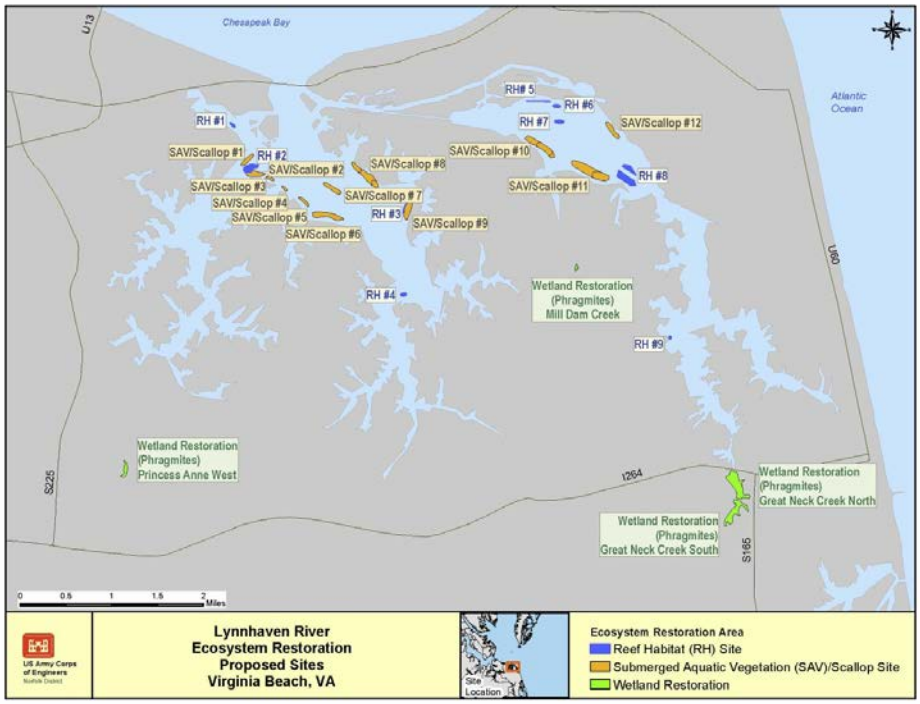
Lynnhaven River Basin Ecosystem Restoration Project
Virginia Beach, Virginia

24 September 2013



ABSTRACT: The project proposes restoration of tidal wetlands and aquatic ecosystem habitats within the Lynnhaven River Basin. The watershed is located within the City of Virginia Beach in Southeastern Virginia at the lower end of the nationally significant Chesapeake Bay.The non-Federal sponsor of this project is the City of Virginia Beach.

The study area consists of the entire Lynnhaven River Basin, a 64-square-mile tidal estuary and surrounding riparian areas, which is located wholly within the boundaries of the City of Virginia Beach, Virginia, bounded on the northeast by First Landing State Park and on the southeast by Oceana Naval Air Station. The watershed, representing one-fourth of the area of the City of Virginia Beach, performs vital functions to the City and its residents. The Lynnhaven River is the largest tidal estuary in the City and lies in the heart of the urbanized northern half of the City. This resource has 150 miles of shoreline and hundreds of acres of marsh, mudflat, and shallow water habitats. The river supports a tremendous level of recreational boating and fishing, crabbing, and ecotourism. The river has become increasingly stressed as the watershed has experienced a shift from a predominantly rural to a predominantly urban/suburban land use pattern. This conversion has resulted in loss of natural buffers and increases in population and density. The City of Virginia Beach and other organizations recognize the value of the Lynnhaven ecosystem and have made significant investments into the restoration of the ecosystem.

The Recommended Plan consists of four elements: restoration of tidal salt marshes, restoration of submerged aquatic vegetation, re-establishment of a population of bay scallops, and construction of reef habitat.

Wetland Restoration/Diversification. Four sites, totaling approximately 38 acres, within the Lynnhaven River Basin have been identified for restoration or diversification of wetlands. Each site currently contains established stands of the nonnative, invasive, emergent plant *(Phragmites australis)*. Two sites were selected for restoration of the indigenous salt marsh community and reduction of the population of invasive plant species growing on site. At two other sites, it was determined that the removal of *P. australis* would not be successful due to tidal restriction and reestablishing the full tidal range was prohibitively expensive. Instead, ecological function will be established by increasing habitat diversity, through the construction of habitat features, including islands, channels, and pools, in order to break up the homogeneous *P. australis* stands.

Submerged Aquatic Vegetation. Twelve sites have been selected in Broad Bay (42 acres) and the Lynnhaven Mainstem (52 acres). The sites will be planted with Submerged Aquatic Vegetation (SAV) seeds of two species, *Ruppia maritime* (widgeongrass), and *Zostera marina* (eelgrass).

Reintroduction of Bay Scallops. The 12 sites selected for reintroduction of the bay scallop are located within the SAV restoration sites and total approximately 22 acres. The SAV beds would be restored first, as bay scallops are known to prefer SAV to other substrates. No scallop restoration would commence until a minimum of one year after SAV restoration begins.

Reef Habitat. The nine project sites selected for the restoration of reef habitat are located in the Lynnhaven Mainstem and the Broad Bay/Linkhorn complex. Artificial reef structures would be built in approximately 10.5 total acres in the Lynnhaven Mainstem and 21 total acres in the Broad Bay/Linkhorn complex.

The ecological benefits estimated for the Recommended Plan include an increase in secondary production (285,000 kg/yr of aquatic biomass), an increase in species diversity (measured using a biological index), and an increase in marsh productivity (an average increase of 70 points using the USEPA Marsh Assessment Score). The plan would improve the habitats in the most cost-effective manner.

The Recommended Plan was evaluated using a discount rate of 3.75 percent and fiscal year (FY) 2013 price levels. First costs of the project are currently estimated at $34,413,000. Expected annual costs are estimated at $1,529,000. The Federal and non-Federal investments required to implement the current project proposal are estimated at $22,368,000 Federal (65%) and $12,045,000 non-Federal (35%).

REPORT DOCUMENTATION: Pertinent documentation on the project, the results of the Civil Works Review Board, and subsequent Washington-Level Review Actions, are linked below:

- CWRB Agenda
- Project Summary
- CWRB Briefing Slides
- CWRB Lessons Learned
- CWRB Meeting Record
- State & Agency Review Comment Letters
- Documentation of Review Findings
- Signed Chief of Engineers Report
- Advance Copy to Congressional Committees
- ASA(CW) Memo to OMB
- OMB Response
- ASA(CW) Transmittal to Congress
- Signed Record of Decision
- Authorization

ADDITIONAL INFORMATION:

North Atlantic Division

Norfolk District