



Meeting Summary
CMI Annual Researchers' Meeting
& Annual General Meeting

May 10, 2013
Memorial Hall, Silverton BC

Every year CMI members get together to provide updates on their projects, catch up on everyone's news, hear what's happening in the different parts of our region, and have a few field trips. It's an informal atmosphere and non-CMI members are always welcome. The meeting included our Annual General Meeting for 2012.

This year fifty people gathered at the Memorial Hall in Silverton. We heard seven talks, viewed four posters and displays, and chose from three field trips.

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Natural Resource Officers, Compliance and Enforcement Branch

During the meeting, Natural Resource Officer Paul Maika told us about the new Natural Resource Officer positions in the provincial government.. A brochure describing the role of these officers is appended to this document.

Oral presentations

1. Timesavers translated from the field to office: Mobile Government Database (VENUS) and GIS Applications

Carrie Nadeau, Summit Environmental Consultants
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This presentation included a colourful synopsis of the Trimble Yuma rugged tablet interface; illustrating applications used in the field for collection of baseline data. Includes a demonstration of how the Yuma tablet is used to enter data directly into the VENUS database, how a digital portable map is advantageous in the field, and how you can use these interfaces for your advantage to skip data entry steps in the office.



<http://www.trimble.com/Outdoor-Rugged-Computers/yuma.aspx?dtID=features>

The end product of both of these applications allowed:

- Data entry directly into VPro (VENUS) according to RISC standards in the field eliminating the data entry step at the office;
- Uploading project shape files into MapWindow (freeware) to use the application for plot selection and navigation in the field; and,
- Real-time creation of GIS layers to record plot locations and other point source data.

Biographical notes

Carrie Nadeau, B.Sc, R.P.Bio., is a biologist with eight years' experience in environmental consulting. Her background includes baseline terrestrial assessments, environmental impact assessments, plant ecology, wetland and terrestrial restoration, rare and endangered species habitat restoration, fish and fish habitat inventories and assessments and environmental monitoring. She has spent the last year collecting and reporting baseline vegetation and terrestrial information, assessments, and reclamation planning for a proposed mine in Northern BC.

2. Rare or little known biodiversity of the Selkirk Mountains

Anne Sherrod and Craig Pettitt, Valhalla Wilderness Society

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Since 2002 the Valhalla Wilderness Society has been sponsoring species surveys by taxonomic specialists in the central Selkirk Mountains. Most of the surveys were done in the Interior Cedar-Hemlock biogeoclimatic zone, although there was also some sampling in high elevation habitats, in the Englemann Spruce-Subalpine Fir zone, or higher, in the Interior Mountain Heather Alpine zone.

Old-growth stands within the Inland Temperate Rainforest (ICHwk and ICHvk) have received the most attention, but some of the scientists have also sampled disturbed forest, wetlands, and bedrock meadows. The collecting sites ranged from the Slocan Valley north to Revelstoke, and included some drainages on the east side of Arrow Lakes Reservoir, as well as the Lardeau River and Duncan River drainages. There have been many discoveries of species of lichens, mosses, plants, mushrooms, and snails not previously known from the interior of British Columbia, or in some cases British Columbia, Canada, or North America. A small number of species have been new to science.

The BC Conservation Data Centre (CDC) currently recognizes 210, 148 and 155 red- and blue- listed species in the Arrow, Kootenay, and Columbia Forest Districts respectively. The following table shows that the majority are present in the Interior Cedar-Hemlock Zone. Perhaps this reflects the higher number of species at lower elevations, which has experienced greater habitat disturbance.

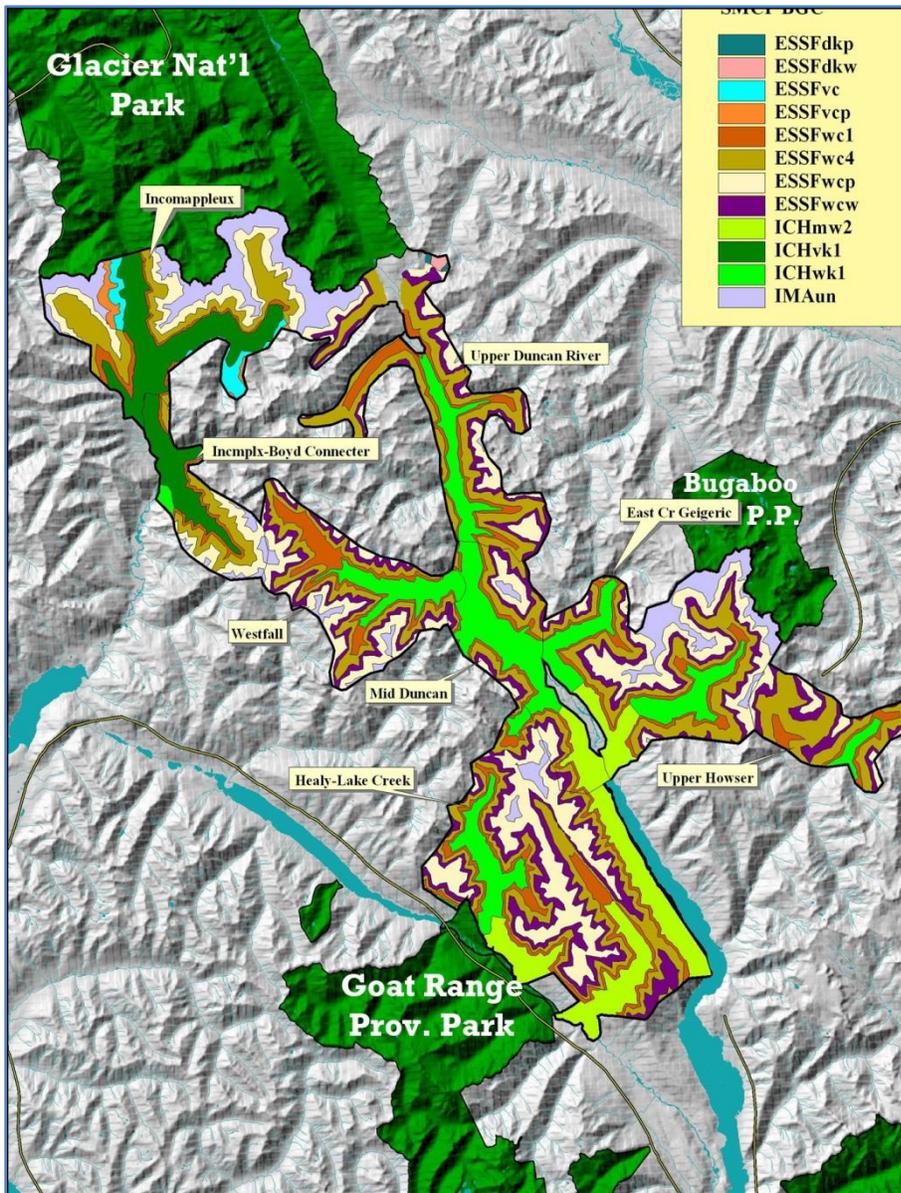
Red- and blue-listed species in the central Selkirk Mountains by forest district and elevational zone.

Forest district	Total Red- and Blue-listed	Cedar-hemlock	Subalpine forest	Alpine (IMA)
Arrow	210	71%	41%	13%
Kootenay	148	87%	44.5%	13%
Columbia	155	65%	60%	28%

Even so, the CDC readily acknowledges that the taxonomic groups assessed to-date represent only a small portion of the total biodiversity of any area of the province. While the presence of large species is roughly known, small species may be little known, and very small species are detectable only by thorough scientific surveys requiring expertise in taxonomy and meticulous work in the laboratory.

The Valhalla Wilderness Society began sponsoring biodiversity research in connection with our project to increase protection of Inland Temperate Rainforest. The Central Selkirk Mountains are in a transition zone in which precipitation increases northwards, and commensurately, the cedar-hemlock forest changes from moist to wet to very wet subzones. The following shows the ICH subzones in the Lardeau, Incomappleux and Duncan River valleys, which compose the Society's Central Selkirk study area.

Valhalla Wilderness Society's Central Selkirk study area



In the central Selkirks, the wet rainforest begins in the valleys radiating east and west from the Goat Range Provincial Park. But the rare *very* wet rainforest, ICH-vk, occurs no further south than the latitudes of the Incomappleux River.

Scientific and conservation interest in the Incomappleux Valley increased with the discovery of a large, intact old-growth forest, with trees up to 1,800 years old, in the upper part of the valley. Scientists told the Society that this forest may have been growing continuously since it began, sometime after the last Ice Age. So the question naturally occurred, what does a rainforest that has been intact for thousands of years

have that, say, a drier 250-year old tract of cedar-hemlock forest doesn't have?

From 2002 to 2012 the Valhalla Wilderness Society (VWS) assisted surveys of lichens, macrofungi, and land snails. In the process the scientists noted rare plants. With this field work, VWS eventually defined an area of high conservation interest for further study. As shown in the map on the previous page, it consists principally of wet and very wet rainforest types, with some moist ICH in the south, and some interconnecting high-elevation terrain. However, the lichen and snail surveys covered a much broader area as far south as Perry Ridge in the Slocan Valley.

A common trend amongst all the taxonomic groups surveyed was the occurrence of species normally associated with coastal habitats, reinforcing the perception of the Inland Temperate Rainforest as an echo of the Coastal Temperate Rainforest.

Lichens

The lichen team consisted of Dr. Toby Spribille, University of Graz, Austria, and Curtis Björk and Trevor Goward, co-curators of lichens at UBC.

Within three years of Spribille's first survey of the Incomappleux Valley, and with only cursory surveys, the lichen list for the Incomappleux stood at 283, and included three species new to Canada, three new to North America and seven that were deemed new to science, and subsequently published as such in 2008. This was many more lichen species than all the plant species in the area put together; it very quickly remade the scientific community's perception of biodiversity in BC's interior, humid, coniferous forests. The scientists believe that the Inland Temperate Rainforest may equal or surpass coastal rainforest in lichen diversity.

During the last ten years, Spribille, Goward, and Björk carried out surveys in many areas of the Interior Wetbelt, and on the BC coast. The Valhalla Wilderness Society also sponsored GIS mapping of nearly the entire Interior Wetbelt of BC, a 14.3 million hectare area. The upper Incomappleux forest is one of three hotspots for tree lichens so far found in the Interior Wetbelt, others being the Robson Valley and the North Arm of Quesnel Lake. All three are in the very wet old-growth, ICHvk and have far more tree lichen species than other areas sampled.

Some Inland Temperate Rainforest in the Central Selkirks outside of the Incomappleux Valley did yield some rare inland occurrences of coastal species. According to Spribille's report on the Kuskanax Valley, in a mid-elevation hemlock forest with mixed old western red cedar,

“four typically coastal oceanic macrolichen species were found, including the southernmost inland locality to date for *Platismatia norvegica*. A crustose lichen species new to science (*Bactrospora* sp.) and previously known from only two localities, was found to be common on bark of old hemlock trees. At a second site in the subalpine zone, numerous lichens were collected from soil and tree branches and trunks. One species previously known worldwide only from Montana, *Micarea subalpina*, was found new for Canada. Furthermore material was gathered of a new species of *Pyrrhospora* on whitebark pine and balsam fir branches, also the first records of the species for Canada. An uncommon aquatic vascular plant species, *Sparganium hyperborea*, was found in shallow pools in the subalpine cirque basin”.

Such areas contribute to the portrait of rainforest conditions and high lichen diversity in these mountains. However, the Kuskanax Valley is in the less wet biogeoclimatic zone, ICHwk, and has been heavily fragmented, so it does not approach the exceptionally high numbers of lichen species in the upper Incomappleux, and the other lichen hotspots of the Interior Wetbelt. The exceptionally low elevation of the upper Incomappleux Valley may also be responsible for its high biodiversity. Even ICHvk within Glacier National Park does not have nearly as high a number of lichens species, perhaps because it begins at an elevation of 800 + metres, whereas the Incomappleux old-growth outside the park begins at about 600 metres.

There is currently a backlog of species collected in the central Selkirks that could not be identified, but have not had sufficient laboratory work to confirm them as new to science, which takes a great amount of time and resources. Seven crust lichens that were reported in 2008, including several from the Incomappleux, required a team of international experts from five countries to carry out DNA analysis and other tests to confirm that they were new to science. (Spribille et al, *The Bryologist*, 2008) Once they were known, the species new to science were found in other areas with very old, very wet Inland Rainforest. However, one species, *Myochroidea minutula* Printzen, has never been found anywhere else in the world but in the upper Incomappleux Valley, where it inhabited only the oldest trees.

New discoveries extended into 2012, when Dr. Spribille discovered *Usnea longissima*, the Methuselah's beard lichen, in a side canyon in the Incomappleux Valley – only the second inland occurrence of this coastal rainforest species in North America on record.

Mushrooms

The mushroom survey was conducted by prominent mycologist Dr. Oluna Ceska, with the assistance of Dr. Adolf Ceska, formerly with the BC Conservation Data Base in Victoria. Twenty species were found in a clearcut, but a spectacular 80 species in the ancient rainforest. Of these 80 species, 41 were coastal species. The most notable discovery was *Phaeocollybia piceae*, which had previously been found only in the wettest and oldest coastal rainforest such as Olympic National Park and the Redwoods (Ceska, A. 2006). Before the discovery in the Incomappleux old-growth, its only known location in BC was in the lower Carmanah Valley on Vancouver Island. According to the Botanical Electronic News (BEN) of March 24, 2006:

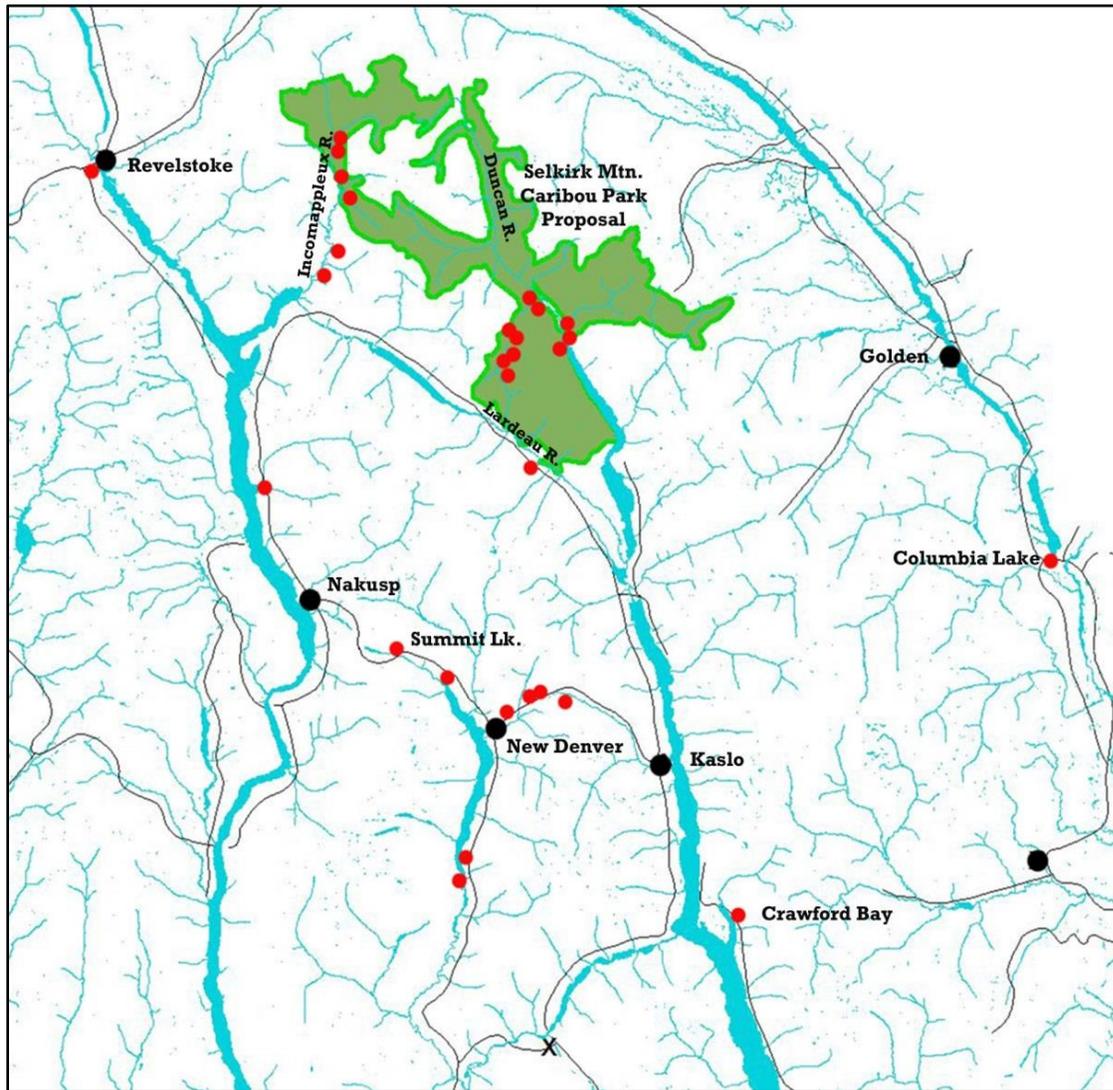
“In the fall of 2004, Oluna Ceska collected a striking *Phaeocollybia* during the Valhalla Society’s mycological inventory of an ancient (old-growth) forest in the Upper Incomappleux Valley ... all *Phaeocollybia* are considered relatively rare.”

Land Snails

The snail team consisted of Dr. Jeffrey Nekola, University of New Mexico; Dr. Brian Coles, Research Associate, National Museum of Wales; Dr. Michal Horsák, Masaryk University, Czech Republic; Veronika Schenková, a Ph.D. program student, Masaryk University. They carried out southeastern British Columbia’s very first land snail survey that examined all habitats and elevations within the study area.

The sampling area included the following biogeographic zones for snails: Northern Province, Rocky Mountain Province, Washingtonian Province, Oregonian Province. Twenty-nine sites were sampled; 39 species from 18 families were documented.

Snail sampling sites, southeastern British Columbia, August 27-September 3, 2011



One-fifth of the snail species found are listed as species at risk in British Columbia. Six species found during the study are coastal species that have seldom or never been found east of the coast range. All of these coastal species were found in cedar-hemlock forests, and 4 were found in old-growth forests. The scientists also found a Coeur d'Alene Salamander, a species of conservation concern throughout its range, near the wetland at the head of Duncan Lake.

One of the most important findings to the scientists was being able to document the northernmost extent of the Washingtonian Biogeographic Province. In the US the Washingtonian Province stretches across the Columbia Basin in central Washington and central and northern Idaho, to the continental divide in Montana, and into southeastern

BC. In this study its northern limit appeared to be defined by the northern end of Slocan Lake and the Retallack area east of New Denver. The species in this biogeographic province “appear to represent relicts of the time in which mixed conifer/deciduous forest covered the entire northern hemisphere.” As a result, a number of species found in and around the Slocan Valley have close relatives in the forests of the central and southern Appalachians.

Unlike lichen diversity, which increases in a northward direction with colder, wetter climate, snail diversity increases in a southerly direction with increasing warmth. The richest snail diversity (21 species), was found in a small wetland along the Slocan River, where the species were characteristic of the Washingtonian Province. Four of the species collected in the Slocan Valley are listed by the BC Conservation Data Centre as being of conservation concern. They are: *Vertigo elatior* (red-listed), *Cryptomastix mullani* (blue-listed), *Oreohelix strigosa strigosa* (blue-listed), and *Anguispira kochii* (blue-listed). Additionally there were two (*Radiodiscus abietum* and *Vertigo modesta sculptilis*) never before found in Canada.

The red-listed *Vertigo elatior* was previously seen in only one other location in BC, a century ago. Red-listed by the BC Conservation Data Centre, it was believed to have disappeared from the province entirely. However, it was present from the Slocan River to Summit Lake in small numbers.

Plants

While making their assessments, scientific teams noticed rare plant species in the Incomappleux Valley, especially in the ancient forest and in an extensive wetland complex at Kellie Creek. In the old-growth forest, they found the red-listed *Botrychium montanum*, a primitive fern that goes back to the first melting of the glaciers; and a coastal moss that is rare inland, *Hookeria lucens*.

Due to dams the Columbia Basin lost 26% of its wetlands, so while wetlands are extremely important everywhere, they are especially important in the Columbia Basin. The Kellie Creek wetland was not on the radar of any of the scientists whom we contacted about it. It was not amongst the 6 priority riparian and wetland habitats listed in the Columbia Basin Riparian and Wetlands Action Plan. Perhaps this is because it is only 1.5-2 square kilometers in size, which is small compared to the ones listed as priorities. But it was described by Dr. Spribille as an extraordinary mosaic of wetland types, including open sedge meadow, marsh, shrub-carr, floating mats, and open ponds. There are also stands of riparian cottonwood adjacent to this wetland.

This wetland is also unique because it is located in the ICHvk biogeoclimatic zone, and because the Incomappleux River has no dams on it. Just off the road in the wetland, with only the most cursory examination, scientists identified two red-listed plants, *Liparis loeselii*, (one of Canada's rarest orchids) and *Urticularia ochroleuca*, an insect-eating plant; as well as the blue-listed beaked spikerush, *Eleocharis rostellata*. The same area contains the red-listed snail, *Vertigo elatior*, and a blue-listed snail, *Vertigo arthuri*.

Conclusion

The scientists who participated in these studies point out that, with the cursory nature of their studies in the central Selkirks, there is no question that many other species in these mountains remain there unknown, some few perhaps even unknown in Canada or anywhere in the world.

Many species means many functions in ecosystems. The common and well-studied species show us that they all have very important functions. Many lichens fix nitrogen. Scientists have reported that up to 50% of the nitrogen input to Pacific Northwest forests comes from lichens. (Brodo, et al., *Lichens of North America*).

The common lichen, *Lobaria pulmonaria*, was traditionally believed by native people to be effective against tuberculosis. Studies have verified this. Lichens have been found to have anti-tumour or antibiotic properties, as well as some effectiveness against HIV. This is why many scientists today are saying that the loss of species is a crisis that threatens the survival of humanity.

Our humid and wet cedar-hemlock forests are not the Amazon by any means, but ten years ago one would never have imagined that species from the central Selkirks would be in laboratories all over the world. Last year VWS was contacted by two researchers from Harvard University who wanted to collect flatworms in the Incomappleux forest. The international scientific world is increasingly putting great value on the unique ecosystems of the Columbia Basin.

Reports

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To read this report please contact Anne Sherrod at the Valhalla Wilderness Society,
anne@vws.org

Goward, T. and Spribille, T., "Lichenological evidence for the recognition of inland rain forests in western North America," *J. Biogeogr.*, 2005, 32, 1209-1219.

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To read this report please contact Anne Sherrod at the Valhalla Wilderness Society,
anne@vws.org

Printzen, Christian et al., "*Myochroidea*, a new genus of corticolous, crustose lichens to accommodate the *Lecidea leprosula* group," *The Lichenologist*, 40(3): 195-207 (2008)

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Spribille, T., Björk, C., Ekman, S., Elix, J., Goward, T., Printzen, C., Tonsberg, T., Wheeler, T., "Contributions to an epiphytic lichen flora of northwest North America: I. Eight new species from British Columbia inland rainforests," *The Bryologist*, bryo-112-01-08.3d 24/7/08 12:44:30.

Spribille, T., "Lichens of an old-growth inland rainforest, Incomappleux River drainage, southeastern BC: preliminary inventory and implications for conservation," 2006, updated 2012 . To read this report please contact Anne Sherrod at the Valhalla Wilderness Society, anne@vws.org .

Biographical notes

Craig Pettitt and Anne Sherrod are directors of the Valhalla Wilderness Society. Pettitt is a forest technician and Sherrod is a writer for the society. Valhalla Wilderness Society assists biodiversity research in areas of conservation interest, by providing a small amount of funding for field work, and/or by providing transportation and guiding services in the field. For every day in the field, the scientists usually carry out weeks of meticulous work in the laboratory with the support of their universities, or on a volunteer basis.

3. State of the Environment in the Columbia Basin Boundary Region: Which indicators would be useful to you?



COLUMBIA BASIN
RDI
RURAL DEVELOPMENT INSTITUTE

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For indicators related to Air and water contact, Lauren Rethoret at lrethoret@selkirk.ca*

The Rural Development Institute, in collaboration with Columbia Basin Trust and the Selkirk Geospatial Research Centre, is updating the State of the Basin report and moving it online. The State of the Basin is an indicator and monitoring program developed in 2008 to collect, analyze and report on information for the purpose of providing an up-to-date picture of the vitality of basin communities and the environment we live in. The 2008 report had just six environmental indicators. Rural Development Institute plans to expand the number of indicators by at least 15, and present them on a web-based geospatial portal that can continually be updated as new data becomes available. The goal is to make the information relevant to researchers as well as decision makers and the general public. We have developed a list of over 50 candidate indicators, and are looking for feedback from the people who will be using this portal. Examples of new candidate indicators include changing glacier cover and snowpack, human-bear conflicts, invasive species, pollution release, urban green spaces, private land conservation, ecosystem restoration, water quality, and many more. I will present some of these indicators and ask if they would be useful to you, or your area of interest. I am looking for suggestions on indicators we may have missed; to develop partnerships to help promote the projects you are working on; and to identify sources of data. We

want to make sure that all indicators are technically sound, understandable, relevant, measureable and feasible.

Biographical notes

Adrian Leslie, MSc, RPBio. has been working in the Columbia Basin on ecosystem conservation, restoration and research for over 10 years. He has experience working in both terrestrial and aquatic ecosystems from low elevation floodplains to high elevation forests throughout the Columbia Basin. He has led several research and restoration projects, and presented at past CMI meetings on his whitebark pine restoration project, and his *Armillaria* root rot research. Adrian has worked with a variety of environmental stakeholders in the Columbia Basin including non-profit, governmental, educational, industrial, and private organizations. He is a long-time supporter of CMI, has a keen interest in conservation and restoration of critical habitat, and a deep appreciation for the ecosystems in the Columbia Basin.

For more information on this project, visit
Columbia Basin Rural Development Institute's website:

<http://www.cbrdi.ca/>

4. Best Management Practices for forest management around Northern Goshawk breeding areas in interior British Columbia

Kari Stuart-Smith, Canadian Forest Products Ltd.

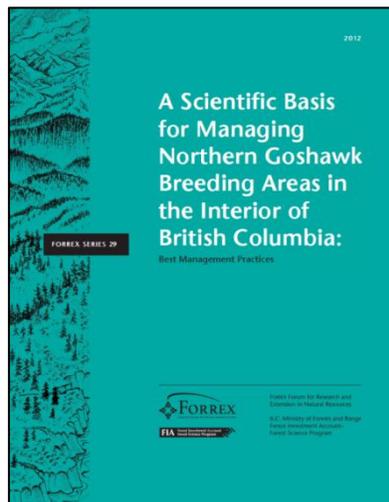
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(Kari was unable to attend the meeting.)

The Northern Goshawk (*Accipiter gentilis atricapillus*) has been a species of management concern in western North America for over 20 years, with the loss of mature and old forest from resource development identified as the most significant factor threatening goshawk populations. In British Columbia, foresters began implementing various strategies to manage around goshawk nests when the goshawk was designated as an Identified Wildlife Species in 1999. However, the effectiveness of these strategies was unknown. Thus, in 2001, I began a ten-year goshawk monitoring program in the East Kootenay in association with Karl Larsen and William Harrower. The objectives of the project were to:

- Identify the types of forests goshawks were nesting in;
- Determine the size and composition of post-fledgling areas; and,
- Determine the size of reserve required in order for goshawks to re-occupy their nest areas following logging around them.

Results were combined with those from a similar goshawk project in the Skeena area run by Todd Mahon and Frank Doyle, and used to develop a set of Best Management Practices (BMP's) for goshawk breeding areas in the interior of British Columbia. A new management unit called the Breeding Area was defined as part of this project.



A Scientific Basis for Managing Northern Goshawk Breeding Areas in the Interior of British Columbia: Best Management Practices.

A. Kari Stuart-Smith, William L. Harrower, Todd Mahon, Erica L. McClaren, and Frank I. Doyle

Forrex Series 29, 2012

http://www.forrex.org/sites/default/files/forrex_series/176-goshawk-final.pdf.

5. Assessing western toad mortality on Highway 6 at Summit Lake

Jakob Dulisse, Jakob Dulisse Consulting

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Introduction

The western toad (*Anaxyrus boreas*), is listed as Near Threatened by the World Conservation Union, as Special Concern by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), and is blue-listed by the BC Conservation Data Centre. Summit Lake hosts a regionally and provincially significant breeding population of western toad, estimated to involve millions of individuals. Tens of thousands of adults and juveniles are killed by vehicle traffic on Highway 6 as they migrate to and from the lake in three phases every year:

1. Adults moving to the lake to breed;
2. Adults leaving the lake post-breeding; and
3. Toadlets leaving the lake after transforming from tadpoles.

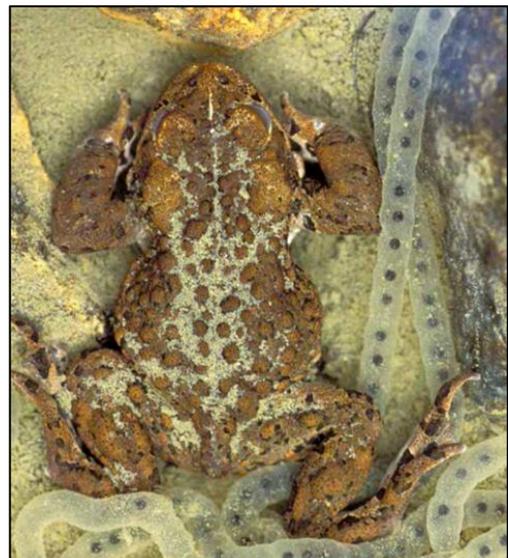
Migration is sporadic, taking place during warm, wet nights for adult toads and during wet or humid days for toadlets. Investigation of the mortality problem began in 1997 and mitigation structures (metal and plastic culverts and drift fences) were installed in 2006 and monitored for efficacy in 2007. Despite these efforts, significant mortality is still occurring. The current project was initiated to fully assess this issue via rigorous survey efforts with the end goal of designing effective mitigation measures within 2-3 years.

The specific objectives for the 2010-2012 field seasons were to determine:

- the breeding distribution and the location, timing, and severity of highway mortality; and
- the efficacy of the mitigation structures installed in 2006.

Methods and results

Fieldwork was conducted from April to October each season. Fieldwork consisted of nocturnal road surveys for adults, canoe surveys for breeding sites, time-lapse photography within underpass culverts and permanent toadlet sampling transects. Adult western toads were observed on Highway 6 for the duration of our survey periods and we identified six main breeding areas so far (defined by the presence of 1-16 pairs of adults in amplexus) in sheltered



waters with emergent vegetation. Subsequent movements of tadpoles and toadlets indicate that toadlets may not always emerge from the lake at the breeding sites. Permanent toadlet sampling transects revealed several important migration areas. Time-lapse photography captured relatively few toadlets and no adults using the culverts. Mark-recapture of adults began in 2011 and we are hoping to be able to make some population estimates this season.

Discussion

Understanding the year-to year variation in breeding and migration distribution is central to our assessment. Mapping the main migration routes will enable us to better address location and design features of future mitigation structures. So far, we have found that some breeding sites and migration routes appear to remain constant while others vary from year to year. Determining the significance of mortality at juvenile and adult life stages will require population estimates of adults and juveniles. Current and future work will include population monitoring to inform priorities for crossing structures and provide a baseline for tracking population trends.

Biographical notes

Wildlife biologist Jakob Dulisse has been involved in a variety of wildlife research and conservation projects throughout the Columbia Basin for the past 16 years. As a consultant in partnership with other individuals and groups, he usually works with birds, reptiles and amphibians.

6. Community values in lake management planning

Therese DesCamp, President, Slocan Lake Stewardship Society, and Board member Sally Hammond.

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Slocan Lake Stewardship Society is a not-for-profit volunteer society dedicated to the care and protection of Slocan Lake. The Society's purposes are to support and initiate:

- Research and cooperative planning for the care and protection of Slocan Lake and its foreshore;
- Programs for sustainable lake use; and
- Education about Slocan Lake and its environs.

As part of its work to care for and protect Slocan Lake, SLSS has initiated scientific and community studies to help encourage local and regional governments to move toward a lake management planning process.

In 2012, the Society commissioned a community wide values survey. *Imagine! Slocan Lake* was designed for maximum participation across economic, social, and geographic communities. The process used an independent consultant who worked with a broad-based 14-member community advisory committee. The consultant and advisory committee worked together to address issues of format and content, validity, duplication, and participation. The questionnaire had a "test drive" at a day-long session with 28 community members before the final tweaking and release via mail, email, pick-up and hand distribution.

Over 30% of permanent and seasonal residents participated in the survey showed a surprisingly consistent vision for the future of Slocan Lake. The survey participation rate is double what is necessary to assure 95% statistical validity. With this information, the villages and Regional District have begun to move toward a lake management plan, one that we hope will adequately reflect the values of the community.

This presentation will recount the work that led up to the *Imagine! Slocan Lake* survey and include a brief synopsis of results.

Biographical notes

The presenters are community volunteers who currently serve on the board of SLSS. Therese has been a member of the board since its inception in 2007, and president since 2009. Sally is a community volunteer with a long history of activism around

watershed issues. She served on the Advisory Council of the *Imagine!* project and then came onto the board in fall of 2012 when the project was complete. Each can speak to a different experience with this project.

For more information about the Slocan Lake Stewardship Society,
and the Imagine Slocan Lake project, visit:

<http://slocanlakess.com/>

7. The Slocan River, Follow the Fish - From Compensation to Ecology



Jennifer Yeow, Passmore Laboratory Ltd., Winlaw BC
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Large meandering rivers flowing through cottonwood forests and cedar stands were once the climax ecosystem in valleys throughout the West Kootenays. The Slocan River Valley contains remnants of this habitat, which acts as a reserve and refuge for sensitive and endangered species. In this valley, cottonwood groves are known for their recreational fishing and hunting values. However, it wasn't until a nearby dam upgrade project designated the Slocan as a river well suited for a fish compensation program that people began to consider: What is the fish capacity of the Slocan River? Can it be enhanced?

Compensation normally consists of instream structures built of large logs anchored with rock and strategically placed to maximize use by fish. They are normally welcomed by the community. This was not entirely the case in the Slocan Valley where recreational safety and aesthetic values are important.

Through a public consultation process, a compensation program was agreed upon. Columbia Power Corporation agreed to install a lesser number of structures and our

local community group, the Slocan River Streamkeepers, facilitated tree planting and livestock fencing for riverside landowners. The Streamkeepers welcomed the opportunity because it met their objective to engage in restoration activities, and the Columbia Power Company work helped to meet its mandate to enhance fish habitat. The program began in 2004 and, after 5 years of planting, a decision was made to focus on ecologically sensitive bank restoration. Streamkeepers enlisted help from experts at the B.C. Cattlemen's Association. through the Environmental Farm Plan of ARDcorp. Three projects were completed and two more are awaiting funds.

Monitoring is key in assessing the value of any program. Historically, this meant counting the size and species of fish at the structures and in adjacent reaches. This was done between 2006 - 2011. Plant survival was also monitored. While a high variation does exist between sites, the results to date are encouraging. In 2012, ortho air photos of the entire Slocan riparian corridor were used to map and identify critical habitat and potential projects. The photos and maps were also used to do a sensitive ecosystem inventory.

The original question regarding the fish capacity of the Slocan River is beginning to be answered. In addition to fish counts, the assessments, which include a habitat inventory, have enabled us to better understand how the river functions. The importance of side channels is critical because side channels distribute water throughout the riparian corridor, moderate extremes in flow, and reduce erosive pressure on the main channel. Over time, these side channels become blocked due to log jams, sediment in-filling or human activities.

The program will be reviewed in 2014 and again, input from the community will be sought. The success of the program will depend on finding sites for main and side channel restoration that provide habitat and meet landowners need to protect eroding banks.

Biographical notes

Jennifer Yeow has worked with environmental groups in the West Kootenays since 1994. She is a microbiologist and owner of Passmore Laboratory Ltd. Jennifer's interests are water quality and river restoration.

For more information about the Slocan River Streamkeepers, visit:

<http://www.slocanriverstreamkeepers.com/>

8. Kootenay Camas Project

Eva Johansson. Kootenay Wild
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The goal of the Kootenay Camas Project is to increase local knowledge of the botanical, environmental, and cultural importance of common camas (*Camassia quamash*) and its associated ecosystems in order to steward existing populations and restore camas habitat.

In 2012, we used predictive mapping and reports from local residents to locate camas populations. We surveyed the area from Waneta to Winlaw, and from Patterson to Marsden. We found the confluence of the Kootenay and Columbia rivers to be the area with the most extensive populations, as well as the locale with the most individual finds.

This year we will extend the inventory and initiate morphology, phenology and distribution studies. We presented our preliminary results.

Biographical notes

Eva Johansson is a professional agrologist. She is a founding member of the West Kootenay Native Plant Study Group. She managed West Kootenay Plants Ltd., a native plant nursery, for 5 years. She has a Master of Science degree with a Major in Earth Science from University of Stockholm and a diploma in Restoration of Natural Systems from University of Victoria. As project coordinator of the Kootenay Camas Project, she is interested to learn more about citizen science, public outreach, and the cultivation and propagation of camas.

For more information about the Kootenay Camas Project, visit:

<http://growwild.kics.bc.ca/Articles/KootenayCamasProject/index.html>

1. Slocan Lake Stewardship Society

Margaret Hartley, Director, SLSS
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This display by the Slocan Lake Stewardship Society shared information on the following themes:

- Water Quality Study
- Near Shore Water Quality study
- Foreshore Fish and Wildlife Habitat Assessment
- Aquatic Invasive Species prevention and monitoring program
- Mapping projects
- Stewardship education initiatives
- *Imagine! Slocan Lake* (community values survey)

The Society's main goal is to maintain the integrity of the Lake's ecosystem, therefore we work to foster community-based stewardship, expand scientific knowledge about the Lake's ecosystem, and support development of a Lake Management Plan.

2. Integrating honeybees with riparian tree and shrub production: Agroforestry in Slocan, BC

Robin Murray, Murray Woodlot, Slocan BC
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British Columbia is replete with small private woodlots endowed with streams. Riparian corridors are rarely put to human use, yet can provide multiple benefits to land owners when managed with care. The shrubs in this system benefit from honey bee pollination services while they support honey production. The riparian buffer further compliments the apiary by providing both a windbreak and surface water required by bees. The shrub species selected for this project have markets within and outside the region: cascara (*Rhamnus purshiana*), high-bush cranberry (*Viburnum opulus*) and tall Oregon-grape (*Mahonia aquifolium*). Despite numerous small-scale honey producers in the West Kootenays, demand for honey is higher than the local supply.

3. Stump removal for root disease control: trial examinations in southeastern British Columbia

Michael Murray, Ministry of Forests, Lands and Natural Resource Operations

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Mike Curran, Ministry of Forests, Lands and Natural Resource Operations

Root disease caused by *Armillaria spp.* is a leading agent of mortality and growth loss in forest plantations of southeastern B.C. The removal of stumps soon after tree harvesting has been promoted as a method to limit root disease in post-harvest regeneration. During the 1980s and 1990s numerous operational trials were established in southeastern BC with stump removal treatments. Many of these trials are now being evaluated for efficacy of stump removal. Our objective is to estimate the efficacy of stump removal for ameliorating root disease. To do this, we are assessing current incidence of root disease and growth among fourteen trials. Two trials (Knappen Creek and Wetask Lake) have preliminary results. Assessments for all fourteen trials are expected to be completed in 2013.

4. Long-term bat research and monitoring program in the Creston Valley Wildlife Management Area, June 2011 to January 2013

Marc-André Beaucher of Creston Valley Wildlife Management Area

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Cori Lausen, Birchdale Ecological

In 2011, the Creston Valley Wildlife Management Area (CVWMA), a 7,000-hectare Ramsar wetland located in southeastern British Columbia and a site of national significance for bird migration, was the grateful recipient of an Anabat SD2 bat detector (Titley Scientific; Bob Berry Titley Award). The detector was awarded to help initiate a long-term monitoring program on the CVWMA. After an intensive Anabat training workshop, we deployed the detector passively at 10 different locations, including a newly built “Bat Condo” modeled after Bat Conservation International’s Community Bat House, the first of its kind built in Canada. Data were recorded on approximately 470 nights (June 2011 - January 2013). We rotated the detector through 10 different monitoring stations during the first half of the monitoring period and set it up in one location for the remaining ~250 nights. Preliminary analysis suggests the presence of at least 8 species, including the Hoary Bat (*Lasiurus cinereus*), which had not been previously confirmed on the CVWMA. Relatively high bat activity was recorded May - October, lower levels March - May, and little activity November - March. Data collected

over the years will help build a bat habitat map for the CVWMA, provide baseline data for activity rates and species diversity pre-WNS, and supplement other research projects conducted in British Columbia.

Field trips

1. Field trip to the heart



heart'srest

Therese DesCamp, Heart's Rest Retreat Centre,
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Changes in government regulations, cuts in government funding and personnel, and escalating environmental damage take their toll not only on the ecosystems in which we live, but also on the hearts and minds of biologists, ecologists, and other professionals and dedicated volunteers in the environmental sector. Burn out, disillusionment, infighting, and depression are common responses to increased stress and pressure.

But there is a cheap and effective vaccination against stress: meditation. Contemporary neuroscience studies show that meditation acts not only as treatment but also as a preventative against anxiety. It can improve emotional stability, mental focus, empathy, response flexibility, and insight, while decreasing reactivity and fear. This field trip helps environmental workers understand the science behind meditation practices, and provides a rudimentary introduction to a range of practices so participants can select one that fits them best.

Biographical notes

Dr. DesCamp is an environmental volunteer (founding member of Slokan Lake Stewardship Society) and writes about environment and spirituality as well as the brain and prayer practices. She has taught graduate courses on the brain and prayer in Berkeley, CA and Vancouver, BC, as well as open courses in Portland, OR; Boulder, CO; and Seattle, WA.

2. Grizzlies, toads and railroads field trip

Wayne McCrory, Valhalla Wilderness Society

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This field trip was cancelled due to too much snow and a risk of avalanches at some of the stops planned by Wayne.

The field trip will start at Three Forks, about a 10 minute drive east of New Denver, with various stops between the ghost towns of Three Forks and Retallack to explain and interpret mining history, abandoned railroads, ghost towns, and natural history. Natural history will include the Selkirk grizzly bear, its spring habitats, and possible bear viewing at Bear and Fish Lakes as well as several short hikes to look at grizzly habitats and feeding ecology. We will look at Western Toad breeding habitat and discuss associated toadlet road mortality issues at Fish Lake. We will then go to the old mining town of Retallack and take a half-hour hike on the cedar grove interpretive trail. We will look at a black bear den in an ancient cedar. Craig Pettitt may be along to interpret lichen species research here and elsewhere in the Selkirks by lichenologist Toby Spribelle, as well as snail and other research underway by international scientists to expand our knowledge of temperate rainforest biodiversity.

3. Interface fuel treatment and morels field trip

Tyson Ehlers, Tysig Ecological Research, Winlaw BC

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Stephan Martineau, Manager, Slocan Integral Forestry Cooperative

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This field trip visited a site south of Silverton (walking distance from the Memorial Hall) where Slocan Integral Forestry Cooperative is currently conducting a 47 ha interface fuel treatment program. The trip showcased a fuel management project with the opportunity to find morels and other mushrooms. The project is aiming to enhanced community safety and fire preparedness by reducing fuel loading. Treatment goals are

to reduce lower canopy, ground, and ladder fuel loading, to alter the size classes of fuels, and to reduce horizontal and vertical fuel continuity.

The project is leading to:

1. reduction in opportunities for ignition,
2. reduction in the intensity and rate of spread of a wildfire if it was to occur,
3. reduction in the potential impact to adjacent communities if a wildfire was to occur,

The treatment has also stimulated increased morel production and improved recreation opportunities.

4. Toads at Summit Lake field trip

Jakob Dulisse, Jakob Dulisse Consulting
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Jakob followed-up his presentation from the morning by showing us a breeding area, some fencing, and two Highway 6 underpasses at Summit Lake. Jakob netted toads from Summit Lake so the group could view them.