Issue #6 – Fall 2011

newsletter

Climate Change Adaptation Research for Forest and Rangeland Ecosystems: Resiliency Implications at the Landscape Level

Message from Dr. John Innes, Principal Investigator

Welcome to the Fall 2011 issue of our e-newsletter. As tornadoes, floods, wildfires and droughts become the new normal and climate "weirding" continues here in British Columbia (BC) and across our planet, the work of the South Selkirks Climate Change Research Team seems more valuable than ever. This issue features research findings from the Ecological Resiliency Dimension (ERD) Team. Our feature article discusses some climate change scenarios and the ecological monitoring being performed by Dr. Walt Klenner (BC Ministry of Forests, Lands and Natural Resource Operations), Margie Eddington (University of British Columbia PhD Candidate), Dr. David Huggard (independent consultant) and Laurie Kremsater, R.P.Bio., R.P.F. (independent consultant).

Looking back, the Spring 2011 issue of the e-newsletter summarized Dr. Natasha Caverley's research findings from "Honouring the Voices of the Ktunaxa Nation and Métis Nation BC – Kootenays: Perspectives on Climate Change in the South Selkirks Region." Just to recap, Dr. Caverley's qualitative study gathered viewpoints from Ktunaxa Nation and Métis Nation BC – Kootenays Region "key informants" on human resiliency, climate change adaptation and coping in the South Selkirks Region. The resulting data showed that respondents believe monitoring and local traditional knowledge can aid in climate change awareness, education, design and subsequent implementation of adaptation strategies in the region. Examples of local knowledge centered on monitoring and/or adjusting patterns related to hunting, freshwater availability, erosion of cultural landscapes, and changes in the location and abundance of plants, animals and their habitats.

Looking forward, the next and final edition of our e-newsletter (Winter 2011) will highlight results from the Public Opinion Survey, the Economic Resiliency Dimension and provide next steps and recommendations in climate change adaptation in the South Selkirks Region.

From left to right: Dr. Walt Klenner, ERD Team Leader and Margie Eddington, Leader of the joint UBC/BC Government Project developing a monitoring strategy for the forest and range environment in the context of climate change

Ecological Resiliency Dimension Findings: Adapting to Uncertainty

As this project was launched in 2010, the ERD team set out to answer the following questions: What are the likely climate scenarios for this region, and how will these affect vegetation succession? What climate change adaptation practices would be required to encourage resiliency while maintaining or enhancing conservation values of ecosystems in the study area?

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Dr. Walt Klenner and PhD Candidate Margie Eddington's research will culminate in recommendations relative to forest management planning and practices related to ecosystem services and wildlife habitat management that will foster resiliency in the study area under expected climate change scenarios. Dr. David Huggard and Laurie Kremsater's involvement as part of the ERD team is instrumental in terms of identifying indicators for modelling and interpreting results of these models with regards to likely impacts of climate change on biodiversity in the study area.

Western Screech Owl – one of many species commonly found in the South Selkirks Region
Photo courtesy of the Fish & Wildlife Compensation Program

In the meantime, their work has yielded a number of noteworthy findings related to two main prongs of inquiry: monitoring and adaptation.

The ERD team is looking at monitoring in light of climate change. The data collection frameworks currently in place in BC are good and may be quickly and easily bolstered to examine the effects that climate change is having on the provincial landscape. For example, the ERD team is developing an innovative approach for anticipating and responding to climate change by tracking changes in ecosystem distribution and composition in the region. Along with other data sources, they utilized National Forest Inventory (NFI) plots – an inventory system consistent over space and time and offering a "sound, scientifically defensible distribution of plots across the province and an on-going re-measurement strategy that collects and/or collates data for both the ground plots and the photo every ten years" (Eddington & Innes, 2011). This system, used in concert with the Terrestrial Ecosystem Mapping (TEM) and Vegetation Resources Inventory (VRI), may offer "the best possible approach for tracking changes in ecosystem distribution and composition over time" (Eddington & Innes, 2011).

"Our preliminary results show that while some bolstering of the existing monitoring framework is required, the province does have the existing institutional capacity to start to examine how ecosystem distribution and composition is changing with climate change."

(Eddington & Innes, 2011)

The ERD team noted that climate change will likely have several effects on vegetation in the region: species regeneration failures are more common, there are longer-term shifts in species assemblages, and savannification (the loss of forests to prairie-like grasslands) is on the increase. Moreover, there is greater variability in annual forest productivity, shifts in species composition of native grassland communities, and an increase in the area occupied by unpalatable species.

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Corn Creek in the Creston Valley Wildlife Management Area
Photo courtesy of Marc Andre Beaucher

In general, the uncertainty and unpredictability of weather trends and their ecosystem effects continue to hamper attempts to make ironclad recommendations to ecosystem managers about adaptability; however, this points to the imperative of adapting to uncertainty. Furthermore, ecosystem managers can do several things to facilitate resiliency:

- use harvesting and stand techniques that help seedlings to survive;
- match species to optimal environments;
- reduce forest susceptibility to insects, disease and fire; and
- plan landscapes in patterns that enable species to move.

Finally, forest management policies should be modified as much as possible to reflect climate change.

"Be wary of overly optimistic scenarios…Droughts, late frosts, water shortages and weeds are probably here to stay. Manage for diversity. Observe, think, adapt and share. Apply what we already know about good land management and resource stewardship."

-Dr. Walt Klenner, South Selkirks ERD Team Leader and Wildlife Habitat Ecologist for the BC Ministry of Forests, Lands and Natural Resource Operations

Resiliency Dimension Highlights

From April to September 2011, we carried out the following activities:

Public Opinion Survey. Dr. Howard Harshaw continued his administration of the South Selkirks Public Opinion Survey providing participants with the option to complete a web or paper-based version of the survey.

Ecological Monitoring. Following up on Margie Eddington's ecological monitoring work, Laurie Kremsater continued with the identification of forest and rangeland climate change monitoring indicators focusing on abiotic processes – specifically, temperature, precipitation, snowpack, stream flow, water temperature, water quality, unseasonable or unexpected weather conditions and wind throw.

Collaboration. Dr. Harshaw participated in one of the West Kootenays (WK) Project Team's Climate Change Workshops where Dr. Rachel Holt and her team presented information about potential local climate impacts and implications for forest managers.

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Elk in the Boundary Lake Area
Photo courtesy of Dean Tichit

Extension. In May 2011, Dr. Klenner was a guest speaker at the East Kootenay Conservation Program's (EKCP) "Conserving Working Landscapes – the Future of Agriculture in the East Kootenay" workshop in Cranbrook, BC. Dr. Klenner made a presentation on the future of native grasslands, range land management and grazing adaptation in relation to climate change in the East Kootenay Region.

In August 2011, Drs. Innes, Caverley, Harshaw and Klenner participated in a dialogue session with representatives from the Great Northern Landscape Conservation Cooperative (GNLCC) in Montana and Idaho, USA. The on-line session provided an opportunity for our team to learn more about GNLCC's current endeavours and vice versa. Climate change and other landscape-level stressors are of importance to the GNLCC in terms of developing USA-based and cross-boundary relationships to share scientific and practitioner-based knowledge (e.g., monitoring and education) to promote a coordinated approach to understanding and implementing climate change adaptation solutions.

The South Selkirks Team was featured in *Identifying* – a special edition of the BC Métis Assembly of Natural Resources (BCMANR) Magazine and the Nature Conservancy of Canada's (NCC) *The Ark* which highlighted our team's research endeavours.

Future Activities

From October to December 2011, we will have fully transitioned from the research analysis stage to the extension/knowledge transfer stage of the study.

During our last quarter, members of the South Selkirks Study Team will be holding dialogue sessions with our strategic partners who have been actively involved and supportive of our endeavours over the past two years. These sessions will serve as an opportunity to review the research findings and respond to questions from our partners regarding next steps in advancing climate change adaptation in the South Selkirks Region. Also, Drs. Harshaw and Caverley will be co-presenting their collective research work on the Human Resiliency Dimensions of Climate Change in the South Selkirks Region in November 2011 via a FORREX webinar.

Finally, technical reports and related articles will be prepared and submitted to our strategic partners serving as tools for decision makers to aid in future climate change policy, planning, program design and implementation.

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