

Stop Losing Ground to Erosion

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Forms of Erosion

- ▶ Surface erosion
 - ▶ Sheet erosion
 - ▶ Wind erosion
 - ▶ Wave action
- ▶ Fluvial erosion
 - ▶ Rill erosion
 - ▶ Gully erosion
 - ▶ Tunnel gullyng
- ▶ Mass-movement erosion
 - ▶ Slips, earth flaws
 - ▶ Scree erosion
- ▶ Streambank erosion

Erosion- NATURAL

Derived from the Latin word *rodere* meaning to 'gnaw'

- ▶ Natural process in which we have little to no control over
 - ▶ Soil types
 - ▶ Slope
 - ▶ Lake effect winds (wave action)
 - ▶ Storms
 - ▶ Natural streams and channels









Erosion- MAN MADE

Erosion is a natural process but is often intensified by human land use practices

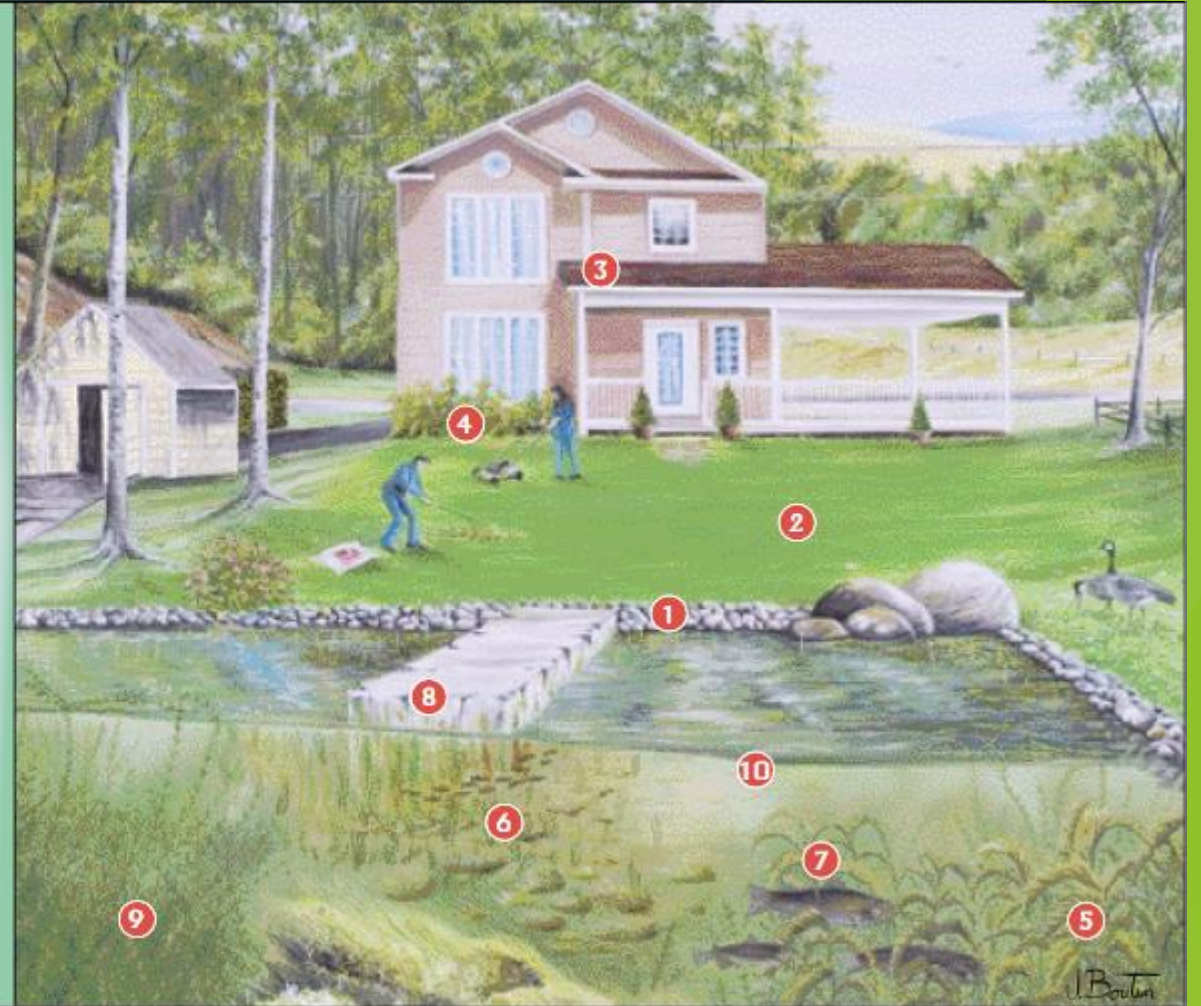
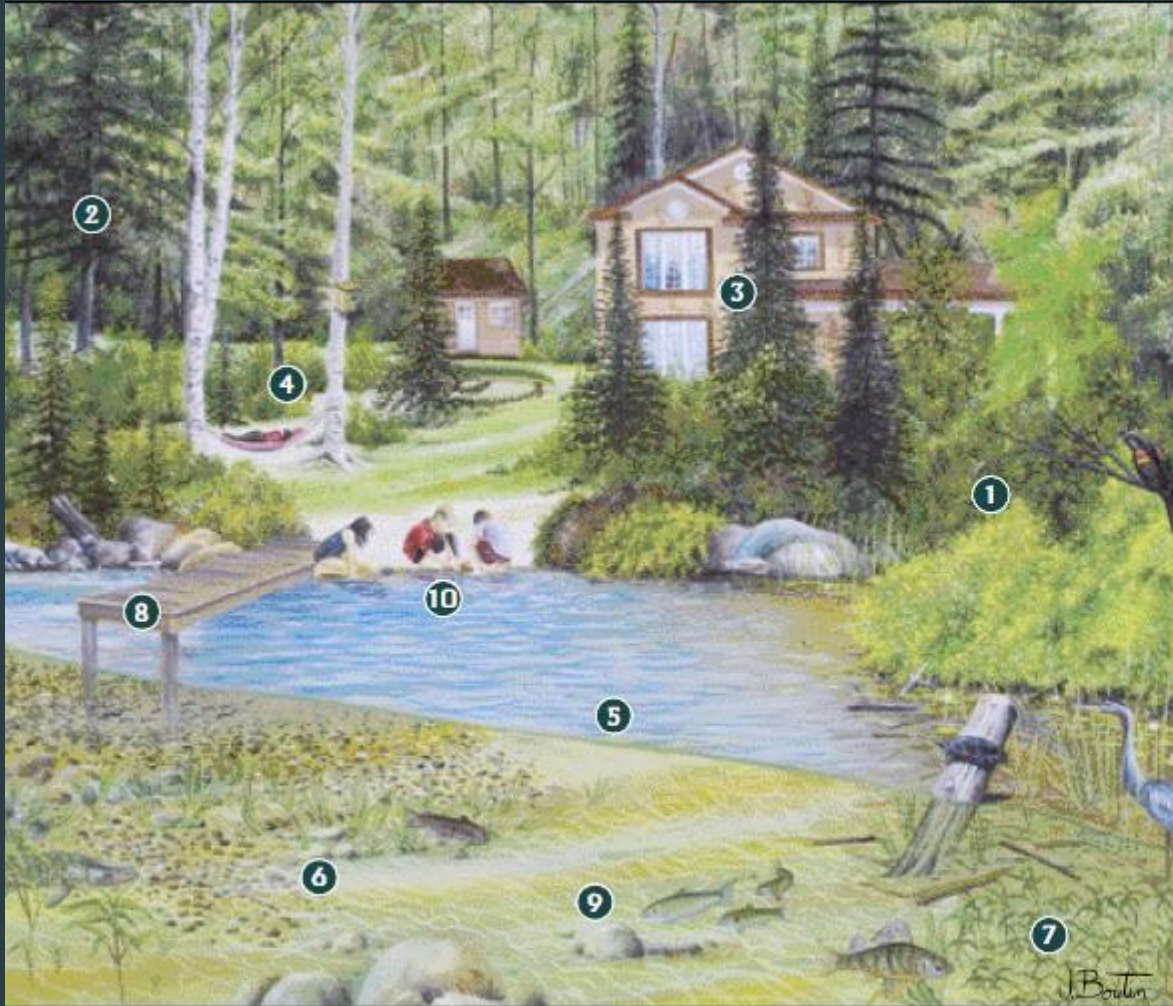
- ▶ Process in which we contribute to erosion
 - ▶ Stripping of vegetation and removal of mature trees (established root systems)
 - ▶ Slope (by design)
 - ▶ Livestock, Cultivation
 - ▶ Wave action
 - ▶ Bad land use planning







Known the Signs - Become a Erosion Detective



Source: DFO <http://www.qc.dfo-mpo.gc.ca/infoceans/Infoceans200609-eng.html>

Understanding Erosion *Perceptions*

Low Impact Development

- ▶ Approaches to development on your property that provide for “low impact” on the environment
- ▶ Permeable pavements “porous pavement”- allowing water to soak in around the home.
- ▶ Rain Gardens
- ▶ Bioswales

Perceptions









Source: Ecoslim <http://www.ecosim.ca/ELCWebApp/consult.html>







What Types of Erosion Problems do You Have?



Simple and Effective Ways to Stop Losing Ground to Erosion

Many fixes are simple and cost effective

- ▶ Don't typically require a MNRF permit
- ▶ No previous experience needed
- ▶ Uses native plants locally sourced
- ▶ Occur above the high water mark

Not intended for larger scale projects

- ▶ Restoring a hardened shoreline
- ▶ Installing rock or other large scale works at the water edge
- ▶ Using heavy equipment at the shoreline (in water work)
- ▶ Shoreline alterations below the high water mark have the potential to damage aquatic habitat

***Identifying the high water mark allows for a reasonable determination of where special precaution must be taken when modifying the shoreline (e.g., sediment control measures and extent of work needed)

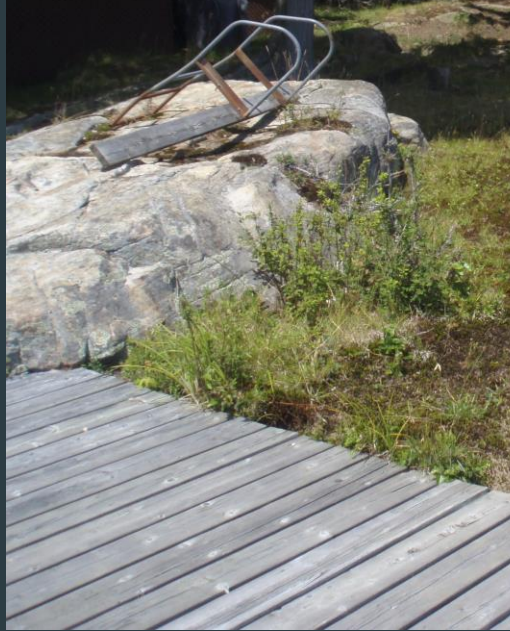
Embrace the Natural Look!

- ▶ Choose native plant varieties which promote biodiversity and are suitable to the shoreline environment
- ▶ Incorporate woody shrubs (dogwoods/willows) which have complex root systems
- ▶ Herbaceous plants (grasses and wildflowers) increase the overall fertility of the soil
- ▶ Projects with the greatest diversity are the most successful.
- ▶ Low or high bank profiles
- ▶ Undercutting, sheet, rill/gully
- ▶ Low cost with little disturbance



A good goal to strive for - fully vegetated shoreline frontage of 15 metres or 25% (whichever is less) open for access (sitting and swimming, docks etc).







Source: Rasin River Conservation Authority
Solutions for shoreline erosion

Source: http://www.fws.gov/refuge/detroit_river/what_we_do/resource_management.html



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Common Shoreline Plants

in Parry Sound-Muskoka

Look around your lake or river and note how nature works to minimize erosion on healthy, more natural shorelines. Make note of what types of wildflowers, grasses, trees and shrubs you see in these areas. These are the plants you want to include in your planting plan.

The species you choose will depend on the specific light, moisture and soil conditions present on your property. Specific requirements for each species can be found using Evergreen's Native Plants Database (nativeplants.evergreen.ca/) or a field guide such as *Forest Plants of Central Ontario* by Lone Pine Publishing.

Trees

- Yellow birch** (*Betula alleghaniensis*)
- Red maple** (*Acer rubrum*)
- Black cherry** (*Prunus serotina*)
- White cedar** (*Thuja occidentalis*)
- White pine** (*Pinus strobus*)
- Eastern hemlock** (*Tsuga canadensis*)



Sweet gale

Shrubs

- Serviceberry** (*Amelanchier sp.*)
- Red osier dogwood** (*Cornus stolonifera*)
- Sweet gale** (*Myrica gale*)
- Willow species** (*Salix spp.*)
- Meadowsweet** (*Spiraea alba*)
- Steeplebush** (*Spiraea tomentosa*)
- Winterberry** (*Ilex verticillata*)
- Buttonbush** (*Cephalanthus occidentalis*)
- Nannyberry** (*Viburnum lentago*)
- Northern wild raisin** (*Viburnum cassinoides*)



Northern wild raisin

Plants

- Canada anemone** (*Anemone canadensis*)
- Swamp milkweed** (*Asclepias incarnata*)
- Canada blue-joint grass** (*Calamagrostis Canadensis*)
- Canada wild rye** (*Elymus canadensis*)
- Sedge species** (*Carex spp.*)
- Blue-flag iris** (*Iris versicolor*)



Swamp milkweed
Credit: Edward Teune

Aquatic Plants

- Pickerel weed** (*Pontederia cordata*)
- Broad-leaved arrowhead** (*Sagittaria latifolia*)
- Water smartweed** (*Polygonum amphibium*)



Blue-flag iris
Credit: D. Gordon E. Robertson

Resources

Extension Note - Preserving and Restoring Natural Shorelines - www.lrconline.com/Extension_Notes_English/pdf/shrlns.pdf

Call your local Ministry of Natural Resources office (Bracebridge: 705-645-8747 Parry Sound: 705-746-4201) or the Natural Resources Information Centre at 1-800-667-1940

Visit the MNR website (www.mnr.gov.on.ca/en/Business/CrownLand/2ColumnSubPage/STEL02_165786.html) for information about Work Permits.

Visit the Fisheries and Oceans Canada website for information about *Working Around Water* and the federal Fisheries Act - www.dfo-mpo.gc.ca/regions/central/water-eau-eng.htm or call the Parry Sound office at 705-746-2196

Evergreen Native Plants Database - nativeplants.evergreen.ca/

The Stewards' Guide Series
is a collaborative project

Source: Muskoka Watershed Council

Use Caution When Choosing Your Plants

- ▶ Not all plants are good for erosion control
- ▶ Not all plants are created equal
- ▶ ***** Not all plants sold in Muskoka nurseries labelled as “ native” are truly native to our area.

You may cause more harm if you don't choose the right species for the job!



Native Plant Sale

Saturday, May 9th 2015
9am – 12pm
Bracebridge & Huntsville

Order online at
www.muskokaconservancy.org
or call (705) 645-7393 x200

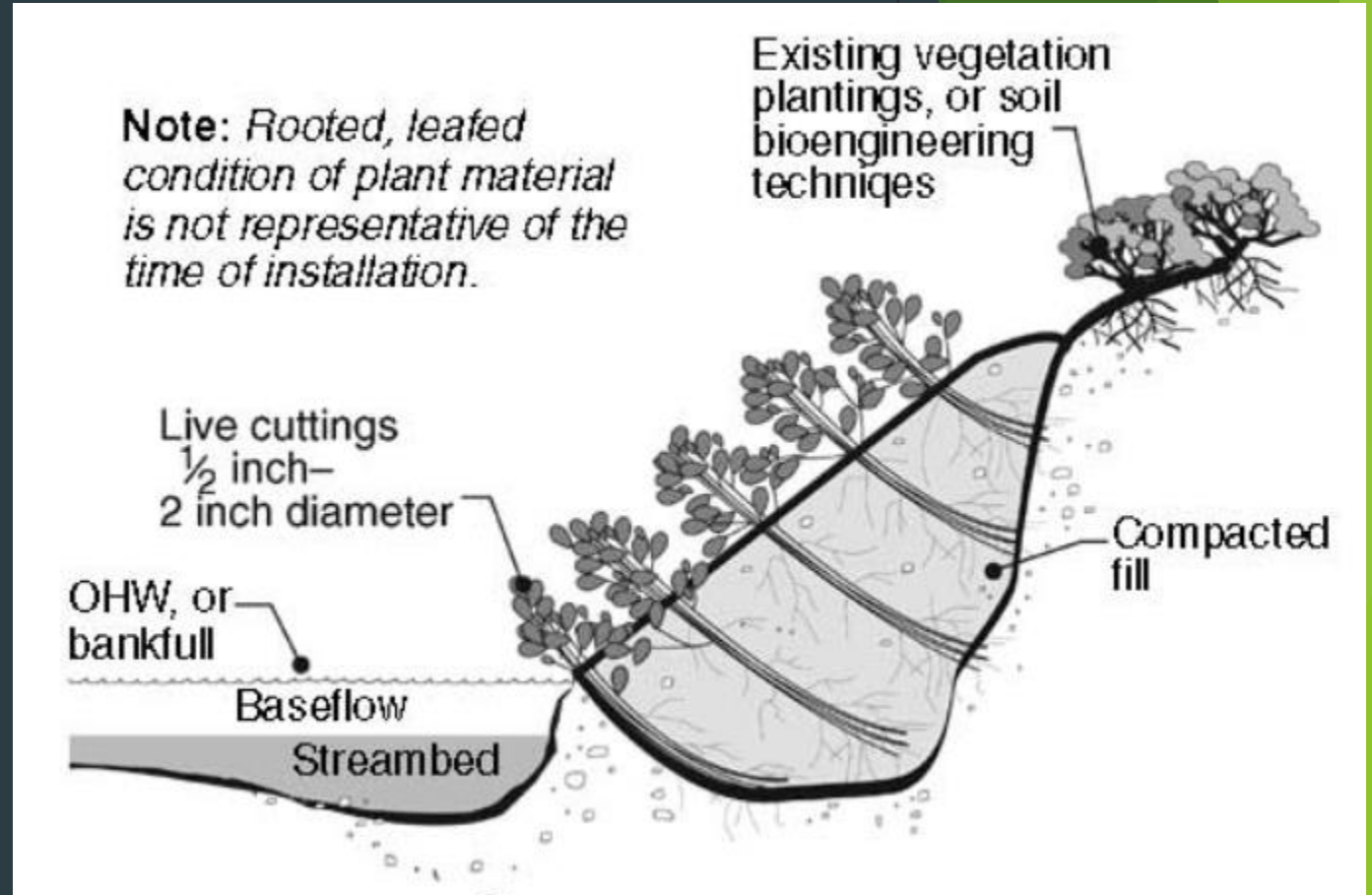
 **MUSKOKA CONSERVANCY**
www.muskokaconservancy.org

Consider Bioengineering

Brush Layers

- ▶ Live cuttings in bundles staked into the banks
- ▶ For low or high bank profiles
- ▶ Undercutting, sheet, rill or gully erosion

Great for immediate protection on slopes and upper banks, but less suitable for areas at the waters edge.



Source: US Forest Services

Live Stakes



(Sound Native Plants Photo)

- ▶ Live cuttings which are staked directly into the shoreline
- ▶ For low or high bank profiles
- ▶ Undercutting, slope failure

Versatile, little environmental disturbance, low cost, good for early stage erosion ** can take up to several years to become established.

Fascines/ Brush Mattresses

- ▶ Bundled live cuttings which are secured to the bank. This creates a platform for vegetation to grow
- ▶ Or can be used as Layers of live cuttings placed into the upper part of the bank
- ▶ For low or high bank profiles
- ▶ Undercutting, sheet, rill or gully, slope failure

Fascines offers erosions and sediment protection while just mattresses provide immediate protection but not as effective on lower banks.

** Restrictions- MNRF permit may be required (fascines).



Source: Solutions for Shoreline Erosion_RVCA

Coir Log

- ▶ A flexible log made of coconut fiber or other natural material
- ▶ Used along the shoreline to absorb wave energy to assist in vegetation establishment
- ▶ For low or high bank profiles
- ▶ Undercutting, sheet, rill or gully erosion, used with upland plantings

** Restrictions- MNRF permit may be required.



Source: http://www.rvca.ca/programs/shoreline_naturalization_program/how_to_naturalize.html

It is Worth Mentioning

Heavier rock treatment, that incorporates plantings and diverse nearshore condition



Lots of Information Available - Where to Look

Living In Cottage County -
What You Need to Know
(Muskoka Watershed Council)

Ministry of Natural Resources
and Forestry

Department of Fisheries and
Oceans
Primers- Shoreline

Conservation Authority
Websites
i.e. Rideau Valley
Toronto and Region

Friends of the Muskoka
Watershed
Muskoka Conservancy
Local Environmental Firms
Naturalist Clubs
Lake Associations

In Ontario, the beds of most lakes and rivers are public lands. Section 14 of the *Public Lands Act*, to authorize specific activities and works on public lands and shore lands. A Work Permit may be required in some cases including requirements and considerations under the provincial *Endangered Species Act (2007)*. If in doubt as to whether a permit is required or not you are encouraged to contact your local Ministry of Natural Resources and Forestry office.

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Source: MNRF

QUESTIONS?