

PLANTING GUIDE FOR TIDAL SHORELINE EROSION MANAGEMENT IN NEW HAMPSHIRE

Plants can provide highly effective erosion control and related benefits, including soil stabilization and improved ability to adapt to changing conditions. Plants also provide other environmental benefits such as wildlife habitat, pollution reduction, and carbon storage that hardened or structural stabilization methods do not provide. This resource list includes a selection of the numerous native or naturalized plant species in New Hampshire that can help manage erosion near a tidal shoreline. The guiding principles in this resource are intended to aid in the development of a planting plan and to improve erosion management of tidal shorelines.

WHAT IS TIDAL SHORELINE EROSION?

Tidal shoreline erosion is a natural process by which tides, waves, flooding, and other factors wear down or carry away rocks, soils, and/or sands along a coastal or estuarine shoreline. Erosion can occur slowly over a long period of time or rapidly following an extreme event like a storm. Erosion can be exacerbated by human-caused stressors like boat waves, land use changes, built shoreline structures, foot traffic, and sea-level rise.

WHAT ARE NATIVE PLANTS?

Native plants are part of the balance of nature that has developed over hundreds or thousands of years in a particular region or ecosystem.

WHAT ARE NATURALIZED PLANTS?

Naturalized plants are introduced species that are not native but have become part of our ecology, are unlikely to invade sensitive ecosystems, and do not have invasive characteristics.

1

KNOW WHAT IS ALLOWED

2

UNDERSTAND THE ECOSYSTEM, YOUR SHORELINE, AND POSSIBLE CAUSES OF EROSION

3

TACKLE EROSION AT THE SOURCES

4

PLANT NATIVE SPECIES WITH DEEP ROOTS THAT COVER THE GROUND

5

CONSIDER YOUR OPTIONS WHEN PLANTS CAN'T DO IT ALL

GUIDING PRINCIPLES



1. KNOW WHAT IS ALLOWED.

Depending on your shoreline, you may need to comply with local, state, and federal rules to manage your land to minimize erosion. Check with your municipal government office (usually your zoning official, Conservation Commission, or town clerk) for guidance on what activities are allowed.

2. UNDERSTAND THE ECOSYSTEM, YOUR SHORELINE, AND POSSIBLE CAUSES OF EROSION.

First, take the time to learn about your shoreline and how it functions as part of the landscape and ecosystem. Next, understand what forces might be causing unwanted erosion on your land. Factors like environmental zone (dune, salt marsh, bank, etc.), slope (steep, moderate, etc.), soil type (sandy, well-drained, wet, etc.), and surrounding land use (e.g. stormwater runoff) or vegetation (e.g. tree shade) can influence erosion. Taking action now to manage land that is upland of the water's edge can help to avoid additional erosion and more expensive management options on your property.

3. TACKLE EROSION AT THE SOURCE.

Once you have done your best to figure out what is causing erosion on your property, the next step is to create a land management plan that addresses these causes. For example, if the erosion is a result of foot traffic on your shoreline, the management plan should include limiting foot traffic access. If your erosion is being exacerbated by shade trees that limit understory growth, limb the shade trees to improve light reaching the ground. If stormwater runoff or other drainage is creating erosion, one solution is to re-route or enhance infiltration. If new plants are part of your land management plan, a planting plan that is specific to the site landscape, ecology, and conditions of your site should be developed. This guide and other sources can be used to help develop this plan.

4. PLANT NATIVE SPECIES WITH DEEP ROOTS THAT COVER THE GROUND.

A healthy, deep-rooted groundcover is critical for reducing soil erosion. Grasses are typically the best type of plant for establishing a stable shoreline — both seaward and landward of the shoreline — and for stabilizing steep slopes. Shrubs may be helpful further upland in more stable areas. Well-established trees provide important erosion control, however, they may also contribute to erosion if they are located at eroding shoreline edges or steep slopes, or shading understory and groundcover species. Where possible, select species that are native or naturalized to New Hampshire to maintain native genetic makeup of species and improve plant success. Keep in mind that planting prohibited invasive species is illegal. If there are existing, prohibited invasive species on your property, contact the [New Hampshire Department of Agriculture](#) (for upland plants) or the [New Hampshire Department of Environmental Services](#) (for wetland plants) to determine management options.

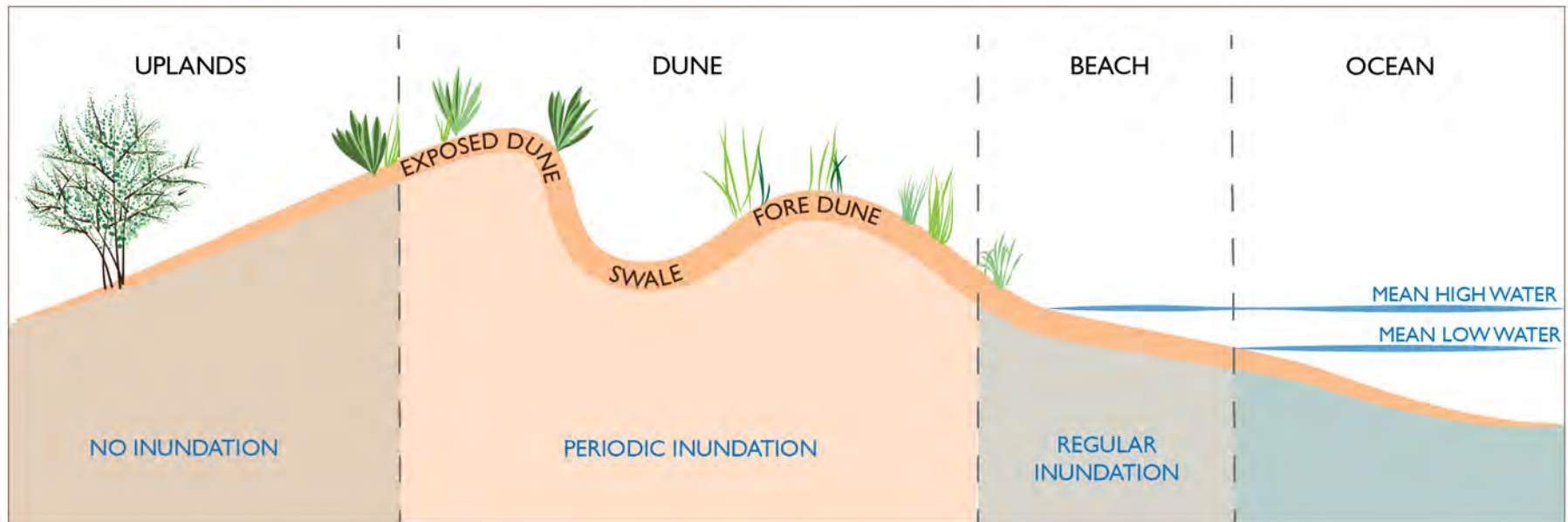
5. CONSIDER YOUR OPTIONS WHEN PLANTS CAN'T DO IT ALL.

Native plants should always be part of your erosion management plan, but for advanced erosion you may also need to install structural elements, such as coir fiber matting, coir rolls, rocks, or engineered dune/bank cores. More advanced erosion management projects will likely require permits, professional designs, and consideration of future conditions such as sea-level rise.

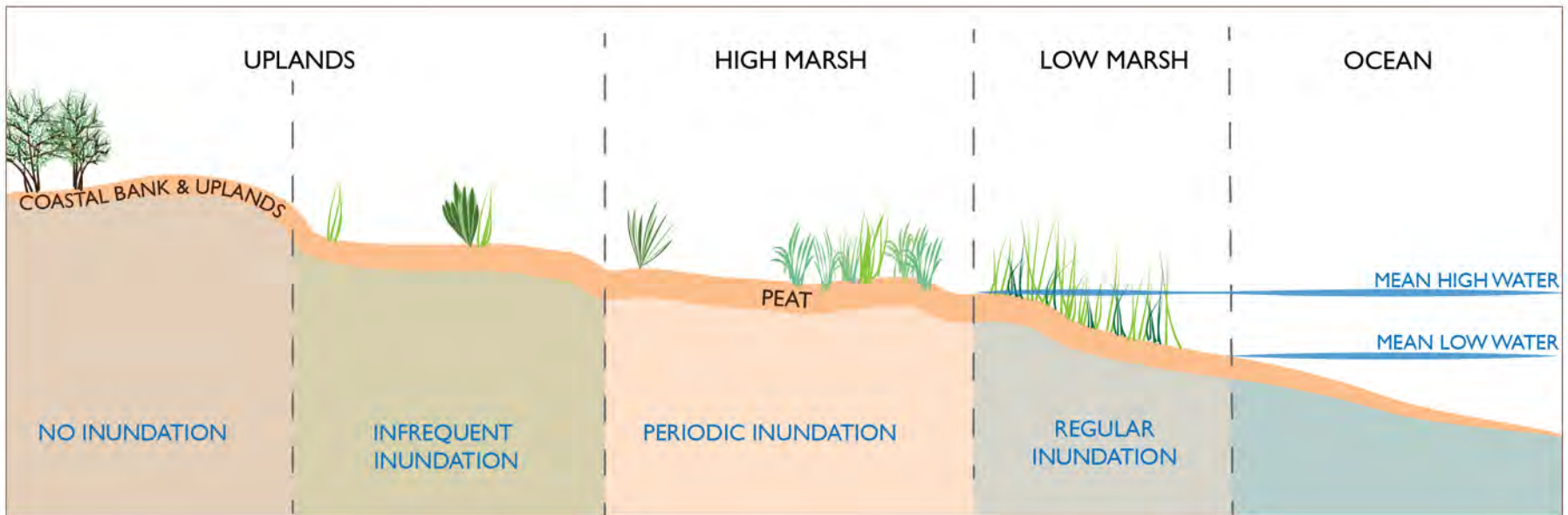
This Guide is a resource for homeowners, contractors, Conservation Commissions, and others interested in shoreline management and planting. It was developed by the New Hampshire Department of Environmental Services Coastal Program in partnership with The Great Bay Stewards, the New Hampshire Fish and Game Department Great Bay National Estuarine Research Reserve, the University of New Hampshire Cooperative Extension and the Coastal Habitat and Restoration Team, and New Hampshire Sea Grant with assistance from EF | Design & Planning, LLC.

To learn more about tidal erosion management options such as living shoreline projects, contact the N.H. Department of Environmental Services Coastal Program at CoastalProgram@des.nh.gov.

SHORELINE ENVIRONMENTAL ZONES











































EXPOSED SHORELINE (DUNES)



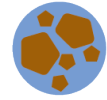










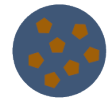















PROTECTED SHORELINE (MARSH)

PLANT LIST FOR TIDAL SHORELINE EROSION MANAGEMENT IN NEW HAMPSHIRE




























SPECIES ID & PHOTO	COMMON NAME SCIENTIFIC NAME	FORM	SHORELINE ZONE							SOIL	LIGHT	HEIGHT (FT)	SALT TOLERANCE	GROWTH RATE	
			UPLANDS (EXPOSED)	UPLANDS (SHELTERED)	MARSH EDGE	HIGH MARSH	LOW MARSH	DUNE	BEACH						
 <p>G1 <small>Gregg Moore</small></p>	Beach grass <i>Ammophila breviligulata</i>		●						●	●			2-3'	H	
 <p>G2 <small>Gregg Moore</small></p>	Big bluestem <i>Andropogon gerardii</i>			●									4-8'	L	
 <p>G3 <small>Gregg Moore</small></p>	Black grass <i>Juncus gerardii</i>					●							1-2'	M	
 <p>G4 <small>Photo maybe assumed on Wikimedia Commons, released under CC BY-SA 3.0</small></p>	Fernald's sedge <i>Carex merritt-fernaldii</i>		●						●	●		 	1-3'	L	

KEY	FORM	SOIL TEXTURE	SOIL MOISTURE	LIGHT REQUIREMENT	SALT TOLERANCE	GROWTH RATE
    	Grass (G) Herb/Vine (H) Shrub (S) Forb (F) Tree (T)	    	  	  	- Sp L M H None Low, Only Spray Low Medium High	  

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			UPLANDS (EXPOSED)	UPLANDS (SHELTERED)	MARSH EDGE	HIGH MARSH	LOW MARSH	DUNE	BEACH						
 <p>G5 <small>David Stang on Wikimedia Commons, released under CC BY-SA 4.0.</small></p>	Little bluestem <i>Schizachyrium scoparium</i>		●	●					●	●		 	2-4'	-	
 <p>G6 <small>Gregg Moore</small></p>	Prairie cordgrass <i>Spartina pectinata</i>			●	●								3-8'	M	
 <p>G7 <small>Gregg Moore</small></p>	Saltgrass <i>Distichlis spicata</i>					●							1-3'	H	
 <p>G8 <small>Gregg Moore</small></p>	Saltmeadow cordgrass <i>Spartina patens</i>				●	●			●				1-3'	H	
 <p>G9 <small>Gregg Moore</small></p>	Seaside goldenrod <i>Solidago sempervirens</i>		●	●	●	●			●	●		 	2-5'	H	



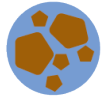














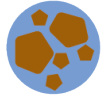







* Species was available for purchase at the [New Hampshire State Forest Nursery in 2020](#)

● Fresh Wetland

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			UPLANDS (EXPOSED)	UPLANDS (SHELTERED)	MARSH EDGE	HIGH MARSH	LOW MARSH	DUNE	BEACH					
 <p>G10</p>	Smooth Cordgrass <i>Spartina alterniflora</i>					●	●					0.5-7'	H	
 <p>G11</p>	Switchgrass <i>Panicum virgatum</i>		●	●	●				●		 	3-6'	M	
 <p>H1</p>	Beach pea <i>Lathyrus japonicus</i>		●						●			1-2'	Sp	
 <p>S1</p>	Bayberry <i>Myrica pensylvanica</i> *		●	●					●		 	5-7'	Sp	
 <p>S2</p>	Beach plum <i>Prunus maritima</i> *		●	●					●			4-7'	Sp	

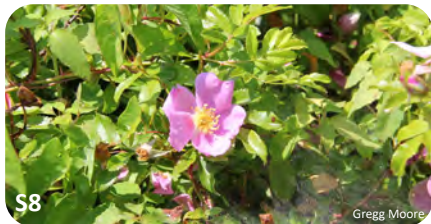

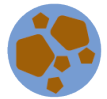






















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 <p>S3 Gregg Moore</p>	Coastal sweet pepperbush <i>Clethra alnifolia</i>		●	●								6-12'	Sp	
 <p>S4 David Stang on Wikimedia Commons, released under CC BY-SA 4.0.</p>	Juniper <i>Juniper horizontalis</i>		●	●					●			1.5'	Sp	
 <p>S5 Gregg Moore</p>	Serviceberry/ Shadbush <i>Amelanchier spp.</i>		●	●								10-25'	Sp	
 <p>S6 Gregg Moore</p>	Swamp mallow <i>Hibiscus moscheutos</i>		●		●	●						2-7'	L	
 <p>S7 Public Domain</p>	Sweet fern <i>Comptonia peregrina</i>		●	●								2'	-	































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			UPLANDS (EXPOSED)	UPLANDS (SHELTERED)	MARSH EDGE	HIGH MARSH	LOW MARSH	DUNE	BEACH							
 <p>S8 Gregg Moore</p>	Virginia Rose <i>Rosa virginiana</i> *		●	●						●			4-6'	Sp		
 <p>F1 Gregg Moore</p>	American searocket <i>Cakile edentula</i>									●	●			0.5-2'	Sp	
 <p>F2 Gregg Moore</p>	Beach pinweed <i>Lechea maritima</i>									●	●			0.5-1.5'	Sp	
 <p>F3 Gregg Moore</p>	Coastal jointweed <i>Polygonella articulata</i>		●							●	●			0.6-2'	Sp	
 <p>F4 Wingch Poon on Wikimedia Commons, released under CC BY-SA 2.5</p>	Common bearberry <i>Arctostaphylos uva-ursi</i>		●	●						●	●			0.5-2'	Sp	

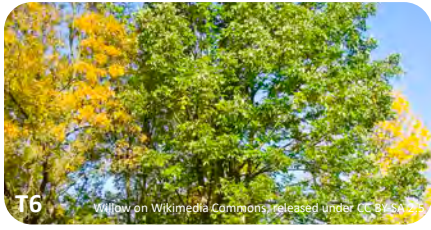
















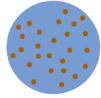







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 <p>T1 <small>Gregg Moore</small></p>	Bear oak <i>Quercus ilicifolia</i>		●	●								25'		
 <p>T2 <small>magnolia1000 on Wikimedia Commons, released under CC BY 2.0</small></p>	Sassafras <i>Sassafras albidum</i>		●	●								35-50'		
 <p>T3 <small>Famartin on Wikimedia Commons, released under CC BY-SA 4.0</small></p>	Black cherry <i>Prunus serotina</i>		●	●								60-90'		
 <p>T4 <small>David J. Stang on Wikimedia Commons, released under CC BY-SA 4.0</small></p>	Black tupelo or blackgum <i>Nyssa sylvatica</i>		●	●								30-60'		
 <p>T5 <small>Sten Porse on Wikimedia Commons, released under CC BY-SA 3.0</small></p>	Eastern red cedar <i>Juniperus virginiana</i>		●	●	●							40-50'		

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			UPLANDS (EXPOSED)	UPLANDS (SHELTERED)	MARSH EDGE	HIGH MARSH	LOW MARSH	DUNE	BEACH					
 <p>T6 <small>Willow on Wikimedia Commons, released under CC BY-SA 4.0</small></p>	Green ash <i>Fraxinus pennsylvanica</i>		●	●								50-70'	-	
 <p>T7 <small>Gregg Moore</small></p>	Northern red oak <i>Quercus rubra</i> *		●	●								60-75'	-	
 <p>T8 <small>Gregg Moore</small></p>	Paper birch <i>Betula papyrifera</i>		●	●								50-70'	-	
 <p>T9 <small>Willow on Wikimedia Commons, released under CC BY-SA 3.0</small></p>	Swamp white oak <i>Quercus bicolor</i>		●	●								60-80'	-	
 <p>T10 <small>David J. Stang on Wikimedia Commons, released under CC BY-SA 4.0</small></p>	White oak <i>Quercus alba</i>		●	●								100'+	-	

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