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Stormwater and Erosion
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Conference

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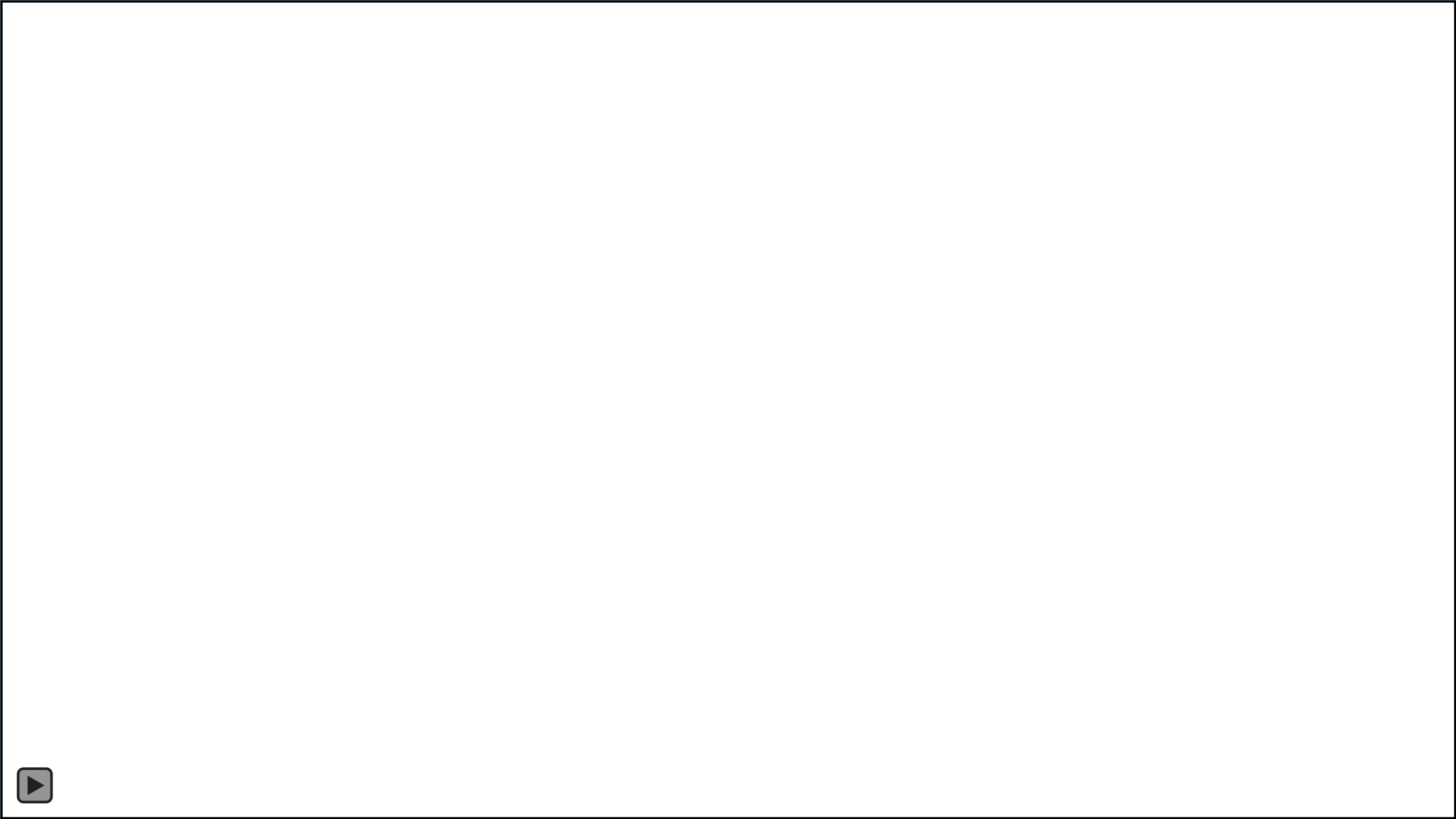
Alewife Stormwater Wetland and Park



Source to Stream Conference

March 2023

HATCH



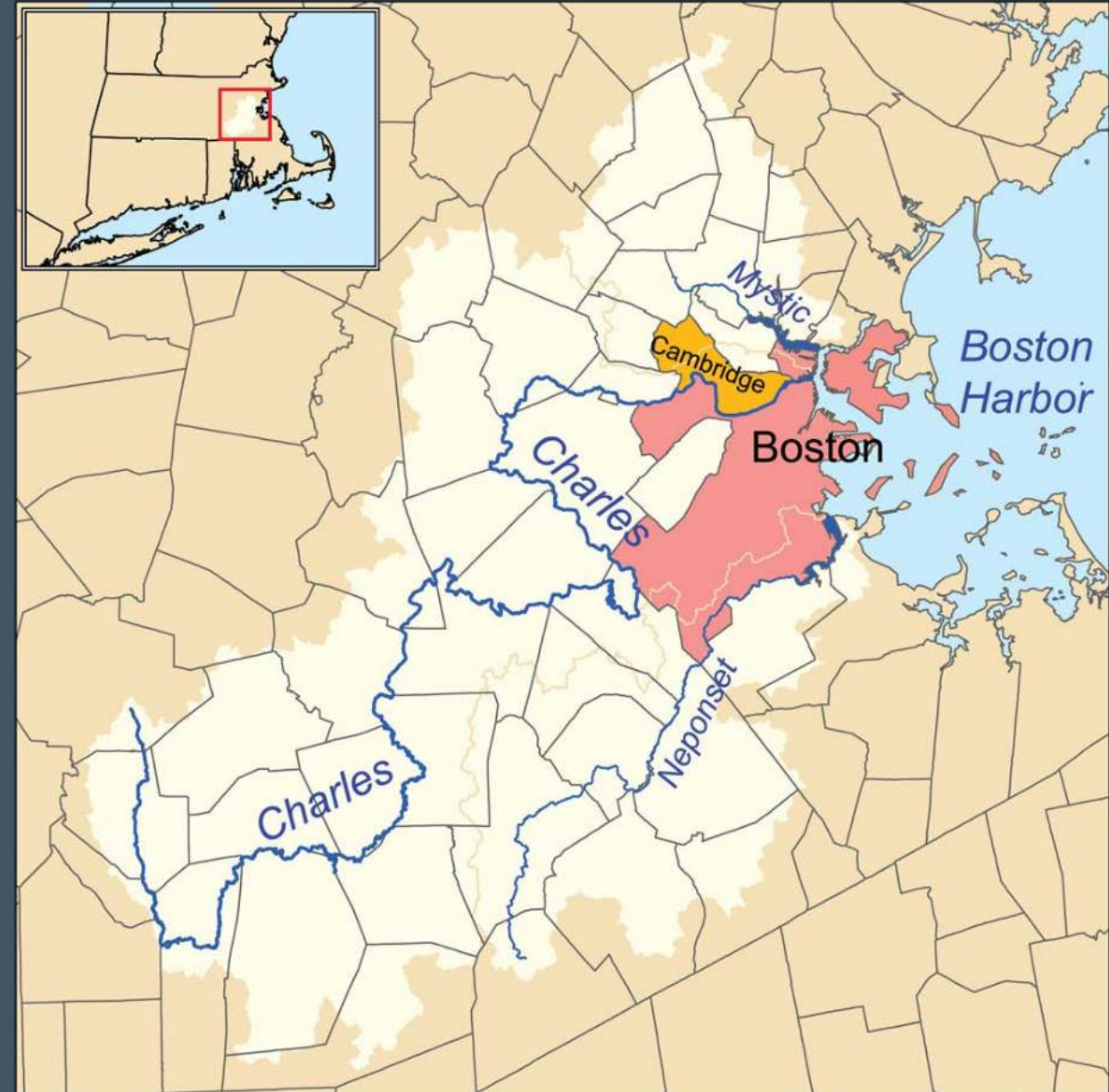
Agenda

- Project Background and Goals
- Stormwater Wetland Benefits
- Stormwater Wetland Components
- Construction
- Long-term Monitoring and Management



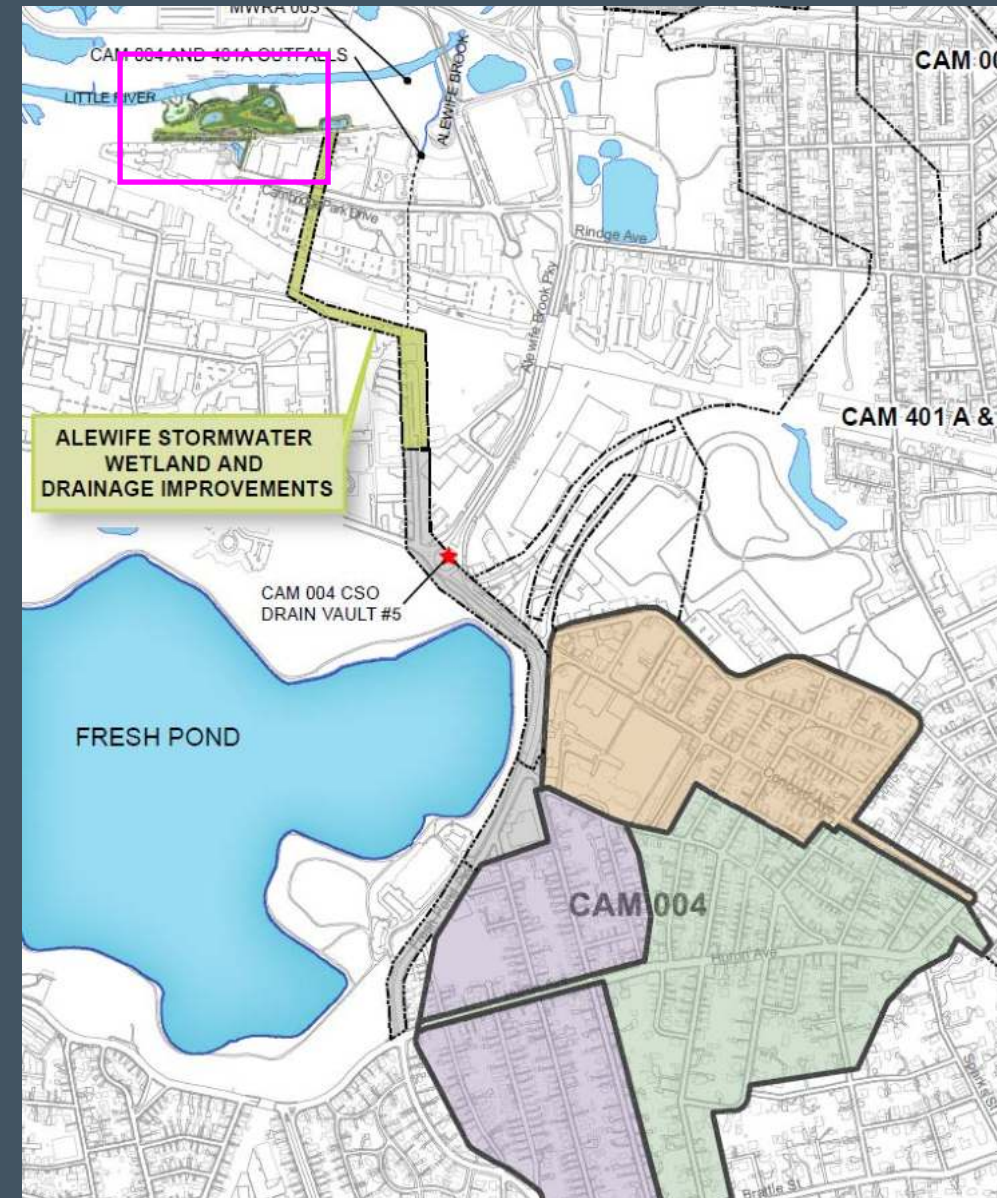
Project Background

- Part of the court-ordered cleanup of the Boston Harbor.
- Required to reduce or eliminate combined sewer overflow (CSO) discharges into Boston Harbor, within the Mystic, Charles and Neponset River Watersheds.



Project Goals

- Reduces CSO volume entering Alewife Brook by 85%.
- Reduces number of CSO activations (frequency) from 63/year to 7/year.
- All sewer separation (upstream) projects completed prior to Alewife Stormwater Wetland.
- Utilized integrated stormwater treatments (inc. Green Infrastructure).



Alewife Reservation Project Benefits

Fully integrated with DCR Alewife Reservation and Greenway Master Plan:

- Water Quality Improvements: 3.4-acre treatment wetland, and future closure of the CAM004 regulator.
- Ecological enhancements of fish and wildlife habitat quality.
- Mitigation of invasive plant species.
- Improved site amenities.
- Educational and recreational opportunities.



Habitat Creation



- Deep, emergent and high marsh; open water.
- Wet meadow, broadleaf floodplain and scrub/shrub.
- Riparian woodland.
- Over 120,000 native wetland plants.
- Over 3,800 native upland plants.
- Five (5) native seed mixes used.

Site Amenities

- Multi-use connector path.
- Trails and boardwalks (1,600 linear feet).
- Overlooks (3).
- Amphitheatre.
- Benches and bike racks.
- Kiosk and interpretive signage.



Project Timeline

2002 to 2010

- Planning, Design and Permitting (project appealed in Design phase).

2011 to 2012

- Site Preparation & Construction.

2012 to 2013

- Vegetation Establishment & Training.

2013

- Open to Public.
- Construction Cost \$6.1M (CAD).



Construction (2011 – 2012)

- Pre-construction Wildlife Reconnaissance
 - Search work area for burrows, dens, nest sites.
 - Guide placement of fence gaps for escape.
 - Site monitoring to detect any fauna at risk.
- Pre-construction Rare Plant Reconnaissance
 - *Gentiana Andrewsii* found in September 2010.



Project Components

- Wetland Forebay; Water Quality Swale and Wetland Basin; Oxbow; Wet Meadow Floodplain; and Parkland.



Aerial View of Wetland System



Legend

1. Little River
2. Oxbow/Island Habitat
3. Main Wetland Basin
4. Wet Meadow Overflow

Sediment Forebay

- Traps sediment, floatables and trash.
- Cabled concrete block bottom & access ramp.
- Forebay outlet structure allows for smaller flows.
- 2021 Sediment Removal yielded red-eared slider, catfish, fish, bullfrog, snapping turtle, American eel, crayfish, clams and snails.



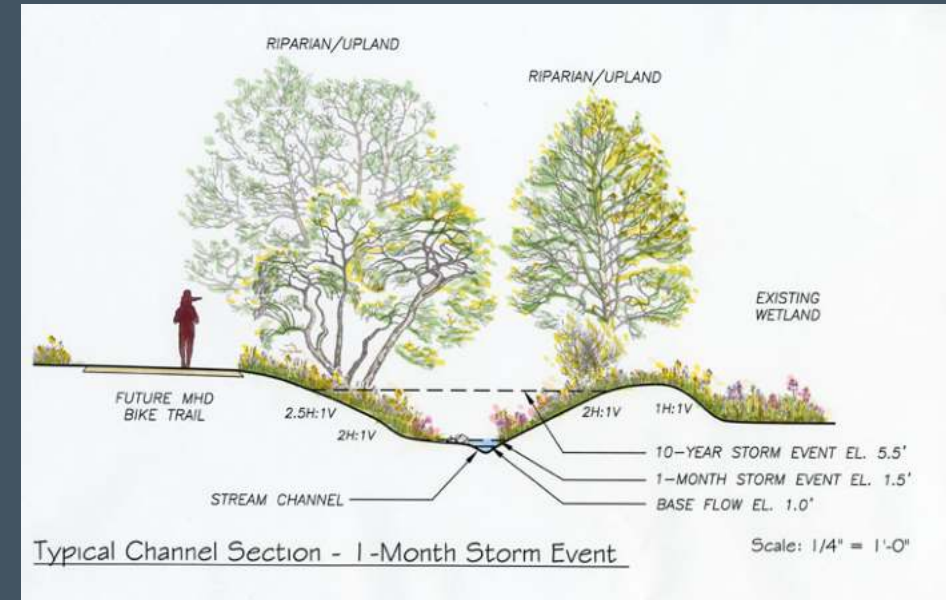
Sediment Forebay – 2021 Cleaning



- Wildlife biologists relocated fish, reptiles & amphibians prior to sediment removal.

Water Quality Swale

- Promotes infiltration during low-flow events.
- 2.5:1 slopes stabilized by ECB's, seed mixes and live stakes (650).
- Channel stabilized with 12" coir logs.
- Invasives and debris in channel removed annually and after storm events.



Water Quality Swale

- Live stakes included *Cornus amomum*, *Salix discolor*, *Alnus rugosa*, and *Cephalanthus occidentalis*.
- High Marsh plugs in channel bottom.
- Channel stabilized with 12” coir logs.



Water Quality Swale



- Photos taken one (1) and five (5) years after construction.

Stormwater Wetland – Main Basin

Stormwater Wetland

- Footprint = 3.4 acres
- Detention = 10.35 AF

Habitat Types

- Open Water
- Deep Marsh
- Emergent Marsh
- High Marsh
- Riparian Woodland



Stormwater Wetland Planting

- 120,000 wetland plugs and tubers.
- Straight natives, locally sourced and grown.
- Phased planting.
- Volunteer plantings.



Plant Succession and Diversity

- Wetland inhabitants include: muskrat, deer, swan, geese, ducks, hawks, frogs, turtles, fish, herons, kingfisher, eel, and crayfish.



Outfall

- 36" outfall controlled with a 12" underflow and high-level weir to maximize detention time.



Oxbow: Additional Habitat Creation

- Additional 0.3 acres of storage.
- Created island habitat.
- Replaces floodplain volume taken to create the stormwater wetland.
- Designed for possible River Herring spawning with pond and wetland fringe.



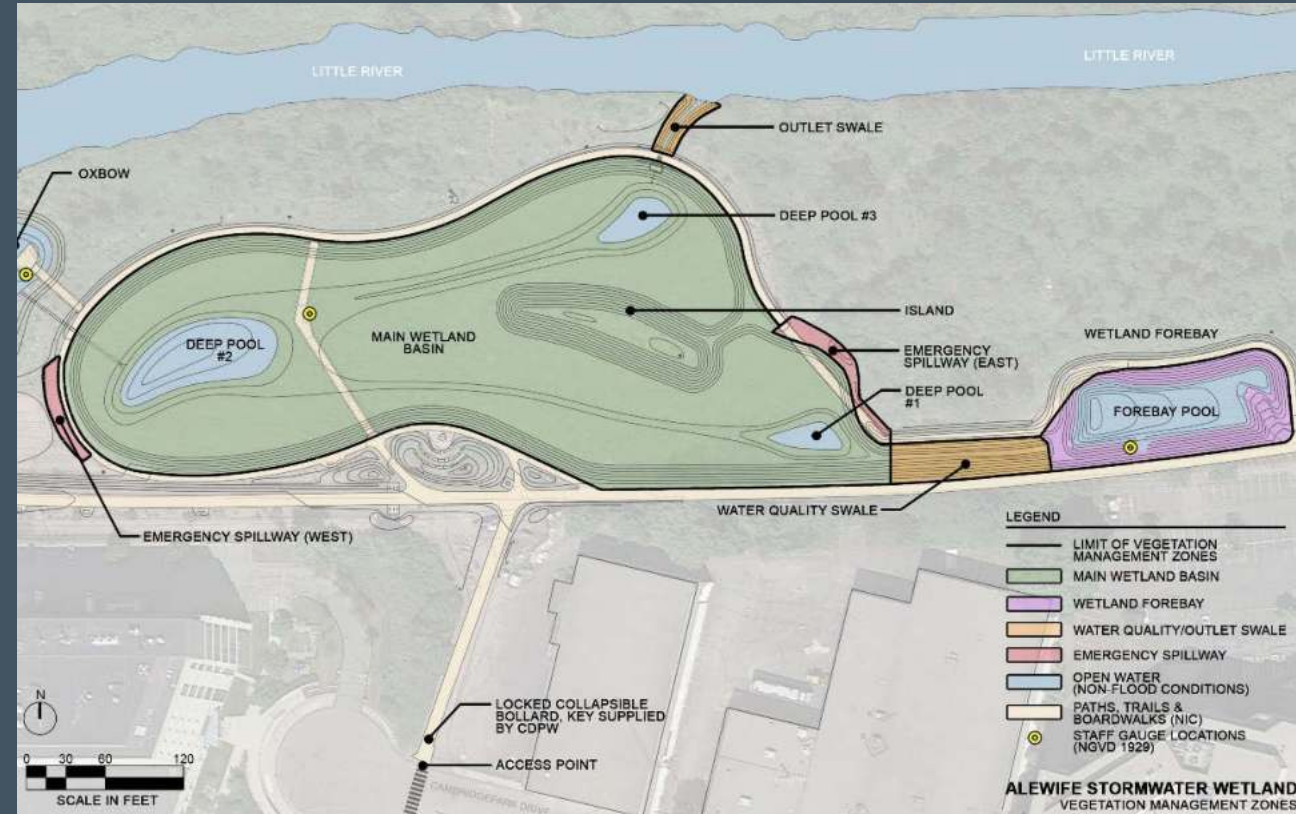
Wet Meadow

- Additional 0.41 hectares of storage and habitat.
- 10 – year overflow design.
- Herbaceous seed mix.
- Woodies managed with electric trimmers every Spring.
- Invasive species removed manually.



Vegetation Management - Approach

- Start with MA DCR 5-year Vegetated Management Plan (VMP).
- Develop VMP for entire Stormwater Wetland system.
- Gain approval through Local and State regulatory agencies.
- Submit monthly and annual reports.
- Includes bi-annual site walks.



Vegetation Management - Approach

- Specialized Management Contract (3 - year).
- Applies Adaptive Management strategies.
- Removal of all state-listed invasive species.
- Re-planting, seed collection, & re-seeding.
- Additional activities include: trash collection; sediment removal; channel cleaning; water level monitoring; temporary fencing and signage; and public education.
- Annual cost \$68k (CAD) or \$32k/hectare (CAD) for vegetation management.





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