



Vegetation Management on Coastal Bluffs

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Maine Geological Survey
Robert G. Marvinney, State Geologist

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Author: *Peter A. Slovinsky*

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Building Resiliency Along Maine's Bluff Coastline

Technical Manual
for use of the
Shoreline Management Assessment Decision Tree
Finalized October 2017
Revised November 27, 2017

As part of a project for the Maine Coastal Program (MCP)/Maine Department of Agriculture, Conservation and Forestry (DACF), the Cumberland County Soil and Water Conservation District (CCSWCD), developed a **Shoreline Management Assessment (SMA)** to support coastal landowners, community organizations and boards, municipal officials, and other interested parties who need to manage assets at risk due to coastal bluff erosion. This work was supported by the National Oceanic and Atmospheric Administration (NOAA) Coastal Zone Management Cooperative Agreement #NA14NOS4190047 pursuant to the Coastal Zone Management Act of 1972 as amended.

The SMA allows the overall vulnerability of a coastal bluff to be quantified and helps the evaluator to determine whether a bluff restoration approach can

... incorporate "living shoreline" elements (mimicking natural systems by incorporating plants and biological materials)

or whether

... only a "hard armoring" approach (using elements like rock-filled wire baskets, boulders, or concrete) can be used

and if

... a mixture or both approaches is recommended

... to rebuild the bluff and prevent further erosion.

The SMA features three levels:

- 1) A general compilation of data and overview of the instability of a large area: the **reconnaissance level assessment (RLA)**;
- 2) A limited *intermediate*, desktop-level ranking focused on specific study areas within the larger area: the **prediction level assessment (PLA)**; and
- 3) A highly-focused first step to *recommend solution(s)* for a single study area: the **design level assessment (DLA)**.

The data and elements that should be considered at each of these three levels (RLA, PLA, and DLA) are shown in the **SMA Chart** included in **Attachment A** (also available in a large format, for improved legibility, on the project website).



A STUDY OF BLUFF BANK EROSION
FOR BUSTINS ISLAND, FREEPORT, ME

PREPARED: APRIL, 2018

UPDATED: MAY, 2019

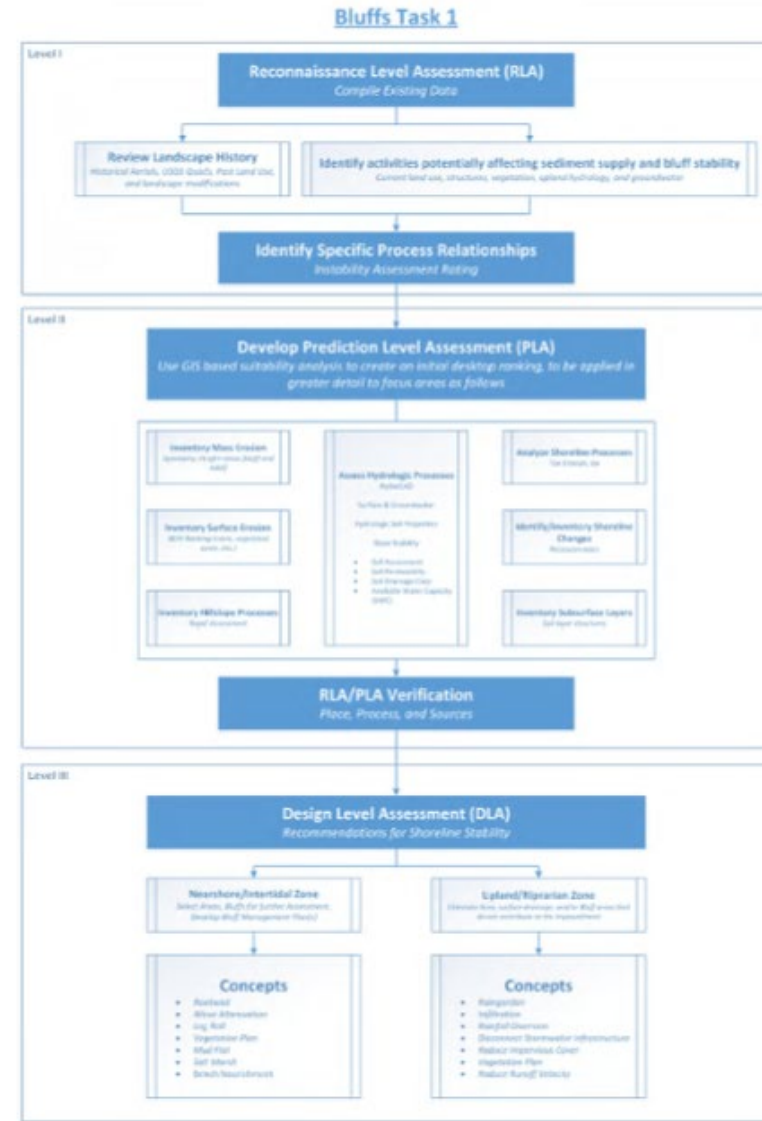


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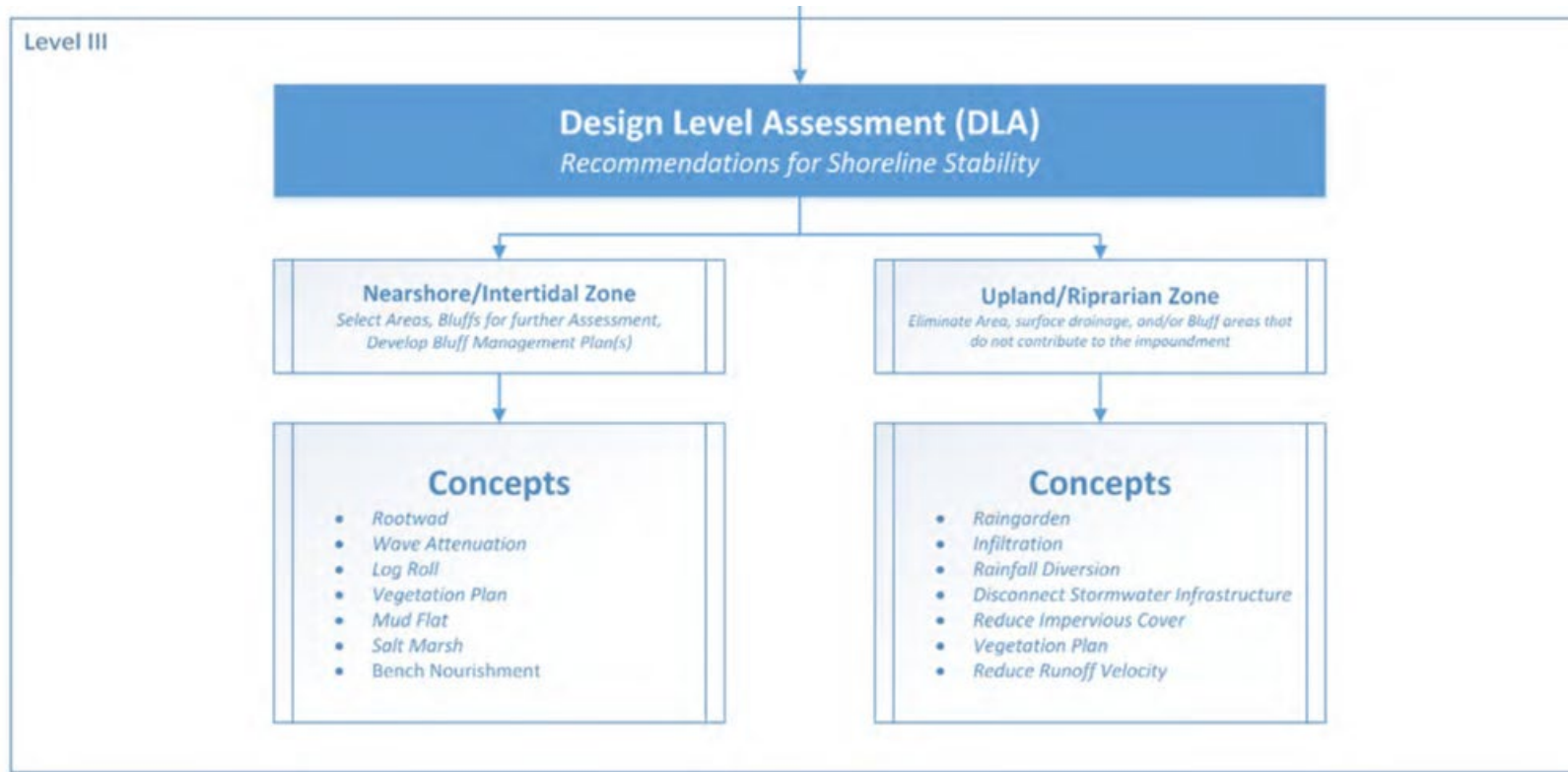
Resources to determine best course of action

<https://www.cumberlandswcd.org/documents-1/coastal-bluffs>

Site assessment is critical



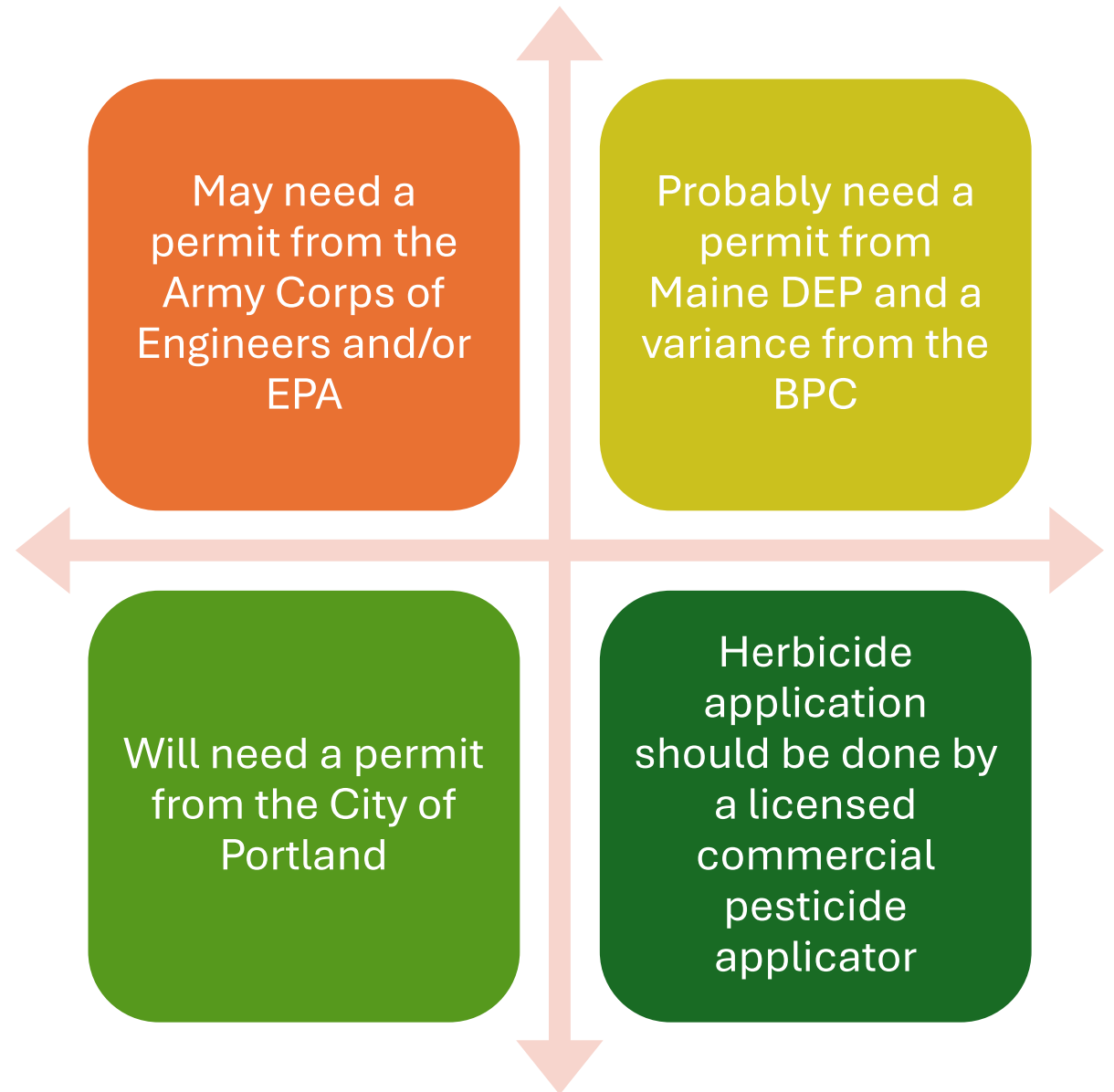
Living shorelines – Design concepts vary



Planting site assessment



Federal, state and local permitting



maine.gov/dacf/php/gotpests/solutions/terrestrial-invasive-companies.shtml

USDA APHIS Applic... Division of Animal... Office of Informatio... Hemp Database MainIT - Third-Par... Office of Informatio... Agriculture - Docu... OIT Service Catalog... Jenna Hinkley MS-TAMS Logon

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Pest Solutions

Terrestrial Invasive Plant Control Companies

Tick/Mosquito Companies

List of Licensed Companies Offering Services for Control of Invasive Terrestrial Plants

The following list includes companies that are licensed to provide services for control of invasive terrestrial plants in Maine. The Maine Board of Pesticides Control does not recommend these above any others. This is not a complete list of licensed companies; these responded to a letter asking if they wanted to be listed. Others wanting to be listed should contact the Board by emailing pesticides@maine.gov or calling (207) 287-2731 (created October 2018).

Company Name	Address	Phone	Email / Website	Area Served
Absolutely Complete Property Services	8 Evergreen Farms Rd, Scarborough, ME 04074	207-415-8011	nhjort@acps.me	Androscoggin, Cumberland, Oxford, Sagadahoc, and York counties
Aroostook Arboriculture Inc.	PO Box 402, Presque Isle, ME 0769	207-227-4726	darren@groundperfectionspecialists.com	Statewide
Bartlett Tree	9 Washington	207-883-	ntucker@bartlett.com	Cumberland

RELATED LINKS

[Maine Natural Areas Program](#)

State Rules re Invasive Plants administered by the Maine Horticulture Program

Who can do the control work?

Managing invasive plants

Physical removal – may cause significant soil disturbance

Covering with mulch or tarps – takes years to work and causes significant loss of soil life

Solarization – not very effective in northern climates, very short window of opportunity

Cutting or mowing – not very effective on established perennial plants, may take years to be effective or may increase the population density

Herbicides – most effective and least disruptive, allows for immediate establishment of native plants

Invasive Plant Management

Herbicide choice and timing are different for each species

A variance is needed to do application within 25 feet of high-water mark

Herbicides are effective as foliar applications (triclopyr or glyphosate)

Cut-stump applications (glyphosate or triclopyr solution applied immediately after cutting except in early spring), or basal bark application (for stems <6" diameter, triclopyr ester in oil)




Foliar applications have higher risk of drift

Cut stump and basal treatments are extremely low risk for people and the environment





Then what?

- Invasive plant management requires persistence
 - Seedbanks can last for many years
 - Re-sprouting must be pulled or mowed before it gets established
 - Birds will continue to deposit new seeds
 - In some areas, native plants should be added to reduce re-invasion
- 

Cumberland County SWCD Guide

This is an excellent resource to help select plants to stabilize a coastal bluff

<https://www.cumberlandswcd.org/s/171114-Coastal-Planting-Guide-Web-Reduced.pdf>



Planting for Slope Stabilization on Maine's Coastal Bluffs

Coastal Bluffs—defined as “a steep shoreline slope formed in sediment (loose material such as clay, sand, and gravel) that has three feet or more of vertical elevation just above the high tide line” (Maine Geological Survey)—make up about 38% of Maine’s coastline. Unstable bluffs can erode slowly or suddenly collapse, forming landslides. Some amount of bluff erosion is expected, and is beneficial to replenishment of beaches and other shoreline areas. However, because of significant risks to life and property, landowners and shoreline managers may wish to temper the speed of bluff erosion and reduce the risk of sudden collapse.

The stability of a coastal bluff is influenced by interactions with both the land and sea. This guide includes information for one of the most critical factors affecting bluff erosion rates and overall stability: vegetation. When selecting plant varieties for slope stabilization, there are many factors to be considered, including salt tolerance, soil depth, and water availability. This guide recommends native Maine plants that can be used to stabilize coastal shorelines and that have been determined to be suitable for restoration that uses a living, natural shoreline instead of armoring (such as with rip rap). Plant species are organized by whether they are classified as woody or herbaceous and whether they are recommended for shallow soil (<18”) or deep soil (>18”).

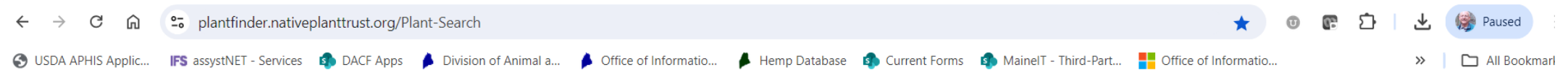
Not all bluff shorelines are suitable for living shorelines. Prior to planting a living shoreline, see the Suitability Table (**Table 1**), to determine if your site is suitable. If a shoreline is not a suitable option for stabilization, alternatives to traditional hard armoring should be considered. For example woody debris can be placed on or anchored to shorelines. In some cases “root wads” (also known as toe wood), as shown in **Figure 1**, may be used as an alternative. Woody structures can help protect and armor exposed



Figure 1. Root wads inserted into unstable banks can help protect bare soil from erosion, from a project in coastal Oregon. In areas not suitable for living shorelines, root wads can be an effective alternative providing stabilization and habitat.

Image source: BioEngineering Associates, <http://bioengineers.com/seaside/>

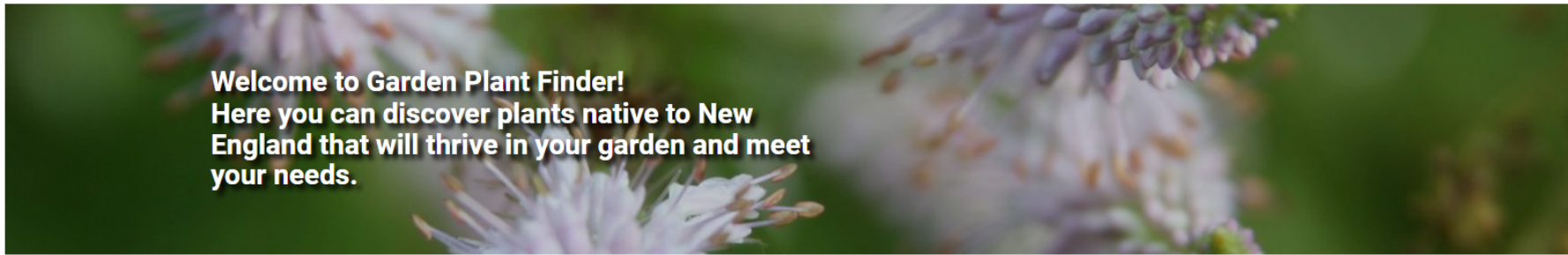
Great online plant choice resource



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Additional Information

- [About Ecoregions, Cultivars and More](#)

Search for plants by name using "quick search," or narrow your results based on plant type, flower color, [New England Level 3 ecoregion](#), exposure, moisture, bloom season, and even [cultivation status](#). Specify whether to show results that meet *all* or *any* of your search criteria by toggling the box at the bottom of the page. You can also use our search tool to access information about the full range of plants sold at Garden in the Woods and Nasami Farm.

Check out our [Important Definitions](#) page to learn more about ecoregions, cultivation status, and why certain plants are included in this database.

Note: This site is still under development, and is being regularly updated and improved to make it a more comprehensive resource. To alert us of site functionality problems, please contact ulorimer@nativeplanttrust.org.

<https://plantfinder.nativeplanttrust.org/Plant-Search>

Straight species,
full sun, average
soil, salt tolerant,
erosion control/soil
stabilization



Amelanchier spicata
running serviceberry



Arctostaphylos uva-ursi
red bearberry



Aronia arbutifolia
red chokeberry



Aronia melanocarpa
black chokeberry



Clethra alnifolia
summersweet



Comptonia peregrina
sweet-fern



Morella carolinensis
bayberry



Prunus maritima
beach plum

Straight species,
part sun, wet soil,
salt tolerant,
erosion control/soil
stabilization



Amelanchier spicata
running serviceberry



Aronia arbutifolia
red chokeberry



Aronia melanocarpa
black chokeberry



Clethra alnifolia
summersweet



Rosa carolina
Carolina rose



Salix discolor
pussy willow



Swida sericea
red twig dogwood

Proper planting and after care essential

- Minimal soil disturbance
- Planting at the correct depth
- Mulching properly
- Watering properly
- Protection from deer or other critters

MULCH VOLCANOES KILL

As beneficial as mulch is, too much will kill trees and shrubs. More than 2-4 inches is over-mulching and piling up mulch around the trunk or stem in a "Mulch Volcano" will also kill the tree.

No!

Do:

- Check mulch depth
- Pull back mulch piled against a tree trunk or stem
- Mulch out to tree's drip line or beyond
- Keep mulch flat not mounded

Good job!

TELL YOUR LANDSCAPER!

The infographic features a light blue background with green brushstroke accents at the top and bottom. It contains two circular images. The top image shows a tree with a large, dark mulch volcano around its trunk, labeled 'No!'. The bottom image shows a tree with a flat, even layer of red mulch extending to its drip line, labeled 'Good job!'. Text is arranged around these images to provide instructions and warnings.

Questions

