Presentation by Geoff Wilson, Northeast Wetland Restoration

York River Stewardship Committee meeting
9/23/25

York River - Smelt Brook Salt Marsh Restoration Project

Project funding provided by the York River Stewardship Committee through the National Park Service under CFDA 15.962 – National Wild and Scenic Rivers System

YORK RIVER
WILD & SCENIC

York River - Smelt Brook Salt Marsh Restoration Project

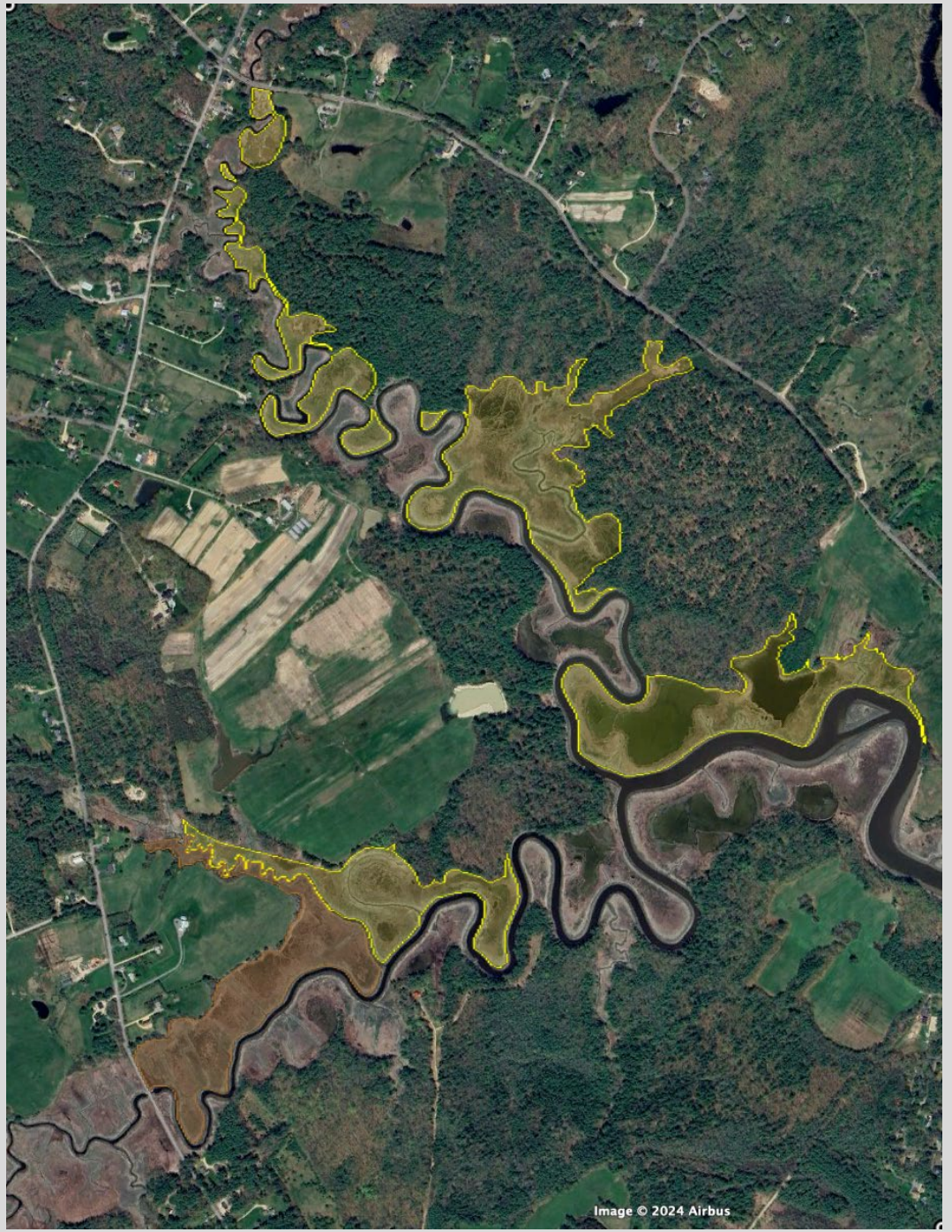
2024 Preliminary Design Area +/- 132 Acres

Smelt Brook Preserve, Near Point Preserve, and First Parish parcels +/- 104 Acres

Edkins Parcel +/- 28 Acres

Funding provided by the York River Stewardship Committee through the National Park Service under CFDA 15.962 – National Wild and Scenic Rivers System

YORK RIVER
WILD & SCENIC



York River - Smelt Brook Salt Marsh Restoration Project

Design Parameters

- Clay Core Embankments

Subterranean Ditch Voids Four Feet On Center

York River - Smelt Brook Salt Marsh Restoration Project

Design Parameters

- Clay Core Embankments
  - Frequently mentioned in agricultural literature in early 1800s
  - Found in other locations
    - MCHT Old Pond Preserve
    - Trustees Old Town Hill Reservation

Maine Coast Heritage Trust

Old Pond Preserve
Hancock, Maine

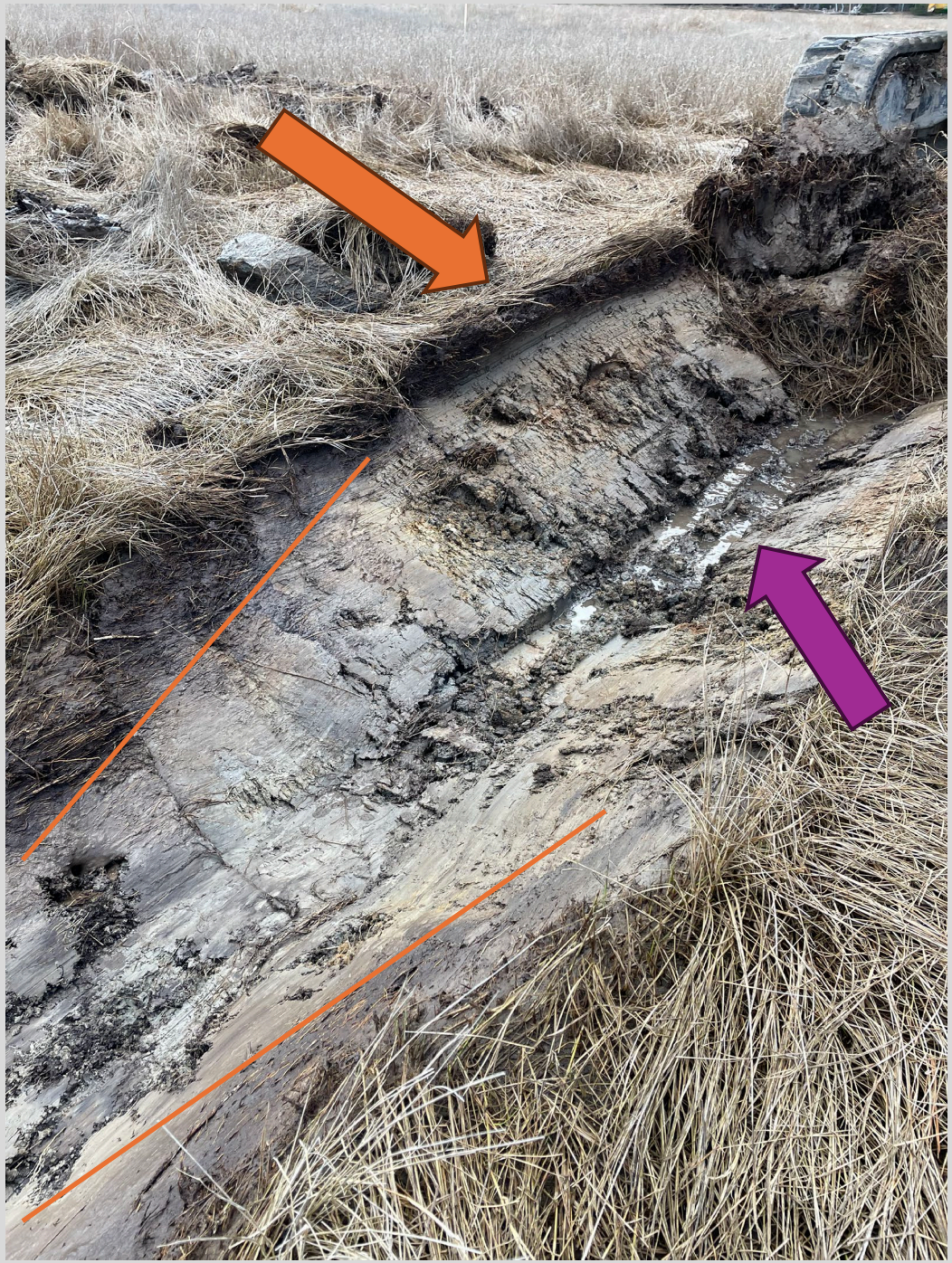
York River - Smelt Brook Salt Marsh Restoration Project

Design Parameters

- Clay Core Embankments
  - Darker higher organic content above orange lines
  - Thin organic layer at orange arrow
  - Immediate hydrology release in talweg indicates groundwater barrier (purple arrow)

Maine Coast Heritage Trust

Old Pond Preserve
Hancock, Maine



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Maine Coast Heritage Trust

Old Pond Preserve
Hancock, Maine

York River - Smelt Brook Salt Marsh Restoration Project

Design Parameters

- Phragmites

Smelt Brook Preserve, York Maine

- Fully vegetated in 1973
- Midpoint between ascending lunar node
- 2.5 Metonic cycles prior to the present day
- Darker hues indicate saturation

Smelt Brook Preserve, York Maine

- Largely Vegetated in 1998
- Two seasons after Metonic high in 1996
- 1.5 Metonic cycles prior to the present day
- Darkest hues indicate low vegetation density

Smelt Brook Preserve, York Maine

- Largely Vegetated in 2007
- One season after Metonic low in 2006
- One Metonic cycles prior to the present day
- Darkest hues indicate low vegetation density
- Phragmites encroachment in northeast tributary

Smelt Brook Preserve, York Maine

- Large areas unvegetated in 2012
- Three seasons before Metonic high in 2015
- .75 Metonic cycles prior to the present day
- Darkest hues indicate no or low vegetation density
- Phragmites encroachment in northeast tributary

Smelt Brook Preserve, York Maine

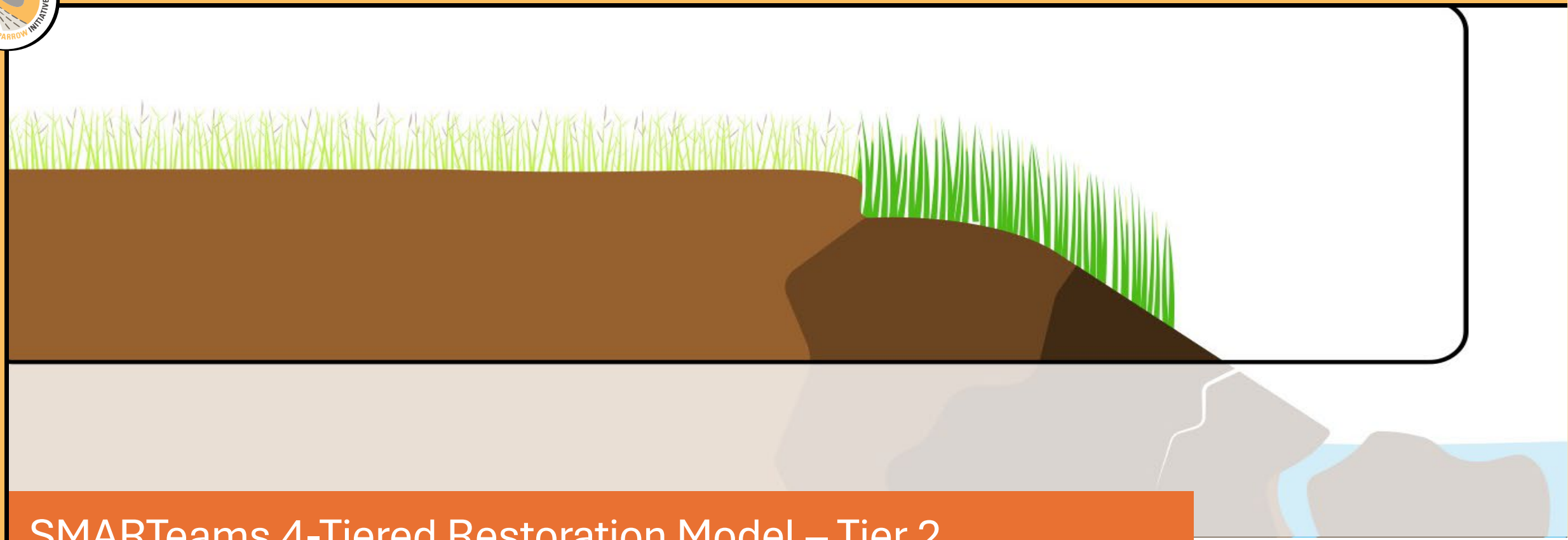
- Large areas unvegetated in 2021
- Three seasons before Metonic low in 2024
- Current Metonic cycle low
- Darkest hues indicate no or low vegetation density
- Texture indicates that brackish species recolonizing portions of open water during Metonic low period
- Revegetation strongly indicates clay core embankment influence on pore water salinity trends

SMARTeams 4-Tiered Restoration Model

SMARTeams 4-Tiered Restoration Model – Tier 1

Platform Hydrology

- Halt subsidence trajectories
- Stabilize marsh platform
- Preserve 1,500 to 4,000-year-old blue carbon stores
- Provide base for vertical accretion



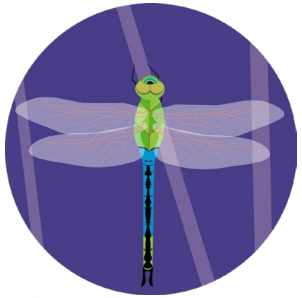
SMARTeams 4-Tiered Restoration Model – Tier 2

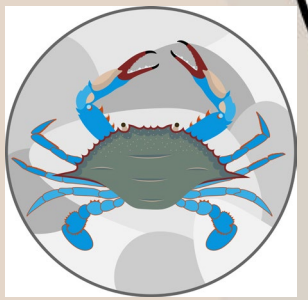
Surface Hydrology

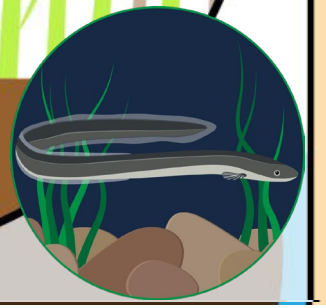
- Increase primary production
- Increase below ground biomass
- Increase accretion rates
- Increase carbon sequestration rates
- Increase marsh resiliency

SMART Teams 4-Tiered Restoration Model

Tier 3





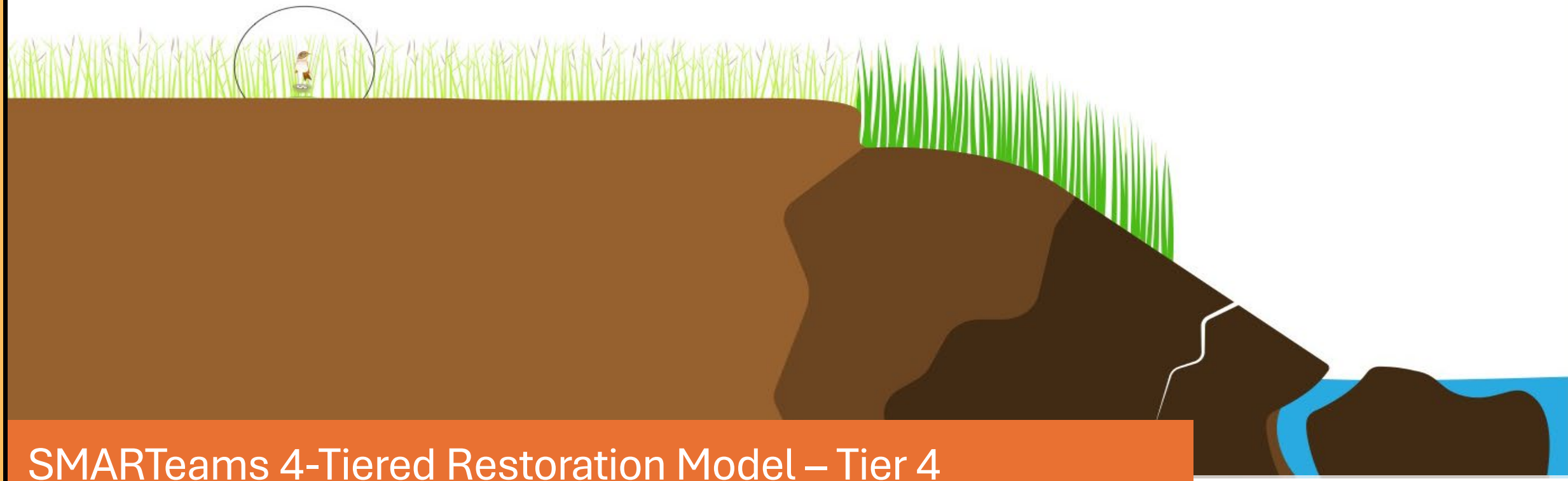


Wildlife Management Considerations

Not Limited to Saltmarsh Sparrows

Other Migratory Species

Commercially Important

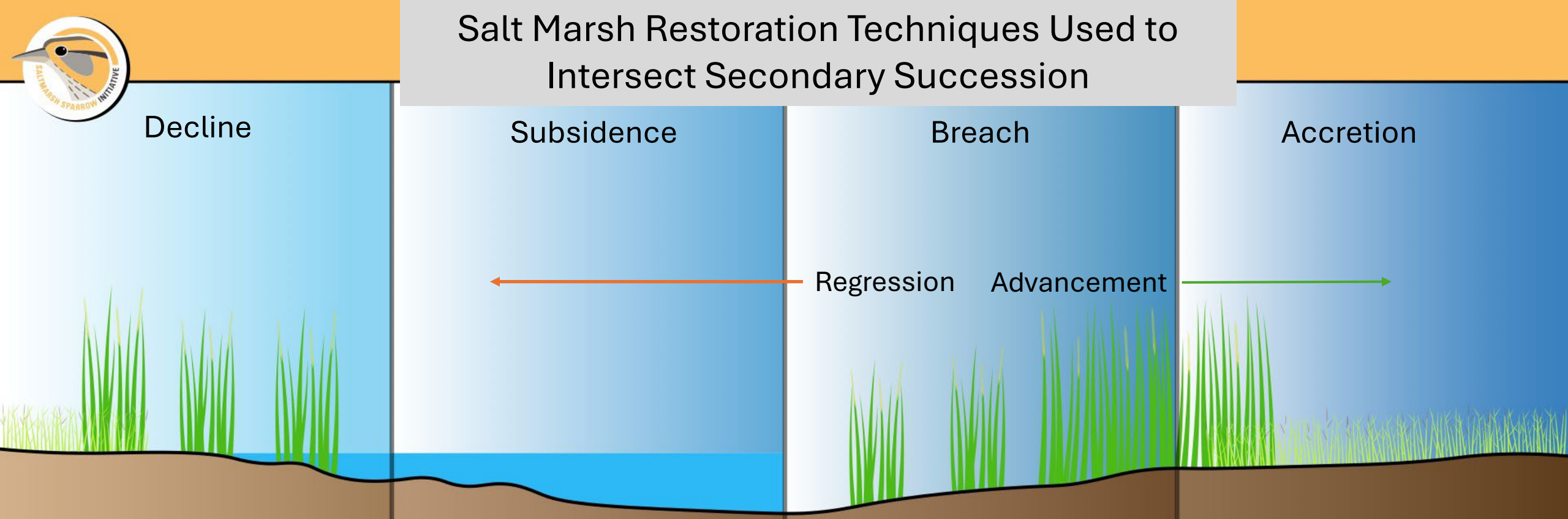


SMARTeams 4-Tiered Restoration Model – Tier 4

Long-Term Management Considerations

- Monitoring to ensure success
- Adaptive management strategies
- Vertical accretion to restore elevation across marsh platform
- Managed marsh migration

Salt Marsh Restoration Techniques Used to Intersect Secondary Succession



Intervention Technique

- Ditch Remediation Linear Treatment
- 1st Order Channels

Intervention Technique

- Ditch Remediation Point Treatment
- 1st and 2nd Order Channels

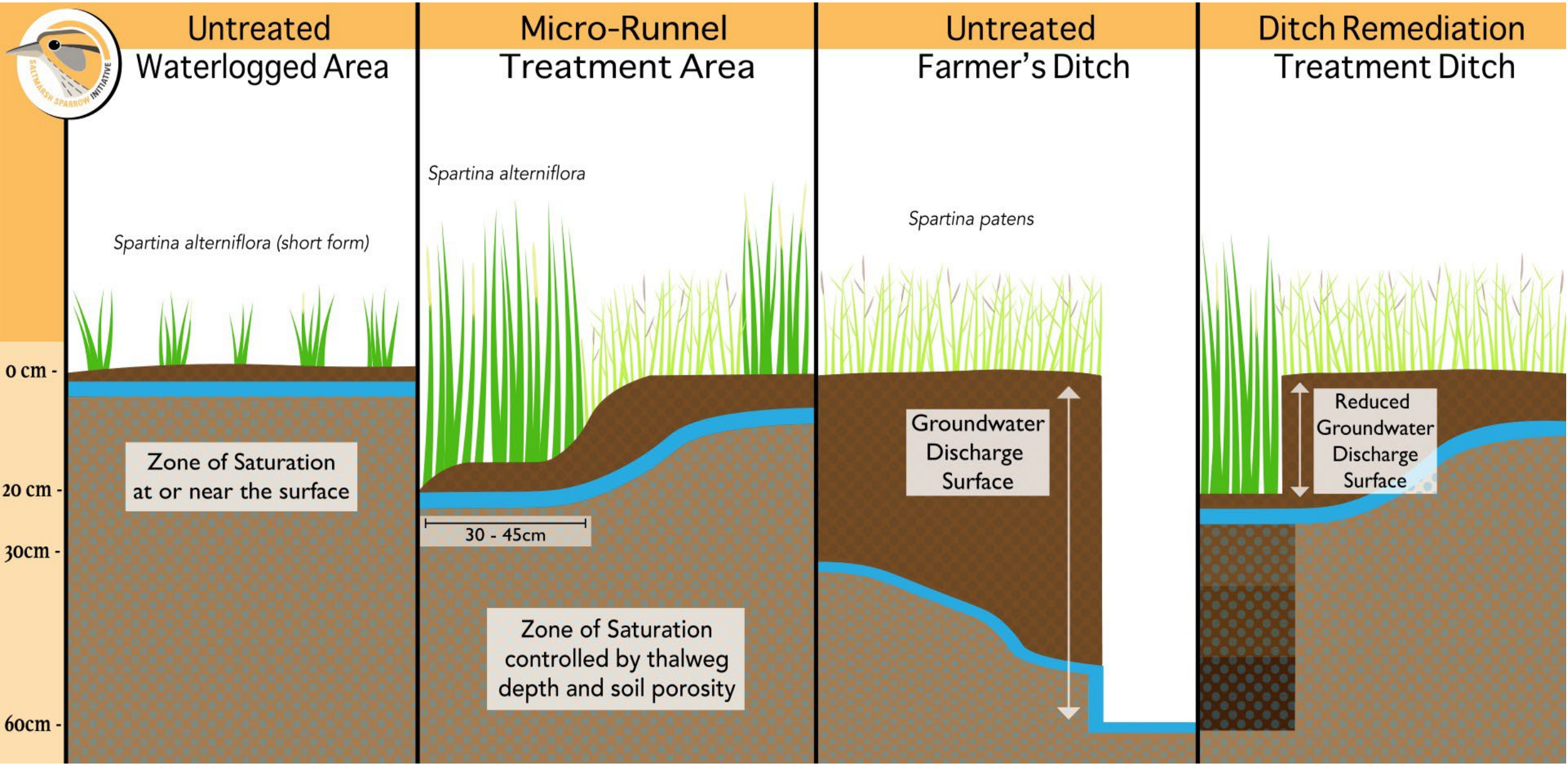
Intervention Technique

- Ditch Remediation Point Treatment
- 1st Order Channels

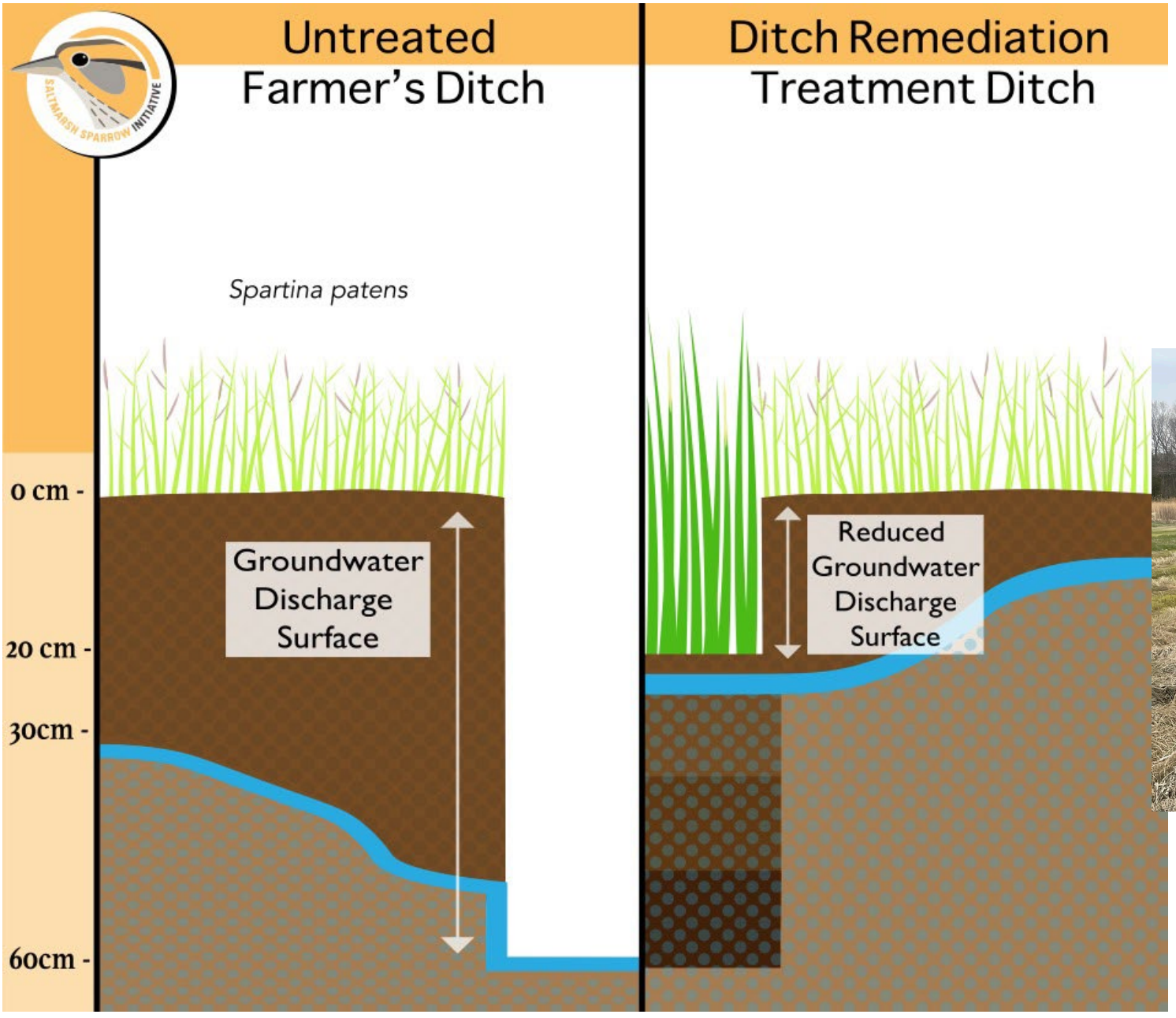
Longterm Monitoring

- Adaptive Management

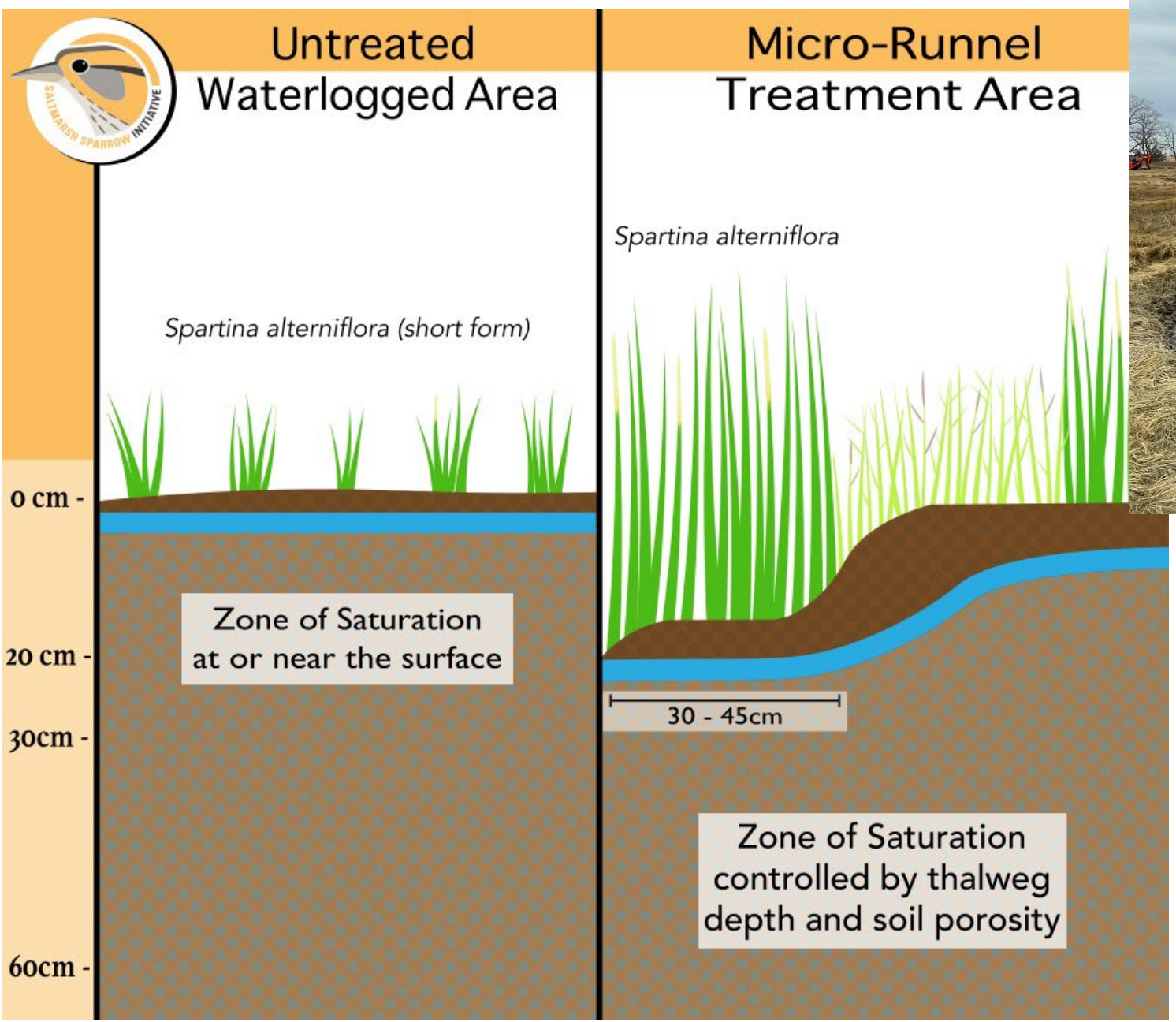
SMARTeams Restoration Approach



SMARTeams Restoration Approach

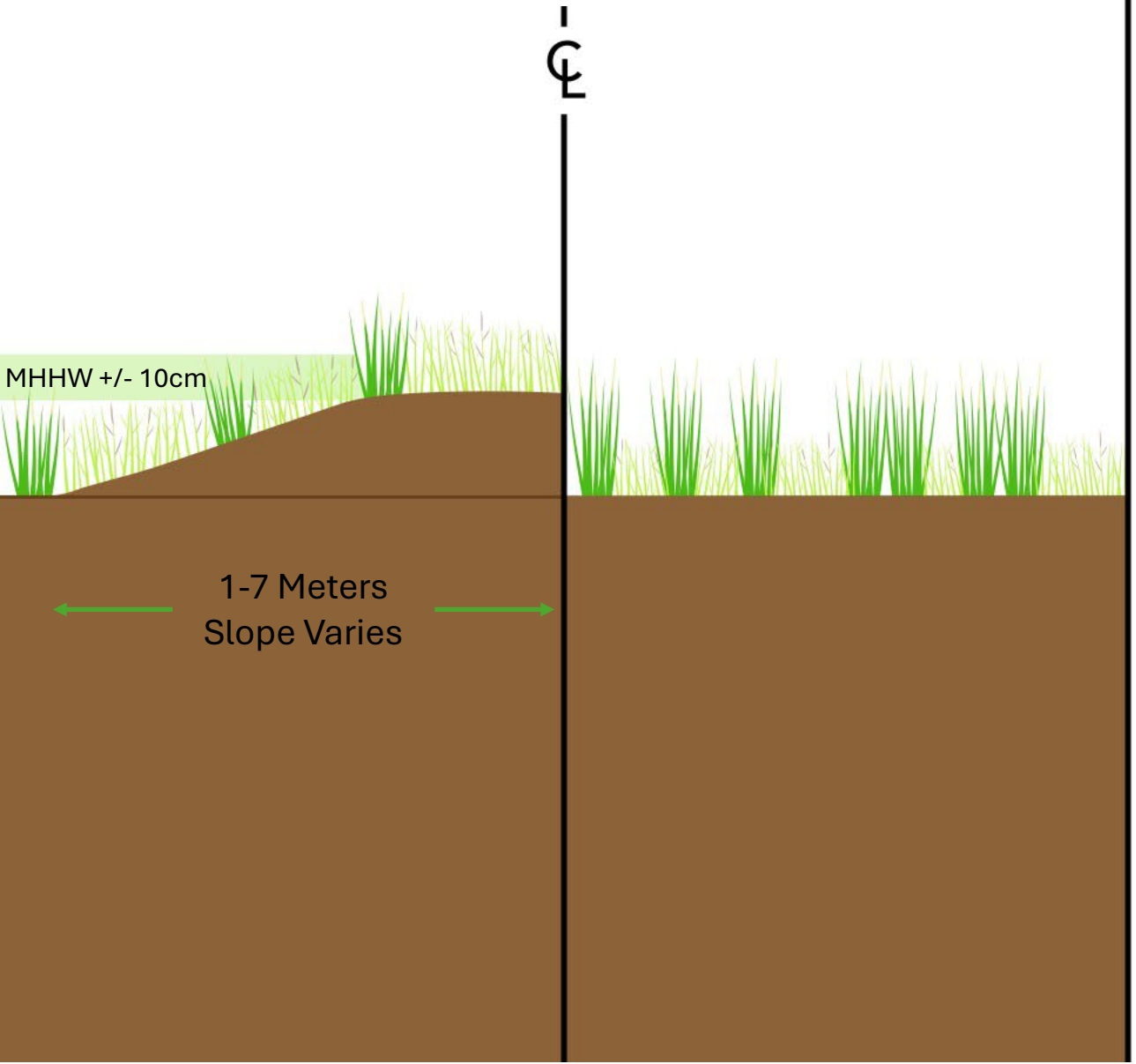


SMARTeams Restoration Approach

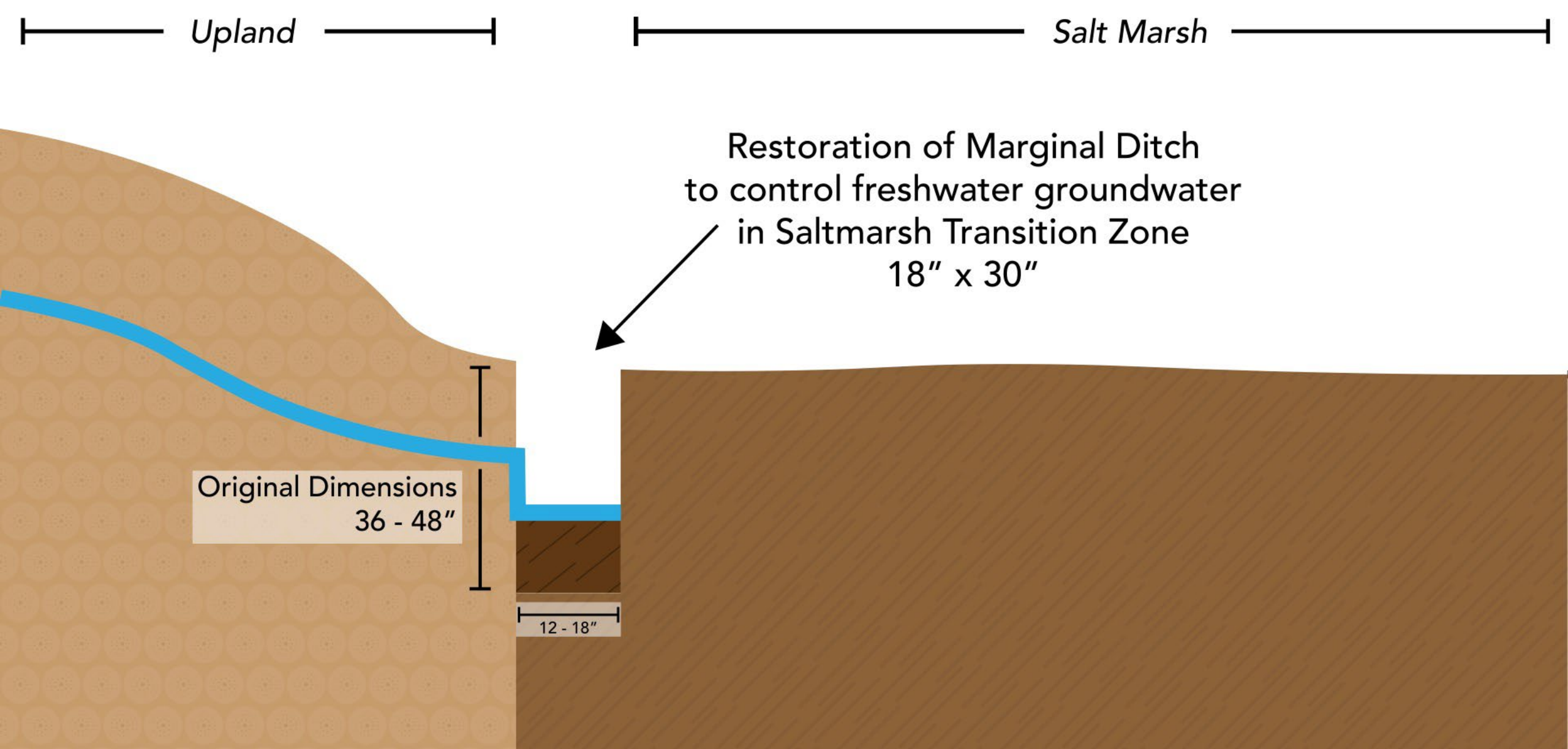


SMARTeams Restoration Approach

Marsh Habitat Islands



Restoration of Marginal Ditch



Stable Framework Restored

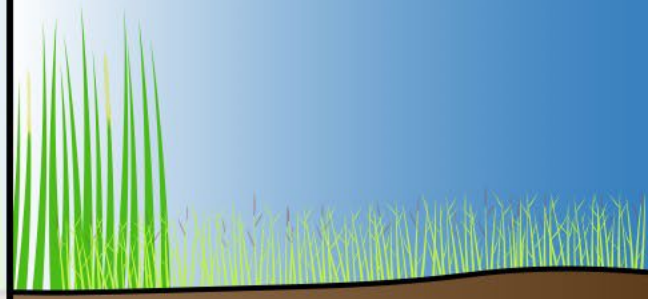
- Stabilized Marsh Platform
- Stabilized Channel Hydrology
- Stabilized Marsh Productivity
- **Stabilized Trajectory to Tideshed Equilibrium**

August 2022

August 2024

Salt Marsh Secondary Succession

Accretion



Increased Marsh Soil Surface Elevation
Increased Primary Productivity
Loss of Open Water Area
Maximized Heterogeneity

Smelt Brook Salt Marsh Restoration Project

2024 Preliminary Design Area

- Existing Conditions

Restoring Single Channel Hydrology is Similar to Connecting Existing Ditch Segments On or Off

Smelt Brook Preserve

Smelt Brook Salt Marsh Restoration Project

2024 Preliminary Design Area

- Single Channel Hydrology

Restoring Single Channel Hydrology is Similar to Connecting Existing Ditch Segments On or Off

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Smelt Brook Preserve

Smelt Brook Salt Marsh Restoration Project

2024 Preliminary Design Area

- Single Channel Hydrology
- Restored Ditches

Restoring Single Channel Hydrology is Similar to Connecting Existing Ditch Segments On or Off

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Smelt Brook Preserve

Smelt Brook Salt Marsh Restoration Project

2024 Preliminary Design Area

- Existing Conditions

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Smelt Brook Preserve

Smelt Brook Salt Marsh Restoration Project

2024 Preliminary Design Area

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Smelt Brook Preserve

Smelt Brook Salt Marsh Restoration Project

2024 Preliminary Design Area

- Ditch Remediation

Restoring Single Channel Hydrology is Similar to Connecting Existing Ditch Segments On or Off

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Smelt Brook Preserve

Smelt Brook Salt Marsh Restoration Project

2024 Preliminary Design Area

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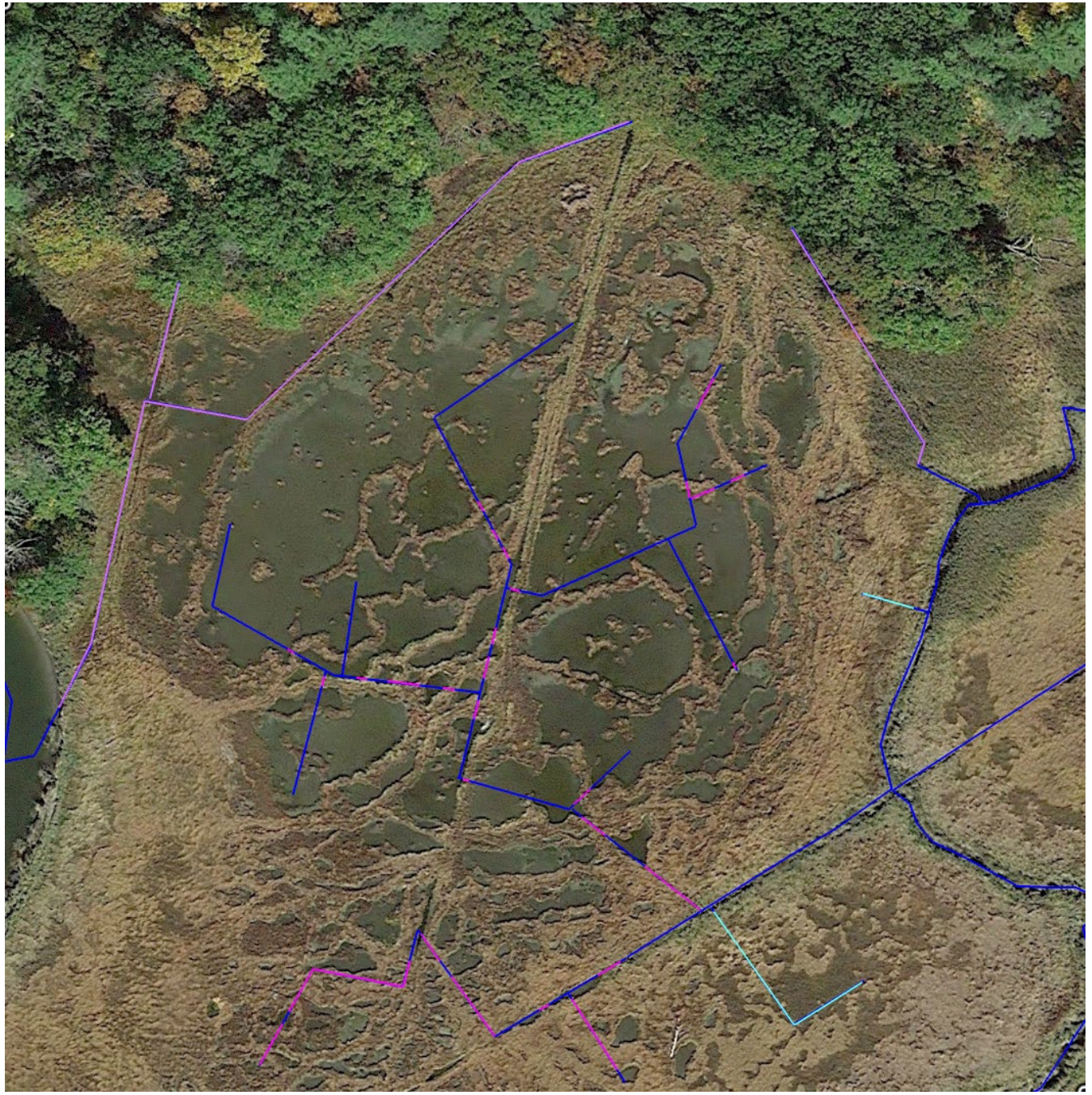

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Smelt Brook Preserve

Smelt Brook Salt Marsh Restoration Project

2024 Preliminary Design Area

- Single Channel Hydrology
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Smelt Brook Preserve

York River - Smelt Brook Salt Marsh Restoration Project

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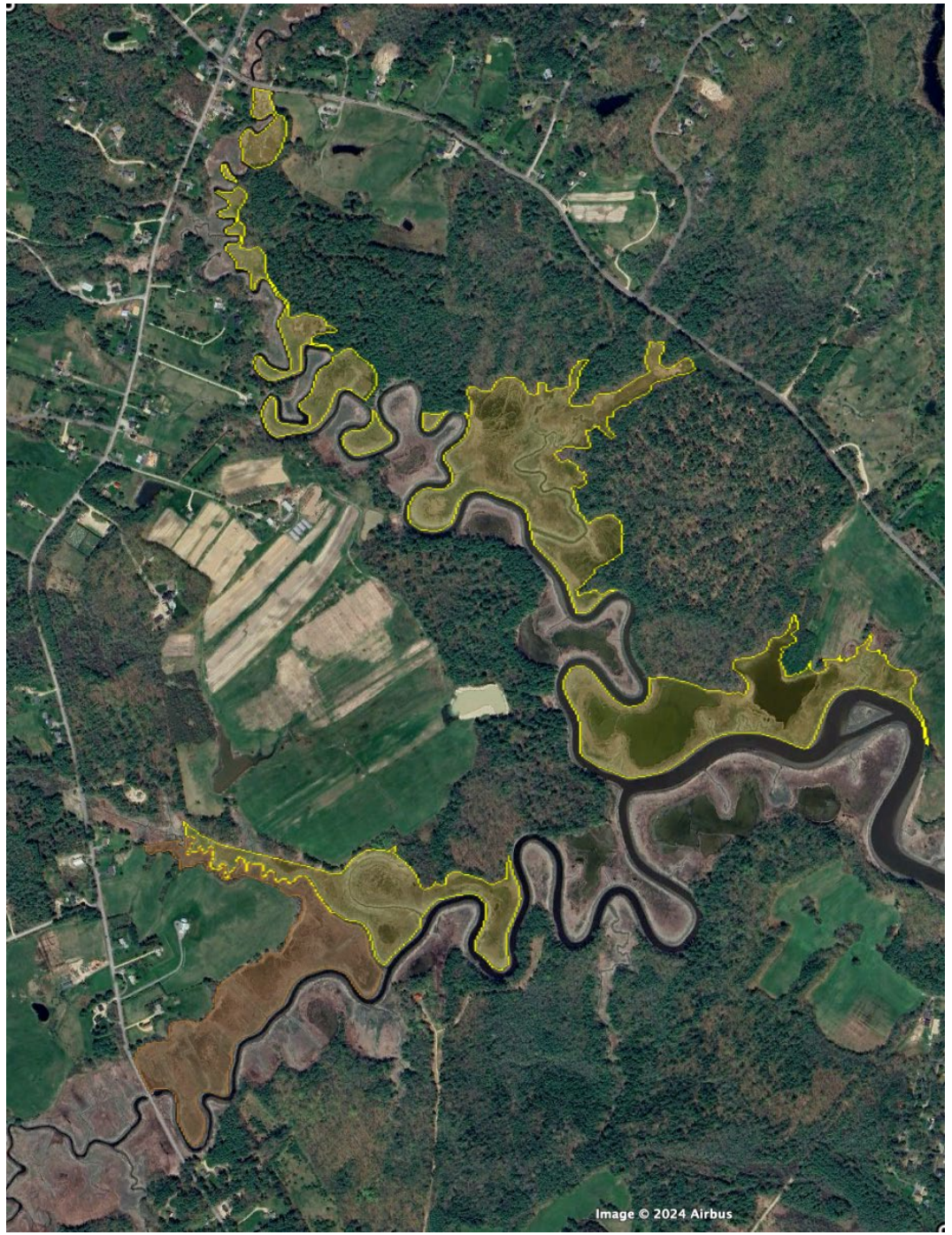
Edkins Parcel +/- 28 Acres



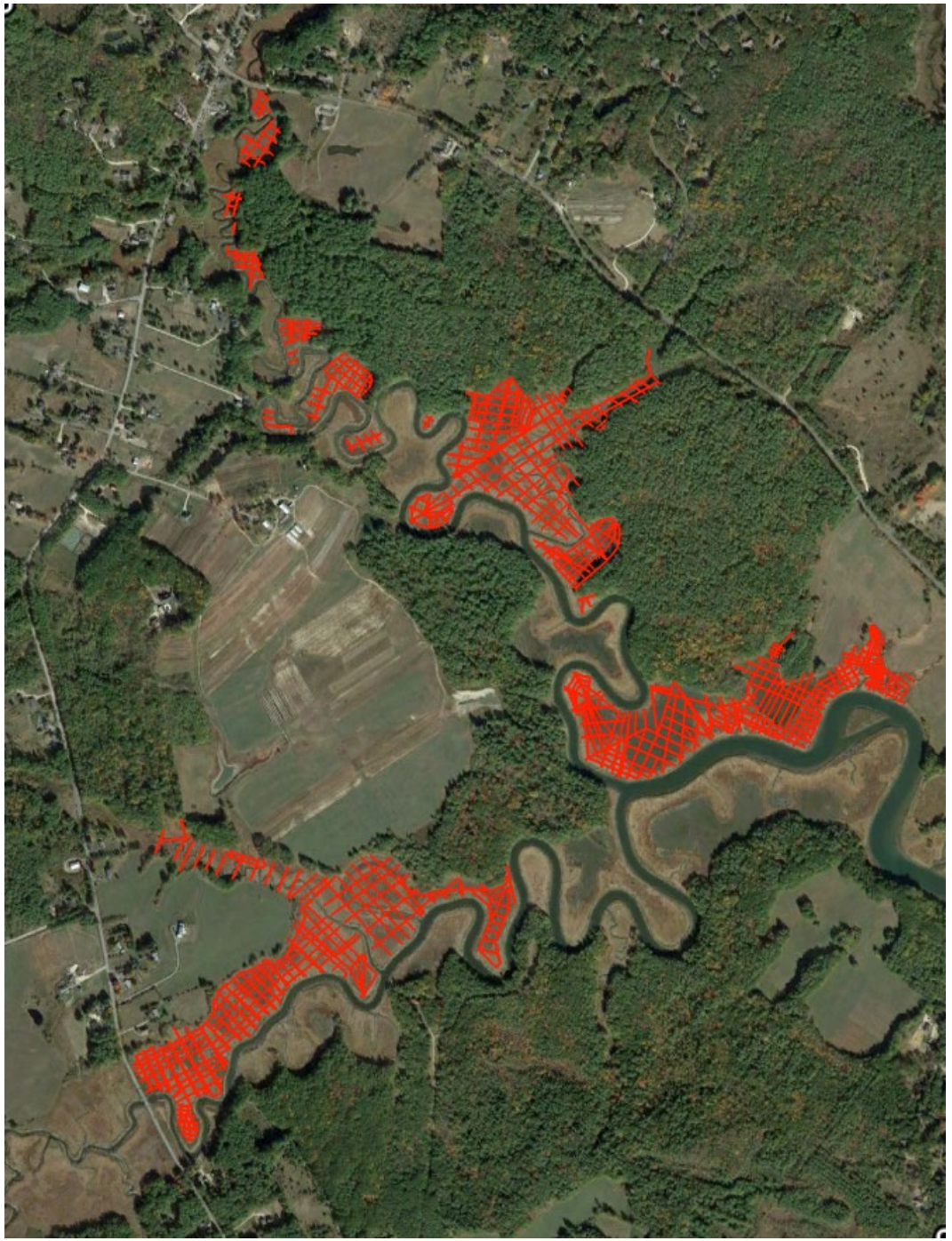
York River - Smelt Brook Salt Marsh Restoration Project

2024 Preliminary Design Area

- 391 Late Period Embankments

Smelt Brook Preserve, Near Point Preserve, and First Parish parcels

Edkins Parcel



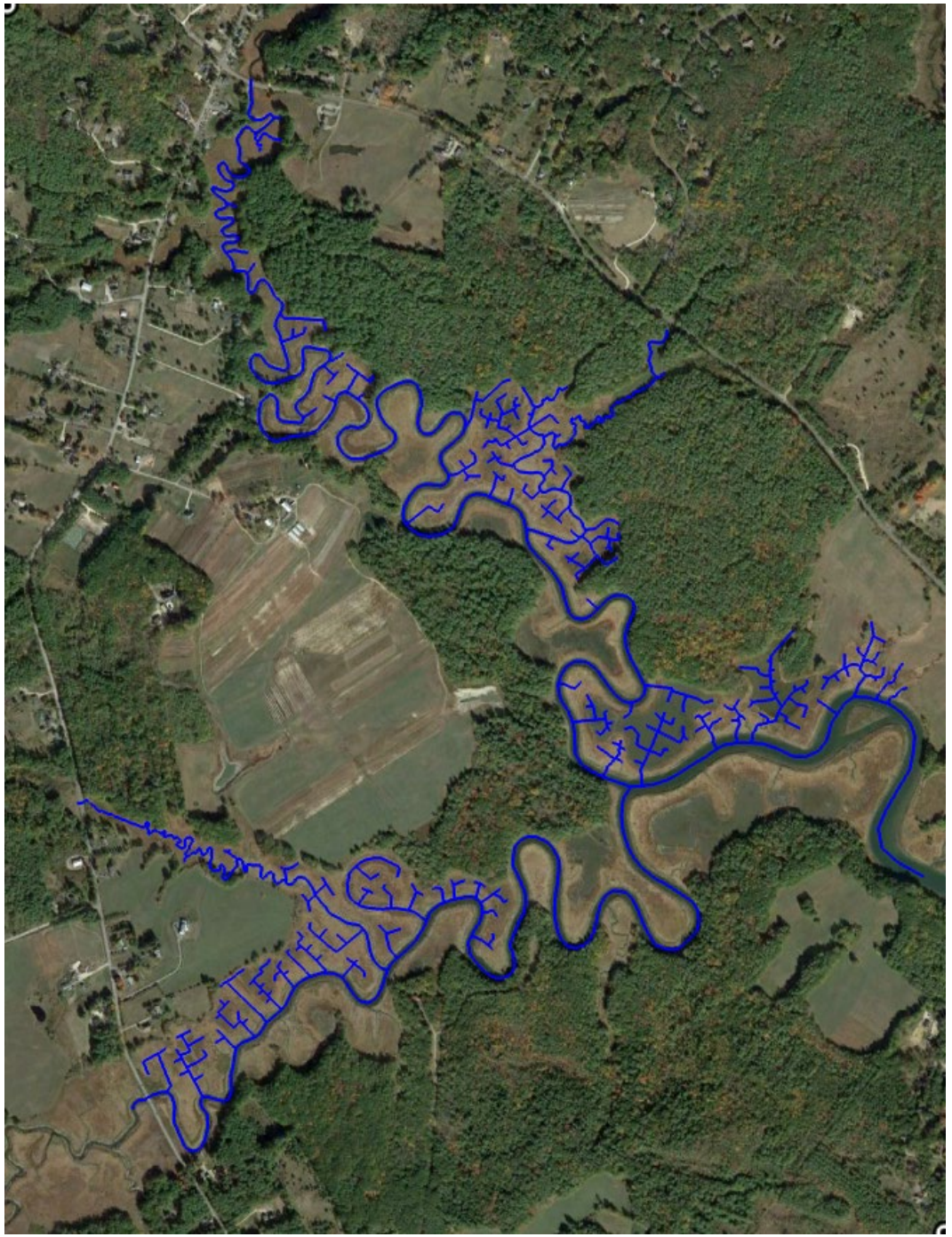
York River - Smelt Brook Salt Marsh Restoration Project

2024 Preliminary Design Area

- 265 Single Channel Hydrology Pathways

Smelt Brook Preserve, Near Point Preserve, and First Parish parcels

Edkins Parcel

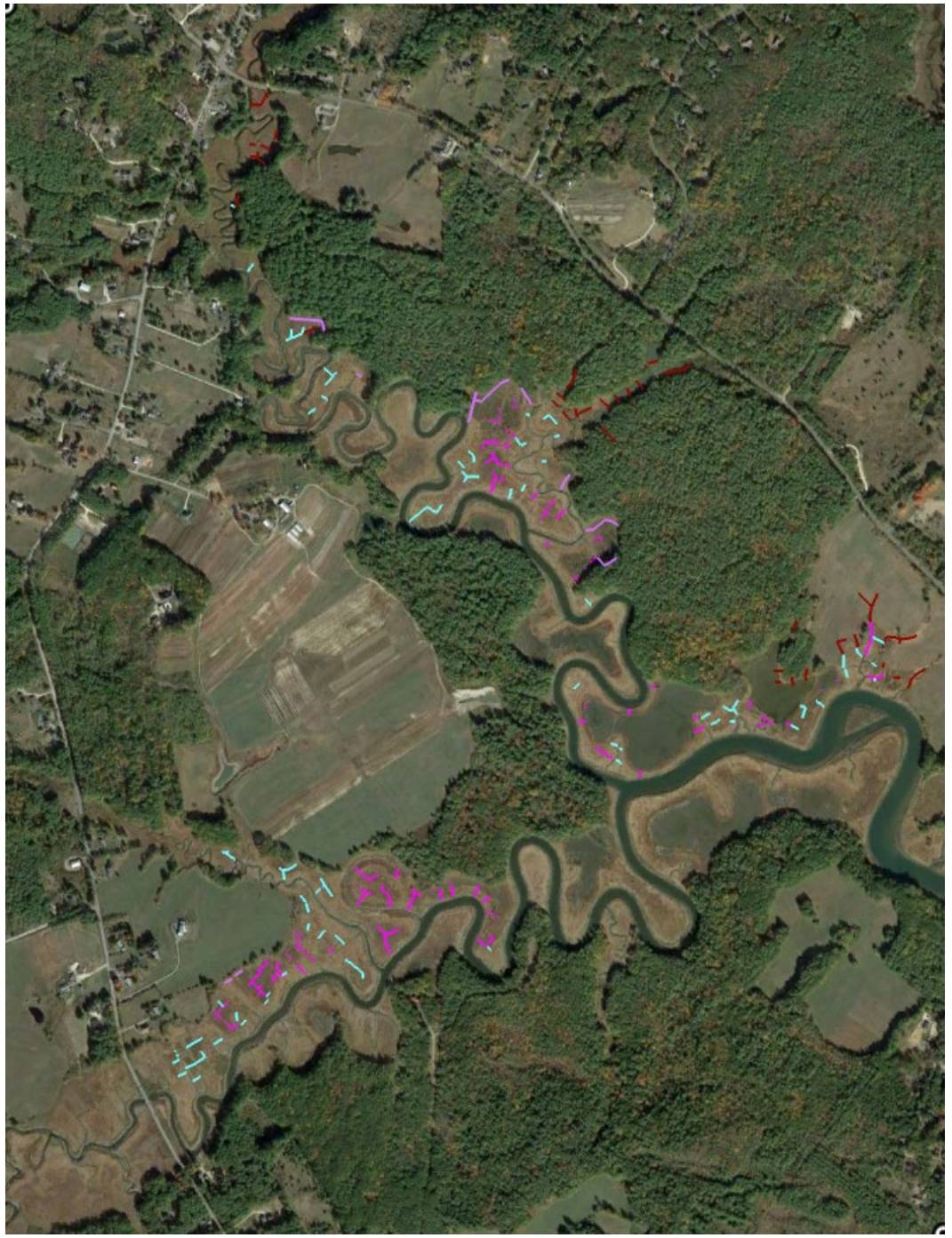


York River - Smelt Brook Salt Marsh Restoration Project

2024 Preliminary Design Area

- 265 Tidal Channel Restorations

Smelt Brook Preserve +	*196 Hydrology Pathways*
Edkins Parcel	*53 Hydrology Pathways*



York River - Smelt Brook Salt Marsh Restoration Project

2024 Preliminary Design Area

- 130 Remediation Ditches

Smelt Brook Preserve +	*88 Ditch Remediation*
Edkins Parcel	*42 Ditch Remediation*

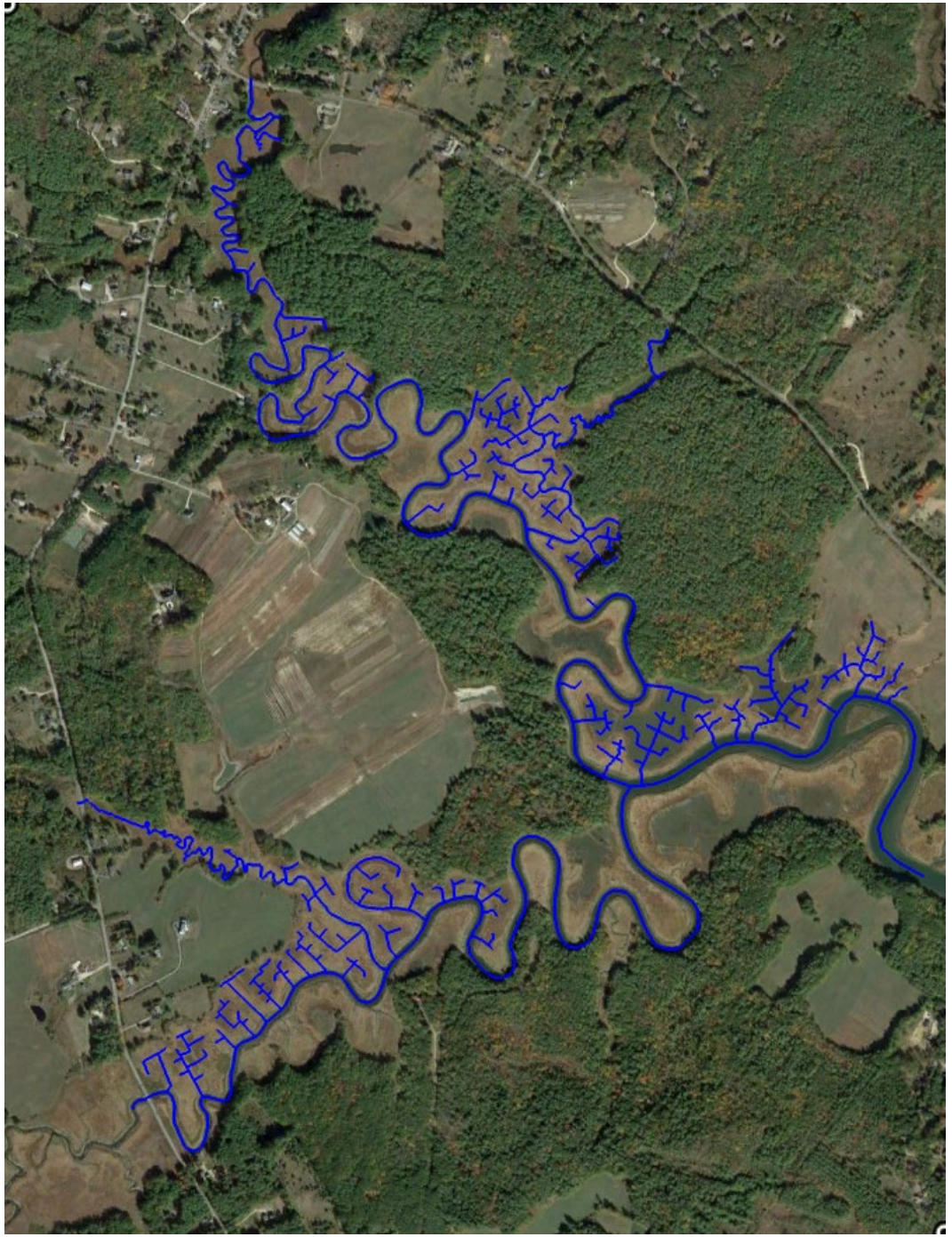
York River - Smelt Brook Salt Marsh Restoration Project

2024 Preliminary Design Area

- 265 Single Channel Hydrology Pathways

Smelt Brook Preserve, Near Point Preserve, and First Parish parcels

Edkins Parcel



Thank You

Next Steps