CMI Annual Researchers' Meeting

May 1, 2008

Revelstoke, BC

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Acknowledgements

The Columbia Mountains Institute of Applied Ecology would like to thank CMI Director **Doug Adama** for his role in organizing and running the meeting, and CMI Director **Mike Miller**, who loaded presentations onto the conference laptop and cued them up for each speaker.

Thank you to the **Fish and Wildlife Compensation Program**, who brought David Green and Jason Emery to speak at the meeting.

And, of course, we'd like to thank the **CMI members and other participants,** who travelled from various towns in British Columbia to attend the meeting.

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Meeting Description

Every year CMI members get together to provide updates on their projects, catch up on the news, and hear about new ecological initiatives in southeastern British Columbia. This year, in addition to the regular assortment of talks, we heard about riparian values, songbirds, and species at risk from two speakers sponsored by the Fish and Wildlife Compensation Program. As usual, our short Annual General Meeting was held right after lunch.

About 30 people attended this year's CMI Annual Researchers' Meeting at the United Church Hall in Revelstoke. Presentations took place all day, with opportunities for further exchange of information at coffee breaks and lunch hour.

Agenda

9:30 a.m. **Welcome to the meeting,** Doug Adama, CMI Director and Master of Ceremonies

9:40 a.m. **Impacts of Western Hemlock Looper outbreaks on forest structure and function in the Columbia Forest District – Implications for mountain caribou,** Gregg Walker, Mount Revelstoke and Glacier National Parks

10:00 a.m. **BC Breeding Bird Atlas Project,** Marc-André Beaucher, Creston Valley Wildlife Management Area

10:20 a.m. **Roger's Pass Project reclamation after 25 years: An example of successional reclamation** David Polster, Polster Environmental Services

10:40 a.m. *Coffee*

11:00 a.m. **The development of guidelines for the management of BC's wild berries,** Michael Keefer, Keefer Environmental Services

11:20 a.m. **Ecology and roadkill risk of an endangered badger population near their range limit in southcentral BC,** Richard Klafki, Thompson Rivers University

11:40 a.m. **Managing Species at Risk in Mount Revelstoke and Glacier National Parks,** Alice Weber and Jen Theberge, Mount Revelstoke and Glacier National Parks

Noon Lunch, provided

1:00 p.m. **CMI Annual General Meeting**

1.45 p.m. **About the Selkirk Geospatial Research Centre,** Paul Sneed, Selkirk College

2:05 p.m. **Dam operations and Yellow Warblers in the Revelstoke Reach**, David Green, Simon Fraser University Centre for Wildlife Ecology

2:55 p.m. *Coffee*

3:10 p.m. **Lessons learned from riparian restoration projects in the South Okanagan**, Jason Emery, Solitudo Environmental Services

4:00 p.m. Final discussion and finish for the day.

Presentation Summaries

About the Presentation Summaries

Presenters provided the following summaries or abstracts. Contact information is provided for all presenters, along with an invitation to contact the presenters directly for more details about their work.

1. Impacts of Western Hemlock Looper outbreaks on forest structure and function in the Columbia Forest District – Implications for mountain caribou

Gregg Walker, Mount Revelstoke and Glacier National Parks, Revelstoke BC
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Co-authors:
Alfaro, R., A. Shand, V. Waring, Canadian Forest Service, Pacific Forestry Centre, Victoria, BC, and Susan Hall, Revelstoke and Glacier National Parks, Revelstoke BC.

Western hemlock looper (WHL) (*Lambdina fiscellaria lugubrosa*) is a major forest insect disturbance agent in the interior cedar-hemlock forests of the Columbia Mountains. This insect is a cyclical defoliator with a periodicity of 9 years that impacts some stands repeatedly. In the Interior cedar-hemlock (ICH) zone, un-disturbed old forests are rare due to forestry, hydroelectric reservoirs, and transportation corridors. These old forests support diverse communities and rare species, including threatened mountain caribou. Though it is clear that WHL disturbance affects old ICH forests, it is not known what the impacts are.

We studied the history of WHL outbreaks and the landscape and stand level changes induced by WHL defoliation on the structure and function of old interior cedar hemlock forests in the Columbia Forest District. This research included analyses of the Forest Insect and Disease (FIDS) aerial survey data, and the establishment of replicate study plots in stands affected by different outbreaks. There have been five major outbreaks of WHL in the Columbia Forest District since 1937. The dendrochronological record showed that during WHL outbreaks, most of the susceptible forest did not sustain sufficient defoliation for detection by FIDS surveys, but low severity impacts to trees were widespread. In relation to other variants of the ICH forest type, the drier mw1 and wetter wk1 and vk1 variants have a disproportionately high risk of being affected. This effect occurs in distinct patches, and most (74%) patches of WHL defoliation are smaller than 150 ha in size, while a few patches (8%) were larger than 450 ha. Occasionally, WHL defoliation can cause substantial tree mortality and lead to stand replacement, usually in patches smaller than 50 ha. More commonly, defoliation causes low levels of tree mortality and partial tree removal, or levels of tree mortality that are not significantly different than those in unaffected stands. Relationships between WHL

disturbance and understorey vegetation were not clear, except that diversity decreased with increasing time-since-disturbance by WHL. Understorey vegetation tends to return to pre-disturbance conditions within 30 years of disturbance by WHL.
Arboreal lichen loading and wildlife tree density was highest in stands with a moderate amount of tree mortality. Patches of severe WHL defoliation (stand replacement) may exacerbate fragmentation of mountain caribou habitat because arboreal lichens and snow interception are lost due to tree mortality, and because the shrubby regenerating vegetation is perhaps desirable for other ungulates and their predators. However, most of the susceptible forest is lightly or moderately impacted by WHL outbreaks, and this may be positive for mountain caribou habitat because wildlife trees and arboreal lichen loads are increased, yet canopy cover and snow interception are maintained.

2. BC Breeding Bird Atlas

Marc-André Beaucher, Creston Valley Wildlife Management Area, Creston BC
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The British Columbia Breeding Bird Atlas is the province's most extensive and important bird monitoring project and one of the largest volunteer based initiatives in British Columbia. Between 2008 and 2012 more than one million bird records will be submitted by thousands of citizen scientists from every part of the province. The province is divided into 41 regions to manage coverage of the 10,000 10-km squares. Volunteers survey and count birds in their assigned square. Some volunteers will single-handedly cover more than 20 squares during the course of the five breeding seasons. The data will appear online in real time complete with mapping and graphing tools.

For more information on the BC Breeding Birding Atlas, visit: www.birdatlas.bc.ca

3. *Rogers Pass Project Reclamation after 25 Years: An Example of Successional Reclamation*

David F. Polster, Polster Environmental Services Ltd., Duncan BC
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CP Rail Roger's Pass Project was a $500 million double-tracking and tunnel building project through Glacier National Park that was undertaken in the 1980's. Considerable concern was raised about a major construction project in Glacier National Park which included: two 500 person camps, over 18 km of tunnels, 16 km of surface grade, 2 km of bridges, and a major ventilation shaft at the top of the pass. In addition to the design measures developed to reduce environmental impacts of the project and various environmental protection measures that were installed (e.g. self-contained rotating biological contactor sewage treatment plants for each camp; exhaust filters for kitchen fumes and detailed water and air quality monitoring programs) an extensive reclamation program was developed to treat project disturbances. This paper describes the development of that reclamation program and the results that have been obtained.

Reclamation of Roger's Pass Project disturbances was based on the re-establishment of the natural successional processes and patterns that have been "reclaiming" natural disturbances in the project area. Initially, a review of the species and patterns of establishment that had developed naturally on various natural and human caused disturbances in the Roger's Pass was conducted. This information was used to develop detailed reclamation designs for the various project disturbances. Reclamation work was undertaken in concert with the construction so that the biological advantages of working with freshly applied soils and substrates could accrue to the reclamation program. The reclamation work entailed application of specially formulated agronomic species seed mixes and planting a diversity of native trees and shrubs. The first contract on the $500 million project was for the collection of seeds and propagules for the native plants that would be used in the reclamation of project disturbances. Project plants were grown at Lower Mainland nurseries before any construction activity was undertaken in the pass. Of the over one million trees and shrubs that were planted on project disturbances, over half were Sitka alder (*Alnus viridis (Chaix.*) DC ssp. *sinuata* (Regel) A. & D. Love), a keystone pioneering species that facilitates the re-establishment of natural ecosystems processes.

Opportunistic monitoring of the progress of the reclamation has been conducted since the project was completed in late 1988. A thesis was completed in 1998 looking at the reclamation progress (Lamb 1998). This paper provides an overview of the results of the monitoring, including inspections conducted in 2007 and the relationship of the reclaimed sites to the surrounding vegetation.

Reference:

Lamb, T. 1998. *A study of plant community structure and reclamation evaluation of disturbed subalpine sites in Glacier National Park*, British Columbia. unpublished M.Sc. thesis. University of Alberta. Edmonton, Alberta.

4. The Development of Guidelines for the Management of BC's Wild Berries

Michael Keefer, Keefer Ecological Services, Cranbrook BC
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Co-authors: Robin Munro, Wendy Cocksedge, Jason Meuleman, and Nancy MacPherson

British Columbia has a large diversity of edible berry species, many of which are important to wildlife, First Nations, and recreational harvesters, with some being commercially valuable. Many of these species were actively and passively managed by First Nations for millennia. Despite the importance to wildlife and people, there is a scarcity of literature to be found on how to manage for these species. In the interest of developing such guidelines, Siska Traditions Society, the BC Ministry of Forests and Range Research Branch, and others are collaborating on two projects, *Measuring Success in Managing for Saskatoon berries and other NTFPs* and *Synthesis of Knowledge and Development of Huckleberry Management Recommendations in BC.* The former project, being managed by Siska Traditions, also includes an experiment focused on the management of Saskatoon bushes that incorporates traditional knowledge and disturbance ecology, testing burning, pruning, and control treatments. In its first year the site of the experiment (located in the Fraser River Canyon near Lytton, B.C.) was timber cruised, fuels and fire history assessed, oral history interviews completed, and the relevant literature reviewed.

Results to date show good agreement between field and oral data sources on the stand structure and fire history, and have provided a modern context for a number of Nlaka'pamux terms that refer to plant management. Data from these projects are being assembled into a consistent searchable format that includes fields such as aboriginal uses, commercial values, habitat relationships, and management considerations such as response to fire, palatability to wildlife, susceptibility to disease, competition, etc. As part of this project, guidelines were written for the maintenance and enhancement of Saskatoon (*Amelanchier alnifolia*), blackcap (*Rubus leucodermis*), beaked hazelnut (*Corylus cornuta*), and black huckleberry (*Vaccinium membranaceum*). The information being compiled is targeted to resource managers, including First Nations, foresters, agrologists, horticulturalists, and biologists.

5. *Ecology and roadkill risk of an endangered badger population near their range limit in southcentral BC*

Richard Klafki, MSc. candidate, Thompson Rivers University, Kamloops BC
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Co-authors: Karl Larsen, Thompson Rivers University, Kamloops BC; Roger Packham, BC Ministry of Environment, 100 Mile House BC; and Brent Persello, BC Ministry of Transportation, Kamloops BC.

Southcentral British Columbia is the northwestern range limit of the American badger (*Taxidea taxus*) and supports a nationally endangered subspecies (*T. t. jeffersonii*). Previous studies have indicated that two main factors are contributing to the decline of badgers in British Columbia:

1) deterioration of suitable low-elevation burrowing habitat; and
2) road mortality caused by major transportation corridors.

Since April 2007, we have been investigating how these factors are impacting a population of the animals at their extreme northern limit. Badgers were tracked using conventional VHF telemetry, along with GPS technology in 2007 and 2008. The badgers have been found to have extremely large home ranges (males=358 km^2, n=14, SD=653; females =30 km^2, n=8, SD=29) as compared to conspecifics further south, suggesting that habitat is suboptimal and/or access to mates is constrained by low densities of animals. The large home ranges apparently cause animals to make long forays (longest straight-line distance traveled was 84 km in 3 months), bringing them onto roads and railway lines.

Specific road-crossing locations were identified and road and traffic characteristics that made badgers susceptible to road mortality were described. We also documented badgers using existing metal corrugated culverts to underpass major highways (mean = 0.5 passages/wk). Roadkill risk appears highest for both sexes during summer months when adult breeding season movements coincide with increased summer recreational traffic. On-going habitat fragmentation and degradation with a projected increase in vehicular traffic in the study area indicate the animals could face extirpation, not unlike that seen within southern parts of their range. Implications for conservation of endangered badger metapopulations susceptible to roadkill are discussed.

6. Managing Species at Risk in Mount Revelstoke and Glacier National Parks

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This presentation described the listing of species in Mount Revelstoke and Glacier National Parks that have been reviewed or will be under review by the Committee on the Status of Endangered Wildlife in Canada for protection under the *Species at Risk Act*. There are a number of amphibians, fish, birds and mammals in the parks that will be managed through population inventories, critical habitat identification, and recovery strategies. Potential recovery actions for listed species were identified.

7. About the Selkirk Geospatial Research Centre

Paul Sneed, Coordinator and Research Scientist, Selkirk College, Castlegar
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The Selkirk Geospatial Research Centre (SGRC) was established at Selkirk College in 2003 to promote the cooperative use of geographic information science, systems, and tools for environmental and socio-economic problem-solving to support the needs, goals, and decisions of the people of the Kootenay region and beyond. This presentation will provide a brief overview of the SGRC's history, primary mission, some current projects, and future plans. The discussion will highlight the opportunities the SGRC may offer for synergistic research partnerships and collaboration with individuals interested in the application of geospatial research tools.

For more information about the Selkirk Geospatial Research Centre:
http://selkirk.ca/research/sgrc/

8. Dam Operations and Yellow Warblers in the Revelstoke Reach

David Green, Simon Fraser University Centre for Wildlife Ecology, Burnaby BC
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Dr. David Green from Simon Fraser University presented the results of three years of work on Yellow Warblers breeding in the drawdown zone of the Upper Arrow reservoir. Detailed studies of this riparian dependent bird are providing a means to evaluate how current and/or future dam operations impact bird populations, assess the overall health of riparian habitat, improve restoration of riparian habitat and evaluate the success of restoration efforts. Dr. Green and MSc. candidate Sam Quinlan's work was funded by the Fish and Wildlife Compensation Program, BC Hydro ESI and an NSERC Industrial Postgraduate Scholarship.

For more information about David Green's projects, visit:
www.sfu.ca/biology/faculty/green/

9. Lessons learned from riparian restoration projects in the South Okanagan

Jason Emery, Solitudo Environmental Services, Delta BC
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Jason Emery gave a presentation on the results and lessons learned from various riparian restoration projects in the South Okanagan. Jason's work focused on riparian habitat creation and enhancement targeting a number of requirements for threatened and endangered species including the Yellow-breasted Chat and Spadefoot Toad. In addition to the "physical" restoration efforts, Jason's work also documents wildlife responses and use of these newly formed habitats. This work is funded through the Canadian Wildlife Service (Environment Canada) and supported by groups such as The Okanagan Nation Alliance, The Nature Trust of British Columbia, and Ducks Unlimited Canada.