

## Poster Session

Posters will be available at Vancouver Island University during the conference. There will be a poster session where presenters will be available to discuss their posters at the Nanaimo Museum.

6:00 pm to 9:00 pm

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#### **BC Parks Foundation**

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to understand the impacts  
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disturbances on large  
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#### **University of British Columbia**

Responses to warming of  
alpine plants: above-ground  
phenology and greenness  
in the Nch'kay region  
(Garibaldi Provincial Park)

## Catherine Jacobsen

BC Parks

### **BC Parks West Coast Region Climate Change Vulnerability Assessment**

#### **Abstract:**

Managers in BC Parks West Coast Region are increasingly faced with management issues and decision-making in response to impacts on park values from climate-related risks. In recent years, parks and protected areas have experienced repeated impacts from storms, extreme river flows, flooding, wildfire, erosion and shifting species and ecosystems. These changes affect a wide range of biodiversity, cultural and recreational values, along with park operations and facilities. This project was initiated to pilot the Canadian Parks Council's Climate Change Adaptation Framework for Parks and Protected Areas to examine relevant climate change impacts, assess risk and describe vulnerabilities in the West Coast protected areas system. Through a participatory process involving BC Parks staff along with First Nation partners from the Ka:'yu:'k't'h'/Che:k:tles7et'h' First Nations, and informed by a synthesis of climate data for the region, participants identified key vulnerabilities and a range of systemic and on-the-ground strategy options to begin meeting the challenges. This project provided a starting place to consider the impacts of climate change and integrate this information into planning and decision-making for parks and protected areas in BC.

#### **Contributors:**

Hayley Dato, BC Parks

#### **Acknowledgements:**

Living Labs (2021-22)

## Jamie Clarke

BC Parks Foundation

### Density estimation using camera traps: what is possible?

#### Abstract:

Accurate estimates of wildlife population metrics are critical for successful stewardship; they guide conservation actions, from protecting threatened species to setting hunter-harvest limits. Density (abundance per unit area) is a metric of particular importance, as it can be compared across space, species and time without bias. For density estimates to be of ecological relevance and conservation use, however, they must be of quality – that is, accurate, precise and repeatable – and produced at regular intervals. The methods used should also be practical, economical, and safe for both people and wildlife. Standard methods of density estimation in BC – for example, aerial surveys – can be dangerous, expensive and limited in scope. Could camera traps be a tenable alternative? Here, we summarize and describe “what is possible” with camera trap-based density estimation: which models have been developed/adapted for use with camera trap image data, what kinds of inputs are needed, the critical assumptions of each model, and their advantages/disadvantages. Bringing this information together is a first step in deciding camera traps’ staying place in wildlife management in BC.

#### Contributors:

- Holger Bohm, Ministry of Forests
- Cole Burton, WildCo Lab, UBC

#### Acknowledgements:

This work was funded by the Province of British Columbia through the Ministry of Forests, Lands, Natural Resource Operations & Rural Development.

This work was done on the traditional, ancestral, and unceded territories of the Coast Salish Peoples – the Sk̓wx̓wú7mesh (Squamish), Stó:lō and Səl̓ílwətaʔ/Selilwitulh (Tsleil-Waututh) and x̣ʷməθkʷəỵəm (Musqueam) Nations – and the sngaytskstx (Sinixt) People.

## **Madeleine Wrazej**

Wildlife Coexistence Lab, Forest Resources Management Dept., Faculty of Forestry,  
University of British Columbia

### **Non-Invasive Sampling to Assess Impacts of Recreation on Mountain Goats in Banff and Yoho National Parks**

#### **Abstract:**

Mountain goats (*Oreamnos americanus*) have been found to be sensitive to anthropogenic disturbance, but the effects of non-motorized recreational activities on mountain goats are still not well understood. Mountain goats inhabit mountainous regions of western North America, including Banff and Yoho National Parks. These Parks experience high volumes of visitors and have extensive trail networks passing through important goat habitat. High human use of these areas may cause increased stress or altered goat behaviour, such as displacement from suitable habitat and altered diel activity patterns. My research aims to investigate the impacts caused by recreation on mountain goats in Banff and Yoho National Parks using non-invasive fecal stress hormone analysis and wildlife camera traps. I hypothesize that increasing recreation in these parks is causing elevated stress and altered behavior of mountain goats. Fecal sample collection and camera trapping is being conducted at sites with varying levels of recreation pressure. With the support of academic and government partners, I aim to improve our understanding of the impacts of recreation on mountain goats within the parks. The analysis and baseline data from my study can help inform future decisions on management and protection of mountain goat habitat both inside and outside of parks.

#### **Contributors:**

- Dr. Cole Burton, Wildlife Coexistence Lab (UBC)
- Dr. Seth Cherry, Resource Conservation Manager (Lake Louise, Yoho Kootenay Field Unit) – Parks Canada

## **Moe Nadeau**

Simon Fraser University, Yellowstone to Yukon Initiative

### **Exploring Ethical Space for land use planning in the Upper Columbia region of British Columbia**

#### **Abstract:**

In 2019, British Columbia (BC) adopted Bill 41: The Declaration on the Rights of Indigenous Peoples Act (DRIPA). DRIPA committed BC to developing a new planning framework, modernized land use planning (MLUP), that involves ethical collaboration with Indigenous Peoples. Planning theorists have long called for planning practices that interrogate dominant power imbalances. However, planning policy and practice is missing clear frameworks to implement ethical decision-making in land use planning. Ethical Space, a conceptual approach used to balance power between Indigenous and non-Indigenous people, may prove to be a promising framework to ethically advance land use planning. This thesis examines how Ethical Space could be applied to land use planning, through an exploratory application in the Upper Columbia. Research methods include semi-structured interviews with practitioners and government representatives, document analyses, and reflective practices. Research findings present theoretical and practical applications of Ethical Space in land use planning. Upper Columbia governments are encouraged to adopt Ethical Space in their much-needed regional planning efforts.

#### **Contributors:**

Gwen Bridge, Gwen Bridge Consulting Ltd.

#### **Acknowledgements:**

Thank you to those who helped fund this research – SFU's Community Engaged Research Funding Program, Mitacs, and the Yellowstone to Yukon Conservation Initiative.

This research was conducted on Sinixt, Syilx, and Ktunaxa lands. I am grateful to be a guest on their lands and learn more about conservation and reconciliation through their cultures.

## **Morgan Davies**

Capital Regional District

### **Innovative approaches to mitigating ecological impacts: a restorative justice case study**

#### **Abstract:**

A variety of options and tools allow land managers to respond to impacts to ecological and cultural values within protected areas. The Capital Regional District (CRD) manages a system of regional parks and trails encompassing more than 13,200 ha. of lands and over 100km of regional trails throughout southern Vancouver Island and the Gulf Islands. The CRD has a mission to manage lands for public enjoyment and recreation while also fostering stewardship and connecting people to nature. A case study involving a restorative justice process in response to an unsanctioned event within a Gulf Island regional park is presented. This case study illustrates the applicability, challenges, benefits and outcomes of restorative justice processes to land management agencies and protected areas stewards. Interactions with species at risk, critical habitat degradation, local community values, and existing bylaw enforcement processes will be discussed. The case study demonstrates novel compliance and enforcement opportunities in the context of a growing Park Ranger program.

#### **Contributors:**

- Stuart Walsh, Regional Parks, Capital Regional District
- Andrew Freer, Regional Parks, Capital Regional District

#### **Acknowledgements:**

The CRD conducts its business within the traditional territories of many First Nations, including but not limited to BOKÉĆEN (Pauquachin), MÁLEXEL (Malahat), Pacheedaht, Pune'laxutth' (Penelekut), Sc'ianew (Beecher Bay), Songhees, STÁUTW\_(Tsawout), T'Sou-ke, WJOLELP (Tsartlip), WSIKEM (Tseycum) and xwsepsem (Esquimalt), all of whom have a long standing relationship with the land and waters from time immemorial that continues to this day.

## Mu He

University of Alberta

### **Recreation's impact on river conservation behaviors**

#### **Abstract:**

We describe how recreation may inspire conservation of one of Canada's largest urban parks, the North Saskatchewan River Valley (NSRV) – a Ribbon of Green that winds through the heart of Edmonton Alberta. We investigated how attitudes toward pro-environmental behaviors, subjective norms, perceived behavioral control, and recreational use may influence behavioural intentions that affect the ecological wellbeing of the North Saskatchewan River and its river valley. A telephone survey was used to collect insights from 1501 Edmonton residents. Results indicate that perceived behavioral control (e.g., I know how to protect the NSRV), subjective norms (e.g., family members want me to conserve water), and recreation use (i.e., frequency of rec use) had a significant and direct effect on both private- (e.g., use of slow-release fertilizers) and public-sphere (e.g., group-based clean up and restoration projects). Perceived behavioral control was the strongest predictor of private-sphere behavior while the subjective norms were the strongest for public-sphere behavior. The importance of perceived behavioural control and social norms in inspiring pro-park and pro-environmental behaviours should be emphasized in stewardship promotion communications campaigns and program design. The study also confirmed that engagement in parks recreation appears to encourage stewardship of parks as well and related ecological systems.

#### **Contributors:**

Elizabeth Halpenny, University of Alberta

#### **Acknowledgements:**

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## **Pierre Vernier**

University of Alberta

### **Designing Conservation Areas for Biodiversity Persistence**

#### **Abstract:**

Establishing conservation areas is the primary strategy implemented to address the biodiversity crisis. In Canada, the percentage of global terrestrial area and inland water conserved is 13.5% with a commitment of 30% by 2030. However, global reviews of existing terrestrial and freshwater conservation areas challenge the effectiveness of many conservation areas to maintain biodiversity. To support biodiversity persistence, the latest science recommends that conservation areas (CAs) be biologically representative, large, hydrologically connected, and resilient to natural disturbance and external human perturbations. Tools to support reserve design have evolved to improve hydrologic connectivity and reduce vulnerability to human disturbance. However, no existing model incorporates all recommendations for persistence of biodiversity in the design of CAs. Here, we propose a model for CA design that is based on the fundamental properties that support biodiversity: size, intactness, and connectivity. Once candidate CAs are identified, they are ranked based on representation. This diverges from popular design tools such as MARXAN and Zonation by reversing the design order with representation assessed last. We apply this approach to the design of ecological benchmarks and illustrate how the approach can be used to improve the design of existing CAs as Canada works towards a 30% protection target.

#### **Contributors:**

- Kim Lisgo, Research Assistant
- Marc Edwards, Research Assistant
- Fiona Schmiegelow, Principal Investigator

#### **Acknowledgements:**

Wilburforce Foundation

## Rebecca Smith

University of Victoria

### **Looking at the big picture: using wildlife camera traps to understand the impacts of human disturbances on large mammals in and around Canada's Mountain National Parks Abstract:**

A key approach to conserve wildlife amid prolific landscape alteration from resource extraction and urbanization is through the establishment and long-term maintenance of protected areas (PAs). Little to no landscape alteration is permitted to occur within PA boundaries and as such, PAs have been denoted a "cornerstone of conservation". PAs are of particular importance to large mammal species because they require large areas of undisturbed habitat to persist. Continuous habitat in PAs, however, is only one component of the complex, heterogeneous landscape that wildlife utilize. For example, timber extraction in B.C. often occurs adjacent to the boundaries of PAs and PA mandates frequently emphasize the importance of these areas for public enjoyment, providing many opportunities for recreation and in turn, disturbing wildlife. My research seeks to understand the relative impacts of human disturbances inside (e.g. recreation) and outside (e.g. resource extraction) of PAs on large mammals through the use of wildlife camera traps deployed across Canada's Mountain National Parks. I am using large mammal detections obtained from these cameras to model species occurrences with natural landscape features, human footprint features, and human presence data to improve our understanding of the role of PAs in terms of the greater landscape.

#### **Contributors:**

- Dr. Jason Fisher, University of Victoria
- Dr. Nancy Shackelford, University of Victoria

#### **Acknowledgements:**

Funding: University of Victoria, Banff-Canmore Community Foundation, Oil Sands Monitoring, Government of BC (BCGS)

Data contribution & collaboration: Parks Canada

Territorial: The Canadian National Parks from which my data has been collected span a multitude of traditional territories and sacred lands. In no order this includes the lands of the Secwépemc, Ktunaxa, Syilx, Iyârhe Nakoda (Bears paw, Wesley, Chiniki), Blackfoot Confederacy (Siksika, Kainai, Piikani), Tsuut'ina, Aseniwuche Winewak, Danezaa (Beaver), Nêhiyawak (Cree), Anishinaabe (Ojibway), Mountain Cree, and Métis.

The University of Victoria, where I work, is on the traditional territory of the ləkʷəŋən peoples, and the Songhees, Esquimalt and W̱SÁNEĆ peoples continue their historical relationships with the land in this area to this day.

## **Tyler Chai and Allen Zhao**

University of British Columbia

### **Responses to warming of alpine plants: above-ground phenology and greenness in the Nch'kay region (Garibaldi Provincial Park)**

#### **Abstract:**

Climate change is causing widespread phenological advance and the lengthening of growing seasons in tundra ecosystems. In summer 2022, we installed twelve open-top chambers to warm the tundra in the Nch'kay region (Garibaldi Provincial Park) by one to three degrees Celsius as part of the International Tundra Experiment (ITEX). Paired with control plots, these chambers are located in three alpine plant communities: sedge, willow, and heather meadows. Phenocams above each plot take photos at thirty-minute intervals. Using these photos, we will calculate a daily greenness index. The photos will also allow us to identify the date of first flowering, seed set and leaf senescence for a few common species in each plant community. We predict increased peak greenness, delayed senescence (greenness decline), and earlier flowering within the warming chambers and will explore how quickly we start to see the effects of warming after chamber installation. A heat wave in early August flooded the willow site, providing the opportunity to observe the effects of abnormal flooding in addition to warming. This study will answer how quickly alpine plant communities respond to warming as well as explore the influence of extreme weather (such as flooding) on greenness and phenology.

#### **Contributors:**

- Cassandra Elphinstone, University of British Columbia
- Courtney Collins, University of British Columbia
- Nathalie Chardon, University of British Columbia
- Anya Boardman, University of British Columbia
- Katie Goodwin, University of British Columbia
- Nina Hewitt, University of British Columbia
- Greg Henry, University of British Columbia
- Amy Angert, University of British Columbia

#### **Acknowledgements:**

We are guests on the traditional, ancestral, and unceded territory of the xwməθkwəy̓əm (Musqueam), Skwxwú7mesh (Squamish), Stó:lō, and Səlílwətaʔ/Selilwitulh (Tsleil- Waututh) and Lílwat Nations. As such we are communicating and learning from these Nations as

much as possible during our studies. Primary funding for this project came from the BC Parks Living Lab for Climate Change and Conservation. Also supporting this research was the University of British Columbia's Work Learn Program and an NSERC Discovery Grant to G. Henry.