



## Post Hurricane Sandy Maritime Forest Creation Bradley Beach, NJ

A Small Scale Project  
with  
Large Scale Application

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# OUTLINE

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- Process
- Final Design
- Construction Schedule
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- Partners



# Background

***Maritime Forest:*** An ocean coastal wooded habitat or hammock characterized as a narrow band of forest that developed almost exclusively on stabilized back dunes of barrier islands, inland of primary dunes and scrub. Found on higher ground in back dune areas within range of salt spray



Globally imperiled community due to its rarity

# Background

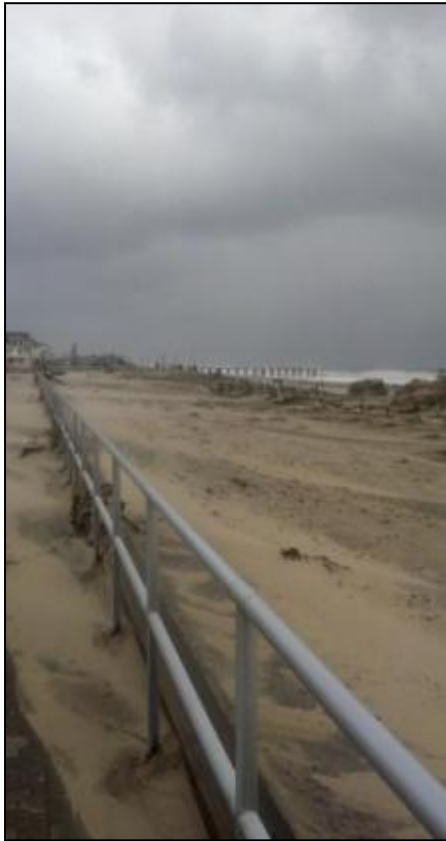


- Location
- Pre- Hurricane Sandy
  - 0.4 Acre hard-packed lot
  - Multiple Uses
  - Nuisance Species
  - Stormwater runoff
  - Fletcher Lake



# Post Hurricane Sandy

- ~ Flooding
- ~ Damaged homes and businesses
  - ~ Utility damage
  - ~ Loss of revenue
  - ~ Sand accretion
    - ~ Gazebo
    - ~ Aerators
  - ~ Flume Operation
  - ~ Water quality
    - ~ Debris

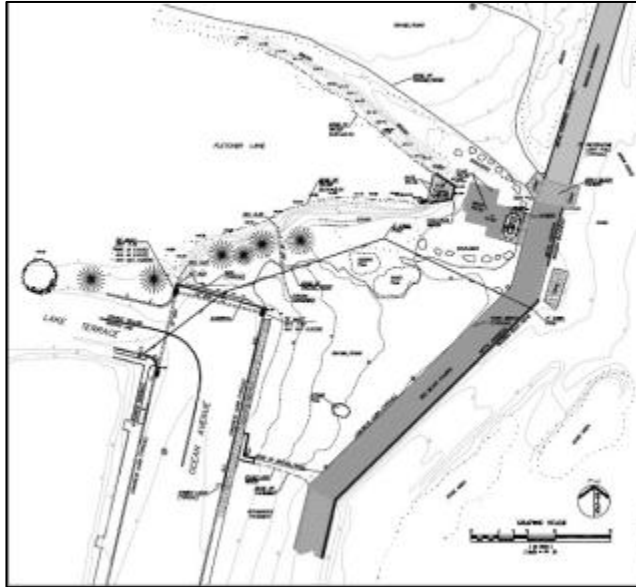


# Objectives



- Combine Natural and Anthropogenic Elements
- Promote Resiliency and Protect Community
- Reduce Risk
- Reduce Stormwater Sheeting
- Buffer Lake Fletcher
- Improve Biodiversity and Water Quality
- Environmental Outreach/Stewardship
- Monmouth County Master Plan
- Provide a small scale model that has **Large Scale Application**

# The Process



- Obtain Local Support
- Municipal Organizations, Commissions, and Boards
- Identification of 501(c)(3)
- Obtain Funding
  - Franklin Parker Small Grant
- Partnership Creations
- Jurisdictional Assessments
- Permits and Approvals
- Obtain More Funding
  - Sustainable NJ grant
  - NJCWRP funding

# Final Design





# Planting List

## PLANT SCHEDULE

QTY.	KEY	SCIENTIFIC NAME	COMMON NAME	SIZE	FORM	NOTES
CALIPER TREES						
10	ACRU	ACER RUBRUM	RED MAPLE	1 - 1-1/2"	B & B	LOW BRANCHED
5	ILOP	ILEX OPACA	AMERICAN HOLLY	1 - 1-1/2"	B & B	LOW BRANCHED
EVERGREEN TREE						
23	JUVI	JUNIPERUS VIRGINIANA	EASTERN RED CEDAR	6'-8' HT.	B & B	FULLY FORMED
14	PIRI	PINUS RIGIDA	PITCH PINE	8' - 10' HT.	B & B	FULLY FORMED
UNDERSTORY AND MULTI-STEMMED TREES						
10	AMCA	AMELANCHIER CANADENSIS	SHADBUSH	6'-8' HT.	B & B	3-STEM MINIMUM
4	BEPO	BETULA POPULIFOLIA	GREY BIRCH	6'-8 HT.	B & B	3-STEM MINIMUM
13	PRMA	PRUNUS MARITIMA	BEACH PLUM	4'-6 HT.	B & B	FULLY FORMED
CONTAINERIZED TREES						
4	ACRU	ACER RUBRA	RED MAPLE	3'-4' HT.	#2 CONT.	FULLY FORMED
9	CEOC	CELTIS OCCIDENTALIS	HACKBERRY	3'-4' HT.	#2 CONT.	FULLY FORMED
13	PRSE	PRUNUS SEROTINA	BLACK CHERRY	3'-4' HT.	#2 CONT.	FULLY FORMED
9	SAAL	SASSAFRAS ALBIDUM	SASSAFRAS	3'-4' HT.	#2 CONT.	FULLY FORMED
11	QUIL	QUERCUS ILICIFOLIA	BEAR OAK	3'-4' HT.	#2 CONT.	FULLY FORMED
5	QUMA	QUERCUS MARILANDICA	BLACKJACK OAK	3'-4' HT.	#2 CONT.	FULLY FORMED
SHRUBS						
62	BAHA	BACCHARIS HALIMIFOLIA	GROUNDSEL TREE	3'-4' HT.	#2 CONT.	MULTI-STEMMED
96	MOPE	MORELLA PENNSYLVANICA	BAYBERRY	3'-4' HT.	#2 CONT.	MULTI-STEMMED
30	RHCO	RHUS COPPOLINA	SHINING SUMAC	3'-4' HT.	#3 CONT.	MULTI-STEMMED
51	ROVI	ROSA VIRGINIANA	VIRGINIA ROSE	3'-4' HT.	#2 CONT.	MULTI-STEMMED
14	VACO	VACCINIUM CORYMBOSUM	HIGHBUSH BLUEBERRY	3'-4' HT.	#2 CONT.	MULTI-STEMMED
47	VIDE	VIBURNUM DENTATUM	ARROWWOOD	3'-4' HT.	#2 CONT.	MULTI-STEMMED

RESTORATION PLANTING MIX						
2800	AMBR	AMMOPHILIA BREVILIGULATA	BEACH GRASS		2" PLUG	18" ON CENTER
1200	PAAM	PANICUM AMARUM	BITTER PANIC GRASS		2" PLUG	18" ON CENTER
1000	ASTU	PANICUM VARIGATUM	SWITCH GRASS		2" PLUG	18" ON CENTER
1200	SCSC	SCHIZACHYRIUM SCOPARIUM	LITTLE BLUESTEM		2" PLUG	18" ON CENTER
600	SOSE	SOLIDAGO SEMPERVIRENS	SEASIDE GOLDENROD		2" PLUG	18" ON CENTER





## Construction Schedule



6/2013 – Final Design approved by SCD (Valid until 12/19/2016)

- Initial Project Conception 2010
- Funding and Project Approval 2011 - 2012
- Meetings with DPW ongoing since 2012
- SCD Notification – September 6
- Mark-out Notification – September 9
- SESC Implementation – September 13 - 17
- Excavation and Amendment - September 17 - 25
- Plant Delivery – September 26 and 27
- Planting Dates – September 28 (29<sup>th</sup> contingency)
- Monitor, Lighting, Signage, and Replant – April 2014
- Additional Grant Funding – Spring 2014

# Issues and Challenges



- Planting Season
- Vegetation Availability
- Loss of Dunes
- Compacted Soils
- Soil Placement/Removal Costs
- Invasive Removal and Control
- Eruv Pole
- Irrigation System
- Utility Locations
- Emergency Access
- Adjacent Flume
- ADA
- Loss of Parking
- Surf Camp
- Security
- Plant Survivability

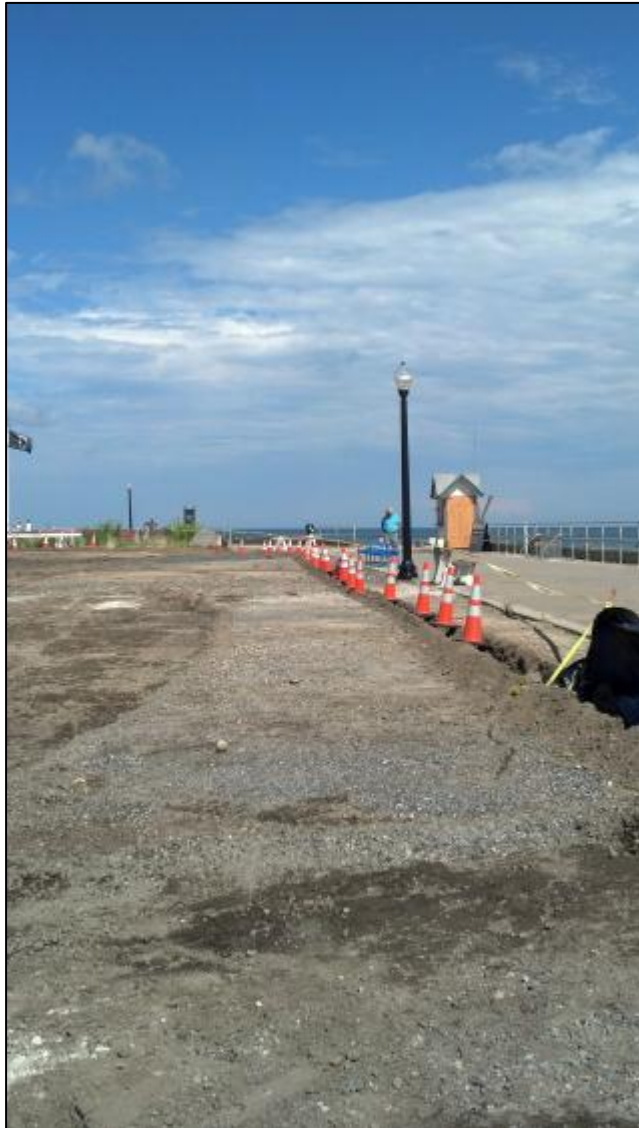




# Results



# Results





## Benefits

- Flooding
- Improved Resiliency
- Reduce Risk
- Habitat/Biodiversity
- Improved Water Quality
- Recreation
- Stronger Community
- Improved eco-conomy
- Environmental Awareness



# Future Regional Needs Monmouth and Ocean County



- Create Centralized Regional Program
- Restore the Coastal Lakes
  - Dredging/Dredge Placement Options
  - Flume/Ocean-Beach Redesign-Repair
  - Fish Passage
  - Re-scaping of Shoreline/Revegetation
  - Maritime Forest/Back Dune Plantings
  - Flood Control/Storm Water Management
  - Debris Removal
  - Dunes





# Since the Planting



- Continued Maintenance
  - Topping
  - Pruning
  - Weed removal
- Community Involvement
- New funding
  - Rutgers
  - 5K Race
- Replant/Replace
- Recent Species Observed
  - Song sparrow
  - Least tern
  - Dove
  - Red-wing blackbird



# Partners and Thanks



- Coastal America
- NJ Corporate Wetlands Restoration Partnership
- American Littoral Society
- AECOM
- United States Army Corps
- US Fish and Wildlife Service
- NOAA
- Environmental Protection Agency
- New Jersey Department of Environmental Protection
- Monmouth County Department of Public Works and Engineering
- Bradley Beach Environmental Commission
- Bradley Beach Shade Tree Commission
- Bradley Beach Department of Public Works
- Borough of Bradley Beach
- Pinelands Nursery and Supply
- Brock Farms
- PS&S
- Fletcher Lake Commission
- Bradley Beach Elementary School Eco-Club
- Sylvan Lake Commission
- Avon Environmental Commission
- Rutgers Cooperative Extension
- Volunteers
- Chris Benosky, Chris Syrett, John Wright, Jim Shissias, Julie Shrek, Gary Engelsted, Joyce Wilkins, Rich Bianchi

