# Shoreline Naturalization Project
# Seba Beach 2009-10

September 2010

Wabamun Watershed Management Council

Retaining walls and non-vegetated shorelines are a very common sight on shore-line properties in Alberta. These urbanized shorelines have a huge impact on the lake and shoreline from impacting aquatic vegetation and fish populations to reducing the stability and diversity of lake shores.

There are numerous benefits associated with restoring a more naturalized shoreline. For example naturalization helps protect shorelines, reduces erosion and nutrient loading, re-establishes wildlife habitat, improves fish habitat and water quality, and is visually pleasing.

In an effort to improve water quality and to demonstrate that modifying an urbanized shoreline into a more natural habitat is both possible and attractive, naturalization of a shoreline was undertaken at Seba Beach on Lake Wabamun. Kelly & Doug Aldridge volunteered to do the work at their family property. They started the process of planning and getting appropriate approvals from the Summer Village and Provincial & Federal departments in the fall of 2009. On the weekend of June 12 and 13, 2010, a dozen volunteers participated on the construction and planting of this unique project. The following provides an overview of the process.

## Steps for shoreline naturalization

**Step 1: Property Assessment**

The Federation of Alberta Naturalists (FAN) runs the Living by Water Program that assesses the current conditions of a waterfront property and then suggests actions that can be taken to improve the property. On June 28, 2008 a shoreline advisor assessed the Aldridge's property and through this initiative provided the owners with a full property assessment. Please refer to *appendix 1* for an example of the Living by Water assessment form.

The overall assessment of the Aldridge's property helped them determine the state of their shoreline property and the potential for changes or enhancements that could make it more natural. Because winds are often from the South-East, the property suffered from a severe erosion problem for which some shoreline armouring with rock/gravel material had already occurred. The upper slopes of the shoreline were shored up by railway ties, with manicured lawn behind.

The image below shows what the property looked like prior to naturalization.

**Step 2: Goals for the project**

Prior to starting the naturalization project it was important for the owners to reflect on what they wanted their shoreline to look like and be used for. For example, they needed to consider what human uses they wanted to preserve or create and what type of naturalization they desired. Some of the elements they considered were:

- Views to preserve or create
- Seating areas to preserve or create
- Recreation areas for children/adults
- Access paths to keep or add
- Dock access and location
- Desire for certain types of plantings, e.g. native species, flowering plants, berry producing shrubs
- Interest in attracting birds and other wildlife
- Overall density of planting desired
- Issues needing correction, e.g. erosion problems
- Location of services, e.g. septic fields or water lines

The Aldridge family decided that the best outcome would be to proceed with a shoreline naturalization that maintained some views, incorporated new seating and paths to the water, plus included plantings that were both showy and bird/wildlife friendly. The dock storage and boat access was to remain in place while the railway ties would be removed and upper gravel/lawn area would to be sloped in a more natural grade to the existing rock shoreline. No work was planned on the water's edge or in the water itself. The Aldridge's wanted their property to serve as a demonstration site to show that reversing an urbanized shoreline into a healthy environment is possible without sacrificing views of the lake or recreational use.

In August 2009 they held an information session at their property to showcase with friends & neighbors what they were planning and the process for doing this type of work. This was done with support from the Wabamum Watershed Management Council (WWMC), Alberta Environment (AENV), Seba Beach Village Council, and from Mr. Sheldon Helbert (a professional biologist and consultant on the project).

**Step 3: Seek Expertise as Needed**

As a landowner undertakes a project, it is advised that they obtain expert advice where needed. This could be from landscapers or from nurseries/greenhouses for advice on native species for an area and planting techniques. Engineers, professional biologists and landscape design architects can also be hired to oversee the entire process if the financial resources are available.

Any re-grading of shorelines will likely require professional advice in terms of ideal slopes and erosion prevention. For example, the ideal slope for shorelines has a ratio of 1:5 as this gradient is most effective for preventing erosion. Remember that you cannot alter your shoreline in any way (even for naturalization) without the proper municipal, provincial and federal authorizations.

For this project, Sheldon Helbert did a soil assessment of the Aldridge's property. He performed a soil assessment by making three test holes that showed that the soil was suitable for growing native plants. Also in August, 2009 an Alberta Environment specialist confirmed the high water line.

**Step 4: Application process**

Shores and lakes are under many jurisdictions. Prior to commencing any shoreline naturalization it is important to contact the appropriate federal, provincial and municipal/county/summer village authorities to obtain the required permits based on who has authority on the part of shoreline being altered as outlined below:

- From your property line to the high water mark is often municipal reserve, i.e. under municipal legislation
- From the high water mark to lake bed and shore is under provincial legislation, specifically:
  - Water Quality & Quantity – Alberta Environment
  - Lake Bed and Shore – Public Lands
  - Fish Populations – Sustainable Resource Development
- Fish Habitat & Navigable Waters are under federal legislation - Department of Fisheries and Oceans

As the process for receiving authorization can take some time, it would be wise to start the process in the fall so that all the required permits and authorizations could be acquired by the spring of the following year. The Aldridge's applied in January 2010 and obtained all the required approvals by the end of April 2010. For their location, they only had to apply with Alberta Environment (using the combined form http://environment.alberta.ca/01189.html) and AENV took the responsibility to forward the request to Public Lands/Sustainable Resource Development and to the Department of Fisheries and Oceans. In addition the Summer Village required letters of support from neighbours to show their agreement with the naturalization project.

The following is a list of the information that was required for the application process:

- A letter stating:
  - What the proposal is
  - Why it needs to be done

- A location plan, which must include:
  - Proposed works in relation to property line
  - If applicable, any municipal reserve lands between the applicant's property and the water body
  - Location of proposed works and the present, highest and lowest known water levels
  - If applicable, dimensions of the site, e.g. boundary of the area required to enclose the installation
  - Minimum plan size 21.5cm x 28cm

- Cross sections must show:
  - Existing conditions and proposed modifications
  - Relevant measurements
  - Minimum plan size 21.5cm x 28cm

- If available, a photograph or copy of a photograph showing the existing shore line

Appendix 2 contains a detailed list of all departments and jurisdictions that may need to be contacted for approval depending on the scope of a project.

**Step 5: Detailed Design**
A detailed sketch of the desired plant layout and site features is very helpful to guide the naturalization work, for example in selecting and purchasing plants/seed mixes, as well as for placement on the actual planting day. Appendix 3 contains the design suggested for the Aldridge's property.

It is very important to consider the mature height and width of the plants, shrubs and trees selected to ensure that the planting is not too dense and that views are not obscured when the planting is mature. It is a good idea to not plant too heavily initially, to let plant selections grow a bit, and then reassess in later years to see if more plants are needed. As mentioned in step 3 one can refer to a plant nursery or reference books for ideas of native plants specific to an area and to determine their mature sizes - see references listed in Appendix 4.

Aim for a design that is visually pleasing from all sides and that accommodates any landscape features such as paths, seating areas, benches, fire pits, play areas, dock access, etc. Selections of berry producing plants are important if enhanced wildlife habitat is desired.

Since some native plants may be difficult to acquire, it is a good idea to contact nurseries or greenhouses in the fall to pre-order your desired plants for the spring (see ANPC site listed in Appendix 4). You may also need to adjust your plan based on what is available.

**Step 6: Planting day**
Plan ahead, in order to have adequate numbers of volunteers and all the necessary tools !

1. Do not forget to schedule and book if needed a bobcat or any other machinery.
2. Order and schedule a delivery time for top soil, mulch and gravel if needed.
3. Ensure you have erosion prevention materials available, e.g. a silt fence, geo-textile membrane, jute netting – burlap was used over the seeded area of this naturalization to protect the site.
4. Ensure you have enough helpers available.
5. Make sure you have enough planting tools for everyone.

In order to help others plan financially for a project of this nature, the costs for this project are included under Appendix 5.

**Step 7: Maintenance**

After the planting it is important to water the new naturalized shoreline on a regular basis and keep the area weeded to ensure the desired plantings have limited competition. Silt fencing can be removed after the grass seed has fully established and the soil is stable. Also as mentioned in Step 5, reassess your shoreline in following years to see if additional plants are needed to complete the naturalization project.

## Pictorial overview of the project

Before view: View of original shoreline

First step: removing the retaining wall and fire pit and installation of silt fence

Second step: removing the top soil.

Third step: re-grading and measurement of slope to a ratio of 1:5

Fourth step: leveling the soil

Fifth step: outlining and laying out the planting area

Sixth step: transplanting trees and shrubs

Seventh step: seeding the native grass & flower mix (all native species)

Completed planting – looking south

Completed planting – looking north

Looking towards lake showing growth over summer – August 2010

Looking back from lake – August 2010

# Appendices

## *Appendix 1: Homesite Consultation Assessment form*

Date: _____

File Number: _____

Location: _____

**Shoreline:** A healthy shoreline, with abundant native vegetation, helps protect water quality, fish and wildlife habitat and protects against erosion and property loss. Look after your best shoreline insurance policy – a buffer strip of native plants along the shoreline. If you've got the space, make it 30m wide. The wider the strip, the bigger the benefits!

**Buffer zone** (present characteristics)

1. Please check for evidence of erosion:
   None ___ Minor ___ Moderate ___ Severe ___
2. Estimated percent of shoreline affected by erosion:
   less than 10% ___ 11-25% ___ 26- 50% ___ 51-75% ___ 76-100% ___
3. Check all that apply which describe this property's buffer zone:
   a) ___ turf grass to the water's edge
   b) ___ turf grass to water's edge; has a fringe of aquatic vegetation
   c) ___ turf grass to some form of retaining wall
   d) ___ sparsely vegetated with shrubs and trees
   e) ___ clumped shrubs and trees
   f) ___ densely vegetated with shrubs and trees

4. Please estimate the total width of shoreline which has been cleared to provide access to the water's edge for boating, beach, views, dock, other structures: _____ metres or _____ feet
5. Please estimate how much of this property's shoreline falls into each of the following four categories:
   degraded ____ % ornamental / landscaped ____% being restored to natural ____% natural ____%
6. Is there evidence of alien invasive plants on this shoreline:
   No evidence ____ Occasional sightings ____ Some large clusters ____ Many large clusters ____
   6.1) What is the client doing about the invasive plants?
   nothing ____ pulling ____ spraying ____ other_____
7. To what extent is the beach composed of imported sand:
   None ____ Minor ____ Moderate ____ Major ____ N/A ____
8. Are pets (e.g. dogs or cats) allowed to roam unleashed? Yes ____ No ____ N/A ____
9. Is there any special wildlife habitat present on site?
   9.1) Observed: Yes ____ No ____
   Comments: _____
   9.2) Reported by client: Yes ____ No ____
   Comments:_____
10. Are there any dead standing trees on the shoreline? Yes _____ No _____
11. Does the client clear away driftwood, debris etc that washes up on the shoreline? Yes _____ No _____

***Recommendations:***

Start a buffer strip by leaving some grass uncut near the water's edge (suggested): _____ metres or _____ feet

Protect a strip of native plants along the shoreline: minimum width _____ metres or _____ feet

Comments: _____

Replant native shrubs and trees along the shoreline

Comments: _____

Check regularly for invasive plants and remove them carefully

Let imported beach sand erode naturally and let native plants grow back

Create sand beach above high water mark.

Let natural debris (e.g. driftwood, fallen trees) accumulate

Retain dead standing tree(s); prune top for safety if necessary

Keep pets and / or livestock away from the waterfront / creekside

Other Comments _____

**Built structures** (present characteristics)

1. Has this shoreline been "hardened" with rock, rip rap, concrete, steel or wood structures? Yes _____ No _____
   1.1) By what percentage: less than 10% ___ 11% to 25% ___ 26% to 50% ___
   51% to 75% ___ 76% to 100% ___
2. If the shoreline has been hardened is there evidence of some attempt to soften:
   No softening _____ Minor _____ Moderate _____ Major _____
3. Does this shoreline have a dock structure, boathouse, etc.?
   No _____ Low impact _____ High impact _____
   Comments:_____
4. Does the client periodically paint the dock, or a deck near the water, fences, or any other structures where paint could wash into water? Yes _____ No _____

***Recommendations:***

"Soften" shoreline
Comments: _____
Build a low impact dock
Comments:_____
Replace/remove solid dock
Comments: _____
Modify access to shore
Comments:_____
Modify retaining wall
Comments:_____
Follow safe painting practices (use of biowash for preparation, use of tarps for spills and paint scrapings)

Other Comments: _____

**Yard** (present characteristics)

### A) Grassed area

1. Is the client planning any further clearing or development on the shoreline? Yes _____ No _____
2. Is the client using pesticides in the yard and / or garden? Yes _____ No _____
3. Is the client using fertilizers in the yard and / or garden? Yes _____ No _____
4. Does the client use any motorized yard maintenance tools (weed trimmers, lawn mowers, etc.)?
   Yes _____ No _____

***Recommendations:***

Minimize the amount of trees and plants cleared during construction projects
Prune trees to obtain more open views, instead of removing them
Reduce use of fertilizers and pesticides
Handle fuels, oil and other chemicals with great care to avoid spillage
Have a Green Bin on hand whenever refueling lawn mowers, weed trimmers, etc. to deal with fuel spills

Other Comments: _____

### B) Driveway

1. Potential for runoff from driveway or road:
   No potential _____ Minor potential _____ Moderate potential _____ Severe potential _____

### *Recommendations:*

Redirect driveway runoff into a settling / soaking area

Other comments: _____

## C) Hot tub / swimming pool

1. Does the client have a hot tub / swimming pool? Yes _____ No _____
2. Determine how the tub / pool is drained and rate the potential for runoff entering surface water:
   No potential _____ Minor potential _____ Moderate potential _____ Severe potential _____
   2.1) Is there a dry well for drainage? Yes _____ No _____

### *Recommendations:*

Follow Best Management Practices for drainage (allow chlorine to gas off; when pH is balanced to surface water, allow to drain and spray into forest area or over lawn away from septic field; pump uphill if necessary)

build dry well for hot tub / pool drainage

Other comments: _____

## House

## A) Onsite sewage disposal systems:

1. Type of system:
   outhouse ___ holding tank ___ septic tank and field ___ sewage treatment plant ___ other _____
2. If holding tank: Has the client ever performed a leak test? Yes _____ No _____
3. Does the client know where the septic field is located? Yes _____ No _____ N/A _____
4. Setback of septic field to nearby surface water:
   Less than 30 metres / 100 ft _____ Over 30 metres / 100 ft _____
5. Has the septic system been pumped in the last three years? Yes _____ No _____
6. Has the distribution box been inspected in the last five years? Yes _____ No _____
7. Does the client use phosphate free soaps and cleaners? Yes _____ No _____
8. Does the client use septic enzyme additives? Yes _____ No _____
9. Does the client use bleach, other disinfectants, or drain cleaners? Yes _____ No _____
10. Does the client load the system with several loads of laundry in a day, or several baths in a day?
    Yes _____ No _____
11. Does the client have any water saving devices such as low flow showerheads or low flush toilets?
    Yes _____ No _____
12. Other factors – willows or poplars etc. near system?

### *Recommendations:*

Test holding tank for leaks

Use phosphate free soaps and cleaners

Use alternative cleaners like baking soda and vinegar instead of toxic products

Discontinue use of enzyme additives and septic starters

Pump septic tank regularly (for a field system, every two to three years)

Avoid overloading septic system by staggering full laundry loads throughout the week

Conserve water by using low flow showerheads and toilets

Obtain specialist's opinion on septic system

Follow best management practices for maintaining septic systems

Other comments: _____

## B) Roof runoff

1. Erosion potential from roof runoff:
   None _____ Minor _____ Moderate _____ Severe _____

### *Recommendations:*

Improve drainage by installing a dry well and / or gravel trench at end of downspouts

Other comments: _____

## C) Guests

1. Does the client have frequent visitors and / or tenants during the summer or other times of year?
   Yes _____ No _____

### *Recommendations:*

Provide Green Guest Guide for guests

Other Comments: _____

## Boating

1. Does the client have a boat with gas motor? Yes _____ No _____
   1.1) If yes: does your motor meet EPA 2006 guidelines? Yes _____ No _____ Not Known _____
   1.2) If not known: approximately how old is the motor? _____ years
2. When was the last time the motor was serviced?
   Within last two years _____ Over two years _____ N/A _____

### *Recommendations:*

Use oil absorbing bilge cloths

Practice safe refueling

Reduce boat wake (slow down to 5 km/hr within 160 m / 500 feet from shore)

Purchase a 2 or 4 stroke motor that meets EPA 2006 guidelines

Maintain boat motor and have it inspected regularly

Other Comments: _____

## Your Homesite Consultation Follow-up Report

See attached _____ left with client _____ to be delivered at a later date _____

Homesite Consultation completed by: _____

This is a general guide only. It is the responsibility of the waterfront resident and / or individual receiving the homesite consultations to obtain all necessary permits for corrective work from relevant municipal, government and other agencies, and to obtain the necessary professional advice regarding any element of work related to personal safety or to the structural integrity of buildings or other property, for example in relation to shoreline erosion, bank stability, retaining walls, construction plans and approvals, septic permits, tree condition and removal, or any other actions suggested in this homesite consultation. It is recommended that any alterations and / or corrective measures be carried out with due care and attention to human safety, and property and landscape integrity. The Living by Water Project, its partners, agents and contractors cannot accept any responsibility for any work carried out as a result of the actions recommended in this homesite consultation.

For more information contact: The Living by Water Project (AB) c/o FAN

11759 Groat Road, Edmonton, AB, T5M 3K6

Phone: 780 427 8124 Fax: 780 422-2663 Email: shorelines@fanweb.ca www.livingbywater.ca

## *Appendix 2: Legal jurisdiction*

**Municipality / County**:
The municipality, village or county is responsible for the land going from the property line to the high water mark (municipal reserve)

- Permit / approval required

**Provincial**
The provincial government is responsible for the land from the high water mark to the lake bed and shore.

1. **Alberta Environment :**
   Water Act applies - permit/ approval required
   Under the Water Act, it is mandatory to provide notice to neighbors of proposed development of your property

2. **Sustainable Resource Development** :
   Regulations apply if you affect fish population

3. **Public lands**
   Is responsible for the lake bed and shore.

**Federal**

1. **Parks Canada :**
   Is the responsible authority for docks, boathouses and other shoreline structures.

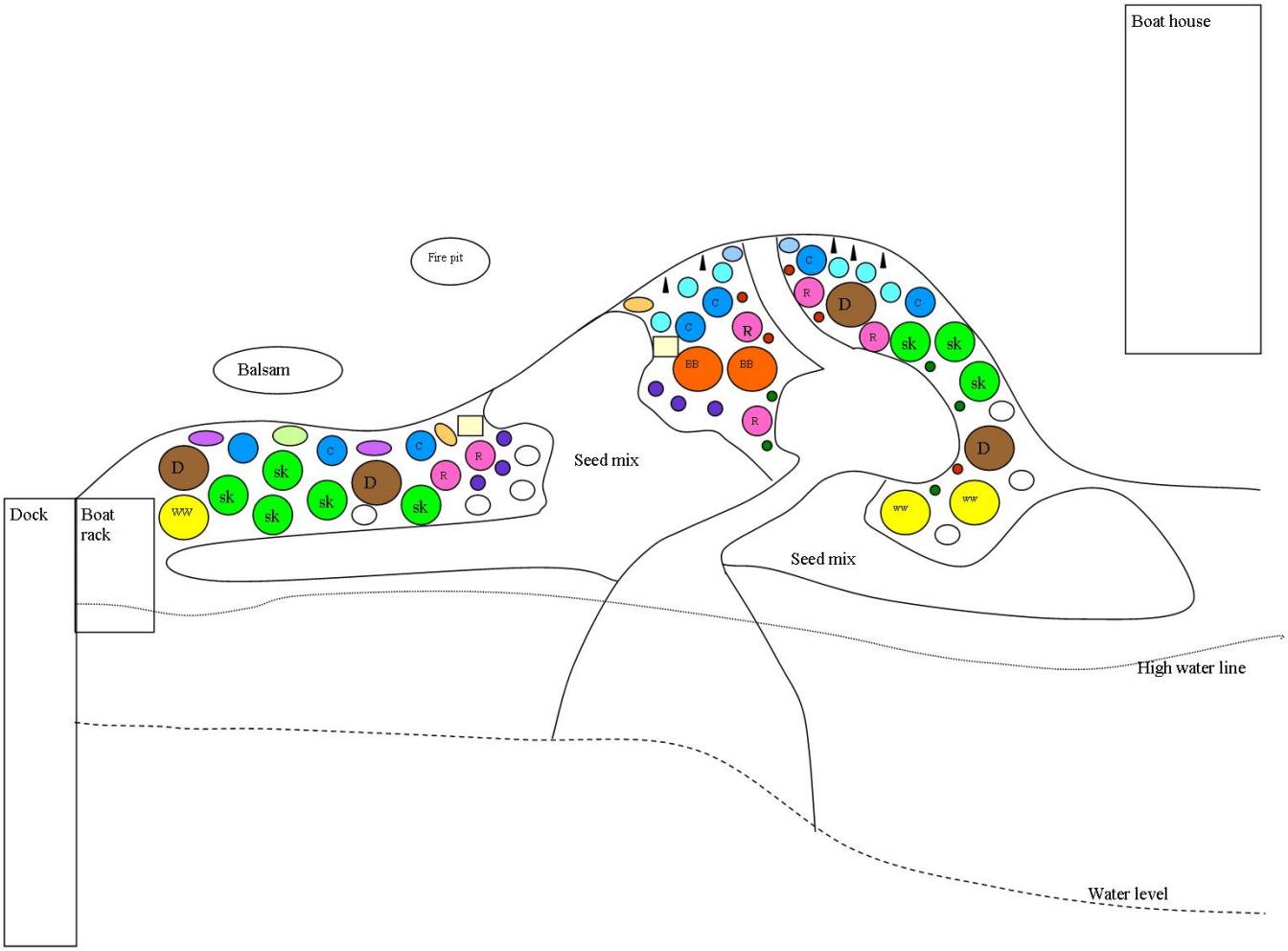
2. **Navigable Waters**
   Is the responsible authority for transportation on water.

3. **Fisheries and Oceans Canada (DFO):**
   Fishery Act: Under the legislation you must comply with the Operational Statement. You will not require a review by the DFO if your project complies with the conditions and follows the *Measures to Protect Fish and Fish habitat* listed in the Operational Statement.
   - http://www.dfo-mpo.gc.ca/regions/central/habitat/os-eo/provinces-territories-territoires/ab/index-eng.htm

   Species at Risk Act, or also knows as the SARA. You must comply to SARA regulations if there are species at risk located near your shoreline project

   - www.sararegistry.gc.ca

## *Appendix 3: Planting Design*



## Landscape guideline

| Color / Shape | Letter code | Specie | Quantity |
|---|---|---|---|
|  | C | Wild red current | 7 |
|  | SK | Saskatoons | 8 |
|  | D | Dogwoods | 4 |
|  | R | Common wild rose | 6 |
|  | BB | Russet Buffaloberry | 2 |
|  | - | Shrubby cinquefoil | 6 |
|  | WW | Wolf willow | 3 |
|  | - | Bearberry | 5 |
|  | - | Bergamot | 5 |
|  | - | Tufted hair grass | 6 |
|  | - | Goldenrod | 6 |
|  | - | Harebell | 4 |
|  | - | Northern bedstraw | 4 |
|  | - | Canada Violet | 4 |
|  | - | Blue Flax | 6 |
|  | - | Sheep fescue | 6 |
|  | - | High bush cranberry | 7 |

## *Appendix 4: References*

**Web sites for reference**

Alberta Environment – application form for shoreline alteration located at this site
http://environment.alberta.ca/01189.html

Alberta Native Plant Council (ANPC) – check list of nurseries/greenhouse to source native plants
http://www.anpc.ab.ca/content/links.php

Alberta plant watch
http://plantwatch.fanweb.ca/

Center for sustainable watersheds
http://www.watersheds.ca/whatwedo/lbw.html

Cottage Life
http://www.cottagelife.com/

Cows and Fish: Alberta Riparian Habitat Management Society
http://www.cowsandfish.org/

Fisheries and Oceans Canada – The Shore Primer
http://www.dfo-mpo.gc.ca/regions/central/pub/shore-rivages-pr/pdf/shore-rivages-pr_e.pdf

Landscape Alberta Nursery Trades Association
http://www.landscape-alberta.com/

Living by Water program run by the Federation of Alberta Naturalists (FAN)
http://naturealberta.ca/alberta-natural-history/living-by-water

Wabamun Watershed Management Council (WWMC)
http://www.wwmc.ca

**Books and publications**

Landscape Alberta nursery trades association (2009) *Trees and shrubs for the Prairies.* Landscape Alberta Nursery Trades Association publication. (Good reference for determining mature plant sizes)

Hale, Greg; Ambrose, Norine et all (2005) *A field guide to common Riparian Plants of Alberta*. Cows and Fish program, Alberta. 63 pages ISBN: 0-7785-4067-7

Helbert, Sheldon (2009) *A Beginners Guide to Shoreline Ecological Restoration*. Edmonton, Alberta (see www.wwmc.ca web site)

Knowles, Hugh (1995) *Woody Ornamental from the Prairies*. University of Alberta
ISBN: 1-55091-025-6

Moss, EH (1983) *Flora of Alberta.* University of Toronto 2nd edition ISBN: 0-8020-2508-0

Valastin, Pat (2001) *Caring for Shoreline Properties - changing the way we look at owning lakefront property in Alberta*. Alberta Conservation Association; Edmonton, Alberta

William, Sarah (1997) *Creating the Prairie Xeriscape*. University of Saskatchewan
University extension press ISBN: 0-88880-357-5

## *Appendix 5: Cost of the naturalization project*

| | | |
|---|---|---|
| Sunstar Nurseries | Plants | $ 673.50 |
| Bedrock Environmental | Plants and seed | $ 236.25 |
| Cascade Geotechnical | Silt Fence | $ 59.66 |
| | Staples | $ 21.00 |
| WalMart | Burlap | $ 29.40 |
| Apache Seeds | Burlap | $ 40.00 |
| S.V. Seba Beach | Dump fee for railroad ties | $ 35.00 |
| Wabamun Home Hardware | Landscape rake | $ 40.40 |
| | **Total** | **$ 1,135.21** |

| | | |
|---|---|---|
| Summerview | Excavation work | $ 252.00 |
| | Load and remove excess soil | $ 189.00 |
| | **Total** | **$ 441.00** |

| | |
|---|---|
| **Total cost using volunteer labour and consulting** | **$ 1,576.21** |