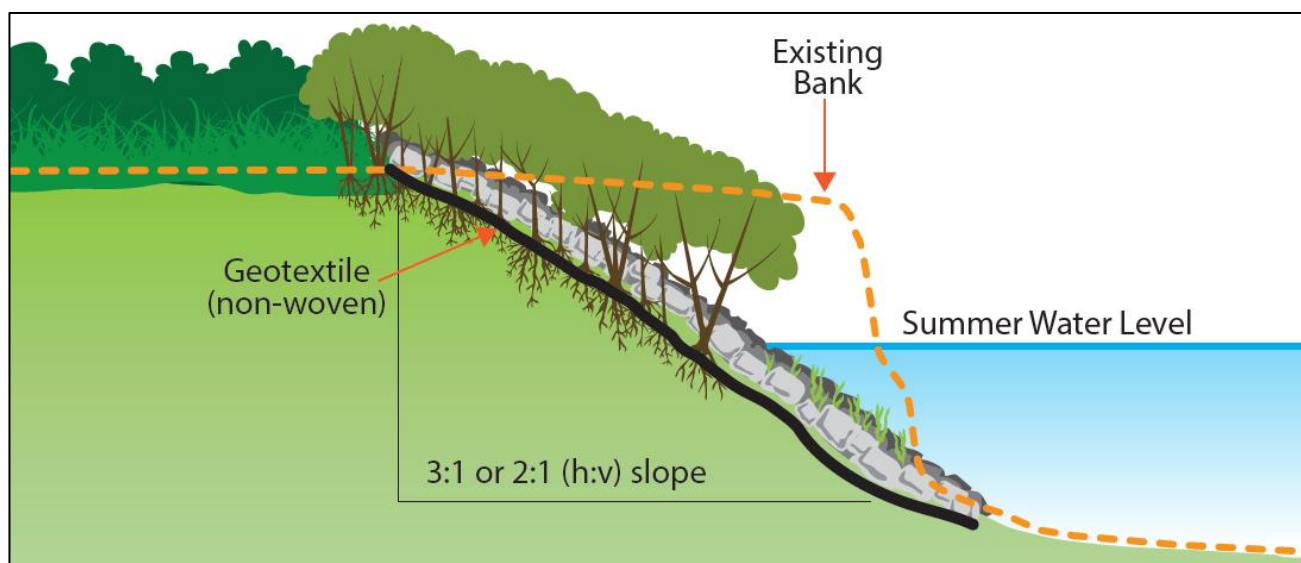


WHAT IS VEGETATED RIP RAP

Shoreline “rip rap” is the use of graded, angular rock along a shoreline with the purpose of erosion control. Older styles of erosion control methods like gabion baskets, armour stone and other vertical retaining walls are generally no longer permitted due to their negative impact on the aquatic environment and likelihood to fail over time. While rock rip rap still represents a “hardened shoreline”, vegetation can be incorporated by planting native trees and shrubs within the rocks. This “vegetated rip rap” helps to reduce the negative impacts of a hardened shoreline by creating a more natural, ecologically friendly, and aesthetically pleasing shoreline area. However, this method is considered a last resort, and should only be used when replacing vertical shoreline walls, or where heavy erosion is occurring. For minor erosion concerns, consider softer approaches.

Typically, rip rap is installed at 2:1 or 3:1 slope and underlined with non-woven geotextile. The gentle slope and coarse rock effectively dissipate wave energy while providing protection from erosion. The geotextile layer helps hold in place fine soil particles that could get washed away between gaps in the rock. Plants can be installed within the rip rap by strategically moving rocks to expose an area of the geotextile fabric and cutting an “X” through the geotextile so that a plant can be planted into the soil below.

VEGETATED RIP RAP DIAGRAM



PLANTS FOR VEGETATED RIP RAP

Native plants are best for sensitive, natural areas like shorelines. Woody plants like trees and shrubs are best for added erosion protection due to their deep, complex root systems. Chosen plants could include bareroot seedlings, plugs, live stakes/cuttings, or larger potted plants. Larger plants may be needed for deeper layers of rock so that they are not planted too far below the grade of the surrounding rock.

SUGGESTED PLANT SPECIES

- Ninebark (*Physocarpus opulifolius*)
- Red Osier Dogwood (*Cornus stolonifera*)
- Sweet Gale (*Myrica gale*)
- Swamp Rose (*Rosa palustris*)



Ninebark



Red Osier Dogwood



Sweet Gale



Swamp Rose

TIPS FOR VEGETATED RIP RAP

DO

- **ALWAYS have a permit.** All shoreline alteration work requires permission from Rideau Valley Conservation Authority (RVCA) and other agencies depending on your location (Parks Canada or Ministry of Natural Resources and Forestry (MNRF)).
- **Follow proper guidelines** for installing rip rap including re-grading slope to a stable 2:1 or 3:1 slope, using a non-woven geotextile fabric lining and using blasted, angular rock of appropriate size.
- **Respect “No In-water” work windows** in place to protect fish spawning/nursery times (Contact MNRF for the timing window on your lake or river).
- **Incorporate native vegetation** both within the rock and above it. Deep, complex root systems will help further stabilize the shoreline and create a more natural shoreline that will help protect habitat and ecological functions of the shoreline.
- **Apply rock to a suitable depth.** If rock layer is applied too thick, you will not be able to reach the soil below needed for proper plant establishment. If you aren't able to plant within the rock, plant directly above it so that the vegetation can overhang the rip rap.

DON'T

- **Don't use rounded rock or river stone.** Round rocks are easily suspended and moved by ice and wave action. Angular rock is better for “locking” together and staying in place.
- **Don't undersize or oversize your rock.** Like round rocks, rocks that are too small will be easily washed away. Rock that is too big will have large gaps between them that are prone to erosion. Aim for rocks that are approximately six to twenty inches in diameter. Steep slopes or areas with high wind, wave or ice activity may require larger rock.
- **Don't apply soil over rock layer-** Plants need to be planted into the soil below the rock and geotextile layer. Loose soil on top of the rip rap will not support plant growth and will wash away quickly contributing to aquatic habitat degradation.
- **Don't install rip rap if you don't need it!** Rip rap should only be used when replacing vertical shoreline walls, or where heavy erosion is occurring. For minor erosion concerns, consider softer approaches like planting a shoreline buffer, installing coir logs or other bioengineering methods. Often, simply reinforcing the toe of the slope with existing rock accompanied by shoreline planting is all you need to prevent minor erosion.

EXAMPLE- VEGETATED RIP RAP TO REPLACE OLD RETAINING WALL



BEFORE

Failing retaining wall was an eyesore and posed safety concerns. Soil was being eroded and washed away through cracks between the logs and old railroad tie logs were at risk of leaching toxins into the lake and surrounding soil.

DURING

Wall was replaced with rock rip rap by an experienced contractor. Old railway ties were removed, and the slope was re-graded to a stable angle. Angular rock “rip rap” placed over geotextile fabric at an appropriate depth.



AFTER

Planting pockets were created by hand moving rocks and cutting through the fabric below. Native shrubs were planted into the exposed soil beneath and rocks were carefully repositioned around the base of the plants being sure to leave room for future growth.

Note: additional planting upland of rip rap is also recommended