

Municipal Vulnerability Preparedness Program Action Grant Case Study

Municipality: Town of Swampscott

Project Title: Beach Access Resiliency and Accessibility Improvements

Award Year (FY): 2020

Grant Award: \$ 367,054

Match: \$ 122,351

Match Source: In-Kind Services and Cash

One or Two Year Project: Two Year Project

Municipal Department Leading Project: Department of Public Works

Project Website URL: <https://www.swampscottma.gov/community-and-economic-development/pages/phillips-beachsandy-beach-access-resiliency-improvements>

Community Overview:

- ***What is the population size of your community and where is it located?***

Swampscott has a population of approximately 15,000. The Town is located on the North Shore coast between Lynn and Marblehead.

- ***Do you have any [Environmental Justice](#) or other Climate Vulnerable communities? (Think about both those who live and work in your town.)***

There is one EJ block group for minority population which is located near the Town's MBTA commuter rail station. This block group represents approximately 9% of the Town population.

It is estimated that approximately 1,500 persons, or 10% of the Town's population is potentially directly vulnerable to coastal flooding by the Year 2070 due to a combination of sea level rise projections, storm surge, and coastal flooding.

- ***Other unique traits of your municipality like who the top employers are, geography, history, etc.***

Swampscott is home to the unique Fish House, located at 391 Humphrey Street, which is the oldest fish house in the country. This building is a registered national landmark and is the only municipally owned working fish house of its kind in the country. The Fish House is highly vulnerable to coast storms, even during present day conditions.

Project Description and Goals:

- ***Where was the project located?***

This project is located at two beach access ways that are vulnerable points along the coastline to coastal storm surge and flooding. Because access points are naturally low

laying in elevation, they are the first locations where storm surge will flow inland and affect vulnerable properties and streets. The two specific access points for this project include Phillips Beach and Cassidy Park Beach (at the east end of Fisherman's Beach).

- ***What climate change impacts did the project address?***

Due to their low-laying nature, the Cassidy Beach Park and Phillips Beach access ways are flood pathways into inland floodplains during coastal flood events. This project reduces flooding through these access ways by elevating these access ways using nature-based solutions, namely nourishment of the existing dunes with additional sand and plantings, thereby increasing the resilience of critical transportation, public safety, water, wastewater and recreational assets in present and 2030 floodplains. The project will prevent stillwater flooding through the access ways up to the 2030 0.1% annual chance flood elevation, virtually eliminate flood volumes from wave runup and overtopping in 2030 nuisance events and significantly reduce runup and overtopping flood volumes in 2030 extreme events. Overall, this project was aimed at reducing near and medium-term flood risk in this area.

- ***What were the specific goals and tasks of the project as stated in your application?***

The specific goals and tasks of the project were as follows:

- Adding and grading compatible sand to the maximum elevations and slopes feasible without adversely impacting abutting properties or accessibility.
- Stabilizing the sand using native vegetation.
- Installing access mats along designated paths to provide ADA accessibility and minimize sand compaction and vegetation disturbance.
- Beautifying access way areas directly abutting roadways with new ADA compliant surfacing and amenities such as bicycle racks.

- ***Did your project meet the goals set forth in your application in terms of:***

- **Employing nature-based solutions** – Yes, the core strategy employed was nourishment of sand dunes and planting of native vegetation to reduce erosion.
- **Improving equitable outcomes for and fostering strong partnerships with EJ and other Climate Vulnerable Populations** – This project equitably serves all populations in Swampscott, including EJ and Climate Vulnerable Populations.
- **Providing regional benefits** – The project improved the two beach access ways which provide regional benefits.
- **Implementing the public involvement and community engagement plan set forth in your application** – This project was a continuation of a planning and

design process that included collaboration with the Town's Municipal Design Committee, and public education through numerous Town Meetings. At the outset of this phase of the project, the team completed two Stakeholder Meetings to review the project objectives, obtain advice and direction from stakeholders, prepare a public information campaign, and update the final design with public feedback. Public outreach was completed through meetings with the Town Planning Board and Conservation Commission.

- **Finishing the project on time** – This project received a one year extension from the MVP Program. The time extension allowed the team to give deeper consideration to the design's impacts to existing resource areas and adjust the site elements proposed. The time extension also allowed construction activities and native beach plantings to occur during the ideal time window to assure a successful outcome.

Results and Deliverables:

- ***Describe, and quantify (where possible) project results (e.g. square footage of habitat restored or created, increase in tree canopy coverage, etc.). Report out on the metrics outlined in your application.***

This project imported over 270 cubic yards of compatible sand material to each of the two beaches, elevating the grade of the beach access ways by 12- to 18-inches. 27,000 beach grass culms, close to 150 shrubs, and 600 little bluestem grasses were planted to beautify and protect the nourished dunes.

Based on modeling output available during the concept planning phase in 2017, the Year 2030 flood volume overtopping the sand dune is anticipated to be cut in half at Cassidy Park Beach and virtually eliminated at Phillips Beach. Over time, the Town will be able to validate if the projected/modeled benefits will be realized.

- ***Provide a brief summary of project deliverables with web links, if available.***

This project delivered a set of construction drawings and specifications that yielded the final construction work completed in June 2022.

Lessons Learned:

- ***What lessons were learned as a result of the project? Focus on both the technical matter of the project and process-oriented lessons learned.***

Based on the different aspects of these projects, some important lessons learned are as follows:

Environmental Permitting

Delineation was initially done based on the historic data available for the site. The initial resource area delineation was questioned during the environmental permitting process. Environmental planners then took physical sand samples and updated the resource delineation which required a modification to the design approach at both beaches. It is important to conduct sufficient research along with field work including sampling to gain full confidence in the interpretation of coastal resource areas.

Scheduling for Construction Projects

Beach grass plantings were an important part of this accessibility improvements project for protection of the nourished dune. American Beach grass prefers to be planted in the fall, winter, or spring months. Based on the initial project schedule, these plantings were to be done in the months of May and June, which would be outside their optimal season for establishment. However, the re-arranged schedule helped this aspect and the beach grass was planted in favorable climatic conditions.

After this experience, a preferred construction schedule would perform the sand placement and plantings in early October to allow the plantings a period to establish before the winter storm season. Should damage be experienced over the winter, the spring season would be available to restore and re-plant any damaged areas. This would require that the Contractor have the ability to acquire new plantings or have a stock of plantings set aside as a contingency.

Robust Plans for Winter Storms

This project was negatively affected by one winter storm occurring April 19, 2022 at Cassidy Park Beach. Storm surge pulled up several plugs of newly planted beach grass and damaged some of the staked erosion control mats. Fortunately, the placement of the sand and the anchoring effect of the remaining plantings limited the extent of the damage, and the overall project was not affected.

Sand dune restoration and plantings projects should consider that there is a real likelihood of winter storm impacts like this when working on the exposed coastline. It is key to avoid work in times when winter storms are most likely. Also, it is important that the construction contract between the Town and Contractor make it clear that the Contractor is responsible for a contingency plan for erosion of dune and is ultimately responsible in providing the work described in the construction contract.

- ***What is the best way for other communities to learn from your project/process?***

The Town welcomes visitors from other communities to come see the final product and discuss the project.

Partners and Other Support:

- Include a list of all project partners and describe their role in supporting/assisting in the project.

This project was a highly collaborative project with multiple partners for different roles. The partners on this project are listed below along with their role:

Owner

- Town of Swampscott

Funding Partners

- Coastal Zone Management – Funded planning phases of this project
- MA Energy and Environmental Affairs (MVP program) – Funding agency for final design, permitting and construction

Regulatory / Permitting Agencies

- Swampscott Conservation Commission
- Massachusetts Department of Environmental Protection
- Coastal Zone Management
- MEPA Program

Planning and Design Team

- Swampscott Municipal Design Committee
- Swampscott Department of Public Works
- Swampscott Community and Economic Development
- Kleinfelder – Lead Engineer
- Klopfer Martin Design Group (KMDG) – Landscape Architect
- Rimmer Environmental – Environmental Permitting
- WSP – Surveyor

Construction Contractor

- JAM Corporation

Project Photos: See Attached

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Select Photographs

CASSIDY PARK BEACH



Pre-Construction Dune Looking from Beach Towards Puritan Road



Post-Construction Improved Dune Looking from Beach Towards Puritan Road



Pre-Construction Access Way Looking Towards Puritan Road



Post-Construction Pedestrian Only Access Way

PHILLIPS BEACH



Pre-Construction Beach Access Way



Post-Construction Improved Beach Access Way with Plantings and Access Mat



Pre-Construction Beach Entrance Facing Ocean Avenue / Shepard Avenue



Post-Construction Beach Entrance Facing Ocean Avenue / Shepard Avenue



Post-Construction Beach Entrance Facing Southwest