lake windermere ambassadors
healthy water for healthy communities

September 12, 2012

Kinsmen Beach Restoration Project
~Final Summary Report~

The Lake Windermere Ambassadors are a community lake stewardship group based in the East Kootenay region, British Columbia. In the time between September 2011 to September 2012 the group developed and implemented a lake shoreline restoration project. One of the purposes of the project was to serve as a pilot project. We hope that what we learned during this project will be helpful to other groups planning to undertake a lake shoreline restoration project. We would like to thank the Fish and Wildlife Compensation Program and the Columbia Valley Local Conservation Fund for making this work possible.

The following is a summary of the activities undertaken as part of this project.

Site Planning

The Lake Windermere Ambassadors worked in collaboration with the District of Invermere to develop a plan for the site that would stabilize the eroding bank, re-vegetate the shoreline and provide access for the community to move between the park area and the beach. We hired a Registered Professional Biologist to draft a plan for the site. The resulting design aimed to meet multiple objectives for the site and was based on the biologist's assessment of the physical conditions of the bay and beach.

Construction

A local contractor volunteered to provide large rocks for the project free of charge as a service to the community. The rocks were used to create a partial retaining wall on the steep eroding bank and a layer of rock around the exposed cottonwood tree roots. The contractor placed filter cloth between the rocks and a layer of fill so that added soil would not be lost from the site and fish habitat would not be degraded.

A local logging company, Canfor, donated logs to the project. Several large logs were brought in to create a terrace along the steep bank and to prevent further erosion between the large cottonwoods. On the heavily used portions of the beach, flat rocks were placed below the logs to serve as steps for access points. Thus, we were able to construct the entire site with natural, untreated materials.

The final construction element for this project was creation of a swale in the area receiving the most runoff from a lakeside parking lot. Over the years, the runoff has eroded the bank and delivered potentially polluted runoff directly to the lake. We had originally envisioned a grassy swale at this site, but the biological consultant recommended a rock feature instead. The medium-sized rocks in the swale will deflect the energy of the runoff, allowing pollutants to settle out of the water. Shrubs we added along the edges of this feature will provide an additional filtration function.

Our Water Act approval was for finishing "in-stream" work before April 30th. The work requiring heavy machinery began April 25th and was complete by noon on April 30th.

Plants and Planting

Planting took place after the main construction phase, in May 2012. We had purchased plants from Tipi Mountain Native Plants in the fall of 2011 so that they would be ready for spring planting. We planned to supplement that purchase with willows we harvested ourselves and would plant as live stakes. Unfortunately, we were not able to keep the willow cuttings at the optimal temperature (slightly above freezing) over the winter and they had died by the time of planting.

A very successful aspect of this project was the planting work party. We received the help of Grade 8 students from a new class at David Thompson Secondary School titled "Growing Green" which has a focus on community and agriculture and involves field trips to complete projects in the community. On the day of the planting, the students received instruction from their teacher and a local expert in native plants and then planted the plants, added an organic fertilizer and then watered the plants. The students contributed 72 hours of service to the planting project.

The plants added to the site were: yarrow, saskatoon, cut-leaved anemone, kinnikinnick, prairie sagewort, red-osier dogwood, black hawthorn, silverberry, choke cherry, golden currant and willow.

Education

The Lake Windermere Ambassadors staff, Board and volunteers had many opportunities to interact with the public during construction, planting and maintenance of the site. We answered questions about why we were doing the project and the benefits of a healthy shoreline. We also developed two educational signs which we placed along the restoration site, each of which included the Fish and Wildlife Compensation Program logo. We developed educational brochures that we placed in a waterproof brochure box at the beach. The brochures, also containing the Program logo, were distributed at Pynelogs- the beachside café overlooking the restoration site, at the District of Invermere office and in local businesses. We sent out several press releases over the period of the project, and local newspapers released a number of stories about our project. Over the summer we conducted several interpretive tours of the lake in which we taught participants about lake ecology, water quality, and shoreline "best practices". During the tours, conducted in a boat, we showed participants the restoration site from the water.

We are currently working with a professional designer to develop a large interpretive panel for the park. The sign will include a profile of a healthy shoreline and the fish and wildlife likely to use it. It will include text about the fish and wildlife values of the restoration site, contrasted to the damaging bulkheads predominant around the lake. We focused our energy on completing the physical restoration during this past spring and summer, and the sign will not be ready by the time of final reporting on the Fish and Wildlife Compensation Project. We would be happy to send in photographs of the sign after it is installed next spring.

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The Restoration Project and Nature

Lake levels were exceptionally high during the spring of 2012. Residents mentioned that this was the highest the lake has been in 20 years. The high water was accompanied by heavy rain and wind storms throughout June, which swept away many of the plantings in the lower elevations of the restoration site, pulled gravel and soil from behind our logs, and even eroded some of the shoreline behind our features. Yet had our restoration project not taken place, the shoreline erosion would have likely been even more severe, potentially toppling the large cottonwoods on the site. During the period of high water, we noticed fish hiding in the gaps between the rocks and logs we had added to the beach. Had we not completed this project, only a steep eroded bank would have been present, providing no cover for fish.

As was to be expected, the plant survival was variable in the project site. Plants in shaded area survived and thrived, while the plants that received direct sun all summer did not increase in size and suffered leaf loss from grazing and insects.

Table 1: Plant success, measured August 2nd, 2012, compared to time of planting, May 5, 2012. Note that "survival" statistics account for the plants lost due to high waters. Growth statistics account for the average growth of individuals of that species.

	Survival	**%Growth**
Yarrow	**62%**	**136%**
Saskatoon	**88%**	8%
Cut-leaved anemone	**86%**	25%
Kinnikinnick	0%	n/a
Prairie Sagewort	**63%**	**141%**
Red-osier dogwood – above log	**83%**	27%
Red-osier dogwood - below log	**100%**	**61%**
Black Hawthorn	**87%**	13%
Silverberry	30%	47%
Choke Cherry*	**120%**	-1%
Golden Currant	**93%**	3%
Willow	**100%**	**100%**

*New sprouts of cottonwood were likely mistakenly identified as choke cherry

Note that the drought-tolerant plants, yarrow and sagewort, were the most successful plants at this site. This definitely informs our plans for future planting at this site.

Next Steps

The high water and damage to the site has meant that further work is needed to recover the project's fish and wildlife values and aesthetic features. Beginning in the fall of 2012, The District of Invermere and Lake Windermere Ambassadors will work to improve the site. We will try a new method for harvesting willows and add willow live-stakes to the natural shoreline. We will also incorporate bioengineering features composed of brush layers and willows below the high water mark on the lower reaches of the site. We expect that within five years the plants will be thriving at this site and our objectives for fish and wildlife habitat improvement will be fully met.