

THE GREAT BAY
LIVING SHORELINE PROJECT

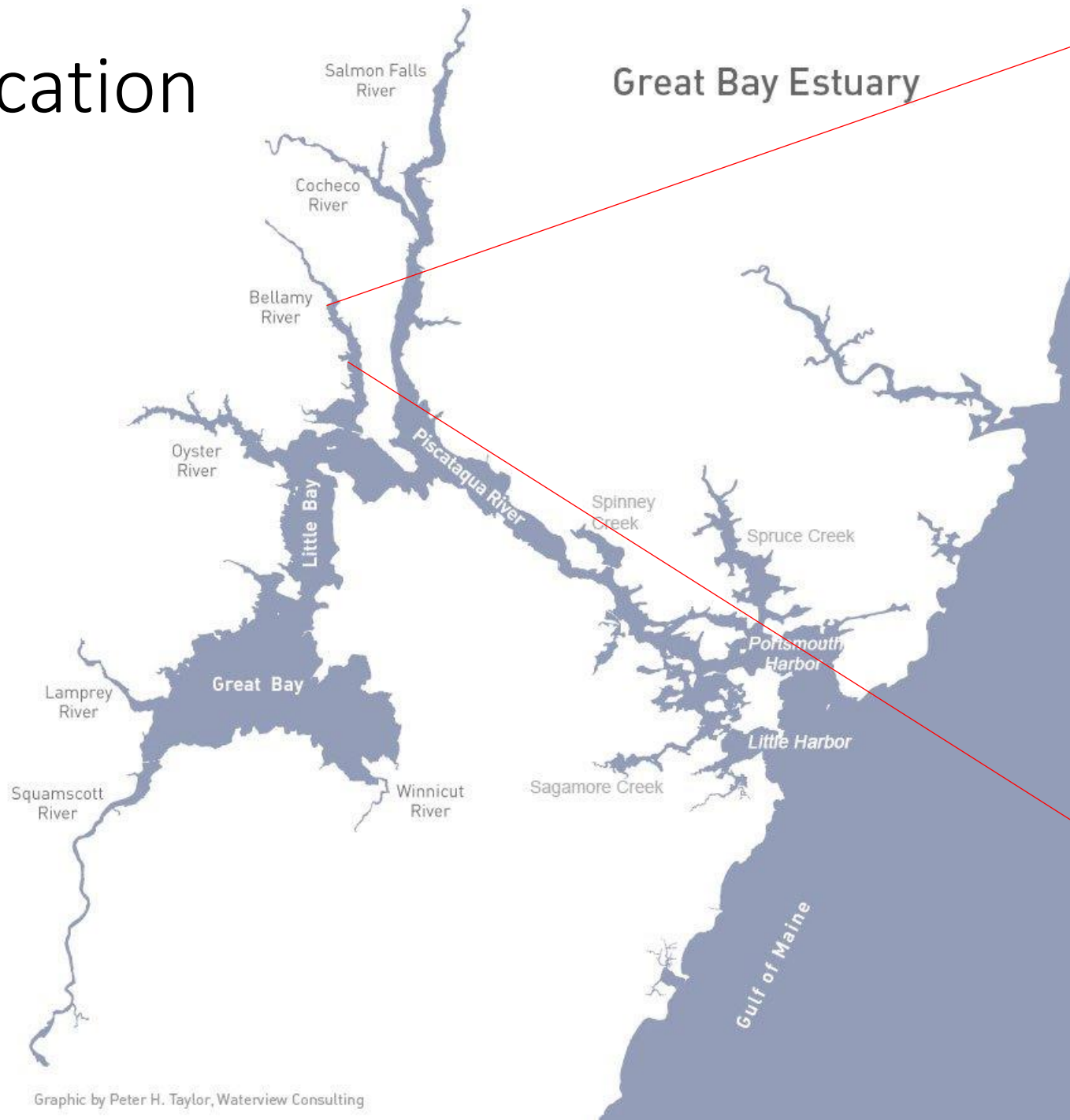


77 SPUR ROAD – CONCEPTUAL DESIGN

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APRIL 8, 2022

Location



Graphic by Peter H. Taylor, Waterview Consulting



Existing Conditions



South Section: Moderate/Stable



Looking South

Middle Section: Steep/Eroding



Looking East

North Section: Retaining Walls/Armoring



Looking Northeast



Looking North



Looking North



Looking North

Impairments & Stressors

- Impairments

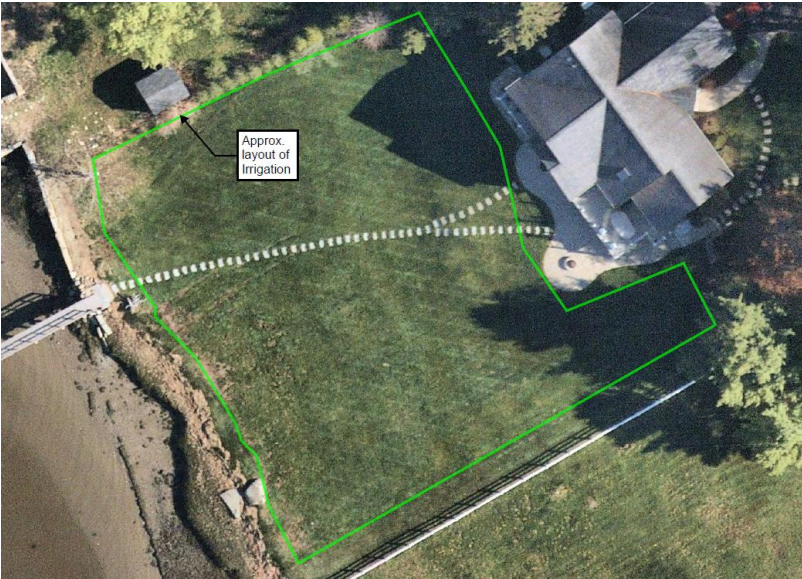
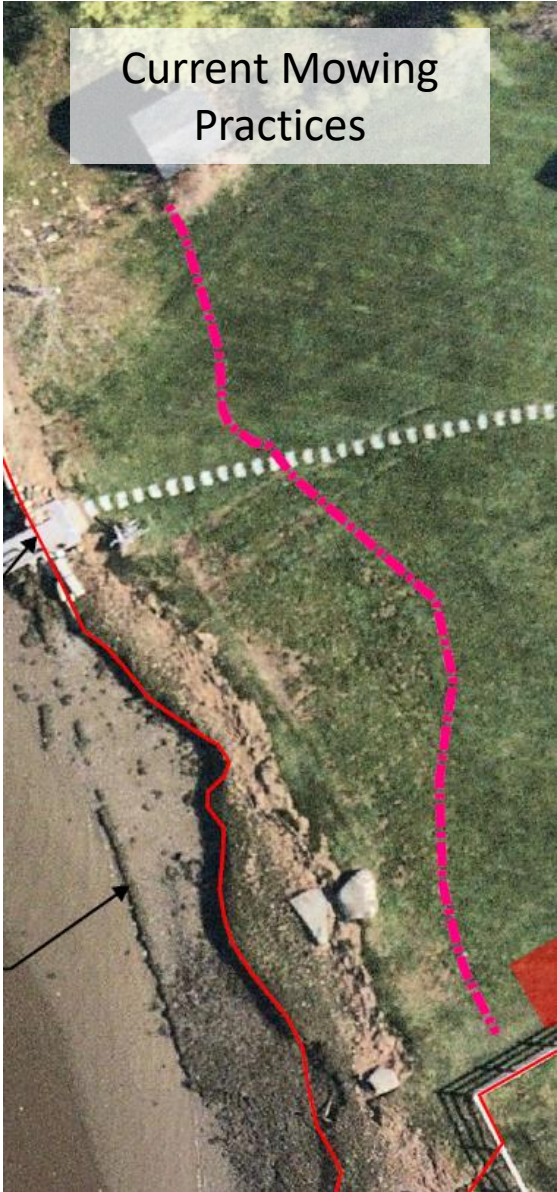
- High marsh restricted to narrow band that is badly eroded along seaward edge in many areas
- Relatively healthy marsh despite erosion

- Stressors

- Standard tidal action
- Increasing inundation/sea level rise
- Winter storms
- Ice scouring/rafting



Site Constraints



Project Goals

- Ecological Goals

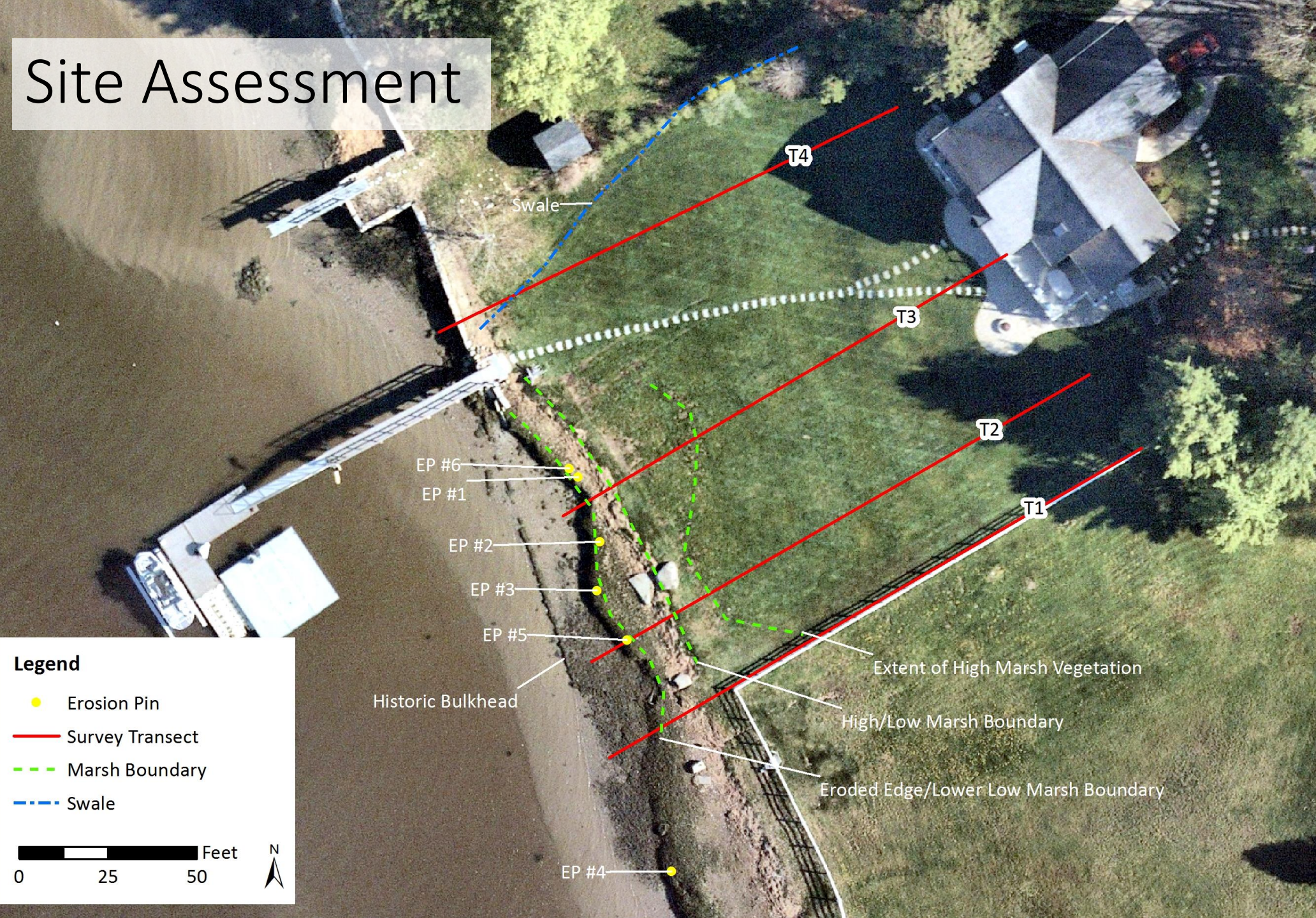
- Protect existing salt marsh from further erosion
- Restore salt marsh and shoreline functions that have already been lost to erosion
- Allow for some inland migration of salt marsh as sea level rises

- Landowner Goals

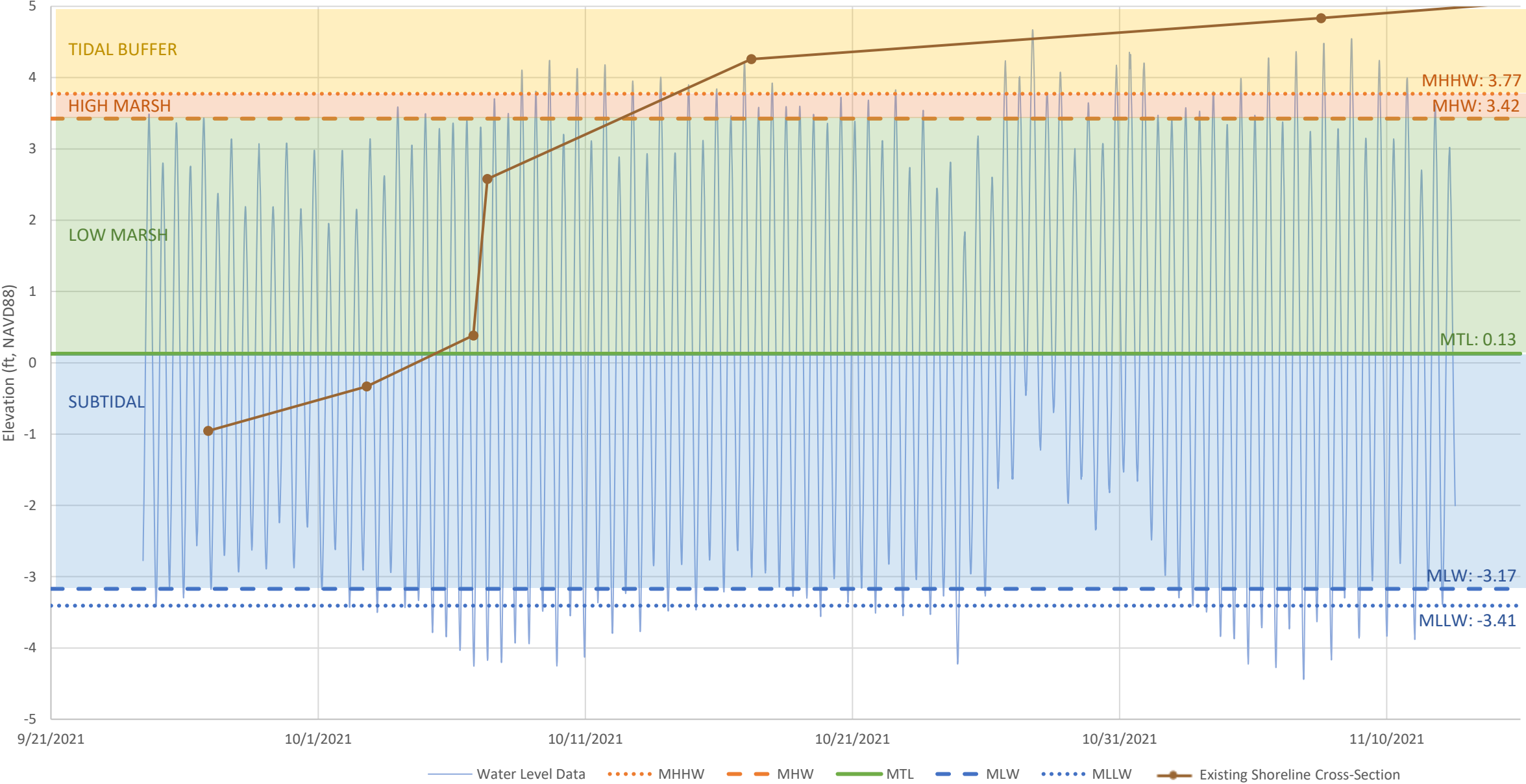
- Limit further shoreline erosion
- Protect lawn and property from flooding and erosion hazards
- Maintain some lawn for pets, open space, and field of view to river
- Provide for seasonal storage of several large docks on land accessible by barge-mounted crane



Site Assessment



Tidal Data Analysis



Sea Level Rise Projections

Datum	Elevation (ft, NAVD88)		Zone
	Existing (Fall 2021)	2050 SLR Scenario (+1.3')	
HTL	5.77	7.07	Tidal Buffer
MHHW	3.77	5.07	High Marsh
MHW	3.42	4.72	
MTL	0.13	1.43	Low Marsh
MLW	-3.17	-1.87	Subtidal
MLLW	-3.41	-2.11	

NH Guidance for Estimating Coastal Flood Risk Projections

STEP 1. DEFINE PROJECT GOAL, TYPE, LOCATION, AND TIMEFRAME(S)

Step 1.1 | Define the project goal and project type

Step 1.2 | Define and inventory the project area

Step 1.3 | Define the timeframe(s) for the project

= ~30 yrs (2050)

STEP 2. DETERMINE TOLERANCE FOR FLOOD RISK

Step 2.1 | Identify project characteristics that influence tolerance for flood risk

Step 2.2 | Determine tolerance for flood risk based on project characteristics

= High Tolerance

STEP 3. SELECT AND ASSESS RELATIVE SEA-LEVEL RISE (RSLR)

Step 3.1 | Select RSLR estimate(s) for the project

Step 3.2 | Assess RSLR impacts to the project

= 1.3 feet

STEP 4. IDENTIFY AND ASSESS RSLR-ADJUSTED COASTAL STORMS

Step 4.1 | Identify RSLR-adjusted Design Flood Elevation (DFE)

Step 4.2 | Assess RSLR-adjusted coastal storm impacts to the project

STEP 5. IDENTIFY AND ASSESS RSLR-INDUCED GROUNDWATER RISE

Step 5.1 | Identify RSLR-induced groundwater rise for the project

Step 5.2 | Estimate depth to present-day and future groundwater

Step 5.3 | Assess RSLR-induced groundwater rise impacts to the project

STEP 6. IDENTIFY AND ASSESS PROJECTED EXTREME PRECIPITATION

Step 6.1 | Account for projected increases in extreme precipitation

Step 6.2 | Assess projected extreme precipitation impacts to the project

STEP 7. ASSESS CUMULATIVE RISK AND EVALUATE ADAPTATION OPTIONS

Step 7.1 | Assess cumulative coastal flood risk to the project

Step 7.2 | Identify and evaluate adaptation options to mitigate coastal flood risk

Step 7.3 | Select and implement preferred option(s) or revisit previous steps

Bank Erosion Projections

Pin No.	Dist. from S Edge of Pier (ft)	Protruding Distance (mm)			Erosion Rate		2050 Erosion Distance (ft)
		9/24/2021	10/28/2021	3/19/2022	mm/day	mm/yr	
6	33	0	11	59	0.398	145	14
1	36	0	24	—	0.706	258	25
2	55	0	33	163	1.114	406	39
3	67	0	33	147	1.023	373	36
5	83	0	2	0	0.059	21	2
4	150	0	20	15	0.199	73	7
Average (all data)					0.583	213	20
Average (excluding #1 & #5 outliers)					0.683	249	24



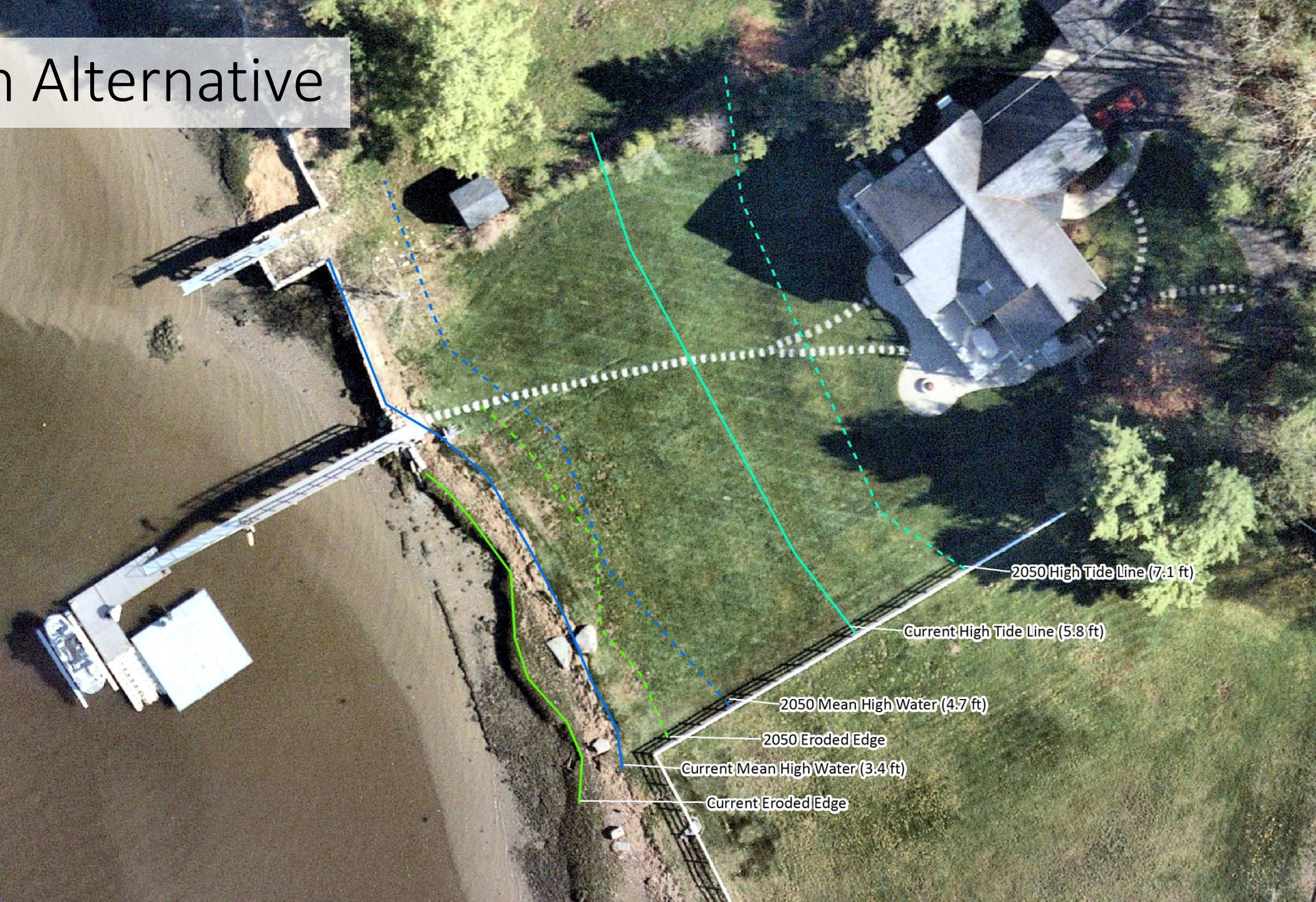
No Action Alternative

Legend

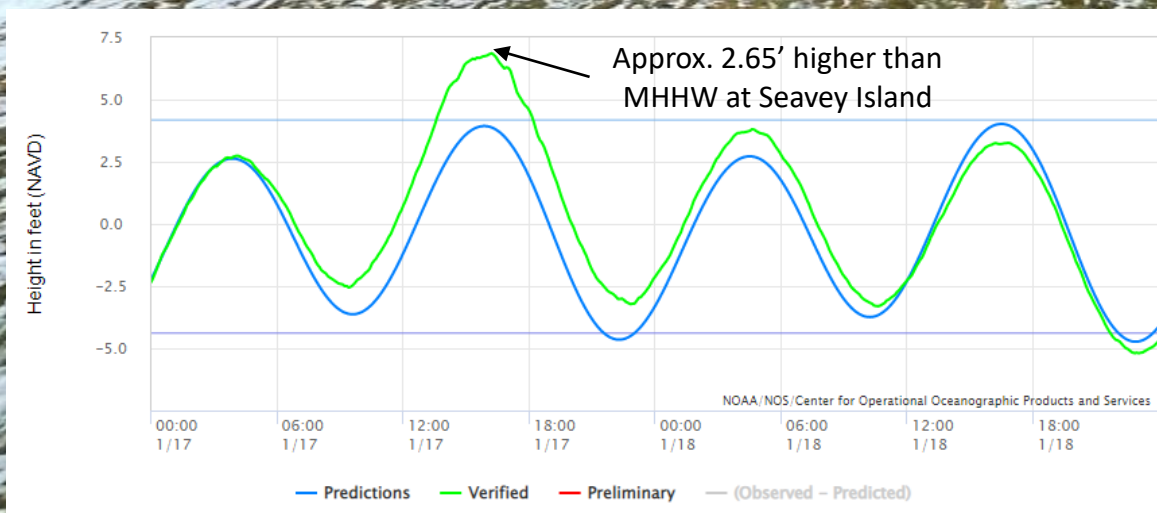
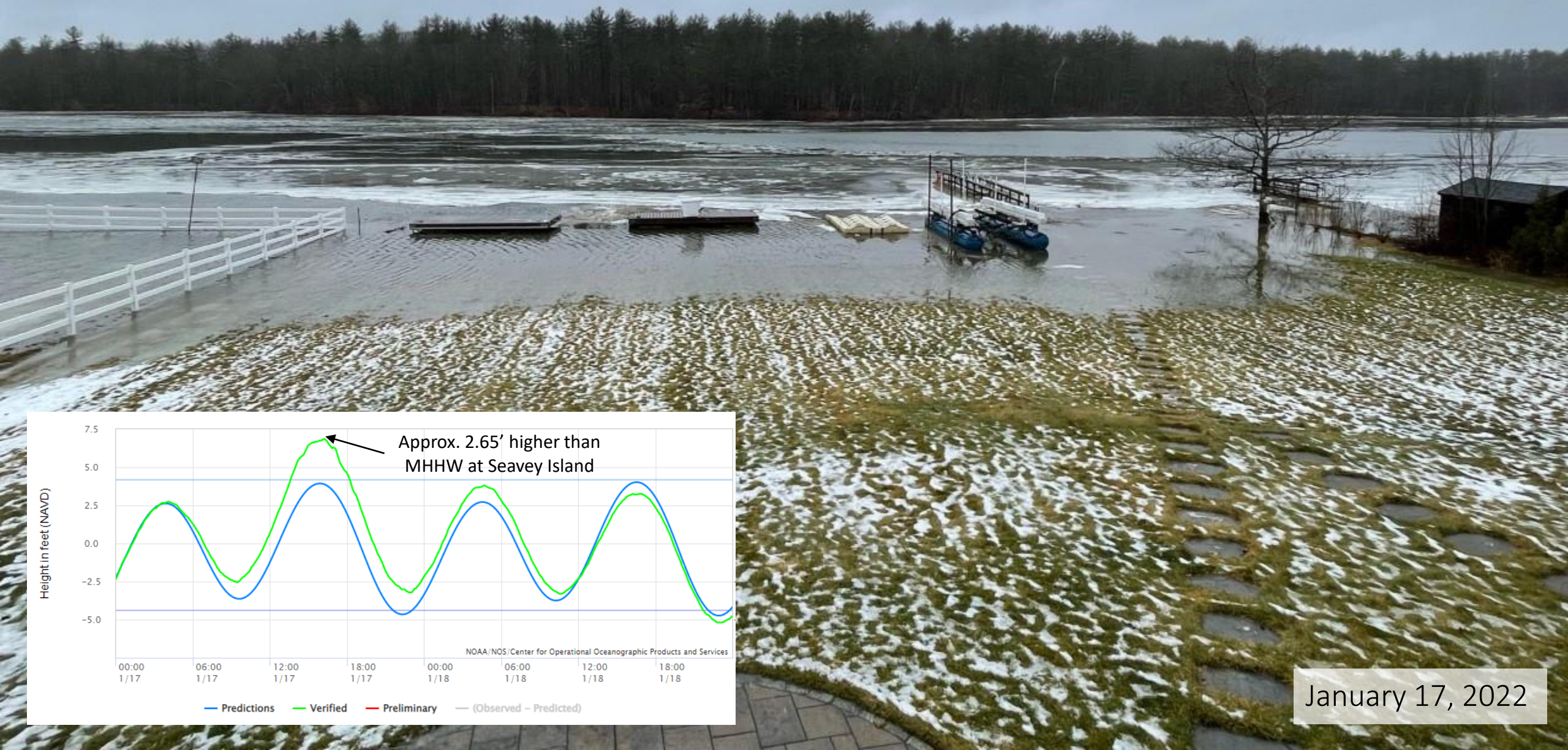
- Current Eroded Edge
- 2050 Eroded Edge
- Current MHW
- 2050 MHW
- Current HTL
- 2050 HTL

0 20 40 Feet

N

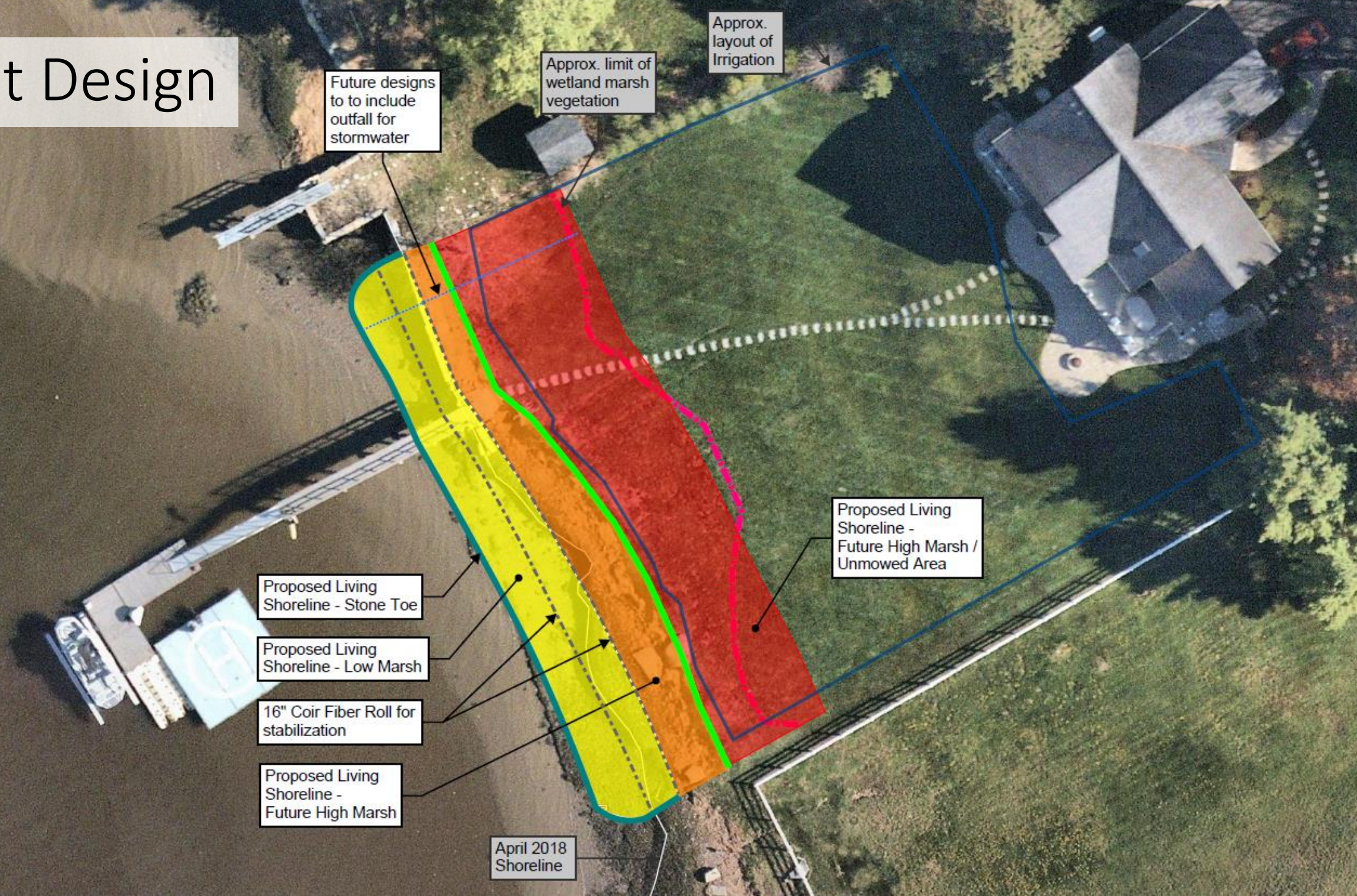


High Tide + Storm Surge



January 17, 2022

Concept Design



Future designs
to to include
outfall for
stormwater

Approx. limit of
wetland marsh
vegetation

Approx.
layout of
Irrigation

Proposed Living
Shoreline -
Future High Marsh /
Unmowed Area

Proposed Living
Shoreline - Stone Toe

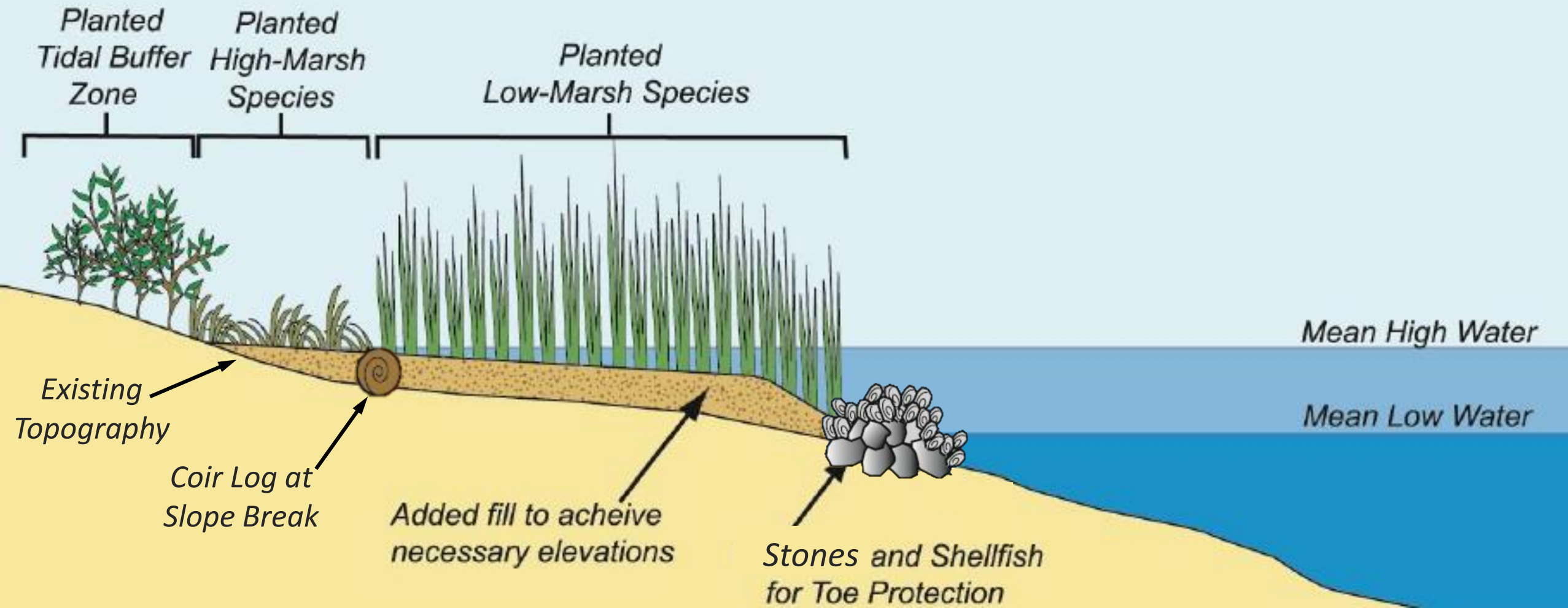
Proposed Living
Shoreline - Low Marsh

16" Coir Fiber Roll for
stabilization

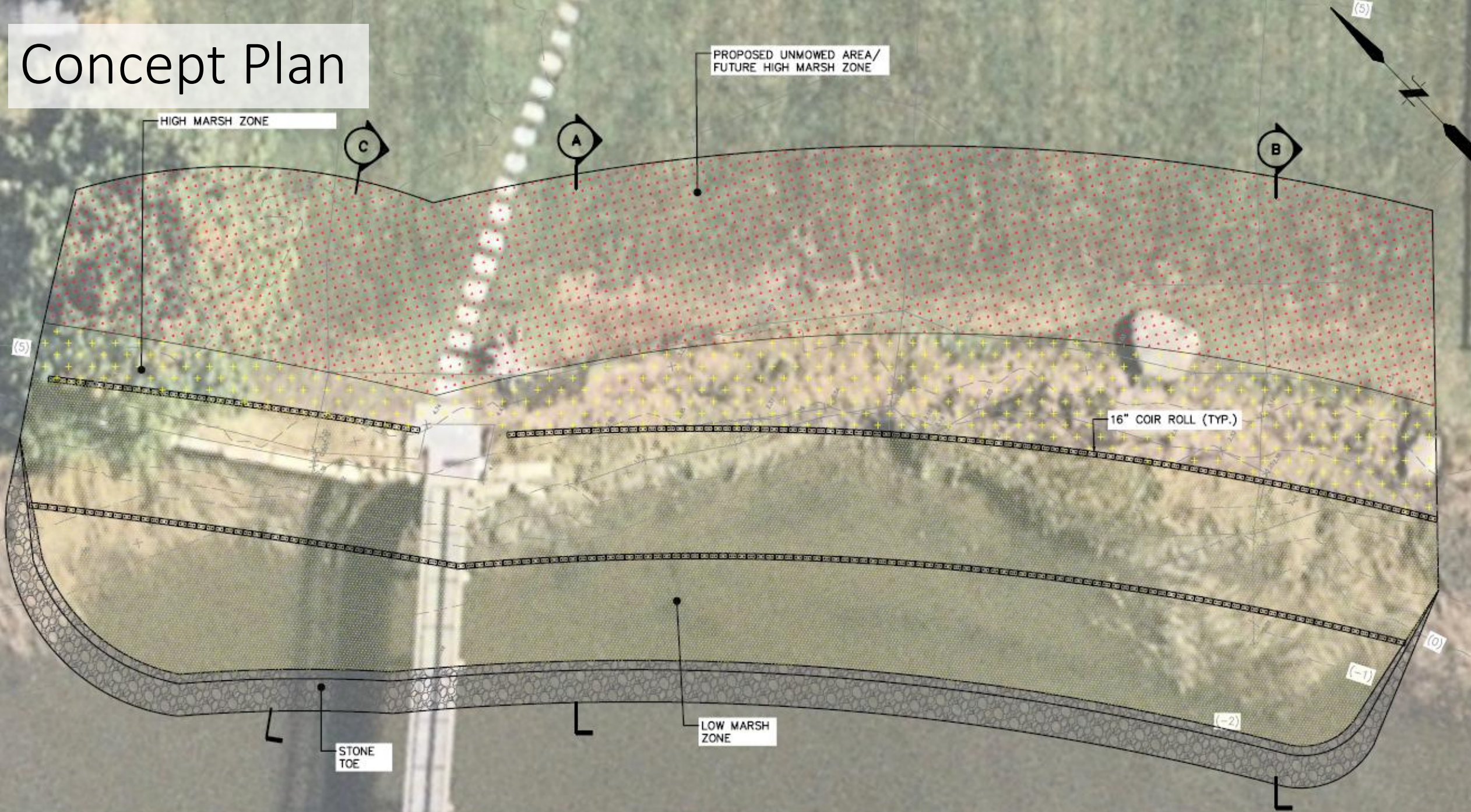
Proposed Living
Shoreline -
Future High Marsh

April 2018
Shoreline

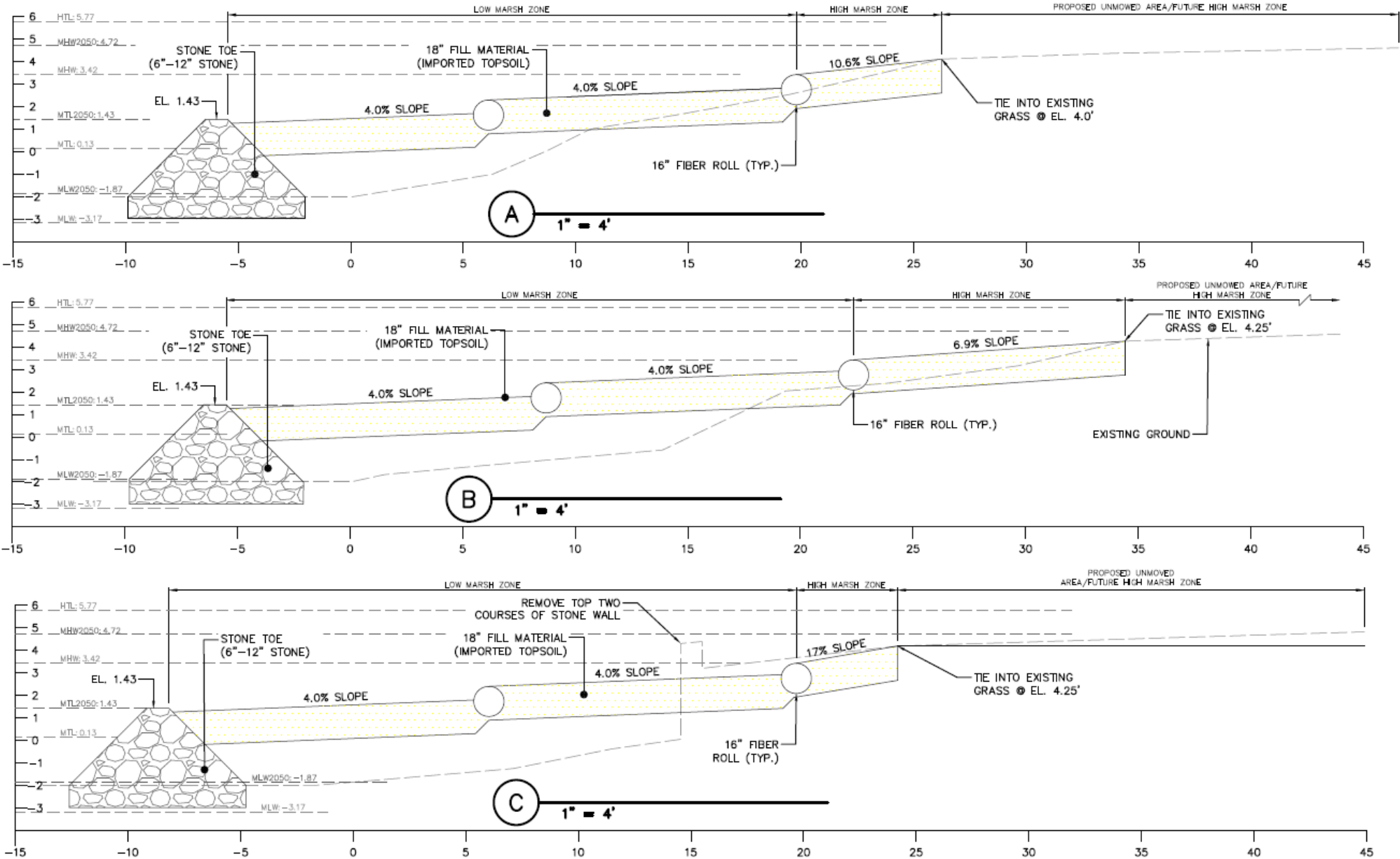
Concept Design – Typical Section



Concept Plan



Concept Sections



Renderings – Existing Conditions

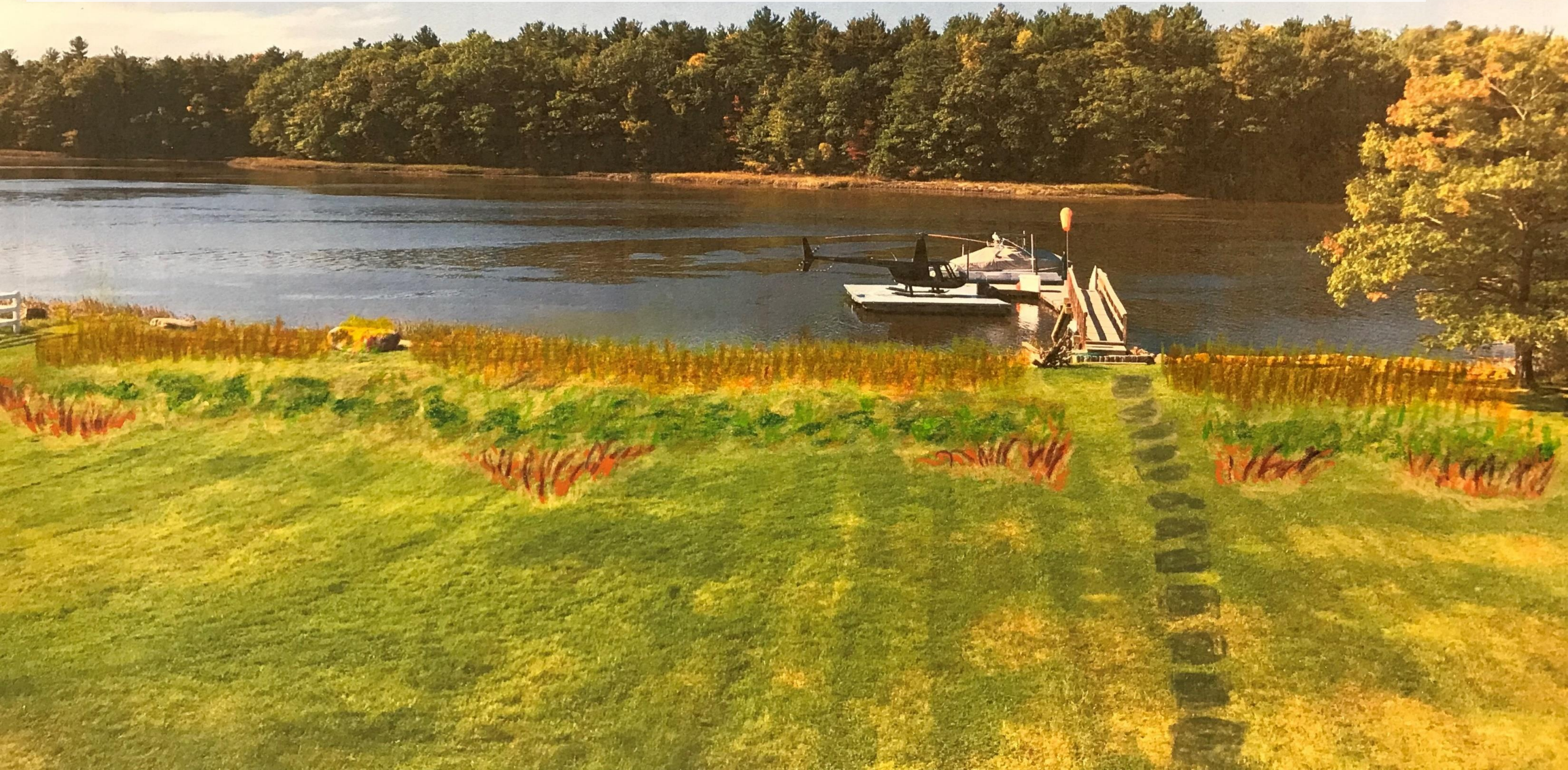


Renderings – Proposed Salt Marsh with Low & High Marsh Grasses Only



Landowner Selected Alternative

Renderings – Proposed Salt Marsh with Upland Grasses in Tidal Buffer



Renderings – Proposed Salt Marsh with Protective Boulders in Tidal Buffer



Permitting Requirements

STATE

- NHDES Minimum Impact Tidal Shoreline Stabilization Project (Env-Wt 609.10(b))
 - **< 200 linear feet and extending < 50 feet seaward of Mean Low Water**
 - Coastal functional assessment
 - Coastal vulnerability assessment
 - Close coordination with NHDES
- NHDES Shoreland Permit (Env-Wq 1412)
 - Shoreland Restoration – eligible for restoration of a waterfront buffer
- NH Dept. of Historical Resources (DHR) – Archeological Assessment
 - Phase IA Survey
 - Request for Project Review



LOCAL

- Dover Conditional Use Permit (CUP)
- Conservation Commission Approval
- Planning Board

Next Steps

- Preliminary Design
- Permitting
- Final Design
- Construction
- Post-Construction Monitoring
 - Initial/ongoing planting success
 - Shoreline erosion rate
 - Topo survey to assess settlement/erosion
 - Biological indicators



A scenic view of a lake with a white fence, a house, and driftwood in the foreground. The image shows a calm body of water with a white picket fence running along the left side. In the background, a grey house is visible. The foreground features a grassy area with some fallen leaves and a large pile of driftwood on the right. The water is slightly rippled, and there's a small rock in the middle ground. The overall atmosphere is peaceful and somewhat somber due to the overcast sky.

Questions?

Design Team

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