

How to Naturalize Your Shoreline

Every shoreline is unique and requires different approaches to naturalization. Current and desired land use, existing conditions, soil type, availability of sunlight and moisture, and naturalization goals all play a significant role in selecting the appropriate naturalization methods. Some methods may include:

Creating a “no-mow” zone near the shoreline and allowing vegetation to re-establish on its own.

Active planting of native trees, shrubs, grasses, wildflowers and/or aquatic plants in the buffer area.

Placing or allowing the **accumulation of woody debris** along shoreline.

Removal or “softening” of existing hard structures like retaining walls, gabion baskets and rip rap.

Utilizing various bioengineering methods such as coir logs, live cuttings, and brush mattresses to control or reduce erosion.

How Much Is Enough?

Determining how much of a shoreline buffer you need is dependent on many factors including the slope of your shoreline, your goals for naturalization (bank stability vs. habitat creation), and reasoning behind naturalization (personal decision vs. regulatory/building permit requirement).

Regulatory and planning approvals typically require a 15-30 metre buffer allowance. While new developments require significant setbacks from watercourses, RVCA recognizes that this is not always possible for pre-existing properties and that ANY size buffer is an improvement.

For landowners that simply wish to begin a shoreline naturalization process, a minimum width of three to five metres is suggested. In general, it is recommended that the entire shoreline frontage is vegetated leaving 15 metres or 25% (whichever is less) open for access (sitting and swimming areas, docks, etc.)

How to Naturalize Your Shoreline

Planting

1. Assess Your Property

- Think about how you use your shoreline. How do you access it? Where would you like to maintain views/sight lines?
- Find your high water mark and the location of your property lines.
- Determine site conditions such as soil type, moisture and compaction, drainage patterns and availability of sunlight.
- Does your property have excessive erosion? Problems with your septic system? Planning to install a new dock? You may want to address these issues before planting your shoreline.

SOIL TYPES

Sand- Coarse texture, gritty to the touch, particles can be seen by the human eye, good drainage

Silt- Fine texture, smooth to the touch when wet, particles not visible without microscope

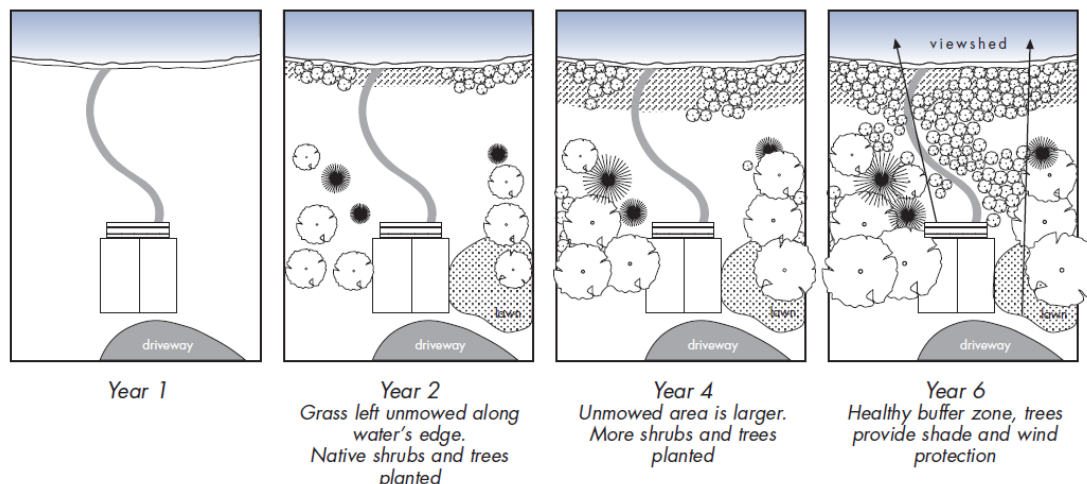
Clay- Very fine texture, sticky and plastic-like when wet, poor drainage

Loam- A combination of sand, silt and clay particles, desirable soil type for many plants

Organic- Dark in colour, high in organic material, wet, common in wetland or seasonally flooded areas

2. Develop a Planting Plan

- Map out where you want to plant and determine how many plants you will need.
- In general, shrubs should be planted about 1 metre apart, and trees should be no closer than 2.4 metres (remember to consider mature plant height and width when spacing plants).
- Place low growing shrubs, wildflowers and grasses in areas where you want to maintain views. Placing larger trees along the edges of your property helps delineate property boundaries, maintains privacy and doesn't block views of your shoreline.



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3. Select Plant Species

- Select plants that are appropriate for your site conditions (soil, sunlight, etc.).
- Choose native plant species grown from local seed sources as they are best suited to survive local climate conditions and provide the greatest benefits to wildlife (exercise caution when purchasing native species from commercial nurseries as plants that appear native may actually be similar exotic species or cultivars—purchase plants from a native plant nursery whenever possible to ensure authenticity).
- Choose flowering or fruit bearing plants for maximum wildlife benefits.
- Look to see what is growing locally—there is a good chance that these plants will do well on your property too.
- Decide what size/type of plant you want to use:
 - **Bare Root**-bare root seedlings have exposed roots, so they need to be planted while the plant is dormant (early spring). Bare root plants are inexpensive and easy to transport. They must be properly handled, stored and cared for to reduce transplant shock and ensure good survival rates.
 - **Potted**- Potted plants come in a variety of sizes. They are more expensive, can be difficult to transport in large quantities, can have good survival rates if cared for properly and can be planted at any time during the growing season.



Native plant nursery



Planting bare root plant



Potted nursery stock

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Planting

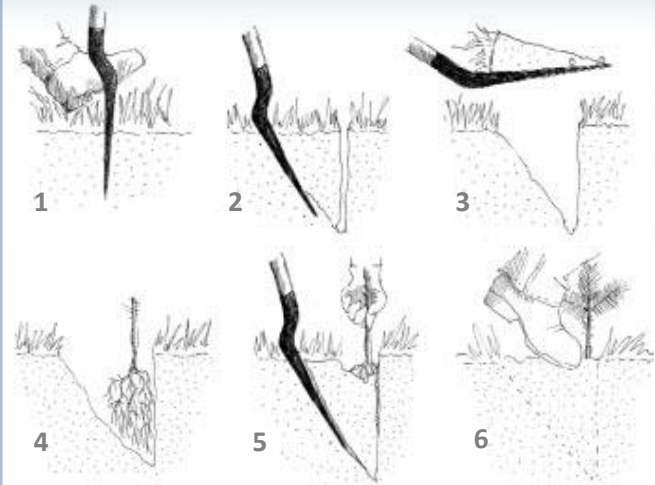
4. Plant

- Prepare your site as needed. Examples of site preparation include mowing of tall grass, soil amendment, and removal of sod, ornamental plants or invasive species. Often, plants can be planted directly into existing ground conditions.
- Keep plants moist and shaded until ready for planting. Ensure that proper handling and planting techniques are used.
- Water plants after planting.
- Remember to take lots of before and after photos!

5. Maintenance & Aftercare

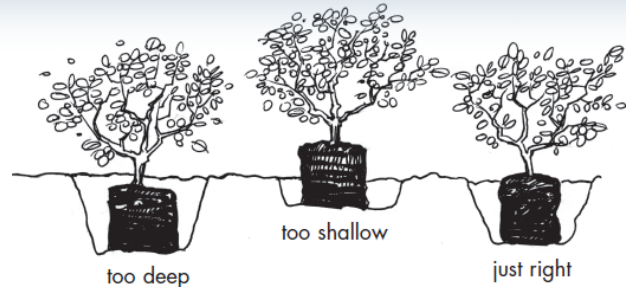
- Mulches improve growing conditions and promote faster growing by suppressing competitive weeds and grasses and by keeping in moisture. They also make it easier to locate small seedlings in overgrown areas. Different types of mulches include:
 - **Coir mats:** Coir mats are portable, biodegradable, mats made from coconut fibre.
 - **Loose mulches:** Loose mulches include woodchips, bark and straw. While affordable and useful in some circumstances, loose mulch is easily eroded and should be limited in flood-prone shoreline areas. Always choose non-dyed mulch.
 - **Others:** Cardboard, wet newspapers, old carpet, biodegradable plastic brush sheets.

Bare Root Planting



From Extension Notes: Careful Handling and Planting of Nursery Stock

Potted Planting

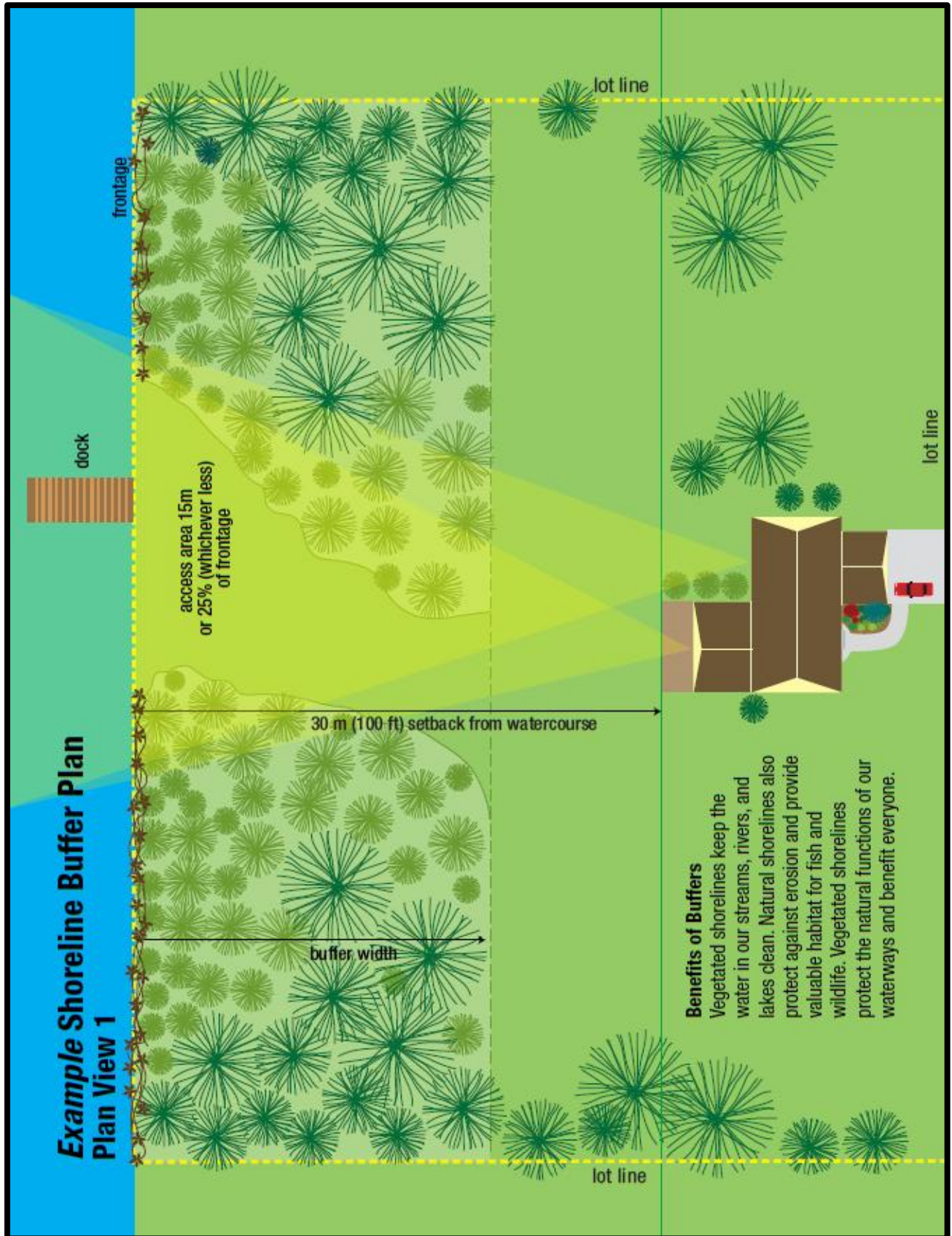


From *On the Living Edge: Your Handbook for Waterfront Living*

- Tree guards should be installed around deciduous trees to prevent mice and vole damage.
- New plants will need to be watered depending on site conditions and recent weather.
- Weeding, pruning and trimming around plants may be required to reduce competition.
- Replace dead plants as necessary.
- Do not fertilize.

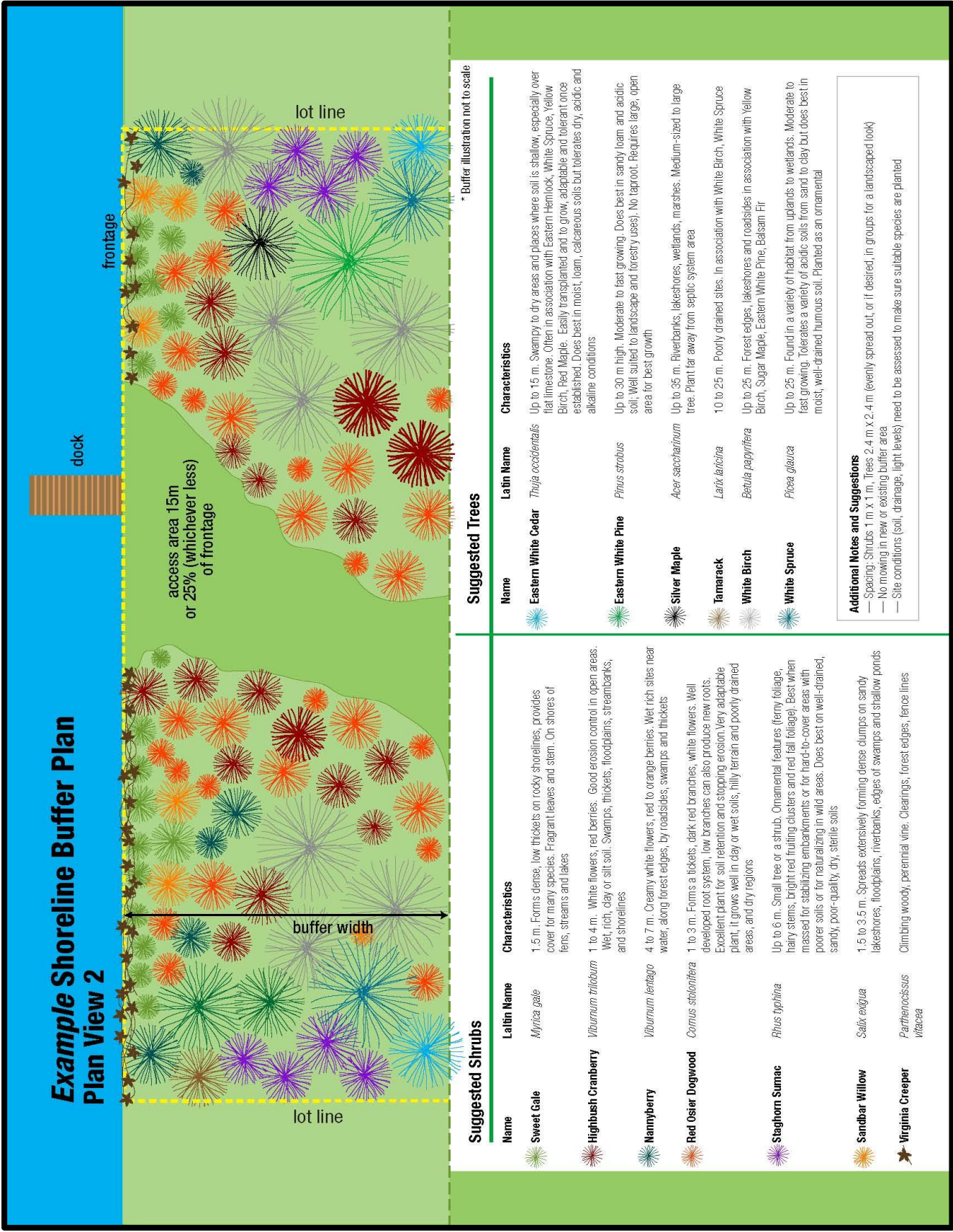
How to Naturalize Your Shoreline

Planting- Example Planting Plan









How to Naturalize Your Shoreline

Planting- Example Planting Plan







**Example Shoreline Buffer Plan
Plan View 2**

Suggested Trees

Name	Latin Name	Characteristics
 Eastern White Cedar	<i>Thuja occidentalis</i>	Up to 15 m. Swampy to dry areas and places where soil is shallow, especially over flat limestone. Often in association with Eastern Hemlock, White Spruce, Yellow Birch, Red Maple. Easily transplanted and to grow, adaptable and tolerant once established. Does best in moist, loam, calcareous soils but tolerates dry, acidic and alkaline conditions
 Eastern White Pine	<i>Pinus strobus</i>	Up to 30 m high. Moderate to fast growing. Does best in sandy loam and acidic soil. Well suited to landscape and forestry uses). No taproot. Requires large, open area for best growth
 Silver Maple	<i>Acer saccharinum</i>	Up to 35 m. Riverbanks, lakeshores, wetlands, marshes. Medium-sized to large tree. Plant far away from septic system area
 Tamarack	<i>Larix laricina</i>	10 to 25 m. Poorly drained sites. In association with White Birch, White Spruce
 White Birch	<i>Betula papyrifera</i>	Up to 25 m. Forest edges, lakeshores and roadsides in association with Yellow Birch, Sugar Maple, Eastern White Pine, Balsam Fir
 White Spruce	<i>Picea glauca</i>	Up to 25 m. Found in a variety of habitat from uplands to wetlands. Moderate to fast growing. Tolerates a variety of acidic soils from sand to clay but does best in moist, well-drained humous soil. Planted as an ornamental

Additional Notes and Suggestions
 — Spacing: Shrubs 1 m x 1 m, Trees 2.4 m x 2.4 m (evenly spread out, or if desired, in groups for a landscaped look)
 — No mowing in new or existing buffer area
 — Site conditions (soil, drainage, light levels) need to be assessed to make sure suitable species are planted

Suggested Shrubs

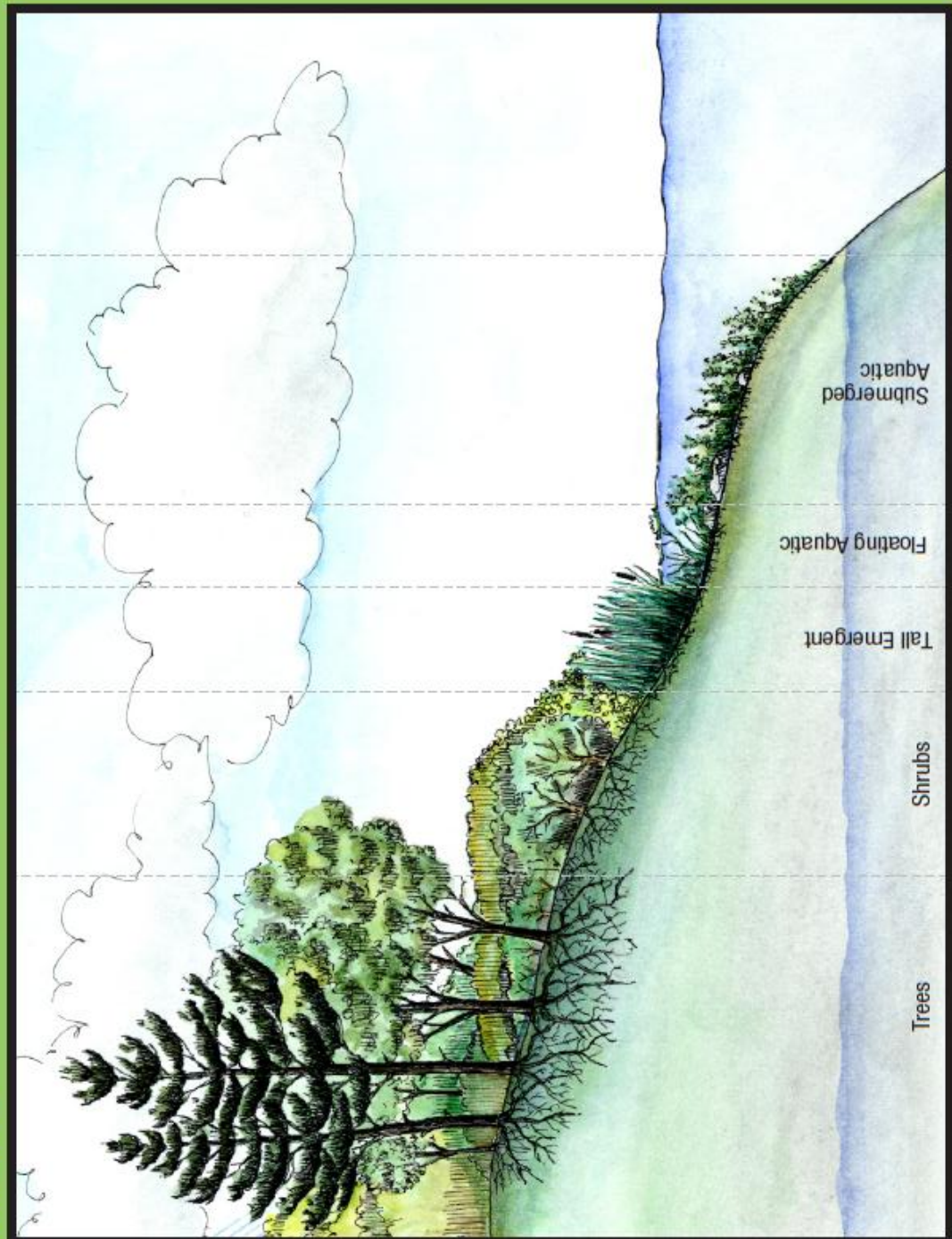
Name	Latin Name	Characteristics
 Sweet Gale	<i>Myrica gale</i>	1.5 m. Forms dense, low thickets on rocky shorelines, provides cover for many species. Fragrant leaves and stem. On shores of fens, streams and lakes
 Highbush Cranberry	<i>Viburnum trilobum</i>	1 to 4 m. White flowers, red berries. Good erosion control in open areas. Wet, rich, clay or silt soil. Swamps, thickets, floodplains, streambanks, and shorelines
 Nannyberry	<i>Viburnum lentago</i>	4 to 7 m. Creamy white flowers, red to orange berries. Wet rich sites near water, along forest edges, by roadsides, swamps and thickets
 Red Osier Dogwood	<i>Cornus stolonifera</i>	1 to 3 m. Forms a thickets, dark red branches, white flowers. Well developed root system, low branches can also produce new roots. Excellent plant for soil retention and stopping erosion. Very adaptable plant, it grows well in dry or wet soils, hilly terrain and poorly drained areas, and dry regions
 Staghorn Sumac	<i>Rhus typhina</i>	Up to 6 m. Small tree or a shrub. Ornamental features (fern foliage, hairy stems, bright red fruiting clusters and red fall foliage). Best when massed for stabilizing embankments or for hard-to-cover areas with poorer soils or for naturalizing in wild areas. Does best on well-drained, sandy, poor-quality, dry, sterile soils
 Sandbar Willow	<i>Salix exigua</i>	1.5 to 3.5 m. Spreads extensively forming dense clumps on sandy lakeshores, floodplains, riverbanks, edges of swamps and shallow ponds
 Virginia Creeper	<i>Parthenocissus vitacea</i>	Climbing woody, perennial vine. Clearings, forest edges, fence lines

* Buffer illustration not to scale

How to Naturalize Your Shoreline

Planting- Example Planting Plan

**Example Shoreline Buffer Plan
Side View**



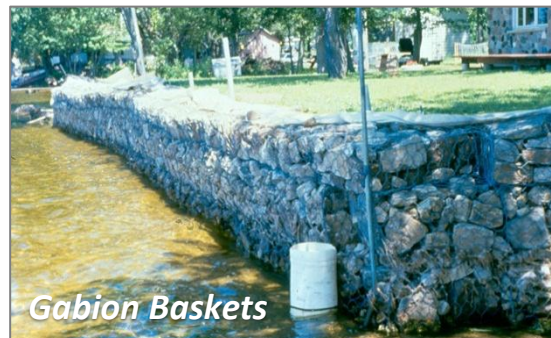
How to Naturalize Your Shoreline

Softening Hardened Shorelines

In the past, shoreline erosion problems were often dealt with by the “hardening” of shorelines through installation of retaining walls constructed of armour stone, rip rap, old railroad ties, gabion baskets, and other materials. While these structures offer a temporary solution to erosion, they can actually result in more damage to downstream/neighbouring properties and even the shoreline they were intended to protect.

Retaining walls interfere with natural shoreline processes and currents. Overtime, the increased impact of water on the vertical walls in combination with surface water runoff behind the walls leads to slumping, eroding gullies, undercutting and eventual failure of the wall.

In response to the issues caused by retaining walls, there has been a push towards “softer” shoreline protection options such as vegetated buffers and bioengineering techniques. In cases where a retaining wall is already in place, erosion can be reduced and the life of the wall can be protected by planting native shrubs around the wall, or in the case of a rip rap shoreline, planting between the rocks. The roots of the plants will help hold the soil in place, and overhanging branches and foliage will soften the impact of wave action.



Gabion Baskets



Box Car Siding



Concrete



Failed Retaining Wall

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Softening Hardened Shorelines

Each of these shorelines has a pre-existing shoreline hardened with rip rap that has been “softened” through naturalization. Surrounding vegetation helps protect these structures by helping to stabilize the shore and absorbing some of the impact from waves, runoff, etc. The vegetation also provides some wildlife habitat.



How to Naturalize Your Shoreline

Bioengineering for Erosion Mitigation

Bioengineering is the combination of engineering techniques with the use of natural materials like live plant material and geotextiles to stabilize soils. It is often used as a means of repairing/remediating shorelines from the effects of erosion with the intent of minimizing the overall impact to the environment. The end goal is a self-repairing shoreline that stabilizes soils, minimizes erosion and contributes to healthy habitat.

Bioengineering is an excellent alternative to rip rap or hardened shoreline structures because it is:

- low maintenance and self-repairing
- cost effective
- less Invasive
- promotes good habitat for fish and wildlife
- allows for the establishment of native plants
- protects shorelines from erosion

Bioengineering is not an appropriate solution for all erosion problems. Existing site conditions such as waterfront access, erosion type/source, soil type, existing vegetation, wave action and fluctuating water levels all need to be considered for bioengineering projects.

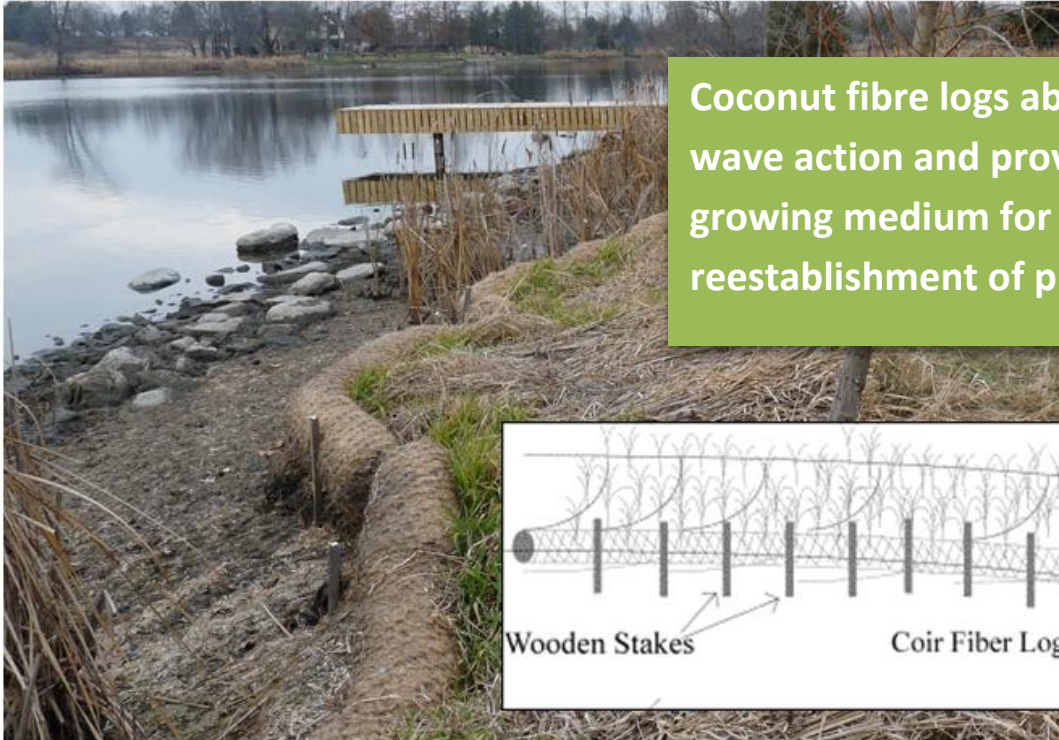
For more information on bioengineering see *Solutions for Shoreline Erosion - A Basic Guide to Bioengineering*



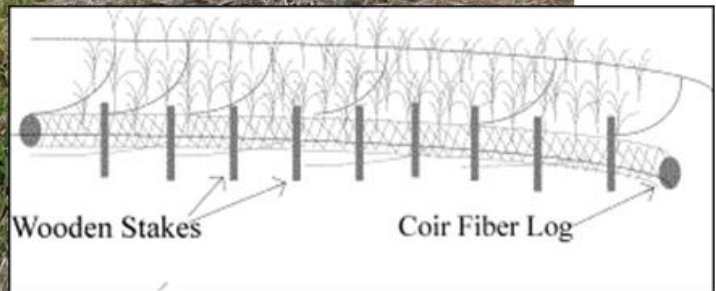
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Bioengineering for Erosion Mitigation

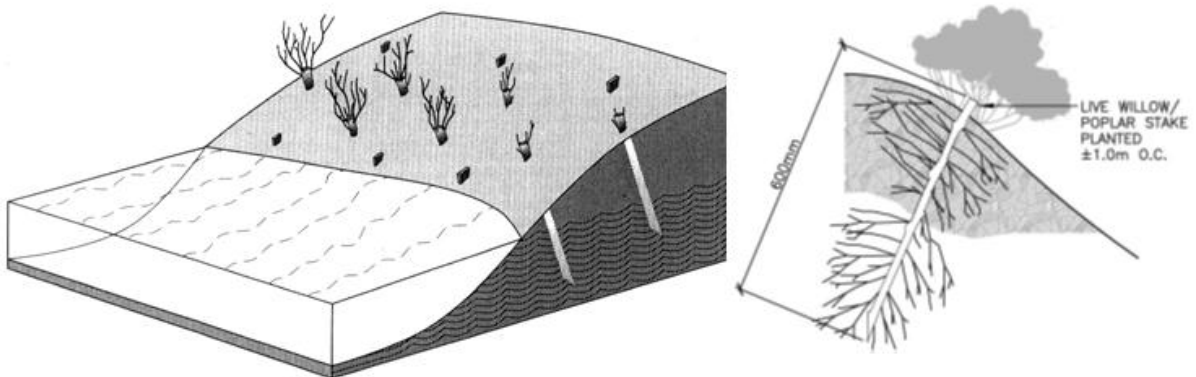
Coir Fibre Logs



Coconut fibre logs absorb wave action and provide a growing medium for the reestablishment of plants.



Live Stakes

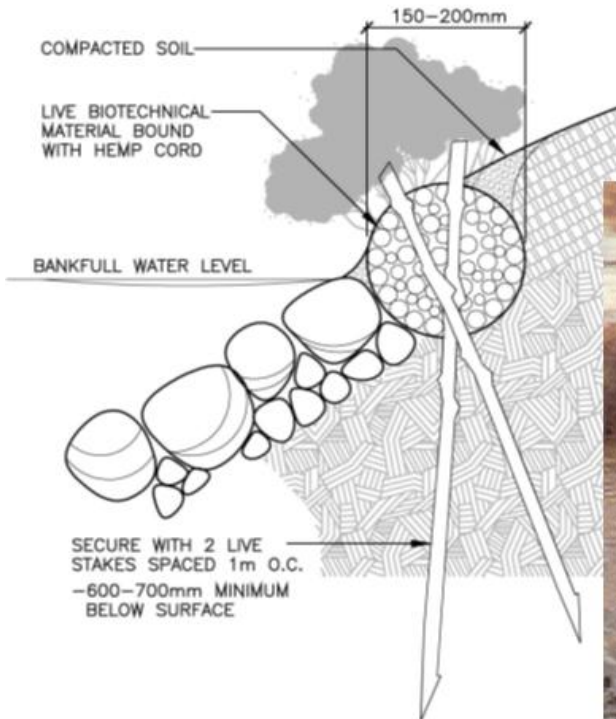


Live, woody cuttings which are tamped into the soil to root, grow and create a living root mat that stabilizes the soil by reinforcing and binding soil particles together, and by extracting excess soil moisture.

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Bioengineering for Erosion Mitigation

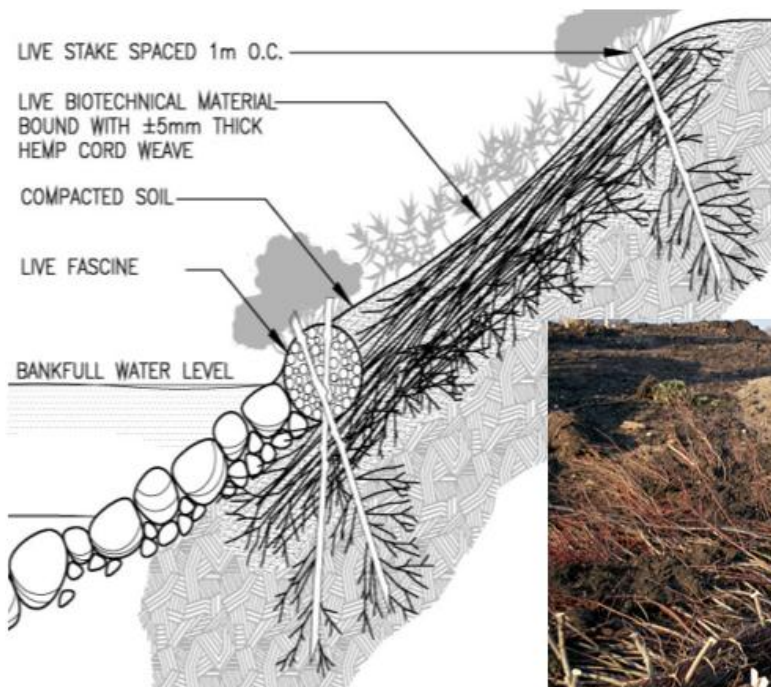
Fascines



Logs made of bundled, live, native plant cuttings are staked into the ground along shorelines. The cuttings eventually root and establish a protective wall of shrubs.



Brush Mattresses



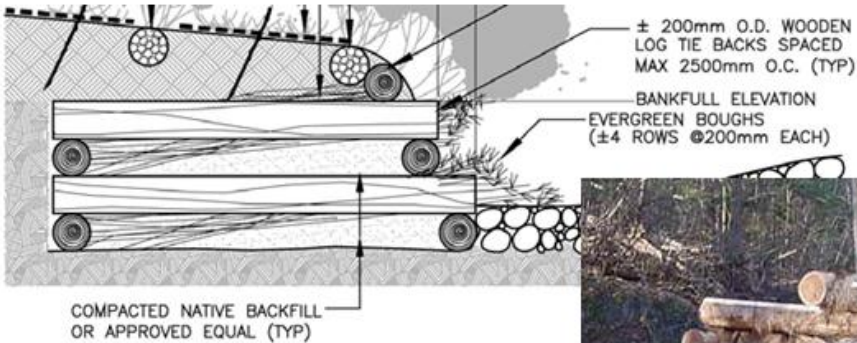
Similar to fascines, criss-crossing layers of live plant materials are staked into the ground to provide a mat of vegetation.



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Bioengineering for Erosion Mitigation

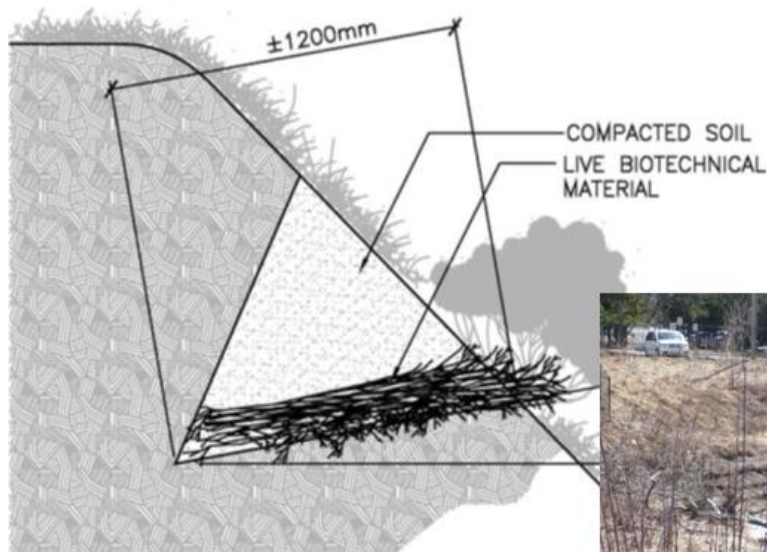
Crib Walls



A natural retaining wall constructed out of logs. Live plant materials held in place by geotextiles are placed between logs. This technique used when slope re-grading is not possible.



Brush Layer



One or more layer of live plant material is partially covered with compacted soil to create a layer of vegetation. Soil layers can be wrapped with a geotextile for extra stability.



How to Naturalize Your Shoreline

RVCA FINANCIAL & TECHNICAL HELP

SHORELINE PLANTING

Shoreline Naturalization Program

RVCA's Shoreline Naturalization Program offers technical guidance and financial assistance to waterfront property owners interested in naturalizing their shorelines.

The Program offers:

- 75 percent incentive grant up to a maximum of \$1,000
- Free on-site visits with qualified staff that provide simple, cost-effective advice on "how-to" protect your shoreline
- Project planning and support:
 - Shoreline planting plan development
 - Types of plants to use and local sources for plant stock
 - Planting advice and/or assistance
- Shoreline naturalization workshops, talks and project assistance for community or lakegroups

EROSION

Ottawa & Rideau Valley Clean Water Programs

The Rural Clean Water Programs offer financial and technical assistance to farmers and rural landowners undertaking projects to protect and improve water quality. Grants cover up to 50 to 90 percent of eligible project costs to a maximum of \$500-\$15,000 (depending on project type). There are two separate programs—the Ottawa Rural Clean Water Grants Program (inside Ottawa) and the Rideau Valley Rural Clean Water Program (outside of Ottawa).

Potential projects include:

- Erosion control measures
- Livestock restriction from waterways (alternate watering, fencing, etc.)
- Nutrient management plans
- Windbreaks
- Top ups for RVCA's Shoreline Naturalization and Private Land Forestry Programs
- And more

LARGE-SCALE FORESTRY

Private Land Forestry

RVCA's Private Land Forestry Program offers guidance and financial assistance for rural property owners who want to reforest a minimum of 0.4 hectares of suitable land. Our professional tree planting program has planted over 4.4 million trees since 1983.

The program offers:

- Subsidized project costs
- Site visits and planting plans by qualified forestry staff
- Ordering and handling of seedlings, trucking and cold storage
- Site preparation, tree planting and tending
- Survival assessments and refill planting