitable habitat must be maintained within 7 km of prairie rivers in Alberta. VHF radio telemetry showed that the foraging home ranges and distances varied by prey type and by adult sex; thus home ranges varied through the nesting season. While foothill habitats appear secure with livestock grazing, lower elevation sites are adjacent to irrigated cropland jeopardizing the future of these falcons. Annual movements of breeding falcons based on 18 satellite transmitters were primarily within Canada with only three wintering in the US. We suggest that limited nest sites encourages falcons to stay on territory year-round. Increases in over-wintering waterfowl at anthropogenic sites may facilitate over-wintering in southern Alberta. Surveys of nesting falcons that have been carried out on select portions of several Alberta Rivers over the past decades by volunteer banders show that the population is in decline. The decline is mirrored with declines in Saskatchewan and BC. We recommend an urgent review by COSEWIC and listing to Threatened in Canada.



and that different grazing management techniques can influence what those vegetative qualities look like. Therefore, this study contrasts the heights, vertical cover, and litter accumulation of vegetation found in two pastures managed with different grazing regimes in southwest Saskatchewan and compares it with grassland songbird diversity established via point counts. Vertical cover and litter accumulation were statistically different between the two pastures and songbird diversity showed to be highest where the values for these characteristics were greater. The results of this study support the recommendation to promote low intensity grazing in order to improve songbird habitat as well as the facilitation of further studies on the impacts of other grazing regimes on grassland songbird habitat and diversity.

Biosketch: I am in the final year of my Bachelor of Ecosystem Management at Lethbridge College and have a passion for wildlife conservation especially in the vulnerable grassland ecosystems of our Canadian prairies. I look forward to my future career in the wildlife biology and grassland ecology fields!

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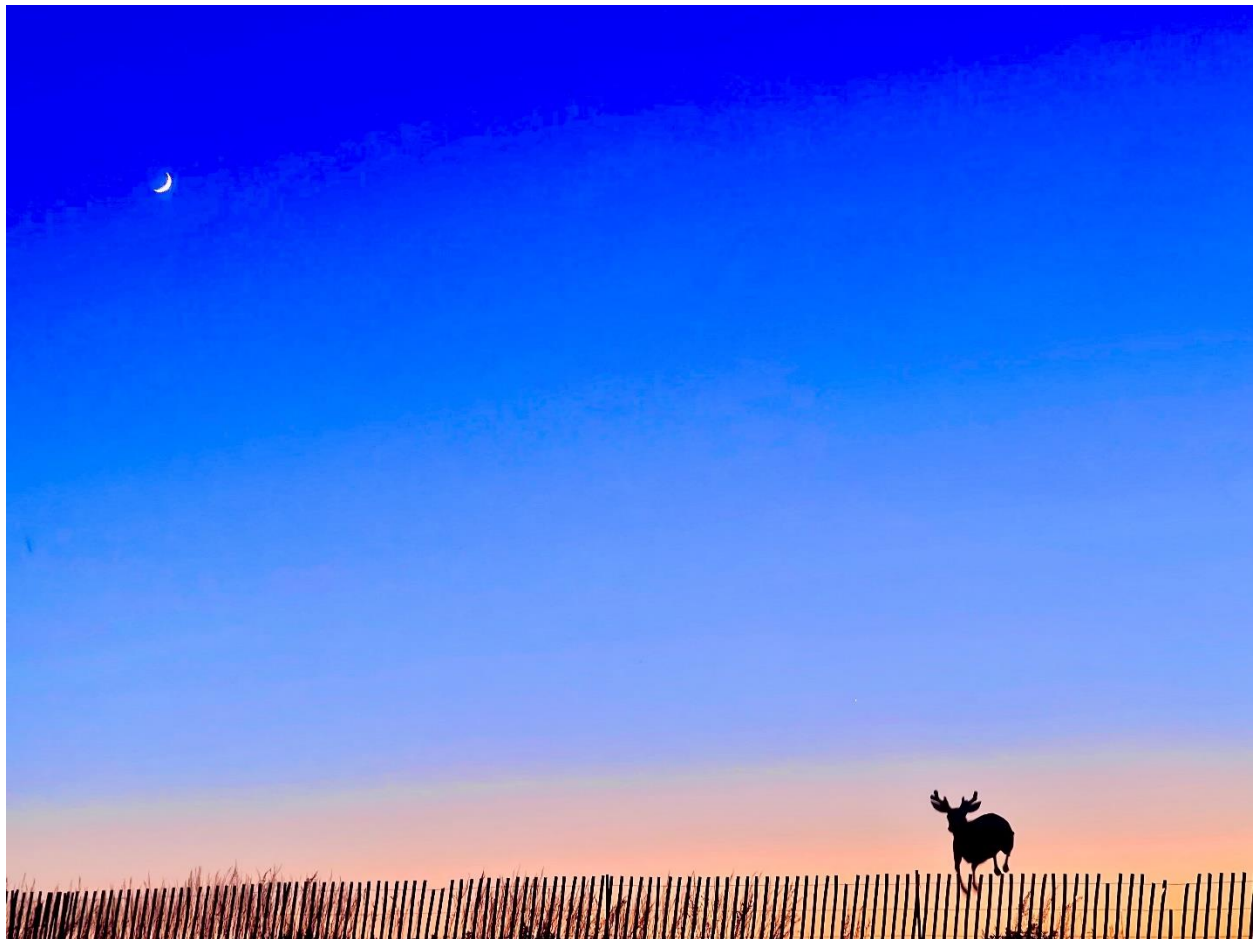


Photo: Everett Hanna

APPENDIX C3: WILDLIFE DISEASE ABSTRACTS

Anne Hubbs, Alberta Environment and Parks

Title: Harvest Management and Chronic Wasting Disease Prevalence Trends in Western Mule Deer Herds.

Abstract: We analyzed retrospective data on harvest management practices and corresponding chronic wasting disease (CWD) prevalence trends in 36 western US and Canadian mule deer (*Odocoileus hemionus*) management units (units). Our analyses employed logistic regression and model selection, exploiting variation in practices within and among jurisdictions to examine relationships between harvest management and apparent prevalence (the proportion of positive animals among those sampled). Despite notable differences in hunting practices among jurisdictions, our meta-analysis of combined data revealed strong evidence that the amount of harvest was related to CWD prevalence trends among adult male mule deer in the 32 units where prevalence at the start of the analysis period was 5%. All competitive models included the number of male deer harvested or number of hunters 1-2 yr prior as an explanatory variable, with increasing harvest leading to lower prevalence among males harvested in the following year. Competitive models also included harvest timing. Although less definitive than the number harvested, median harvest dates falling closer to breeding seasons were associated with lower prevalence in the following year. Our findings suggest harvest “when sufficient and sustained” can be an effective tool for attenuating CWD prevalence in adult male mule deer across western ranges, especially early in the course of an epidemic. Evidence of a broad relationship between the amount of harvest and subsequent changes in CWD prevalence among adult male mule deer provides an empirical basis for undertaking adaptive disease management experimentation aimed at suppressing or curtailing CWD epidemics.

Biosketch: Anne has worked as a wildlife biologist for the Alberta Government for 20 years involving big game management, decision-making science and population modeling. She has her Masters in Ecology and PhD in Zoology, and enjoys biking, x-skiing and hiking in her spare time. Managing disease risk for bighorn sheep.

Kyle Shanebeck, University of Alberta

Title: Parasitic infections an energetic burden in river otter and mink in Western Canada.

Abstract: We assessed the energetic condition of river otter (*Lontra canadensis*) and mink (*Neogale vison*) in relation to parasitic infection by helminths (cestodes, nematodes, trematodes, and acanthocephalans) in Alberta and British Columbia. Mink and river otter carcasses were obtained from licensed fur trappers during the winter of 2020-2021. Gross necropsies were performed to determine overall health and energetic condition based on fat deposits (both internal and external), reproductive mass, liver somatic index (LSI), splenic mass index (SMI), and body mass index (BMI). The respiratory tract, heart, gastrointestinal tract, liver, spleen, pancreas, omentum, kidney, adrenal gland, and bladder were examined and parasites recorded. Multiple parasites were found, including some zoonotic species of concern. Most prevalent was infection by metacercaria (third larval stage)



of Diplostomid (Digenea) parasites with over 80% of necropsied animals infected. Metacercariae burrowed into the intestinal or stomach wall, often migrating to the pancreas (most commonly), liver, kidneys, diaphragm, or abdominal musculature. Animals with moderate or severe infections showed classic signs of peritonitis and were in poorer condition, especially in terms of internal fat stores, than animals with mild or no infection. While many Diplostomids are generally not reported as serious threats to wild mammals, our findings show that parasitic infection can be a significant burden on the energetic condition of wild mammals. This is especially concerning for mustelids, which have high energetic demands. Continued monitoring of aquatic mammals, which are particularly susceptible to parasitic infection, is needed as this may have serious implications for individual health and population dynamics.

Biosketch: Kyle is a PhD Candidate at the University of Alberta (energetic effects of parasites in aquatic mammals). They have a Masters in Ecology from the University of Bremen, in collaboration with the Institute for Terrestrial and Aquatic Wildlife Research, University of Veterinary Medicine Hannover (acanthocephalan parasites of sea otters and seals).

Maria Dobbin, University of Alberta

Title: Risky Business: Relating Contact Locations with Risk of Chronic Wasting Disease.

Abstract: Chronic wasting disease (CWD) is a fatal, prion disease that infects cervids across North America and is transmitted through direct contact with infected individuals or via contaminated environments. In Alberta, CWD is exhibiting spatial patterns in disease risk as it continues to spread westwards throughout the province since it was first detected in 2005. We investigate the seasonal effects of grouping patterns and landscape heterogeneity on direct, pair-wise contacts within and between sex-specific groups of mule deer (*Odocoileus hemionus*) in eastern Alberta. First, we establish criteria based on spatial-temporal movements of collared deer to define sex-specific (same or mixed sex) group membership. Second, we model the relative probability of a sex-specific contact occurring in a locale based on landscape characteristics. Third, we relate seasonal predictions of the spatial contact probabilities to the risk of deer being CWD-infected in an area based on hunter-harvest, CWD surveillance data. We determine that predicted contact probabilities for within and between-group males during winter and between-group females during summer were the best predictors for risk of deer being CWD positive. Further, the effect of contacts among between-group male pairs during winter have an effect size 7 and 16 times greater than the within-group male contacts and between-group female contacts, respectively. These results provide insights into the mechanisms that produce spatial patterns of CWD in Alberta and can be used to inform management action and disease surveillance.

Biosketch: Maria Dobbin is a master's student at the University in Alberta in Dr. Evelyn Merrill's lab. Her research focuses on chronic wasting disease and how mule deer behaviour affects patterns in disease transmission.

Laurens Put, University of Alberta



ALBERTA CHAPTER OF
THE WILDLIFE SOCIETY

Conference 2021 | *Wildlife Without Borders*

Title: Chronic wasting disease in white-tailed deer in Alberta: Does genotype play a role in spatial risk?

Abstract: Our understanding of factors that affect transmission of chronic wasting disease (CWD) in wild cervid populations has improved through monitoring programs. Recently, white-tailed deer were found to be less likely to be CWD positive when they had mutations in the 96 gene of the PRNP (prion protein). To determine whether this genetic mutation affects CWD risk beyond demographic, temporal and landscape variables, we used a large dataset of hunter-harvested white-tailed deer samples collected for CWD testing in Alberta from 2005 to 2020. First, we modelled CWD risk in response to sex, year, distance to previous CWD cases, and variables related to the harvest site. Second, using our top model from the risk analysis, we used a subset of the data (2014 to 2017) for which genetic data was available, to determine if the number of 96S mutations (i.e., 0/1/2) improved model fit. We found including the number of 96S mutations variable improved the model, where each mutation reduced the odds of a white-tailed deer being CWD positive. Our findings highlight the need to perform genetics testing on hunter-harvested samples to understand the spread of CWD.

Biosketch: Laurens Put is a Research Assistant in Dr. Evelyn Merrill lab at the University of Alberta. He received his MSc Forest and Nature Conservation from Wageningen University in 2009. His expertise is in R, GIS and data management, but he also likes to be outside doing fieldwork.

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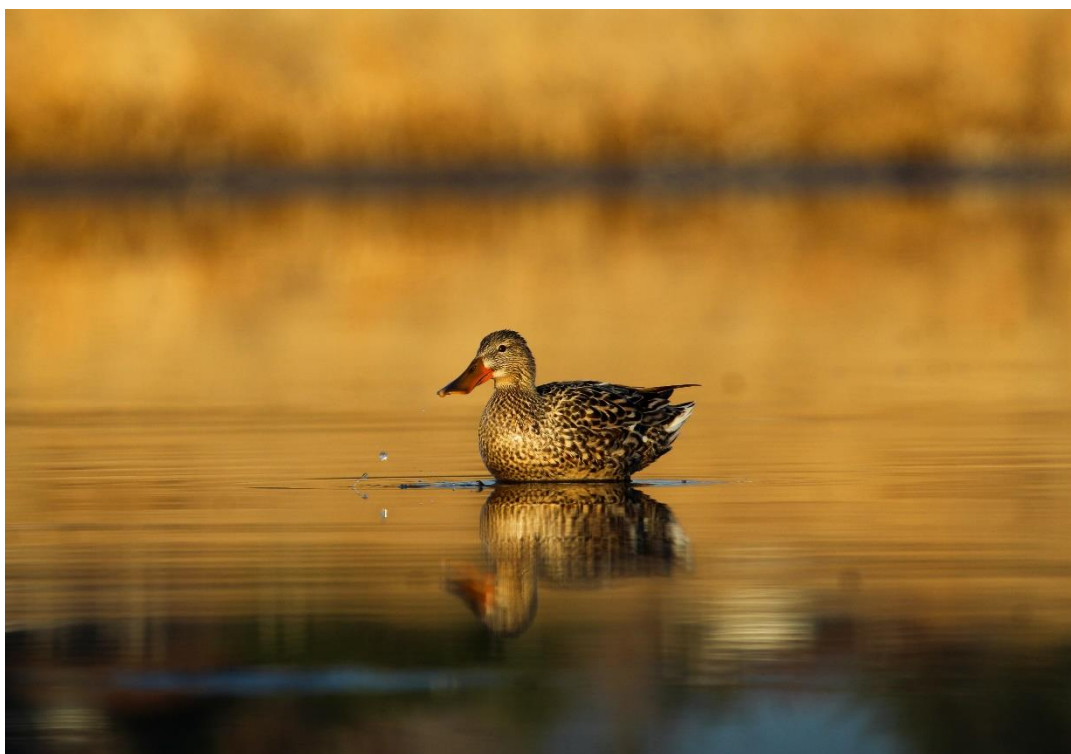


Photo: Layton McAndrew

APPENDIX D: HUMAN WILDLIFE CONFLICTS ABSTRACTS

Brianna Lorentz, University of Alberta

Title: Efficacy of translocation as a management tool for Columbian ground squirrels in Jasper National Park.

Abstract: The use of translocation to mitigate human-wildlife conflict has increased with declining public acceptance of lethal methods, particularly in protected areas. However, the outcomes of these translocations are not well understood, and there is a lack of consensus on the protocols for and benefits of this approach. In Jasper National Park, activities and burrows of Columbian ground squirrels (*Urocitellus columbianus*) sometimes interfere with the development of infrastructure and the operations of existing structures. To advance mitigation protocols, we trapped, marked, and monitored 107 ground squirrels and translocated 31 ground squirrels in family groups in 2020 and 2021. The translocated squirrels were soft-released and monitored daily using RFID tags, VHF radio collars, and systematic trapping until the end of their active period. We used Kaplan-Meier statistics to estimate and compare the survival of translocated squirrels and control squirrels at both capture (control) and release sites. Initial survival rates after translocation were only slightly lower than that of the controls within the first year, but survival to 1 year post-translocation was much lower for the translocated individuals. This survival rate may be insufficient to justify the high labour costs of moving and supporting translocated Columbian ground squirrels, which may have similar success when allowed to disperse naturally from disturbed sites.

Biosketch: I am in the third year of my Master of Science in the St. Clair Lab at the University of Alberta where I study the management of Columbian ground squirrels in Jasper National Park. My interests include human-wildlife conflict, animal behaviour, and the ecology of mammals and birds.

Sage Raymond, University of Alberta

Title: Urban-Adapted Coyotes Select Cryptic Den Sites Near Human Development.

Abstract: Coyote (*Canis latrans*) populations in cities are accompanied by increasing rates of human-coyote conflict. Several authors suggest that conflict results from the presence of pups near dens, but little is known about how coyotes select dens in urban areas. In this study, we conduct a multivariate analysis of third (i.e., home range) and fourth (i.e., den sites) order habitat selection at dens to determine whether proximity to dens is associated with reported conflict. We used snow tracking to find 120 dens in natural areas in Edmonton, Alberta, Canada and resource selection functions to assess habitat selection with remotely sensed variables (third order) and microsite habitat features (fourth order). We defined conflict encounters from comments in a community reporting database and used general linear models to assess their proximity to dens. Habitat selection models provided weak fits at the third order but strong fits at the fourth order, wherein coyotes selected for hiding cover, steep slopes, and eastern exposure. Coyotes showed weak or no responses to most metrics of human presence. Reported human-coyote conflict increased near dens and during the pup rearing period, especially outside natural areas. Our results suggest that coyotes in Edmonton den in natural areas with surprising proximity to human development, but in

microsites that minimize detection by people. Urban wildlife managers might increase public education about how to recognize potential denning habitat near residences, reduce vegetation cover where it is likely to produce conflict, and encourage public reporting of defensive coyote behaviour potentially associated with den proximity.

Biosketch: Sage is a master's student studying urban-adapted coyotes in Edmonton as part of the Edmonton Urban Coyote Project, under the supervision of Dr. Colleen St. Clair. They integrate analytical techniques with field methods such as snow tracking with goals to reduce human-wildlife conflict.

Claire Edwards, University of Alberta

Title: Aversive conditioning of grizzly bears in Kananaskis Country, Alberta, Canada.

Abstract: Grizzly bears (*Ursus arctos*) were listed as a threatened species in Alberta in 2010. Since then, population numbers in Alberta have expanded, alongside an increase in human-bear conflict. Parks and protected areas provide important refugia for threatened populations of grizzly bears. In such areas, bears frequently experience neutral events with humans, leading to habituation. This adaptation by adult female bears may enhance offspring survival by shielding them from infanticidal male bears, but habituated bears can pose challenges for wildlife managers tasked with visitor safety. Management jurisdictions address human-bear conflict with a suite of tools, including aversive conditioning and hazing. These tools apply negative (noise or pain) stimuli to bears with the goal of increasing wariness and reducing proximity to people. In Kananaskis Country, Alberta Parks has conducted hazing and aversive conditioning since 2000 with a corresponding 50% reduction in grizzly bear mortality and relocations within the core of the park. Our goals are to quantify conditioning tools and protocols and relate them to immediate and medium-term bear responses. From 2000-2019, 51 marked, (and many unmarked) grizzly bears were conditioned 7572 times, with a range of 1-1014 actions/bear. Female grizzly bears were targeted in 64% of conditioning actions. When females were accompanied by cubs (25% of occurrences), over 99% of the time cubs were less than 2 years of age. Preliminary data from five adult females also showed that conditioning actions and proximity to human use features declined as bear age increased, suggesting that aversive conditioning can help reduce conflict-associated behaviour.

Biosketch: Claire is an MSc. student at the University of Alberta, where she is studying human-bear conflict management, trying to better understand correlates for success of hazing and aversive conditioning programs for bears.

Gabrielle Lajeunesse, University of Alberta

Title: Preliminary Results from a Community-Based Aversive Conditioning Program of Urban Coyotes (*Canis latrans*) in Edmonton.

Abstract: Coyotes (*Canis latrans*) are increasingly common in urban areas across North America where they may occupy residential neighborhoods, den underneath houses, and approach or attack people or pets. Many governmental entities recommend aversive conditioning, or hazing, as a humane way to deter urban coyotes from approaching people, but there are few guidelines for implementing this technique. This project aims to develop and refine the use of aversive conditioning by members of a community as a cost-effective and humane tool to reduce human-



coyote conflict. In 2021, the program used a before-after-control-impact design in treatment and control neighbourhoods from February-May wherein 76 volunteers in 28 neighborhoods patrolled designated areas for both coyotes and attractants. When coyotes were observed, volunteers measured the overt reaction distance and flight initiation distance as they walked towards the coyote. When volunteers were within 40 m of coyotes, they either receded (control) or hazed (treatment). Volunteers spent 569 hours patrolling, submitted 656 patrol forms, described 64 coyote sightings, and conducted aversive conditioning five times. Coyotes receded from volunteers 80% of the time when they were observed and 100% of the time when they were conditioned. Coyotes were observed again in neighborhoods an average of 9.72 days later when no conditioning occurred and 37.4 days later when it did. These results suggest that aversive conditioning can increase wariness and reduce daytime sightings of coyotes in residential areas, but more data will be gathered in 2022.

Biosketch: Gabrielle is a second year master's student in Ecology at the University of Alberta. She is the co-founder of the Urban Coyote Intervention Program, a community-based aversive conditioning program that aims to increase wariness in coyotes that occupy residential areas and contribute to human-coyote coexistence.

Andrea Morehouse, Waterton Biosphere Reserve/ Wlnisk Research and Consulting

Title: Dealing With Deadstock: A Case Study of Carnivore Conflict Mitigation From Southwestern Alberta.

Abstract: Livestock deaths are a reality for livestock producers and disposal options for dead livestock (i.e., deadstock) can have ecological implications. Before the 2003 detection of bovine spongiform encephalopathy (BSE) in Canadian cattle, rendering companies removed deadstock for free. Post BSE, they charged producers for deadstock removal to offset costs associated with new regulatory requirements, which resulted in increased on-farm disposal of deadstock. This increase has ecological implications because deadstock are a major attractant for large carnivores, bringing them near other agricultural attractants like stored grain and feed and living livestock, which can exacerbate conflict. To help mitigate deadstock-associated conflicts, the Waterton Biosphere Reserve's Carnivores and Communities Program (CACP) supported community deadstock removal efforts beginning in 2009, including reimbursement of on-farm removal costs, bear-resistant deadstock bins, and a livestock compost facility (operational 2013-2014). We present a case study describing the development, implementation, and results of the deadstock removal program. We tracked the number of head of livestock removed each year, the number of participating landowners, the average cost per head, and total program costs. We also assessed participants' perspectives of the deadstock removal program. The CACP has removed 5,400 livestock carcasses, representing between 15.3 and 23.0% of available carcasses in the program area; 67.3% of livestock owners indicated they use the program for deadstock disposal. Average cost to compost an animal was significantly less than other removal methods (\$36.89 composting vs. \$79.59 non-composting). We conclude by discussing ecological and social implications for deadstock removal and make suggestions for future management considerations.



Biosketch: Andrea Morehouse is an independent scientist who works on a variety of conservation and management issues related to large carnivores in multi-use landscapes. She moved to Alberta in 2007 and completed both an M.Sc. and Ph.D. in ecology at the University of Alberta. is a past president of the Alberta.

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Photo: Michael Schumacher



APPENDIX E: SOCIAL SCIENCE RESEARCH AND CONSIDERATIONS IN WILDLIFE MANAGEMENT ABSTRACTS

Brian Joubert, Alberta Environment and Parks

Title: Hunters' and non-hunters' wildlife value orientations – Cooking Lake Blackfoot PRA visitors.

Abstract: Over the past century, the increasing modernization of society and urbanization in North America have contributed to a shift from a value orientation of domination (which emphasizes human benefits from the environment), to one of mutualism (which emphasizes a more biocentric philosophy that places value on healthy environments and wildlife). The use of value orientations has been widely applied to explore relationships between acceptability of hunting wildlife populations and specific wildlife management methods (Zinn et al., 1998; Whittaker et al., 2006). Value orientations may be able to better predict the general acceptability of wildlife management population control methods with more accuracy than acceptability to specific management situations or actions (Whittaker et al., 2006). Using the Wildlife Value Orientations scale (Manfredo et al., 2009), we investigated the wildlife value orientations of Cooking Lake-Blackfoot PRA visitors to explore and understand differences in perspectives about wildlife among hunters and non-hunters. Data were collected from PRA visitors using multi-mode sampling; responses were received from 362 hunters and 173 non-hunters. We review the dimensions of wildlife value orientations, including the appropriate use of wildlife, development beliefs, social affiliation, and caring beliefs to illustrate the differences and similarities in the perspectives that hunters and non-hunters have towards wildlife. We discuss the implications of these different perspectives for the management of wildlife in the Cooking Lake-Blackfoot PRA, and in Alberta more generally.

Biosketch: Brian Joubert is currently the manager of licensing for Alberta Fish and Wildlife. His career spans applied management of wildlife, protected areas and nature-based tourism, as well as more recent experience in the policy, planning and legislative aspects of conservation. He has a strong interest in the human dimension of conservation, especially how our values and attitudes, shaped by culture and social norms, influence how we perceive conservation, and interact with fish and wildlife.

Howie Harshaw, University of Alberta

Title: Understanding and characterizing the potential for conflict between hunters and non-hunters in the Cooking Lake-Blackfoot PRA.

Abstract: Challenges to modern conservation approaches often have a human dimensions element. The potential for conflict between hunters and non-hunters poses threats to the continued access for hunting at public mixed-use sites in the province. Understanding and characterizing the potential for conflict at the Cooking Lake-Blackfoot Provincial Recreation Area (PRA) east of Edmonton will help to identify sources of conflict before they become major issues. Recreation conflict is not just an outcome from competition over scarce resources; it is understood as interference between actors that is attributable to their behaviour. Recreation conflict has been conceptualized as two broad types. Interpersonal occurs when there is an encounter between recreationists that disrupts



the actors? planned activities through disturbance, subtraction of the shared resources, or unsafe behaviour. Social values conflict does not necessarily require any physical encounters, but occurs between individuals/groups who do not share similar values or norms. We investigated how hunters and non-hunters share the landscape at Cooking Lake-Blackfoot PRA, and the current state of, and potential for, interpersonal and social values conflict between hunters and non-hunters in the PRA. Data were collected from PRA visitors using multi-mode sampling; responses were received from 362 hunters and 173 non-hunters. We demonstrate the asymmetrical nature of recreation conflict, and report on the potential for conflict for 8 visitor behaviours. Recommendations for conflict reduction are presented.

Biosketch: Dr. Howie Harshaw examines the human dimensions of natural resources, with an emphasis on outdoor recreation in an effort to understand the relationships that people have with nature, and to investigate the interactions of resource development and quality of life.

Annie Loosen, University of Northern British Columbia/ Yellowstone to Yukon Conservation Initiative

Title: Who, what, when, where: Evaluating recreational use from multiple data sources in western Alberta.

Abstract: The global pandemic has underscored the need for people to connect to nature, with outdoor recreation skyrocketing in recent years. However, poor recreation planning, management, or enforcement can have varying impacts on wildlife, such as displacement from winter home ranges or cause a switch from daytime to strictly nighttime movements. It can also create conflict among user groups, who possess different values about outdoor experiences. Yet, the appropriate tools to monitor recreational use have not been evaluated, particularly the strengths and weaknesses of different data sources at varying scales. In a 12,500 km² study area, we gathered five data sources for monitoring winter and summer, motorized and non-motorized recreation: remote trail cameras, trail counters, local recreation experts, social media including smartphone fitness applications, and aerial surveys. Our study area includes federally and provincially protected areas in the Rocky Mountains and Alberta Eastern Slopes, in addition to public and private lands. We are mapping the intensity of recreational use by data source and at different spatial scales to evaluate congruence, and identify areas of spatial overlap or disconnect. As well, we will correlate winter recreation data from aerial surveys and social media, a rapidly growing source of information about human-use. Next steps include developing comprehensive models of human use across seasons and activity types and developing functional models of disturbance of key wildlife species. The results of this research will help governments, conservation and recreation groups to identify which data source(s) are best suited to reach respective monitoring and management goals.

Biosketch: Annie is a post-doctoral researcher at the University of Northern British Columbia and Yellowstone to Yukon Conservation Initiative where she is evaluating how motorized and non-motorized recreation influences wildlife. Annie enjoys long walks on the proverbial beach, and really likes potato chips.

Matthew Pyper, Fuse Consulting Ltd.

Title: Conservation Success Stories - What makes them tick?

Abstract: Conservation can often feel like a problem driven field, whereby key players are working to understand, avoid, and reduce negative impacts on the environment. This inherent focus on problems can lead to feelings of pessimism regarding the potential to solve environmental problems and make advances towards collaborative solutions. However, success stories are more common than one might expect and there are important lessons to be learned from past and ongoing conservation successes. To explore conservation success stories and what key drivers led to their success, we completed a brief study that focused on analyzing four key conservation success stories in Western Canada: grizzly bear conservation (Alberta), the creation of the Castle parks (Alberta), the protection of the Peel watershed (Yukon), and Vancouver Island marmot conservation (British Columbia). Topics were selected based on peer feedback collected via Twitter and by emailing key players in the land management and conservation discipline in Canada. In our list of respondents, we endeavored to have balanced representation from academia, industry, ENGOS and government, and gender parity. We completed research on each topic and conducted a series of interviews with key individuals involved in each success story. A total of five key themes emerged: 1) conservation takes time, 2) opportunism leads to success, 3) you can't do it alone, 4) clear and common goals are key, and 5) science is important but it is not enough. We will explore these concepts in more detail and share observations about how they can be leveraged.

Biosketch: Matthew Pyper is an Ecologist and Science Communicator, and Principal of Fuse Consulting. He and his team work everyday to find creative ways to communicate science and facilitate conversations on topics related to forest ecology, conservation biology and land restoration. He is an M.Sc. graduate of the University of Alberta.

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Photo: Michelle Hoang