Massachusetts Water Resources Authority

Presentation to the

WSCAC

Update on Invasive Aquatic Plant Management at MWRA Reservoirs

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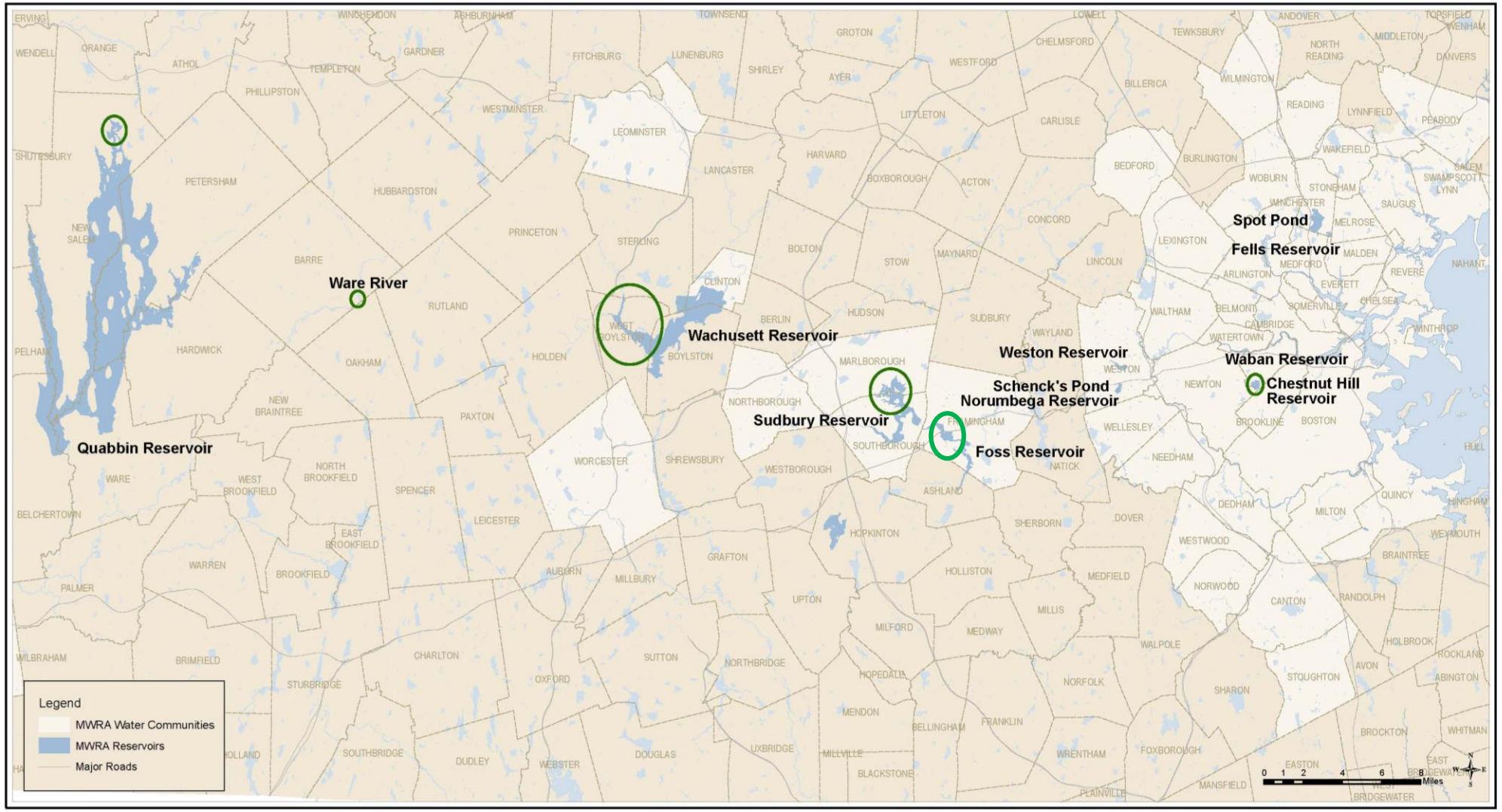
Geographic Spread of Aquatic Invasives across Reservoir System

MWRA/DCR Reservoirs with Invasives Control Projects



These four plants are the main concerns to our reservoirs now

Eurasian Watermilfoil

Fanwort

Variable Leaf Milfoil

Water Chestnut

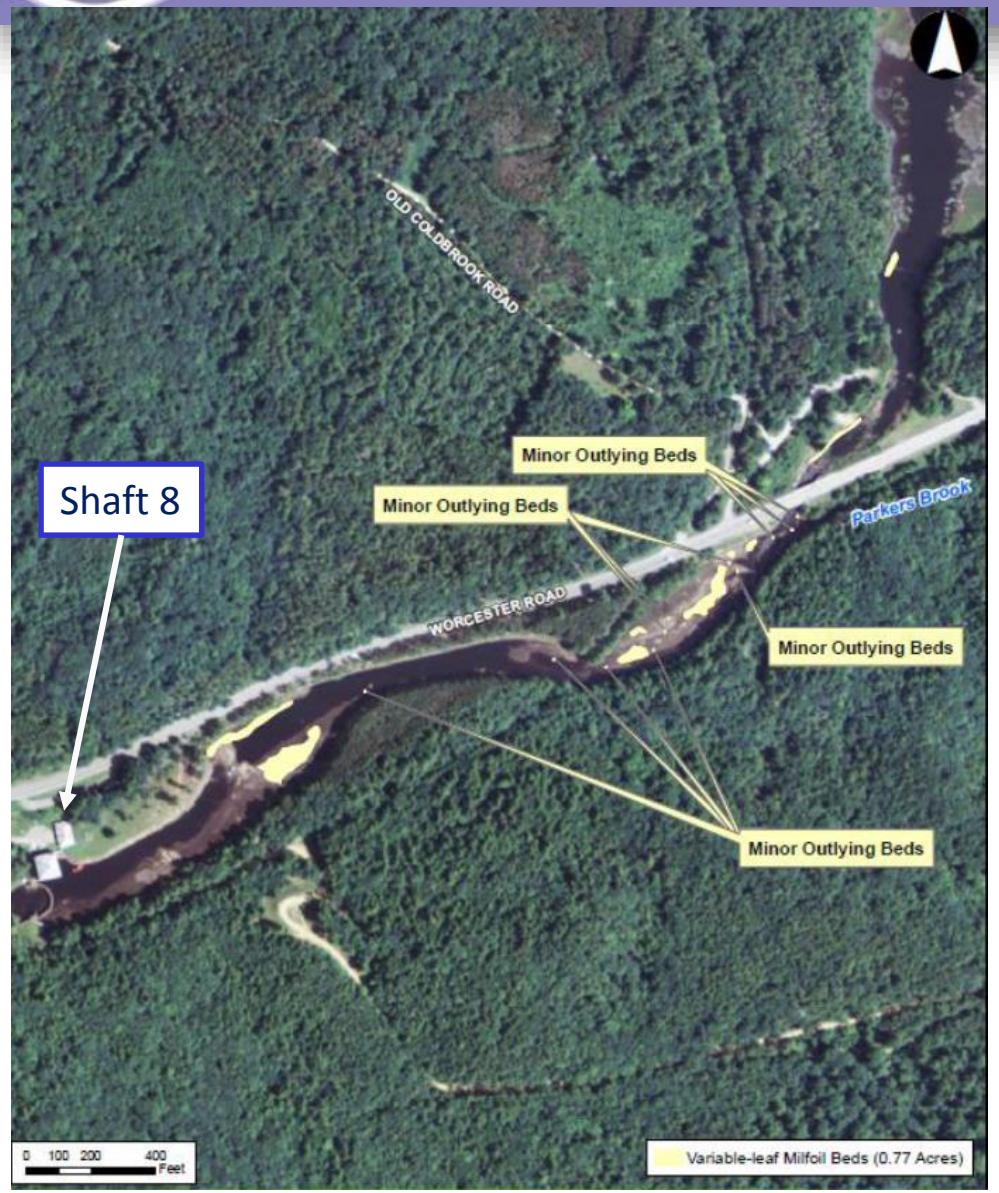
Spread by roots, seed and fragments

Spread by seed

Overview of Program Locations for aquatic invasive (AI) plants management

- Quabbin – No known AI in main reservoir. Non-native Variable Leaf Milfoil (VLM) in upstream settling basins.
- Ware River
- Wachusett
- Sudbury
- Foss
- Norumbega – One pioneering colony of EWM discovered and removed in 2015. Has not returned.
- Weston -- No known AI
- Chestnut Hill
- Fells -- No known AI
- Spot Pond -- No known AI

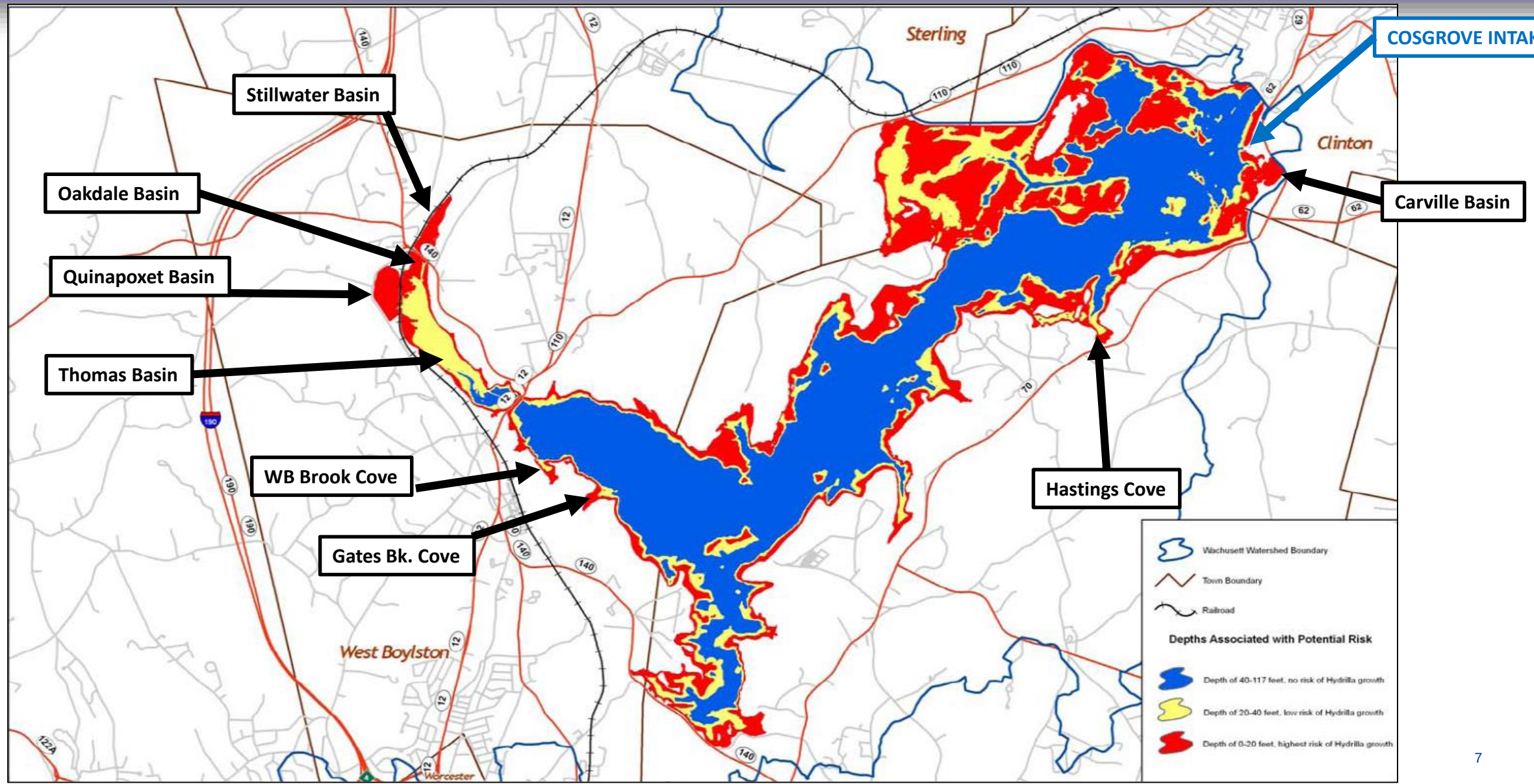
Ware River Shaft 8 Intake Pool



Intake Pool at drawdown with exposed milfoil

Ware River VLM harvest

Wachusett has the most intensive activities. Highest Risk.



Control efforts by Diver Assisted Suction Harvesting (DASH)

Suctioned plants emerge on screen

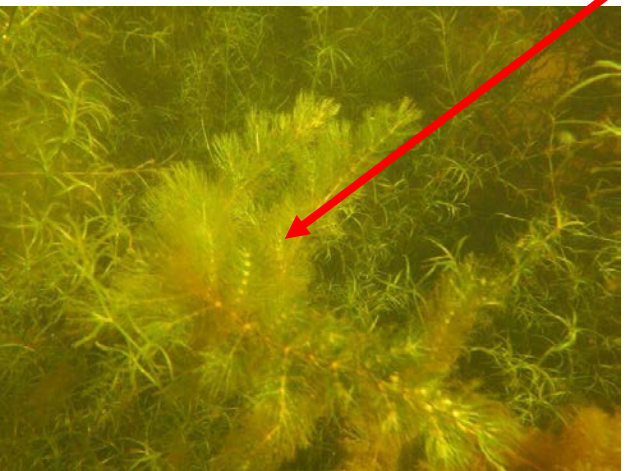
Suctioned plants Include roots

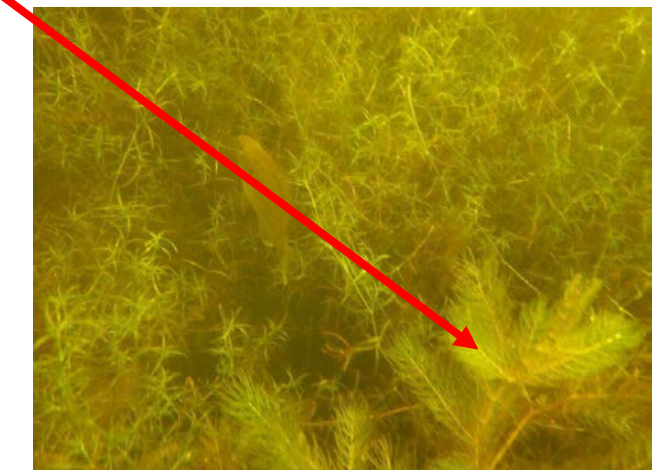
Native plants are returning to Stillwater Basin in the DASH-cleared areas

Native Urticularia (bladderwort) and native naiad

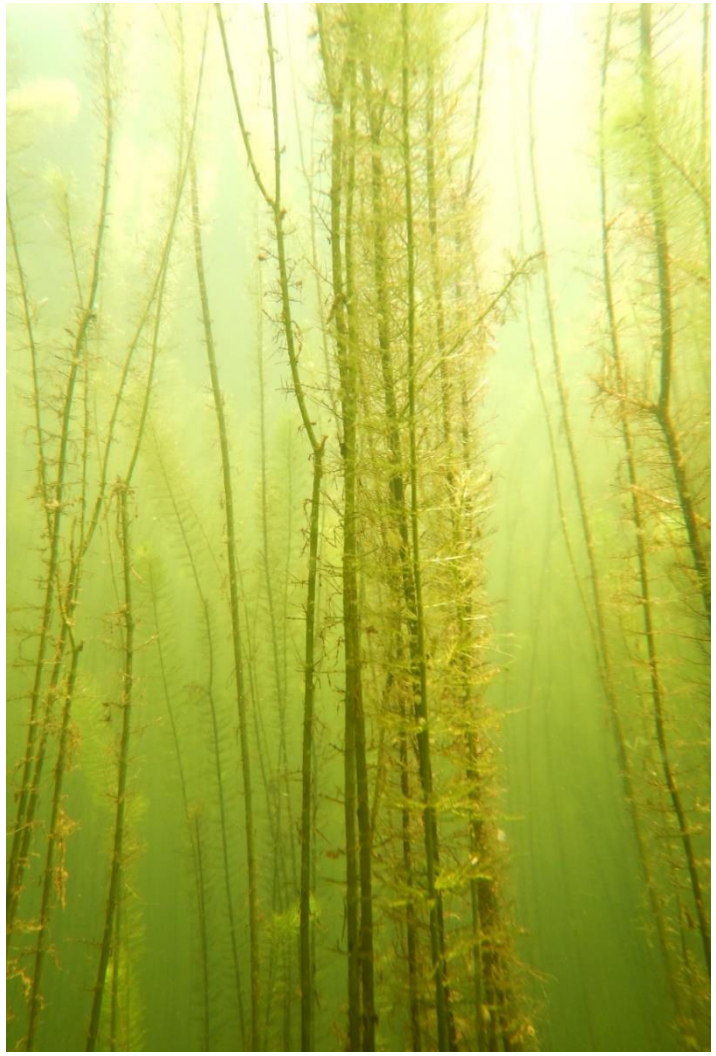
Its getting harder to find the invasive plants among abundant returned native plants.

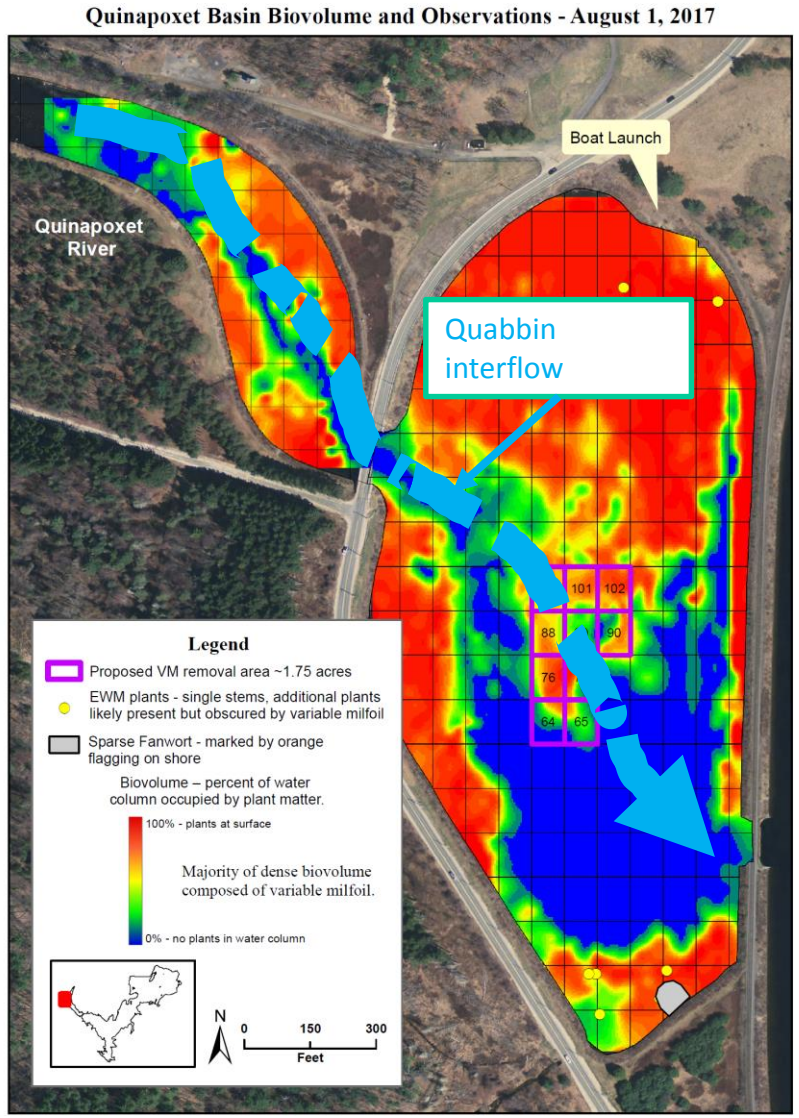
Native P. robbinsii (front), native Naiad (back)





Quinapoxet Basin VLM





What's next – Wachusett Program

1. Continue DASH in Stillwater Basin; modify scope to account for less growth

2. Continue DASH in lower basin and coves. Begin larger-scale removal of VLM in Quinapoxet Basin

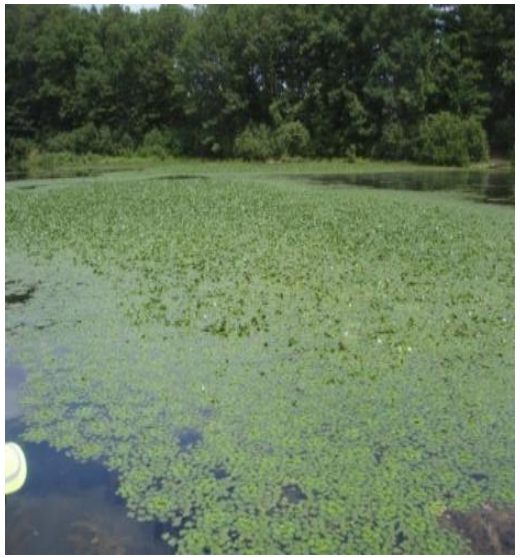
3. Continue to deploy the QA/QC diver to verify the work is complete and thorough

Sudbury Water Chestnut 2008 - present

In 2008 dense mats and mature plants with many nuts

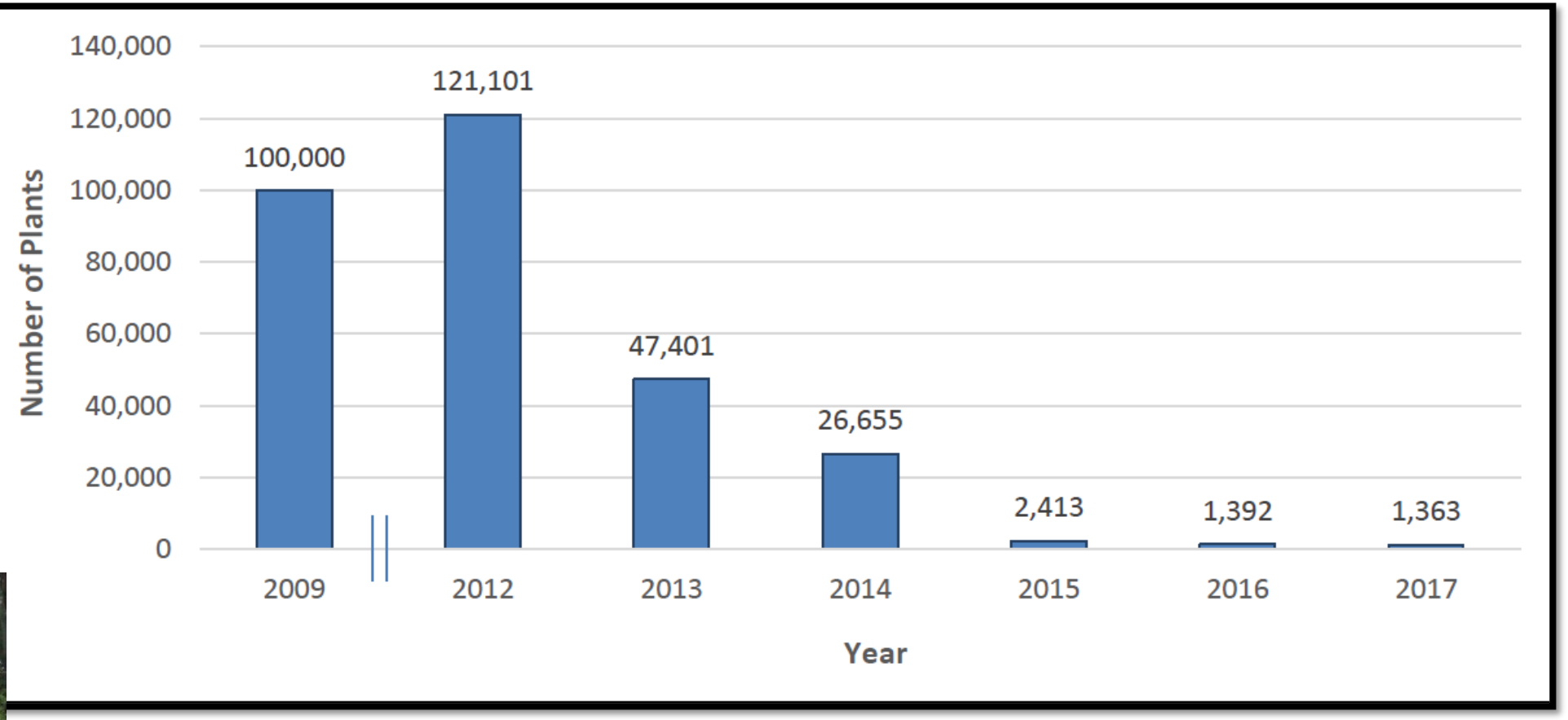
2019 – scattered small immature plants

Sudbury Water Chestnut Control history



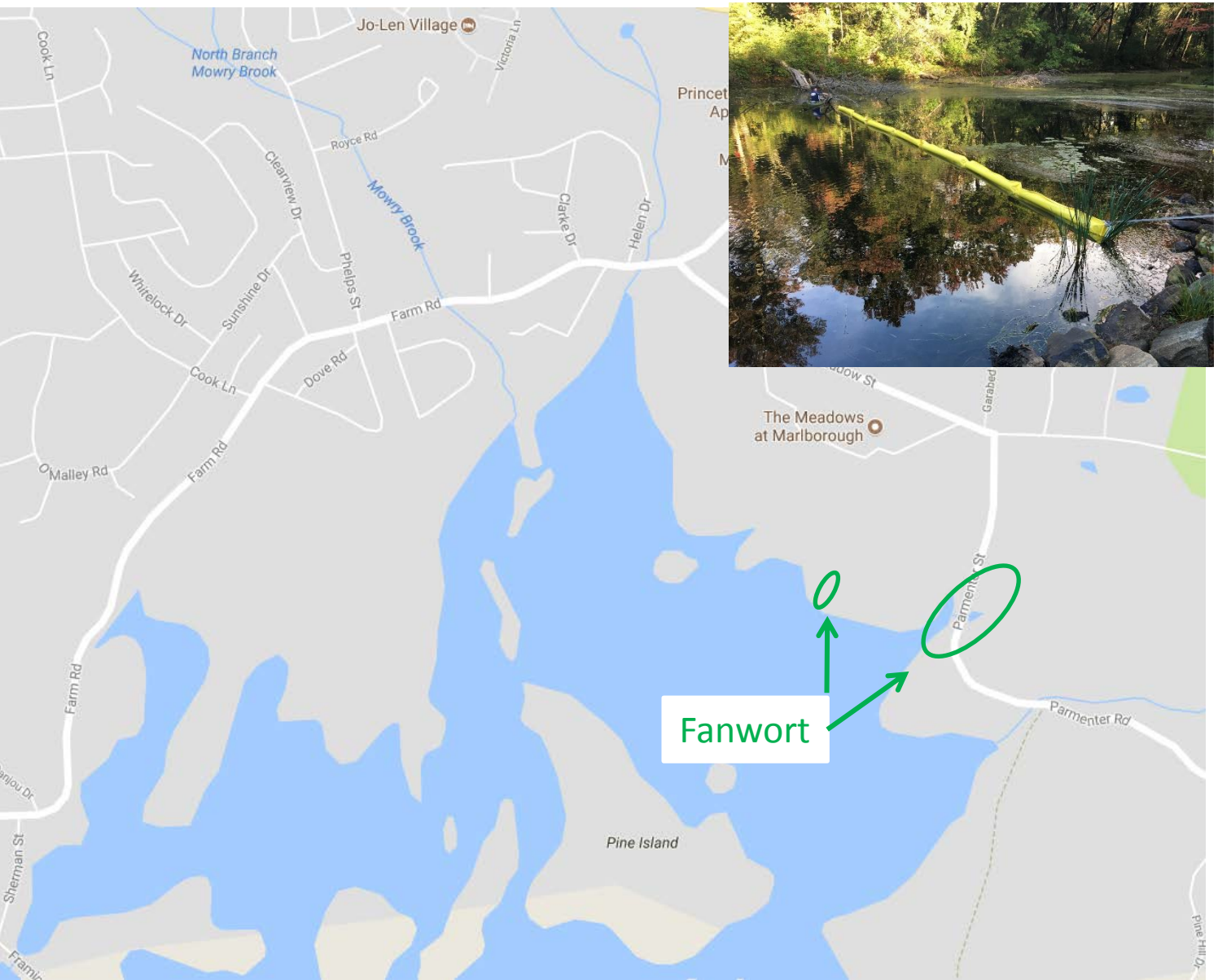
2011 heavy infestation

Mechanical harvester



Transition from mechanical harvesting to hand harvesting as extent of water chestnut decreases

2017 - New 0.5 acre Fanwort infestation discovered at Sudbury Reservoir



½ acre dense infestation discovered early August 2017.

Installed fragment barrier to contain.

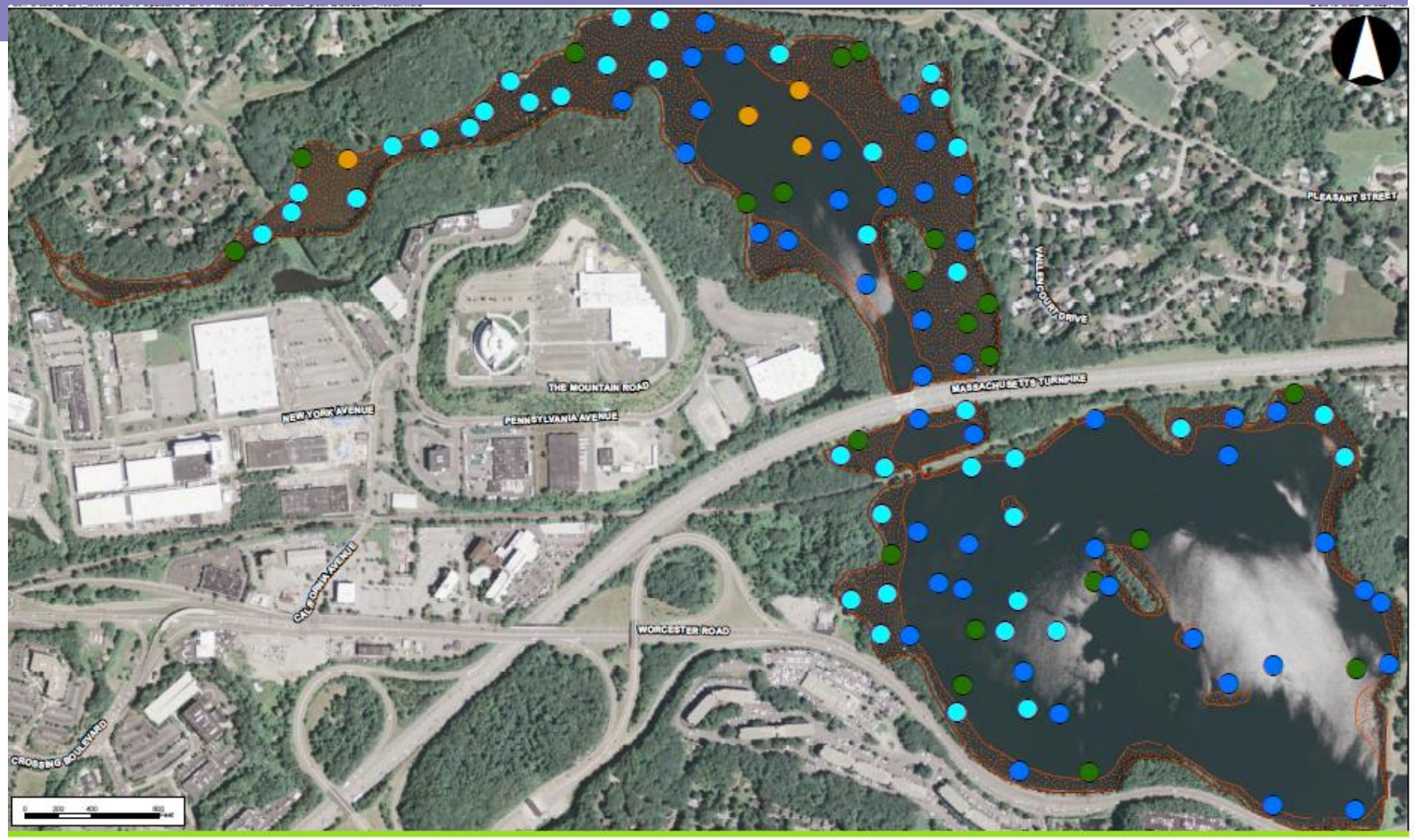
DASH approach continues 2019

Foss Reservoir 2015/2016 Winter Drawdown Effective

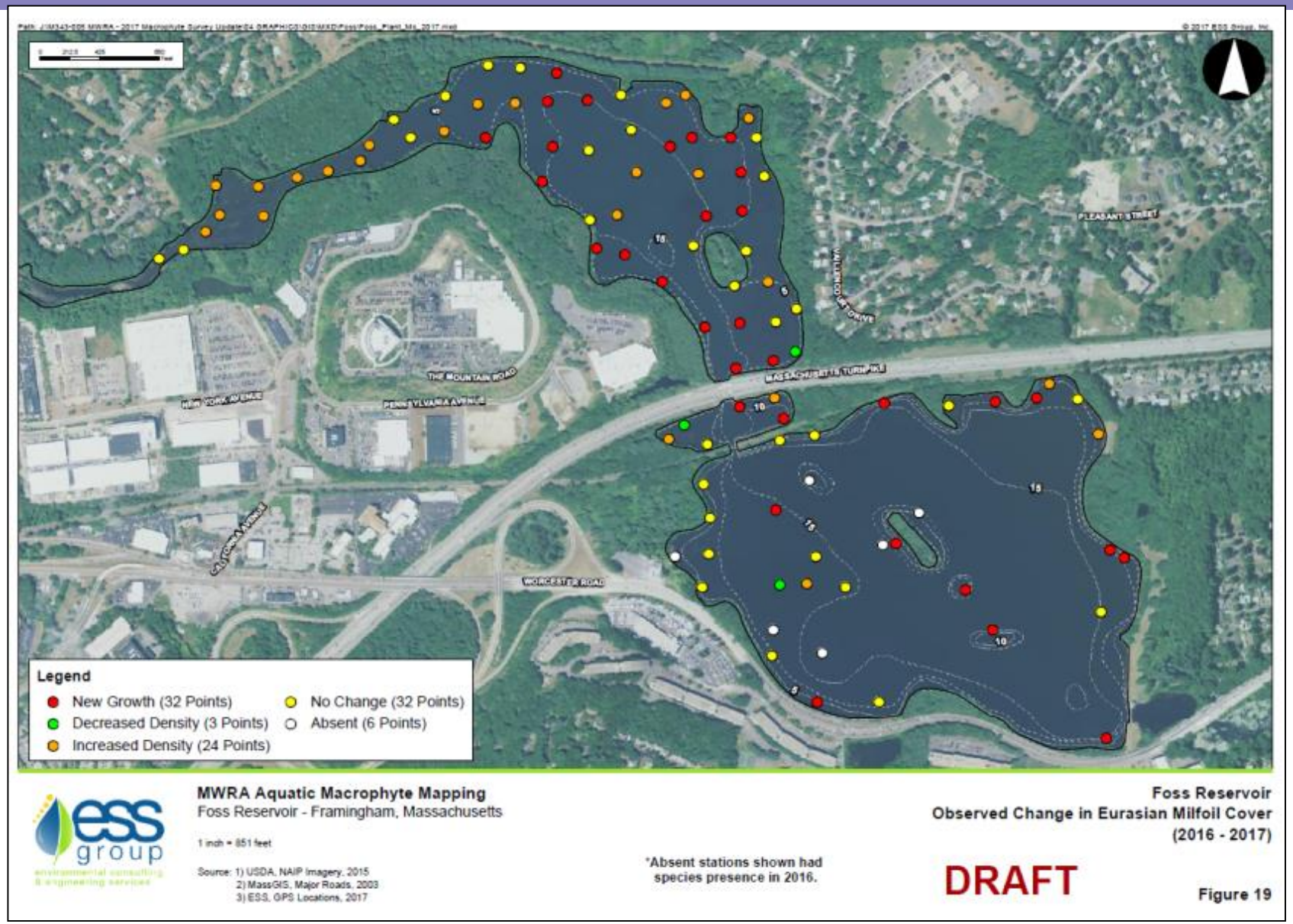
Blue tones represent areas where some control of milfoil was achieved. Most of the points are **Blue.**

Green represents no measurable effect in milfoil growth.

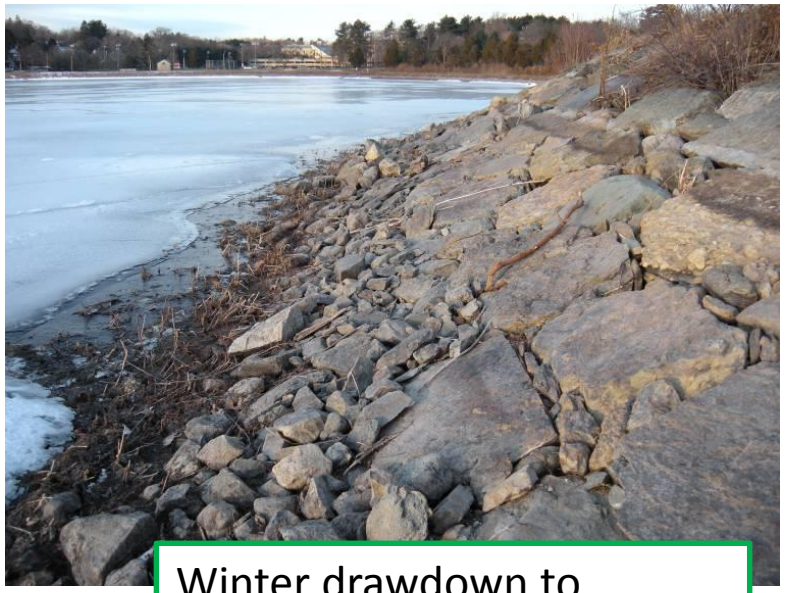
Orange represents areas of new milfoil growth (confined mainly to deeper areas of north basin).



EWM rebounds after 2016/2017 drawdown suspended due to drought

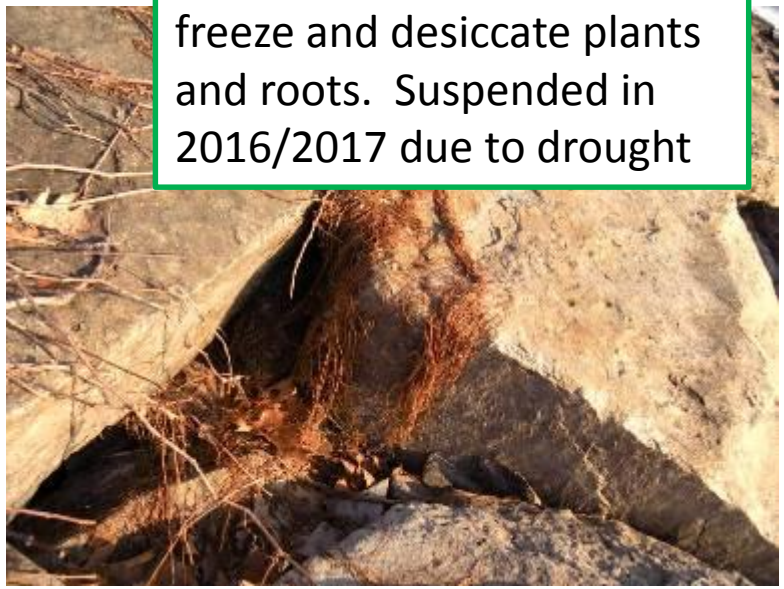


Chestnut Hill – dual approach has resulted in reduction of invasives



Mechanical harvest of dense EWM

Winter drawdown to freeze and desiccate plants and roots. Suspended in 2016/2017 due to drought



Chestnut Hill Reservoir Cyanobacteria (a/k/a *Bluegreen algae*)

- Cyano. bloom in 2014. Performed alum treatment to bind with phosphorus (a nutrient for blooms)
- Cyano. bloom returned in June 2017. Signs posted.
- 2 Alum treatments spring 2018