



Case Study: Successful Living Shoreline Group 1 General Permit

Project Name: Hampton River Living Shoreline

Location: Western shoreline of Herberts Creek, Hampton, VA

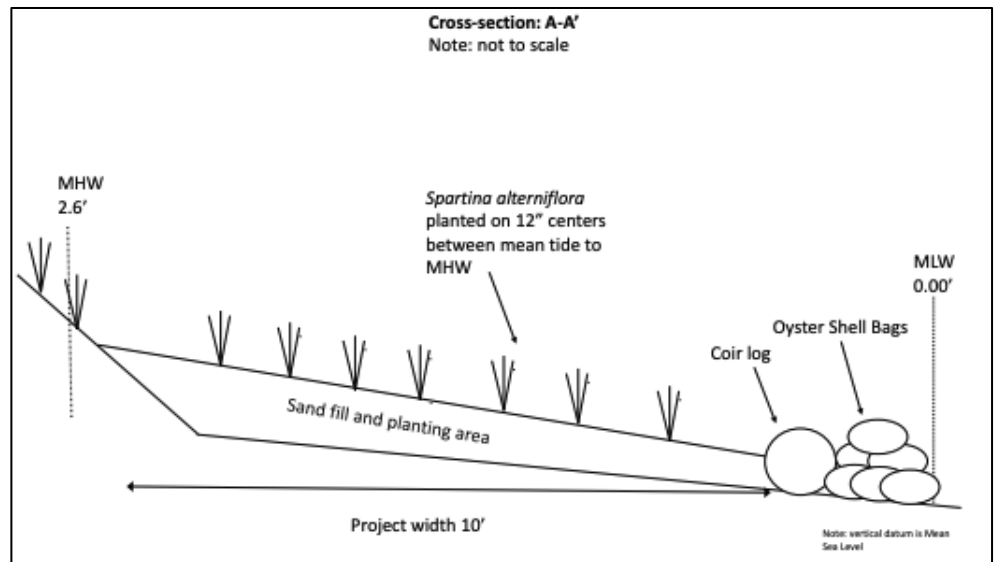
Project Summary: To combat shoreline erosion, a homeowner worked with the Elizabeth River Project and the James River Association to permit and install 160 linear feet of living shoreline along shoreline in Hampton River.

Project Description: Along the section of shoreline where the living shoreline was to be installed was rubble concrete. Before living shoreline installation began, all rubble concrete was removed. This living shoreline project consisted of two sections (100 linear feet and 60 linear feet) of 16" coconut fiber coir logs covered by oyster shell bags that were placed at mean low water and tied to mean high water. Behind each coir log section, clean coarse grade sand was placed then planted with native salt marsh vegetation (*Spartina alterniflora*).

Project Materials:

- Clean commercial borrow pit sand
- Coconut fiber coir logs
- Oyster shell bags
- *Spartina alterniflora*

Steps to Reduce Impacts: Steps were taken to reduce disturbance to existing salt marsh vegetation. Oysters existing within living shoreline site were hand-harvested and placed among oyster shell bags at the completion of project.



Project Encroachment: This living shoreline encroached on 1,124 square feet of non-vegetated wetlands (mudflat) with a maximum 15 feet encroachment channelward of mean high water.

Project Results: This project qualified for a Virginia Marine Resources Commission’s Living Shoreline Group I General Permit based on project materials (no riprap), fetch not exceeding ½ mile in any direction, project footprint located landward of mean low water, and sand not placed in manner that raised elevation of existing wetland above elevation of jurisdictional wetlands. Since this project met the requirements for the General Permit, a separate wetlands permit was not required.

Project Timeline:





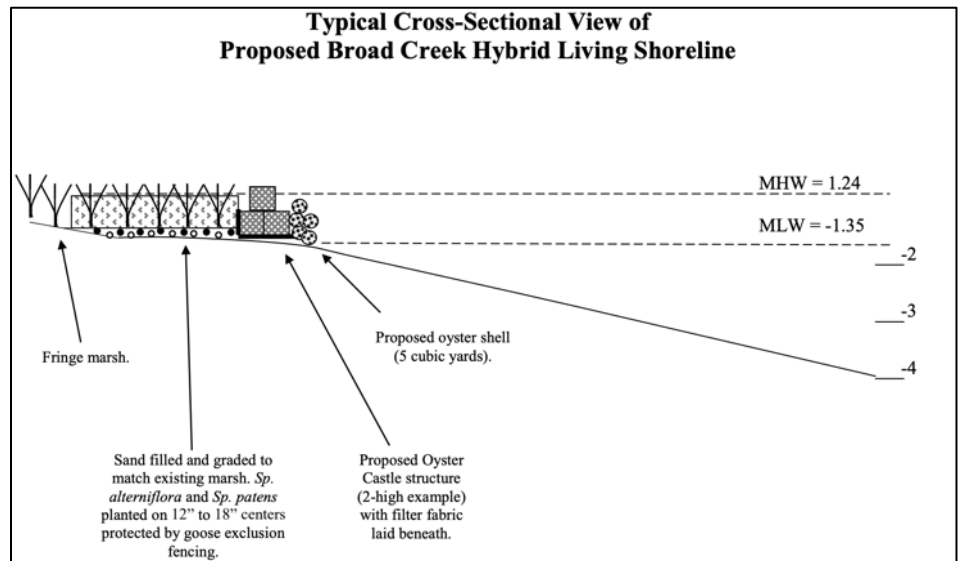
Case Study: Successful Living Shoreline Group II General Permit

Project Name: Elizabeth River Living Shoreline

Location: Eastern shoreline of Broad Creek, Norfolk, VA

Project Summary: To protect and restore an existing salt marsh shoreline from erosion, a homeowner worked with the Elizabeth River Project to permit 164 linear feet of hybrid living shoreline.

Project Description: This living shoreline project consisted of two sections of oyster castles (40 linear feet and 50 linear feet) and one section of coir logs (74 linear feet). The two Oyster Castle sills were built by stacking Oyster Castles 2- or 3-high with oyster shells placed on top of sills and channelward. The coir logs used for the single coir log section were either 12" or 16" in diameter. All three sections were placed above mean low water. Behind the hybrid living shoreline, clean sand (48 cubic yards) was placed and graded to existing elevation then planted with salt marsh vegetation (*Spartina alterniflora* and *Spartina patens*). Goose exclusion fence was placed around the perimeter of the planting area.

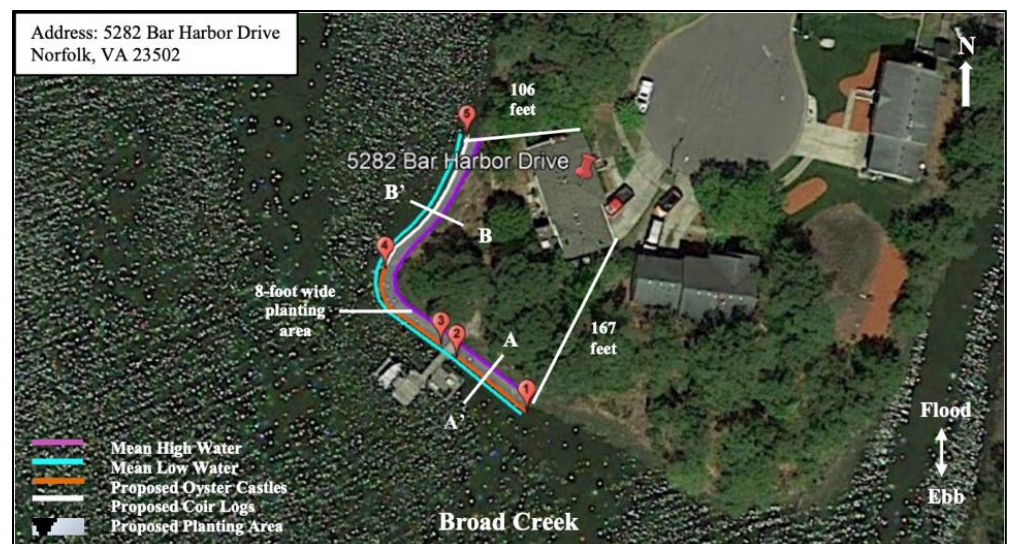


Project Materials:

- Clean commercial borrow pit sand
- Coconut fiber coir logs
- Oyster Castles
- *Spartina alterniflora*
- *Spartina patens*
- Goose exclusion fencing
- Wooden stakes

Steps to Reduce Impacts:

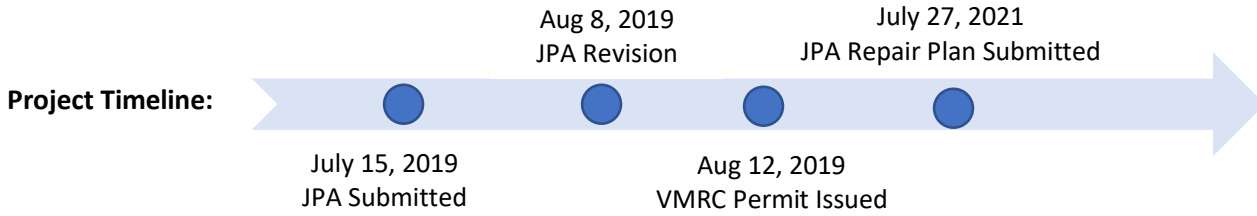
To reduce impacts to buffer area, all material was delivered to homeowner driveway then mobilized using a wheelbarrow or concrete buggy. To reduce impact to existing salt marsh, plywood walking/driving paths were placed. Oysters existing within living shoreline site were salvaged and moved channel-ward beyond project footprint.



Project Encroachment: This living shoreline encroached on 1,312 square feet of nonvegetated wetlands (mudflat) with a maximum 20 feet encroachment channelward of mean high water and 5 feet of mean low water.

Project Results: This project with modifications qualified for a Virginia Marine Resource Commission's Living Shoreline Group 2 General Permit based on project materials, fetch exceeding ½ mile in one direction, and created marsh totaling

8 feet in width. Since this project met the requirements for the General Permit, a separate wetlands permit was not required. Two years after the living shoreline was installed, the living shoreline was considered unsuccessful due to improper elevations. Therefore, a repair plan was submitted under the JPA as a revision to install additional coir logs, clean sand, oyster shell, and native vegetation. The revision did not require additional authorization because repairs were within existing project footprint and elevations did not exceed original proposed grade.



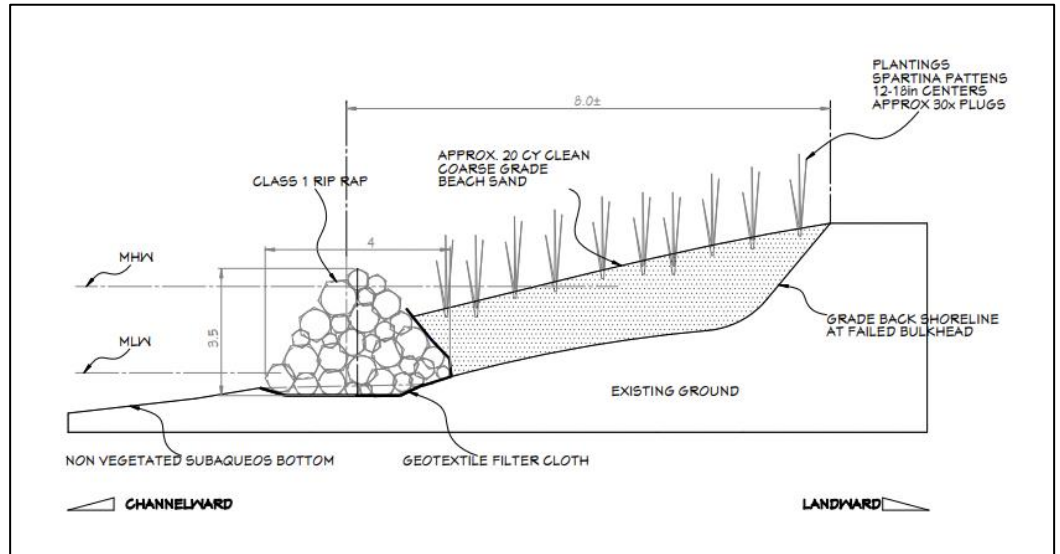


Case Study: Successful Living Shoreline Group II General Permit

Project Name: Poquoson River Hybrid Living Shoreline
Location: Eastern shoreline of Cabin Creek, Poquoson, VA

Project Summary: To mitigate severe erosion and undermining due to failed bulkhead, a homeowner worked with a marine construction company to install 90 linear feet of hybrid living shoreline along the Poquoson River.

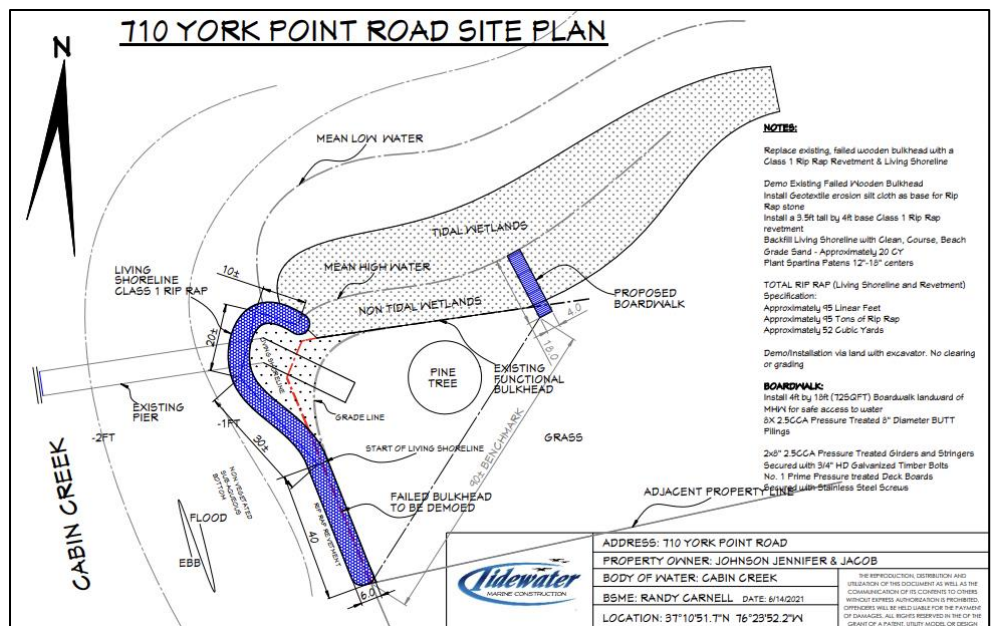
Project Description: The original project proposed was to replace a failing, wooden bulkhead with a rip rap revetment of approximately 90 linear feet. Additionally, the project included the installation of a 4-foot boardwalk landward of mean high water for safer water access. After the Poquoson Wetlands Board and Virginia Marine Resource Commission visited the project site, it was recommended that a new site plan be created to incorporate a living shoreline to meet regulatory requirements. Working with the homeowner, the marine construction company developed a site plan that replaced the failing bulkhead with a class 1 rip rap revetment and hybrid living shoreline along 40% of the shoreline. Once the failing bulkhead was removed, rip rap was installed along 40 linear feet of the shoreline and a living shoreline that incorporated a rock sill was installed along 60 linear feet of shoreline. Behind the hybrid living shoreline, clean sand was placed, then planted with salt marsh vegetation (*Spartina patens*).



Project Materials:

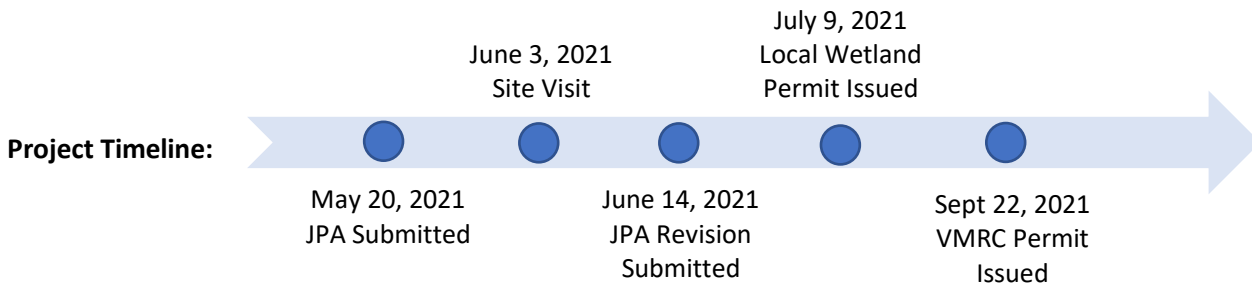
- Class I rip rap
- Geotextile erosion silt cloth
- Rip stone
- Clean coarse beach grade sand
- *Spartina patens*

Steps to Reduce Impacts: No clearing or grading was required for this project. Rip rap installed over non-vegetated subaqueous sandy bottom.



Project Encroachment: This living shoreline encroached on 300 square feet of subaqueous bottom with a maximum 3 feet encroachment channelward of mean high water and 3 feet mean low water.

Project Results: A portion of this living shoreline project qualified for a Virginia Marine Resource Commission’s Living Shoreline Group 2 General Permit based on project material (riprap sill) and project location in subaqueous bottoms. The remaining portion of the living shoreline project required a wetlands permit from the Poquoson Wetlands Board due to placement of sand fill landward of existing bulkhead. No permit was required for the boardwalk due to location being landward of mean high water.





Case Study: Permitting a Living Shoreline Requiring a Subaqueous Permit

Project Name: Poquoson River Hybrid Living Shoreline

Location: Northwest shoreline of Poquoson River, VA

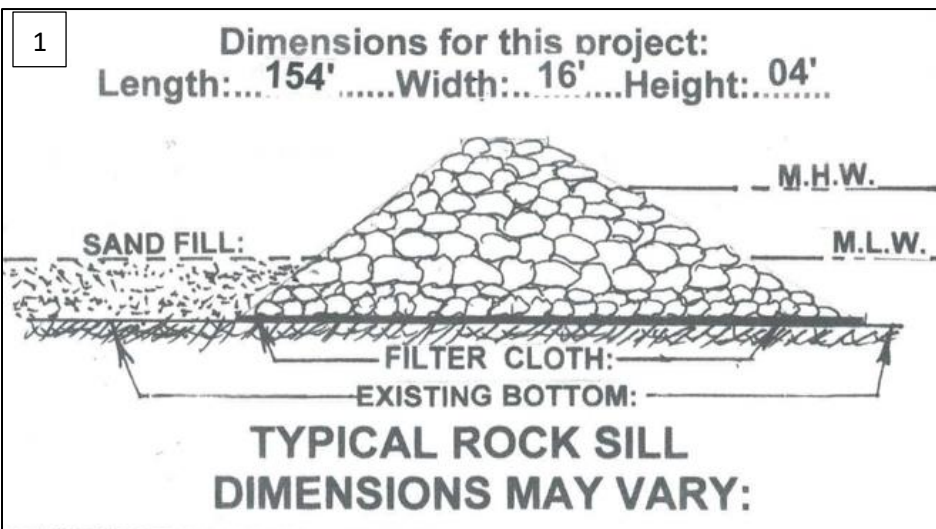
Project Summary: To reduce wave generated erosion along a shoreline, two homeowner worked with a marine construction company to install 154 linear feet of hybrid living shoreline along the Poquoson River.

Project Description: This JPA proposed to install a rock sill in front of a vegetated wetland along two properties. The rock sill to be installed consisted of armor stone sill that would be placed on filter cloth and approximately 154 feet long, 2 feet high and 16 feet in base width. To improve wetland habitat, project proposed to place clean sand and plant appropriate wetland plants in front of marsh fringe.

Project Materials:

- Quarry Stone Class II
- Filter cloth
- Clean, coarse sand

Steps to Reduce Impacts: To reduce impacts to upland area, all project activities took place through a common access point. To access project site, wooden mats were placed to reduce impacts to vegetated area.



Project Results: This project with modifications was approved for a Virginia Marine Resource Commission Subaqueous permit. Modifications to the original JPA included improved project site drawings and increased clarity in project design. Specifically, original drawing was of a typical rock sill (1) and needed to be site specific (2). Additionally, project sill height did not account for local sea level rise, and area of beach nourishment, limits of vegetated wetlands and benchmarks were missing in design. After modifications to original JPA, the site

was evaluated further due to potential impact on submerged aquatic vegetation and sill location encroaching on oyster leasing ground. After further review, this project did not impact submerged aquatic vegetation but did encroach on oyster leasing ground. Therefore, the applicants had to obtain permission from the oyster lease holder to encroach on leasing ground. In total, this JPA had four revisions before receiving permits. This project also required a wetlands permit from the York County Wetlands Board due to project location within tidal wetlands.

