Quick Assessment & Selection Checklist
Nature-based Solutions to Shoreline Erosion

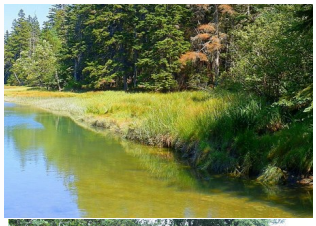
This tool is intended for use by homeowners, contractors, municipal officials, and others involved in the assessment, selection, or construction of shoreline stabilization projects. Use this resource for selecting appropriate tools and practices to stabilize shorelines using the least amount of intervention to become more resilient to erosion long term and function as natural systems, protecting the shoreline, water quality, and habitat for fish and wildlife..

Design Goals & Objectives (O U R)

Observe and blend project with any unaltered shore near site

Use native, natural, living, and biodegradable materials

Reach conditions that function as a naturalized shore over time



Assess Sources of Instability & Erosion to inform possible Tools (S H O R)

Source & Severity of Erosion

Assess the contributions of instability by source such as Surface water Flows, Groundwater, wave action/ toe erosion, and Ice.

Height & Slope Risk

Assess contributions of height, slope, and soil conditions to instability risk

Overland Water and Land Use

Assess how use of the site may affect stability

Re-vegetate/Re-connect Shoreline Buffer

Assess the existing shoreline vegetation and the contribution to stability, water quality, & shoreline habitat connectivity.

Evaluate & Improve (E)

Evaluate and Improve Performance Over Time

A nature-based shoreline will require time to provide full strength and stability. Over time, assess the health of the shoreline areas and make incremental improvements for stability and habitat

"OUR SHORE" QUICK ASSESSMENT

Using the S H O R Quick Assessment on this page select the level of instability risk within each criteria outlined. See potential stabilization practices using the corresponding results in Section E to select stabilization practices that can be combined to meet your sites needs. Select and combine practices from each category or combine practices within a category to increase stabilization ability where needed. Permitting of certain projects may require additional review and consultation. Consult an engineer or other experts to fully assess any site where safety and property are at risk. Use this tool with the **Maine DEP *Shoreline Stabilization Guide*** for more detailed information on permitting and each practice.

Lower ← Instability Risk → Higher

S — Source & Severity of Erosion – Assess the contributions of instability by source

Overland Erosion/ Wave Spray	☐ No recent bank erosion or loss from overland flows	☐ Bank is eroding with observable change and loss from overland flows	☐ Bank erosion is occurring with measurable change from overland flows
Groundwater	☐ No evidence of groundwater seepage	☐ Evidence of limited or seasonal groundwater seepage or impacts to slope	☐ Groundwater is severely impacting the stability of the slope
Toe & Wave Erosion	☐ Toe erosion in limited areas or none	☐ Moderate toe erosion, beginning to	☐ Bank is slumping from lack of toe support
	☐ Site is mostly sheltered from severe wave action	☐ Site receives some wave action, but only large storms cause erosion. Only toe is affected	☐ Site is exposed to wave action and increased impacts from severe storms. Waves erode toe and bank

H — Height & Slope Risk – Assess contributions of height, slope, and soil to instability risk

Bank Height	☐ Low Bank (less than 3 feet)	☐ Moderate Bank (3-6 feet)	☐ High Bank/Bluff (over 6 feet)
Slope Severity	☐ Low Slope (less than 3L:1V)	☐ Moderate Slope (between 3L:1H—1L:1H)	☐ Steep Slope (> 1L:1V)
Current Slope	☐ Surface Protection = 80 - 100% intact vegetation and duff layer	☐ More than half of surface has vegetation and duff layer	☐ Less than half of surface has vegetation and duff layer
Soils	☐ Soils contain mix of sediments and stone; fairly stable soil condition	☐ Erosion is consistent but slow	☐ High rate of erosion, sliding and very unstable soils of solely sand or fine sediments

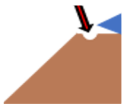
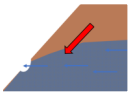
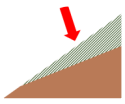
O — Overland Water and Land Use – Assess how use of site affects stability through overland flow changes

Surface water flow to the bank	☐ No concentrated or channelized flow from adjacent land use	☐ Some concentrated or channelized flow is directed toward the eroding bank resulting in minimal sheet or rill erosion.	☐ Concentrated or channelized flow is directed down the embankment with rills and gully erosion. No protection is in place.
Lawn or bare ground near bank	☐ No lawns or bare ground are within 100 feet of the shoreline	☐ No lawns or bare ground are within 25 feet of the shoreline	☐ Lawn area or bare ground are located within 25 feet of the shoreline
Distance to impervious surfaces	☐ No roads, driveways, houses, or other impervious surfaces are within 100 feet of the shoreline	☐ No roads, driveways, houses, or other impervious surfaces are within 25 feet of shoreline	☐ Roads, driveways, houses, or other impervious surfaces are within 25 feet of the shoreline
Overall impact of surface flows	☐ Very limited impacts from surface flows, surface flows properly managed	☐ Moderate Overland Impact from surface water	☐ Overland flow of water is a significant contributor to instability

R — Revegetate/reconnect shoreline buffer* – Assess levels of buffer vegetation and habitat connection

Vegetation within 250 Feet?	☐ Dense mix of shrubs and trees (70%+ Coverage)	☐ Average vegetation (20-70% coverage)	☐ Low/sparse vegetation (less than 20%)
Vegetation with 25 Feet?	☐ Dense mix of shrubs and trees (70%+ Coverage)	☐ Average vegetation (20-70% coverage)	☐ Low/sparse vegetation (less than 20%)
How natural is the shoreline habitat?	☐ Bank and vegetation are not altered. No riprap or hardened structures installed.	☐ Bank impaired by riprap/hardened structures but vegetation is present or is pruned, mowed, or otherwise altered	☐ Bank is hardened and/or no vegetation present

"OUR SHORE" TOOLS & PRACTICES

Overland Erosion /Bank Protection 	☐ None – no overland erosion to instability ☐ Increase buffer vegetation & duff layer ☐ Land Use Best Practices	☐ Use of Vegetation Practices (seeding, planting, bioengineering) ☐ Temporary mulch/blankets with vegetation practices ☐ Permanent mulch/duff replacement & vegetation ☐ Flow Diversion (Upslope of bank) ☐ Overland Flow Modification Rain gardens, Level spreaders, Plunge pools, & Energy Dissipation ☐ Slope interruption practices ☐ Surface roughening	☐ Multiple "Moderate Risk" Treatments ☐ Slope Severity Tools ☐ Brush mattress ☐ Living Riprap & variations ☐ Dead riprap with planting or that allows future growth (see filter layer alternatives) ☐ TRMs & Cellular confinement ☐ Vegetated Soil Nail walls ☐ Green Gabions & Marine Mattresses
Groundwater Tools 	☐ None – no groundwater or subsurface drainage issue corrections ☐ Land Use Best Practices	☐ Groundwater interception & drainage: rock sandwich, French drains; living drains; filter gravel, biodegradable fabrics with vegetation ☐ Brush mattress ☐ Examine & correct **land use** contributions – septic systems, irrigation systems, etc.	☐ Groundwater interception & drainage Filter Layers for graded/disturbed slopes ☐ Gravel Drainage Layer ☐ Crushed Stone Drainage Layer ☐ Brush Mattress filter layer ☐ Geotextile Filter layer
Toe Protection 	☐ None – Toe erosion is not present or minimal, rate is very slow; Retain natural conditions ☐ Land Use Best Practices	☐ Living Toe Protection ☐ Coir logs ☐ Natural Media filled socks & bags ☐ Encapsulated Soil Toe Protection ☐ Log Sill Toe ☐ Living Brush Layering/dense toe live staking (FW only) ☐ Anchored woody deposits ☐ Fringe wetlands (in resource)	☐ Stone packed undercut or cobble toe ☐ Add brush layering (freshwater) ☐ Anchored riprap toe stones in trench ☐ Stone packed undercut or cobble toe ☐ Add brush layering (freshwater) ☐ Tree root wads & Log Jams ☐ Vegetated Timber Crib Toe ☐ Vegetated Gabion Toe ☐ Log Skids (Ice) ☐ In-Water Practices *(see page 4)*
Slope Severity Tools 	☐ None – Slope is low or moderate and stable ☐ Land Use Best Practices ☐ Increase buffer vegetation & duff layer	☐ Use of Vegetation Practices or other Overland Erosion Practices ☐ Slope interruption practices (coir logs, wattles, contour swales, contour planting) ☐ Minor Regrading: reversion (light grading) and vegetation ☐ Minor Regrading: *rough topography, pit & mound, contour swales* and vegetation (**revisit "S-Overland Flow" treatments)**	☐ Smooth regrading (**revisit "S-Overland Flow" treatments)** ☐ Benching/terracing (**revisit "S-Overland Flow" treatments)** ☐ Pilings & vertical support ☐ Encapsulated soil lifts planted with vegetation, living brush layering (freshwater) ☐ Living Crib Walls ☐ Vegetated Gabion* slopes & marine mattresses ☐ Vegetated Soil Nail Walls ☐ In-Water Practices *(see Page 4)*

Land Use Best Practices 

Vegetated buffers

- ☐ Refrain from raking or removing organic duff and vegetation
- ☐ Refrain from dumping brush or lawn clippings over bank (blocks vegetation and increases risk from overland erosion)
- ☐ Plant only native vegetation

Pathways/resource access

- ☐ Define & stabilize pathways
- ☐ Make pathways meander through the buffer to prevent concentrated flows
- ☐ Limit access points to more stable bank areas
- ☐ Cover pathways with mulch or crushed stone
- ☐ Don't store docks on the shoreline or bank

Lawns & Gardens

- ☐ Minimize lawns/maintained areas near the bank
- ☐ Reduce and minimize lawn or other impervious surfaces draining to bank
- ☐ Limit mowing, allow revegetation of buffer, or set mower height higher

Houses & Roof Runoff

- ☐ Discharge any outfalls (Drains, sump pump discharge, gutters) to dissipate energy and spread out water (plunge pool, level spreader)
- ☐ Use rain gardens, dripline trenches for roof Runoff

Driveways, Parking, & Road Runoff

- ☐ Prevent/divert flows driveways & roads using water bars, infiltration steps, or mulch covering
- ☐ Minimize runoff from impervious surfaces to the bank
- ☐ Identify any high energy or concentrated water flows – slow it down, spread it out

VEGETATION & HABITAT PRACTICES

Shoreline stability and a healthy vegetated buffer are closely linked. Increasing the amount and variety of vegetation, as well as installing multiple layers of vegetation (such as groundcover, shrubs, and trees), can improve overall slope stability and create habitat connectivity. Combining these practices yields the best results. **Encourage Natural Growth, add native seeds, plant native nursery plants, use bioengineering & live staking**

- ☐ **Terrestrial & Aquatic Shade** — Fish and wildlife need shade to keep the ground and water cool and to provide places to escape predators.
- ☐ **Cover Diversity** — Fish and wildlife need different types of cover, for example overhanging trees, herbaceous plants, logs, leaves and duff.
- ☐ **Natural Vegetation Diversity**— A diversity of plant species give wildlife varied food sources, refuge, perching, and hiding spots.
- ☐ **Woody Material Inputs** —Decomposing wood feeds fungi and bacteria into the ground promoting soil health and enriching the surrounding environment. The promotion of trees and natural wood fibers in shoreline projects helps to prevent the surrounding waters from becoming nutrient starved.
- ☐ **Travel Corridor consideration**—Animals need to be able to move along and adjacent to the shoreline. Dense cover and a traversable surface are essential to facilitating this migration.
- ☐ **Soil Health & Subsurface Habitat** —Minimizing disturbances to the soil structure goes a long way towards preserving the health of the shoreline soil system. Allow roots and soil life access between the surface treatment, prevent compaction & preserve soil layers, use the site's soils and seeds to increase regeneration quickly
- ☐ **Natural Sediment Transfer** — Erosion and sediment transfer is a natural process, and in certain locations it is extremely important to preserve natural sediment transfer & nutrient processes.

In-water Tools and Techniques

Rivers & Streams	Lakes, Ponds, Wetlands	Coastal Wetlands & Shores	Coastal Sand Dunes & Beaches
☐ Root Wad Deflectors ☐Bendway weirs, other flow deflectors ☐Rock weirs & rock ramps ☐ Targeted Chop & Drop woody debris ☐Gravel/sand bar livestaking	☐ Wave attenuation devices and techniques ☐ Root wad attenuation ☐ Woody deposits & logjams ☐Marsh sill	☐Wave attenuation devices/techniques ☐Living Breakwater ☐Marsh Creation /Enhancement with Toe Protection/marsh sill ☐Natural Marsh Creation/Enhancement ☐Oyster shell reefs & encapsulated oyster shels	☐Dune with Engineered Core ☐Sediment deposition via wave & wind attenuation ☐*Beach nourishment*[+] ☐*Dune- Natural construction*[+] ☐*Enhance Dune Vegetation*[+]

For more information on Assessing Shoreline erosion, selecting appropriate nature-based solutions, installation and permitting guidance, see DEP's Nature-based Shoreline Stabilization Guide

DEP Permitting of Nature-based Stabilization Solutions

Many of the nature-based options outlined for bank stabilization can be completed using Permit By Rule Section 8. For activities in sand dune systems, some nature-based stabilizations and beach nourishment may qualify for Section 16-A of Permit BY Rule. These projects may also require a permit from the Army Corps of Engineers and local municipality under Shoreland Zoning.

Maine DEP Natural Resources Protection Act Page: https://www.maine.gov/dep/land/nrpa/index.html