Pacific Parklands FOUNDATION

donor report

August 2009

Derby Reach Regional Park

METRO VANCOUVER

Langley Bog used as a living lab

The Langley Bog, a rare and distinct ecosystem, is located in Derby Reach Regional Park. This large and challenging project will see intact bog protected, and many hectares of bog that were mined for peat in the 50s and 60s restored over the next decade or so.

The Langley Bog in its splendor.

Trinity Western University Natural Resources students use the bog as a 'living lab', and they and local volunteers will install boardwalks, viewing platforms, cedar rail fences, signage — all designed to encourage low-impact public enjoyment of this very unusual ecosystem. The bog is home to the blue-listed Greater Sandhill Crane, and the goal is to make these big birds even more secure in the future than they have been in the recent past. The Project Team is dedicated to bringing health to the Langley Bog and to restoring and maintaining its unique ecological value.

Project Goals

1. Reversing Negative Environmental Impact

In the past people did not understand the importance of bogs and wetlands to the surrounding ecosystem and carried out agricultural and other activities of urbanization that damaged the bog.

Farming, peat mining and road building has placed the bog – which provides a significant and rare habitat to many species of plants and wildlife – in a precarious position. The original bog covered an area of more than 525 hectares. Approximately 75% of the bog has been converted to cranberry fields, with another 15% being mined for peat moss. The remaining 10% is bog forest and two bog meadows. 25% of the original bog is available for restoration and preservation.

2. Promote Solutions to Change

The project offers an opportunity for study, research and restoration of the bog and to maintain its unique ecological value; bring health to the bog; and begin to safely use it for public access. This information will be shared with other groups who are addressing similar issues in other bogs and wetlands. The community realizes the bog cannot be used as it was in the past. The project will tell us how best to enhance recovery and sustainability and monitor its recovery in the future.

Bog plays important role

3. Change Happens Through Education
As part of a regional park this bog offers great potential for public education and preservation, sustainability, and recovery. The bog will play an important role in the education of school groups, nature groups and others. School programs in the Metro Vancouver area will be able to access this outdoor laboratory and classroom. Programs will be planned and implemented to include youth environmental groups such as "Salmon in the Valley", *Catching the Spirit* and others.

Original Project Objectives

1. Program objectives
- Restoration/improvement of the unique ecosystem
- Research into preserving land quality and use
- Provide a model to other restoration projects across the region
- Identify and facilitate educational opportunities in the bog
- Increase and manage safe and sustainable public access and activity in the bog
- Harness the invaluable workforce provided by dedicated adults and youth.

2. Project Activities
Baseline characterization of the bog and related habitats: collecting data regarding the development of the bog to its current state; and documenting the current status of soil, hydrology, water chemistry, plant communities, invasive species, wildlife and fisheries.

- Design and implementation of various habitat restoration projects
- Collaboration with local conservation groups to teach and train volunteers how to work most effectively in the bog
- Interpretation and education.

3. Deliverables produced by the project
- Outdoor laboratory developed
- Ongoing research program created and expansion of programs for youth
- Innovative restoration techniques developed
- Populations of unique and rare wildlife and plant species increased
- Air pollution decreased converting carbon dioxide into long-term, organic carbon forms
- Coordinated approach to work with the many groups of adults, youth and students and offering increased public access to the bog.

Professor David Jordan takes a tree core sample. Tree cores tell historical information about the bog, including when trees began to grow and what times of greater or lesser growth have occurred that are related to climate.

4. What we hope to achieve
The project team hopes to protect and restore the bog and its unique environment through this project. They want to see the restoration and improvement of the Langley Bog and increased public access to this rare and diverse ecosystem and hope to develop innovative and sensitive methods of land restoration that can be shared with other conservation groups and the community. We want to engage local community environment groups.

Getting down to work

Kaysha measures dissolved oxygen in a well pipe. These wells are the source of sub-surface water samples and make up the sampling network, along with surface water sites.

Students, Kaysha Vandergugten, Diana Budi Ayu and Jesse Dias, along with faculty members, David Jordan, Geraldine Jordan, and Paul Brown worked in the Langley Bog and were involved in 2008 summer projects.

Kaysha was the lead student researcher throughout the summer; Diana was hired for five weeks and Jesse for one week. Kaysha and Diana were salaried by the grant and Jesse's time was in kind from TWU.

The group worked on various components of the project producing the following outcomes:

- Ridge and channel topography established and mapped
- Main water features mapped
- Generalized polygons of forest areas mapped
- Special features noted with data points
- GIS layers modified, and corrected for bog and bog-associated features
- General peat plant features mapped
- A tree core spatial network established
- Some small trees were destructively sampled for growth-height relationships
- 95% of the tree cores prepared for analysis
- 95% of one-pass age estimates completed
- Piezometers made and a piezometer well network installed
- Well water and 13 surrounding surface water locations measured
- Preliminary peat restoration study set up continuing a study from 2006.

Summer research produces ongoing work

a. Using nitrate and calcium raw mV measurements, calculate final concentrations
b. Complete core preps, initial age estimates, and complete a two part refining and correcting age estimation process
c. Determine age-height relationships using destructively sampled small trees
d. Display, map, and analyze spatial and attribute data for trees and waters
e. Determine and set up an information organization scheme
f. More wells to be installed to fill in data for a few areas.

Initial data processing needs to be completed and evaluated. Future direction/studies will then be determined.

Decisions are made in coordination with a community based umbrella group that consists of representatives from Metro Vancouver Parks – East Area office; Trinity Western and Fraser Valley Universities; and a wide variety of local park, environmental and other related organizations/ associations that meet on a regular basis.

Summer 2009 Project Activities

Research and restoration:

1. Tree coring for age determinations and bog activity correlations.
2. Second round of water chemistry data collection.
3. Water flows and movement.
4. Surveying – survey a grid across the bog from known elevation points to get absolute elevations that can be used to determine groundwater elevations in addition to depth from surface.
5. 14C analysis for dating bog peat at different levels – two to six analyses required.
6. Removal of invasive/exotic species in selected areas. Larger plants like blueberry could also be sampled during removal for ring/aging analysis.
7. Patch monitoring – the test areas where large sphagnum plugs were "planted" need surveying for plant identification in the plug as well as control patches. Growth of species in each patch can then be monitored to obtain more accurate estimations of re-growth.

TWU students Matt and Simon survey the bog.

The Project Team for Summer 2009

Three students have been hired for the summer of 2009 using Langley Bog Project funds: Trish Buhler, Michael Ness, and Matthew Paivinen. The three PPF-funded students are being hired for 6, 8–9, and 12 week positions. In addition, one student is being supplied through TWU with NSERC-USRA and TWU Biology Department funding for 16 weeks (Simon Steunenberg).

Mike Ness takes a tree core sample.

Trish and Mike had prior bog experience having completed undergraduate thesis projects in the bog, for which each also received a $750 scholarship from PPF funds (we hope to repeat that in 2009–10). While Mike and Trish will be leaving at the end of summer, Matt will continue for another year or two and we hope his experience this year will be available in the future. Students will be able to work in pairs in the bog or be accompanied by a faculty member or other bog volunteer/personnel.

Thank you to our donors and partners

- Anglo Canadian Shipping Company
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- Derby Reach/ Brae Island Parks Association
- Langley Environmental Partners Society

Message from the Executive Director

As you can see from this report, the Langley Bog Stewardship project needs additional funding to continue the work set out by the faculty of Trinity Western University in the original project concept.

We need your help to continue on with this very important environmental project.

Your contribution and support can make a difference. If you wish to support the Langley Bog Stewardship project, we will find the way that works best for you, from cash or in-kind donations to endowment funds, or other methods of giving. You can gain tax benefits as well as the opportunity to help ensure that this project is successful for future generations.

To those donors who are already helping us, our grateful thanks and to those considering supporting this project to the next level, please feel free to contact me.

Denise Coutts
Executive Director

Our mission:
- protecting greenspace
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