Introduction

Living shorelines consist of an array of new restoration tactics designed to stabilize coastal erosion and help adapt to sea level rise, while also enhancing ecology, such as fish and wildlife habitat and water quality. Beginning in 2007, the Partnership for the Delaware Estuary and the Haskins Shellfish Research Laboratory of Rutgers University crafted and implemented the Delaware Estuary Living Shoreline Initiative (DELSI), consisting of planning, design, implementation and scientific monitoring of new types of living shoreline projects that are suitable for our region. Until recently, DELSI efforts have been focused in tidal salt marsh habitats surrounding Delaware Bay.

A core principle of DELSI is that the ecological structure and functions at a site need to be sustained or enhanced, while addressing other goals such as erosion control, flood mitigation, contaminant stabilization, etc. A first step in studying the feasibility of a living shoreline approach at a new site is to determine the baseline ecological conditions and assess whether suitable biotic “raw material” exists in the target area. Living shorelines should be designed to take advantage of the natural resilience properties of dominant fauna and flora and their interactions.

This project examined which flora, fauna and habitat types exist within the urbanized Delaware River waterfront that might be targeted for use in living shoreline projects. Initial concepts have been suggested for two potential sites in Camden, New Jersey: Harrison Avenue Landfill and Phoenix Park.

Methods

Field reconnaissance at the Harrison Landfill site during 2012-2013 consisted of surveys using a RTK-GPS for mapping of intertidal elevation contours, intertidal vascular plants, and substrate types. Shallow subtidal communities of freshwater mussels and submerged aquatic vegetation were surveyed at the Harrison site using semi-quantitative snorkeling methods in 2013 (Figures 2-4), building on earlier qualitative surveys in the vicinity. Field surveys at the Phoenix Park site were limited to visual observations of elevation gradients, substrates and dominant biota at mean low water.

Elevation data from RTK surveyed areas were used to generate topographic maps. Substrate and biotic data were interpreted using best scientific judgment to devise project concepts designed to diversify, expand and stabilize targeted habitat types. For more details, please see Partnership for the Delaware Estuary Report Number 14-05, available at: http://www.delestatu.org陸ideprepare.php.

Conclusions and Next Steps

- Preliminary results suggest that a “hybrid mosaic” living shoreline design is possible for both Camden project sites.
- A mix of SAV, low marsh and high marsh would add complexity for fish and wildlife, augment rare wetland types, and strengthen coastal resilience.
- Beds of freshwater mussels would likely boost particle filtration services by millions of gallons per day, and help protect and restore rare species.
- When paired with adjacent restoration of the upland, these projects would enhance the quality of life for urban communities.
- Additional studies are planned to improve living shoreline project designs and to estimate net benefits for water quality of urban waterfront projects.

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