

UNDER WESTERN SKIES



September 27 – 30, 2016

Mount Royal University, Calgary, Alberta

Parks and Protected Areas Research Group Panel and Poster Session Abstracts



Institute for
Environmental
Sustainability

Mount Royal's Institute for Environmental Sustainability
and the
Parks and Protected Areas Research Group

In 2013, Mount Royal University's Institute for Environmental Sustainability (IES) was established to support student learning, community involvement, and research efforts that improve environmental health and sustainability. As an integral part of Mount Royal University, student learning and support are central to the IES. Undergraduate research assistants are supported both directly through the Institute and by IES funded projects. In 2015, in conjunction with Mount Royal's Department of General Education IES supported the development of an undergraduate sustainability field school in Scotland. Each year hundreds of community members engage in dialogue about sustainability at the IES Seminar Series, Special Events, and the annual IES Earth Day Speaker Event. And through the IES Research Grants fund 29 sustainability projects have been supported in just three years.

The Parks and Protected Areas Research Group of the IES focuses on issues surrounding the sustainability of parks and other protected areas. Twenty-five members meet quarterly to discuss topics ranging from the sustainability of tourism to the ecosystem services provided by parks. The Parks and Protected Areas Research Group organized two sessions on September 28, 2016 at the Under Western Skies conference held at Mount Royal University. The conference abstracts from the panel session and open poster session are presented here.

For more information about the Institute for Environmental Sustainability and the Parks and Protected Areas Research Group please visit mtroyal.ca/ies

PARKS AND PROTECTED AREAS RESEARCH GROUP

PANEL SESSION ABSTRACTS

Wednesday, September 28, 1:00 – 2:30 p.m. Room EC 2075

Engaging Citizens in the Protection of Parks and Species

Dorothy P. Hill

Department of Biology, Mount Royal University, Calgary, AB, Canada

Public Participation in Scientific Research (PPSR) or “citizen science”, involves members of the public collecting, analysing, and/or using scientific data. In the past two decades there has been an exponential increase in the number of citizen science projects, many of which involve the collection of environmental monitoring data. Increased data collection capacity over greater geographic and temporal scales than would otherwise be possible is one of the chief benefits of these citizen science projects. However, the impact of these projects on the participants themselves should not be overlooked. Environmental-focused citizen science projects can increase ecological literacy and foster a sense of stewardship amongst participants. Engaging the public through citizen science projects can make them partners in the protection of parks and species, and should be considered in the suite of management tools available.

The Role of Conservation NGOs in Parks and Protected Areas

Katie Morrison

Conservation Director CPAWS Southern Alberta

Creation and management of parks and protected areas require both science and public support. Many different perspectives and organizations are needed to ensure our most ecologically important areas receive the protection they need and are managed to conserve ecosystem values and connect people to nature. In this presentation CPAWS Southern Alberta will talk about their particular role as a conservation NGO in both creation of new protected areas and ensuring that management of protected areas prioritizes ecosystem values. Since 1967 CPAWS Southern Alberta Chapter has led conservation efforts to protect important areas in Alberta. CPAWS will use examples of their work in our Banff National Park and the new Castle Wildland and Provincial Parks to illustrate the important role of NGOs in conserving protected areas.

Nursing in Nature: Connecting parks and practitioners

Don Carruthers Den Hoed, PhD (c), Alberta Parks
Sonya L. Jakubec, PhD, Mount Royal University

When a guy who worked in parks for 24 years became an Adjunct Professor at the Mount Royal University School of Nursing and Midwifery, most people scratched their heads. But nursing is a perfect fit for parks in the *Healthy by Nature* era – and these health practitioners are eager to join us on the path!

This session will explore how parks can link to medical and wellness measures through an overview of the field and an examination of recent work by Alberta Addictions and Mental Health, Alberta Parks, and Mount Royal University on the “Mental health and well-being impacts of inclusive park experiences on adults with disabilities and their caregivers” and “The role of nature and parks in end-of-life and palliative experiences.”

Experiential Learning on Public, Private and Protected Lands

Dianne Draper and Kathy Rettie
University of Calgary and Mount Royal University

Experiential learning builds skills beneficial to students in both their academic and life pursuits. Field school experience is especially attractive to those considering post graduate research and seeking experience in research design. Our presentation focuses on two field schools that provide essential opportunities for students’ to develop an ability to interpret human and natural landscapes; and to develop and convey critical thinking skills that extend beyond the classroom. Connecting place and livelihood, students have the opportunity to assess the relationship between workers and residents with respect to economy, community and sustainability. The Okanagan Valley provides an ideal setting for students to focus on research and techniques in the analysis, planning and management of parks, tourism and recreational resources. The Cairngorms National Park field school, located in the Scottish Highlands, concentrates on sustainability. Students gain an understanding of the rights and responsibilities of citizens and landowners; they also become acquainted with the skills necessary to understand and effect change. As the next generation of environmental stewards, students experience first-hand the complexity and interdisciplinary nature of public, private and protected area land management.

PARKS AND PROTECTED AREAS RESEARCH GROUP

POSTER SESSION ABSTRACTS

Wednesday, September 28, 4:30 -6:00 p.m. Room EC 1040

Environmental and Commercial Operations in National Parks

Barb McNicol and Molli Bennett

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There is a need for protected areas, such as national parks, to promote positive visitor experiences while simultaneously enhancing the understanding of their value. There is also the need for improved understanding, by parks management, of the connection between environmental supply and the business success of the commercial tour operations within parks. One way this can be accomplished is by investigating the link between factors that influence environmental conservation and performance by commercial tour operators. Factors that influence conservation include: natural features, physical attributes, management initiatives and/or governance policies. Following 16 exploratory field interviews and a pilot study, a final survey N=97 was distributed to commercial tour operators that function in Banff and Jasper National Parks, and was accompanied by 17 further qualitative interviews. Methodology was designed to evaluate how environmental supply impacts the business success of commercial tour operators within national parks, ultimately helping park management to evaluate current and future commercial tourism actions.

Ecosystem Services Provided by Alberta Wetlands

Cameron Egler, Jonathan Cooper, and Chyloe Healy

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Alberta's wetlands cover approximately 20% of the province and can be found in every region. However, wetlands are frequently destroyed for human convenience due to a lack of understanding of the ecosystem services they provide. Ecosystem services are the benefits nature provides to households, communities, and economies for little to no cost. The disappearance of wetlands by human means has prompted the Alberta government to implement a wetland policy to minimize the further loss and degradation of wetlands. One way to assess wetland ecosystem health is by monitoring populations of indicator species such as amphibians. For this project we conducted a literature review to assess the ecosystem services provided by Alberta's intact wetlands. Specifically, we examined the services pertaining to flood control and water filtration, biodiversity support, and cultural ecosystem services. Our results emphasize the importance of wetlands to Albertans and offer incentive for involvement in monitoring programs, such as Call of the Wetland.

Changes in the distribution and abundance of bumble bees in southern Alberta from 1985-2011

Robin E. Owen

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Recently much attention has been paid to the drastic and alarming contraction of the distributions, and the corresponding decline in the abundance, of some bumble bee (*Bombus*) species in North America and Europe. In North America *Bombus affinis* Cresson, *B. terricola* Kirby and *B. occidentalis* Greene have all disappeared from significant parts of their historic ranges. In Alberta *B. occidentalis* is in serious decline having disappeared, or almost disappeared, from locations where it was once one of the most common species in the mid-1980s. In contrast another species, *B. moderatus* has increased its distribution and abundance. It occurs in the northern and western regions of North America and reaches its southern limit in Alberta. In 1915 the southernmost record was Banff; by 1987 it had appeared in Kananaskis Country, 40 km southeast of Banff, and by 2010 it had spread 80 km further east to become one of the more common bumble bee species in Calgary, where it had never been previously recorded. This represents a rate of spread over the last 20 years of about 4 km/yr. In 2011 it was recorded in Edmonton. The simplest hypothesis that can account for this change is that it is just a continuation of the natural expansion of its range following migration via Beringia from Eurasia after the end of the last ice age. An alternative hypothesis is that it is filling the niche vacated as a result of the decline in *B. occidentalis*.

How clear cut logging will affect soil erosion rates in the Ghost River watershed

Jonathan Cooper

Dept. of Earth and Environmental Sciences, Mount Royal University, Calgary, AB, Canada

The objective of my project is to determine how clear cut logging will affect soil erosion rates in the Ghost River watershed, in western Alberta. The Ghost watershed supports critical wildlife habitat, is rich in ecotourism opportunities, and is home to small communities and a deep rooted ranching population. The watershed also experiences commercial forestry activities, and more clear-cutting is planned. The Universal Soil Loss Equation (USLE) was originally developed for agricultural areas, but can also be used for forested slopes such as in the Ghost Valley. Using the USLE, data on rainfall amounts, soil erodability, slope, cover, and conservation practice factor were modeled and the results mapped in a sample area of the watershed. Values for intact-forested areas within the Ghost Valley were compared to the areas that have recently been clear-cut. This comparison helps to predict how proposed clear cutting will impact sediment erosion in the Ghost River Valley.

Chytrid Fungus and Alberta Amphibians

Carol Maichle, Glynnis Mathieson, and Justin Plett
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Amphibian populations have been declining globally in recent years. Chytridiomycosis, a fungal disease that attacks amphibians caused by the fungus *Batrachochytrium dendrobatidis* (*Bd*), has been proposed as a major cause of this loss of biodiversity. Using a literature review, we examined the pathophysiology of chytridiomycosis and the impact it is having on amphibian numbers worldwide. We also examined the potential of this disease to impact amphibian populations within Alberta. Although there have been no confirmed cases of chytridiomycosis in the province, provincial biologists have documented the presence of *Bd* in almost half of the wetland sites surveyed. Spores of *Bd* can be accidentally spread from one wetland to another by hikers, campers, anglers, and hunters. Preventative measures, such as proper washing of boots after visiting a wetland and citizen science initiatives to document amphibian and wetland health, can help minimize the risks of chytrid fungus to Alberta amphibians.

Patterns of fish species distributions replicated across three parallel rivers suggest biotic zonation in response to a longitudinal temperature gradient

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Environmental gradients determine the distributions of individual species, which, in turn, shape patterns of species assemblage across those gradients. We used species distribution models to study the assemblage of fish species along the three mainstem rivers in the South Saskatchewan River Basin (SSRB) in Alberta, which flow in parallel across an 800 km longitudinal span and down 1400 m from the Rocky Mountains to the Great Plains of North America. We estimated the similarity of species assemblages along each river to identify general patterns of species assemblage associated with temperature and five other physiochemical variables. Mean July water temperature, which ranged from < 11 °C at high elevation to > 21 °C at low elevation, was strongly associated with the presence-absence of most species in the SSRB. We found that high turnover occurred at two locations along the longitudinal gradient: where mean July water temperature was approximately 15 °C and where mean July water temperature was approximately 19 or 20 °C. There was also an increase in species richness at lower elevations where water temperatures were higher. Models incorporating forecasted changes in water temperature with climate change will likely provide accurate predictions of changes in the diversity and distribution of riverine fish communities across topographically heterogeneous landscapes.

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Road Watch in the Pass: A successful citizen science project in the Crowsnest Pass, Alberta

Rob Schaufele

Road Watch in the Pass & Collision Count Project

Road Watch in the Pass (RW) is a successful Citizen Science Project, located in the Crowsnest Pass, Alberta. RW diligently works to protect the diverse wildlife in the Southeastern Rocky Mountains, and to reduce the negative impacts of Hwy#3. Hwy #3 in this area of the Crown of the Continent bisects critical wildlife habitat, restricting wildlife movement, and reducing wildlife connectivity. Wildlife mortality is significant because of the high numbers of wildlife vehicle collisions (WVC's). Overall, the RW goal is to reduce the high number of WVCs, and increase safe passage for both wildlife and people. WVC's pose a major safety issue to both wildlife and humans.

Road Watch was established in 2004 as a citizen science initiative to collect information on wildlife crossings on Highway 3. To date, RW has collected over 5000 citizen reported wildlife observations, contributed information to numerous planning processes, and has acted as a springboard for identifying strategies to address human wildlife conflicts. The project has evolved into an outreach program, advocating for environmental social justice changes. Through the political policy process, and by teaching and practicing community advocacy skills, RW uses community development initiatives to work towards their goals. Road Watch's educational paradigm is that active citizenship promotes transformative behavior, resulting in positive changes. Through participation in the RW program, individual community members contribute to the scientific process, engage with other community members, take ownership over research results and take a front line approach in communicating these results to decision makers and advocating for policy changes. Road Watch's mission is to assist and support the implementation of wildlife crossing structures at key/hot spot locations in the Crowsnest Pass area.

Ecological Integrity (EI) Monitoring: A key management tool for Parks Canada

Derek Petersen, MSc.

Ecological Integrity Monitoring Coordinator

Lake Louise Yoho Kootenay and Banff Field Unit, Parks Canada

Ecological Integrity (EI) Monitoring is a key management tool for Parks Canada to measure and report on its success in maintaining or restoring the ecological integrity of the national parks. For Banff, Yoho and Kootenay National Parks three ecological indicators and five ecological measures have been chosen to understand and assess the health of the natural resources of the parks. For each measure a structured monitoring program has been designed and implemented and thresholds have been established against which field data can be compared and the Condition of the measure assessed.

A survey of studies conducted in the Crown of the Continent Ecosystem from 2000-2015 reveals areas of data deficiencies and suggests future research priorities

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The Crown of the Continent Ecosystem spans 72,000 km² along the Rocky Mountains from southwestern Alberta and southeastern British Columbia to northwestern Montana. Maintaining the integrity of this ecosystem across multiple jurisdictional boundaries presents challenges, one of which is simply keeping track of the research being conducted in the region. Using the library databases of Mount Royal University and Parks Canada, as well as non-digitized reports from Waterton Lakes National Park, we compiled and annotated over 200 studies conducted in the Crown of the Continent Ecosystem from 2000-2015. We then assigned keywords to each study and classified them according to location, type of research, and focal species. This analysis revealed that some locations and topics are underrepresented. For example, our sample did not include any studies that were conducted in the Bob Marshall Wilderness or the Yakh/Yaak Valley despite their importance in preserving biodiversity. There were fewer studies conducted in British Columbia compared to Montana and Alberta, and invertebrate animals and plants were underrepresented compared to vertebrate animals. The majority of studies were monitoring or survey type studies. The management reports tended to be management plans or policies, as opposed to policy assessments. Although our sample is biased towards the Waterton Lakes area, we believe that the data deficiencies we found represent current knowledge gaps and suggest future research priorities.

Historic mapping of Bluebird trails surrounding the Cross Conservation Area

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Mountain Bluebirds (*Sialiacurruoides*) are one of three North American bluebird species. When bluebirds declined during the 20th century, habitat loss resulting in a shortage of nest sites was identified as a contributing factor. This inspired volunteer conservationists to erect bluebird nest boxes along fence lines across the continent, resulting in a system of "bluebird trails." Other bird species have also benefited from these efforts. The foothills region near Priddis Alberta has supported a system of Mountain Bluebird trails for nearly 30 years. Multiple times each year, a dedicated group of amateur birders monitor nest box occupancy. However, over the past 30 years there have been considerable changes with regards to development and agricultural land use near these bluebird trails. Geographic information systems (GIS) were used to map active and unused Mountain Bluebird nest boxes within and adjacent to the Ann & Sandy Cross Conservation Area near Priddis. Historic mapping of land use and nest box occupancy trends may help to illustrate the story that has been documented by volunteers throughout the development of this area.

Partnerships for Experiential Education: Practice and Potential in the Okanagan Valley, B.C.

Dianne Draper, Kathy Rettie, Glenn Mandziuk, Ellen Walker-Matthews, Greg Hopf,
Mike Overend, & Gillian Satherstrom

Experiential learning actively engages learners in selected experiences, provides them with opportunities to undertake focused reflection, critical analysis and synthesis, and thereby enables people to increase knowledge, develop skills, clarify values, and enhance their capacity to contribute to their communities (Association for Experiential Education, n.d.). Although typically provided by a range of experiential educators (e.g. teachers, guides, therapists, coaches), in some situations, experiential education may be enhanced by partnerships with other parties (e.g. non-profits, businesses, agencies, governments). In the case highlighted here, students in a 2016 University of Calgary Geography field-based program held in the Okanagan Valley, BC, both benefitted from and contributed to, a cooperative endeavor with the Thompson Okanagan Tourism Association (TOTA) to assist the Penticton Indian Band (PIB) identify potential opportunities to ‘develop’ the Kettle Valley Railway trail that runs through their land.

As the umbrella organization representing tourism interests in the region, TOTA’s staff enabled students to meet with a PIB elder who explained the band’s perspective on cultural and environmental education as prime objectives of the trail’s potential revitalization. Students walked up to 15 km on the trail, focusing on their personal responses to the landscape, making photographic images to illustrate the ‘sense of place’ they experienced there, and forming their recommendations for the future of the PIB section of the KVR. Overlapping goals of the partners in this project point toward considerable potential for advancing educational, cultural and touristic outcomes.