



LYNNHAVEN RIVER

Tidal Wetland Restoration

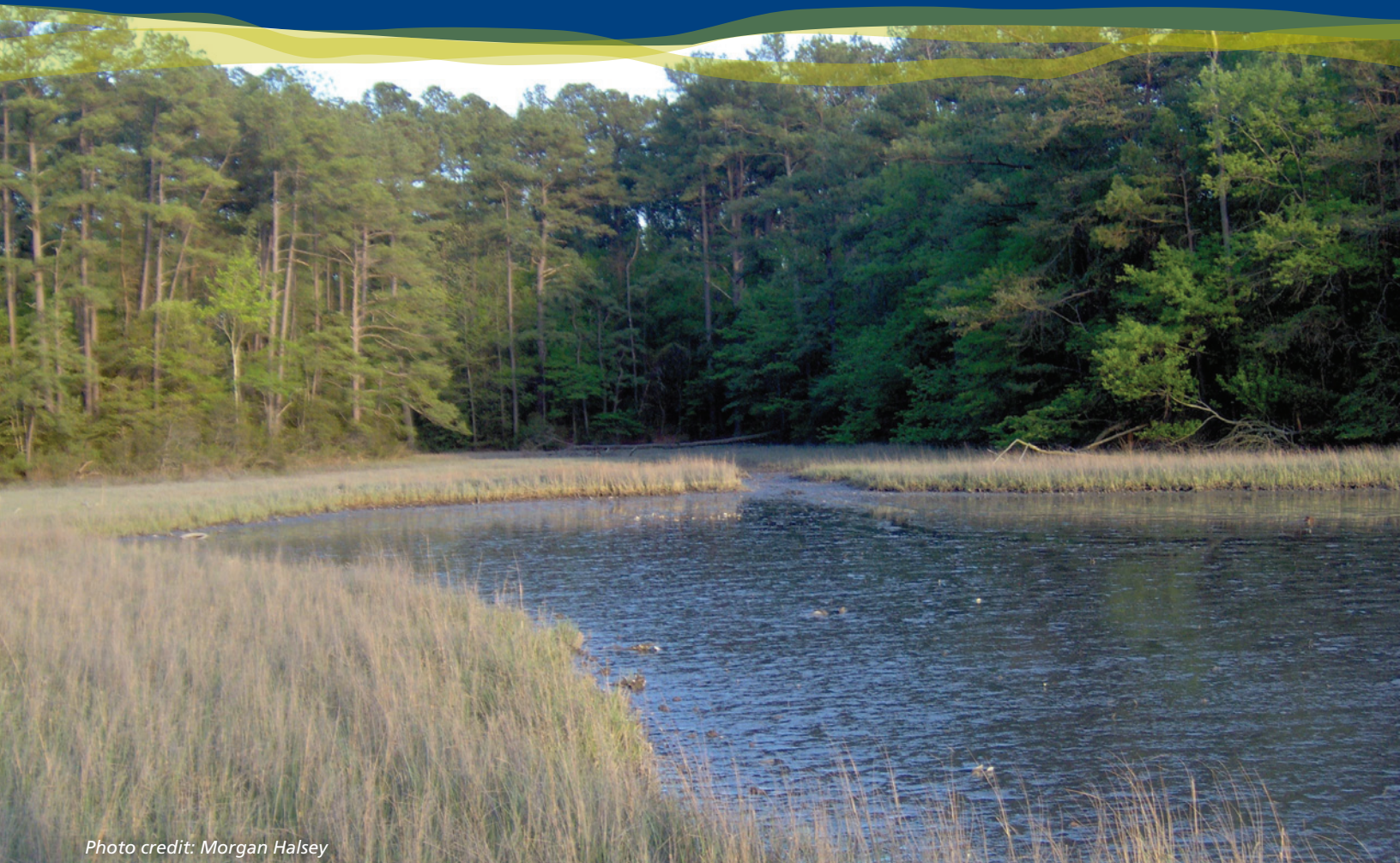


Photo credit: Morgan Halsey

Tidal wetlands are the natural shorelines that give our local waterways their characteristic beauty. Influenced by the tides, they may be flooded daily or only a few times a month. Tidal wetlands may be covered with plants or have a stone, mud or sand bottom, and often support important intertidal organisms, such as oysters, mussels, crabs and juvenile fish.

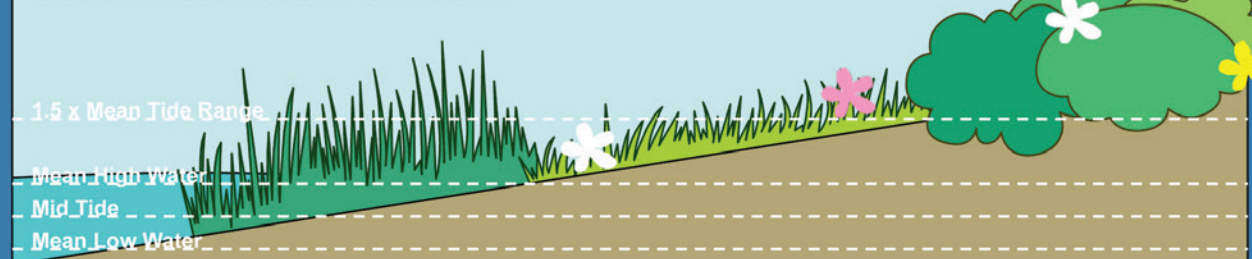
Our tidal wetlands provide fish and wildlife habitat, boating and fishing recreation, and commercial harvests of marine fin- and shellfish, while providing valuable services such as flood control, shoreline erosion control and the protection of water quality through removal of harmful nutrients.

Because tidal wetlands are so valuable to marine ecosystems, the term "Living Shoreline" has been used to describe the use of restored tidal wetlands and native buffer vegetation for shoreline erosion control.



The Tidal Shoreline

Tidal Shoreline Profile



Bird's Eye View



Low Marsh Zone

1 Vegetation appears at elevations between mean low and mean high water. In the Lynnhaven, this zone is dominated by Saltmarsh (or smooth) cordgrass (*Spartina alterniflora*).

The tidal shoreline is comprised of zones based on land elevation relative to the tides.

Mean low and mean high water refer to the average low tide and the average high tide elevations.

High Marsh Zone

2 Vegetation appears at elevations above mean high water. In the Lynnhaven, this zone is primarily composed of a mixture of vegetation including Saltmeadow hay (*Spartina patens*), Saltgrass (*Distichlis spicata*), Marsh elder (*Iva frutescens*) and Groundsel-tree (*Baccharis halimifolia*).

Transition Zone/Upland "Buffer"

3 Vegetation appears at elevations above 1.5 x mean tide range, added to mean low water (this elevation represents the local, legal, jurisdictional wetland boundary.) This zone is vegetated by a diverse mixture of native plants important for their habitat value and buffering of upland runoff.

Consider a Living Shoreline



Shoreline on the Lynnhaven River with failing bulkhead (before). Photo credit: Bill Fleming



Same shoreline after the installation of living shoreline. Photo credit: Kevin DuBois

Living shorelines are the state-preferred approach to erosion control because they provide long-term protection, restoration or enhancement of tidal wetlands through the strategic regrading and placement of plants, sand fill, stone support and other structural and/or organic materials such as

biologs. In contrast to hard structures such as stone revetments and bulkheads, living shorelines preserve the important natural connections between aquatic, marine and upland ecosystems. Living shoreline treatments reflect the best understanding of how shoreline wetlands function, and how the benefits they provide can be sustained. For these reasons, living shorelines are seen as the most desirable shoreline treatment option by resource managers, scientists, conservationists and federal, state and local planning officials.

Benefits of Living Shorelines:

- Creates a natural buffer that absorbs wave energy and reduces erosion
- Maintains natural shoreline dynamics
- Preserves, creates, and maintains habitat for aquatic plants and animals
- Restores critical feeding and nursery habitat for fish
- Improves water quality and clarity
- Enhances wetland resiliency to sea level rise
- Provides credit towards the Lynnhaven River NOW Pearl Home Award Program

All waterfront projects require construction permits and a certified engineering design. Because of the preferred status of living shoreline projects, permitting of these projects may proceed more quickly than those for other shoreline projects. Consult Lynnhaven River Now's Restoration Project Coordinator* for guidance and advice on how to proceed. The Virginia Beach Planning Department will be able to provide permitting information for projects within the City of Virginia Beach.

*Joe Scalf, Lynnhaven River NOW Restoration Project Coordinator, 757-962-5398 or joe@lynnhaven2007.com. For more information on living shorelines, visit the VIMS Center for Coastal Resource Management's Living Shoreline at <http://ccrm.vims.edu/livingshorelines/>.



Same living shoreline with view including upland buffer area. Photo credit: Kevin DuBois

Things You Can Do

Know your wetland boundary. Stop mowing your wetland grasses. Establish a "no-mow zone" or plant a buffer to establish a healthy transition to your high marsh zone. Enhance your buffer area with native vegetation. Remove shoreline debris to encourage natural growth of your wetland grasses. To learn how to get started, contact Lynnhaven River Now's Restoration Project Coordinator. See page 3 for contact information.

Phragmites



Phragmites australis is an invasive, non-native grass that is quickly spreading throughout our tidal wetland areas and disrupting the natural balance of our already diminished wetland system. It is a large, perennial grass that is found in wetlands and adjacent lands reaching heights up to 20 feet. *Phragmites* typically forms dense, monotypic stands that reduce the diversity of plant and animal species and provide little habitat value for wildlife. It spreads vigorously by rhizomes and can quickly overtake an area, smothering

out native vegetation. Disturbed sites are particularly vulnerable to *Phragmites* invasion. *Phragmites* can tolerate both fresh and salt water conditions, and is frequently found along our Lynnhaven River's shorelines.

It is very difficult to eradicate *Phragmites*, but it can be controlled with persistent treatment over several seasons. Control methods include spraying with appropriate herbicides by a certified applicator, mowing, and excavating. These control methods each work with a varying degree of effectiveness and are often appropriate in combination with each other. Management and control efforts are needed from both local municipalities and private property owners. If unchecked, the spread of *Phragmites* will continue.

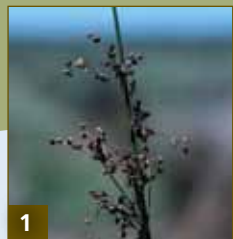
Wetlands and Sea Level Rise

To learn more about "The Effects of Sea Level Rise on Tidal Wetlands in the Lynnhaven River Watershed," go to: http://www.ccrm.vims.edu/gis_data_maps/static_maps/lynnhaven_project/Lynnhaven%20Final%20Report.pdf.

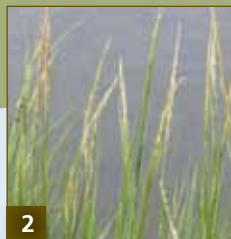
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Tidal Wetland Plants



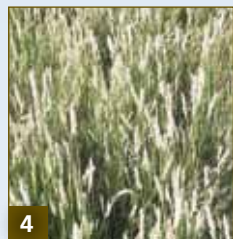
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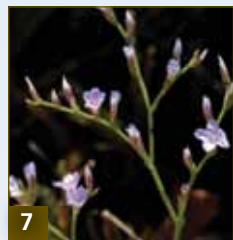
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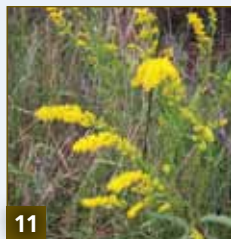
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ZONE 1 LOW MARSH ZONE – Vegetation appears between mean low and mean high water.

- | | |
|---------------------------------|-------------------------------|
| 1. <i>Juncus roemerianus</i> | Black needlerush |
| 2. <i>Spartina alterniflora</i> | Saltmarsh or smooth cordgrass |

ZONE 2 HIGH MARSH ZONE – Vegetation appears at elevations above mean high water.

- | | |
|------------------------------------|-------------------------|
| 3. <i>Borreria frutescens</i> | Sea oxeye |
| 4. <i>Distichlis spicata</i> | Saltgrass |
| 5. <i>Iva frutescens</i> | Marsh elder |
| 6. <i>Kosteletzkya virginica</i> | Marsh mallow |
| 7. <i>Limonium</i> spp. | Sea lavender |
| 8. <i>Panicum virgatum</i> | Switchgrass |
| | (upper reaches of zone) |
| 9. <i>Pluchea purpurascens</i> | Saltmarsh fleabane |
| 10. <i>Salicornia</i> spp. | Glasswort |
| 11. <i>Solidago sempervirens</i> | Seaside goldenrod |
| 12. <i>Spartina cynosuroides</i> | Big cordgrass |
| 13. <i>Spartina patens</i> | Saltmeadow hay |
| 14. <i>Schoenoplectus robustus</i> | Saltmarsh bulrush |

ZONES 2 AND 3 HIGH MARSH TO UPLAND BUFFER – Vegetation found in both upper levels of the High Marsh continuing into the Upland Buffer area.

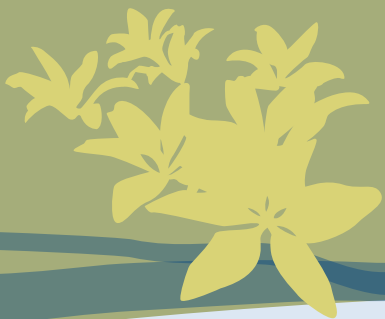
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|----------------------------------|-------------------------------|
| 15. <i>Baccharis halimifolia</i> | Groundsel-tree |
| 16. <i>Hibiscus moscheutos</i> | Marsh hibiscus or rose mallow |
| 17. <i>Impatiens capensis</i> | Jewelweed |

ZONE 3 TRANSITION ZONE/UPLAND BUFFER – Vegetation appears at elevations above 1.5x mean tide range, added to mean low water.

- | | |
|--------------------------------|----------------|
| 18. <i>Asclepias incarnata</i> | Swamp milkweed |
|--------------------------------|----------------|

PHOTO CREDITS:

1. Photo credit: Larry Allain, USDA, NRCS. 2011. The PLANTS Database (<http://plants.usda.gov>, 1 November 2011). National Plant Data Team, Greensboro, NC 27401-4901 USA.
 2., 3., 4., 6., 8., 9., 15. & 16. Photo credit: Kevin DuBois
 7. & 17. Photo credit: Lytton J. Musselman, Old Dominion University
 10. Photo credit: David Byrd
 14. Photo credit: Center for Coastal Resource Management – VIMS



Wetland and Native Plant Sources

Virginia Sources:

COASTAL PLANTS

Michael Cullipher
2088 Jarvis Road, Virginia Beach, VA 23456
Phone (757) 721-7456
bocull@msn.com

WILD WOODS FARM NATIVE PLANT NURSERY

PO Box 61413
Virginia Beach, VA 23466-1413
Phone (757) 421-3929
wildfood@cox.net
<http://ecoimages-us.com/nursery.aspx>

NATURESCAPES

4075 Vicksburg Road, Suffolk, VA 23437
Phone (757) 539-4833; fax (757) 986-3633
wetlandplant@aol.com

Look for annual Native Plants Sales
from these local sources, too:

LYNNHAVEN RIVER NOW

www.lrnw.org

THE HERMITAGE MUSEUM AND GARDENS

www.heritagefoundation.org

THE VIRGINIA NATIVE PLANT SOCIETY

www.vnps.org

THE VIRGINIA LIVING MUSEUM

www.thevlm.org

Out of State Sources:

COASTAL PLAIN CONSERVATION NURSERY

3067 Conners Drive
Edenton, NC 27932
Phone (252) 482-5707
<http://coastalplainnursery.com/>

ENVIRONMENTAL CONCERN INC.

PO Box P 201 Boundary Lane
St. Michaels, MD 21663
Phone (410) 745-9620
nursery-sales@wetland.org
www.wetland.org

MELLOW MARSH FARM

1312 Woody Store Road
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www.mellowmarshfarm.com

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