Herring River Restoration Project

Overview of Secondary Management Activities

Herring River Executive Council; Thursday September 29, 2021

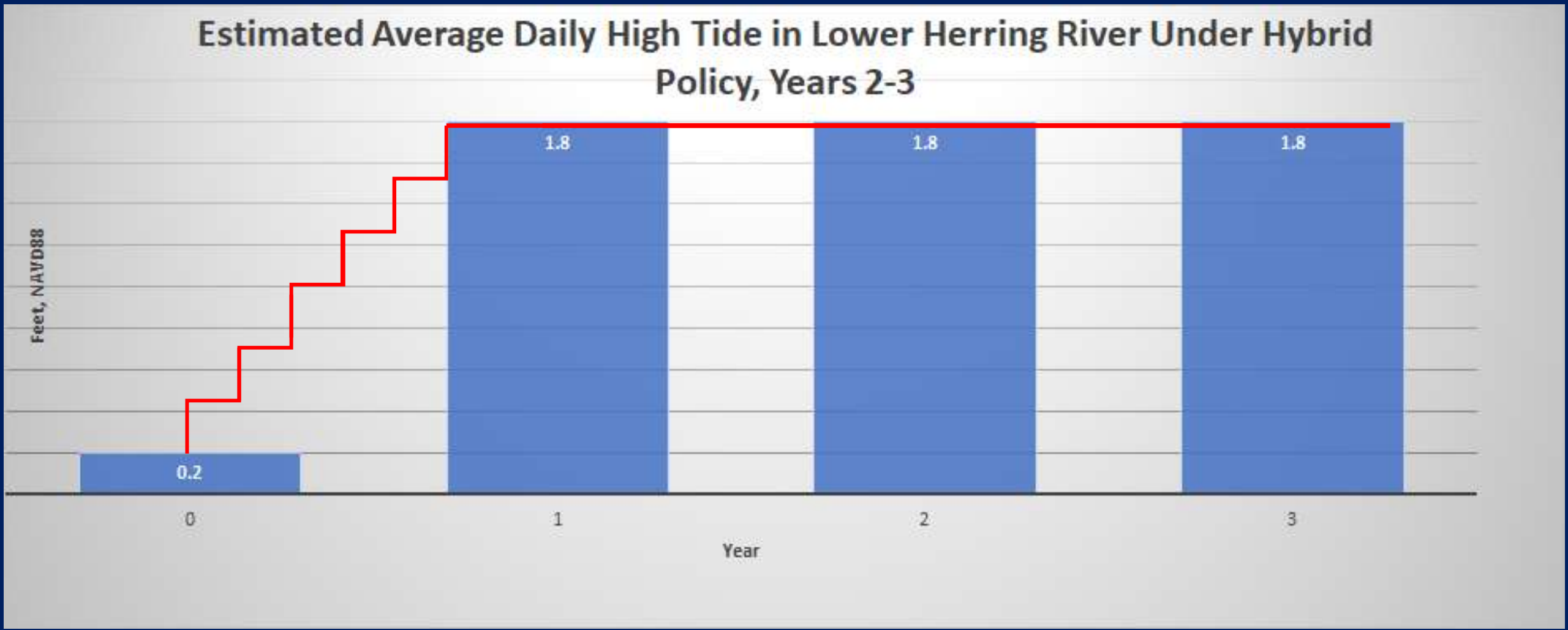
Primary Management = Tide Gate Manipulation

Secondary Management =

- Removing Trees, Shrubs, Phragmites in Current and Future Brackish and Saltwater Habitats
- Removing Anthropogenic Fill From Marsh Surface
- Enhancing Tidal Flow in Natural Stream Channels
- Managing Flow in Anthropogenic Ditches for Salt Marsh Functions and Mosquito Control
- Enhancing Marsh Surface Elevation for Salt Marsh Functions and Mosquito Control

July Meeting Summary

Hybrid 5-yr/15-yr Rapid Tide Gate Policy Approach – 3 Components



Hybrid 5-yr/15-yr Rapid Tide Gate Policy for First 3 Years of Implementation – Details (1 of 2)

- "Year Zero" (Construction Stage)
  - ✓ Construct CNR Bridge & Mill Creek WCS
  - ✓ Road & property mitigation (not necessarily required to implement initial strategy)
  - ✓ **Begin vegetation management** (Phragmites mowing [45 acres]; Tree removal [42 acres])
  - ✓ Continue and complete pre-restoration monitoring
- **Year 1**
  - ✓ High Tide of 1.8 feet is a critical water level threshold where tides overflow stream/creek banks and begins to flood marsh surfaces
  - ✓ First 1-2 months: Gates set to maintain existing tidal condition to ascertain function and test mechanical systems
  - ✓ Next 10-11 months: Initiate small, progressive gate openings approximately two months apart to reach MHW water surface from ~0.2 to ~1.8 feet (Lower River)
  - ✓ **Continue vegetation management** (Tree removal [42 acres]; Shrub cutting [39 acres])
  - ✓ Initiate Post-construction monitoring

Hybrid 5-yr/15-yr Rapid Tide Gate Policy for First 3 Years of Implementation – Details (2 of 2)

- **Years Two and Three**
  - ✓ Continuous monitoring will occur and the flexibility to adjust management will be based on assessment of project outcomes
  - ✓ Apply actual observations to rerun models, data elicitation, and community surveys to improve predictive data for subsequent decision-analysis
  - ✓ Formulate longer-term management strategy based on assessment of Years 1-3 data
  - ✓ Hold gates for average high tide of ~1.8 feet in Lower River for two years
  - ✓ Intensive data collection
  - ✓ **Year 3 of vegetation management** (Tree removal [42 acres]; Shrub cutting [39 acres])
  - ✓ **Conduct Pilot Project to remove spoil berms and restore marsh elevation**
  - ✓ Authorize one short-term event-based larger tide gate opening during Annual High Tide or storm surge to collect data on sediment deposition

Herring River Restoration Project

Overview of Secondary Management Activities

- **Primary Purposes of Vegetation Management**
  - Enhance/promote growth of salt marsh vegetation
  - Avoid accumulation of dead material in tidal creeks and channels
  - Improve/manage aesthetics through removal of dead above ground vegetation
  - Promote Blue Carbon Benefits; Retain Carbon Within the Marsh Soil

- Managing Above-Ground Material
- Draft Vegetation Management Plan Currently Under Review by Massachusetts Endangered Species and Natural Heritage Program
- Public Land Only; Any Work on Private Land Will Be at Owner's Request and With Their Consultation

Herring River Restoration Project

Overview of Secondary Management Activities

Removal Methods – According to Site Conditions

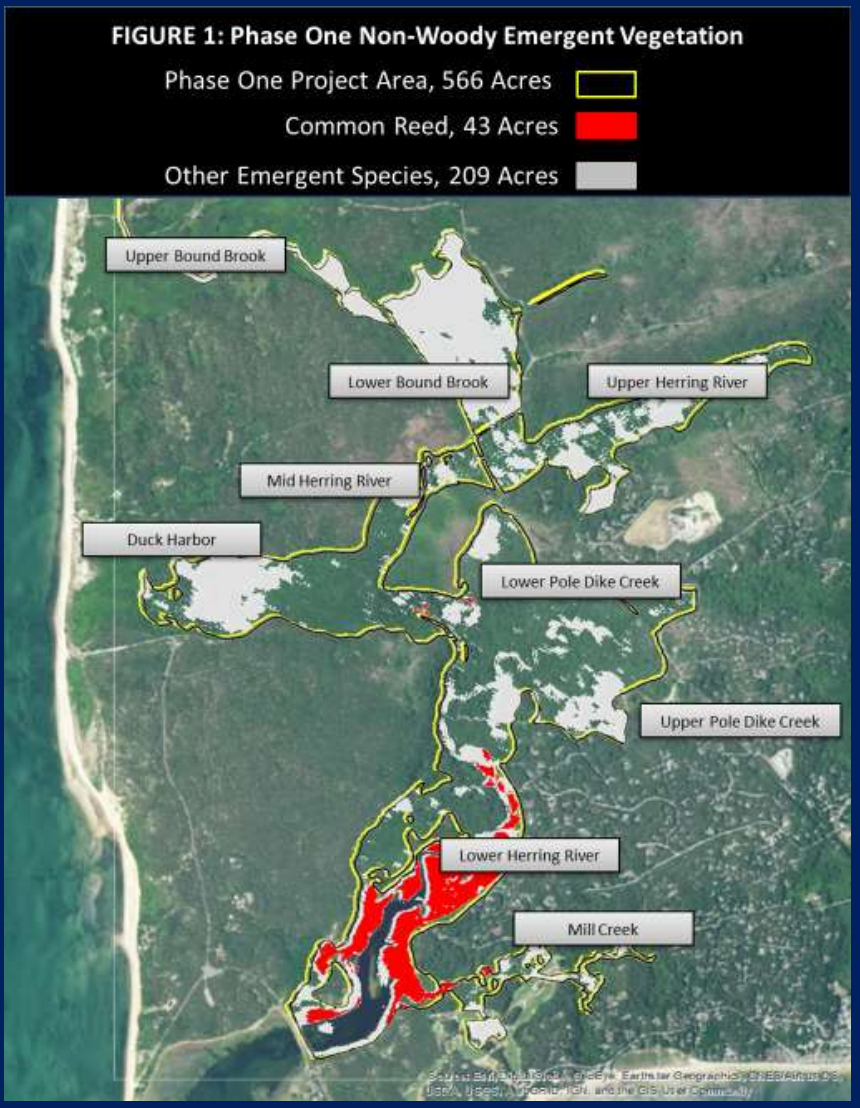
- Land Clearing Contractor(s) and HR-Specific Field Crew (e.g. "Americorps")
- Mowing, Machine-mounted "Brush Hog"; Specialized for Low Ground Pressure
- Hand Removal: Powered (i.e. Brush Saw) and Non-Powered Equipment
- Standard Forestry Practices, Single Trees
- Full-Tree "Fecon"/"Brontosaurus" Mulchers

Log/Slash/Brush Handling Methods

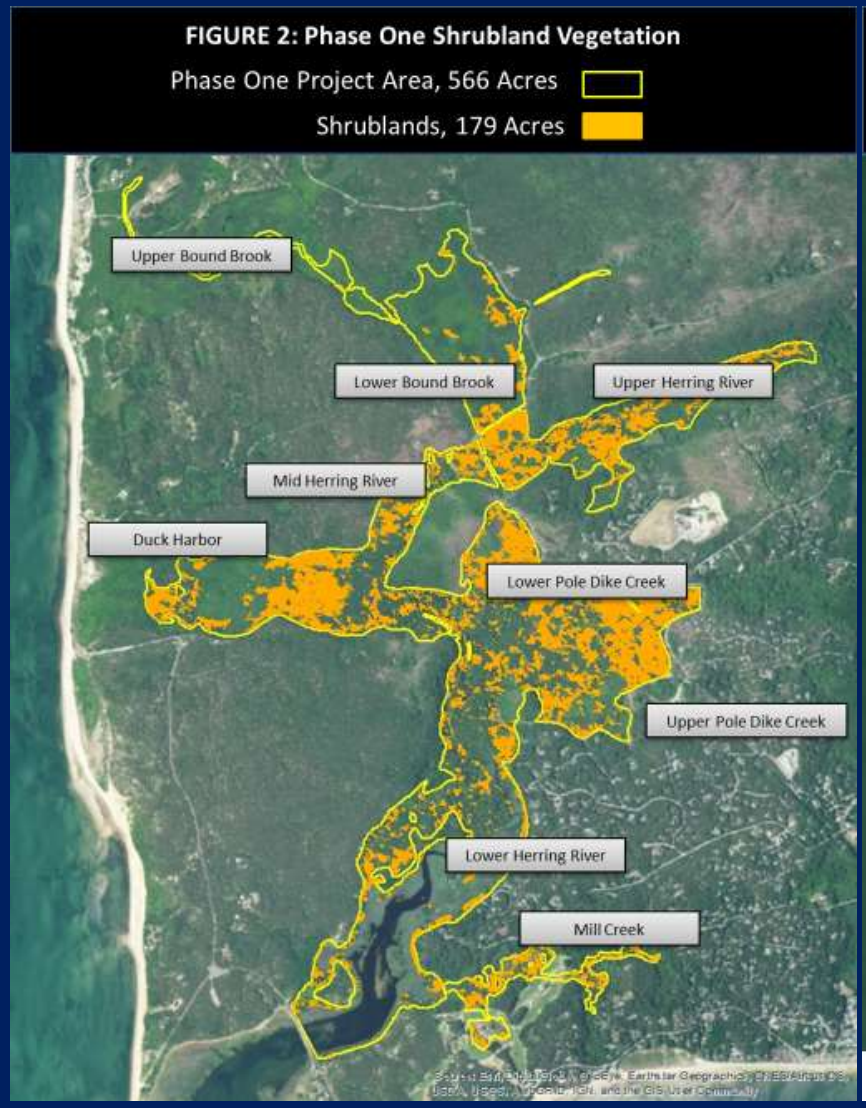
- Wood Chips, Reuse for Burial in Marsh Soil or Unwanted Ditches
- Bundles/"Wattles"; Shrub and Phragmites Stems for Sediment Retention
- Full Logs for Ditch Plugging
- Biochar – Retains Carbon in Soil
- Pilot Program for Evaluating Removal & Disposition Methods Under Consideration

Herring River Vegetation Management Locations, Phase 1
348 acres: About 62% of Phase 1 area

Phragmites



Shrublands

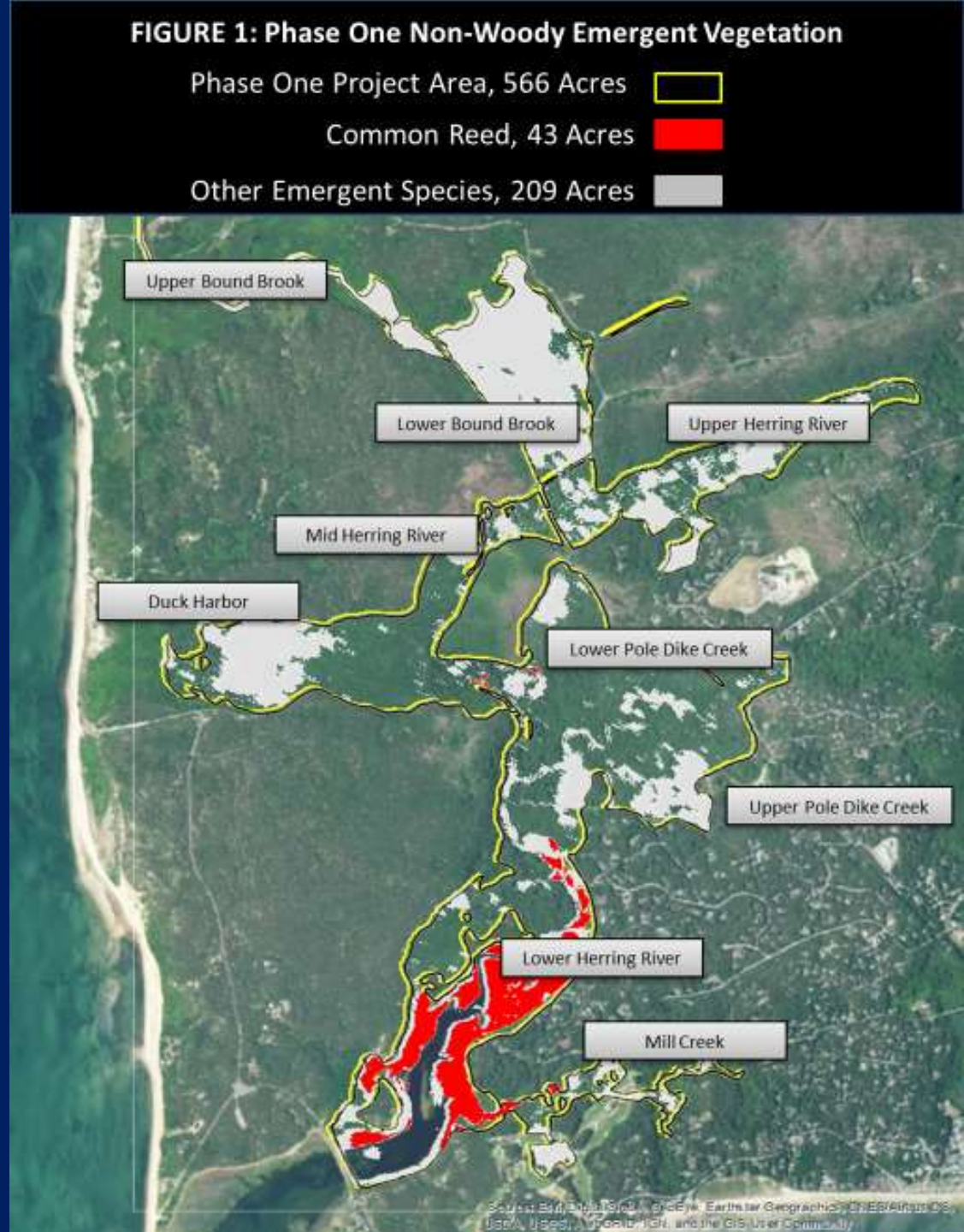


Woodlands

Herring River Vegetation Management Locations, Initial 3-year Management Period

Phragmites

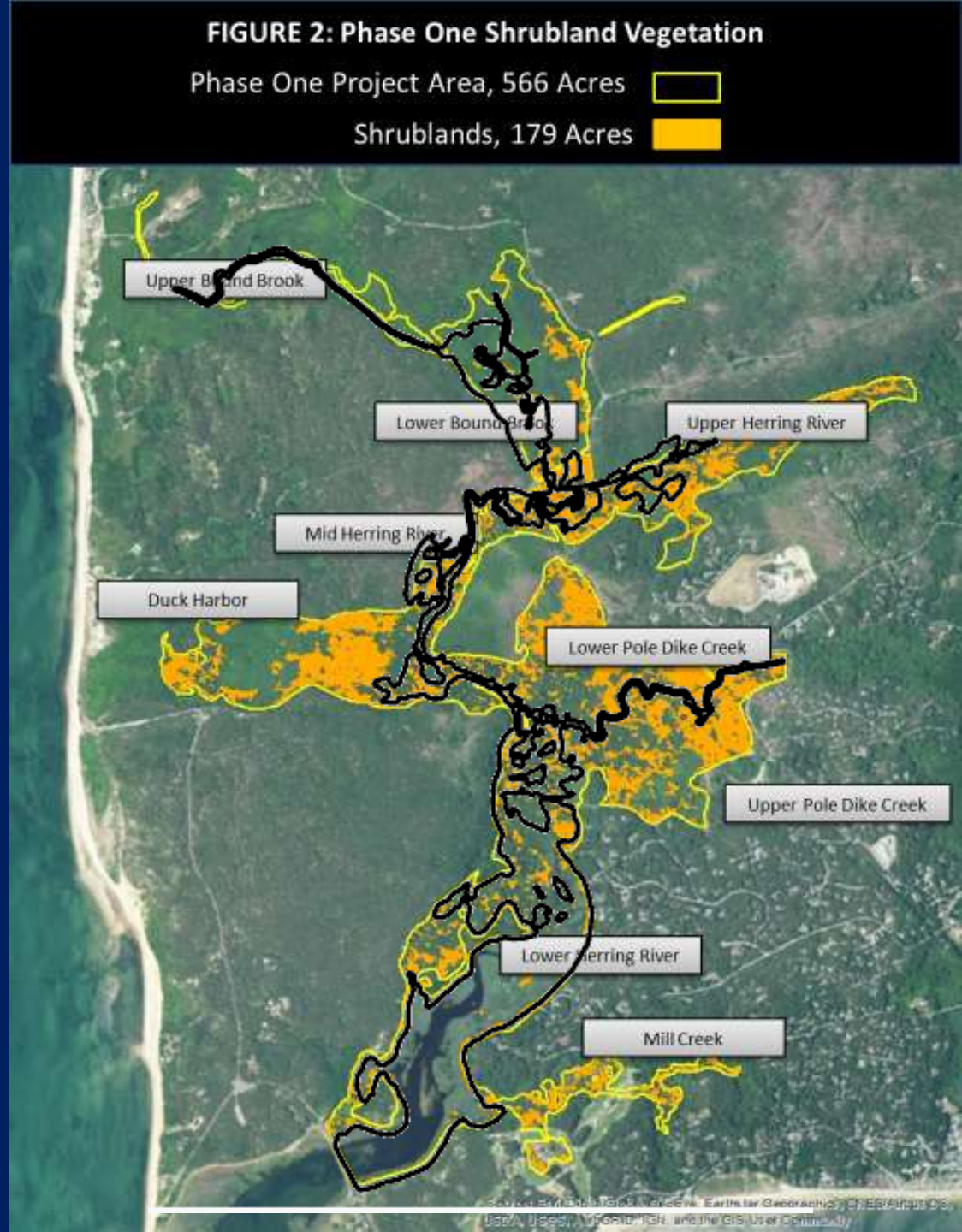
- Remove All Phragmites in Project Area During Year 0 (CNR Dike Construction) and Year 1
- > 95% in Lower Herring River
- Flooded with Salt Water at End of Year 1
- Monitoring Plan for Duration of Project to Detect Regrowth and Spread
- Disposition of Cut Material Needs More Research



Herring River Vegetation Management Locations, Initial 3-year Management Period

Shrublands

- Remove Shrubs in 3-year Inundation Area During Year 1 and Year 2 (Black Outline →)
- Approx. 90 acres, < 50% of Shrubland Coverage
- Flooded with Salt Water at End of Year 1



Herring River Vegetation Management Locations, Initial 3-year Management Period

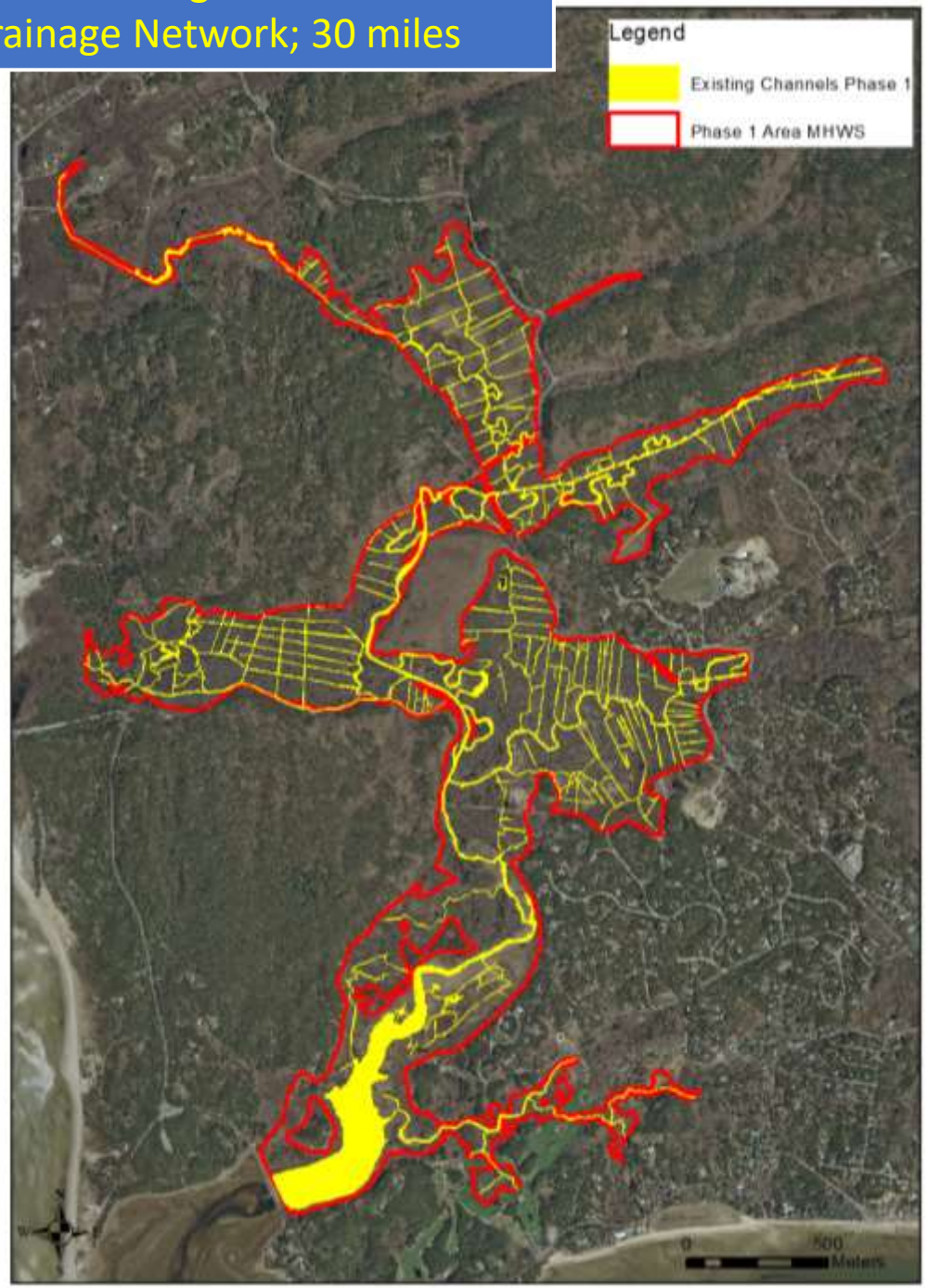
Woodlands

- Prioritize Tree Removal in Lower Herring River, and Lower Pole Dike Creek in Year 2 (Black Outline →)
- Approx. 60 acres; Complete Other Areas as Funding Allows
- Methods:
  - Low Ground Pressure Tracked Mower (Contractor)
  - Full Tree Mulcher (i.e. “Fecon”; Contractor)
  - Standard Forestry Practices
- Considering Re-use of Logs, Brush, and Woodchips to Support Other Project Objectives

Funding and Pilot Projects

- If Approved, North America Wetlands Conservation Act Grant Will Cover All Vegetation Management Needed for 3-year Initial Period; Approximate Grant Period Summer 2022-24
- NAWCA Grant Also Includes Pilot Berm Removal and Sediment Management Study
- Under Consideration: Study to Test and Evaluate Methods and Refine Future Workplan and Budget for Extensive Phragmites, Shrub, and Tree Removal
- Monitoring Data from Pilot Studies Will Be Presented to Executive Council, Regulatory Oversight Group, and Stakeholder Group and Will Guide Future Management

Estimated Existing Stream Channel and Drainage Network; 30 miles



Estimated Natural Stream Channel Network; 15 miles