

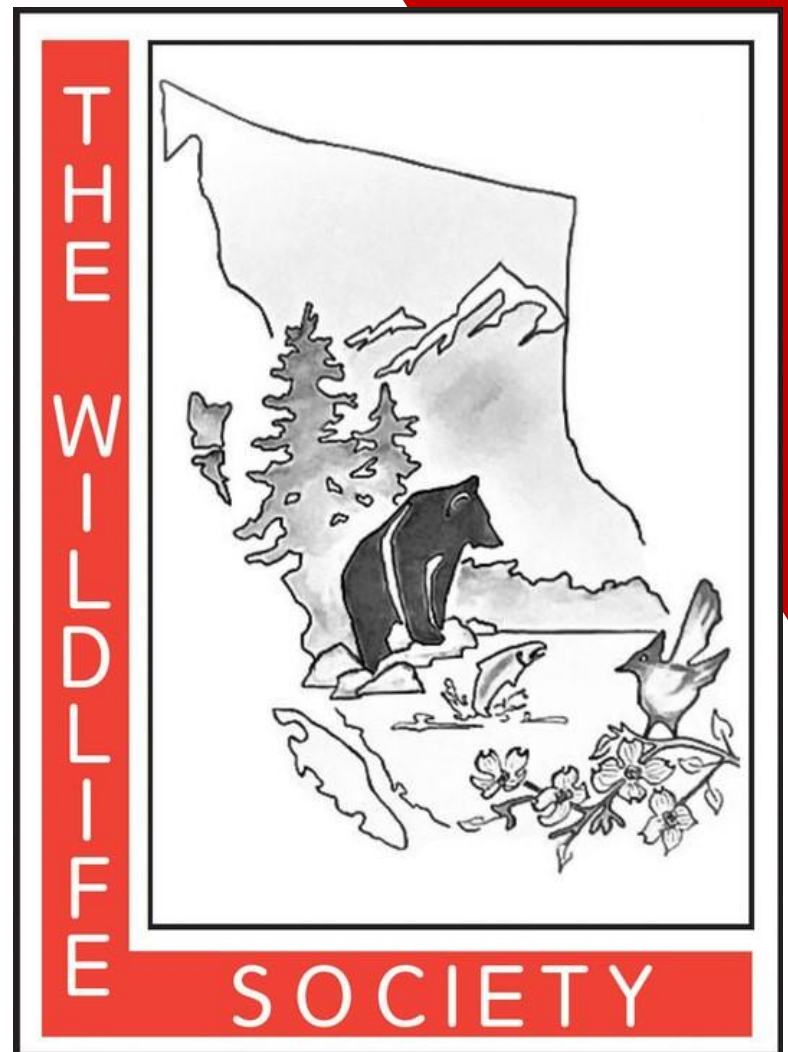
BC Chapter of The Wildlife Society

Program Guide

**3rd Annual
Conference**

Wildlife in a Burning World

**March 13 – 16, 2024
Delta Hotel
Kamloops, BC**



British Columbia Chapter

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President's Welcome from the BC Chapter of The Wildlife Society

Dear BC-TWS and Conference Attendees,

It is my sincere pleasure to welcome you to the 2024 BCTWS Conference, with the theme, Wildlife in a Burning World!

Last year's conference in Victoria was energizing. I felt the excitement in the room from each person, whether it was their first or hundredth conference. People were unfailingly kind and considerate to one another, and for myself as a young professional, I felt supported by all at the conference centre. Thank you for trusting us, your BCTWS executive board, by continuing to attend these awesome events.

This conference is located on Tk'emlúps te Secwépemc territory. We are incredibly privileged to be here. There are many talks and posters this week that will provide examples for working together in meaningful ways – and how to uphold protocols and multiple sets of ethics. The projects that BCTWS members are engaged in span the territories of dozens of First Nations in BC and beyond. We express our gratitude to the people, lands, waters and animals who we get to work with. There's more (much more) work to be done – and we are looking forward to seeing our members progress the status quo.

Students, consultants, First Nations Guardians and representatives, government biologists, professors, non-profit leaders and organizers are gathering this week in Kamloops, spanning many study areas geographically and taxonomically. I encourage you to take the time to chat with someone whose name you've seen online but haven't had the pleasure of meeting yet, and to nurture relationships within the BCTWS community. I cannot express my gratitude enough to each and every one of you for attending and keeping the vibes high.

If you see one of the representatives from our generous sponsors, it would be wonderful of you to thank them – you will see their logos displayed on screens, as well as some booths. Please also consider spending FAR too much money on the silent auction that will run Thursday and Friday – there are some dreamy vacation options in there!

I thank you for your attendance, energy, questions and appreciate you contributing to the current and future landscape of wildlife professionals in the province and across the country.

Sincerely,



Alexia Constantinou

President BCTWS / 2024 Conference Co-Chair

BCTWS 2023/24 Committee

Past-President:	Julie Kanya
President:	Alexia Constantinou
President-Elect:	VACANT
Treasurer:	Bill Harrower
Secretary:	Rod Davis
Director - Student Liaison:	Agnès Pelletier
Director - Communications:	Cayla Naumann
Director at Large (Conference Co-Chair):	Joanna Burgar
Director at Large (Conference Co-Chair):	Jason Fisher
Director at Large:	Krycia Tuttle
Director at Large:	Catherine Denny
Director at Large:	Erin Tattersall

Conference Coordination

Conference Coordination: Joanna Burgar, Jason Fisher, Alexia Constantinou
Communications: Alexia Constantinou
Social Media and Marketing: Cayla Naumann
Registration: Rod Davis
Panels: Joanna Burgar, Rod Davis
Digital Program: Alexia Constantinou, Krycia Tuttle
Budget: Bill Harrower, Joanna Burgar
Student Liaison: Agnès Pelletier
Volunteer Coordinator: Agnès Pelletier, Rod Davis
Fundraising: Catherine Denny, Jason Fisher
Silent Auction: Catherine Denny, Jason Fisher
Photo contest: Erin Tattersall
Venue and Social: Joanna Burgar, Jason Fisher
Special thanks to Karl Larsen at TRU for help with conference planning.

Volunteers

Special thanks to all the other volunteers that helped with the conference, particularly our moderators, student talk judges & the TRU TWS Student Chapter, who have generously planned social events throughout the week and have assisted with registration!

Our Platinum Sponsors



HABITAT CONSERVATION
TRUST FOUNDATION



WILD SHEEP SOCIETY
— OF BRITISH COLUMBIA —



SUSTAINABLE
FORESTRY
INITIATIVE

Teck

THANK YOU!!!

Our Gold Sponsors



Our Bronze Sponsors



Migrations

THANK YOU!!!

Silent Auction Donors

Make sure to bid on the silent auction donations during the breaks and Friday evening poster session.

Silent Auction closes Friday, March 15 – 6 PM



RED COLLAR BREWING & DISTILLING CO.



Organizations donating complimentary coupons or tickets for attendees:



THANK YOU!!!

General Information

Venue: Kamloops Delta Hotel
[540 Victoria Street, Kamloops BC V2C 2B2](#)
[Downtown Kamloops Hotel, Canada | Delta Hotels Kamloops \(marriott.com\)](#)

Complimentary basic wifi is available throughout the Delta Hotel Kamloops. Basic wifi is suitable for checking emails and light web browsing.

Registration Desk: Located in front of the Ridge Room and outside the Rivers Ballroom (main conference room), except Wednesday afternoon when registration will be outside the Mountainview Terrace Room (2nd floor, next to the pool). The registration desk will be open:

- Wednesday March 13 3:00 pm – 6:00 pm
- Thursday March 14 8:00 am – 10:00 am
- Friday March 15 8:00 a m – 10:00 am
- Saturday March 16 8:30 a m – 9:00 am.

Conference presenters should check in here to upload their presentation and confirm poster location. Please arrive early on the day of your presentation to allow time for uploading.

Lunch Breaks: Lunch breaks are scheduled from ~12:00 pm-1:15 pm and are on your own for March 14 and provided March 15. There are many great dining options in the vicinity of the conference centre. We highly recommend joining with other conference goers to continue to network over lunch!

Refreshment and Networking Breaks: Coffee, tea, and snacks will be served during all networking breaks in the Rivers Room. Please note that there is a water station - feel free to bring your reusable water bottles.

Welcome Social: Please join us for the Welcome Social, with light snacks (including vegan and gluten free options) free of charge and a cash bar, on Wednesday March 13th from 3:00 pm – 6:00 pm in the Mountview Terrace.

Offsite Evening Social: Everyone 19+ is welcome to the evening conference social Thursday March 14th (doors open at 5:00 pm) at the Noble Pig – 650 Victoria Street. There will be a special presentation by the naturalist Frank Ritcey at 6:00 pm and light snacks (including vegan and gluten free options) will be provided free of charge. The social is hosted by the BC Chapter. Conference goers as well as friends, colleagues and partners are all welcome to attend.

Poster Session: Please join us for the Poster Session, with light snacks (including vegan and gluten free options) free of charge and a cash bar, on Friday March 15th from 4:00 pm – 6:00 pm in the Mountview Terrace.

Offsite Wildlife Trivia: Join fellow conference goers for a fun social hosted by the TRU TWS Student Chapter at the Frick & Frack (577 Victoria Street) at 6:30 pm on Friday, March 15. Wildlife trivia will start promptly at 7:00 pm.

Silent Auction:

Silent auction items will be displayed in the Rivers Ballroom during the conference. Participants are encouraged to bring items to donate for this fundraising auction. Proceeds help to defray the costs of this and future conferences for students and young professionals and ensure maximum participation and professional development opportunities.

Auction bids close Friday, March 15 at 6:00 pm, with 2 pickup options: Friday from 6:05 – 6:20 pm and Saturday from 8:00 – 8:30 am. Winners to be listed at registration desk and will need to be present for pickup. Any items not claimed by 11:00 am on Saturday will be offered to the second-highest bidder.

Conference Communicable Disease Policy

Covid-19 and other respiratory diseases continue to prevail.

The following protocols will be in place for the 2024 BCTWS conference:

1. The conference will abide by guidelines and directives issued by the British Columbia Provincial Health Officer and provincial health authorities.
2. Wearing masks during indoor venue events will be encouraged but not required. This policy is subject to change dependent on any health authority directives in place at the time of the conference. A supply of medical masks and sanitizer stations will be provided at the venue.
3. Please do not attend the conference if you are feeling ill. We ask that every person self-monitor for symptoms of illness before entering the event each day. If you are feeling feverish, have a persistent cough, or are otherwise experiencing potential symptoms of Covid-19, please do not enter the event. Registration refunds may be arranged by contacting BCTWS by email at tws.bc.chapter@gmail.com.
4. Attendees should at all times follow directions that may be given by event or venue staff, to ensure the safety and comfort of all event attendees. We look forward to everyone enjoying a healthy, safe and productive event.

Conference Social

Join us for beverages, free food, a special guest presentation,
and networking at the
Noble Pig on Thursday, March 14



Must be 19+. Doors open at 5:00pm; Frank Ritcey at 6 pm. 650 Victoria Street.

[The Noble Pig | Inspired food. Unique brew.](#)

TRU Student Chapter Quiz Bowl Event Trivia Night – Friday, March 15 | 7 PM



Doors open at 6:30pm. Trivia starts at 7pm

Frick & Frack, 577 Victoria Street; www.frickandfrack.ca

Detailed Schedule: Thursday March 14 (morning)

Time	Thursday March 14
8:00	
8:05	
8:10	
8:15	Registration Table Opens
8:20	
8:25	
8:30	
8:35	
8:40	
8:45	
8:50	
8:55	
9:00	
9:05	
9:10	
9:15	
9:20	Opening Remarks
9:25	Opening Prayer – Joanne Brown
9:30	Welcome from the BCTWS President & Conference Chairs
9:35	
9:40	Wildfire & Wildlife Panel
9:45	
9:50	
9:55	
10:00	
10:05	
10:10	
10:15	
10:20	
10:25	
10:30	
10:35	Networking & Refreshments
10:40	
10:45	
10:50	Jason Fisher - Trails, blazing: How fire in boreal systems affects mammal communities, against the backdrop of forest harvesting and petroleum development.
10:55	
11:00	
11:05	Meghan Allan - Influence of Fire on Vegetation Community and It's Impacts to California Bighorn Sheep Forage in Skeetchestn Territory
11:10	
11:15	
11:20	Mackenzie Howse - Pollinators in the Pyrocene: Hymenoptera & Lepidoptera & Diptera, Oh My!
11:25	
11:30	
11:45	Katrina Moretti - Use of Beavers for Hydrological Mitigation
11:50	
11:55	Kiah Allen - How do you like your fire? Utilizing prescribed fire as an ecosystem restoration and resiliency tool.

Detailed Schedule: Thursday March 14 (afternoon / evening)

12:00	
1:00	
1:05	<i>Lunch on your own</i>
1:10	
1:15	Tai Avgar - Woodland caribou population viability in a fiery future
1:20	Olivier Jumeau - Post-wildfire caribou habitat and lichen regeneration in Uikatcho Territory, British Columbia
1:25	Hailey Wynnyk - A Stress Indicator in Mule Deer Potentially Used to Assess Ecological Disturbance,
1:30	
1:35	Rory Fogarty - Forestry, fire, and fur: Factors influencing population densities of endangered fishers (<i>Pekania pennanti</i>) in central interior British Columbia
1:40	
1:45	Alexia Constantinou - Rapid-Fire Response Needed: An Analysis of the Columbian Fisher Population in British Columbia
1:50	Joanna Burgar - Balancing Act: Navigating the Future of Fishers through Innovative Modeling and Landscape Planning
1:55	Shannon Werden - Identifying Habitat Factors Affecting Fisher Reproductive Output in BC
2:00	Mae Frank - Foraging, food, and fishers: what do fishers in the Central Interior of BC eat?
2:05	Faye d'Eon-Eggertson - Movements patterns of wolves on barren-ground caribou ranges in northern Canada
2:10	
2:15	Siobhan Darlington - Seasonal cougar dietary plasticity, specialization, and similarity across a gradient of land-use change in the southern interior of British Columbia
2:20	
2:25	
2:30	<i>Networking & Refreshments</i>
2:35	
2:40	
2:45	
2:50	Lindsay Whitehead - In the Wake of Wildfire: Unraveling Direct and Indirect Effects of Wildfire on Western Rattlesnakes (<i>Crotalus oregonus</i>)
2:55	
3:00	
3:05	Veronica McKelvey - Hibernation site selection of three sympatric snake species
3:10	
3:15	Erin Blythe - Small mammal abundance and <i>Crotalus oregonus</i> (Western Rattlesnake) body condition,
3:20	Angus Smith - Understanding Roosevelt Elk on Vancouver Island: habitat selection, migration, and dispersal
3:25	Jessica D. Derksen - The Impact of Roadway Mortality on a Long-Lived Freshwater Turtle: Pre- and Post-Mitigation Assessment
3:30	Carley Dolman - American Bullfrog Management in the West Kootenays
3:35	<i>buffer</i>
3:40	
3:45	<i>Film Viewing (BCWSS)</i>
3:50	
3:55	
4:00	
4:05	
4:10	
4:15	
4:20	
4:25	
4:30	TRU - Seminar Series (Andrea Lyons)
4:35	
4:40	
4:45	
4:50	
4:55	
5:00	Social - Noble Pig 19+ event (appies provided) Frank Ritcey @ 6 pm (doors open 5:00 pm) Photo Contest Voting
late	

Detailed Schedule: Friday March 15 (morning)

Time	Friday March 15
8:00	Registration Table Opens
8:05	
8:10	
8:15	
8:20	
8:25	
8:30	Welcome - Hunter Lampreau
8:35	
8:40	
8:45	buffer
8:50	Conservation Affairs Committee Panel
8:55	
9:00	
9:05	
9:10	
9:15	
9:20	
9:25	
9:30	
9:35	
9:40	
9:45	
9:50	
9:55	
10:00	
10:05	
10:10	
10:15	
10:20	Networking & Refreshments
10:25	
10:30	
10:35	
10:35	Kathleen Carroll - Indigenous-led research on traditional territories highlights the impacts of forestry harvest practices on culturally important plants,
10:40	Erin Tattersall - Affirming Indigenous Data Sovereignty in wildlife monitoring in the era of Open Data
10:45	Bill Harrower - American Goshawk habitat management in British Columbia, bridging fine- and coarse-scale approaches
10:55	
11:00	Emily Lomas - BC Ferret Pig Update
11:05	
11:10	Kara Atkinson - Taming the mouse: Getting a grasp on small mammal population dynamics in grassland communities
11:15	Clara Boisclair B. - Evaluating the influence of habitat characteristics on Pika abundance and distribution in Mount Revelstoke and Glacier National Parks
11:20	Ryan Way - Environmental Preferences of Oregon Forest Snails
11:25	Kristen Mancuso - Yellow-breasted Chat monitoring in the West Kootenays
11:30	Sydney - Tracking the long-distance migration and abundance of Wilson's phalaropes (Phalaropus tricolor) at saline lakes across the western hemisphere.
11:35	Kelsey Freitag - Examining Impacts of Climate Change and Habitat Loss on the Distribution and Abundance of Long-billed Curlews, a Species at Risk in Canada
11:40	Lorena Munoz - The evolution of song and colour in the family Thraupidae
11:45	Alison Lundgren - Biotic Interactions as Limiting Factors of Burrowing Owls (Athene cucularia) in British Columbia

Detailed Schedule: Friday March 15 (afternoon / evening)

11:50	
12:00	Lunch Provided
1:00	BCWP - Wildlife Exhibit in Rivers Ballroom
1:05	
1:10	
1:15	Steve Wilson - Do Our Models Predict or Explain?
1:20	Shae Turner - Evaluating the role of prealternate molt in carry-over effects from overwintering to migration for Neotropical migratory warblers
1:25	Luis Gerardo Gomez Vargas - Attractive or inconspicuous? Male density, but not colour, predicts extra-pair paternity in mountain bluebirds.
1:30	
1:35	Marissa Dyck - Dracula's Ménagerie- Understanding carnivore community ecology in the Romanian Carpathians
1:40	
1:45	Cole Burton - Mammal responses to global changes in human activity vary by trophic group and landscape
1:50	Katherine Andy - Take a walk by the river: Exploring how human-caused development and stream channel morphology influence the utility of riparian areas for mammalian communities
1:55	Jamie Clarke - Camera traps for density estimation: an eye to improving the science that guides management
1:55	buffer
2:00	
2:05	
2:10	Migrations Demo
2:15	
2:20	
2:25	Networking & Refreshments
2:30	
2:35	
2:40	
2:45	
2:50	Adam Ford - The moose in the room - the most politically important species in Canada,
2:55	
3:00	
3:05	Sydney Goward - Remote cameras sample mountain ungulate population demography as compared to aerial surveys in an Indigenous-led community-based monitoring program
3:10	
3:15	Larisa Murdoch - Assessing and comparing habitat selection across three herds of bighorn sheep ewes in the Kamloops region
3:20	Andrew Barnas - Evolving prey behavioural responses to predators: Applications of individual based artificial neural network genetic algorithms to investigate caribou-wolf interactions
3:25	Calen Wong - Movement ecology and road mortality for three threatened species of snakes in the South Okanagan
3:30	
3:35	Kevin White - Life-history trade-offs and climatic variability influence mountain ungulate reproduction
3:40	
3:45	
3:50	Darren Sleep - Adapting Sustainable Forestry to a Burning World
3:55	
4:00	Poster Session
4:30	Cash Bar & Light Snacks Provided
5:00	Julien Gullio; Olivier Jumeau; Isabel Deutsch; Steffani Singh; Myung Jin (John) Kang; Josie Cumming; Marissa Chaille;
5:30	Elisha Miller; Megan Braun; Emerald Arthurs; Jenna Watson; Joanna Burgar; Cindy Hurtado; Alessandro Freeman; Victoria Harbo; Robin Naidoo; Zoe Konanz; Tazarve Gharajehdaghipoor;
6:00	Kwasi Wensford
6:30	Student Quiz Bowl Doors @ 6:30 pm Trivia @ 7 pm Frick n Frack
late	

Detailed Schedule: Saturday March 16

Time	Saturday March 16
8:30	8:30 Registration Table Opens
8:35	
8:40	
8:45	
8:50	
8:55	
9:00	BCTWS AGM
9:05	
9:10	
9:15	
9:20	
9:25	
9:30	
9:35	
9:40	
9:45	
9:50	
9:55	
10:00	Networking & Refreshments
10:05	
10:10	Emmanuel Mercier - Effects of shoulder season temperature variability on population persistence from transition matrix models
10:15	
10:20	
10:25	Samantha Gidora - eDNA air sampling for bats: Implications for mine reclamation and closure
10:30	
10:35	Closing Keynote - Ed Struzik
10:40	
10:45	
10:50	
10:55	
11:00	
11:05	
11:10	
11:15	
11:20	
11:25	
11:30	Student Winners Announced & Closing Remarks
11:45	
11:50	
11:55	
12:00	Lunch On Your Own
1:00	<p>Field Trips Leave Delta @ 1 pm, return by 4:30 pm</p> <p>BCWP 1:30 - 2:30 pm - Burrowing Owl talk and tour 2:30 - 3:15 pm - rehab facility / Kirk the caribou / other points of interest 3:15 - 3:45 - time to explore the park ~4 pm - bus leaves BCWP (arrives Delta by 4:30 pm)</p> <p>Wild Sheep Viewing Travel via bus to known sheep locations; hiking unlikely considering weather conditions and sheep locations. Arrive back at the Delta between 4:00 and 4:30 pm</p>
4:25	

Presentation Information

Day 1: Welcome, Wildlife and Wildfire Plenary, Rapid-Fire and Contributed Talks, BCWSS Film Viewing, Social (March 14)

- **Opening prayer – Joanne Brown**

Joanne Brown is a member of the Cheslatta Carrier Nation, L'silu clan, born and raised in her home territory near Burns Lake, British Columbia. She moved to Secwépemc'ulucw from Prince George in 1996. Joanne's previous work with Employment and Immigration Canada, as well as her studies in geography and anthropology (TRU) made a natural fit with an occupation in Indigenous post-secondary education. She is grateful for her amazing community, especially working with neighbours and friends.

- **Welcome by the BCTWS President & Conference Chairs**

- **Wildfire and Wildlife Plenary**

Understanding the challenges and benefits for wildlife in a burning world, both locally and provincially, and consideration of mechanisms to effectively manage and conserve wildlife in a burning world.

Moderator:

Joanna Burgar (BCTWS Director)

Panelists:

Jill Harvey – Thompson Rivers University

Andrea Lyons – Washington Conservation Science Institute

Leith McKenzie – Director Forest Investment and Reporting Branch, BC Gov

Lisa Tedesco – BC Government perspective

Francis Johnson – Industry perspective

- **Social @ Noble Pig with special guest presentation by Frank Ritcey**

fritcey@hotmail.com

Frank was raised in the wilds of Wells Gray Provincial Park and has spent much of his life connected to nature in one way or another. His interests are varied from his work with the BC Conservation Foundation as a human/wildlife conflict coordinator to his time in the field as a wildlife videographer. Retired now, he spends as much time as possible in the field with his camera and is always happy to share his latest captures with a like-minded audience.

Day 2: Conservation Affairs Committee Plenary, Rapid-Fire and Contributed Talks, Poster Session, Student Quiz Bowl (March 15)

- **Welcome – Hunter Lampreau**

Hunter Lampreau is a member of the Secwépemc Nation, Neskonlith on his mother's side, Simpcwemc on his Fathers. He was given the Secwépemc name of Peyecw7, which means 'provider for his own' at birth by his kye7e, Mary Thomas Sr. Growing up immersed in cultural activities on the land, he developed a connection, and admiration for the resources Secwépemc culture relies on for its continuity. Recognizing the trends of decline in wildlife, habitat and cultural resources, he elected to pursue a career in environmental policy, grounded in the teachings of the Skú7pecen Telling, and the necessity for the new era of environmental policy to recognize and enable governments to Walk on Two-Legs. Hunter strongly believes the paradigm shift required to establish effective environmental stewardship policies is intertwined with the need for systemic transformation that builds bridges between cultures, and allows for Secwépemc principles, laws, and jurisdiction to be recognized and respected.

- **Conservation Affairs Committee Plenary**

Moderator:

Rod Davis (BCTWS Secretary)

Panelists:

Celine Davis – Ministry of Water, Land and Resource Stewardship (virtual)

Andrea Barnett – Ministers Wildlife Advisory Council

Adam Ford – Ministers Wildlife Advisory Council

Jennie McCaffrey – BC Parks Foundation

Stewart Guy – BC Nature

Day 3: BCTWS AGM, Keynote Speaker, Rapid-Fire Talks and Student Presentation Winners (March 16)

- **Keynote Speaker by Ed Struzik**

<https://www.nytimes.com/2018/08/24/world/canada/extreme-fires-canada-letter.html>

Ed Struzik has been called one of Canada's "pre-eminent modern-day explorers" by Canadian Geographic. His travels by foot, ski, dog team, canoe, kayak, icebreaker and helicopter have taken him to the remotest corners of the polar world. His articles on environmental and scientific issues appear in journals, magazines and newspapers such as the Los Angeles Times, Scientific American, The Narwhal, Tyee, Policy Options, the Globe and Mail, Toronto Star.

Edward has earned more than 3 dozen awards, for his outstanding contribution to the understanding of science.

His book, *Swamplands: Tundra Beavers, Quaking Bogs and the Improbable World of Peat* was made a top pick by Wall Street Journal. *Sierra Magazine* included it in its list of four "must read" books. His many other articles appear in newspapers, journals and magazines such as *Scientific American*, *Canadian Geographic*, *Policy Options*, and in newspapers such as the *Los Angeles Times*, *Globe and Mail* and *Toronto Star*. He often appears in documentaries such as *National Geographic's The Last Ice* and on radio and television programs such as *PBS's Living on Earth*, *CBC's The Current*, and the *Geographical Podcast of the Royal Geographical Society in Great Britain*.

In *Firestorm*, journalist Edward Struzik visits scorched earth from Alaska to Maine, and introduces the scientists, firefighters, and resource managers making the case for a radically different approach to managing wildfire in the 21st century. Wildfire was the topic of the 2023 Distinguished Lecture he recently delivered at the University of British Columbia. His latest book, *Dark Days at Noon*, delves into the history of wildfires in North America. Through archive sifting and first-hand reporting, he details dozens of the continent's most infamous fires and the response to them. His works have been described as "incendiary and intoxicating" by Pulitzer Prize winner David Marks Shribman. York University's Eric B. Kennedy says it is "easily one of the most beautiful books on wildfire I have encountered."

CONTRIBUTED TALKS (Alphabetical order)

Title: Seasonal cougar dietary plasticity, specialization, and similarity across a gradient of land-use change in the southern interior of British Columbia

Siobhan Darlington, University of British Columbia Okanagan; Karen Hodges, UBC Okanagan; Adam Ford, UBC Okanagan; Samuel Foster, University of Idaho; Jonathan Pauli, University of Wisconsin-Madison; Burci Lacin Alas, University of Wisconsin-Madison

s.darlington@ubc.ca,

Abstract: In the southern interior of British Columbia, cougars (*Puma concolor*) are the proximate source of mortality for declining mule deer (*Odocoileus hemionus*), co-occurring in a modified landscape from forestry, roads, agriculture, and wildfire. We evaluated the seasonal cougar diet composition, specialization, and similarity for individuals differing in habitat composition, phenotypic characteristics, and behaviour. We deployed 51 GPS collars on adult cougars in three study areas and identified prey remains at 926 kill sites between February 2020 and August 2023. We further pulled hair and whiskers from study animals and collected hair samples from cougar prey to conduct stable isotope analysis. We weighed support for hypotheses for diet specialization and similarity using Generalized Additive Mixed Models. Cougars in the western interior primarily consumed mule deer and moose, and increasingly consumed white-tailed deer and elk farther east. Both males and females prey-switched to smaller-bodied prey in the summer months. Males were most likely to be dietary specialists in the population and exhibited resource partitioning with nearby females. Urban density was the strongest predictor of diet similarity between individuals. These data will be used to inform wildlife managers on the effects of disturbance on cougar diet and evaluate predation pressure on mule deer.

Key Words: cougar, diet, specialization, disturbance, wildfire

Title: Dracula's Ménagerie- Understanding carnivore community ecology in the Romanian Carpathians

Marissa Dyck, University of Victoria; Ruben Iosif, Foundation Conservation Carpathia; Barbara Promberger-Furpass, Foundation Conservation Carpathia; Viorel Popescu, Columbia University and University of Bucharest

marissadyck17@gmail.com

Abstract: Carnivores are important top-down regulators in ecological communities and the loss of carnivore species can have devastating ecosystem effects. As such, rewilding efforts have become increasingly popular. Some top predators readily reestablish in human-dominated landscapes and exhibit potential coexistence with humans. However, the recovery of apex predators after sustained absence raises questions about their impacts on the existing community. The Romanian Carpathians represent one of the few areas in Europe that still harbor intact viable populations of carnivore species, and serve as a stronghold for populations, despite anthropogenic influences. We used data from camera traps coupled with multispecies occupancy models and structural equation models (SEM) to assess community dynamics within the carnivore guild. We evaluated seasonal patterns of occupancy and interspecific interactions between three carnivores: wolf, lynx, and wildcat using multispecies occupancy models. We found seasonal differences in the predictors of occupancy and co-occurrence. For both seasons, we found that conditional occupancy probabilities of all three species were higher when another species was present, and for apex predators was higher with increased forest cover. We applied SEMs to camera trap data of apex predators, mesocarnivores, and prey species to evaluate the relative importance of top-down versus bottom-up influences in shaping community dynamics. Preliminary results suggest that environmental variables play a more critical role in species occurrence than interspecific interactions.

Key Words: Structural equation modeling, carnivores, predator-prey, community ecology, Europe

Title: Trails, blazing: How fire in boreal systems affects mammal communities, against the backdrop of forest harvesting and petroleum development.

Jason Fisher, University of Victoria

fisherj@uvic.ca

Abstract: The western boreal forest is burning. Fires are bigger, hotter, more widespread than at any point in recent history. Fire has always been centre to the boreal forest's story, but how mammals can adapt to this new intensity remains to be seen. Mammal communities are already in flux due to cumulative effects of landscape change from petro development and timber harvesting. This talk reviews decades of literature on the effects of fire on boreal mammals, through the successional stages post-fire. Drawing comparisons to forest harvesting, and placed against the backdrop of 20 years of research on response to disturbance, I ask: Can we burn away the patterns imposed by oil and gas? Or will these disturbances contribute to cumulative effects? I highlight burning questions, knowledge gaps, and offer hypotheses for future research to help us meet this challenge forewarned and forewarned.

Key Words: Fisher, *Pekania pennanti*, density, spatially explicit capture-recapture, British Columbia

Title: Forestry, fire, and fur: Factors influencing population densities of endangered fishers (*Pekania pennanti*) in central interior British Columbia

Rory Fogarty, Thompson Rivers University; Rich Weir, Artemis Wildlife Consultants; Karl Larsen, Thompson Rivers University

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Abstract: The isolated and endangered Columbian population of fishers (*Pekania pennanti*) is of conservation concern in central British Columbia (BC), yet little is known about the distribution and abundance of the species in several regions. We conducted DNA-based mark-recapture surveys to estimate the density of fishers in two spatially distinct ecosystems where current data were lacking, and evaluated which factors best explained the distribution of fishers in each ecosystem. We found the density of fishers varied substantially between study areas, primarily due to the level of trapping mortality during each survey season. The density of fishers in the Chilcotin study area west of Williams Lake was among the highest ever reported for the province (21.3 ± 3.8 SE fishers/1000 km²), whereas density in the Enterprise study area southeast of Williams Lake was among the lowest (8.9 ± 2.7 SE fishers/1000 km²). Forested stands with wet soil moisture regimes composed of older deciduous and spruce trees were most strongly related to higher densities in both study areas. This study provides wildlife managers with a snapshot look at the density of fishers in two areas of central interior BC that will help refine the estimate for the endangered Columbian population.

Key Words: Fisher, *Pekania pennanti*, density, spatially explicit capture-recapture, British Columbia

Title: The moose in the room - the most politically important species in Canada.

Adam Ford, University of British Columbia - Okanagan Campus; Mateen Hessami, Clayton Lamb, Rob Serrouya, Melanie Dickie, Mark Hebblewhite

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Abstract: Conservation biology has long held certain species in high regard and overlooked others - large, charismatic carnivores and high-profile, rare species have consumed the most funding and political attention in recent decades. In Canada, which contains the largest areas of intact wildlife habitat in the world, there are growing signs that the foci of conservation biology's past will be insufficient to meet the needs of the future. Recent court decisions and trade offs in the outcome of different endangered species recovery tools, indicates that species with strong ties to Indigenous cultures and the food security/sovereignty across cultures will take a more central place in conservation and land management. Moose capture this changing sentiment like few other species. With links to food, predator culls, protected area management, and climate change, moose are poised to be one of the most important drivers of land use decision making across one of the largest countries in the world.

Key Words: food sovereignty, wildlife restoration, Indigenous-led conservation, ecology, harvest

Title: Remote cameras sample mountain ungulate population demography as compared to aerial surveys in an Indigenous-led community-based monitoring program

Sydney Goward, University of Victoria , Andrew Barnas, University of Victoria; Édouard Bélanger, Gwich'in Renewable Resources Board; Steve Andersen, Gwich'in Renewable Resources Board; Trevor Lantz, University of Victoria; Jason T Fisher, University of Victoria

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Abstract: Wildlife demography is a crucial parameter in monitoring and modelling a population's persistence through time. Aerial surveys have been the most common method for obtaining demographic data, but they come with limitations such as sample size, temporal constraints, costs, and cause significant disturbance to wildlife. Remote cameras are a non-invasive alternative to wildlife monitoring, providing continuous longitudinal and repeated sampling of a population, particularly useful for species that aggregate in fission-fusion dynamics, such as Dall's sheep (*Ovis dalli dalli*). We collected and compared Dall's sheep population demography data for three years, through an Indigenous-led, community-based monitoring program. The objective was to investigate the variability of lamb:nursery and ram:nursery ratios, and ram classification as captured by remote cameras and aerial surveys. We found that with sufficient samples, camera data collected in appropriate seasons produced precise lamb:nursery, ram:nursery, and ram classification proportions, as compared to aerial surveys, ultimately indicating similar population status trends between the two methods. Aerial surveys are still important in determining population sizes and trends. However, incorporating a remote camera system into the monitoring process allows for a more comprehensive examination of demography, while fostering an opportunity to explore further questions in mammal community ecology and impacts to populations.

Key Words: Wildlife camera, community-based monitoring, Dall's sheep, demography, aerial survey

Title: American Goshawk habitat management in British Columbia, bridging fine- and coarse-filter approaches

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Abstract: Land use management in British Columbia has a long history of utilizing both fine- and coarse-filter management approaches, Wildlife Habitat Areas and Ungulate Winter Range are examples of fine-filter approaches that provide protection for specific life requisites. Coarse-filter strategies, such as seral stage targets and Old Growth Retention Areas applied in tactical and strategic plans, are intended to meet larger scale habitat requirements for a suite of species, but often do not link to specific population targets or broad-scale habitat requirements of focal species. Despite the apparent protections offered by fine- and coarse-filter strategies, prominent species of concern, including mountain caribou, spotted owl, American goshawk, and several species of amphibians and reptiles are continuing to decline. Ongoing research on American goshawk, and translation of research findings into the provincial management framework, offers an opportunity to bridge fine- and coarse-filter strategies to provide comprehensive strategies for the species that meet its complete life history requirements. Here, we describe how a risk-based management approach applied to different genetically defined goshawk populations can help support both territory-scale management of known breeding areas, while contributing to broader landscape unit objectives that support a broad range of biodiversity.

Key Words: American Goshawk, Species At Risk, Habitat Management

Title: Pollinators in the Pyrocene: Hymenoptera & Lepidoptera & Diptera, Oh My!

Mackenzie H. W. Howse, University of Northern British Columbia; Dezene P.W. Huber, University of Northern British Columbia

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Abstract: Insect pollinators are declining globally due to habitat loss and human driven climate change. With modern fires increasing in size, severity, and frequency, it is vital to understand local trends in pollinator ecology. British Columbia, while diverse in pollinators, has been poorly surveyed in terms of biodiversity; much of the research being done in southern regions. In 2022, I collected over 1500 pollinators within high severity burn perimeters ranging from one to ninety years old on BC's dry interior plateau. Specimens were collected in ultraviolet reflective pan traps, identified to the lowest taxonomic level through morphological and genetic analysis, and assessed for biodiversity in relation to time since fire, position relative to fire edge, and trap colour. Other environmental factors such as vegetation diversity, coarse woody debris, and crown closure. were also assessed relative to species diversity. Preliminary results indicate a very large diversity of insect pollinators in these fire driven ecosystems, but this study has not approximated the biodiversity of the area. If we are to understand the dynamics of pollinator communities on both a local and global scale, it is essential that more work be done in under-sampled regions.

Key Words: Insect, Pollinator, Forest Pollinator, Biodiversity, High-severity wildfire

Title: Hibernation site selection of three sympatric snake species

Veronica McKelvey, Thompson Rivers University; Lily Ragsdale, Thompson Rivers University; Leigh Anne Isaac, Ministry of Water, Land and Resource Stewardship; Karl W. Larsen. Thompson Rivers University

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Abstract: The potential scarcity of suitable snake hibernacula at northern climes makes understanding the criteria defining this habitat necessary. We explored how three sympatric snake species vary in their selection of overwintering habitat and investigated how the habitat relates to the number of individuals present at dens within each species. The study area lay on the northern limits of all three species, suggesting that selection for appropriate hibernacula would be strong. We identified 28 snake hibernacula in total. At the microscale, the Great Basin Gophersnakes (*Pituophis catenifer deserticola*) and Western Yellow-bellied Racers (*Coluber constrictor mormon*) selected hibernacula with more cover features, while Western Rattlesnakes (*Crotalus oreganus*) preferred hibernacula with an increased availability of basking features. No measured habitat features effectively explained the number of gophersnakes and racers we detected at the dens, which may result from their generalist habitat selection or low representation. In contrast, increased rattlesnakes were found at sites with larger entrances on southern aspects. Understanding intra- and interspecific hibernacula selection patterns is critical in developing conservation and mitigation plans for northern snakes. We also caution against using hibernacula 'models' from well-studied species (e.g., Western Rattlesnakes) to extrapolate to other species, even within the same ecosystem.

Key Words: Habitat selection, hibernaculum, overwinter, communal denning, herpetology

Title: Adapting Sustainable Forestry to a Burning World

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Abstract: Given the unprecedented wildfire season of 2023 and – with a low snowpack and drought-like conditions currently being experienced - the likely severity of the 2024 wildfire season, adapting forest management to the changing natural environment is no longer an option. Climate Smart Forestry is now needed and expected if we are to successfully maintain both forests and biodiversity along with the other values forests contain. Forest management has great potential to help reduce atmospheric carbon and maintain healthy forests, but only if it can sustainably navigate the twin threats of both catastrophic fire and biodiversity loss. Innovative approaches to harvesting are needed that reduce fuel loads and fire risk, reduce emissions, increase sequestration, protect existing species and their habitats, adapt forests to new climate envelopes, braid traditional ways of knowing with new science, and maintain societal values all while continuing to deliver products that are needed in a green and prosperous economy. To reach this panacea, innovative and adaptive approaches are needed to manage wildlife populations now, keeping in mind the changes likely to be seen as climate envelopes shift. This talk will focus on the types of research and understanding that will be needed to meet this challenge of successfully and sustainably managing “Wildlife in a Burning World”, and meeting the needs of society for generations to come.

Title: Life-history trade-offs and climatic variability influence mountain ungulate reproduction

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Abstract: Knowledge about how demographic processes of mountain obligate species might be affected by climatic variation is critical to management and conservation. We used long-term monitoring data collected from individually-marked mountain goats ($n = 180$ females, 2005-2021) in coastal Alaska to examine hypotheses about intrinsic and extrinsic drivers of reproductive demography. Our analyses revealed the importance of life-history trade-offs and environmental variability on reproductive performance. The cost of reproduction, defined as the impact of reproducing the previous year on the current year reproduction, was high, especially for young, largely primiparous females (13-32% reduction) and old, senescing individuals (27-43% reduction); parturition of prime-aged individuals was relatively unaffected by giving birth the previous year (2% reduction). Winter snow conditions, which alter energetic expenditure and forage availability, exerted strong negative effects on reproduction (20-35% reduction, depending on age). The relationship between temperature during the preceding summer growing season and parturition was likewise negative though weaker and more variable (10-15% reduction). Combined with previous demographic and behavioral studies of coastal mountain goat populations, our results fill an important information gap and expand our understanding about how the interplay between life-history trade-offs and environmental variation influence reproductive demography of climate-sensitive mountain ungulates. Our results have important conservation implications and can be used to explicitly integrate variation in winter and summer climate to advance our capability to sustainably manage mountain goats.

Key Words: climate, mountain goat, life-history, *Oreamnos americanus*, population ecology, reproduction

Title: In the Wake of Wildfire: Unraveling Direct and Indirect Effects of Wildfire on Western Rattlesnakes (*Crotalus oreganus*) ,

Lindsay Whitehead, Thompson Rivers University; Dr. Christine Bishop , Environment and Climate Change Canada; Dr. Karl Larsen, Thompson Rivers University

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Abstract: As climate change drives trends towards warmer and drier environments, wildfire is increasingly prominent. Western Rattlesnake (*Crotalus oreganus*) faces heightened vulnerability in British Columbia as its habitat, located at the northern periphery of its range, consists predominantly of dry, fire-prone ecosystems. Near Osoyoos, BC, the population biology and movement ecology of rattlesnakes has been studied since 2002. In 2021, the Nk'Mip Creek wildfire engulfed nearly 200 km², impacting a significant portion of the study population's habitat, altering vegetation cover at denning, foraging and birthing locations. Our two-decade mark-recapture study suggests substantial population growth, from 156.0 ± 54.6 in 2002 to 689.2 ± 65.8 in 2021, with pre-disturbance $\lambda 1.17$ and overwinter survivorship of 0.79. Remarkably, post-wildfire observations show no significant decline in λ (0.75), survivorship (0.74 ± 0.11), or abundance (643.1 ± 97.9). Although some individuals exhibit burn scars, overall body condition remains comparable. Post-fire radio-tracking data of 41 snakes reveals that the majority of snakes (n=36) migrated to unburnt valleys during summer months, potentially indicating increased mortality or habitat fidelity shifts among snakes previously migrating to now-burnt areas. This research provides valuable insights into the impacts of wildfires on Western Rattlesnakes and, by extension, other snake species in northern latitudes.

Key Words: Herpetology, Wildfire, Species at Risk, Mark-Recapture, Ecological Resilience

RAPID FIRE TALKS (Alphabetical order by first author last name)

Title: Influence of Fire on Vegetation Community and It's Impacts to California Bighorn Sheep Forage in Skeetchestn Territory

Meghan Allan, Skeetchestn Natural Resources Corporation/Thompson Rivers University
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Abstract: Forage availability and habitat structure can significantly impact California bighorn sheep (*Ovis canadensis californiana*) diet and quality of life. Over the last decade, an increasing amount of high-intensity and high-severity fires have been observed, specifically Skeetchestn Territory within Secwepemcúl'ecw. This research focuses on the impacts of fire on vegetation community within grassland ecosystems and the relationship between bighorn sheep forage. Sampling took place in Skeetchestn Territory during the fall of 2021 and spring of 2023. There was burned and unburned sites were identified and surveyed in the BGxh2 zone with vegetation data collected. Results showed that three years post-fire, burn sites had high bare ground cover and lower litter cover than unburned sites. Additionally, the burn sites had higher forb cover; grass cover, shrub cover, and species richness remained lower than unburned sites. MetaDNA showed that bighorn sheep diet post-fire includes; *Pseudoroegneria spicata*, *Hesperostipa comata*, *Bromus inermis*, *Polygonum aviculare*, *Medicago sativa*, *Comandra umbellata* and *Rhus typhina* due what was available. An increase in forb cover, may benefit bighorn sheep forage although species richness and a decrease in grass cover may indicate insufficient nutritional availability to bighorn sheep.

Key Words: Wildfire, Bighorn Sheep, Vegetation Community, Grasslands, Plant Response

Title: How do you like your fire?

Kiah Allen, BC Wildfire Service; Sarah Budd, BCWS
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Abstract: The BC Wildfire Service's provincial cultural and prescribed fire (C&Rx) team is building out a research program that aims to improve understanding of the effects of fire as a tool on the landscape. This includes understanding short-term impacts and predicting how proposed landscape-level fire regimes will behave under future climate scenarios. C&Rx Fire research priorities generally focus on Indigenous collaborative research (Indigenous-led research questions), applied fire ecology (working towards wildfire-resilient landscapes) and fire social science (improving community trust and integrated fire stewardship approaches). Both planned and unplanned fire can impact wildlife and pyrodiversity, making it critical that we increase our collective understanding of how fire affects wildlife habitats. This talk will provide an overview of the provincial C&Rx Fire research program and discuss research priorities directly related to the effects of planned fire on wildlife and habitat. The outcomes of this research may help fire practitioners and land managers determine when 'good' fire could be utilized as a stewardship tool to meet multiple objectives.

Key Words: Cultural Fire, Prescribed Fire, Ecosystem Restoration, Catastrophic Wildfire, Planned Fire

Title: Take a walk by the river: Exploring how human-caused development and stream channel morphology influence the utility of riparian areas for mammalian communities

Katherine Andy, Simon Fraser University; Chelsea Little, Simon Fraser University

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Abstract: Human-caused development and climate change are causing large-scale disturbances that are reshaping local composition of ecological communities across a landscape. Riparian areas could contribute to landscape resilience as this habitat type is accustomed to disturbances, contains a variety of resources for wildlife, and has dendritic properties. My objective was to understand how development intensity, stream channel morphology, and other landscape features determine how mammalian communities use stream, riparian, and matrix habitat types within watersheds in Maple Ridge and Squamish. This research demonstrated that riparian areas are an important habitat type for many mammal species, though their ability to support mammals could be facilitated by connections to neighboring habitat types. I found that mammalian communities include species with different associations to environmental characteristics. Landscape managers must anticipate the species that will benefit from changing environmental conditions and the species that will not benefit. This research illuminates that as anthropogenic development and climate change intensity, protecting riparian areas of many widths provides space and a variety of microhabitats to support diverse biotic functional groups. At the landscape scale, managers should promote riparian connectivity so wildlife can move to intact habitat patches while disturbed habitat patches recover.

Key Words: riparian areas; landscape resilience; camera trapping; habitat use modeling

Title: Taming of the mouse: Getting a grasp on small mammal population dynamics in grassland communities

Kara Atkinson, Thompson Rivers University; Dr. Karl Larsen, Thompson Rivers University; Dr. Leigh Anne Isaac, BC Provincial Government

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Abstract: Small mammal communities are fundamentally linked to many trophic levels in ecosystems. As consumers, they increase plant diversity and soil quality, act as seed and fungal dispersers, and protect environments from drought or fire. As prey, small mammals function as the main food source for a wide range of small and meso-predators. Climate change pressures on cricetid mammal communities may lead to cascading effects such as low growth and reproduction in predators and increased predation on other species. Understanding oscillations in these populations is essential to predicting ecosystem-wide responses. My project is examining the oscillations of the Deer Mouse (*Peromyscus maniculatus*) and the Montane Vole (*Microtus montanus*) in the semi-arid grasslands of interior British Columbia over the past 27-plus years. Data from an ongoing trapping program at Thompson Rivers University will be analysed alongside environmental factors to seek correlates to oscillations, detect cycling, and (potentially) enable future forecasting. In addition, I am augmenting the long-term data set with information on seasonal and spatial variation in abundance, home range, and body condition, to provide context to the historic trends and help generate prey quality predictions in the face of climate change for the large number of at-risk predators in the grasslands.

Key Words: small mammals, oscillations, grasslands, predator-prey, climate change

Title: Woodland caribou population viability in a fiery future

Tal Avgar, Biodiversity Pathways Ltd/University of British Columbia

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Abstract: Climate change is here, and with it, an expected increase in the frequency, intensity, and extent of wildfires. In my talk, I will present a map of the possible pathways by which wildfire might impact the population viability of woodland caribou (*Rangifer tarandus caribou*; mountain and boreal ecotypes), a species that is already subject to local populations' declines and extirpations across western Canada. A synthesis of these pathways suggests that a fiery future is expected to amplify existing deleterious processes impacting woodland caribou population viability, and primarily unsustainable predation due to growing alternative prey populations.

Key Words: Climate change; conservation; moose; deer; wolves

Title: Evolving prey behavioural responses to predators: Applications of individual based artificial neural network genetic algorithms to investigate caribou-wolf interactions

Andrew Barnas, University of Victoria; Christina Semeniuk, University of Windsor; Jason Fisher, University of Victoria

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Abstract: Anthropogenic landscape change in Canada's Oil Sands regions increases predation of caribou by wolves. Predicting responses of prey populations to changing predator regimes is difficult but may benefit from simulation approaches. Caribou populations evolved under different predation regimes prior to industrial resource extraction, so the evolutionary context of evolved behavioural responses is critical to understand. One approach is individual based models incorporating artificial neural networks (ANNs) and genetic algorithms, offering more flexible approaches to identifying fitness-maximizing behaviours. Models allow virtual agents to evolve optimal strategies under historic conditions, then examine responses of evolved strategies to novel predator regimes. We simulated populations of caribou and wolves, where caribou are equipped with ANNs to sense characteristics of wolf hunting patterns, and fitness-maximizing behavioural strategies are inherited by the next generation via genetic algorithms. Caribou face trade-offs between remaining in habitat patches to maximize energy intake or to flee their habitat in response to wolf presence. Preliminary results indicate caribou with ANNs have greater fitness than those without. Prey populations converge on optimal anti-predator behaviours, but are sensitive to predation pressure and immigration rates. Future model development will examine changing predator characteristics via altered landscapes, and exposing evolved caribou responses to novel environments.

Key Words: predator-prey, simulation, adaptation, netlogo, caribou

Title: Small mammal abundance and *Crotalus oregonus* (Western Rattlesnake) body condition.

Erin Blythe, Thompson Rivers University; Lindsay Whitehead, Thompson Rivers University; Karl W. Larsen, Thompson Rivers University

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Abstract: Understanding how prey availability impacts predators reveals important trophic interactions, yet such data are not easily obtained. For 11 years, we have been following the summer abundance of cricetid small mammals in tandem with population studies of the threatened Western Rattlesnake (*Crotalus oregonus*) in Osoyoos, BC. Preliminary analyses suggest an increasing trend in total small mammals captured over this time period, with a corresponding increase in rattlesnake abundance. However, despite year-to-year fluctuations in small mammals, we did not detect a corresponding trend in average body condition of adult male or female snakes. This is consistent with a negligible correlation detected between total small mammal captures and rattlesnake body condition. Following the Nk'mip Creek wildfire in 2021, no significant impact to total small mammal captures or rattlesnake body condition were detected. Ongoing analysis will use SECR (spatially-explicit capture-recapture) models to produce more refined annual estimates of small mammal abundance.

Key Words: predator, prey, snake, abundance, body condition

Title: Evaluating the influence of habitat characteristics on Pika abundance and distribution in Mount Revelstoke and Glacier National Parks

Clara Boisclair B., Thompson Rivers University; Emily Studd, Thompson Rivers University; Jacqueline Sorensen, Thompson Rivers University; Nancy Flood, Thompson Rivers University; Lisa Larson, Mount Revelstoke and Glacier National Parks

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Abstract: Montane regions are highly sensitive to climate change with montane species that are particularly susceptible to warming temperatures as they specialize in extreme environments. The American pika (*Ochotona princeps*) is an excellent example of montane species at risk from climate change. While there is limited research on the effects of climate change on American pikas in Canada, understanding the environmental factors that drive changes in the species abundance and distribution is essential for effective wildlife conservation and management. Mount Revelstoke and Glacier National Parks launched a Pika monitoring project in 2022 to follow population trends over time. My research, a collaborative project with Parks Canada, investigates how physical characteristics such as elevation, aspect, and talus patch size, as well as biotic variables such as habitat type within talus patches and bordering the talus, and vegetation type influence pika abundance. In August and September 2023, data on pika abundance and habitat characteristics was collected at 12 sites across the two Parks; 5-9 location points were surveyed twice at each site. This research will help predict the distribution and abundance of pika within these two National Parks, and more generally, across montane regions of Alberta and British Columbia.

Key Words: American pika, alpine, abundance, habitat, climate change

Title: Balancing Act: Navigating the Future of Fishers through Innovative Modeling and Landscape Planning

Joanna Burgar, Ministry of Water, Land and Resource Stewardship; Tyler Muhly, WLRS; Scott Yaeger, WLRS; Rich Weir, Artemis Consulting

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Abstract: Fishers (*Pekania pennanti*), a housecat-sized relative of wolverines and martens, are declining and at high risk of extirpation in the Central Interior of British Columbia, due to extensive habitat disturbance from forest harvest. A lack of coordinated landscape level planning has led to diminishing opportunities to maintain the limited remaining habitat. To quantify responses to different management scenarios, we combine Individual-Based Modelling with spatially discrete event simulations (SpaDES) to follow generations of individual fishers through key life-history stages. By 'scaling up' existing knowledge that describes individual fisher habitat relationships, these models allow us to evaluate, understand, and predict changes to local fisher populations caused by management decisions. We show how the Columbian population of fishers responds when landscapes have stable amounts and configurations of low, medium, and high-quality habitat and when quality habitat is lost or gained.

Key Words: fisher, Individual-Based Model, SpaDES, predictive modelling, forest harvesting

Title: Mammal responses to global changes in human activity vary by trophic group and landscape

Cole Burton, University of British Columbia; Chris Beirne, University of British Columbia, Kaitlyn Gaynor, University of British Columbia; Cat Sun, University of British Columbia; Alys Granados, University of British Columbia; Roland Kays, North Carolina State University; + additional co-authors

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Abstract: Wildlife must adapt to human presence to survive in the Anthropocene, so it is critical to understand species responses to humans in different contexts. We used camera trapping as a lens to view mammal responses to changes in human activity during the COVID-19 pandemic. Across 163 species sampled in 102 projects around the world, changes in the amount and timing of animal activity varied widely. Under higher human activity, mammals were less active in undeveloped areas but unexpectedly more active in developed areas while exhibiting greater nocturnality. Carnivores were most sensitive, showing the strongest decreases in activity and greatest increases in nocturnality. Wildlife managers must consider how habituation and uneven sensitivity across species may cause fundamental differences in human-wildlife interactions along gradients of human influence.

Key Words: human-wildlife coexistence, mammal conservation, camera trap, behavioural ecology, anthropogenic impact

Title: Indigenous-led research on traditional territories highlights the impacts of forestry harvest practices on culturally important plants

Kathleen Carroll, University of Victoria; Kathleen A. Carroll, University of Victoria; Fabian Grey, Canada Whitefish Lake First Nation; Nicholas Anderson, Canada Whitefish Lake First Nation; Nelson Anderson, Canada Whitefish Lake First Nation; Jason T. Fisher, University of Victoria

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Abstract: Indigenous Knowledge and governance are critical to successful conservation and to Indigenous Peoples' ability to live sustainability on their lands. However, various land use practices from outside groups impact the conservation value and traditional resources these lands provide. Here we evaluated the effects of harvest, glyphosate application, and fire on 51 edible and medicinal plant species used by Indigenous Peoples of north-central Alberta. Using linear models, machine learning methods, and vegetation data collected between 2007 and 2020, we found that edible and medicinal plant species richness and abundance were best explained by glyphosate application and harvest. Despite our models' indication that species richness and abundance were higher in harvested and treated study sites, detailed qualitative data suggests these forestry practices negatively impacted Indigenous Peoples' ability to use traditional plants. Importantly, plants in treated areas were not suitable for human consumption due to glyphosate applications and exhibited abnormal color and flavor presentations. Concerns over access to traditional resources are increasingly important as human impacts continue to expand globally. Thus, we hope that this Indigenous-led study design leveraging both quantitative and qualitative data can result in successful partnerships that better reflect the environmental concerns of Indigenous Peoples.

Key Words: Indigenous-led, forestry, harvest, plants, machine learning

Title: Camera traps for density estimation: an eye to improving the science that guides management

Jamie Clarke, University of Victoria; Jason Fisher, University of Victoria; Holger Bohm, BC Ministry of Forests; Cole Burton, University of British Columbia

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Abstract: Measures of population density (abundance/area) are essential for wildlife management - especially for establishing sustainable yields of game species and building trust in hunting regulations. Ungulates (e.g., moose) are an important group of terrestrial mammals for subsistence and Indigenous hunters. The Government of BC has standard protocols for measuring ungulate densities, with aerial ungulate surveys (AUSs) recommended for most species. AUSs are a well-established but imperfect survey tool, leading practitioners to wonder: what other tools and methods are at their disposal? This project will compare the robustness and feasibility of camera trap surveys versus AUSs for ungulate density estimation and, ultimately, game species management. It will test camera trap density models for unmarked species, evaluating the effects of sampling design and assumption violations. The quality of density estimates will be compared between camera trap models and to concurrent AUSs. Density is an essential metric for wildlife management - but to be useful, estimates must be accurate, precise, and produced at regular intervals, using methods that are economical and safe. Existing protocols for ungulate density estimation do not meet these criteria. This project asks: could camera trap surveys fill knowledge gaps in AUS programs, improving the science that guides wildlife management?

Key Words: camera trap, aerial survey, density, ungulate

Title: Rapid-Fire Response Needed: An Analysis of the Columbian Fisher Population in British Columbia

Alexia Constantinou, University of Victoria; Joanna Bugar, Ministry of Water, Land and Resource Stewardship; Jason Fisher, University of Victoria; Francis Johnson, Alkali Resource Management

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Abstract: Fishers (*Pekania pennanti*) in central British Columbia are declining at a rapid pace and are predicted to become extinct in the next decade. These estimates of decline are built on habitat values and rates of forest harvesting and trapping, but greater certainty requires that current models are validated with fisher detection data. To obtain these we are using camera traps: multi-species, non-invasive monitoring tools that allow us to monitor not only fishers, but their prey and their weasel-family relatives. We ask where these species occur on the landscape (and more importantly, are missing), in what habitat types they occur, and what habitat stewardship methods can be implemented, led by First Nations leaders to enhance fisher habitat. Thus far, collaborations have been built with small-scale, local forest harvesting operations to create more useful habitat for fishers as well as their prey, but there are no regulations from government for these adjustments. We hope to detect fishers across central BC in collaboration with Esk'etemc, T'exelc and Stwecem'c Xget'tem Nations, compare these detections against the habitat models previously created, and detect fisher relatives and their prey in the same area. We also ask if current cultural and prescribed burns can facilitate enhanced habitat for these species, especially as fishers require coarse woody debris for pursuing prey and large diameter, mature trees for denning. Pursuing applied habitat treatment with the Nations' stewardship teams will allow for a more holistic, multi-knowledge system approach to conserving fishers and the ecosystem to which they belong.

Key Words: Mesocarnivores, prescribed burning, fishers, population decline, habitat

Title: The Impact of Roadway Mortality on a Long-Lived Freshwater Turtle: Pre- and Post-Mitigation Assessment

Jessica D. Derksen, British Columbia Institute of Technology and Simon Fraser University; Douglas B. Ransome, British Columbia Institute of Technology

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Abstract: Roadway mortality has been identified as a primary threat to freshwater turtles in Canada. Despite this, mitigation measures are often implemented only after elevated levels of roadway mortality are observed in a given area. Western painted turtles (*Chrysemys picta bellii*) are a long-lived freshwater turtle species whose slow life history leaves them vulnerable to additive sources of adult mortality. A population viability analysis (PVA) was conducted on a population of western painted turtles in the rural community of Baynes Lake, utilizing three years of life-history data. In response to escalating roadway mortality, a turtle underpass and directive fencing were installed along a critical migration route. Road mortality was assessed both before and after these mitigation strategies were implemented. Results from the model suggest that the population would unlikely persist beyond 100 years with pre-mitigation levels of road mortality (a mortality rate of <2%). The findings underscore the significance of proactively implementing mitigation strategies in rural areas, particularly where initial indications of relatively low road mortality have been identified.

Key Words: population viability analysis (PVA), road mortality, western painted turtle, mitigation strategies, conservation planning

Title: Movements patterns of wolves on barren-ground caribou ranges in northern Canada

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Abstract: With many herds of barren-ground caribou in northern Canada undergoing large population declines, there has been an increase in public concern about the factors contributing to and exacerbating these declines, including the role of predation by wolves. While there are many studies of wolf movement and predation patterns further south, these studies are lacking in northern Canada due to logistics and remoteness, resulting in large data gaps. In the Inuvialuit Settlement Region of the Northwest Territories, it has been over 30 years since the last large-scale wolf monitoring program. We are planning to equip wolves with GPS collars to learn more about their movement patterns and predation strategies in relation to the movements of barren-ground caribou herds.

Key Words: wolves, movement, predation, barren-ground caribou, Arctic

Title: American Bullfrog Management in the West Kootenays

Carley Dolman, Okanagan Nation Alliance

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Abstract: Invasive American bullfrogs have crossed the Canada-United States border from Washington into the West Kootenay region of British Columbia. The Okanagan Nation Alliance is leading the charge to manage the bullfrog population in Nelway, and this is no easy task. All life stages, from egg mass to adults, some nearly 16 cm in snout-vent-length, are present in the population. And the population is growing. Monitoring and eradication tactics include: eDNA sampling, nocturnal visual surveys, capture by electro-frogger, and hand-captures. This presentation will describe a night out in the wetland and the strategy behind hunting for Nelway American bullfrogs.

Key Words: Invasive Species Bullfrogs Amphibians Wetlands

Title: Foraging, food, and fishers: what do fishers in the Central Interior of BC eat?

Mae Frank, Thompson Rivers University; Karl Larsen, Thompson Rivers University; Joanna Bugar, Government of British Columbia

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Abstract: This research will focus on understanding the diet and prey availability of a subpopulation of fisher (*Pekania pennanti*) in central British Columbia (Columbian Population). The study will define three treatments based on a group of radio-tracked fishers surrounding Lac la Hache, BC: 1) reproductive female home ranges; 2) non-reproductive female home ranges; and 3) areas outside of known female home ranges. Utilizing fisher scat samples and gut contents, the research will inform a list of commonly consumed prey species. The study will include surveying prey species such as rodents, squirrels, snowshoe hares, and grouse in the specified treatment areas to better understand prey availability. Additionally, the research will investigate the dietary preferences of fishers during key points in their lives, including winter, whelping, and breeding seasons. By examining these factors, the study will aim to contribute insights into the dietary habits of the Columbia population of fishers, overall enhancing our understanding of their ecology and informing current and future conservation strategies.

Key Words: Fisher (*Pekania pennanti*), Mesocarnivore, Diet, Prey Availability, Conservation

Title: Examining Impacts of Climate Change and Habitat Loss on the Distribution and Abundance of Long-billed Curlews, a Species at Risk in Canada

Kelsey Freitag, Thompson Rivers University; Kelsey Freitag, Thompson Rivers University; Matthew W. Reudink, Thompson Rivers University; Ann E. McKellar, University of Saskatchewan and Environment and Climate Change Canada; David Bradley, Birds Canada; Tanya Luszcz, Environment and Climate Change Canada; Mateen Shaikh, Thompson Rivers University; Rémi Torrenta, Birds Canada; Scott Flemming, Environment and Climate Change Canada

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Abstract: Environmental stressors such as climate change and habitat loss profoundly impact the distribution and abundance of species. These impacts are amplified in birds, especially grassland-dependent species. Long-billed Curlews (*Numenius americanus*) are a vulnerable bird species that breed in native grasslands. In British Columbia, large areas of grassland habitat have been lost to agricultural conversion and urban encroachment. Prior to 2022, a British Columbia-wide survey had not been conducted since the early 2000s, leaving a 20-year gap in our knowledge of curlew abundance and distribution in the province. During a survey conducted in 2022, we uncovered a distinct 85km northward shift in the breeding range of this species. We examined how changes in land cover and climate over the past two decades have driven this range shift. To accomplish this, we analyzed historical and present curlew survey data and developed habitat occupancy models to understand the drivers behind curlew occupancy. We found curlew occupancy to be positively correlated with cropland habitat and higher latitudes while being negatively correlated with grassland habitat. This research provides fundamental knowledge on how anthropogenic stressors impact grassland species. Understanding distribution and abundance patterns is crucial to implement critical habitat protections and develop up-to-date conservation plans.

Key Words: Ornithology, grassland species, avian conservation, threatened species, and habitat loss

Title: eDNA air sampling for bats: Implications for mine reclamation and closure

Samantha Gidora, Thompson Rivers University; Caren C. Helbing, University of Victoria; Michael J. Allison, University of Victoria; Mark Louie Lopez, University of Victoria; Naowarat Cheeptham, Thompson Rivers University; Elizabeth L. Clare, York University; Lauchlan Fraser, Thompson Rivers University/Society Canada

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Abstract: The recent advent of environmental DNA (eDNA) air sampling represents a revolutionary approach to evaluate biodiversity. It could prove useful for studying underground habitats such as mines and caves which are often inaccessible or unsafe for visual surveys but are used by wildlife such as bats. However, variations in quality and rigour of assay design and validation may hinder regulatory and policy uptake of eDNA tools for assessing wildlife presence. Our project uses eDNA air sampling methods at inactive underground mines to assess the efficiency of targeted quantitative real-time polymerase chain reaction assays to detect *Myotis* bats. Laboratory validation has been completed for several new bat-specific eDNA assays, including for *Myotis lucifugus* and a Genus-wide *Myotis* assay. We are validating these new assays against a six-step workflow, culminating in a comprehensive field validation at an artificial bat cave and several inactive mines throughout British Columbia. Field validation is underway, including estimation of detection probabilities via eDNA air sampling and comparison to a conventional bioacoustic approach. Our results will advance our understanding of the readiness of eDNA air sampling to inform critical bat conservation and land management decisions.

Key Words: environmental DNA, airborne DNA, bats, *Myotis*, species detection

Title: Forage and competition mediate habitat selection in coastal grizzly and black bears

Tyler Jessen, University of Victoria/Raincoast Conservation Foundation; William Housty, Haíłzaqv Integrated Resource Management Department; Cole A. Burton, University of British Columbia; Paul Paquet, University of Victoria/Raincoast Conservation Foundation; Chris Darimont, University of Victoria/Raincoast Conservation Foundation

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Abstract: Habitat selection is governed by a suite of factors, including landscape features (e.g., forage availability, habitat quality) and interspecific interactions (e.g., competition, predation). In seasonal environments, wildlife generally seek to maximise energy intake by selecting for optimal habitats while avoiding adverse interactions with predators or conspecifics. Disentangling these potentially conflicting motivations for space use is a challenging, but important aspect of land use planning and conservation. We tested competing hypotheses about selection for food availability and presence of conspecifics in sympatric grizzly bears (*Ursus arctos*) and black bears (*Ursus americanus*) in Haíłzaqv (Heiltsuk) Territory on the central coast of British Columbia, Canada. We applied a multi-species, dynamic occupancy modelling approach, including >10 years of spring hair sampling, remotely-sensed landscape data (e.g., NDVI, land cover), and spatially-explicit salmon abundance indices. Our results can be used to directly inform Haíłzaqv and provincial management of grizzly and black bears.

Key Words: Grizzly bear, black bear, Great Bear Rainforest, competition, occupancy modelling

Title: Post-wildfire caribou habitat and lichen regeneration in Ulkatcho Territory, British Columbia

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Abstract: Woodland caribou in the West Chilcotin are Threatened and face population decline due to habitat loss and increased predation. In winter, caribou in this area are dependant on lichen foraging underneath the snowpack, with mature lodgepole pine forests providing suitable lichen availability and predator avoidance. For the Rainbows Mountains and Itcha- Ilgachuz caribou herds in central British Columbia, pine beetle outbreak and forestry has severely reduced the size and quality of winter habitat. Both of these herds are in long-term decline, and the nearby Charlotte Alpands herd is believed to be already extirpated. As wildfires increase in frequency and intensity across British Columbia, uncertainty remains on how lichen and caribou habitat regenerate following wildfire. The Ulkatcho of the West Chilcotin have relied on caribou for subsistence since time immemorial, and elders recall hunting caribou in large groups and sharing meat among the community. However, indigenous harvest of caribou in Ulkatcho Territory is currently nonviable and was banned in 2019. This study provides Indigenous-led research into the effects of wildfire on lichen and caribou habitat regeneration in Ulkatcho Territory, with indigenous knowledge being critical to the successful management of caribou herds and habitat. This study will also provide the Ulkatcho First Nation with a tool to assess suitable post-wildfire caribou habitat, and investigate the effects of wildfire on culturally important vegetation species, including soopalallie, Labrador tea and pine mushrooms. In the face of climate change and increasing wildfire, this study will provide baseline information that will directly inform indigenous management of post-wildfire caribou habitat, and generate new knowledge in natural sciences.

Key Words: Caribou, Wildfire, Lichen, Indigenous knowledge, Habitat

Title: BC Feral Pig Update

Emily Lomas, Ministry of Water, Land and Resource Stewardship

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Abstract: Feral pigs are among the world's most widespread and damaging invasive species. They prey on and compete with native wildlife and livestock, damage ecosystems, spread disease, destroy crops, and pose a risk to public safety. Feral pigs have established populations in several US states and in Canada's prairie provinces. They have been reported in low numbers in BC, but their distribution and abundance are not well understood. Substantial efforts are underway to address the risk of feral pigs through various provincial, national, and international working groups, including the development of a national Invasive Wild Pig Strategy. Following a 2020 BC Risk Assessment, feral pigs were rated a priority for the Early Detection and Rapid Response (EDRR) control method. The management objective for EDRR species is eradication. Through the BC Feral Pig Working Group, subject matter experts are working to support adoption of a Feral Pig Strategy and an EDRR Plan, identify regulatory changes to support pig management, and implement routine surveys for feral pigs. The existence of isolated feral pig reports in BC provides a strategic window to proactively tackle and eliminate this issue before populations become established.

Key Words: Invasive, swine, wild pig, boar, non-native

Title: Biotic Interactions as Limiting Factors of Burrowing Owls (*Athene cunicularia*) in British Columbia

Alison Lundgren, British Columbia Institute of Technology; Lauren Meads, Burrowing Owl Conservation Society of BC; Douglas Ransome, British Columbia Institute of Technology

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Abstract: Western burrowing owls (*Athene cunicularia hypugaea*) were considered extirpated from British Columbia by 1980 and still require active management to sustain a breeding population. The Burrowing Owl Conservation Society of BC has successfully implemented many management initiatives to increase the burrowing owl population, including conservation breeding and release of owls that can survive and reproduce. However, survival and reproductive rates have been observed to vary across sites and years. Our research objective was to investigate if biotic interactions may be limiting the survival and reproductive output of burrowing owls in British Columbia and how predator occurrence and prey availability differ among release sites. Methods used included wildlife camera photographs and direct observations. We expected that release sites with a higher prey abundance and lower predator occurrence would have a higher owl survival rate and reproductive output. Preliminary analyses indicate that there may be regional differences in reproductive output and prey availability but not predator occurrence. Additionally, competition with other species may be more impactful to burrowing owls than previously thought. This information will be used by the Burrowing Owl Conservation Society of BC to improve future release site selection and management decisions.

Key Words: burrowing owl, wildlife management, endangered species, camera traps, predator-prey

Title: Yellow-breasted Chat monitoring in the West Kootenays

Kristen Mancuso, Okanagan Nation Alliance

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Abstract: The southern mountain population of the western Yellow-breasted Chat (*Icteria virens auricollis*) is an endangered species in Canada that occurs in British Columbia. A small subpopulation occurs along the Columbia and Pend D'Oreille River Valleys in the West Kootenays. This subpopulation has been monitored since 2004, with subpopulation sizes fluctuating from 1 – 19 pairs. In 2022, Okanagan Nation Alliance began a colour-banding program of these chats to better understand population demographics, return rates, and territory fidelity. In 2022, we banded 5 adult male chats. In 2023, only 1 chat returned. In 2023, we banded 6 males, 2 females, and 16 nestlings. In 2023, we added in nest monitoring to understand nest success. Many nests were depredated and predators documented on camera included black bear, American red squirrel, and Columbian ground squirrel. Our very preliminary results suggest that this small subpopulation is likely a sink, receiving young and overflow chats from populations farther south in Washington. Chats continued to be attracted to specific territories in this dry brushland habitat and the maintenance of these specific areas is important to population persistence, even if return rates appear to be low.

Key Words: Yellow-breasted chat, endangered species, songbird, West Kootenays

Title: Effects of shoulder season temperature variability on population persistence from transition matrix models

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Abstract: It is accepted that climate change effects wildlife populations. However, much of climate science focuses on mean changes as they are more robust than variability, but they far underestimate the impacts of climate change. More work on variability is needed to better project the impacts of climate change on wildlife populations and to implement effective conservation policies. Harmful threshold crossing events are more likely to be observed during shoulder seasons as a result of variability. I explored how temperature variability in the transition seasons between summer and winter effect population persistence. My question was tested using gridded temperature data of the boreal forest of North America, and two measures of temperature variability to monitor changes in seasonal variability over time. The periods studied were determined using vegetative index, as it is a good indicator of the timing of seasonal phenology. Results of empirical variability were then added into theoretical models of a stable stochastic population to determine their effects on population persistence. My results will provide a generic forecast of the dynamics expected in future wildlife populations. Moreover, my work will provide wildlife ecologists with the methodology to study specific species by incorporating sensitivity to variability of different environmental parameters.

Key Words: Theory, Variability, Temperature, Climate change, Shoulder season

Title: Tracking the long-distance migration and abundance of Wilson's phalaropes (*Phalaropus tricolour*) at saline lakes across the western hemisphere

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Abstract: Wilson's Phalaropes (*Phalaropus tricolor*) are migratory shorebirds that breed in central North America and spend their winters at saline lakes in the interior of South America. Despite decades of research, the migration of these birds has yet to be directly tracked, leaving gaps in the knowledge of their migratory journey. The first goal of this study is to track the migration of Wilson's Phalaropes using avian radio tags deployed on their breeding grounds in Saskatchewan, Canada. Motus Wildlife Tracking System's automated radio telemetry stations will be used to track the migratory route and help identify critical habitats that are utilized by the birds during their migration. The second goal of this study is to see how habitat characteristics and surrounding land use influence the abundance of Wilson's Phalaropes at six lakes across North America. Data on Wilson's Phalarope abundance collected from 2019 to 2023 at each lake will be compared to habitat and land use characteristics for each survey year. This analysis will be used to gain an understanding on the relationship between lake characteristics and Wilson's Phalarope abundance.

Key Words: Migration, Shorebirds, Saline lakes, Radio telemetry, Habitat analysis

Title: Use of Beavers for Hydrological Mitigation

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Abstract: Skeetchestn has been affected by three wildfires since 2017 resulting in nearly 350,000 ha of burned land in Skeetchestn's Traditional Territory. In efforts to restore the proper functioning of the ecosystem within the Territory Skeetchestn Natural Resources Corp. (SNRC), in partnership with Skeetchestn Indian Band, has taken on a multi faceted project funded by the BC Salmon Restoration and Innovation Fund. Our Wildlife team has begun planning for the Beaver relocation program, as part of the project, which will take place this spring. The Beaver program's goal is to restore the upper watershed which will, in theory, increase watershed resiliency all throughout the watershed. Beavers can improve a watershed significantly by opening treed areas to create wetlands and allow establishment of new vegetation. New plant species can support more diverse wildlife through forage and cover in the improved habitat. "Nuisance" beavers from properties on reserve in the lower Deadman will be trapped and held until the entire colony is retrieved. Once the colony is secured, they will be relocated to specific areas within the upper watershed. Using Drone footage from the watershed prior to release the changes in the watershed will be monitored long-term.

Key Words: Wildlife, Ecological Disturbance, Post Fire Hydrological Mitigation, Beavers, Habitat Management

Title: The Evolution of Song and Colour in the Family

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Abstract: Tanagers (family Thraupidae) are one of the largest families of passerine birds, and are well-known for their colourful plumage, striking songs, and wide variation in behaviour and ecology. My goal is to test which morphological and environmental factors drive the evolution of song and colour within the family Thraupidae. To do so I gathered song data from Demery et al. (2018), colour scores from Dale et al. 2015, and ecological and morphological information on each species from open, online databases, such as the International Union for Conservation of Nature (IUCN) and AVONET. I then analyzed the compiled dataset using a series of phylogenetic least squares (PGLS) analyses alongside a recently published phylogeny of all tanager species to control for phylogenetic effects. By studying one of the largest families in the largest order of birds, it helps us further understand the intricacies of ornamentation, ecological and morphological factors within song and colour evolution.

Key Words: song, colour, evolution, ornamentation, ornithology

Title: Assessing and comparing habitat selection across three herds of bighorn sheep ewes in the Kamloops region

Larisa Murdoch, The Wild Sheep Society of BC; Dr. Karl Larsen, Thompson Rivers University; Shaun Freeman, Skeetchestn Natural Resource; Chris Procter, Government of BC

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Abstract: The Bighorn Sheep population in the Kamloops – Thompson Basin area in British Columbia have been declining by ~75% over the past 8 years, including the proposed study area. This decline appears to be directly associated with low lamb recruitment, but the ultimate expression is less clear. This study will examine the implications of habitat selection by ewes across the landscapes. Normally during parturition, ewes stay close to escape terrain as a means of protection for the lambs, sacrificing access to forage. However, the recent decline in the population suggests the opposite may be occurring, i.e., ewes may be sacrificing the safety of escape terrain to access forage. To investigate this hypothesis, our research will investigate whether the sheep in the Kamloops region are selecting preferred habitat on the landscape at key times of the annual cycle. We will do this by comparing habitat selection by ewes to the predicted by a habitat suitability model, which will include investigating forage cover in each home range. All told, I will assess differences in movement patterns across three subpopulations of bighorn sheep during lambing seasons and relate this to the differences in herd productivity.

Key Words: Wildlife management, ungulate ecology, grasslands, habitat selection, movement patterns

Title: Understanding Roosevelt Elk on Vancouver Island: habitat selection, migration, and dispersal

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Abstract: Efforts to manage biodiversity in Canada have focused on identifying causes of decline, but few systems reveal the ecological basis for recovery - particularly for large mammals where the populations of many well-studied species have been trending downwards. Roosevelt elk on Vancouver Island, British Columbia (BC), are one of the few success stories for large mammal conservation in Canada. From a low population of ca. 2700 animals and restricted distribution of ca. 23,000 km² in the 1980s, elk are now expanding throughout their historical range, presenting a rare conservation success story for the ecosystems that they support, as well as for the Indigenous and non-Indigenous communities that harvest elk. However, elk are still listed as “vulnerable” in BC, and the landscape on which they live is undergoing rapid changes caused by resource extraction. We are developing models of habitat selection and movement ecology to quantify elk use of habitat and projected changes in distribution. This will help fill knowledge gaps in current elk management and planning, while also providing an opportunity to study the ecology of a recovering species. This research will provide Indigenous rightsholders and non-Indigenous stakeholders with the knowledge needed to support the recovery of elk.

Key Words: Roosevelt Elk, habitat selection, forestry, landscape change, distribution change

Title: Affirming Indigenous Data Sovereignty in wildlife monitoring in the era of Open Data

Erin Tattersall, University of British Columbia; Warren Cardinal-McTeague, University of British Columbia; Samuel Haché, Canadian Wildlife Service; Danielle Thompson, Environment and Climate Change, Government of the Northwest Territories; Deborah Jenkins, University of British Columbia; Cole Burton, University of British Columbia

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Abstract: The heightened awareness of the need for biodiversity conservation coincides with growing understanding that Indigenous Peoples are critical stewards of biodiversity. In response, the wildlife conservation field is transforming conventional approaches to facilitate more meaningful collaborations with Indigenous Peoples. Indigenous Data Sovereignty (IDS) refers to the rights of Indigenous Peoples to govern data according to their own laws and protocols. It has important implications for wildlife monitoring conducted on Indigenous lands, but has only recently been emphasized in this context. As wildlife monitoring practices shift towards adopting remote sensing methodologies and Open Data practices that expand monitoring capacity, unique challenges to IDS may arise that can jeopardize relationships and monitoring outcomes. Here, we outline the need for IDS in wildlife monitoring on Indigenous lands. We stress that IDS priorities will differ across contexts, and that large collaborations add additional complexity to IDS conversations. Nevertheless, we provide recommendations for affirming IDS in wildlife monitoring and discussion questions to consider when approaching IDS in wildlife monitoring. These can facilitate a shift in approach to data sovereignty in collaborative wildlife monitoring, contribute to more meaningful partnerships between Indigenous Peoples and Western scientists, and facilitate progress towards shared biodiversity conservation goals.

Key Words: Indigenous Data Sovereignty, wildlife monitoring, Open Data, knowledge co-production, biodiversity conservation

Title: Evaluating the role of prealternate moult in carry-over effects from overwintering to migration for Neotropical migratory warblers

Shae Turner, Thompson Rivers University; Christopher Tonra, The Ohio State University; Ivy Ciaburri, The Ohio State University; Bryant Dossman, Georgetown University; Peter Marra, Georgetown University; Christina Robinson, Portland, Jamaica; Mateen Shaikh, Thompson Rivers University; Matthew Reudink, Thompson Rivers University

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Abstract: Despite the importance of moult for feather function, it remains one of the least understood events in the annual cycle of migratory birds. Prealternate moult has received far less attention than prebasic moult because it occurs during one of the least-studied periods of the annual cycle: overwintering. Understanding the factors that shape prealternate moult phenology is critical for understanding its potential to carry over and shape success during spring migration and the breeding season. Here, we investigated 1) the role of winter habitat quality in influencing patterns of prealternate moult and 2) if the timing and intensity of moult carried over to influence the timing of migration. In winter 2023, we studied six warbler species overwintering in Jamaica in two distinct habitats that varied in quality. We captured individuals throughout the season to document the timing and intensity of their moult, then used radio-telemetry tags and a global network of automated receiving towers (The Motus Network) to track migration departure dates. Ultimately, these results advance our understanding of prealternate moult in migratory warblers and will serve as a foundation for examining the role of moult in carry-over effects from winter to migration in our study population.

Key Words: annual cycle ecology, migration, moult, ornithology, Motus

Title: Attractive or inconspicuous? Male density, but not colour, predicts extra-pair paternity in mountain bluebirds

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Abstract: Mountain bluebirds (*Sialia currucoides*) are sexually dichromatic and socially monogamous songbirds in which females in some populations prefer more colourful UV-blue males as both social and extra-pair partners. We investigated the influence of colouration and conspecific neighbour abundance on the occurrence of extra-pair offspring at mountain bluebird nest boxes in Kamloops, British Columbia, Canada. Using blood and feather samples, we examined microsatellite markers to identify extra-pair nestlings at 122 nest boxes. Preliminary analysis indicates that dull plumage colour is not associated with the loss of paternity at the nest, but rather the distance to, and abundance of, mountain bluebird neighbours appears to be an important factor in whether females seek extra-pair males. Our work suggests that the role of plumage colouration in mate choice may be confounded by the effects of neighbour proximity and density.

Key Words: Colour, Extra-pair, paternity, distance, neighbours

Title: Environmental Preferences of Oregon Forest Snails

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Abstract: This study, exclusive to Colony Farms Regional Park, delves into the correlation between nettle presence and the endangered Oregon forest snails. Our findings highlight a significant positive relationship, demonstrating that sites adorned with nettles consistently harbour a greater prevalence of snails compared to those without nettles. The results underscore not only higher snail numbers but a heightened likelihood of snail presence in nettle-rich sites compared to non-nettle sites, emphasizing the significance of nettle habitats for the conservation of these endangered snails. These behavioural nuances emphasize the pivotal role of nettle habitat in shaping the distribution of these endangered snails within the park ecosystem. Intriguingly, the snails start to go into hiding when ground-level relative humidity drops below 85%, with a complete absence of snails observed below 75% ground-level relative humidity. The observed sensitivity to humidity levels provides valuable insights for future studies focused on Oregon forest snails, contributing to a comprehensive understanding of their habitat preferences and aiding in conservation efforts.

Key Words: Endangered, Snails, Nettle, Moisture, Habitat

Title: Identifying Habitat Factors Affecting Fisher Reproductive Output in BC

Shannon Werden, Thompson Rivers University; Dr. Karl Larsen, Thompson Rivers University; Dr. Joanna Burgar, Thompson Rivers University & The Ministry of Water, Land and Resource Stewardship

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Abstract: The Columbian population of fishers are one of two genetically distinct fisher populations in British Columbia and inhabit the central interior of the province. This population is more isolated and is in steep decline. Their low population size has prompted the up-listing of their conservation status to the provincial Red-list, with current projections suggest this population could become extinct in 11 years. Fishers in central BC are understudied and there are many gaps in our understanding. This project aims to fill one of these important knowledge gaps: how does habitat quality affect the reproduction of fishers in the Columbian population? Using radio-telemetry, we will track female fishers in the Cariboo region to better understand the habitat and space use of females within their home ranges. We will concurrently track the reproductive output of individual females and relate this output with the habitat quality of the female's home range. We will also be looking into other reproductive parameters in the hopes of better understanding female fisher reproduction within the Columbian population. Understanding the linkage between habitat and reproductive output will allow decision-makers to incorporate this information into forest management guidance and policy/regulations.

Key Words: fishers, habitat, reproduction, home range, denning

Title: A Comparison of GPS and Accelerometer Data in the Tracking of Animal Activity

Thamindu Widyaratne, Thompson Rivers University; Emily K Studd, Thompson Rivers University; Stan Boutin, University of Alberta; Michael Peers, Memorial University

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Abstract: Traditionally, researchers have used GPS to track animal movement and activity. GPS data solely documents the spatial activity of animals- it has not yet been analyzed whether this is sufficient to describe overall animal activity patterns. Our research explores whether GPS data is comparable to accelerometer data in the tracking of animal activity. Accelerometer and GPS data were concurrently gathered from wildlife in Kluane, Yukon over the past 7 years. We will analyze this data, looking for correlations between activity metrics and data collected from each device. If GPS data is found to be significantly less accurate than accelerometer data in documenting animal activity, accelerometry may be suggested as the standard for capturing animal activity patterns.

Key Words: accelerometer, GPS, activity, mammal, comparative study

Title: Do Our Models Predict or Explain?

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Abstract: Conservation research is now dominated by the near-exclusive use of correlative model selection methods (e.g., using Akaike's Information Criterion to select among candidate models generated from observational data) to generate causal explanations. However, this requires the assumption that models capable of reproducing outcomes are also accurately explaining causal relationships. This conflation between prediction and explanation is common in conservation but distinguishing between them is critical for both generating reliable inferences, and for developing effective management interventions. I present examples of where predictive models can be used appropriately but also how methods should be modified to address causal effects.

Key Words: modelling, statistics, causality, prediction, conservation

Title: Movement ecology and road mortality for three threatened species of snakes in the South Okanagan

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Abstract: In the arid valleys of south-central British Columbia, Western Rattlesnake (*Crotalus oreganus*), Great Basin Gophersnake (*Pituophis catenifer deserticola*), and Western Yellow-bellied Racer (*Coluber constrictor mormon*) all occupy similar habitats. With the rise of development in the area, there is concern surrounding this community of threatened species who call this increasingly fragmented world their home. At a population level, these species share the common threat of direct mortality from roads. Using our 10-year historic Rattlesnake roadkill dataset, our models have shown a peak estimation of 57 adult Rattlesnakes dying due to road mortality in 2017, pre-mitigation efforts, with a forecasted population decline of 97% in 100 years. With the introduction of wildlife culverts, models have estimated a low of 17 adult Rattlesnakes dying in 2023, post-mitigation. With roads being the primary driver of mortality for all three species, we expect similar results in the other two species. To supplement this data, this season, we used radiotelemetry to track individuals of all three species simultaneously to compare movement patterns, identify common critical habitat features, and quantify road avoidance. This work will provide insight into movement patterns of these species surrounding anthropogenic landscape features and will fill knowledge gaps relating to road mortality.

Key Words: Herpetology, movement ecology, road ecology, conservation, endangered species

Title: A Stress Indicator in Mule Deer Potentially Used to Assess Ecological Disturbance

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Abstract: Ecological conditions can elevate stress, affecting mule deer production, fitness and survival. Stress in wildlife can be monitored from the cortisol concentrations in biological samples, including in faeces. SNRC has been collecting deer pellets since the wildfire season of 2021 to evaluate if factors such as disturbance, habitat condition, or climate can alter fecal cortisol levels in deer. We began deer pellet collection in Skeetchestn Territory in August 2021 while the catastrophic Sparks Lake and Tremont Creek wildfires were still burning in the Territory. Six important seasons for mule deer have been sampled. We have since completed the analysis of fecal concentration for our first two years of sampling. Our analysis of results shows that during the wildfire, an ecologically catastrophic event, concentrations of 128.9 ng/mg (95% CI± 27ng/mg) were observed, with 53% of the individual deer being above 101.9 ng/mg. No other sampling period resulted in concentrations of fecal cortisol that were significantly similar to this observation. We believe we can use the high concentration as a threshold for tracking stress in deer and apply it to evaluating land use.

Key Words: Stress, Wildlife, Ecological Disturbance, Cortisol, Mule Deer

POSTERS (Alphabetical order by first author last name)

Title: Cougar spatiotemporal response to human activities in a temperate rainforest recreational multi-use landscape

Emerald Arthurs, University of Victoria; Christopher Bone, University of Victoria; Jason T. Fisher, University of Victoria; Elicia Bell, University of Victoria

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Abstract: The establishment of protected areas often contends with the dual mandate of protecting wildlife such as large carnivores and enhancing opportunities for recreation. However, recreational activities may induce fear responses in carnivores, causing both spatial and temporal displacement. This research aimed to quantify the spatial and temporal responses of cougars (*Puma concolor*) to human activities on southern Vancouver Island in British Columbia. We modeled cougar weekly occurrence frequency in relation to human activity (hiking and vehicles), occurrence frequency and landscape features, using generalized linear models. Temporal responses of cougars were investigated using activity pattern analysis, comparing activity within a recreation area and a no-entry reserve. Cougars avoid occurring with humans (recreationalists), but not vehicles, and we observed minimal influence of habitat features and prey availability on cougar occurrence frequency, as measured by information loss (AIC scores). Activity pattern analysis did not demonstrate significant differences in cougar activity patterns between the recreation area and no-entry reserve, suggesting a lack of temporal response. Insights on how cougars are responding to recreation activities can help inform landscape management and policies by providing information that can be used to mitigate negative impacts and thus ensure that recreational activities are remaining compatible with conservation efforts.

Key Words: carnivore ecology, camera traps, recreational disturbance, human-wildlife interaction, multiuse landscape

Title: Lack of consistency in black bear response to oil sands disturbance features: what pieces are missing?

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Abstract: In the Alberta Oil Sands Region, landscape changes associated with petroleum extraction have altered habitat availability for mammals. Numerous studies have been performed to investigate species response to disturbance features, ultimately with the purpose of directing industrial activities and restoration efforts. Although some patterns have emerged, there is still uncertainty regarding responses of certain species, such as black bears. Black bear response to disturbances is particularly intriguing because results throughout the literature are largely inconsistent, with studies that indicate either a positive, negative, or negligible reaction to features. The purpose of this study is to explore other factors involved in habitat selection that could explain these inconsistencies. I hypothesize that more robust patterns will emerge when different biologically important seasons are considered, a predictor yet to be examined in the literature. I also hypothesize that cub presence will affect bear feature preference. I will test these hypotheses by first collecting bear distribution data from camera arrays employed under the Oil Sands Monitoring program, then modelling this data to determine whether designated predictor variables explain habitat selection. The results of this study will hopefully provide clarity on how black bears are being affected by disturbance features and thus inform conservation initiatives.

Key Words: Black bears, landscape ecology, disturbance, cameras, habitat selection

Title: Working Together to Monitor Biodiversity in B.C.

Joanna Burgar, Ministry of Water, Land and Resource Stewardship; Esk'etemc First Nation; Stswecem'c Xgat'tem First Nation; Williams Lake First Nation; Okanagan Nation Alliance

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Abstract: Members of Indigenous communities are the eyes and ears on the land and have long stewarded, monitored, and managed wildlife. Through the Biodiversity Monitoring Program, the B.C. government is seeking to collaborate with Indigenous partners to monitor wildlife populations on Indigenous traditional territories. This work will inform wildlife management decisions and help support healthy ecosystems and communities. The Biodiversity Monitoring Program uses camera traps and audio recorders to collect baseline data about land-based mammals. The primary goal is to gain information about mesocarnivores and bats, but the program's tools and resources can also be used to collect data about other species of interest. This data is managed from collection to dissemination and is shared with project partners to help support their work. Through further collaborations, the program can expand its efforts to support other partner-specific monitoring projects. Ultimately, collaborations are intended to be flexible, and studies can be tailored to specific monitoring goals. Although the sharing of data collected by partners is appreciated, there is no obligation to share data or information with the Province under this program. The Province is currently working with Esk'etemc, Stswecem'c Xgat'tem, and Williams Lake First Nations, and the Okanagan Nation Alliance.

Key Words: camera trap, ARU, mesocarnivores, bats, Indigenous partners

Title: Is consistency key? An investigation into consistent activity as a potential indicator of stress in squirrels.

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Abstract:

With increasing stresses in environments, from climate change and anthropogenic activities among other things, many organisms are facing serious survival challenges. There is a need of more early indicators of stress. Activity holds promise as an early indicator because it is an immediate response by organisms to changing conditions, but little work has been done to investigate this relationship. This research looks at whether consistency in red squirrels daily activities is indicative of stress. Accelerometer data was collected from the red squirrel population in Kluane, Yukon. This data will be analyzed to look at consistency in activity to determine whether there are links to environmental stresses. The environmental stresses investigated are resource abundance, thermal conditions, and reproductive opportunities. If activity is found to be indicative of stress this can be a revolutionary strategy that already has a basic set up through activity measuring technologies.

Key Words: activity, stress, accelerometer, squirrel, conservation strategy

Title: To burn or not to burn: effects of prescribed burning on thimhorn sheep and alpine mammal populations

Josie Cumming, Thompson Rivers University; Shannon Whelan, Taku River Tlingit; Hannes Schraft, Taku River Tlingit; Emily Studd, Thompson Rivers University

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Abstract: The Taku River Tlingit traditionally used prescribed burns in the alpine to steward the thimhorn sheep population. Burning practices are no longer active within the Taku River Tlingit, and the population of thimhorn sheep has since declined. This study aims to find if revitalising the traditional Indigenous practices of prescribed burning would be beneficial to the thimhorn sheep populations and other alpine wildlife. I completed a literary review relating to alpine wildlife in Atlin, British Columbia, and on effects of burn in thimhorn populations. I was able to tabulate this data to show the costs and benefits of prescribed burn for thimhorn sheep, as well as other alpine mammals. The data strongly suggests that the benefits of prescribed burns in alpine areas outweigh the costs for thimhorn sheep, and other alpine mammals. Increasing burn area allows for increased foraging opportunity for ungulates during winter, greater awareness of potential predation due to increased visibility, higher surviving offspring ratios, and decreased levels of parasites and diseases. Although there are some costs to prescribed burns (causing overlap of ungulate species and therefore leading to greater competition of resources, greater visibility for predators to see prey), the benefits of prescribed burning outweigh the costs.

Key Words: alpine, thimhorn sheep, prescribed-burn, Taku River Tlingit, mammals.

Title: Effects of reproduction and immigration on the short-term population dynamics of urban black-tailed deer (*Odocoileus hemionus columbianus*)

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Abstract: Abundant urban deer reduce biodiversity and pose human-wildlife conflicts. Urban areas lack predators and contain high-quality forage that facilitates high deer abundance. On Vancouver Island, BC, immunocontraception (IC) programs have successfully lowered birth rates in urban black-tailed deer (BTD). It's suggested that this may only be effective in insular environments where immigration is minimal. In an open environment, if a population is reduced, it can create space for fertile deer to immigrate and reproduce. Population dynamics is how a population size changes overtime, and what partly shapes this is the addition of individuals to the population via births or immigration. Therefore, we must investigate both factors. I will assess how reproduction and immigration shape short-term population dynamics in open and closed populations of BTD on Vancouver Island who have received IC. I hypothesize i) birth rates primarily contribute to net population change in the closed system and ii) both birth rates and immigration primarily contribute to net population change in the open system. To test this, I will estimate population densities over time using spatial capture-recapture modelling. A better understanding of BTD population dynamics will inform conservation and management for large urban wildlife species across Canada and enhance urban biodiversity.

Key Words: population dynamics, human-wildlife coexistence, reproduction, immigration, urban deer.

Title: Determining the Accuracy of the Beaver Restoration Assessment Tool for Identifying North American Beaver (*Castor canadensis*) Habitat in Central Interior Cariboo Region of British Columbia

Alessandro Freeman, British Columbia Institute of Technology/Simon Fraser University; Douglas Ransome, British Columbia Institute of Technology; Sarah Nathan, Ducks Unlimited Canada; Aleksandra Kepczynska, Ducks Unlimited Canada; Fiona Tse, Ducks Unlimited Canada; Andrew Pantel, Darin Brooks, Memorial University of Newfoundland & Labrador; Jenna Watson, British Columbia Institute of Technology; Al Martin Fellowship Committee with Habitat Conservation Trust Foundation

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Abstract: Streams and rivers provide ecosystem services for both wildlife and human use. Climate change effects on watersheds in British Columbia have caused reductions in summer/fall flows and loss of perennial systems. North American beaver (*Castor canadensis*) build dams that can retain water effectively and create wetlands for wildlife habitat such as waterfowl. The Beaver Restoration Assessment Tool (BRAT) is a GIS model that assesses a channel's dam capacity based on biological, physical, and hydrological input data. This study assessed the BRAT's ability to accurately estimate suitable and unsuitable beaver habitat. Accuracy was assessed by two methods; (1) by ground-truthing a segment of 15 channels within the Cariboo region for biological, physical, and hydrological habitat parameters estimated by the BRAT; and (2) by running a hydrological model over the 15 ground-truthed channel segments. The assessment results indicate that the BRAT effectively estimates vegetation availability for dam building but does not necessarily indicate a stream's overall habitat quality for beaver, and may not always correctly classify a channel as perennial. By combining the BRAT with hydrological modelling, resource managers may have an improved approach to identify high-quality candidate sites for beaver restoration before committing any field resources.

Key Words: beaver restoration, hydrology, habitat modelling

Title: Neonate mortality in mountain caribou: Insights into the extent and spatiotemporal patterns of wolf predation

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Abstract: Neonate survival in ungulates affects subsequent recruitment of calves into the population—often a limiting factor. Caribou (*Rangifer tarandus*) calf mortality during the neonatal period is commonly attributed to predation, particularly by gray wolves (*Canis lupus*). However, the extent and spatiotemporal characteristics of wolf predation on neonates is understudied in threatened mountain caribou populations. Our ongoing research on Itcha-Ilgachuz caribou ($n = 75$), uses movement models before and after the reduction of wolf populations to estimate the relative contribution of probable wolf predation to neonate mortality rates, average age at which these mortalities occurred, and identify characteristics of probable wolf caused mortality locations. The relative contribution of wolf predation was estimated as 38% prior to wolf reduction. The average age of neonates experiencing probable wolf-caused mortality was 21 days. Probable wolf-caused mortalities, on average, occurred nearer to linear features, and in areas with greater coverage of treed valley bottoms. We corroborated our findings regarding the spatiotemporal characteristics of wolf predation with a parallel camera trap study. Our research highlights the value of using indirect approaches and multiple streams of data to fill empirical knowledge gaps on caribou predation dynamics, informs management plans regarding predator reduction, and identifies habitat protection priority areas.

Key Words: N/A

Title: Anthropogenic risk and habitat best explain cougar space use in a mixed-accessibility coastal landscape

Victoria Harbo, University of Victoria; Christopher Bone, University of Victoria; Jason T Fisher, University of Victoria

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Abstract: Minimally disturbed habitat is crucial for wildlife functions, including hunting, movement, and reproduction. Human presence may directly impact top-predators' habitat, and indirectly heighten their sensitivity to disturbance. As outdoor recreation increases, understanding the impacts on top-predators like cougars (*Puma concolor*) is essential for proper management. Cougars' large ranges and low densities elevate their vulnerability to recreation, posing an increased threat to population or species persistence. This study assesses the effects of human presence on cougar habitat use in a mixed-accessibility system on southern Vancouver Island harboring a dense cougar population. Analyzing data from 48 camera traps, generalized linear models were applied to cougar and human detections along with a range of covariates across spatial buffers (125m-750m), evaluating competing hypotheses related to habitat, prey, and anthropogenic risk. Cougar occurrence was best explained by habitat and risk at a 750m buffer. Cougars spatially avoided dense roads/trails, human occurrence, elevated terrains, conifer forest, and dense canopies. Conversely, cougars favoured broadleaf forests and water sources. Cougars displayed a positive association with vehicular routes, suggesting their strategic use as alternatives to busy recreational trails. These findings guide management strategies, aiming to align human recreational interests with cougar habitat preservation, and mitigate potential human-cougar conflicts.

Key Words: cougar, camera traps, recreation, anthropogenic disturbance, habitat

Title: Distribution Modelling and Population Dynamics for Mesocarnivores in British Columbia

Cindy Hurtado, Ministry of Water, Land and Resource Stewardship; Joanna Bugar, Ministry of Water, Land and Resource Stewardship

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Abstract: In British Columbia, limited information on the distribution and trends of mesocarnivore populations hampers effective management decisions for their recovery. This project addresses this gap by generating, updating, and validating distribution models for 18 mesocarnivore species in BC. We obtained data from diverse contributors, including government biologists, academics, and trappers, to compile comprehensive records across B.C. Integrated population models will be developed for species with enough density information in multiple localities, while species distribution models will be developed for those with limited data. In our modelling, we prioritize mesocarnivore species based on their conservation status in the province; species like fisher are our initial focus. Through this approach, our research aims to enhance the understanding of mesocarnivore dynamics in the region. The project's outcomes will inform the province about the status of mesocarnivore populations, facilitating targeted and proactive management decisions for their conservation.

Key Words: distribution models, fisher, Integrated Population Models, population dynamics, wildlife conservation

Title: Kenkéknem (*Ursus americanus*, American black bear) foraging habits at a disturbed ski area in Skwelkwék'welt, south-central Secwepemcúl'ecw, during severe summer drought

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Abstract: We studied the foraging habits of kenkéknem (*Ursus americanus*) living at Sun Peaks Ski Resort in Skwelkwék'welt, south-central Secwepemcúl'ecw, during severe summer drought to determine whether seasonal shifts in foraging occurred from May to late August. We used scat analysis to identify the seasonal importance of different foods and found kenkéknem to display opportunistic food consumption that reflected seasonal shifts in food quality and abundance, consuming green vegetation in the spring, scwicwéye (ants) in mid-summer, and mátspe7 (wasps) and berries in August. Vertebrate predation was distributed throughout the field season and was focused on small mammals, including voles (*Microtus* spp.) and other rodents. After drought across Secwepemcúl'ecw resulted in a low berry crop in the study area, kenkéknem focused foraging effort on ant-nest raiding. By identifying ants to species level, we showed that kenkéknem in Skwelkwék'welt target wood-nesting species. Kenkéknem also appear to be capitalizing on the development of ski terrain with heavy consumption of xwixwyúysten (*Equisetum* spp., horsetail) in spring, a plant that prefers wet disturbed environments. Understanding seasonal foraging habits of black bears in ski areas assists locals in anticipating periods of increased human-bear conflict. This study recommends forest management in Skwelkwék'welt to consider the importance of woody debris in supporting ant habitat as a means of reducing bear conflicts in low berry years.

Key Words: black bear, foraging, scat analysis, berry crop failure, ski hill

Title: The importance of permanence: a case study on the occupation of rookery sites by female Western Rattlesnakes (*Crotalus oreganus*) after a wildfire.

Caroline Lafond, Thompson Rivers University; Caroline Lafond, Thompson Rivers University; Lindsay Whitehead, Thompson Rivers University; Dana Eye, Thompson Rivers University; Karl W. Larsen, Thompson Rivers University

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Abstract: In 2021, the Nk'Mip Creek wildfire swept through the Osoyoos Indian Band Reserve—affecting ecologically significant grassland habitat, particularly for sensitive species like the Western rattlesnake (*Crotalus oreganus*). A long-term research program at this site enables us to examine the impact of this wildfire on gravid female rattlesnakes, focusing on the occupancy of traditional rookery sites. Two years following the fire, 19 of 25 known rookery showed continuing occupation by gravid females with no significant difference in reoccupation rates occurred between burned and unburnt locations. Eight gravid females detected at the rookeries pre-fire were documented returning to rookeries post-fire; these females exhibited a decrease in body condition from their earlier detection. This study provides improved understanding of the resilience of Western rattlesnake to natural disturbances, contributing to our understanding of wildlife response to environmental changes.

Key Words: Western rattlesnake, rookery, wildfire, disturbance, impact

Title: Testing Soil Carbon in a interior BC Silvopasture

Myung Jin (John) Kang, Thompson Rivers University; Lauchlan Fraser, Thompson Rivers University

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Abstract: Silvopastures are a land management system that incorporates both rangeland and forestry to optimize timber and forage. Current practices of clearcutting plantations releases carbon from the soil. Pastures could be implemented temporarily while silvicultural plantations regenerate. Strip-thinning is a scalable technique that could be used to create silvopastures across landscapes, resulting in alternating rows of forests and pasture. Although the effect that strip-width has on silvopastoral soil carbon is unknown in British Columbia. The research site is an interior BC pine plantation that was strip-thinned mid-rotation and made into pastures in the treated strips of various widths (10 m, 15 m, 20 m). My research will give novel insights on how soil carbon changes throughout a silvopasture due to strip-widths and grazing exclusion by measuring soil nutrients, vegetation diversity and biomass, and microbial communities. Given that this is a wildfire themed conference and my MSc research is focused on soil carbon sequestration, I can shift my poster and discussions with people about the potential benefits of how strip-thinned silvopastures can contribute to mitigating extreme wildfires, climate change on microhabitats, habitat for wildlife, and maybe in creating firebreaks.

Key Words: silvopasture, soil carbon sequestration, climate change mitigation

Title: Estimating Feral Horse Population Density Using Camera Traps and Natural Markings in the Chilcotin Plateau, British Columbia

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Abstract: This study employs existing camera trap data for a mark-recapture analysis to estimate the density of a feral horse population (*Equus caballus*) in the Chilcotin plateau. Using a grid of 30 camera traps spaced 2.27 km apart within a 160 km² area, individual horses were identified based on natural markings. A total of 68 uniquely identified individuals were recorded, with 58 identified by the left flank and 55 by the right flank. Previous aerial data confirmed the study area as a hot spot for feral horse activity. Based on this previous aerial estimate, we hypothesized a density exceeding 0.8 horses/km² within our grid. Spatially explicit capture-recapture (SECR) and mark-resight models were used to compare and contrast results, as well as various buffers, detection functions, and mask sizes were also employed. This research validates pre-existing mark-recapture density estimation methodologies for free-roaming horses and produced a valuable dataset of identified individuals that can be used for future investigations into group dynamics, relational group stability, and seasonal movements.

Key Words: Density estimation, mark recapture, camera trapping, wildlife ecology, feral horse ecology

Title: Weekend worriers? Causal impacts of human trail use on grizzly bear activity

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Abstract: Estimating the impacts of human activities on wildlife species of conservation concern such as grizzly bears (*Ursus arctos horribilis*) is an important question from both academic and management perspectives. However, multiple confounding environmental factors affect the activity of both people and wildlife, and the gold standard for causal inference, randomized controlled trials, is typically difficult or impossible to implement in these settings. Quasi-experimental methods, including pioneering work from the econometrics literature on the estimation of counterfactuals (i.e., what would have happened in the absence of an event or intervention) have significant potential to help us quantify causal impacts of human activity on wildlife, but have been little used in the recreation ecology field. Here, we use two quasi-experimental methods (instrumental variables and synthetic controls) and 6 years of spatiotemporal data on wildlife and humans from a camera trap grid in the South Chilcotin mountains of British Columbia to assess how use of trails and roads by people affects detections of grizzly bears. Our results suggest few detectable impacts at smaller timescales (daily and weekly), but significant causal impacts at larger, seasonal timescales. Leveraging quasi-experimental circumstances and tools can help us better understand the mechanistic impacts of human recreation on wildlife.

Key Words: wildlife ecology; camera traps; recreation ecology; grizzly bears; wildfire

Title: Owl habitat suitability in post-fire landscapes

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Abstract: Human-driven climate change has increased the frequency and severity of wildfires globally. In 2023, 2.48 million hectares of land burned in BC for a record-shattering fire season. Owls are particularly vulnerable to habitat changes caused by fire and post-fire management like salvage logging. As fires reshape landscapes in BC, understanding how burned forests contribute to long-term owl persistence is crucial for conserving at-risk species in the region. For my MSc, I am assessing how owls use burned forests 1-20 years post-fire in the Thompson-Okanagan. I am evaluating owl habitat use by modelling forest metrics against owl occupancy data collected from passive acoustic monitoring and nest searches. I am targeting four owl species—the Great Horned Owl, Northern Pygmy-owl, Long-eared Owl, and the federally at-risk Flammulated Owl. Owl recolonization is expected to be species-specific, with higher owl occupancy in low severity patches. In 2023, I detected all of my target species along with two additional species—the Boreal Owl and Northern Saw-whet Owl—most within regenerating forests burned in 2003. Results will inform forest management to protect those burned forest features vital for long-term owl conservation, as well as investigate the effects of post-fire salvage logging on owl recovery.

Key Words: wildfire, salvage logging, Northern Pygmy-owl, habitat use, passive acoustic monitoring.

Title: Optimal Configuration of Coarse Woody Debris for Maximizing Small Mammal Presence and Diversity in Harvested Forests

Alice Tew, University of Northern British Columbia; Heather Bryan, University of Northern British Columbia
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Abstract: Current fire management standards encourage the removal of coarse woody debris (CWD) from cut blocks despite important benefits to wildlife. Recent findings have shown that the construction of CWD structures, such as piles and corridors, in harvested cut blocks can increase the diversity and abundance of small mammals and their predators. Little is known, however, about the effects of CWD configuration (i.e., piles vs. corridors) on the relative use of structures by different species. Accordingly, this study compares the detection rates and species diversity of small mammals in piles, corridors, and dispersed CWD. We predicted that corridors would have greater use by small mammals relative to piles due to their connectivity to mature forests, and that both structure types would have higher detection rates relative to dispersed CWD because they provide more protective cover. We applied a novel survey method using remote-sensing cameras to detect small mammals in two cut blocks within the Halfway River First Nation Territory. Twenty-nine cameras were deployed throughout the cut blocks from July to August 2023. Nine cameras were placed on corridors, ten on piles, and ten on dispersed CWD within the harvested areas. Preliminary results show higher detection rates of mice, shrews, and birds in CWD piles or corridors compared with dispersed CWD. Mice were detected more often using corridors than piles and dispersed CWD. Findings from this study will provide information on the most effective design of CWD structures and encourage further establishment of CWD piles and corridors by forestry policy-makers and licensees.

Title: An Examination of Dabbling Duck Food Resource Availability Between High- and Low-Quality Restored Wetlands

Jenna Watson, Simon Fraser University/British Columbia Institute of Technology; Alessandro Freeman, Simon Fraser University/British Columbia Institute of Technology; Douglas Ransome, British Columbia Institute of Technology

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Abstract: While much work is being undertaken by Ducks Unlimited Canada to restore wetlands in the Caribou region of British Columbia, recent observations show wetlands are experiencing differences in dabbling duck reproductive success. Some wetlands are facilitating the production of large broods, and others are seeing low yields. During their breeding periods, dabbling ducks are dependent on food resources, specifically benthic macroinvertebrates (BMIs), within wetlands to rear their young. This project compared the abundance and density of BMIs and dabbling duck feeding area between wetlands with high- and low-reproductive success as a potential cause of the variation in reproductive success observed. In summer 2023, four low-quality and four high-quality wetlands were sampled using a complete randomized block design during the May breeding and July brooding periods. Ground truthing of wetland quality type was performed through indicated breeding pair and brood surveys, while BMIs were collected using a traveling sweep approach. Preliminary data analysis shows trends in feeding area and BMI density between high- and low-quality sites and may be the cause of observed differences. This study will help build a greater understanding of factors that affect dabbling duck populations and improve wetland restoration practices aimed at enhancing dabbling duck populations.

Key Words: Waterfowl, Wetlands, Restoration, Invertebrates, Food

Title: The Role of Climate in Habitat Selection and Behavior in Range Expanding Bobcats in British Columbia

Kwasi Wrensford (University of British Columbia), Kaitlyn Gaynor (University of British Columbia)

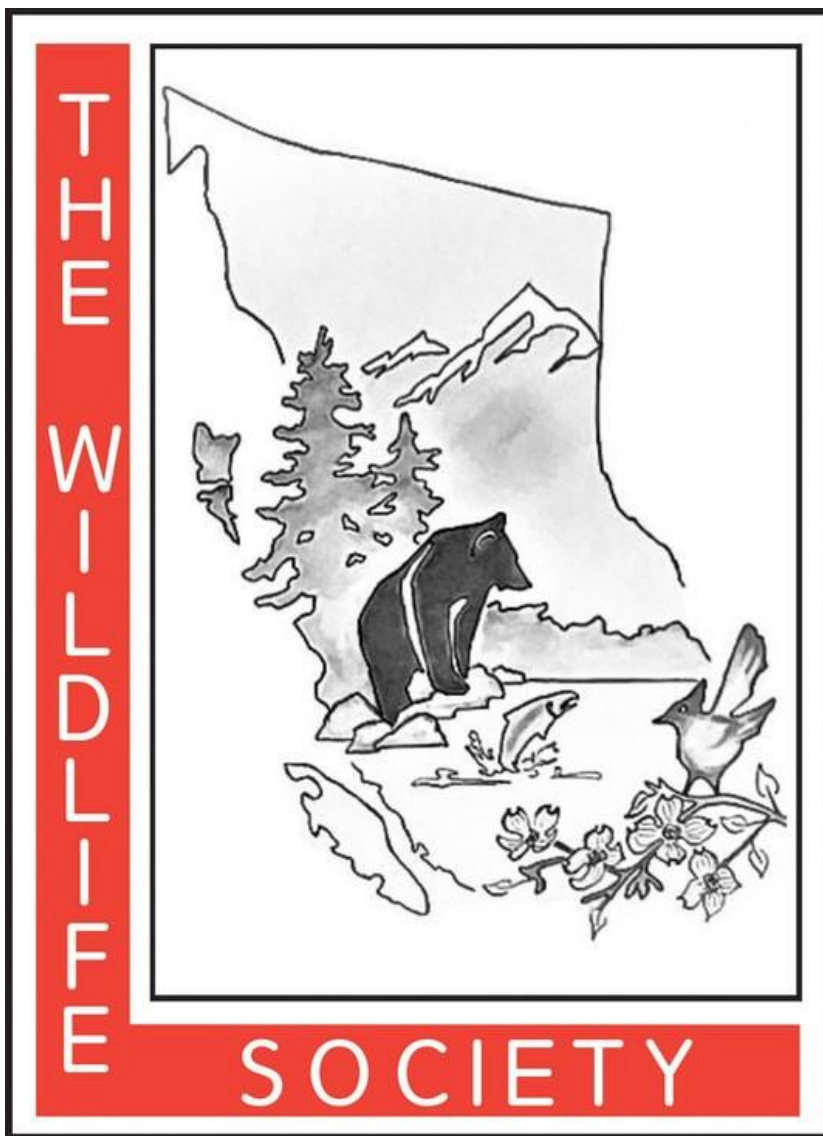
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Abstract: Anthropogenic climate change is having profound effects on animal populations around the world. A commonly observed pattern in response to warming temperatures is for species' ranges to shift to areas of more optimal habitat, either further poleward in latitude or higher in elevation. However, there is a significant degree of variation in the rate and magnitude of these range shifts, and some species do not shift their ranges at all. There is a critical gap in our observations of climate-induced range shifts and the mechanisms driving these patterns. The bobcat (*Lynx rufus*), a medium-sized feline predator with a widespread distribution across North America, have seen a remarkable recovery in their population in the past century. As temperatures warm, bobcats are shifting their range northward into southern Canada. A highly mobile species with large geographic home ranges, bobcats are a compelling system to study how individuals tracking their changing environment can drive population and species range-shift. Here, I propose a camera study of bobcats in British Columbia, examining variation in habitat preference and exploration/boldness behavior along an elevational and latitudinal gradient, to ascertain how individual behavior may drive climate induced range shifts.

Keywords: Climate change, spatial ecology, animal behavior, mammals, carnivores

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