



**WATER SUPPLY CITIZENS
ADVISORY COMMITTEE**
to the Mass. Water Resources Authority

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WSCAC Meeting

Location: MWRA Facilities
Southborough, MA
March 12, 2019 – 10:00 A.M.

WSCAC Members in Bold in Attendance:

Michael Baram, WSCAC Chair, Belmont
Whitney Beals, NE Forestry
William Copithorne, Town of Arlington
Andrea Donlon, CT River Conservancy
Gerald Eves, Trout Unlimited
Bill Fadden, OARS
Bill Kiley, BWSC

Paul Lauenstein, NepRWA
Jean McCluskey, ACEC/MA
Martha Morgan, Nashua River Watershed
Martin Pillsbury, MAPC
Janet Rothrock, League of Women Voters
Kurt Tramposch, Wayland Wells
Roger Wrubel, Mass Audubon

Non-Members in Attendance:

Lexi Dewey, WSCAC Staff
Andreae Downs, WAC
John Gregoire, MWRA

James Guiod, MWRA Advisory Board
Matt Walsh, MWRA
Ace Peckham, WSCAC Staff

WSCAC Business

Michael opened the meeting, announcing the new WSCAC brochure and bringing the monthly Progress Report to the attention of the members.

Ace referenced the tour of the NETA marijuana growing facility in Franklin and asked all attendees to bring a photo ID and to meet in the parking lot at 1:15.

Lexi announced that WSCAC staff will have the brochure professionally printed, and if anyone needs copies, to please contact the office. Staff will be happy to have extra copies printed, or send you a copy of the PDF via email, so interested parties can print it themselves. We hope members can share the brochures with interested organizations or individuals.

Lexi referenced the WSCAC comments on the proposed revisions to the MA Drought Plan and comments received from other organizations, which WSCAC staff sent out to the members. We are waiting for further updates from Vandana Rao at EOEEA.

Michael asked for comments on the WSCAC February meeting summary. There were no comments; Bill Copithorne moved to approve, Kurt Tramposch seconded, and the minutes were approved unanimously.

Lexi then introduced John Gregoire, Program Manager of Reservoir Operations at the MWRA, and Matt Walsh, Project Engineer of Reservoir Operations at the MWRA.

Matt Walsh presented on the levels of the Quabbin and Wachusett reservoirs. 2018 had the third highest precipitation rates in the last 34 years. With so much rain, reservoir levels have increased significantly. The Quabbin started spilling in November, and is still doing so, sending approximately 250 million gallons down the Swift River daily. As a point of interest, John Gregoire mentioned that the Quabbin has two spillways at different elevations. Levels are currently below the upper spillway, but above the lower spillway.

Matt shared figures from 2019, showing that the water levels are slowly dropping back to more normal levels. The MWRA is transferring Quabbin water to Wachusett which generates energy at Oakdale via the hydro turbines.

Kurt asked whether there might be any adverse effects if we have another unusually wet season. Would the higher water levels cause erosion or anything similar?

Matt said that it's just a matter of managing the reservoir levels, and John said that erosion is actually more of an issue at lower water levels. Matt said spilling can be problematic for people downriver, so managing reservoir levels is key to avoid flooding.

Kurt asked if there are any potential issues with the Quabbin spillway itself. John said they have reviewed it, and it is in good condition.

. At Wachusett, releases are done through the Angle Pattern Sleeve valve for normal releases, and with the Crest Gate for releases at higher reservoir elevations. At Quabbin, there are stoplogs to control lower spillway releases. Previously, the McLaughlin Fish Hatchery would request that the stoplogs in the lower spillway remain in place, so that the warmer surface water wouldn't affect the hatchery intakes. However, several years ago a pipe (colloquially known as the "Fish Pipe") was installed by MWRA which ensures that the hatchery gets only cold, bottom water from Quabbin. MWRA has an agreement with the Hatchery to provide six million gallons of water per day, free of charge, to the Hatchery, subject to drought conditions, safe yield concerns, and certain other events.

Bill Fadden asked if there was any way of passing water under the spillways. John said generally no, that stoplogs are the only option, but they did do a study a few years ago regarding installing a crest gate in the lower structure of the Quabbin Reservoir. When the reservoir was designed, there was an expectation that the Metropolitan system would need all the stored water, and didn't anticipate a situation where they would need to waste water. However, since the MWRA has improved its efficiency and water conservation over the years, the reservoirs need to be able to lower water levels in case of emergency. A Quabbin crest gate may offer a solution. MWRA conceptual design scenarios show the reservoir operations team could take up to a foot of water off the Quabbin Reservoir in a matter of weeks, depending on the starting elevation.

Paul asked for clarification on crest gates. Matt showed an image of the crest gate at Wachusett, which is hydraulically operated, and raises and lowers as needed.

Kurt asked about a weather incident in the 1950s, where four hurricanes swept through CT in a very short time, changed hydrologic planning throughout New England (documented in a book called *Twisted Sisters*, published

in 2014). What would happen if that same scenario were to occur today, would the system be able to respond to that much rain?

John responded that those specific hurricanes actually influenced the design of the crest gate at Wachusett. Current spillways meet all safety standards. However, we need to keep in mind that climate change is altering projections, and so there's always a need to review and update data. Discussion revealed that potential issues can arise during specific events. For example, during a storm in 2018, South Carolina experienced 13 inches of rain in a day. Crest gates can help prevent flooding when faced with storms of this magnitude.

Paul asked whether the MWRA gets enough notice from weather forecasts to move water before risks of flooding are forecasted. John and Matt said that they get the same weather reports as the public, but from past experience, they can predict how much water they will need to move during a heavy precipitation event.

Michael asked if there are any ice dam issues, but John said that overall, there have not been any problems with ice dams.

Bill Fadden commended the work done on the Sudbury Reservoir. John commented that the goal is always to avoid spilling because spilling indicates a loss of control. A discussion on how information is shared among municipalities and the MWRA regarding reservoir operations ensued.

Kurt commented that after he went on a wastewater tour in Clinton, he had a newfound appreciation of the risks of flooding (the heavy precipitation of 2010), and asked whether that was a concern regarding the release of water to protect infrastructure. John confirmed that 2010 was an anomaly, and that if things continue as they are, that level of flooding should not occur again.

Bill Kiley asked whether there was an outlet pipeline in Wachusett, or if the water needs to spill over the top, and Matt confirmed that there is a pipe, the Angle Pattern Sleeve Valve (APSV) in the lower gatehouse of the dam. Bill asked whether there was any way to add an energy generation mechanism to the pipe, and John answered that decisions like that are complicated, but they make efforts to generate power at the most efficient locations; however, the APSV doesn't fall into that category.

Matt showed a summary of the Quabbin volume changes over the course of the past year. He showed a chart of the Wachusett Reservoir's operating range which the MWRA keeps within a specific operating band. If the reservoir freezes, they reduce the water level to a lower elevation so they can capture spring runoff (there was no complete ice cover this winter).

Kurt asked why they wait until Wachusett freezes to drop the water levels. Matt explained that the elevation needs to be higher, so that there's less shoreline to attract birds (birds defecate in the water which can raise bacteria levels). Once the waters freeze, the birds won't roost there, so they can safely drop the levels and capture runoff. Kurt asked about the presence of gulls at the reservoirs and John recommended asking Dan Clark (Quabbin Regional Director), about the gull harassment program at both Quabbin and Wachusett Reservoirs. Lexi confirmed that we will ask Dan to come speak about the program at a future meeting.

Matt then showed a chart that indicated mandated releases to the Swift River. MWRA staff checks the gauge at Montague to determine the amount of the required releases (see War Permit, last page of this document) The MWRA funds eight USGS gauges which are critical to meeting the terms of the War Permit. Kurt asked

whether the gauges should be modernized, and John said that some are, some aren't, but they're all working well.

Matt shared the Nashua River releases, also mandated and noted that the amount of water released so far this calendar year is close to the total amount released all last year. He also pointed out where the Sudbury and Foss reservoirs were drawn down for invasives control, and where the levels landed during the drought of 2015-2016.

Lexi asked about testing at new Wachusett Pump Station. John said it has been completed.

Kurt referenced the comments submitted by the Massachusetts Water Works Association in response to the draft Proposed Revisions to the MA Drought Management Plan, which suggested that reservoir spillways should be closed earlier in a drought season, and asked how that could work in practice. Matt responded that it is difficult to predict a drought, so there is no way they could close the spillways earlier, for safety's sake. John mentioned that they'll be engaging in an intensive cleaning of the spillways in the coming season.

Kurt asked about aquatic invasives in the Sudbury River. Is it possible that keeping levels low in the in the Sudbury Reservoir and releasing more water downstream, could this be contributing to the rise in invasives in the river?

Before John began his presentation, he took a moment to address the question of road salt usage. Tests have confirmed that road salt is washing into streams and tributaries and leaching into groundwater (as determined by studies that have seen higher salt content in the summer, rather than occurring just during the winter months). It seems to be most prevalent at Wachusett Reservoir. As a result, the MWRA has increased flow from the Quabbin to Wachusett to improve water quality at the Wachusett. Bill Fadden asked how much of the system yield is from Wachusett and whether it's essential to the water supply. John responded that it is absolutely necessary as a water source.

Kurt asked about road salt alternatives, and if those are an option in local communities. John said that Wachusett Environmental Quality staff are researching this and cataloging what types and amounts of salt are being used. Kurt also mentioned fracking waste brines which are being used in New York as a road salt alternative, and causing contamination of wells. He asked if Massachusetts has made any such move to ban the use of these brines. John said he will look into it. Michael asked how WSCAC can get involved in this issue. Lexi said she will bring updates to the committee as they become available.

John began his presentation, titled "Invasive Aquatic Plant Management at MWRA Reservoirs". He indicated locations of invasive aquatic plants in MWRA reservoirs based on annual surveys done at each reservoir to quantify which invasives are present, and how pervasive they are. The approach that the MWRA has adopted over the years is to address the invasives as soon as possible, and reduce or eliminate them as rapidly as they can. Some of the reservoirs have not suffered with invasive plants, so they're simply being monitored (in the case of one reservoir, Norumbega, there was a small patch of Eurasian milfoil several years ago. The plants were eliminated as soon as they were found, and there has been no recurrence).

Lexi asked how long Quabbin has had invasive plants in the fishing area, and John said that it was probably a very long time. Variable milfoil is technically no longer considered invasive, but rather an established non-native, and it's all over the country. However, when it begins to grow in a new location, it spreads invasively, overtaking other plants, which is why the MWRA is addressing it aggressively.

Variable milfoil was originally imported as aquarium plants, but was occasionally dumped into lakes and ponds, and established itself there. John shared images of the plants, with information on how they propagate and spread. Kurt commented that fanwort is one of the most invasive plants in the Mediterranean, also coming from aquariums. John explained that fanwort and milfoil, when they're at the end of their season, can auto-fragment. The pieces will drift, and a single fragment can spawn an entirely new section of the plant.

John shared an image of the fragment curtain barrier that was installed at one of the fishing areas at Quabbin. It is designed to prevent the milfoil from fragmenting and drifting down to take root in the main body of the reservoir.

Every year at Ware River, the MWRA draws the intake pool down in order to clean the screens on the Shaft 8 intake. In 2013, they found huge patches of variable milfoil growing there. Now, when they draw down the levels, they bring in a contractor to remove any visible plants. One thing that they learned during this process is that the milfoil is so adaptable that it can morph into a terrestrial plant once it is removed from the water. Plants are composted after removal from the water.

Wachusett is the highest at-risk reservoir, with both Eurasian Milfoil and Fanwort. The initial approach was to use divers who hand-harvested the plants, until the MWRA learned of a new approach called DASH (Diver Assisted Suction Harvesting), which has proved very effective. A diver goes underwater with a vacuum hose, identifies the plant, pulls it up by its roots, and uses the hose to suck it up onto the boat and placed on a conveyer belt, where it can be reviewed. Any wildlife can be placed back in the water. The suction helps reduce the risk of fragments and keeps the water clearer so the divers can see for longer periods of time. Over the past five years, they've witnessed native plants returning, and taking back the space that was occupied by the invasive plants (the native plants belong in these waters, and don't pose a problem). As a result, the divers now take more time for less reward, which is a good indication that the efforts are succeeding.

The DASH method is working well enough that the MWRA is using it in the Quinapoxet Basin. The Milfoil was solidly established here, growing up to 13 feet tall and very dense. A pilot project experimented with using the DASH approach to pull and suck up the root ball for these much larger plants. It turned out to be successful enough to expand the effort to address the infestation in the whole body of water.

For upcoming years, the DASH approach will continue, and will be followed up with a QA/QC diver to check work.

In Sudbury Reservoir around 2007, the MWRA discovered acre-sized patches of Water Chestnut. The plant spreads by sharp-edged nuts that are nearly impossible for animals to consume. Initially, the solution was to bring in a mechanical harvester, which essentially mows the plant up and dumps it on shore (must happen before the plant drops its seeds). The approach was successful enough that they are now able to send a boat out with contractors to hand-harvest the plants. The seeds can remain viable for a decade or more, so many of the newer plants are from pre-harvester years. This is also done at Foss Reservoir, as some small patches of Water Chestnut have been discovered there.

Bill Fadden mentioned that Framingham Conservation Commission has been using herbicides to kill aquatic invasive plants. Kurt said that Wayland has been using herbicides as well, including in Dudley Pond (which

feeds into Dudley Brook, which feeds into the Wayland wells). The MWRA does not use herbicides in their efforts to control invasive plants.

Kurt asked if there are new invasives that are potential sources for concern. John said that the consultants always give an update on newest invasives and what's happening elsewhere, so they're always looking down the road. However, the space that they're clearing from the invasive plants is becoming repopulated by native plants, which helps reduce future risks of invasives.

Roger commented that these solutions involve ongoing maintenance, and John agreed that yes, it's something that needs to continue regularly, but at a much lower level at this point. Huge sections of the reservoirs would be impassible by now, if they hadn't initially addressed the issue, and now it's simply a matter of regular maintenance.

Roger also asked about boating, and the risks of reinvasion. John responded that there are very limited places that allow boating on the reservoirs, and where it is allowed, there are specific requirements to ensure that the boats are decontaminated before they go in the water. Illegal boating is an issue, and the MWRA is addressing it as well as they can. Additionally, fire departments also need to use boats to get to the islands for fire prevention or elimination. Since the MWRA doesn't know what steps are taken to decontaminate the boats, this could cause problems, so they're reaching out to the fire departments to start a conversation.

There was a small patch of fanwort discovered at Sudbury Reservoir in 2017, and so the MWRA has immediately addressed it, removing it and watching for its reemergence. This is the approach that they're taking for all invasive aquatic species.

Kurt asked if the temperature of the reservoirs has increased, and if that could be creating a more hospitable environment for invasive species. John said that while they don't have the data for any direct correlations yet, Jamie Carr, the regional director at Wachusett, has recently analyzed water temperatures at Wachusett, and demonstrated a clear 1.5-2 degree increase in temperature over the past hundred years. Paul asked whether this data is available anywhere, as a graph that shows this information may be valuable for those interested in climate change. John suggested having Steve Estes-Smargiassi weigh in on the best way to convey this information.

Foss Reservoir gets drawn down 10 feet in the winter, in order to expose the milfoil to freezing conditions, which kills it. There's not even the need to remove the plants, because they're dead and will simply break down and decompose in the water. They're only able to do so when there's enough water, however – during a drought, this is unjustifiable. Additionally, they were unable to do so in 2018, due to the great amount of rain.

Kurt commented that a lake in Groton tried to draw down to control invasives, but this caused the private wells to dry up as well, and asked if there are wells in the area of Foss Reservoir that may be affected. John said that there are no private wells in the area that he knows of, so this hasn't been an issue. Kurt also noted that DEP has a well drillers' registry, so you can see where roughly wells are placed in a particular area.

John mentioned Chestnut Hill, where they use both draw down and mechanical harvesting methods to control Eurasian milfoil. Mechanical harvesting does not get the roots out; it's more like mowing the lawn.

The other major issue at Chestnut Hill is Cyanobacteria. There were blooms in 2014 and 2017. Phosphorus, which triggers Cyanobacteria, is caused by geese defecating by the water, plants growing and decaying in the water, and dirt and dust being blown into the reservoir from local areas. Last summer and fall, there were back-to-back blooms of the bacteria, so the MWRA treated the reservoir with alum, which binds with the phosphorus and forms a mat to prevent the Cyanobacteria from using the phosphorus to bloom.

Paul asked whether Chestnut Hill Reservoir is used primarily as an emergency backup, and John confirmed it is. It was last used in 2010 during the MWRA water main break. Paul asked what would happen if the MWRA was unable to use Chestnut Hill, or whether there are any alternative options. John said that there are other reservoirs that could be used during an emergency, but Chestnut Hill is an essential backup to the system.

Paul asked about the variability of flow into Swift River, and how the dam affected the biodiversity in the river. He shared graphs from before and after the dam's construction. Essentially, were the varying levels of flow that naturally occurred prior to the dam's construction better for biodiversity? John said that the Swift River didn't dry up at any point during the 2016 drought due to MWRA's mandated releases. In addition, there is an additional 6 mgd flowing down the Swift River due to the new pipe from Quabbin to the McLaughlin Fish Hatchery. Jerry commented that Trout Unlimited sees no issue, and that there are plenty of trout in the river.

Kurt mentioned that there was a recent Environmental Business meeting on climate change retreat, and that the Quabbin's creation was referenced as an example of people having to retreat when the area was flooded. There was a talk several years ago on creating new reservoirs; is that something that's under consideration? John said there isn't any need for a new reservoir at this time.

Matt and John were thanked for their presentations, and the meeting was adjourned.

WSCAC will meet again in a joint meeting with WAC on April 23, 2019 at 10:30 AM at the Waterworks Museum in Boston. Please [visit our website](#) for more information on this meeting.

DIVERSIONS

1. Quabbin (C. 321, Acts of 1927)
 - A. Amount to maintain a flow of 20 MGD at Bondsville.
 - B. The War Department requires the release of 70 CFS (about 45 MGD) when the flow of the Connecticut River is between 4650 and 4900 CFS; and 110 CFS (about 71 MGD) when below 4650 CFS during the period June 1 to November 30.
2. Ware River at Coldbrook (C. 375, Acts of 1926)
 - A. Flood flows in excess of 85 MGD (131 CFS) except that diversion cannot be made between June 1 and December 1 without permission of the State Department of Public Health.
 - B. The War Department does not permit any diversion between June 15 and October 15.
3. Wachusett (C. 488, Acts of 1895)
 - A. Amount to South Branch of the Nashua River to be not less than 12 MG each week; also, if requested by the owner of the Lancaster Mills an additional amount not exceeding 12 MG each week.
4. Sudbury (C. 177, Acts of 1872)
 - A. Amount to the Sudbury River below Framingham Reservoir Dam I to maintain a flow of at least 1.5 MGD.
 - B. Section 3, C. 557, Acts of 1947: The Commission may discharge surplus water into the Sudbury River not exceeding 15 MGD as the Department of Public Health may specify; it shall be paid for at the rate of ten dollars per MG by the towns of Framingham and Natick and other towns discharging sewage effluent into the river above Bannister Brook in Framingham. An additional amount of such surplus water, not exceeding 15 MGD may be discharged into the Neponset River or for industrial use. Provides for payment at the rate of ten dollars per MG plus cost of maintenance and operation.
5. Charles River (C. 603, Acts of 1950)
 - A. The Commission, upon the request of the Department of Public Health, may discharge surplus water from its Sudbury Aqueduct into the Charles River in order to maintain a steady flow in the river.
 - B. The quantity of water to be discharged shall not exceed 15 MGD and shall not exceed 500 MG in any one year.
 - C. Provides for payment at the rate of ten dollars per MG apportioned annually among the cities and towns bordering on the Charles River at or below the point of discharge: Wellesley 8%, Weston 7%, Watertown 13%, Cambridge 16%, Boston 19%, and Newton 23%.