

Title: Endangered Whitebark Pine Ecosystems in the Mountains of West Central BC

ID: 7448

Category: Research

Project Start Date: June 1, 2011

Project End Date: May 31, 2012

Organization Name: Bulkley Valley Centre for Natural Resources Research & Management

Acronym: BVRC

Organization Type: Registered Charity

Contact Information: Dr. Sybille Haeussler, Director and Research Scientist

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Objectives of the Organization (500wds): Established as a registered not-for-profit society with charitable status in 2002, BVRC provides leadership in collaborative, interdisciplinary and credible research that addresses issues in resource sustainability. It serves as a forum for those concerned with natural and cultural resources research, management and sustainability, to identify common research priorities and to provide opportunities for synergistically combining expertise.

BVRC's objectives are:

1. To advance scientific knowledge of the sustainability of natural resources through high quality research
2. To conduct interdisciplinary research on our environment, including its human dimensions
3. To share research results and offer demonstrations of sustainable management to the public.

As of the end of 2010 BVRC has been involved in more than 100 research projects worth more than 4.5 million dollars and has 108 members, mostly local residents of northwest BC, who conduct or are interested in research in a wide range of natural and cultural resource disciplines. We host scientific conferences, training courses, a biweekly seminar series, and offer scholarships and awards to enhance scientific capacity and raise awareness of sustainability. BVRC has a Board of 12 volunteer directors and a small staff that oversee operations, located in an office on Main Street in downtown Smithers.

Summary of Income/Expenses for Previous Year (40wds):

In 2010, BVRC raised \$386,609 in project income and spent the same amount in project expenses. Most expenditures were local to support capacity building in northwest BC. In 2010, we had 18 funding sources, an increase from previous years.

Background on Lead Researcher (200 wds)

Sybille Haeussler PhD RPF is a long-time community-based research scientist from Smithers BC. A founding Director and Past-President of BVRC, Dr. Haeussler works as UNBC's researcher for the Future Forest Ecosystem Scientific Council of BC. Her work examines ecosystem diversity, resilience and restoration in northern BC landscapes. Dr. Haeussler has an honours BSF in Forest Science (UBC 1980), MSc in Forest Ecology (Oregon State 1988) and honours PhD in Environmental Sciences (Université du Québec 2004). She was a Killam/NSERC research fellow at UBC (2005-2007) and completed a fellowship in complex systems science with the Santa Fe Institute in Beijing (2007). In 2008 she gave an invited seminar at New Yorks Cary Institute for Ecosystem Studies, in 2009 was catalyst speaker at UVics PICS Resilient Ecosystems workshop and in 2011 was a panelist at UBCs climate change & forestry workshop. One of BC's most experienced field ecologists, Sybille has published 40+ scientific articles, given 50+ presentations, supervised 5 grad students and is active in local land use planning, sustainability issues and environmental education. She has led BVRCs whitebark pine research since 2007. CV online at: <http://www.pics.uvic.ca/research/details.php?id=4090>

Primary Project Location: British Columbia

Funds Requested (\$CAD): \$8525.00

MEC Products: (for trips into Neníkèkh/Nanika-Kidprice wilderness park):

- 1 3-person lightweight backpacking tent (MEC Tarn 3);
- 10 freeze dried dinners;
- 1 camping stove (MSR whisperlite);

Application Summary (30 wds): This community-based research project will develop restoration strategies for endangered whitebark pine ecosystems of west central BC threatened by mountain pine beetle, blister rust and climate change.

Project Detail (600 words):

Description of how Project Meets the Research Category Evaluation Criteria (600 wds)

Imagine what might happen to our mountain forests and alpine backcountry if the base of the subalpine food chain was suddenly cut by 5 to 20%.* This scenario may be playing out across the mountains of BC with the rapid death of whitebark pine (*Pinus albicaulis*), a keystone species whose fatty, protein-rich seeds support a network of subalpine wildlife that includes birds, chipmunks, squirrels, up to top predators like grizzly bears and golden eagles. Whitebark pine shares a symbiotic relationship with the

Clarks Nutcracker (*Nucifraga columbiana*), a bird who depends on pinenuts for food and plays a critical role in seed dispersal and burial.

When the Mountain Pine Beetle (MPB) spread rapidly across BC in the 2000s, concerns arose about its impact on this iconic subalpine ecosystem. Whitebark pine was known to be threatened by the same alien fungus (white pine blister rust) that nearly wiped out western white pine in the 20th Century. The unprecedented scale of the beetle outbreak, exacerbated by 50 years of fire suppression, warming temperatures, and relentless spread of blister rust have created a perfect storm of cumulative environmental change that now threatens whitebark pine across its entire range in western North America (COSEWIC 2010). Whitebark pine ecosystems are especially rare at their northern range margins, with northern populations being potentially critical to long-run survival in a warmer climate (McLane 2007).

Since 2007, BVRC, a Smithers-based not-for-profit, has conducted research on the health of whitebark pine ecosystems at their northwest range limits in the mountains surrounding our community in collaboration with UNBC, the ex-BC Forest Service, Office of the Wetsuweten, BC Parks and others. The research centres on seven new wilderness Parks established in 2008 within the Wetsuweten territories, in part to protect rare whitebark ecosystems. Our work showed that >80% of mature trees were killed in two successive MPB outbreaks (1980s, 2000s), up to 10% of young trees die per year from blister rust, and that whitebark seedlings are establishing at unsustainably low rates on wildfires (references at: <http://bvcentre.ca/research/project/whitebark>). Facing dramatic cuts to provincial research grants, we now seek funding from MEC for the second research phase which will determine effective restoration techniques and the potential for natural regeneration facilitated by Clarks Nutcracker. Nothing is known about the seasonal behaviour of the Nutcracker in northern BC and how it survives in low pine seed-years. We will: (1) develop a community-led restoration strategy; and (2) assemble baseline data on northern Clarks Nutcracker populations. The funding will complement (a) an NSERC PhD scholarship to Alana Clason; (b) TD Environmental Fund support for field supplies; (c) pending HCTF grant; (d) volunteer labour by BV Naturalists and BC Breeding Bird Atlas; (5) in-kind support from Woodmere Nursery and BC Parks.

Our 2011 objectives are to: (1) establish and monitor 2 restoration trials in a 2010 wildfire and MPB-killed stand using experimental seedlings from UNBC; (2) sow a first round of locally-grown seedlings at Woodmere Nursery to develop effective cultural techniques for northern seedlots; (3) cage cones, collect and process seeds from local Provincial Parks and mountain ranges; (4) study Clarks Nutcracker seasonal activity in Nenikëkh/Nanika-Kidprice Park, Babine Mountains and Hudson Bay Mountain; (5) coordinate a volunteer network to record and collate Clarks Nutcracker observations across Northern BC. Our methods build on research protocols developed by the Whitebark Pine Ecosystem Foundation and the BC Breeding Bird Atlas.

*actual values unknown.

1. Collaboration with an environmental community organization.

BVRC is a community organization dedicated to environmental sustainability. The project is a collaboration with the BV Naturalists, a BC Nature affiliate, and the Whitebark Pine Ecosystem Foundation.

2. Grassroots support. The project is backed by 108 BVRC members, has volunteer support from BV Naturalist birders and northern BC Breeding Bird Atlas contributors and also has support of the Wet'suwet'en First Nation.

3. Urgency of and need for research:

Pinus albicaulis was recognized April 2010 as endangered by COSEWIC. In our 2011 SARA Submission, BVRC demonstrated severe mortality from MPB and white-pine blister-rust and an urgent need for restoration. Across our region, whitebark pine ecosystems are damaged by roads, trails, corridors, gravel pits, staging areas for mining, logging, powerlines, pipelines, communication towers, and insensitive recreation. Expanding such developments into remote whitebark habitat may inhibit restoration treatments such as prescribed burning. Research into successful restoration methods is essential to conserving this species at its northern edge.

4. Project goals attainable in 1-year grant term:

We have clear, achievable objectives for June 2011-May 2012:

- a) Establish whitebark restoration trials at 2010 Gosnell Wildfire in (i) severe crown fire; (ii) low-intensity ground fire with MPB-killed overstory. Measure seedling performance, fall 2011. Statistically analyse data & report results by May 30, 2012. Technical report posted to BVRC website after peer review.
- b) Initiate local seed collections, summer 2011. Cage, collect and process seed from Babine Mountains, Hudson Bay Mtn, Nenikëkh/Nanika-Kidprice Park and other regional sites as warranted by 2011 cone crop. Report results as above.
- c) Initiate whitebark pine nursery trial at Woodmere Nursery, fall 2011. Measure/analyse/report growth.
- d) Monitor and record Clark's nutcracker activity at cone collection sites, summer-fall 2011. Collate region-wide 2011/12 Nutcracker observations. Analyse/report results as above.

5. Experience, qualifications & credibility of Research Leader: Sybille Haeussler, PhD RPF, UNBC's Climate Change Research Coordinator for the Future Forest Ecosystem Scientific Council has 30 years experience in ecosystem research (>40 scientific/technical; >50 scientific presentations) and is known nationally/internationally for work on ecological resilience. Dr. Haeussler has led BVRCs successful whitebark research project since 2007.

6. Rigorous research with measurable results: The project will contribute to Alana Clason's PhD at UNBC. Her research plan will be reviewed and approved by a thesis committee for scientific rigor and measurability. Thesis results will be published in refereed journals. The remainder of the project, to be lead by Dr. Haeussler will follow BVRC [protocols](#) that ensure scientific quality and subject technical reports to independent peer review. Team members belong to the [Whitebark Pine Ecosystem Foundation](#) and follow its research protocols.

7. Strong plan in place to disseminate results, support ENGOS, and influence land-use decisions & outcomes. As with our prior whitebark research, we will publish results as a peer-reviewed report, in scientific articles, prepare an Extension Note, all posted on BVRC's website. There will be 1 BVRC public seminar and 1-3 conference presentations. The work supports the Whitebark Pine Ecosystem Foundation (Clason is on the Board of its Canadian Chapter), BC Nature through the BV Naturalists & BC Breeding Bird Atlas, and will be used by BCParks, BCMoE, Office of Wet'suwet'en, BCMNRO to guide ecosystem restoration in Wetsuweten territories including Parks and Protected Areas. Our science will inform public, First Nations and other government response to environmental impacts of proposed developments, as it has since 2007.

Plans for Project Follow-up and Evaluation (40 wds): BVRC's and BV Naturalists commitment to whitebark pine restoration and Nutcracker monitoring is ongoing. Nursery seedlings will be outplanted and planting trials will be monitored annually for 5 years and intermittently thereafter, and will guide operational-scale restoration. (40 wds)

References

(posted to BVRC whitebark pine webpage at: <http://bit.ly/ih3dBd>)

Clason, A.J. 2010. Overstory and understory dynamics of whitebark pine (*Pinus albicaulis*) ecosystems of Northwestern British Columbia. MSc Thesis, University of Alberta, Edmonton, AB. 134 p.

Clason, A., S.E. Macdonald and S. Haeussler. 2010. [Ecosystem change at whitebark pine's northern limits](#). Nutcracker Notes 18: 12-13.

COSEWIC. 2010. Assessment and Status Report on the Whitebark Pine (*Pinus albicaulis*) in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. x + 44 pp.
www.sararegistry.gc.ca/status/status_e.cfm

Haeussler, S. 2007. [Effects of Cumulative Disturbance on Endangered Whitebark Pine – Lichen Woodland Ecosystems of West Central B.C.](#) Bulkley Valley Centre for Natural Resources Research & Management, Smithers, BC. Extension Note 8. 2 p.

Haeussler, S. 2010. [Exploring whitebark pine at its northwest limits](#). Nutcracker Notes 19: 11-12.

Haeussler, S. 2008. [Threatened whitebark pine ecosystems at their northwest limit](#). Nutcracker Notes Spring 2008 issue: 17-19.

Haeussler, S., A. Woods, P. LePage, K. White and E. Campbell. 2009. [Do whitebark pine – lichen ecosystems of west central British Columbia display tipping point behaviour in response to cumulative stress?](#) Bulkley Valley Centre for Natural Resources Research & Management. Research Report. Smithers, BC. 23 p.

Haeussler, S., A. Clason and J. Vinnedge. 2011. [Amending Canada's Species at Risk Act \(SARA\) to Include Whitebark Pine \(*Pinus albicaulis*\)](#). Comments to the Consultation on Amending the List of Species under the Species at Risk Act: Terrestrial Species – November 2010. Canadian Wildlife Service, Environment Canada, Ottawa, Ontario. 9 p.

McLane, S. 2007. Will whitebark move north with climate change? A study of the current and projected northern species boundary. Whitebark pine in Western Canada Workshop, Centre for Forest Conservation Genetics, University of BC, Whistler, BC, August, 2007.

http://genetics.forestry.ubc.ca/cfcg/proj_other/wbp/Presentation_Curtis-McLane.pdf

Attachments (see following pages):

Budget (xls):

Letters of Support: Office of Wetsuweten, Woodmere Nursery, BC Parks, UNBC-Massicotte