


STAFF SUMMARY

TO: Board of Directors
FROM: Frederick A. Laskey, Executive Director 
DATE: February 19, 2020
SUBJECT: Update on Invasive Aquatic Plants Management at MWRA Source and Emergency Reservoirs

COMMITTEE: Water Policy & Oversight

INFORMATION

VOTE

Mark Johnson, P.E. Director, Waterworks
John J. Gregoire, Program Manager, Reservoir Operations
Preparer/Title


David W. Coppes, P.E.
Chief Operating Officer

RECOMMENDATION:

For information only.

BACKGROUND:

MWRA's control of aquatic invasive plants started at the Wachusett Reservoir in 2002. Since then, MWRA has diligently monitored source and emergency reservoirs for aquatic invasive plant species, and added removal and treatment efforts as conditions have changed. The program goal is to identify new infestations and respond quickly with control measures to prevent spread. Staff have documented successful responses to these programs where the repeated removal of invasive plants has led to the return of native plants. The current program focus and target plants are at the following reservoirs:

Location (west to east)	Target Plant(s)
Ware River at Shaft 8	Variable Milfoil
Wachusett Reservoir	Eurasian Milfoil, Variable Milfoil, Fanwort
Sudbury Reservoir	Fanwort, Water Chestnut
Foss Reservoir	Eurasian Milfoil, Water Chestnut
Chestnut Hill Reservoir	Eurasian Milfoil

Pioneering aquatic invasive plants can quickly out-compete native species, grow to nuisance levels, and ultimately choke off water bodies resulting in water quality problems. Plant die-off and decay consumes oxygen and loads the reservoir with organic matter. This creates a disinfectant demand and increased treatment cost. Added nutrients from this decay can also promote algal growth with the potential for associated toxins and additional water quality concerns. Lastly, aquatic invasive plants can be aesthetic nuisances and clog intake screens.

The invasive plants Eurasian milfoil, Fanwort and Variable Milfoil represent the majority of MWRA's control efforts. These plants spread naturally by roots, seeds and fragmentation, as well as by people, boats, and wildlife. Wildlife is the most challenging vector to control, particularly wading birds, which can transport fragments from other water bodies to reservoirs. They can also ingest seeds and pass them intact.

Aquatic invasive plants respond to subtle changes in environmental conditions. Nutrient inputs, mild or cold winters, wet or dry seasons, duration of reservoir ice cover or lack of ice cover, and reservoir elevations can all have a seasonal impact on invasive plants' growth. Some years have seen marked reductions in invasive plants through harvest and other control operations. In other years, control of plants has varied by species (as one is controlled, another attempts to fill in).

DISCUSSION

Annual surveys are performed starting from the Quabbin Reservoir in the west and throughout the metropolitan emergency reservoirs in the east. Each season's findings are compared to the previous season for monitoring of shifts in plant community and as an early warning of the arrival of new aquatic invasive plants. MWRA and DCR staff also perform *ad hoc* and targeted surveys based on conditions or pressing issues. Enhanced surveillance has now become the norm to scout for any new or changing conditions, and staff have built-in contingency planning to rapidly respond to new infestations.

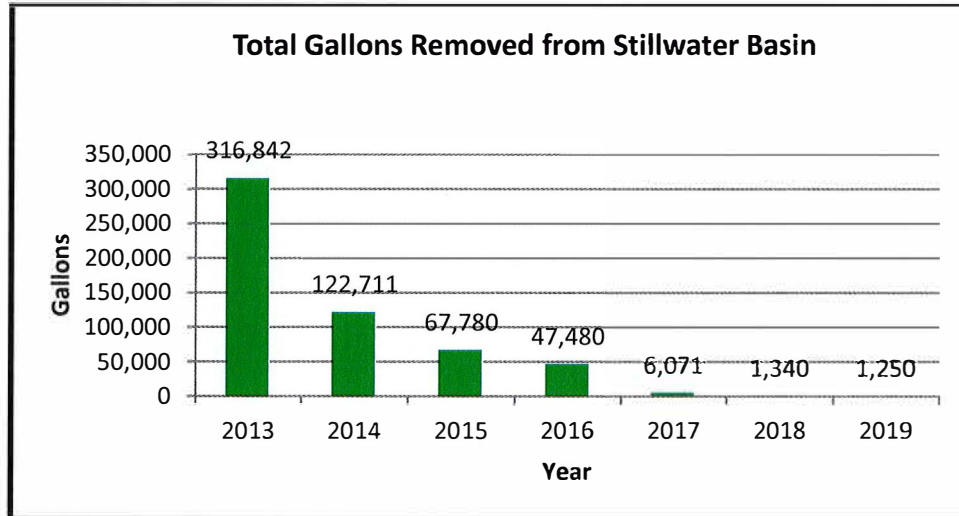
Control measures employed include Diver Assisted Suction Harvesting (DASH), hand-removal by divers and by boat, mechanical harvesting and winter drawdowns at two locations (Foss Reservoir and Chestnut Hill Reservoir) to expose and freeze the plants deep into their root systems.



Foss Reservoir at 10 ft. winter drawdown

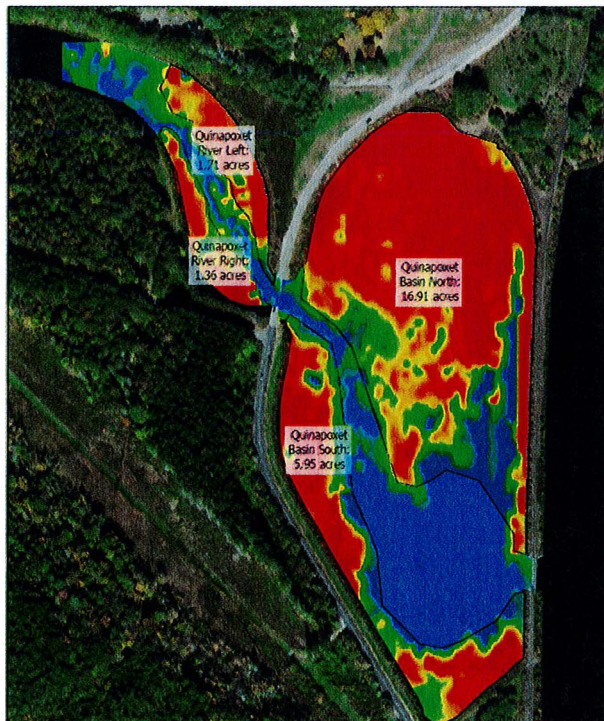
Staff expect that invasive aquatic management at MWRA reservoirs will be a necessary and continuous annual activity to protect water quality for the foreseeable future with levels of effort adjusted to changing conditions. At the Wachusett Reservoir, MWRA has performed seven years

of DASH control efforts in the Stillwater Basin resulting in marked reduction of Eurasian Milfoil and Fanwort, with documented return of native plants (see chart below).



Stillwater Basin Aquatic Invasive Plants removal 2013 -2019

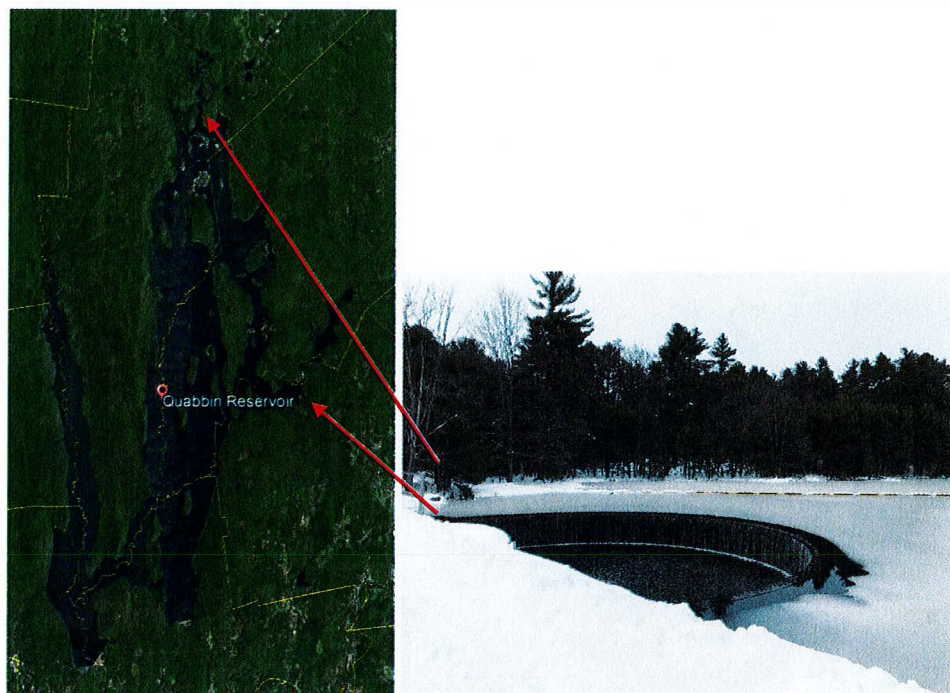
This season staff will begin a higher level of effort at the Quinapoxet Basin to address dense Variable Milfoil population using DASH control measures similar to the program employed at Stillwater Basin. This will include full removal of plants in both the basin and river area upstream of the Thomas Street Bridge.



Quinapoxet Basin at Wachusett Reservoir (red indicates high plant density)

There is also a large population of Variable Milfoil upstream of Quabbin Reservoir. Floating

fragment barriers have been placed, and are maintained, as a control mechanism to prevent fragment migration downstream.



Settling Basins in remote Quabbin tributary areas

Staff are evaluating whether further control removal measures, beyond the existing fragment barriers, are feasible in these remote locations at Quabbin Reservoir. There are no current infestations of aquatic invasive plants in the main body of Quabbin Reservoir. A colony of the invasive plant Brittle Naiad was discovered in 2014 and subsequently removed under MWRA's rapid response approach.

The next annual reservoirs-wide survey contract will commence on July 1, 2020 and includes water quality sampling and water column profile measurements. A key directive in the survey contract is that if any new or expanded aquatic invasives are discovered, it is brought to the immediate attention of MWRA staff and mechanisms are in place to respond.

BUDGET/FISCAL IMPACT:

The FY21 proposed CEB includes \$508,350 for MWRA's invasives control program for all reservoirs comprehensive plant survey; aquatic invasives control operations, and quality assurance diver inspections.