



Prince William County Government
Board of County Supervisors



Living Shoreline at Leesylvania State Park

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What is a Living Shoreline



- **Living shorelines** are a relatively new approach for addressing shoreline erosion and creating protecting marsh areas. Unlike traditional structures such as bulkheads or seawalls that can worsen erosion to adjacent unprotected properties .



Partnership was formed to facilitate the construction of the first Living Shoreline in Northern Virginia



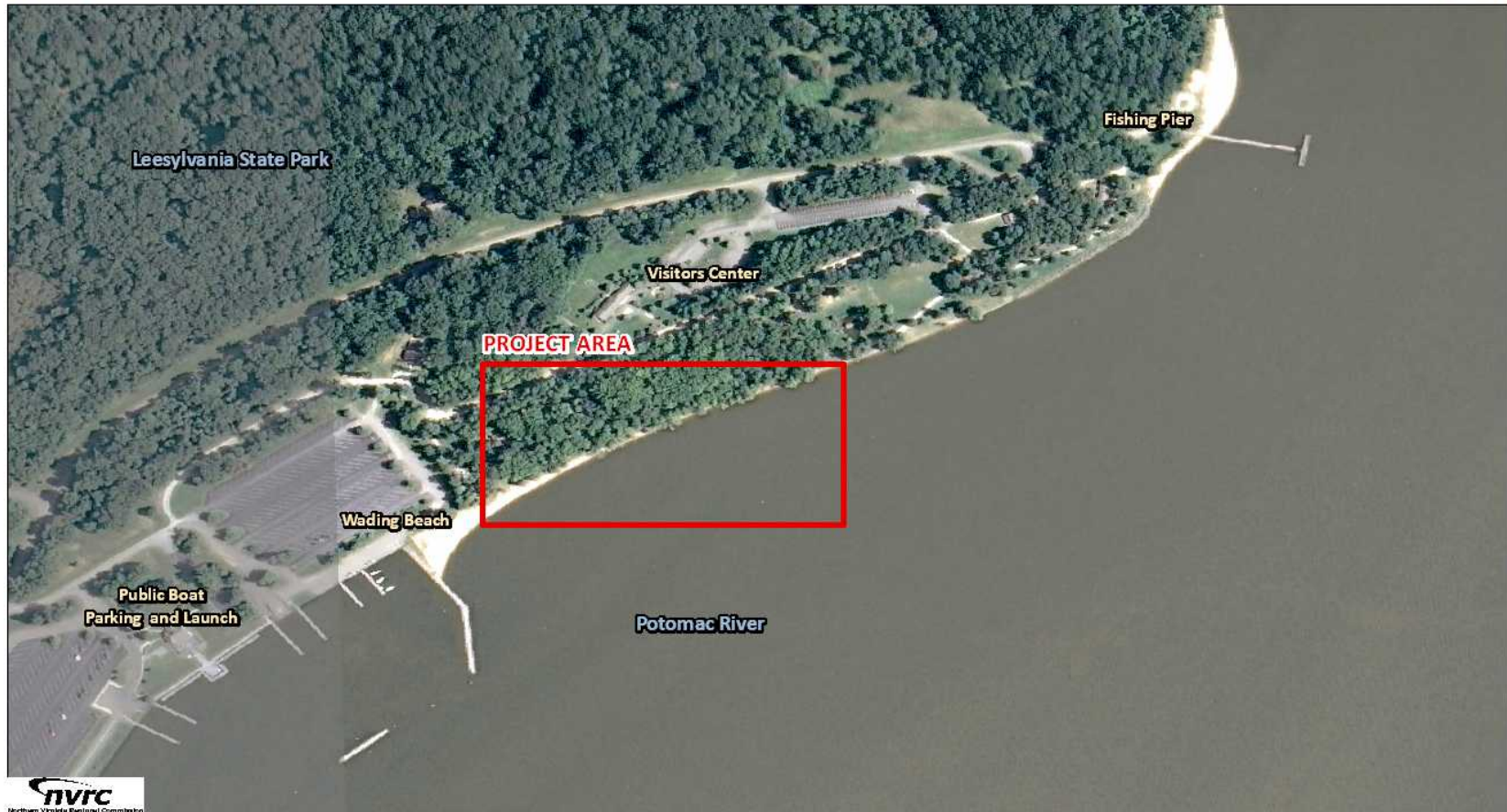
- **NVRC** – Coordination and management
- **Prince William County Department of Public Works** – Permitting and Technical Assistance
- **DCR, Leesylvania State Park** – Site Manager
- **VIMS** – design and oversight



Site Selection



LEESYLVANIA STATE PARK *LIVING SHORELINES PROJECT*



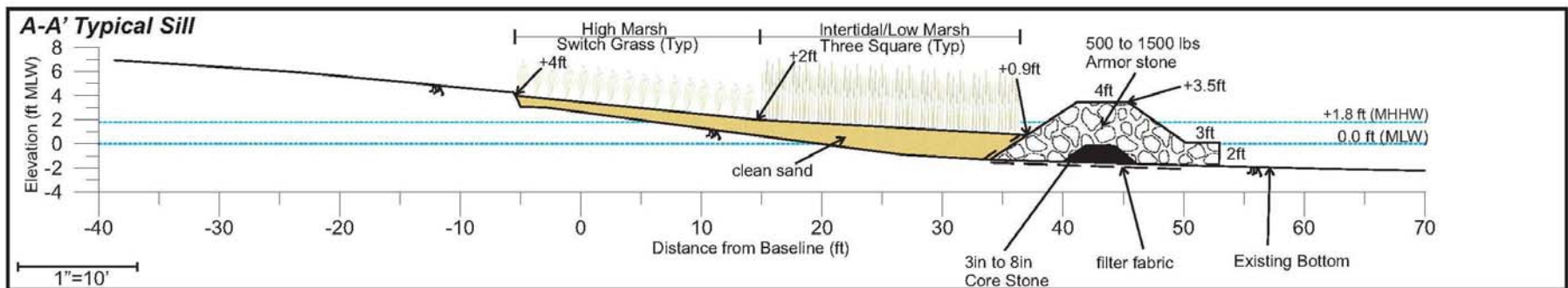
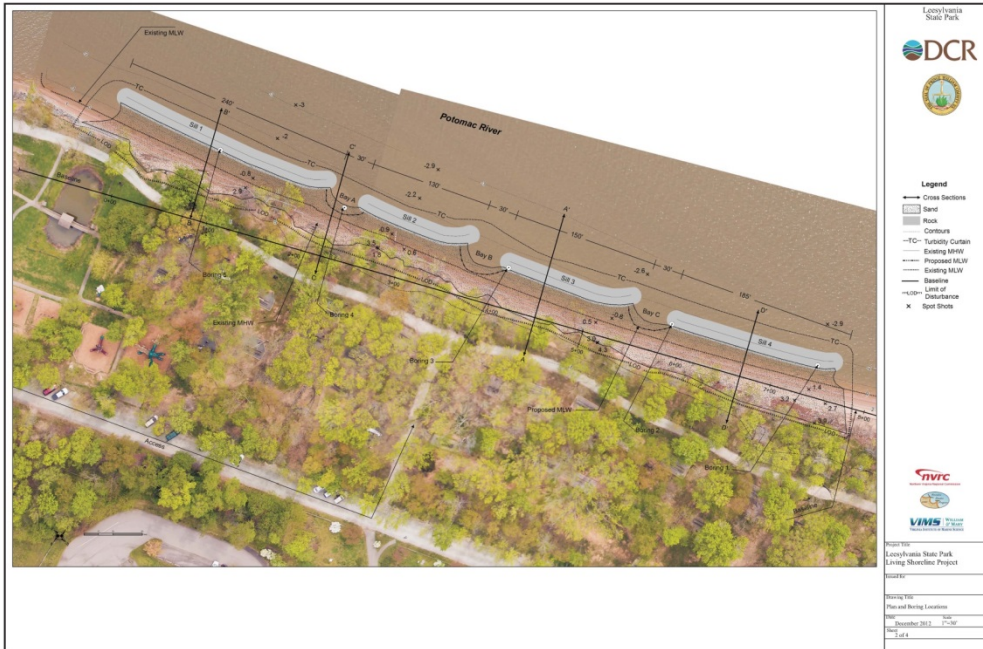
Project Objectives



- Stabilize 800 feet of shoreline
- Enhance 22,000 sq. ft of riparian buffer habitat
- Restore 25,000 sq. ft of intertidal marsh and beach habitat
- Protect park assets from storms
- Filter upland runoff



Design done by Scott Hardaway of VIMS. The Hybrid Approach of Sills and created wetlands.



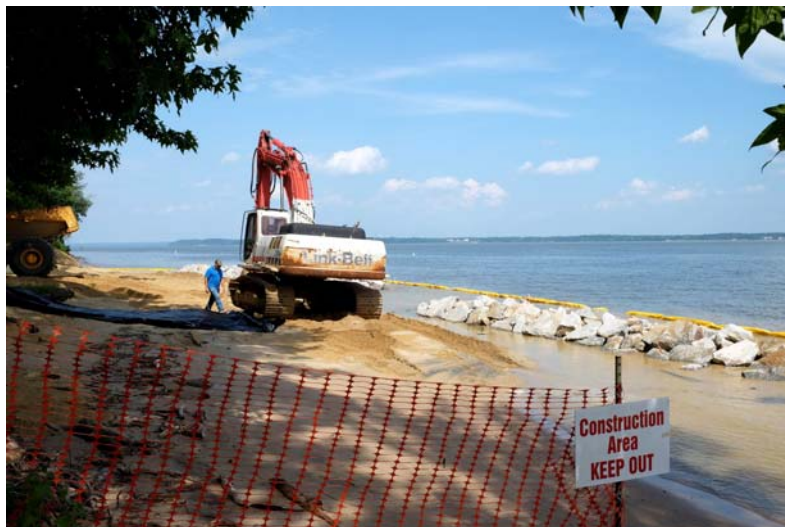
Bulkheads and hard stabilization can sever the natural processes & connections between uplands and aquatic areas.



Construction and Planting



- Project was constructed with no tax dollars. Funded by various Grants and PWC tidal mitigation Fund



TMDL Protocol 1. Prevented Sediment



- Step 1 – Estimate shoreline sediment erosion rate= **1foot/year**
- Step 2 – Convert shoreline erosion to nutrient loading rate – $V(\text{volume}) = L$ (length) E (erosion rate ft./yr.) B (bank height)
 $800 \times 1.0 \times 2 =$ **1600 ft³/yr. Sediment**
 - Default values:
 - Bulk density = $93.6 \text{ lb./ft}^3 \times 1600 =$ **149,760 lbs. sediment /yr. /2000= 74.88 tons sediment/year**
 - $0.57 \text{ pounds TN/ton sediment} \times 74.88 =$ **42lbs. /year**
 - $0.41 \text{ pounds TP/ton sediment} \times 74.88 =$ **30.70lbs./year**
- Step 3 – Estimate shoreline restoration efficiency – Used 100% effectiveness Site specific sampling can be used

We will most likely conduct on site sampling



Areas where samples will be collected for Protocol 1.



Protocol 2 :Denitrification



- 25,000 sq. feet of wetland enhancement and restoration=0.57 acres x default value of 85lb TN /acre/year= 48.7 lb./yr.
- Default values are based on a literature review of 18 studies



Protocol 3 :SEDIMENTATION



- TP:0.57 acres x 5.29 TP/acre /yr.
=9.522lbs.TP/yr.
- TSS:0.57 acres x 6,959lbs.TSS/acre/yr.
= 3,966.63lbs.TSS/acre/yr.

Default values are all based on Literature review of 22 studies



Protocol 4 :Marsh Redfield Ratio



- Can only be used in the first year after construction
- $0.57 \text{ acres} \times 205 \text{ lbs. TN/yr.} = 116.85 \text{ lbs/yr.}$
- Tidal marsh vegetation ties up TN and TP that would otherwise enter the Bay
- • Summarized studies in the Bay and other relevant areas that quantified marsh Redfield ratio and aboveground and belowground production
- • Literature review over 50 studies, summarized each study took the mean aboveground and belowground biomass, and converted to pounds TN/acre/yr. and TP/acre/yr.



A little Recognition from the GOV



Thank You !

