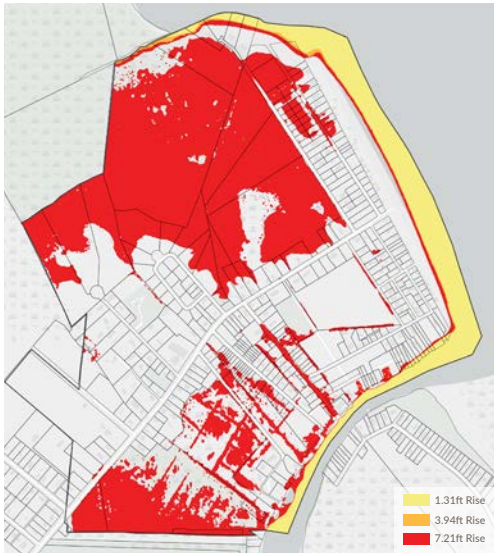
Adapting and Living with Changing Coastal Conditions

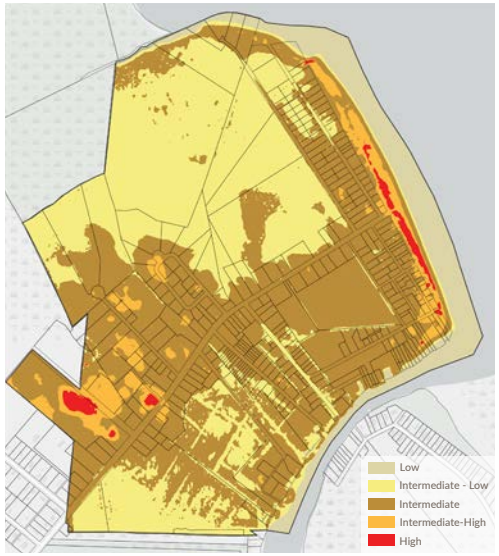
TOWN OF BOWERS

UNDERSTANDING THE SITE AND PROBLEMS FACED

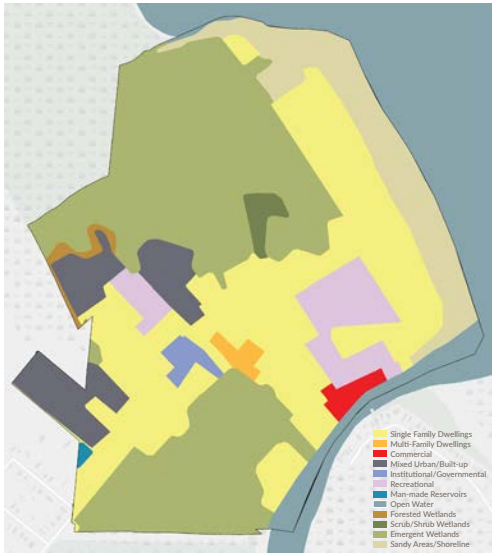
Scope Analysis



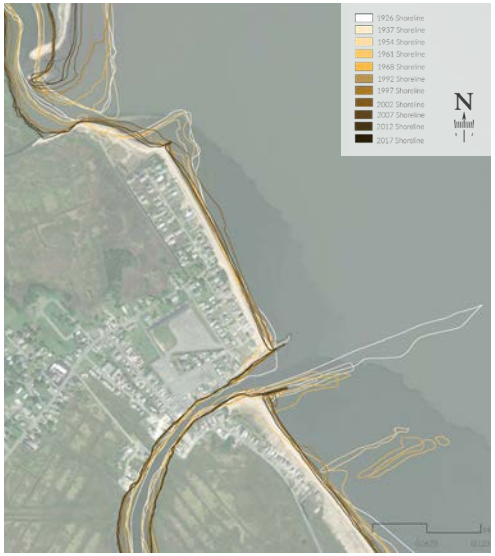
Intermediate SLR
2050 - 2150



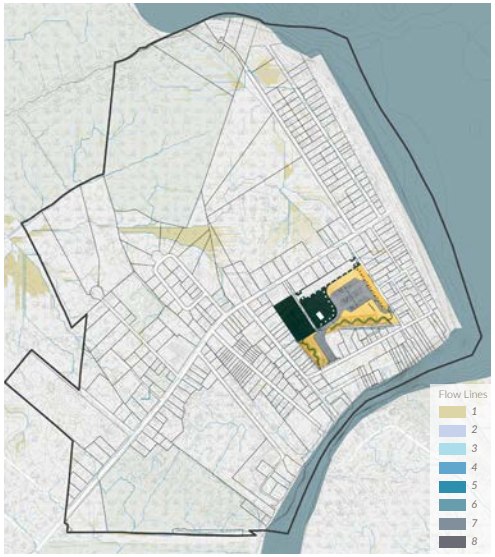
2150 Sea Level Rise



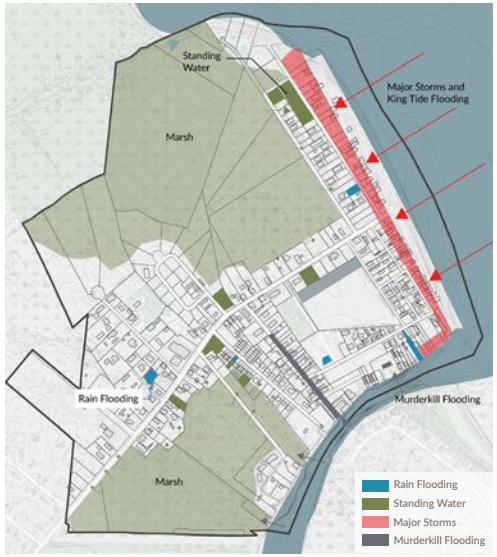
Land Use



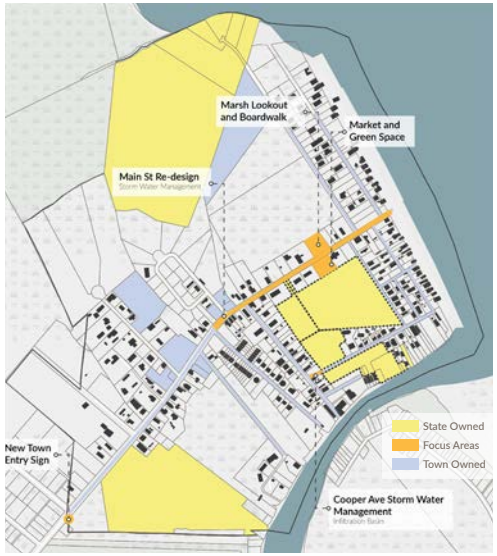
Historical Shoreline Change



Flow Lines Analysis



Current Flooding Issues



Land Ownership and Opportunities

Extensive site analysis was completed not only in person, but remotely using GIS with a focus on historical change, SLR, and land use. This analysis combined with resident concerns was then used to highlight areas needing design intervention.

REESTABLISH MARSH DYNAMICS

Marsh Restoration

North Lookout Tower

Mudflats

Boardwalk for Cyclists and Pedestrians

Meandering channels 'runnels'

DREDGE MATERIAL FROM CREATING CHANNELS RE-USED AND PLACED TO FORM HIGH MARSH AREAS

Low Marsh

Tidal Pools

High Marsh

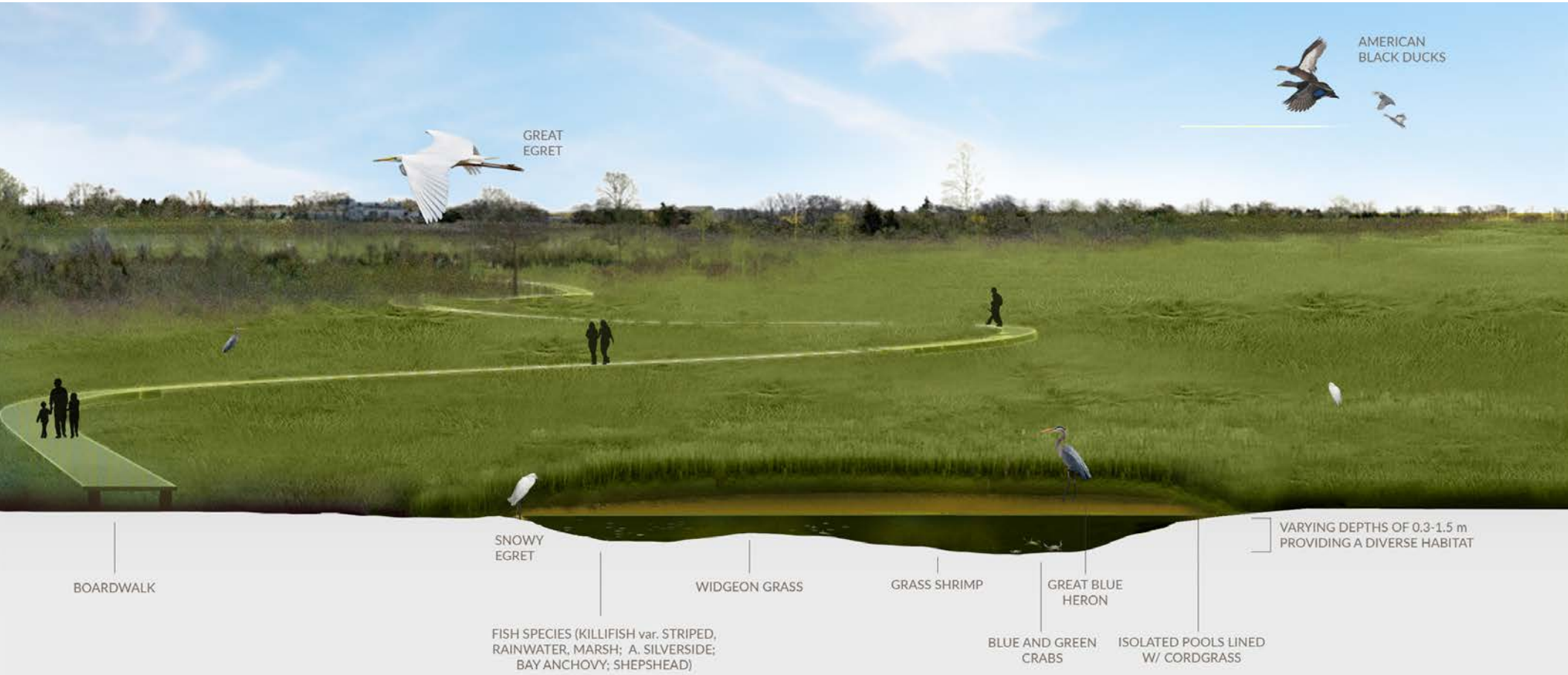
South Lookout Tower

Upland Zone

The northern marsh in the Town of Bowers had mosquito ditches dug prior to the 1950s. Leading to the marsh hydrology being extensively damaged. This plan reestablishes typical marsh processes and improves the flooding protection capacity of this marsh.

SUPPORT LOCAL WILDLIFE

Marsh Restoration



Eelgrass

Edaphic Algae

Widgeon Grass

MUDFLAT

Smooth Cordgrass

LOW MARSH

Salt Marsh Hay

HIGH MARSH

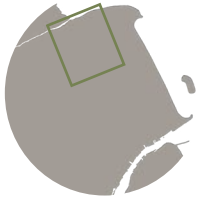
Morella cerifera

Iva frutescens

UPLAND ZONE

ENCOURAGE ECO-TOURISM

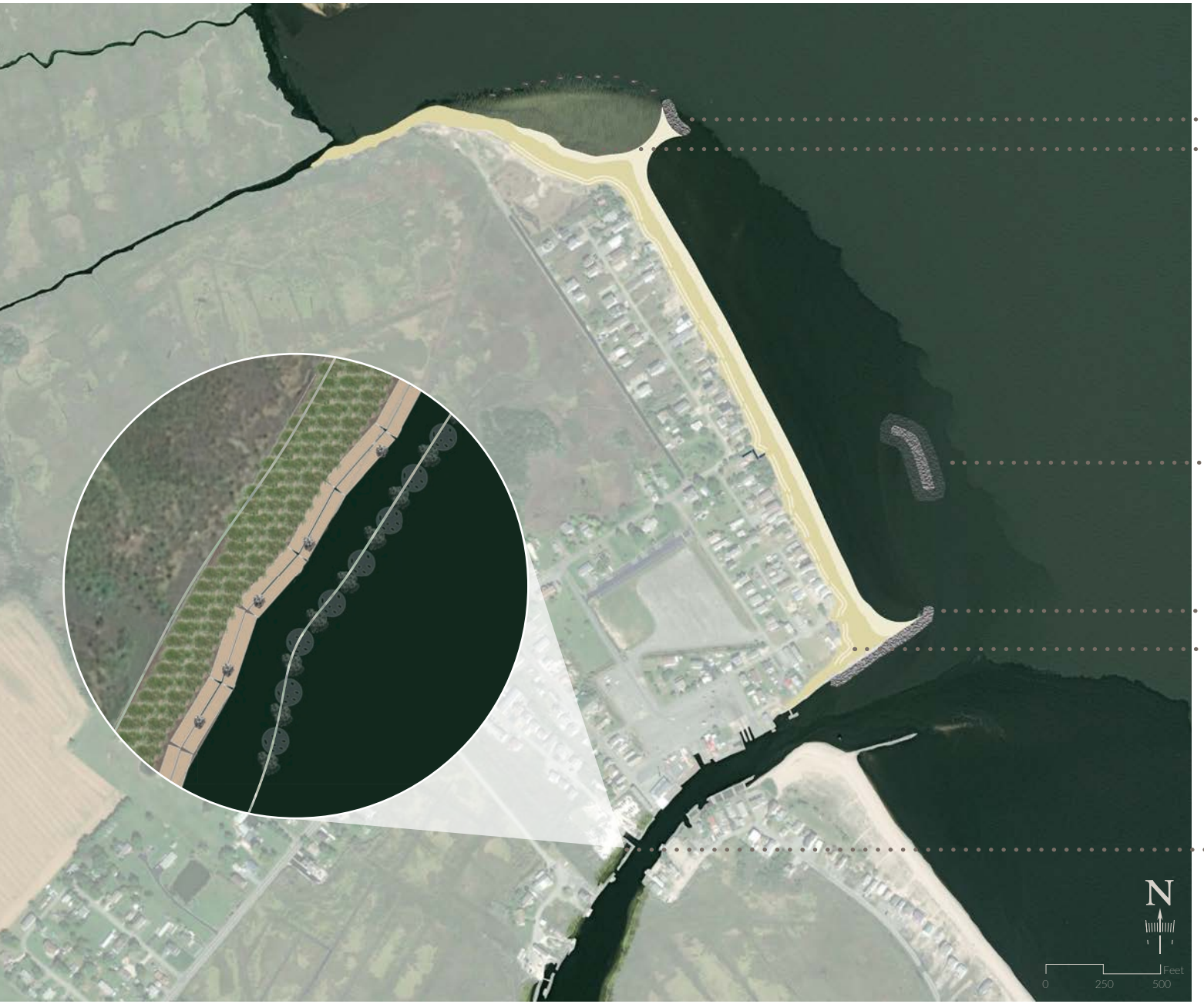
Marsh Restoration



View of the restored marsh from the South lookout tower.

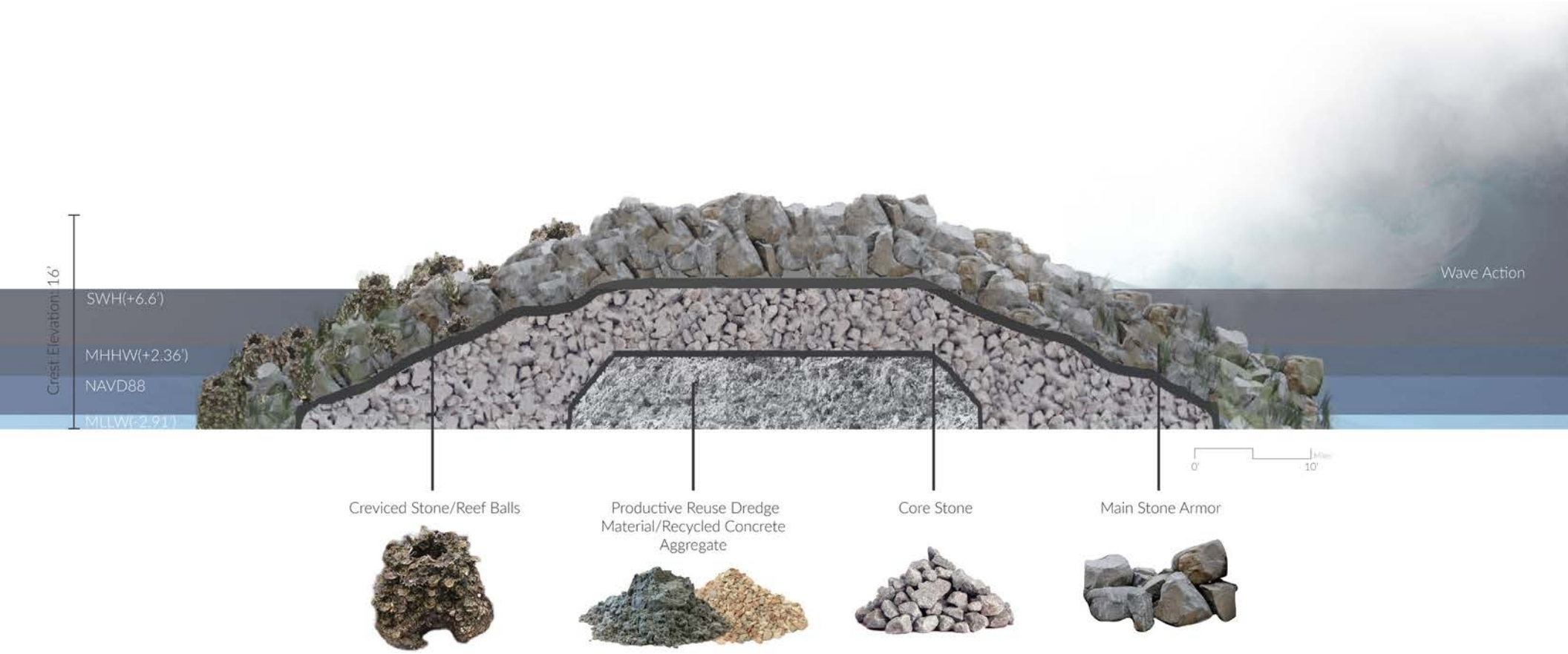
REVITALIZE COASTAL & ESTUARINE ZONES

Coastal Restoration



REDUCING WAVE ENERGY

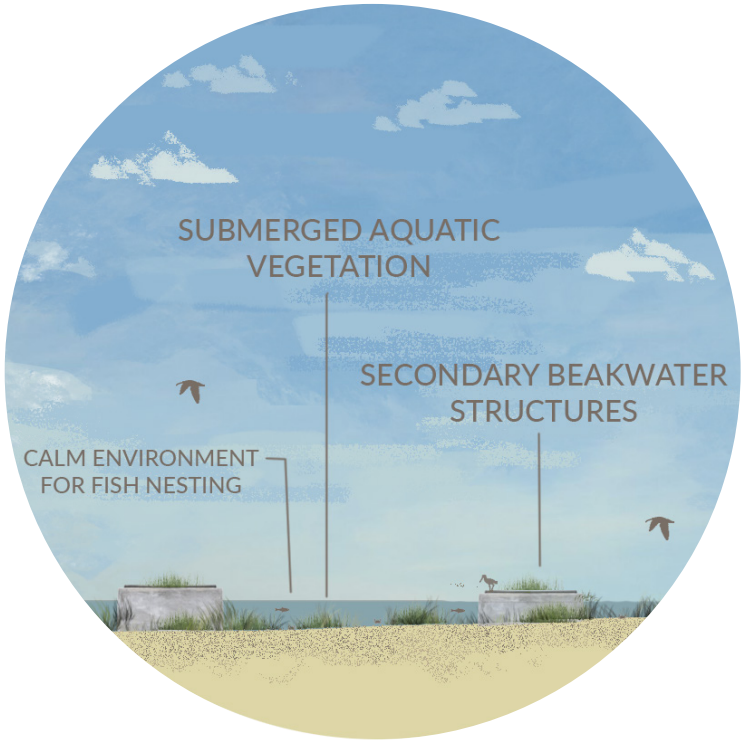
Nodal Point Breakwater

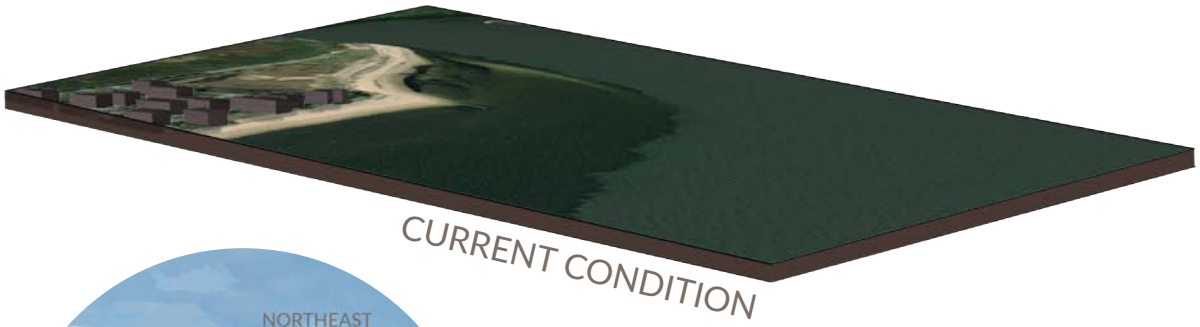


The nodal point breakwater was designed to protect from Southeastern offshore wave action, and Northern wind waves. This design will significantly reduce wave energy while providing opportunities for sea creatures to occupy designed crevices on the side facing the beach.

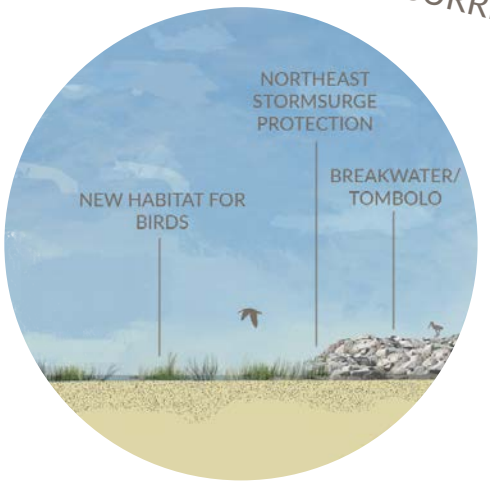
STREGTHENING THE NORTH

Nature-based Protection

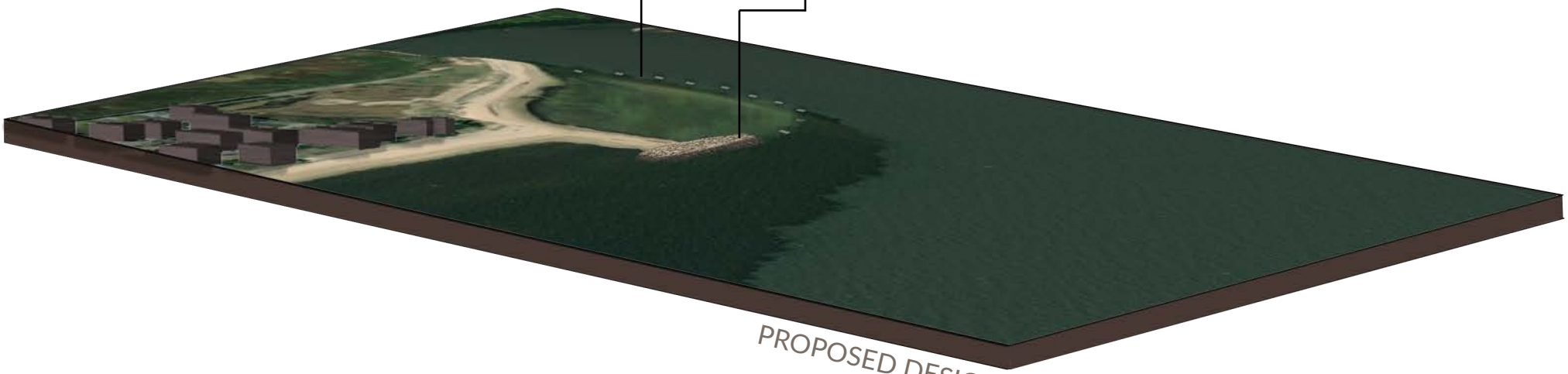




CURRENT CONDITION



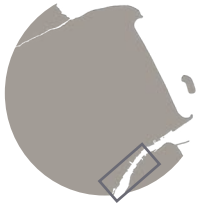
Extending the shoreline to the historic mark through beach nourishment held in place with a headland breakwater. This design breaks down wind and waves to provide habitat for fish, crabs, horseshoe crabs, shellfish, and shorebirds such as the Red Knot.

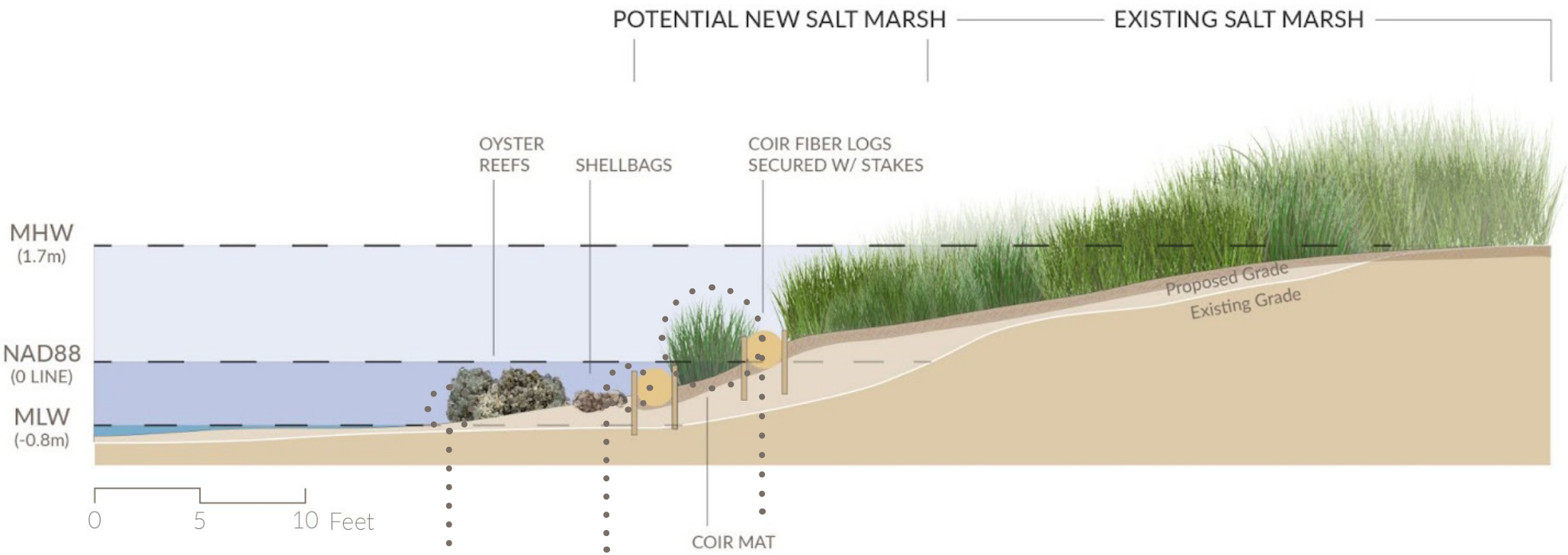


PROPOSED DESIGN

PROTECTING THE EDGE

Living Shoreline





Ribbed Mussels

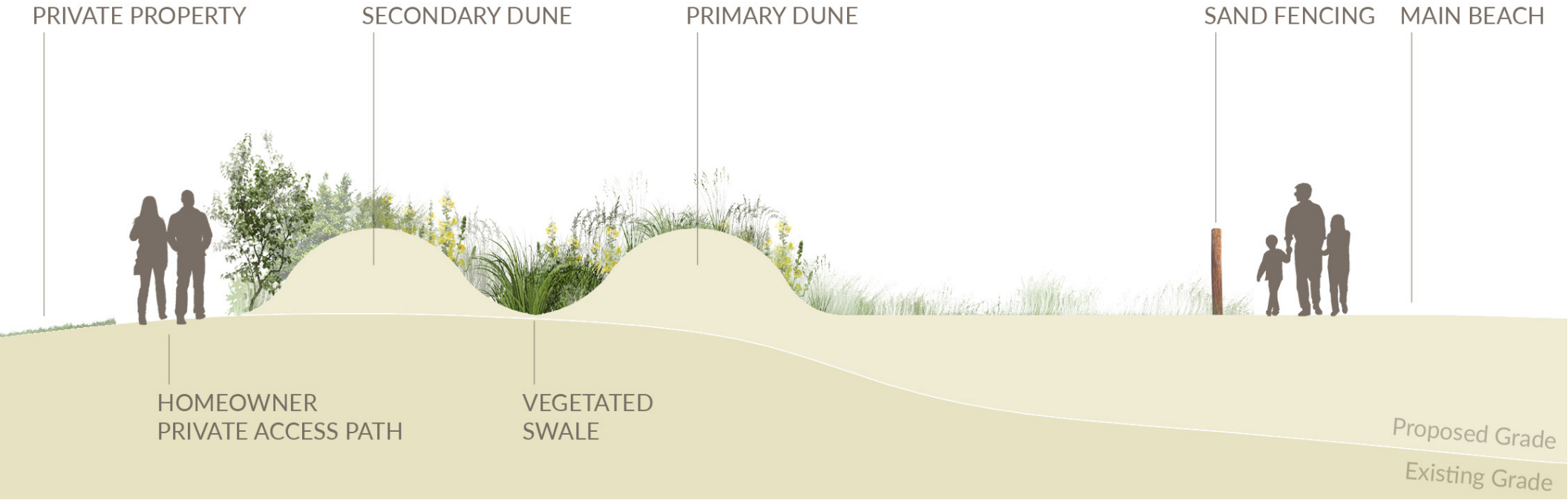
Oysters

Spartina alternafolia

Erosion hotspots along the Murderkill river will be reinforced by a living shoreline design. Increasing habitats for shellfish and improving water quality whilst stabilizing the river's edge. Core fiber logs will restore the salt marsh edge along the river.

RESTORE STABILITY AND PROTECTION & INCREASE BIODIVERSITY

Dune Restoration



The dunes of Bowers Beach will be reconstructed consisting of a primary and secondary dune with an array of vegetation from beach grasses to woody shrubs. The dune system will provide protection and habitat along the entire Bowers' Beach coastline.

Ruddy Turnstone

Red Knot

Eastern Black Rail

Hudsonia tomentosa

Uniola paniculata

Arctostaphylos uva-ursi

Prunus maritima

Morella pensylvanica

Chamaecrista fasciculata

Solidago sempervirens

Panicum amarum

Schizachyrium littorale

Ammophila breviligulata

WOODY BUFFER — SECONDARY DUNE — SWALE — PRIMARY DUNE

FLOODING, COMMUNITY, & CONNECTIVITY

Core Rejuvenation

Updated Beach Access

Connection to Marsh

New Town Center

Current DNREC Project that is Underway

Connecting Bowers Cultural Assets

Stormwater Swale

Murderkill Flooding Protection and Look-out Deck

CONNECTING BOWERS CULTURAL ASSETS

Core Rejuvenation

SHARED PAVED ROAD 13’ SLOPE TO DRAIN TO MEDIAN

CATCHMENT MEDIAN W/ TREE BOXES, PLANTINGS AND FILTER SOIL

SHARED PAVED ROAD 13’ SLOPE TO DRAIN TO MEDIAN

MARITIME MUSEUM

SIDEWALK 5’

PEDESTRIAN CROSSING

CREATE A TOWN HUB

Core Rejuvenation

Seating

Infiltration Basin

Informal Pathway

Bathrooms

Planting Bed

Pavilion/Event Space

Stage

Green Roof

Allee

0 25 50 Feet

N

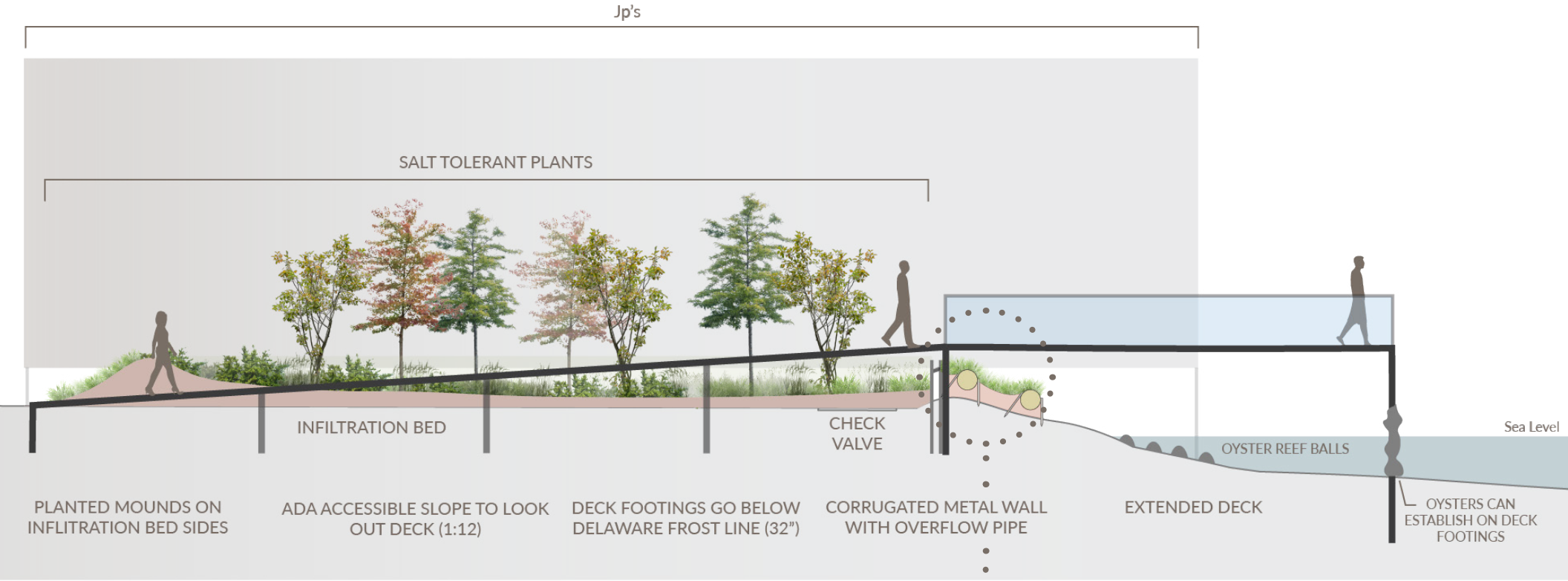
MULTIFUNTIONAL DESIGN

Core Rejuvenation

This space makes use of a re-zoned plot to generate a dynamic community space which can most weekend markets and support the town's music events. The design also includes stormwater management to increase the groundwater recharge capacity in this area.

ENHANCE & PROTECT

Core Rejuvenation



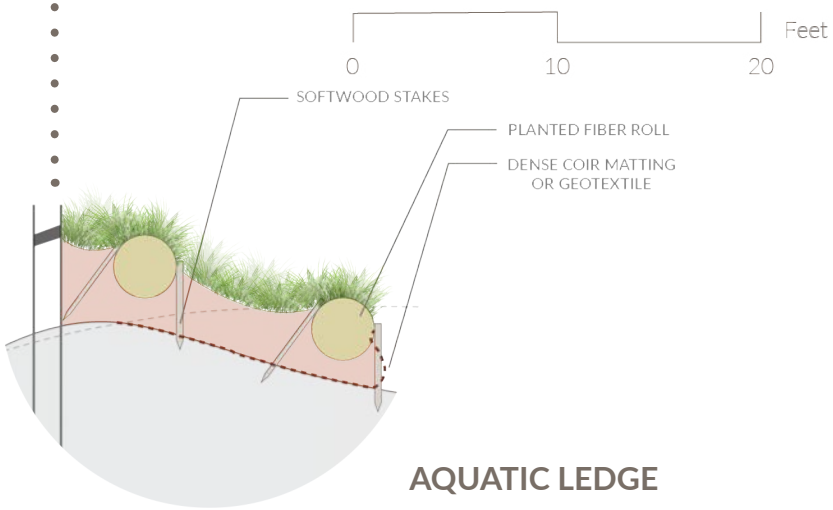
Panicum virgatum

Amelanchier canadensis

Morella cerifera

Baccharis halimifolia

The existing deck along the Murderkill River with flooding problems becomes an extended look out and a nature-based flooding protection vegetated edge.



AQUATIC LEDGE