

APPENDIX E: COASTAL PLANTING GUIDE





COASTAL PLANTING GUIDE

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 soil, particularly in areas that receive large waves, by absorbing the wave energy.

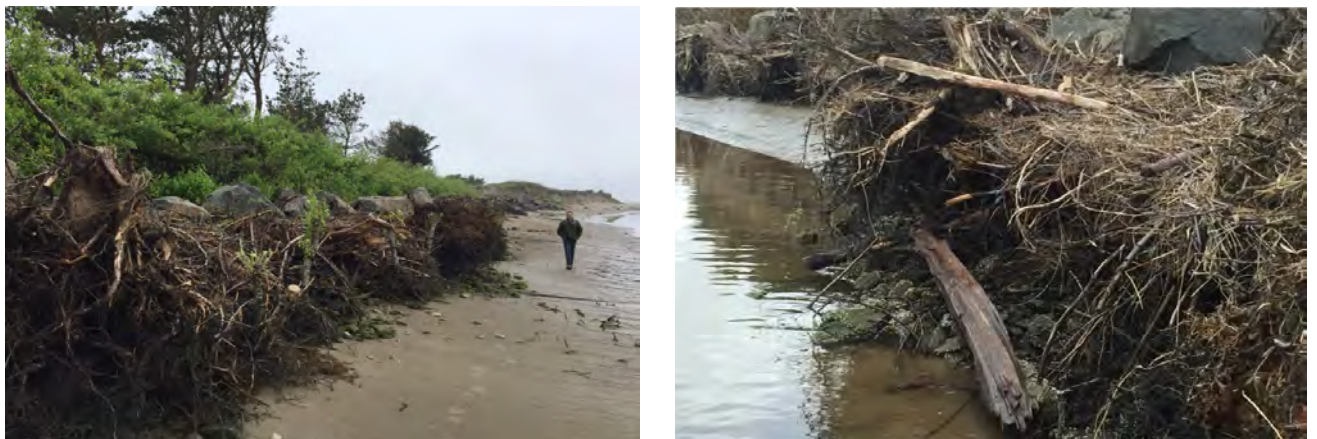


Figure 1. Root wads inserted into unstable banks can help protect bare soil from erosion, from a project in coastal Oregon. In areas not suitable for living shorelines, root wads can be an effective alternative providing stabilization and habitat.

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

Slope Stabilization

Planting a mixture of woody and herbaceous plants will provide the best possible stabilization for slopes, because they have different root structures. Herbaceous plants primarily have many fine roots that grow near the surface to hold soil together. Woody plants have some fine roots that spread along the surface but also have larger roots that grow deeper in the ground, anchoring both the plant and the soil. Using a mixture of herbaceous and woody plants reduces erosion of the top layer of soil and secures soil to the slope, which decreases the potential for shallow slope failures. Slopes greater than approximately 18° may not be suitable for a living shoreline (using plantings for stabilization). Instead, root wads or armoring (such as rip-rap, gabion baskets, or other engineered structures) may be needed, depending on site conditions.

Soil Depth

Soil depth is the measure of the amount of topsoil down to a substrate where plants will not grow. Poor substrate includes bedrock, clay, or coarse nutrient-poor soils. Soil depth will limit the variety of woody plants that can be used, since many have long tap roots that require more than 18 inches of soil. Some species are able to grow into bedrock, which can enhance slope stability temporarily. Over time the roots may cause cracks and contribute to slope failure. This guide separates woody and herbaceous plants into a) those recommended for shallow soils and b) those recommended only for deep soils. The combination of a steep slope and shallow soil may increase the possibility that trees will fall.

Salt Tolerance

For plantings on coastal shorelines, it is important to consider the environmental and physical stresses these plants may experience because of their proximity to the ocean. **It is important to consider the effect of wave heights and “splash-over” on the site.** This guide includes plants with varying degrees of salt tolerance, as follows:

- **Low Tolerance** - can survive occasional salt spray directly on the leaves or in the surrounding soils
- **Medium Tolerance** - can survive occasional soil saturation of salt water or frequent salt spray
- **High Tolerance** - can survive frequent or constant soil saturation and salt spray

Recommended Placement on Bank

Plants should be placed in different zones (toe, lower bank, or upper bank) on the shoreline, depending on their water needs and salt tolerance. As shown in **Figure 2**, the toe zone falls between the mean low water line and the extent of the highest annual tide, known as the intertidal zone. The lower bank rises from the line of highest annual tide to a point roughly midway between top of the bank and the bottom where it transitions to the upper bank.

Plants that prefer wet soils and have a high salt tolerance should be placed on the toe of the bank. The toe is the closest zone to the waterbody and typically has soils that are saturated with fresh or salt water. Plants that prefer moist soils should be placed in the lower bank zone, where soils are typically damp but not completely saturated. Plants that prefer dry soils should be placed in the upper bank zone, where soils are less likely to be saturated by the



Plants with low salt tolerance can be planted on a bluff’s upper bank.

adjacent water body. When placing plants in the lower bank, be mindful of the areas that may receive salt spray under storm conditions.

Recommendations in low wave size areas assume that the upper bank will receive highly infrequent salt spray and no salt water saturation. Plants do not need to be salt tolerant but do need to prefer dry soil. The lower bank assumes infrequent salt spray and no salt water saturation. Plants do not need to be salt tolerant. The toe assumes frequent salt spray or salt water saturation. Plants need to have a high to medium salt tolerance.

When choosing plants, be mindful of how frequently the lower bank zone receives saltwater spray as you may need to select plants that are salt tolerant.

Table 1. Suitability Table - This table help to determine whether a living shoreline (a shoreline that is stabilized by vegetation) is an option for your site. Links to geographic information using Google Earth are provided as necessary.

Factor	Criteria	Scoring	My Site	
Annualized Weighted Fetch* How far are waves traveling before they break? <i>Estimate the distance over open water between your coastline and the nearest significant land area.</i> Contact Maine Geological Survey for this information (see box below).	Very Low (<=0.5 mile)	8		
	Low (>0.5 and <=1 mile)	6		
	Med (1-3 miles)	2		
	High (3-5 miles)	1		
	Very High (>5 miles)	0		
Nearshore Slope How deep is the water? How quickly does it get deeper? http://www.charts.noaa.gov/	Shallow: Less than 3 feet deep at 100 feet out from the High Tide line	6		
	Deep: More than 3 feet deep at 100 feet out from the High Tide line	0		
Landward shoreline type From the mean high water line: what does the land look like where you are considering planting? <i>Note: A scarp is a sharp bank or cliff</i>	Wetlands, swamps, marshes	6		
	Beaches, Scarps, and Banks	5		
	Protected from wind; armored with rip-rap	3		
	Exposed shores armored with rip-rap	1		
Seaward shoreline type From the mean high water line: what does the land look like where it meets the water?	Marsh	6		
	Beach	5		
	Low speed channel	3		
	High speed channel	1		
	Rocky ledge or man-made features	0		
Sunlight Which direction does your site face?	South, Southeast, or southwest	6		
	East or west	4		
	Northeast or northwest	2		
	North	0		
Upland slope How steep is the bank closest to the water? http://www.maine.gov/megis/catalog/kml/wms/medem2_slope.kml	0-3%	6		
	4-9%	5		
	10-15%	4		
	16-30%	2		
	>30%	1		
Relief What is the average elevation 50 feet away from the water? http://www.maine.gov/megis/catalog/kml/wms/medem2.kml	0-5 feet	6		
	5-10 feet	5		
	10-20 feet	3		
	20+ feet	1		
			Total	

Table 2. Suitability Scoring Key, Total Points

Highly Unsuitable	3-7
Unsuitable	8-14
Possibly Suitable	15-21
Suitable	22-29
Highly Suitable	30-44

For help determining the **Annualized Weighted Fetch**, contact Maine Geological Survey: (207) 287-2801 or mgs@maine.gov

Adjusting Placement for Wave Size

Some coastal shore plantings will be impacted by wave energy, water, and salt exposure. The typical wave size for your planting location may affect how close to the water plants can survive. The area that constitutes the toe, or base, of the bank may not be able to support plant life if there are tall waves frequently crashing against it. In this case, it is the use of root wads is recommended to absorb the impact of the waves and guard the soil on the bank against erosion. (Note: installation of root wads requires state and local permits.) This guide recommends adjusting the plant

Detailed Shoreline Types:

Marsh - Includes fresh/brackish marsh or water, fluvial marsh, salt pannes/ponds, low and high salt marsh, mud flats, eelgrass flat, seaweed community, mussel bars

Beach - Includes sand beach, gravel beach, mixed sand and gravel beach, boulder beach, boulder ramp, low energy beach, spit, washover fan, swash bars, dunes and beach ridges, upper shoreface, coarse-grained flats

Low Speed Channel - Includes tidal fluvial channel, abandoned channel, estuarine channel, low velocity channel

High Speed Channel - Influenced by tide, weather, or dredging

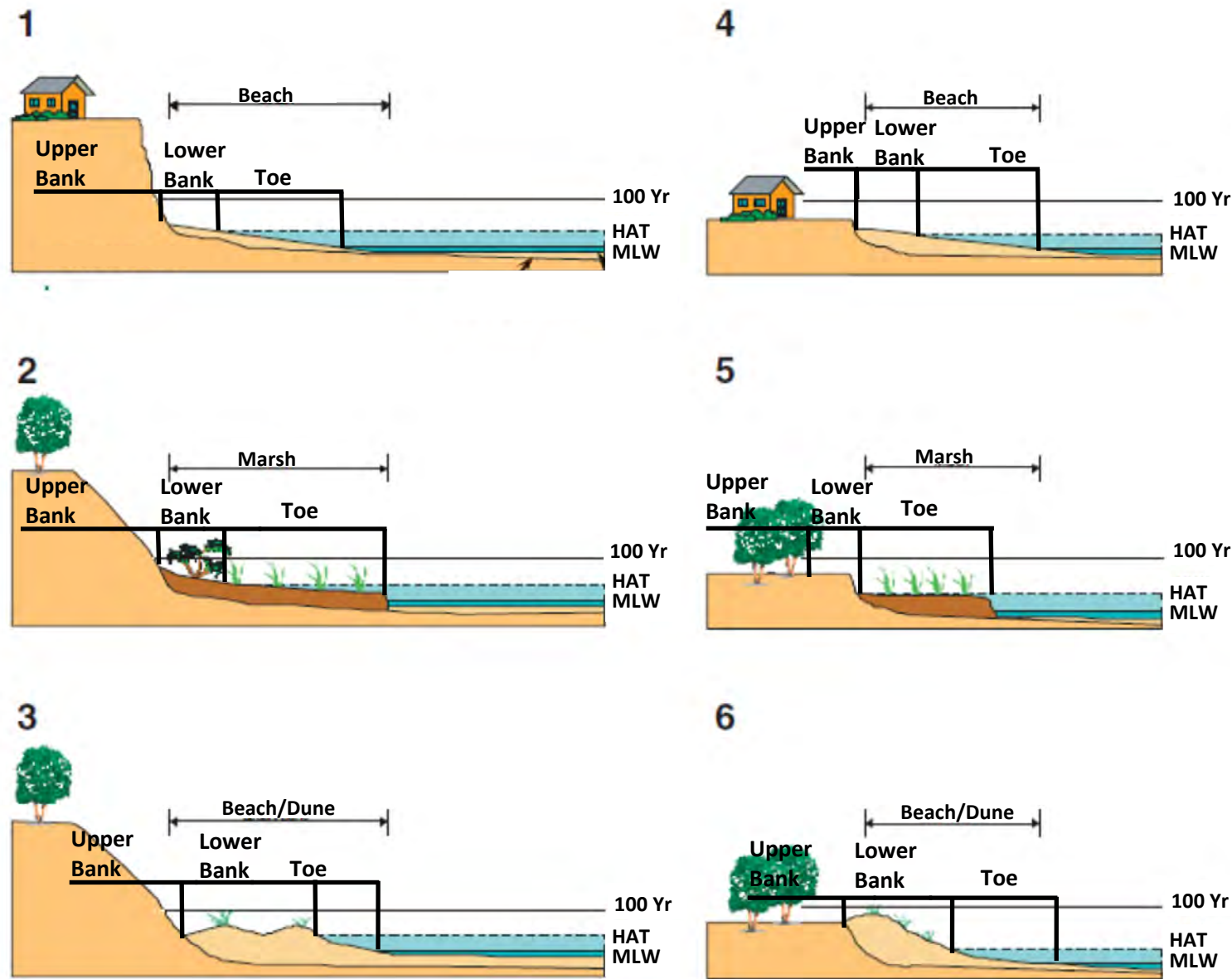


Figure 2. The toe, lower bank, and upper bank zones vary from site to site, depending on land formation and habitats. The toe is always found closest to the water and falls between the mean low water (MLW) line and the highest average tide (HAT) line. The bottom of the lower bank is always at the HAT line.

Image adapted from: Hardaway and Byrne, 1999.

placement in consideration of high predicted wave size. **High wave size (>2 feet over the mean high water line) will increase the amount of the bank that receives salt spray.**

Recommendations in high wave size areas assume that the upper bank will receive occasional salt spray. Plants should have at least some tolerance for salt exposure. The lower bank will receive frequent salt spray and occasional soil saturation. Plants should have at least a medium tolerance for salt. Given high wave sizes, planting on the toe is not recommended, and root wads should be used, if possible. Plants with no or unknown salt tolerance are not recommended for shorelines with high wave sizes.

Resiliency

Coastal plants experience extreme conditions and must be resilient to changing water and weather conditions. For coastal shoreline plants on the toe and lower bank, it is important to select for resilience. Being adjacent to fresh water means water table may rise and drop throughout a season. Plants in these zones must be able to adapt to having either saturated soils or drought for stretches of time. This guide indicates which plants are more resilient to these varying extreme conditions.

Tolerance of Wet Conditions

Water discharged from soil along bedrock may contribute to poor coastal slope stability. For shoreline areas that experience inputs of freshwater, either from streams, wetlands, or stormwater runoff, it is best to select plants that are indicated tolerant of wetland conditions. Using wetland vegetation in areas that receive freshwater can help control the amount of water draining through the soil. Plants indicated to be wetland tolerant in this guide may be placed in wet areas including areas that accumulate stormwater and wetlands. Species will vary based on salt tolerance.



Using wetland plants in areas that receive freshwater from streams, wetlands, or runoff can help reduce slumping caused by saturated soils.

Herbaceous Grasses

These plants are best for planting in marshes, dunes, beaches, or other shoreline areas.

Plant Species		Recommended Location on Bank						
Common Name	Scientific Name	Salt Tolerance				Low Predicted Wave Size		
		High	Med	Low	None	Upper Bank	Lower Bank	Toe
American Beach Grass	<i>Ammophila breviligulata</i>	X					X	X
Big Blue Stem	<i>Andropogon gerardii</i>		X				X	
Bulrushes	<i>Scirpus sp.</i>		X				X	
Canada Reed Grass/ Bluejoint	<i>Calamagrostis canadensis</i>				X		X	
Foxtail Barley	<i>Hordeum jubatum</i>		X			X	X	X
Green Saltgrass	<i>Distichlis spicata</i>	X						X
Saltmeadow Cordgrass	<i>Spartina patens</i>	X						X
Saltmeadow Rush	<i>Juncus gerardii</i>	X						X
Smooth Cordgrass	<i>Spartina alterniflora</i>	X						X
Sweetgrass / Vanilla Swamp Grass	<i>Hierochloe odorata</i>		X				X	X
Switchgrass / Panic Grass	<i>Panicum virgatum</i>		X				X	X

Recommended Location on Bank (continued)									
High Predicted Wave Size			Resiliency		Sun Requirements			Wetland Tolerant	
Upper Bank	Lower Bank	Not Rec'd	Yes	No	Sun	Part Sun	Shade	Yes	No
	X		X		X				X
	X		X		X	X			X
	X							X	
		X			X			X	
X	X				X				X
		X	X		X			X	
		X		X	X			X	
		X			X			X	
	X		X		X				X
	X		X		X	X			X



Herbaceous Low Perennials

These plants are best for planting in shallow soils on steep slopes.

* Indicates additional details and photo included

Plant Species		Recommended Location on Bank							
Common Name	Scientific Name	Salt Tolerance					Low Predicted Wave Size		
		High	Med	Low	None	Unknown	Upper Bank	Lower Bank	Toe
Barren Strawberry*	<i>Waldsteinia fragarioides</i>	X						X	
Beach Pea / Sea Pea / Sea Vetchling	<i>Lathyrus japonicus</i>		X					X	X
Bellflower	<i>Campanula rotundifolia</i>					X	X		
Black-eyed Susan*	<i>Rudbeckia laciniata</i>		X				X	X	
Blood-root*	<i>Sanguinaria canadensis</i>					X	X		
Blue Cohosh	<i>Caulophyllum thalictroides</i>				X		X	X	
Boneset* (Throughwort)	<i>Eupatorium perfoliatum</i>		X					X	X
Bunchberry / Canada Dwarf Dogwood	<i>Chamaeperclymenum canadensis</i>				X		X	X	
Cardinal Flower*	<i>Lobelia cardinalis</i>				X		X	X	
Red / Wild Columbine*	<i>Aquilegia canadensis</i>	X						X	
Common Yarrow*	<i>Achillea millefolium</i>			X			X	X	
Coneflower*	<i>Echinacea angustifolia</i>			X			X	X	
Evening Primrose	<i>Oenothera biennis</i>				X		X	X	
Fleabane	<i>Erigeron sp.</i>					X	X		
Foamflower*	<i>Tiarella cordifolia</i>				X			X	X
Helen's Flower*	<i>Helenium autumnale & flexuosum</i>			X				X	
Indian Cucumber-root	<i>Medeola virginiana</i>					X	X	X	
Blue Flag Iris*	<i>Iris versicolor</i>				X			X	
Jack-in-the-Pulpit*	<i>Arisaema triphyllum</i>			X			X	X	
Jewelweed	<i>Impatiens capensis</i>				X			X	
Lupine*	<i>Lupinus perennis</i>		X				X	X	
Marsh Marigold*	<i>Caltha palustris</i>		X					X	

Recommended Location on Bank (continued)									
High Predicted Wave Size			Resiliency		Sun Requirements			Wetland Tolerant	
Upper Bank	Lower Bank	Not Rec'd	Yes	No	Sun	Part Sun	Shade	Yes	No
	X				X	X	X		X
	X		X		X	X		X	X
		X			X	X			X
X				X	X	X			X
		X				X	X	X	
		X		X		X	X	X	
	X		X		X	X		X	
		X		X		X		X	
		X			X	X		X	
	X		X		X	X			X
X			X		X				X
		X		X		X		X	
		X				X	X		X
		X		X	X	X		X	
X				X		X	X	X	
		X		X				X	
X	X				X	X			X
	X			X	X	X		X	

Herbaceous Low Perennials (continued)

Plant Species		Recommended Location on Bank							
Common Name	Scientific Name	Salt Tolerance					Low Predicted Wave Size		
		High	Med	Low	None	Unknown	Upper Bank	Lower Bank	Toe
Milkweed*	<i>Asclepias incarnata</i> & <i>A. syriaca</i>				X		X	X	
New England Aster*	<i>Symphotrichum novae-angliae</i>		X					X	
Obedient Plant	<i>Physostegia virginiana</i>		X				X	X	
Pearly Everlasting	<i>Anaphalis margaritacea</i>				X		X	X	
Sea Lavender	<i>Limonium carolinianum</i>	X						X	X
Seaside Goldenrod	<i>Solidago sempervirens</i>	X						X	
Silverweed	<i>Argentina anserina</i>			X			X		
Solomon's Seal*	<i>Polygonatum pubescens</i>					X		X	
Spikenard*	<i>Aralia racemosa</i>					X	X	X	
Spotted Joe-Pye Weed*	<i>Eupatorium maculatum</i>		X					X	
Sweet Fern*	<i>Comptonia peregrina</i>		X				X	X	
Sweet Flag	<i>Acorus americanus</i>				X			X	
Tall Meadow Rue	<i>Thalictrum pubescens</i>					X		X	
Thin-leaved Sunflower	<i>Helianthus decapetalus</i>				X			X	
Trout-Lily	<i>Erythronium americanum</i>					X		X	
Turtlehead*	<i>Chelone glabra</i>				X			X	
Violet*	<i>Viola sp.</i>					X		X	
Virgin's Bower*	<i>Clematis virginiana</i>				X			X	
White Baneberry	<i>Actaea pachypoda</i>			X			X	X	
Wild-Oats	<i>Uvularia sessilifolia</i>					X		X	
Wintergreen*	<i>Gaultheria procumbens</i>				X			X	
Yellow Bluebead-lily	<i>Clintonia borealis</i>				X		X	X	

Recommended Location on Bank (continued)									
High Predicted Wave Size			Resiliency		Sun Requirements			Wetland Tolerant	
Upper Bank	Lower Bank	Not Rec'd	Yes	No	Sun	Part Sun	Shade	Yes	No
		X		X	X			X	
	X				X	X		X	
	X				X	X		X	
		X	X		X				X
	X			X		X		X	
	X			X	X			X	
X				X	X			X	
		X				X	X		X
		X				X	X		X
	X				X	X			X
X	X		X		X	X			X
		X		X	X	X		X	
		X			X	X		X	
		X			X	X		X	
		X		X	X	X		X	
X						X	X		X
		X				X	X	X	
		X	X			X	X		X
		X		X		X	X	X	

Herbaceous Ferns

These plants are best for planting in shallow soils on steep slopes.

* Indicates additional details and photo included

Plant Species		Recommended Location on Bank							
Common Name	Scientific Name	Salt Tolerance					Low Predicted Wave Size		
		High	Med	Low	None	Unknown	Upper Bank	Lower Bank	Toe
Bracken Fern	<i>Pteridium aquilinum</i>					X	X	X	
Christmas Fern*	<i>Polystichum acrostichoides</i>					X		X	
Cinnamon Fern*	<i>Osmunda cinnamomea</i>			X			X	X	
Hay-scented Fern*	<i>Dennstaedtia punctilobula</i>					X	X	X	
Interrupted Fern*	<i>Osmunda claytoniana</i>				X			X	
Lady Fern*	<i>Athyrium filix-femina</i>				X		X	X	
Long Beech Fern	<i>Phegopteris connectilis</i>					X		X	
Maidenhair Fern*	<i>Adiantum pedatum</i>				X			X	
Marginal Wood Fern*	<i>Dryopteris marginalis</i>				X		X	X	
Ostrich Fern*	<i>Matteuccia struthiopteris</i>					X		X	
Royal Fern*	<i>Osmunda regalis</i>				X			X	
Sensitive Fern	<i>Onoclea sensibilis</i>			X				X	
Spinulose Wood Fern	<i>Dryopteris carthusiana</i>					X	X	X	

Recommended Location on Bank (continued)									
High Predicted Wave Size			Resiliency		Sun Requirements			Wetland Tolerant	
Upper Bank	Lower Bank	Not Rec'd	Yes	No	Sun	Part Sun	Shade	Yes	No
		X		X					X
		X				X	X		X
X			X		X	X	X		X
		X				X	X		X
		X		X		X	X	X	
		X		X		X	X	X	
		X				X	X		X
		X		X		X	X	X	
		X		X	X	X	X	X	
		X				X	X	X	



Cinnamon Fern

Woody Low Shrubs

These plants are best for planting in shallow soils on steep slopes.

* Indicates additional details and photo included

Plant Species		Recommended Location on Bank								
Common Name	Scientific Name	Salt Tolerance					Low Predicted Wave Size			
		High	Med	Low	None	Unknown	Upper Bank	Lower Bank	Toe	
American Fly Honeysuckle	<i>Lonicera canadensis</i>				X		X			
Bearberry*	<i>Arctostaphylos uva-ursi</i>	X					X			
Bog Rosemary*	<i>Andromeda polifolia</i>			X				X		
Bush Cinquefoil	<i>Potentilla fruticosa</i>	X					X	X	X	
Cranberry*	<i>Vaccinium macrocarpon</i>					X		X	X	
Creeping Juniper*	<i>Juniperus horizontalis</i>		X				X	X		
Fox Grape	<i>Vitis labrusca</i>					X		X		
Huckleberry	<i>Gaylussacia baccata</i>				X		X	X		
Labrador Tea*	<i>Ledum groenlandicum</i>			X				X		
Leatherwood	<i>Dirca palustris</i>					X		X		
Meadowsweet*	<i>Spiraea alba</i>		X					X	X	
Partridgeberry	<i>Mitchella repens</i>					X		X		
Pasture Rose	<i>Rosa carolina</i>	X					X	X		
Rhodora*	<i>Rhododendron canadense</i>				X			X		
Running Serviceberry	<i>Amelanchier spicata</i>					X		X		
Sheep Laurel*	<i>Kalmia angustifolia</i>		X				X	X		
St. Johnswort	<i>Hypericum perforatum</i>				X		X	X		
Virginia Creeper*	<i>Parthenocissus quinquefolia</i>		X				X	X	X	
Virginia Rose	<i>Rosa virginiana</i>	X					X	X	X	

Recommended Location on Bank (continued)									
High Predicted Wave Size			Resiliency		Sun Requirements			Wetland Tolerance	
Upper Bank	Lower Bank	Not Rec'd	Yes	No	Sun	Part Sun	Shade	Yes	No
		X		X	X	X			X
X			X		X	X			X
		X			X	X		X	
X	X				X	X			X
		X			X			X	
X	X		X		X				X
		X			X				X
		X	X			X			X
		X		X		X			X
		X				X			X
	X				X	X		X	
		X					X		X
X	X		X		X	X		X	
X	X		X		X	X		X	

Woody Medium Shrubs

These plants are best for planting in shallow soils on gradual slopes
 * Indicates additional details and photo included

Plant Species		Recommended Location on Bank							
Common Name	Scientific Name	Salt Tolerance					Low Predicted Wave Size		
		High	Med	Low	None	Unknown	Upper Bank	Lower Bank	Toe
Am. Cranberry Viburnum	<i>Viburnum trilobum</i>				X			X	
American Yew*	<i>Taxus canadensis</i>			X				X	
Beach Plum*	<i>Prunus maritima</i>	X					X	X	
Bush Honeysuckle*	<i>Diervilla lonicera</i>				X		X		
Common Elderberry	<i>Sambucus canadensis</i>			X				X	
Flowering Raspberry*	<i>Rubus odoratus</i>				X			X	
Highbush Blueberry*	<i>Vaccinium corymbosum</i>	X						X	
Hobblebush	<i>Viburnum alnifolium</i>				X			X	
Lingonberry	<i>Vaccinium vitis-idaea</i>			X			X	X	
Mapleleaf Viburnum*	<i>Viburnum acerifolium</i>				X		X	X	
Northern Bayberry*	<i>Myrica pensylvanica</i>		X				X	X	
Red Chokeberry *	<i>Aronia arbutifolia</i>	X						X	
Silky Dogwood	<i>Cornus amomum</i>			X				X	
Smooth Sumac	<i>Rhus glabra</i>		X					X	
Smooth Witherod	<i>Viburnum nudum</i>					X		X	
Swamp Rose	<i>Rosa palustris</i>			X				X	
Sweet Gale (Bayberry)	<i>Myrica gale</i>				X			X	
Sweet Pepperbush *	<i>Clethra alnifolia</i>	X						X	
Witch Hazel	<i>Hamamelis virginiana</i>				X			X	

Recommended Location on Bank (continued)									
High Predicted Wave Size			Resiliency		Sun Requirements			Wetland Tolerance	
Upper Bank	Lower Bank	Not Rec'd	Yes	No	Sun	Part Sun	Shade	Yes	No
		X		X	X	X		X	
		X		X		X	X		X
X	X		X		X	X			X
		X	X		X	X	X		X
		X	X		X	X		X	
	X		X		X	X		X	
		X	X		X	X	X		X
X				X	X	X	X	X	
		X	X		X	X			X
X	X		X			X		X	
	X				X	X		X	
		X	X		X	X		X	
	X		X		X				X
		X			X	X		X	
	X				X	X		X	
		X		X	X	X		X	

Woody Tall Shrubs

These plants are best for planting in shallow soils on gradual slopes
 * Indicates additional details and photo included

Plant Species		Recommended Location on Bank							
Common Name	Scientific Name	Salt Tolerance					Low Predicted Wave Size		
		High	Med	Low	None	Unknown	Upper Bank	Lower Bank	Toe
Arrowwood*	<i>Viburnum dentatum</i>	X						X	
Beaked Hazelnut	<i>Corylus cornuta</i>				X		X		
Black Chokeberry*	<i>Aronia melanocarpa</i>			X			X	X	
Buttonbush*	<i>Cephalanthus occidentalis</i>		X				X	X	
Common Juniper*	<i>Juniperus communis</i>	X					X	X	
Gray Dogwood*	<i>Cornus racemosa</i>		X				X	X	X
Hazelnut*	<i>Corylus americana</i>				X		X		
Nannyberry*	<i>Viburnum lentago</i>				X		X	X	
Red-osier Dogwood*	<i>Cornus alba</i>				X			X	X
Smooth Alder	<i>Alnus serrulata</i>				X			X	X
Snowball Bush	<i>Viburnum opulus</i>		X					X	
Spirea	<i>Spirea sp.</i>					X	X	X	X
Staghorn Sumac*	<i>Rhus typhina</i>					X	X		
Winged Sumac	<i>Rhus copallina</i>				X		X		
Winterberry*	<i>Ilex verticillata</i>		X					X	
Witherod Viburnum*	<i>Viburnum cassinoides</i>				X			X	

Recommended Location on Bank (continued)									
High Predicted Wave Size			Resiliency		Sun Requirements			Wetland Tolerance	
Upper Bank	Lower Bank	Not Rec'd	Yes	No	Sun	Part Sun	Shade	Yes	No
	X				X	X		X	
		X		X	X	X			X
X					X	X		X	
	X		X		X			X	
X	X		X		X				X
			X		X	X	X	X	
		X		X	X	X			X
		X	X		X	X		X	
		X	X		X	X		X	
X					X			X	
X			X		X				X
		X	X		X	X			X
		X		X	X	X		X	
		X		X	X	X			X

Woody Small Trees

These plants are best for planting in deep soils on gradual slopes.

* Indicates additional details and photo included

Plant Species		Recommended Location on Bank							
Common Name	Scientific Name	Salt Tolerance					Low Predicted Wave Size		
		High	Med	Low	None	Unknown	Upper Bank	Lower Bank	Toe
American Hornbeam*	<i>Carpinus caroliniana</i>				X		X	X	
American Mountain Ash	<i>Sorbus americana</i>				X			X	
Blackhaw*	<i>Viburnum prunifolium</i>				X		X	X	
Canada Plum	<i>Prunus nigra</i>				X			X	
Chokecherry*	<i>Prunus virginiana</i>	X						X	
Cockspur Hawthorn*	<i>Crataegus crus-galli</i>	X						X	
Common Witchhazel*	<i>Hamamelis virginiana</i>				X			X	
Eastern Red Cedar	<i>Juniperus virginiana</i>	X						X	
Ironwood	<i>Ostrya virginiana</i>				X			X	
Mountain Maple	<i>Acer spicatum</i>				X			X	
Northern Arrowwood	<i>Viburnum recognitum</i>					X		X	
Pagoda Dogwood*	<i>Cornus alternifolia</i>				X			X	
Pussy Willow*	<i>Salix discolor</i>		X					X	
Sassafras*	<i>Sassafras albidum</i>		X					X	
Scarlet Elder	<i>Sambucus racemosa</i>				X			X	
Serviceberry	<i>Amelanchier sp</i>		X				X	X	
Shadblow Serviceberry*	<i>Amelanchier canadensis</i>	X						X	
Speckled Alder	<i>Alnus incana</i>		X					X	
Striped Maple*	<i>Acer pensylvanicum</i>		X					X	

Recommended Location on Bank (continued)									
High Predicted Wave Size			Resiliency		Sun Requirements			Wetland Tolerance	
Upper Bank	Lower Bank	Not Rec'd	Yes	No	Sun	Part Sun	Shade	Yes	No
		X		X		X	X	X	
		X		X	X	X		X	
		X		X		X			X
		X		X	X	X	X		X
	X		X		X	X			X
	X			X	X	X		X	
		X		X	X	X	X	X	
	X		X		X				X
	X			X	X	X		X	
		X		X	X	X	X		X
X	X			X	X	X		X	
	X		X			X		X	
	X		X		X	X	X	X	
	X			X		X	X		X

Woody Tall Trees

These plants are best for planting in deep soils on gradual slopes

* Indicates additional details and photo included

Plant Species		Recommended Location on Bank								
Common Name	Scientific Name	Salt Tolerance					Low Predicted Wave Size			
		High	Med	Low	None	Unknown	Upper Bank	Lower Bank	Toe	
American beech	<i>Fagus grandifolia</i>			X				X		
Balsam Fir*	<i>Abies balsamea</i>		X					X		
Basswood (Linden)	<i>Tilia americana</i>				X			X		
Bigtooth Aspen	<i>Populus grandidentata</i>		X					X		
Black Cherry	<i>Prunus serotina</i>		X					X		
Black Spruce	<i>Picea mariana</i>				X			X		
Black Willow	<i>Salix nigra</i>		X					X		
Blackgum	<i>Nyssa sylvatica</i>	X						X		
Eastern White Pine*	<i>Pinus strobus</i>			X			X	X		
Gray Birch	<i>Betula populifolia</i>	X						X		
Green Ash*	<i>Fraxinus pennsylvanica</i>			X				X		
Hemlock*	<i>Tsuga canadensis</i>				X		X	X		
Jack Pine	<i>Pinus banksiana</i>			X			X			
Larch*	<i>Larix laricina</i>		X					X		
Mountain Ash	<i>Sorbus alnifolia</i>					X	X			
Northern Red Oak	<i>Quercus rubra</i>		X				X	X		
Paper Birch	<i>Betula papyrifera</i>		X				X	X		
Pin Cherry	<i>Prunus pensylvanica</i>				X			X		
Quaking Aspen	<i>Populus tremuloides</i>		X					X		
Red Maple	<i>Acer rubrum</i>		X					X		
Red Pine*	<i>Pinus resinosa</i>				X		X	X		

Recommended Location on Bank (continued)									
High Predicted Wave Size			Resiliency		Sun Requirements			Wetland Tolerance	
Upper Bank	Lower Bank	Not Rec'd	Yes	No	Sun	Part Sun	Shade	Yes	No
		X	X		X	X			X
	X			X	X	X		X	
		X		X	X	X			X
	X			X	X				X
		X		X	X			X	
	X		X		X			X	
	X			X	X	X		X	
X				X	X	X	X		X
	X			X	X			X	
		X	X		X	X		X	
		X		X	X				X
X				X	X				X
	X			X	X			X	
	X		X		X	X		X	
		X		X	X				X
	X		X		X	X		X	
		X		X	X				X

Woody Tall Trees (continued)

These plants are best for planting in deep soils on gradual slopes
 * Indicates additional details and photo included

Plant Species		Recommended Location on Bank							
Common Name	Scientific Name	Salt Tolerance					Low Predicted Wave Size		
		High	Med	Low	None	Unknown	Upper Bank	Lower Bank	Toe
Silver Maple	<i>Acer saccharinum</i>			X				X	
Sugar Maple*	<i>Acer saccharum</i>			X				X	
Swamp White Oak*	<i>Quercus bicolor</i>				X			X	
White Ash	<i>Fraxinus americana</i>	X						X	
White Cedar*	<i>Thuja occidentalis</i>		X					X	
White Oak	<i>Quercus alba</i>		X					X	
White Spruce	<i>Picea glauca</i>	X					X	X	
Yellow Birch*	<i>Betula alleghaniensis</i>	X						X	

Recommended Location on Bank (continued)									
High Predicted Wave Size			Resiliency		Sun Requirements			Wetland Tolerance	
Upper Bank	Lower Bank	Not Rec'd	Yes	No	Sun	Part Sun	Shade	Yes	No
		X	X		X			X	
		X		X	X				X
		X	X		X			X	
	X			X	X	X		X	
	X		X		X	X		X	
	X			X	X				X
X	X			X	X				X
	X		X				X	X	X



Sugar Maple

Herbaceous Perennials

These plants are best for planting in shallow soils on steep slopes

Appalachian Barren Strawberry (*Waldsteinia fragarioides*) Grows from 3 to 8 inches high with a ½ to 1 foot spread. A low, mat-forming, strawberry-like plant with evergreen, basal leaves and several yellow flowers on a leafless stalk. Fruit is not fleshy or edible. Sun to shade. Prefers medium wet, well-drained, organic, slightly acidic soil, but tolerates a wide range. Flowers from April to June. Salt tolerant. Zones 3-9. ○●●☾≡

Black-eyed Susan (*Rudbeckia laciniata*) Grows from 2 to 3 feet high with a spread of 1 to 2 feet and minimum root depth of 10 inches. Leaves are rough, hairy, and lance shaped. Flowers are yellow to orange-yellow with a dark brown center. Full sun to part shade. Prefers dry to medium wet, well-drained soil but is tolerant of heat, drought and a wide range of soils. Low maintenance. Zones 3-9. ○●●☾≡

Bloodroot (*Sanguinaria canadensis*) Grows from 6 to 12 inches high and is usually found in colonies. Part sun to shade. Leaves and root contain an orange/red juice that is poisonous. Flowers in early spring. Grows best in part sun to shade and leaf litter. Zones 3-8 ○●●☾

Blue Flag Iris (*Iris versicolor*) Grows from 1 to 3 feet high with a spread of 6 to 12 feet with a minimum root depth of 6 inches. Leaves are sword-shaped and can be up to 3 feet long. Flowers are usually blue-violet but can be lavender, or red-violet. Full sun to partial shade. Prefers moist to wet, organic, slightly acidic soils. Can tolerate growing in up to 6 inches of standing water. Grows well near bogs and ponds. Zones 3-9. ○●☾

Boneset (*Eupatorium perfoliatum*) Grows 4 to 6 feet high with a spread of 3 to 4 feet. Clusters of small, white flowers bloom in late summer. Leaves are lance shaped and have hairy stems. Full sun to part shade. Prefers medium wet to wet soil and will tolerate sand and clay soils with adequate moisture. Found in swamps and on streambanks. Medium salt tolerance. Zones 4-8. ○●☾

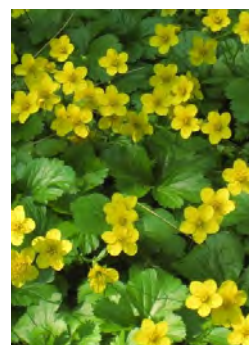
Cardinal Flower (*Lobelia cardinalis*) Grows from 2 to 4 feet high with a spread of 1 to 2 feet and minimum root depth of 12 inches. Bright red flowers are tubular and bloom in late summer. Lance-shaped leaves are finely toothed, approximately 4 inches long. Full sun to partial shade. Prefers medium wet to wet, rich, organic soil. Found near streams and swamps and in low wooded areas. Attractive to hummingbirds. Zones 3-9. ○●☾

Columbine (*Aquilegia canadensis*) Grows from 2 to 3 feet high with a spread of 1 to 1½ feet. Flowers are light pink with yellow to blood red with yellow and bell shaped. Full sun to part shade. Prefers medium wet, well-drained soil but will tolerate a wide range as long as drainage is adequate. Flowers are attractive to hummingbirds. Salt tolerant. Zones 3-8. ○●☾

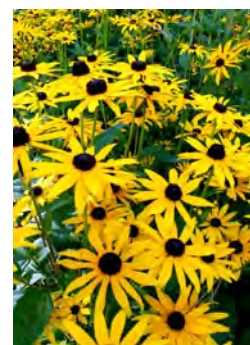
Common Yarrow (*Achillea millefolium*) Grows from 1 to 3 feet high with a spread of 1 foot and minimum root depth of 8 inches. Several long stems produce flat clusters of white, pink, yellow, or red flowers. Full sun to part shade. Prefers dry to moist, well-drained soil but will tolerate a wide range as long as drainage is adequate. Flowers are attractive to pollinators. Zones 3-9. ○●☾

Coneflower/Echinacea (*Echinacea purpurea*) Grows from 1 to 3 feet high with a spread of 1 to 2 feet depending on variety and a minimum root depth of 24 inches. Large, daisy-like flowers can be red, white or light purple. Tends to form clumps. Full sun. Prefers moist, well-drained, neutral to slightly alkaline soil. Heat and drought tolerant. Attracts birds and butterflies. Low salt tolerance. Zones 3-10. ○≡

Helen’s Flower (*Helenium autumnale*) Grows from 2 to 3 feet high with a spread of 3 to 5 feet and a minimum root depth of 6 inches. Yellow flowers are attractive to pollinators. Full sun. Prefers medium wet to wet soils. Low salt tolerance. Zones 3-8. ○☾



Appalachian Strawberry



Black-eyed Susan



Foam Flower



Jack-in-the Pulpit



Bloodroot



Iris



Lupine



Marsh Marigold



Boneset



Cardinal Flower



Milkweed



New England Aster



Columbine



Common Yarrow



Soloman’s Seal



Coneflower



Helen’s Flower



Spikenard



Joe-Pye Weed

Foam Flower (*Tiarella cordifolia*) Grows 8 to 10 inches high with a 1 to ½ foot spread. Masses of tiny white or pink flowers seem to float above the foliage. Broad, maple shaped leaves. Flowers remain up to 6 weeks. Easy to grow in moist to dry soil. Wet soil, especially in winter, can kill the plant. Part shade to shade. Zones 3 to 8. ●≡

Jack-in-the-Pulpit (*Arisaema triphyllum*) Grows from 1 to 2 feet high with a spread of 1 to 1½ feet. Unusually shaped and striped “flower” in mid-spring; clusters of brilliant red berries in fall. Typically grows in wet woodland areas and may take 5 years to flower if grown from seed. Roots are poisonous. Prefers medium wet to wet rich organic soils and partial to full shade. Zones 3-9. ●☾

Lupine (*Lupinus perennis*) Grows from 3 to 4 feet high with a spread of 1 to 1½ feet. Flowers grow in tall spears ranging from blue to purple. Full sun to part shade. Prefers dry to medium wet, well-drained soil. Flowers are attractive to pollinators. Zones 3-6. ○●≡

Marsh Marigold (*Caltha palustris*) Grows from 8 inches to 2 feet high with a spread of approximately 1 foot and a minimum root depth of 8 inches. Typically found in swamps and marshes and is recommended for planting along stream banks, in bog gardens and near ponds. Bright yellow flowers bloom in late spring to early summer. Prefers wet organic soils and partial to full sun. Zones 1-8. ○●☾

Milkweed (*Asclepias syriaca*) Grows from 2 to 3 feet high with a spread of approximately 1 foot and minimum root depth of 18 inches. Clusters of pink flowers bloom in the late spring into the summer and are attractive to butterflies, particularly Monarch larvae. Very adaptable. Can grow in average, dry to medium wet soils that are well drained. Prefers full sun. Zones 3-9. ○☾≡

New England Aster (*Aster nova-angliae*) Grows from 1½ to 2 feet high with a spread of 2 to 3 feet. It grows best in average to wet, well-drained soil with full sun. Blooms in late summer to early fall with dark purple flowers that are attractive to butterflies. Medium salt tolerance. Zones 3-9. ○☾≡

Solomon’s Seal (*Polygonatum pubescens*) Grows from 2 to 3 feet high with a spread of approximately 1 foot. Flowers are small, white, and bell shaped growing in a line down the stem. Full shade to part shade. Prefers wet to medium wet soil but will tolerate drought. Zones 3-8. ●●☾

Spikenard (*Aralia racemosa*) Grows from 3 to 5 feet high with an equal spread. Foliage produces large compound leaves with large clusters of small green white flowers. Full sun to part shade. Prefers dry to medium wet, well-drained soil. Zones 3-8. ○●☾≡

Spotted Joe Pye Weed (*Eupatorium maculatum*) Grows from 4 to 5 feet high with a spread of 1.5 to 2 feet. Found naturally growing in damp meadows. Light pink flowers bloom from mid-summer to early fall and are attractive to butterflies. Prefers average to wet soil with full sun. Zones 4-8. ○●☾



Plant Identification Key

- Full Sun—more than 5 hours of direct sun per day
- Partial Sun—2 to 5 hours of direct sun per day or full day of dappled sun
- Full Shade—Fewer than 2 hours of direct sun per day
- ☾ Wet Soils—Soils that are wet most of the year and/or poorly drained soils
- ≡ Dry Soils—Soils that are dry year round and/or soils that drain quickly.

Herbaceous Perennials (Continued)

Turtlehead (*Chelone glabra*) Grows to a size of 2 to 3 feet with a spread of 1½ to 2½ feet. Flowers are white with a pinkish tinge and are similar to snapdragons. Prefers a rich, moist to wet, organic soil with partial shade. Zones 3 to 9. ☉☂☂

Violet (*Viola sp.*) Grows up to ½ a foot high with an equal spread. Simple flowers range in color from light pink to purple. Full sun to part shade. Prefers medium wet, well-drained soil. Flowers are attractive to pollinators. Zones 4-8. ☉☂☂

Virgin’s Bower (*Clematis virginiana*) A climbing vine that can grow up to 20 feet high with a minimum root depth of 14 inches. Grows best in soil with average to medium moisture and full sun to partial shade. Attractive clusters of silky seeds follow showy white flowers. Grows best on a trellis or fence. Zones 2-10. ☉☂☂☂

Wintergreen/Checkerberry (*Gaultheria procumbens*) Also known as teaberry. Grows up to 6 inches high and spreads 4 to 6 inches annually with a minimum root depth of 12 inches. Favors well-drained, acidic soil with average moisture. Grows in partial to full shade but produces more fruit with adequate light. Leaves are evergreen and red berries remain on the plant all winter. Young leaves and berries have a wintergreen flavor. Zones 3-5. ☉☂☂☂☂



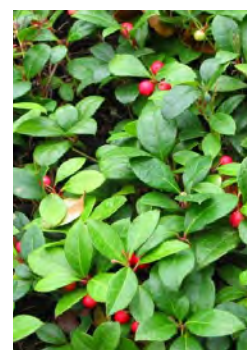
Turtlehead



Marsh Blue Violet



Virgin’s Bower



Wintergreen



Example of a living shoreline with a coir log in Freeport, ME

Herbaceous Ferns

These plants are best for planting in shallow soils on steep slopes

Christmas Fern (*Polystichum acrostichoides*) Grows from 1 to 2 feet high with an equal spread. Plants grow in clumps and stay green year round. Full shade to part shade. Prefers dry to medium wet, well-drained soil. Zones 3-9. ☉☂☂☂

Cinnamon Fern (*Osmunda cinnamomea*) Grows from 2 to 3 feet high with an equal spread with a minimum root depth of 12 inches. Vegetation produces tall brown fronds along with typical fern leaves. Full sun to full shade. Prefers medium wet, well-drained soil. Low salt tolerance. Zones 3-8. ☉☂☂☂

Hay-scented Fern (*Dennstaedtia punctiloba*) Vigorously spreading fern grows to 12 inches with light-green, finely-divided fronds. Foliage is sweet-scented when crushed. Versatile fern grows in many soils and tolerates drought. Found in clearings and on rocky slopes. Part-sun to shade. Moist, well-drained soil. Drought tolerant. Zones 3-8. ☉☂☂☂

Interrupted Fern (*Osmunda claytoniana*) Grows from 2 to 3 feet high with an equal spread and minimum root depth of 12 inches. By mid-summer vegetation has a distinctive gap between lower leaves and upper leaves on each frond where spore bearing leaves have fallen off. Full shade to part shade. Prefers wet to medium wet, well-drained soil. Zones 3-8. ☉☂☂☂

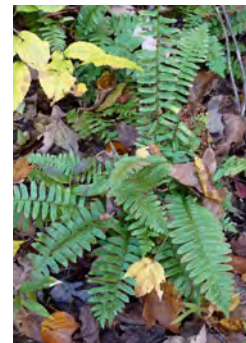
Lady Fern (*Athyrium filix-femina*) Grows from 1 to 3 feet high with an equal spread and a minimum root depth of 12 inches. Vegetation produces fronds with fully separate slender leaves. Full shade to part shade. Prefers medium wet, well-drained soil. Zones 4-8. ☉☂☂☂

Maidenhair Fern (*Adiantum pedatum*) Grows from 1 to 2 feet high with an equal spread and a minimum root depth of 10 inches. Curved stalks cause leaves to spread in a circular pattern. Full shade to part shade. Prefers medium wet, well-drained soil. Zones 3-8. ☉☂☂☂

Marginal Wood Fern (*Dryopteris marginalis*) Grows from 1½ to 2 feet high with an equal spread. Vegetation remains green year round. Full shade to part shade. Prefers medium wet, well-drained soil. Zones 3-8. ☉☂☂☂

Ostrich Fern (*Matteuccia struthiopteris*) Grows from 3 to 6 feet high with a spread of 5 to 8 feet. Large fronds resemble feathers. Full shade to part shade. Prefers wet to medium wet soil. Zones 3-7. ☉☂☂☂

Royal Fern (*Osmunda regalis*) Grows from 2 to 3 feet high with an equal spread and a minimum root depth of 16 inches. Spores are found in tassels and the tip of the frond. Fibrous root systems. Full shade to part shade. Prefers wet to medium wet soil. Zones 3-9. ☉☂☂☂



Christmas Fern



Cinnamon Fern



Hay-scented Fern



Interrupted Fern



Lady Fern



Maidenhair Fern



Marginal Wood Fern



Ostrich Fern



Royal Fern

Plant Identification Key

- ☉ Full Sun—more than 5 hours of direct sun per day
- ☂ Partial Sun—2 to 5 hours of direct sun per day or full day of dappled sun
- ☐ Full Shade—Fewer than 2 hours of direct sun per day
- ☂☂ Wet Soils—Soils that are wet most of the year and/or poorly drained soils
- ☂☂☂ Dry Soils—Soils that are dry year round and/or soils that drain quickly.

Woody Low Shrubs (Up to 4 feet)

These plants are best for planting in shallow soils on steep slopes

Bearberry (*Arctostaphylos uva-ursi*) Grows from 4 to 6 inches with a spread of 3 feet and minimum root depth of 10 inches. Spreads easily to form a mat. Grows best in moist, well-drained, rich, acidic soil. Full sun to partial shade. Light pink, cup-shaped flowers give way to bright red berries in the fall. Helps prevent erosion and is commonly planted along banks. Salt tolerant. Zones 2-6. ○●☀️

Bog Rosemary (*Andromeda polifolia*) Grows from 6 to 30 inches high with a spread of 3 feet. Leaves are narrow, evergreen and leathery with a blue-green color. Some resemblance to the culinary herb. Typically found in northern bogs and marshes. Flowers are small, pink, and bell-shaped. Grows best in very moist, acidic soil in cooler climates. Low salt tolerance. Zones 2-6. ●●☀️

Cranberry (*Vaccinium macrocarpon*) Grows from 6 to 9 inches high and spreads easily. Prefers an acidic, wet to moist soil. Typically grows in bogs. Grows best in full sun. Small pink flowers bloom in the spring and are followed by the commonly known red berries. Edible by wildlife and humans. Zones 2-6. ○☀️

Creeping Juniper (*Juniperus horizontalis*) Grows approximately 2 feet high with a spread of 8 feet and a minimum root depth of 12 inches. Tolerates a wide range of soil as long as it is well drained. Grows best in full sun. Foliage is often a silvery blue color. Small, blue, berry-like fruit. Medium salt tolerance. Zones 3-9. ○☀️

Labrador Tea (*Ledum groenlandicum*) Grows to approximately 3 feet high with a spread of 3 feet and an minimum root depth of 18 inches. Typically found growing in bogs and swamps. Clusters of white flowers bloom in the spring. Grows best with full sun to partial shade. Prefers a wet, acid soil. Leaves are evergreen with a silvery underside. Low salt tolerance. Zones 2-5. ●●☀️

Meadowsweet (*Spiraea alba*) Grows from 3 to 4 feet high with an equal spread and a minimum root depth of 12 inches. Flowers are white to light pink and form in conical clusters with a fuzzy appearance. Full sun to part shade. Prefers wet to medium wet, well-drained soil. Flowers are attractive to pollinators. Medium salt tolerance. Zones 3-7. ○●☀️

Rhodora (*Rhododendron canadense*) Grows from 1 to 3 feet high with a similar spread and minimum root depth of 16 inches. Typically found near bogs and marshy areas. Grows best in wet, acidic soils with full sun to partial shade. Bright pink/purple flowers bloom in spring. Very hardy. Zones 2-6. ●●☀️

Sheep Laurel/Lambkill (*Kalmia angustifolia*) Grows from 1 to 3 feet high with a greater spread. Grows best in moist, organic, cool, acidic soils but can tolerate a variety of soil types. Prefers full sun to partial shade. Bright pink flowers bloom in early summer. As the name suggests it is poisonous to livestock. Zones 1-6. ●●☀️

Woodbine/Virginia Creeper (*Parthenocissus quinquefolia*) A climbing vine that can reach sizes of up to 40 feet with a minimum root depth of 16 inches. Grows easily. Will tolerate a range of soil types and a variety of light conditions. Drought tolerant. Small white flowers in spring. Foliage turns bright red in the fall and small purple berries are produced. When not in a position to climb it is an excellent ground cover and will put down more roots. Zones 3-9. ○●☀️

Plant Identification Key

○ Full Sun—more than 5 hours of direct sun per day

● Partial Sun—2 to 5 hours of direct sun per day or full day of dappled sun

● Full Shade—Fewer than 2 hours of direct sun per day

☀️ Wet Soils—Soils that are wet most of the year and/or poorly drained soils

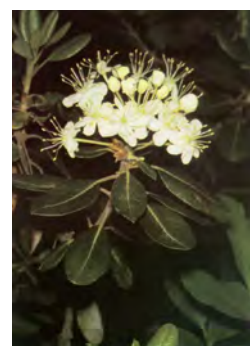
☀️ Dry Soils—Soils that are dry year round and/or soils that drain quickly.



Bearberry



Cranberry



Labrador Tea



Rhodora



Sheep Laurel



Bog Rosemary



Creeping Juniper



Meadowsweet



Rhodora



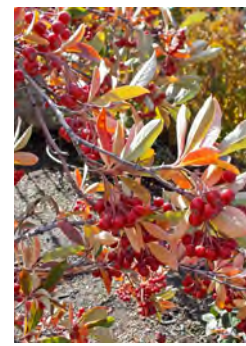
Woodbine



Bush Honeysuckle



Highbush Blueberry



Red Chokeberry



Sweet Fern



Beach Plum



Flowering Raspberry



Mapleleaf Viburnum



Summersweet



American Yew



Northern Bayberry

Woody Medium Shrubs (4-8 feet), Shallow Soil

These plants are best for planting in shallow soils on moderate slopes

Bush Honeysuckle (*Diervilla lonicera*) Also called American Fly Honeysuckle. (Do not confuse with European Fly Honeysuckle which is invasive.) Grows 2 to 5 feet high with a minimum root depth of 16 inches. A straggling shrub with handsome red berries. Sun to shade. Sandy, dry soil. Drought tolerant. Found in cool, rocky woods. Zones 3-7. ●●☀️

Flowering Raspberry (*Rubus odoratus*) Grows from 3 to 6 feet high with a spread of 6 to 12 feet and a minimum root depth of 16 inches. Fragrant pink flowers produce edible red fruits. Full sun to part shade. Prefers medium wet, well-drained soil. Flowers are attractive to pollinators. Zones 3-8. ○●☀️

Highbush Blueberry (*Vaccinium corymbosum*) Grows from 6 to 8 feet in height with a spread of 8 to 12 feet and a minimum root depth of 16 inches. Typically found near bogs and marshes. Prefers moist, well-drained, acidic soil. Sun to partial shade. White bell-shaped flowers bloom in the spring and are followed by edible dark blue berries. Leaves turn red in the fall. Berries are attractive to birds and other wildlife. Zones 5-7. ●●☀️

Mapleleaf Viburnum (*Viburnum acerifolium*) Grows from 4 to 6 feet high with an equal spread and a minimum root depth of 14 inches. Grows best in well-drained, mildly acidic soil with average moisture but can tolerate drier soils. Prefers shade to partial shade. Similar to other viburnums, a cluster of small white flowers gives way to dark blue/black fruits that are enjoyed by birds and other wildlife. Zones 4-8. ●●☀️

Red Chokeberry (*Aronia arbutifolia*) Grows from 6 to 8 feet high with a spread of 3 to 4 feet and a minimum root depth of 14 inches. In fall, foliage turns to bright red and red berries attract birds. Full sun to part shade. Prefers medium wet, well-drained soil. Salt tolerant. Zones 4-9. ○●☀️

Summersweet (*Clethra alnifolia*) Also called Hummingbird Clethra or Sweet Pepperbush. Grows 3 to 8 feet high with a 4 to 6 foot spread and minimum root depth of 16 inches. Attractive, deep-green foliage and very fragrant, white or pink flowers in summer. Sun to shade. Moist to wet soil. Zones 4-8. ●●☀️

Sweet Fern (*Comptonia peregrina*) Grows from 2 to 5 feet high with a spread of 4 to 8 feet and a minimum root depth of 14 inches. Slender, deeply notched leaves. Full sun to part shade. Prefers dry to medium wet soil. Medium salt tolerance. Zones 2-6. ○●☀️

Woody Medium Shrubs (4-8 feet), Deep Soil

These plants are best for planting in deep soils on moderate slopes

American Yew (*Taxus canadensis*) Grows from 1 to 6 feet high with branches spreading to 6 feet and a minimum root depth of 24 inches. Grows best in moist, loamy, alkaline, well-drained soils. Prefers partial to full shade. A popular food for moose and deer. Low salt tolerance. Zones 2-6. ●●☀️

Beach Plum (*Prunus maritima*) Grows 6 to 8 feet high with a spread of 6 feet and a minimum root depth of 20 inches. Grows best in well-drained soil but is adaptable to a range of soil types. Prefers full sun. White flowers bloom in the spring and are followed by edible purple fruits. Typically found along the coast and tolerant of salt. Salt tolerant. Zones 3-7. ○☀️

Northern Bayberry (*Myrica pennsylvanica*) Typically grows from 5 to 6 feet high but can reach 10 feet. Minimum root depth of 20 inches. Spreads easily and forms colonies. Often found in coastal areas. Foliage is semi-evergreen aromatic. Will grow well in dry, acidic soils. Grows best in full sun but will tolerate partial shade. Medium salt tolerance. Zones 2-6. ○●☀️

Woody Tall Shrubs (>8 feet) , Shallow Soil

These plants are best for planting in shallow soils on gradual slopes

Arrowwood (*Viburnum dentatum*) Grows from 6 to 10 feet high with an equal spread. Commonly used as a hedge. Produces flat clusters of small white flowers. Full sun to part shade. Prefers medium wet, well-drained soil. Flowers are attractive to pollinators. Salt tolerant. Zones 1-8. ○●●

Black Chokeberry (*Aronia melanocarpa*) Can grow up to 8 feet high with a spread of 8 feet and a minimum root depth of 14 inches. Grows best in moist, well-drained, acidic soils but will tolerate drier sandy soils or wet clay ones. Particularly good for soil stabilization. Prefers full to partial sun. White flowers bloom in the spring with black berries appearing in the fall and lasting through the winter. Low salt tolerance. Zones 3-8. ○●●=

Buttonbush (*Cephalanthus occidentalis*) Grows 6 to 10 feet with a similar spread and a minimum root depth of 14 inches. Darkish-green, glossy leaves. Large, showy, spherical flowerheads (pom-poms) in summer, followed by spherical fruits that persist into winter. Sun to part-sun. Wet soil. Grows in up to 3 feet of water. Flood tolerant. Found along lakes and streams. Medium salt tolerance. Zones 4-11. ○●●

Common Juniper (*Juniperus communis*) Grows to a height of 3-10 feet with an equal spread and a minimum root depth of 14 inches. Form can be variable from low and spreading to an erect shrub. Cones are berry-like. Leaves are evergreen needles but can turn light brown during the winter. Grows best with full sun. Salt tolerant. Zones 2-6. ●●=

Gray Dogwood (*Cornus racemosa*) Grows to 10 feet high with a spread of 10 to 15 feet and a minimum root depth of 16 inches. Can form thickets. Tolerant of a wide range of soils and city air pollution. Grows best in medium wet soil with full sun to partial shade. Small white clusters of flowers bloom in late spring. Medium salt tolerance. Zones 3-8. ○●●

Nannyberry (*Viburnum lentago*) Grows from 14 to 16 feet with a spread of 6 to 12 feet and a minimum root depth of 14 inches. Grows well in medium wet to average soil but is tolerant of drier soils. Prefers full sun to part shade. Clusters of white flowers turn into blue/black berry like fruit. Supposedly the fruit is attractive to nanny goats, hence its name. Zones 2-8. ○●●=

Staghorn Sumac (*Rhus typhina*) Grows from 10 to 25 feet tall with a spread of 15 to 20 feet. Tolerates a wide range of well drained soils. Grows best in full sun to partial shade. Clusters of fuzzy berry-like fruits are produced in the fall. A popular ornamental shrub due to its showy autumn colors. Zones 3-8. ○●=

Winterberry (*Ilex verticillata*) Grows 6 to 10 feet high with a similar spread and a minimum root depth of 16 inches. Grows best in moist well-drained soils but will tolerate wet, swampy areas. Prefers full sun to partial shade. Bright red attractive fruits last into winter. Male and female plants are needed to produce berries. Low salt tolerance. Zones 3-9. ○●●

Witherod (*Viburnum cassinoides*) Also called wild raisin. Grows 6 to 10 feet high with a lesser spread and minimum root depth of 14 inches. A slender, upright shrub with glossy, green leaves. Round clusters of feathery, white to pink flowers in late spring and whitish fruit turning blue-black in the fall. Red fall color. Sun to shade. Moist to wet soil but tolerates drier conditions. Good for birds. Zones 3-8. ○●●



Arrowwood



Black Chokeberry



Buttonbush



Common Juniper



Gray Dogwood



Nannyberry



Staghorn Sumac



Winterberry



Witherod



Hazelnut



Red Osier Dogwood

Woody Tall Shrubs (>8 feet), Deep Soil

These plants are best for planting in shallow soils on gradual slopes

Hazelnut (*Corylus americana*) Grows from 10 to 16 feet high with a spread of 8 to 13 feet and a minimum root depth of 20 inches. Small bell-shaped flowers grow in clusters. Female plants will produce small edible nuts in the summer. Prefers dry to medium wet, well-drained soil. Zones 4-9. ○●=

Red-osier Dogwood (*Cornus sericea*) Grows from 6 to 9 feet high with a spread of 8 to 12 feet and minimum root depth of 20 inches. Grows best in rich medium to wet soil. Typically found in bogs or swamps and will tolerate a wide range of soils. Young branches are bright red. Small white clusters of flowers bloom in late spring and are followed by fall fruits which are attractive to birds. Prefers full sun to part shade. Zones 2-7. ○●●

Plant Identification Key

- Full Sun—more than 5 hours of direct sun per day
- Partial Sun—2 to 5 hours of direct sun per day or full day of dappled sun
- Full Shade—Fewer than 2 hours of direct sun per day
- Wet Soils—Soils that are wet most of the year and/or poorly drained soils
- = Dry Soils—Soils that are dry year round and/or soils that drain quickly.



Example of a living shoreline on Bustins Island, Falmouth, ME

Woody Small Trees

These plants are best for planting in deep soils on moderate slopes

American Hornbeam (*Carpinus caroliniana*) Grows from 20 to 35 feet high with an equal spread and a minimum root depth of 20 inches. Smooth gray trunk with serrated oval leaves. Full shade to part shade. Prefers dry to medium wet soil. 3-9. ☉ ● ≡

Chokecherry (*Prunus virginiana*) Grows from 25 to 30 feet tall with a spread of 20 feet. Grows best in moist soil but will tolerate drier conditions. Partial to full sun. White flowers bloom in the spring and are followed by bright red berries. Flowers have a strong sweet fragrance. The fruit has an astringent taste but does attract birds. Zones 2-6. ○ ● ≡

Cockspur Hawthorn (*Crataegus crus-galli*) Grows from 25 to 35 feet high with an equal spread and a minimum root depth of 24 inches. Many fragrant white flowers bloom in spring. Branches are armored with long thorns. Fruit produced in the fall is edible, although, unpleasant. Full sun to part shade. Prefers medium wet, well-drained soil but will tolerate a wide range as long as drainage is adequate. Flowers are attractive to pollinators. Zones 3-7. ○ ● ♠

Common Witchhazel (*Hamamelis virginiana*) Grows 10 to 15 feet high with an equal spread with a minimum root depth of 20 inches. Prefers moist, acidic soil and grows best with full sun to partial shade. Small clumps of yellow flowers bloom in early fall and have a pleasing fragrance. Zones 3-8. ○ ● ♠

Pagoda Dogwood (*Cornus alternifolia*) Grows from 15 to 25 feet high with a spread of 20 to 32 feet and a minimum root depth of 20 inches. Small clusters of white flowers with a fuzzy appearance bloom in spring. Full sun to part shade. Prefers medium wet, well-drained soil. Flowers are attractive to pollinators. Zones 3-7. ○ ● ♠

Pussy Willow (*Salix discolor*) Grows from 6 to 15 feet high with a spread of 4 to 12 feet and a minimum root depth of 20 inches. Flowers are showy catkins that emerge in late winter. Full sun. Prefers wet to medium wet soil. Medium salt tolerance. Zones 4-8. ○ ♠

Sassafras (*Sassafras albidum*) Grows from 30 to 60 feet high with a spread of 25 to 40 feet and a minimum root depth of 18 inches. Flowers are yellow-green and grow in small showy clusters. Large tap root. Full sun to part shade. Prefers medium wet soil. Medium salt tolerance. Zones 4-9. ○ ● ♠

Shadblow Serviceberry (*Amelanchier canadensis*) Grows from 25 to 30 feet high with a spread of 15 to 20 feet. Grows best in medium wet, well-drained soil but will tolerate a wide range. Prefers partial shade to full sun. Clusters of white flowers are followed by edible red/purple berries in late summer. Zones 4-8. ○ ● ♠

Striped Maple (*Acer pensylvanicum*) Grows from 15 to 25 feet high with a spread of 12 to 20 feet and a minimum root depth of 28 inches. Green bark on younger trees has distinct white stripes. Full shade to part shade. Prefers medium wet, well-drained acidic soils. Medium salt tolerance. Zones 3-7. ● ● ♠

Plant Identification Key

○ Full Sun—more than 5 hours of direct sun per day

☉ Partial Sun—2 to 5 hours of direct sun per day or full day of dappled sun

● Full Shade—Fewer than 2 hours of direct sun per day

♠ Wet Soils—Soils that are wet most of the year and/or poorly drained soils

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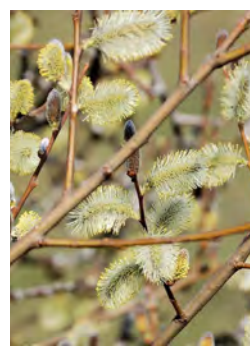
American Hornbeam



Chokecherry



Common Witchhazel



Pussy Willow



Shadblow Serviceberry



Cockspur Hawthorn



Pagoda Dogwood



Sassafras



Striped Maple



Balsam Fir



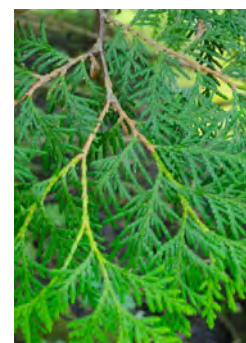
Green Ash



Larch



Sugar Maple



White Cedar



Eastern White Pine



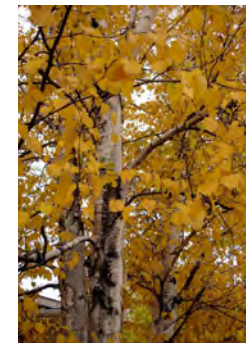
Hemlock



Red Pine



Swamp White Oak



Yellow Birch

Woody Tall Trees

These plants are best for planting in deep soils on gradual slopes

Balsam Fir (*Abies balsamea*) Grow up to 50 feet high and 20 feet wide. Narrow, pyramidal tree; typical Christmas tree shape. Needles are short, dark green, and blunt. Small, light brown cones. Sun to shade. Moist to wet soils. Zones 3-5. ☉ ● ♠

Eastern White Pine (*Pinus strobus*) Can grow to 100 feet with a 40 foot crown. Large, open tree with horizontal branching. Long, soft, blue-green needles. Can be pruned to hedges or windbreaks. Rapid growth. Sun to partial shade. Tolerates dry soil. Does not tolerate salt or flooding. Zones 3-7. ○ ● ≡

Green Ash (*Fraxinus pennsylvanica*) Grows to 60 feet. Rapid growth. Rounded crown. Leaves turn bright yellow in fall. Bark has narrow, interlacing ridges. Zones 3-9. ○ ● ♠

Hemlock (*Tsuga canadensis*) Can grow up to 80 feet with a 30 foot spread in ideal conditions. Large, irregular, pyramidal tree. Small, deep-green needles with a loose, feathery appearance. Small, interesting cones. Also available in dwarf forms. Sun to shade. Does best in cool, moist, well-drained soil. Tolerates shade and some flooding. Zones 3-7. ○ ● ♠ ≡

Larch (*Larix laricina*) Also know as Tamarack. Grows to 65 feet. Narrow and upright with horizontal branches and sweeping twigs. Fine, light-green needles turn yellow in fall and drop. Has the appearance of an evergreen but is not. Full sun. Prefers moist soil but tolerates poor, wet soil and flooding. Medium salt tolerance. Zones 2-4. ○ ♠

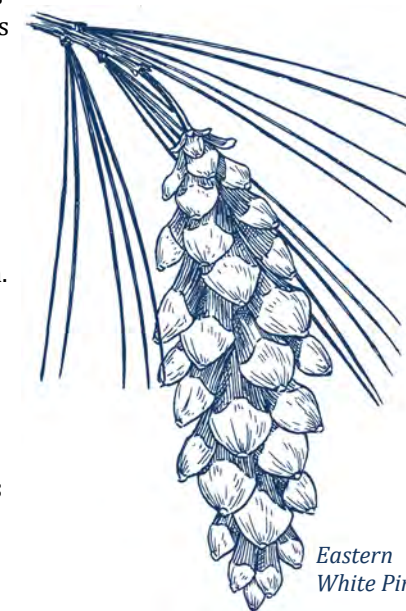
Red Pine (*Pinus resinosa*) Also called Norway Pine. Can reach 80 feet. Rapid growth. Large, handsome, straight tree. Long, dark green, stiff needles. Reddish bark. Makes an excellent windbreak. Full sun. Bet in dry, sandy soil. First discovered near Norway, Maine. Zones 2-5. ○ ≡

Sugar Maple (*Acer saccharum*) Grows up to 75 feet with a 40 foot spread. Stunning orange-red fall color. Full sun, but tolerates some shade. Moist, well-drained soil. Does not tolerate wet or compacted soil. Zones 3-8. ○ ● ≡

Swamp White Oak (*Quercus bicolor*) Grows to 60 feet with a similar spread. Produces many acorns. Leaves irregularly lobed, about 6 inches long, shiny, dark green above and light below. Bark on large trees ridged and furrowed. Moist to wet soil. Tolerates swampy, poorly-drained conditions. Zones 4-8. ○ ● ♠

White Cedar (*Thuja occidentalis*) Also called Arborvitae. Grows to 60 feet and 25 feet across. A dense tree with flat, green aromatic foliage. Often sheered and shaped for landscaping purposes, but has an attractive shape on its own. Sun to part sun. Moist soil best, tolerates flooding and occasional drought. Found in wet soils and swampy areas. Zone 3. ○ ● ♠

Yellow Birch (*Betula alleghaniensis*) Can grow up to 80 feet with a 50 foot spread. Attractive golden, peeling bark on older specimens. Leaves are alternate, 3-5 inches long, turning yellow in fall. Part-sun to shade. Moist soil. Found near streams. Zones 3-7. ● ● ♠



Eastern White Pine

Additional Resources

Natural Landscapes of Maine by Susan Growler & Andy Cutko:

http://maine.gov/dacf/mnap/about/publications/community_classification.htm

Additional plant information can be found on the Department of Agriculture, Conservation and Forestry’s Maine Natural Areas Program website: <http://maine.gov/dacf/mnap/features/index.htm>

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DISCLAIMER: The information provided in this guide is intended for general planning purposes only. Many variables affect how successful individual plants will be at a given site. In addition, weather and overall climate fluctuations (including micro-climate factors) will have a large impact on the success of plant species or community. CCSWCD and the partners who collaborated to create this guide do not guarantee the success of any plant species at any site. Please consult a professional for designs of pathways or structures within the bluff zone.

CONTACT THE MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION AND YOUR MUNICIPAL CODE ENFORCEMENT OFFICER FOR THE PROPER PERMITS ANYTIME WORK IS BEING DONE ADJACENT TO A WATER BODY.

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CCSWCD Authors: Jenna Martyn Fisher and Damon Yakovlevf

We gratefully acknowledge the participation of the following individuals:

Peter Slovinsky and Stephen Dickson, Maine Geological Survey
For more information about the Maine Geological Survey, contact mgs@maine.gov or 207-287-2801.

Kathleen Leyden, Maine Coastal Program
For more information about the MCP, visit www.maineoceanicprogram.org or contact 207-287-2351.

Nicole Anderson, M.P.H., B.S. Horticulture

Troy Barry, Fluvial Geomorphologist