



Fiscal Year 2021 Final Report



Hank's Picnic Area, Quabbin Park

September 2021

Massachusetts Department of Conservation and Recreation
Division of Water Supply Protection
Office of Watershed Management

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Wachusett/Sudbury Region

A. Land Acquisition

In FY21, one project went to record in the first quarter of Fiscal Year 2021 totaling 1 acre in fee costing \$192,500. Another 36.08 acre in fee project on the Sterling/Leominster border closed on the last day of the fiscal year at a cost of \$325,000. Several other projects are in the various stages of due diligence. Two projects were approved by the MWRA Board at the January and June Meetings: the 36-acre Pellecchia parcel (which closed in June) and the 163-acre Cusanello parcel. Both are fee acquisitions in the Wachusett Watershed totaling almost 200 acres. Two online LAP meetings were held to review several parcels that are under consideration. Several land gifts and transfers are on the table.

B. Watershed Preservation Restriction Monitoring

Several high-priority WPRs and Forest Legacy properties were monitored in FY21. Extensive work continued on modernizing the monitoring program to incorporate new technology and procedures. WPR Coordinator and Regional Monitors completed 46 WPR monitoring visits. WPR Coordinator assisted Regional Monitors with training, monitoring visits, and report writing. WPR Coordinator reviewed all monitoring reports completed by Regional Monitors. WPR Coordinator worked with GIS Manager to update and improve WPR Monitoring Workflow.

C. Land Management

Supervision took place on a total of 10 timber sales during FY21. These sales cover a combined 495 acres. Nine of these sales on a combined 433 acres were completed during the fiscal year. There are currently seven timber sales on a combined 399 acres that have been sold but are yet to be commenced. These seven sales are owned by five different logging contractors.

NR accumulated all proposed FY22 forestry information in preparation for annual review, and distributed to the entire review team. Field review was completed during Q4 and a final review document was presented to foresters. A Storymap was created to present the proposed lots to the public pending the Commissioner's approval.

No problems observed during active forestry monitoring. The Princeton long term forestry lot has been sold. Pre-harvest monitoring phase should be ending in early FY22.

Since regular property boundary maintenance began in FY15, 172.3 miles have been maintained which averages to 24.6 miles/year. The past three years have averaged 27 miles/year. With 257 total miles of maintainable boundary line and a goal of a 10-year return frequency, 25.7 miles/year need to be maintained. After seven years of maintenance, there remain nearly 84 miles to go which requires an average of just under 28 miles per year be maintained for the remaining three years.

D. Wildlife Management

The active portion of the bird harassment program operated from early September 16 until the program was discontinued on April 16 when fewer birds were observed at the North Basin and bacteria counts were low or zero. Continued Bird Harassment was conducted for five evenings per week with two shore personnel and a boat crew from March until early April. Some morning observation and harassment was needed. Development and use of a Survey123 app on iPads standardized and simplified data collection and analysis.

Goose control was conducted at the Sudbury, Wachusett and Quabbin Reservoirs. The Reservoir islands and shorelines were surveyed for nesting geese. The goose population management program at DWSP Reservoirs has been effective in both limiting the number of goslings hatched each year and gradually reducing the number of resident adults.

Efforts to keep the Pathogen Zone free of muskrat and beaver continued this year. There were three beaver trapped in the pathogen zone (all in Carville Basin) in Q2. Another three beaver were trapped elsewhere on the reservoir; seven were trapped in Stillwater and Quinapoxet Basins and two were trapped with an emergency permit at Allard St in W. Boylston. Mitigation efforts were implemented and most flooding issues were resolved with a combination of trapping, culvert protection and overflow piping.

Hunting was conducted at Wachusett and Sudbury beginning in October and ending on December 31, 2020. A total of 330 permits were given out for the Reservoir Zone at Wachusett and a total of 611 permits were issued at the Sudbury. The annual Deer Report was completed and submitted to staff and presented at the MWRA Trust Board in Q4. The expansion of deer hunting last year has made a significant impact on the local deer population and will continue into FY22.

E. Public Access Management

Watershed Rangers continue to patrol the watershed. Visitation greatly increased in 2020 during COVID-19 and visitation seemed to remain higher than in past years. In FY21 rangers catalogued 26,295 visitor contacts with 1,786 rule violations noted. Both the number of contacts and the violations were significantly higher than historical numbers. Ninety-eight written warnings were issued, and 286 noncriminal citations were issued, also a marked increase over recent years.

F. Watershed Security

Ranger staff continues to maintain an active presence in the watershed. All Wachusett/Sudbury staff informs Rangers of any unusual activities. Interactions and coordination with MWRA, State Police, Environmental Police and other enforcement personnel continued throughout the year. DCR Rangers and Massachusetts Environmental Police met and coordinated plans for joint enforcement on Opening Day of Fishing, which can be continued annually. Rangers continue to update Law Enforcement and MWRA Security on any ongoing issues on Watershed property.

Multiple incidents of vandalism and destruction of interior and exterior reservoir gates were documented. Damaged gates were secured and replaced promptly.

G. Infrastructure

All Wachusett and Sudbury dams, spillways and dikes were inspected monthly and smaller watershed dams were assessed in the fall and spring. Internal roads were inspected, an Internal Road Plan was created, and work projects generated. Liming of both North and South Dike was completed. Regular monitoring of River Street was conducted.

Regular inspections of stormwater BMPs were conducted at least twice a year and after large rainfall events; minor BMP maintenance is ongoing, including vegetation management. Plans have been prepared for more intensive BMP maintenance work at Gate B1. Gate 25 and WB10 outlet control structures are being modified, as funding allows, by installing a gate valve to allow control of water levels as needed.

Hazardous materials abatement work was completed on Kush building, radio shack building, and Grove Street garages in April, which will allow demolition plans to proceed.

H. Watershed Protection Act

The Watershed Protection Act (WsPA) continues to be successfully implemented in the Wachusett Reservoir watershed. The main staff person responsible for Wachusett WsPA retired after 27 years of service. Staff from Boston, Quabbin, and Wachusett are providing interim support until the position is posted and filled. Staff successfully implemented the provisions of the Watershed Protection Act while working remotely during the Covid 19 pandemic. A total of 43 completed applications were processed in FY21: 21 Advisory Opinions, 19 Determinations of Applicability, and three Variances.

I. Education and Outreach

During the pandemic, new ways were incorporated to accomplish outreach, including pivoting to online resource sharing. Best practices were developed for virtual programming, and a series of videos were posted online. Video companion educational packets were sent to watershed schools and shared with educators across the state. Virtual presentations were provided to libraries. Staff participated in DCR initiatives - Girl Scout Weekend, April Vacation Trip Tip, and Parks as Classrooms. A trip-tip self-guided Explore the Watershed walking tour was designed and promoted via social media for outreach during school vacation.

Activity guides and kiosk posters were made available on watershed education web pages. A Virtual Reservoir Tour and Watershed Wildlife videos were created and distributed by request to replace in person visits. Kiosk posters were replaced as needed. New posters were reviewed following thematic guidelines and posted. New Gate 39 poster installed under a collaboration with Clinton Greenway Conservation Trust. Kiosk posters were revised to include digital commonwealth links to historical photos and posted online.

Extensive work was done on the website, particularly after the declaration of a State of Emergency, to have up to date communication, particularly regarding public access. Fishing, hunting, and education materials were all updated during this fiscal year.

J. Water Quality and Hydrologic Monitoring

Routine sampling was conducted as planned across the watershed. Sampling of all tributaries was conducted twice per month. Nutrient and total suspended solids samples were collected monthly. Chloride samples were collected from selected tributaries and from groundwater wells

to document changes due to excessive applications of road salt. Water quality samples were collected from Shaft 1 to assess Quabbin transfer.

A total of 79 phytoplankton samples were analyzed this fiscal year and 38 profiles were collected in conjunction with phytoplankton and nutrient sampling. Data from MWRA remote sensing buoys are monitored and used to augment sampling programs as necessary. Wachusett aquatic biology staff assisted the Quabbin EQ section with phytoplankton collection and performed analysis from July - October due to retirement of Quabbin staff. A total of 52 Quabbin phytoplankton samples were analyzed in FY21. Wachusett and new Quabbin aquatic biology staff remain in close communication regarding plankton and other water quality monitoring activities. Reservoir nutrients were collected quarterly. Reservoir transects sampling for bacteria were conducted monthly or more frequently except during periods of ice cover or due to pandemic restrictions.

Stream flow was monitored with ten USGS continuous stream gauges throughout the four watersheds. Additional Wachusett streamflow data was provided by continuous water level recorders at eight additional tributary locations. A new Mayfly data logger with sensor to continuously record stage, temperature and conductivity was installed at Waushacum Brook, with data available online in real-time. Six new Mayfly Loggers with Hydros 21 sensors were purchased to be installed next fiscal year. Streamflow measurements were conducted and rating curves updated for each site. Wachusett EQ staff also regularly monitored groundwater at seven locations, snow pack, and precipitation to improve understanding of watershed hydrology.

The 2020 Water Quality Report was completed using the automation of tables, graphs, production of statistics, and basic text developed for the 2019 report.

Staff continued to work with UMass on a range of topics including the continued update of CEQUAL model, research on impacts of salt to reservoir water quality, and development of a new sampling program for Quabbin/Ware River. A new ISA (FY21-22) was developed and approved.

Continued efforts to address issue of excess salt applications and the impacts to water quality included progress in Division practices to utilize pre-treatment and planning towards incorporating brine into future efforts. The newly developed grant program was successfully administered in FY21 to support efforts in Wachusett municipalities to reduce the amount of salt used by local Departments of Public Works. Three towns received a total of \$58,592 through this program: Holden (\$20,000), West Boylston (\$18,592), and Princeton (\$20,000). The Princeton grant for completion of a salt storage facility was extended as work did not ultimately begin until after the end of the fiscal year. The FY22 Work Plan has another \$100,000 available for a second round of grants, once again with a maximum amount of \$20,000 reimbursement per project.

K. Watershed Monitoring and Assessment

Inspections and investigations of potential water quality threats were conducted by EQ staff. Staff gathered significant information on activities in the Sudbury watershed.

Staff continued to update water and wetland resources using plans and field observations. Editing continued on the seven hydrology GIS datalayers within the Quinapoxet River

subwatershed in support of the Wachusett Watershed Hydrology Mapping Project. Editing was completed for 13 subbasins.

The Quinapoxet Environmental Quality Assessment was completed and sent to the Regional Director to incorporate recommendations into a future workplan. Updated status of agricultural sites, hazardous materials sites, and hazardous release sites was documented regularly for all areas of the Wachusett and Sudbury watersheds.

L. Aquatic Invasive Species

Monitoring for aquatic invasive plants was conducted on the reservoir, adjacent lakes and ponds, and select tributaries. Improvements to and use of ArcGIS tools has improved data collection and data sharing efforts. Staff provided support and oversight of MWRA DASH contractor plant removal efforts throughout the reservoir to continue the successful effort to reduce invasive plant growth. Surveys of aquatic vegetation prior to and following removal efforts were successfully completed and illustrate a dramatic reduction in invasive plant biomass.

Thirteen watershed ponds were surveyed in FY21 with no new detections of AIS. A summary of findings will be included in the annual water quality report. Occurrence of one new non-native species, water lettuce, was discovered in the Stillwater River and managed immediately via hand-pulling.

Herbicide treatments of South Meadow Pond continued for two invasive species: *Potamogeton crispus* (curly-leaf pondweed) and Hydrilla; Orders of Conditions were extended for the next three years of management. Management of *Najas minor* (brittle naiad) in the three Lily Ponds continued in FY21; fewer than four acres required treatment. Surveys of Clamshell Pond resulted in no observations of *Egeria densa* for the third year since treatment and low numbers of *Trapa natans* were observed and removed.

M. Wastewater Management

EQ staff continued to work with local Boards of Health to review septic system repairs and new installations. Staff responded to nine inquiries ranging from input on proposed septic system bylaw changes and revisions to earth removal bylaws to site-specific inquiries regarding regulatory review and implementation. Ninety-five septic repair and Title 5 Inspection sites were conducted and information remotely entered.

Civil Engineering staff continued to work with MWRA to provide oversight, management, and support of the Rutland-Holden trunk sewer and the Rutland Holden Relief trunk sewer. Replacement of the metering devices (channels) at Stations C & D are to take place in FY22 under MWRA's oversight. Metering discrepancies will be reviewed and addressed in late FY22 or early FY23, depending on timing of project completion. Quarterly bills were all issued in accordance with internal timelines. Repairs to MH 79, 80 and the line between the two manholes to be undertaken in FY22. Studies will need to be conducted to attempt to find the source of the high hydrogen sulfide that has caused the deterioration of the manholes and line between them.

N. Stormwater Management

The 25% design for the elimination of the last remaining direct discharge from Route 110 in the vicinity of Gate 36 was submitted to MassDOT. Runoff will be diverted off watershed by removing an existing culvert, re-pitching the roadway, and constructing a diversion pipe. The

25% design was submitted to MassDOT. Tighe & Bond also submitted to MassDOT the cost figures for the vertical curve modification. After consultation with MWRA and GZA the lowering of the road elevation near Gate 36 would not impact North Dike. Progress continues towards a final design and permitting with MassDOT.

Culvert assessment training was completed to assist towns with upcoming grant opportunities for replacement; 54 culverts were assessed (53 in West Boylston, one in Sterling) this year.

Regular inspections of active constructions sites were conducted to ensure compliance with stormwater regulations and protect resource areas. During the fiscal year 369 inspections were conducted on 30 sites. Several projects required additional attention and remedial action. Any problems noted were corrected by the contractor in a timely manner. Seven sites were completed and eight new sites were added.

O. Emergency Response

Although COVID impacted training, all planned classes were conducted. Seventy-five people attended five courses, totalling 44 training hours. The attendees included staff from Wachusett, Quabbin, NR, MWRA and WBFD. The Wachusett/Sudbury Comprehensive Emergency Management Plan is mostly complete pending work with DWSP-GIS to update map grids. Trailers and supplies were inventoried. Emergency response supplies and boom received from MWRA was placed at Response Shed (33 Sterling St).

P. Support

Core office functions, such as accounting, payroll, human resources, mail services, inquiries and voicemails to the main office, and work orders were all supported by staff who were primarily working remotely.

Staff continued a trend of developing applications that streamline work flows and facilitate accurate data collection through the use of ArcGIS online. Major accomplishments include the Ranger Daily e-Log and Citation Management Hub, a rollout of the new Encroachment Monitoring system to all staff, the LAP StoryMap which supported remote LAP meetings, improvements to existing projects as new technology and capabilities emerge and a continued growth in the use of GIS throughout DWSP. Now that these approaches are becoming integrated, many benefits are being realized such as improved reporting and tracking capabilities. Electronic workflows revealed tremendous value during the pandemic.

A total of \$8,367,913 was distributed in Payments in Lieu of Taxes to 31 Watershed System communities. Within the Wachusett watershed, \$3,502,986 or 42% of the total, went to seven towns. The five towns in the Sudbury watershed received \$835,459, or 10% of the total PILOT.

Staff continued to work to fill vacancies in the Section. Five full time positions were posted and filled. Two Ranger 1 vacancies were posted and filled by transfer. Retirements affected two important positions within EQ, the Environmental Analyst V and Regional Planner III; both vacancies were posted to be filled and in process but not yet filled at the end of the fiscal year.

Quabbin/Ware Region

A. Land Procurement

Staff continued to work on due diligence and negotiations for acquisitions in FY21 and FY22. Several projects are in the various stages of due diligence. One 150 acre WPR was approved by the MWRA Board of Directors.

B. Land Preservation/Watershed Protection Restriction (WPR) Program

Monitors completed 28 WPR monitoring visits, and all Forest Legacy WPRs monitoring visits and reports were completed. One baseline draft report was completed in-house and is being reviewed.

C. Land Management

Baseline BMP monitoring was conducted at one stream crossing, and post-harvest monitoring was conducted at two sites.

Japanese Stiltgrass treatment in Pelham, New Salem, and Prescott continued this FY. In addition, treatment of buckthorn, bittersweet, and Japanese knotweed was conducted at various locations around the watersheds.

Forestry staff prepared and sold nine timber sales in FY21. Information on all timber sales was prepared and posted on the DCR website as well as on a sign at the timber sale site. New forestry proposals were submitted for 15 lots and were presented to advisory committees. Forestry staff provided oversight and supervision on 14 active timber sales in FY21, and photo point images were collected on 32 harvests.

Work continued on the long-term paired watershed study. A full year of post-treatment water quality monitoring was completed, including monthly grab samples and storm sampling.

CFI data collection was completed in the Quabbin watershed. Approximately six miles of boundary were marked. Over 25 acres of fields have been cut at Quabbin, and a prescribed fire was conducted on the Barre heath.

D. Wildlife Management

The gull harassment program operated for 18 consecutive weeks from 10/8/20-2/13/21. Active harassment took place on 15 scheduled nights. A variety of harassment techniques were used, including bangers, screamers, and lower-powered lasers. There were no coliform exceedances during the program. All operations were performed safely, and training continues on program orientation, cold water and trailer operations, pyrotechnics, and laser use.

Unmanned Aircraft Systems (UAS) flights were conducted at Quabbin weekly for 26 weeks and finished in the beginning of April 2021. The total number of gulls counted at the roost was 4,104. The weekly roost counts varied from zero (Oct. 6 and 15) to 780 (Dec. 29). The average number of birds was 186 gulls/ weekly count.

The Canada goose control zone was surveyed during the nesting season; one nest was located and seven eggs were treated to prevent hatching. The annual report was produced.

Four beaver were removed from the Wildlife Pathogen Control Zone. In addition, work continued to prevent beaver-related flooding issues including monitoring and maintaining culverts, maintaining culvert fence guards, and repairing beaver-deceiver piping.

Research and management for common loons on DSWP waterbodies continued and the annual report was completed for the 2020 season. Lead tackle and fishing line canisters was completed for the 2020 season and totals recorded. One adult loon was captured, banded for identification, and sampled for containments during the 2020 breeding season.

Deer hunting was conducted in New Salem, Pelham and Hardwick during the two-week shotgun season in December, 2020 at Quabbin. Analysis of the hunt data is ongoing, but to-date 28 deer have been reported by hunters (12 in Pelham, eight in Hardwick and eight in New Salem). Final deer report was completed and shared with staff ahead of the 2021 deer hunt planning meeting. Results were presented at the Water Supply Protection Trust meeting. Quabbin ended up with over 685 applications to hunt in 2020. About 500 bonus antlerless deer permits were issued to hunters.

E. Public Access Management

Information on access policies and regulations was distributed through the Quabbin Visitor Center and through numerous public contacts by the watershed rangers. The rangers logged approximately 47,000 visitor contacts during FY21.

The three Quabbin Boat Launch Areas (BLAs) operated daily. The 2020 season opened in May to private boats only, and no rental boats were allowed for the remainder of the season. The 2020 season closed on October 17, 2020. The 2021 season opened on time in mid-April to both private and rental boats. The boat inspection and decontamination programs were implemented again this year, with both boat washings and cold weather quarantines overseen by DWSP staff. Staff continued to use iPads to implement the boat seal program.

EQ staff conduct regular inspections through EQA fieldwork that occasionally uncover recreation-related water quality concerns. These concerns are analyzed and mitigated as needed.

No work was done on the Ware River Public Access Management Plan. The plan has been on hold since winter 2020, pending the Commissioner's review.

Staff provided support and maintained the boat launch at Comet Pond. In addition, they supervise and support the needs for portable toilet availability at the BLA's and during the Quabbin Deer Hunt.

F. Watershed Security

The Watershed Rangers conducted regular patrols of high-vulnerability areas around the reservations, and weekly summaries were submitted to MWRA. Rangers documented 1,877 violations (627 Quabbin, 1,250 Ware River).

Inspections of gates and bar ways on the reservations were performed and necessary repairs made.

Interactions and coordination with the State Police, Environmental Police, the State Police Marine Unit and other enforcement personnel continued throughout the year.

Rangers transitioned over to completely digital logs using iPads and ArcGIS online technology. This has improved record keeping and reporting requirements.

G. Infrastructure

Civil Engineering staff performed and reported on monthly inspections and piezometer readings. DWSP staff conducted mowing, brush-cutting, and other maintenance operations on dams and dikes. Turf repair efforts continued on the dam and dike with promising results. Masonry repairs to parapet walls on Winsor Dam and Spillway Bridge were completed.

Site visits were conducted for Brigham Pond dam, Asnacomet Pond, Demond Pond, and Peppers Mill Pond.

Electrical upgrades were made in Quabbin Tower including new wiring and exhaust fans. The final building envelope study report on the Admin building and Cemetery office was delivered that listed identified issues, probable repair costs, and recommended solutions.

Routine grounds maintenance was completed in Quabbin Park, including field mowing, weed-whacking, and the removal of several hazardous trees or limbs. Staff prepared for Memorial Day in the Quabbin Park Cemetery with numerous plantings and assisted with burials in the cemetery.

Road work performed by DWSP staff included clearing several miles of roadside brush, cleaning drains, and filling potholes in Quabbin Park.

DWSP staff also monitored gravel extractions by the towns of New Salem and Petersham. Two new gravel pits were permitted including one in Quabbin and one in Ware River. Final Gravel Management Plan completed for the Hardwick pit. Gravel Management Plan started for the Barre Heath pit.

H. Watershed Protection Act

Staff implemented the Watershed Protection Act through the review of applications, site visits, meetings with applicants and their representatives, holding variance hearings, and the issuance of decisions. Staff received 36 cases in the Ware River Watershed and an additional eight cases were received for the Quabbin Watershed. Staff investigated several violations in the Ware River and one at Quabbin.

Agendas and minutes were reviewed for all the towns in both watersheds. Staff contacted several towns regarding projects within WsPA jurisdiction. Brochures were provided to several lake associations and follow-up assistance was provided.

I. Interpretive Services

The Quabbin Visitor Center opened to the public on May 29, 2021 with a 4-day per week schedule. About 1,250 people visited the Visitor Center. Approximately 1,300 calls were received and information provided. A variety of remote programs were provided.

A new and updated orientation film for the Visitor Center provides an excellent overview of the history and management of the Quabbin Reservoir for visitors.

<https://www.youtube.com/watch?v=JHiW6KX9-Gc>.

The DCR website was regularly updated with new information about the Quabbin Controlled Deer Hunt, fishing programs, AIS, meeting announcements, the boat decontamination program, plan developments, and forestry projects.

J. Water Quality and Quantity Monitoring

EQ staff conducted routine biweekly water quality monitoring of Quabbin Reservoir watershed (Reservoir and tributaries) and Ware River tributaries. Phytoplankton sampling was conducted following the established monitoring plan. Phytoplankton densities were low during the end of 2020 until May of 2021. Densities of the taste and odor causing taxa *Chrysosphaerella* exceeded early monitoring triggers, and on two dates treatment consideration levels at both 202 and 206. Aside from the chrysophyte aggregation, phytoplankton are typically present at low densities and are dominated by diatoms.

Stream gages at four core water-quality sites and two long-term forestry study sites in the Quabbin Reservoir were maintained. Streamflow measures are taken at varying stream stages to develop site-specific stage-discharge rating curves. More than four streamflow measurements have been made at each site. Routine data download of stream pressure transducers is ongoing.

Annual water quality report was completed.

K. Watershed Monitoring and Assessment

Staff regularly conducted site assessments, attended local board meetings, and monitored online databases to identify potential threats to water quality. Staff investigated various potential violations in the watersheds and followed up as needed. The East Branch Swift River and East Branch Ware EQA reports were completed.

The Yearly Operating Plans for vegetation management work on both the National Grid and Providence & Worcester Railroad rights-of-way were reviewed, and comment letters were submitted.

L. Aquatic Invasive Species

Staff provided AIS information to the public through visitor contacts, displays in the Visitor Center, watershed kiosks, the DCR website, and distribution of brochures during Boat Decontamination and Cold Weather Quarantine programs.

Boat cards continue to be distributed. The three BLAs had 12,800 seals placed on private boats for the year. Each landing used the following number of seals: BLA 1 – 3,300; BLS 2 – 4,300; and BLA 3 – 5,100. Boat inspections are ongoing. CWQ will begin in October of 2021.

DWSP staff assisted in the 2021 macrophyte survey on the Quabbin Reservoir. No aquatic invasives were detected. Staff also inspected and maintained the fragment barriers at BLA 2 and BLA 3. Other work included inspecting gear and equipment prior to use in the reservoir for State Police diving exercises.

M. Wastewater Management

No water quality issues were identified from septic systems, and the oversight provided by Title 5 was generally sufficient.

N. Stormwater Management

Plans were reviewed in the Quabbin watershed for the repair of Glen Valley Rd bridge in Petersham. In Ware River watershed, staff monitored the new subdivision Brintnal Estates, inspected Evergreen Road Bridge, and inspected Brice Lemon Estates.

O. Emergency Response

COVID19 response continued in FY 21. Emergency Contact Information was updated by staff online in SSTA. BLA emergency SOP was also reviewed and updated.

FY21 Spill Response Training was conducted through TIGER training. Emergency response trailers were inventoried and regularly stocked.

New State Police Marine Unit took over responsibility of patrolling the reservoir. Several coordination meetings were held to help facilitate the transition of responsibilities.

Ten spill plans were prepared for timber harvesting operations.

P. Support

Staff participated in a wide variety of job-related trainings and workshops, interagency planning teams, and professional organizations.

A total of \$8,367,913 was distributed in Payments in Lieu of Taxes to 31 Watershed System communities. Within the Quabbin watershed, \$2,919,275, or 35% of the total, went to ten towns. Twenty-three percent of this watershed total, or \$662,153 (or 8% of the total PILOT), was for land annexed from the four towns disincorporated due to the construction of the reservoir. The five towns in the Ware River watershed received \$1,043,036, or 12% of the total PILOT.

FY2021 Work Plan Final Summary

Wachusett/Sudbury FY 21 Final Report



Update on selected tasks in Wachusett/Sudbury workplan for Fiscal Year 2021 from July 1, 2020 through June 30, 2021.

Task No.	Description	Final Report Comments
A. Land Acquisition		
A1	Acquire land. Coordinate due diligence and other tasks/services from DCR and private contractors to complete survey, appraisal, title, engineering, and environmental assessments for proposed acquisitions. Negotiate WPR language, purchase prices and conditions of sale with sellers of property.	Staff continues to work on due diligence and negotiations for acquisitions for FY21 and FY22. One project went to record in the first quarter of Fiscal Year 2021 totaling 1 acre in fee costing \$192,500. Several other projects are in the various stages of due diligence. A fourth quarter 36.08 acre in fee project on the Sterling/Leominster border cost \$325,000.
A2	Develop individual parcel presentation materials and meet with MWRA Board for approval.	Two projects were approved by the MWRA Board at the January and June Meetings: the 36-acre Pellecchia parcel and the 163-acre Cusanello parcel. Both were fee acquisitions in the Wachusett Watershed totaling almost 200 acres.
A3	Communicate with and convene LAP meetings to review parcels and prioritize land purchases.	Two online LAP meetings were held to assess the pursuit of several land acquisitions in the watersheds.
A4	Use the LAP Prioritization Model to identify priority parcels in the watersheds.	The LAP Prioritization Model is working well and has proven useful to facilitate remote meetings.
A5	Continue to solicit and work with landowners in donating conservation interests in land and assist in advising landowners on the tax incentives available when donating conservation interests.	Worked on possible donation of two small gates Brook/Scarlett Brook tracts. One donation of the fee interest in a WPR tract owned by the RLC is being processed. One project is a collaboration with the Princeton Land Trust and abutting landowners, resulting in 188 acres of total protection within the Governor/Cobb basins.
A6	Establish regularly scheduled land/legal meetings to address attorney assignments and project logistics.	Ongoing
B. Watershed Preservation Restriction Monitoring		
B1	Monitor WPRs on a regular basis, following monitoring procedures	WPR Coordinator and Regional Monitors completed 46 WPR monitoring visits. WPR Coordinator assisted Regional Monitors with training, monitoring visits, and report writing. WPR Coordinator reviewed all monitoring reports completed by Regional Monitors. WPR Coordinator worked with GIS Manager to update and improve WPR Monitoring Workflow.
B2	Complete baseline documentation reports for new WPRs prior to acquisition or within a reasonable time after acquisition, following EOEEA specifications. Baselines will be done in-house or through appropriate contracts.	Two in-house baselines were completed this FY. A third in-house baseline has been sent out for landowner review and will be finalized next quarter/FY.
B3	Meet with Restriction Stewardship Working Group and confer with legal to respond to enforcement issues and requests to exercise reserved rights.	Continued working with Restriction Working Group. Finalized Reserved Rights, Enforcement, and Amendment Procedures.
B4	Track changes in landownership for WPRs.	WPR Coordinator and Regional Monitors completed landownership checks.
B5	Explore additional ways to reach out to landowners through the use of social media and web-based content.	Ongoing
B6	Implement WPR records procedure with DCR records manager	Ongoing. WPR Coordinator continued working on inputting WPR records into Inter-Agency Stewardship Database (LIS).
C. Land Management		
C1	Implement the system-wide comprehensive Land Management Plan (LMP).	Ongoing. See specific task updates below.
C2	Prepare forest harvest proposals for next fiscal year including data on proposed harvest areas, characteristics of stands, soils, cultural resources, wetlands, wildlife, unique features, and priority habitats. Proposals shall also include information on lot layout, landings, stream crossings, wetland crossings, and stonewall crossings.	The lot proposal process for FY22 has been completed, for six lots. Detailed proposal narratives were completed, and the updating of the forestry age structure database took place which allowed for the completion of the subwatershed analysis on the Silviculture tab.
C3	Plan and conduct an internal review of proposed logging operations for the coming year, including assessments of silviculture, water quality, wildlife, and other potential impacts/benefits Review lots to ensure consistency with aspects of the CLMP, including wildlife, forestry objectives, and environmental quality.	Internal review process completed; including site walks of all proposed harvest lots, preparation of comments and recommendations by review staff, and issuance of final review report to forestry staff. Completed silvicultural review of 6 Wachusett lots. NGRID 2021 YOP Comment letter submitted P&W RR 2021 YOP Comment letter submitted.
C4	Present annual forest harvest proposals at a public meeting. Accept public comment and respond as needed.	Public AGOL storymap built and published during Q4, covering all FY22 DWSP forestry lot proposals. Public review period began July 9, 2021 (outside of FY21). Letters mailed to Select Boards in affected towns.
C5	Plan, lay out, mark products for removal, prepare maps and permits, establish photo monitoring points, file Forest Cutting Plans, seek bids, award permits, and properly advertise and post forest management operations consistent with the Forest Cutting Practices regulations, the LMP, and approved harvest proposals.	Seven lots were marked on a combined 414 acres throughout the watershed. Nine lots on a combined 515 acres were shown (not counting two lots that were shown multiple times) with only one lot going unsold. Cutting plans were completed and filed for all of the lots and photo monitoring points were established in all lots.
C6	Provide supervision and oversight of all forest harvesting operations on DWSP property. Assure compliance with applicable DCR and NHESP regulations and restrictions, approved BMPs, and all Permit conditions. Maintain adequate site visit records. Monitor post-harvest and collect photo point images consistent with internal policy.	Supervision took place on a total of 10 timber sales during FY21. These sales cover a combined 495 acres. Nine of these sales on a combined 433 acres were completed during the fiscal year. There are currently 7 timber sales on a combined 399 acres that have been sold but are yet to be commenced. These 7 sales are owned by 5 different logging contractors.
C7	Monitor water quality (turbidity) at active harvesting stream crossing sites to measure effectiveness of BMPs.	Most of Q1-Q2 Monitoring missed due to staff absence, Q3-Q4 monitoring continued at anticipated schedule. 21 active site visits, 41 crossings observed, 47 Turbidity samples collected. 77 inactive site visits, 106 crossings observed, 66 Turbidity samples. No problems observed during monitoring.

Task No.	Description	Final Report Comments
C8	Continue to implement long-term paired watershed monitoring to assess impact of DWSP forest management on tributary water quality.	The Princeton lot has been sold. Pre-harvest monitoring phase should be ending in early FY22. All weir construction permits were entered into Green Tracker and permits were e-recorded. All monthly samples collected, except for Q1 when there was no flow.
C9	Conduct periodical regeneration and invasive species surveys to monitor forest health and development resulting from silvicultural activities or other natural disturbances and processes.	Planning began on setting up Continuous Forest Inventory (CFI) plots.
C10	Conduct periodic reviews and monitoring of land management activities and forest conditions to assure compliance and consistency with Land Management Plan.	Planning began on setting up Continuous Forest Inventory (CFI) plots. Data collection will begin in Q1 FY22.
C11	Collect data and maintain GIS datalayers related to forest structure, composition, regeneration, roads, boundary information, stone walls, wetlands, streams, and other data to guide the land management program. Maintain GIS data documenting the location, extent, and intensity of all silvicultural operations.	Ongoing as needed. Once timber sales are completed, the forest cover type map is updated to reflect the effect of the forest management on the forest structure in that area. In 2011, Wachusett foresters created a database which allows for the analysis of the structure of the forest on DWSP property. The age structure, the forest overstory cover type makeup and the soil type makeup can be determined from GIS datalayers. In addition to the analysis of each of these properties on the entirety of the Wachusett forest, a further breakdown at the level of the 22 subwatersheds and 338 working units can be done. For example, the age structure of the entire forest on DWSP property broken into 20-year age groups is as follows; 10% 0-20 years old; 8% 21-40 years; 6% 41-60 years; 9% 61-80 years; 32% 81-100 years and 35% >100 years old.
C12	Assess all new fee land acquisitions, documenting existing conditions of forests, access roads, bridges and culverts, boundary markings, and restoration needs. Integrate these lands into existing GIS datasets and land management, public access, and other watershed management programs.	Ongoing as needed and as new properties are acquired.
C13	Locate, mark, and maintain property boundaries periodically or as needed.	A total of 24.0 miles were maintained during FY21. This is an update of 22.7 miles that were reported under the Q3 accomplishments. Since regular boundary maintenance began in FY15, 172.3 miles have been maintained which averages to 24.6 miles/year. The past 3 years have averaged 27 miles/year. With 257 total miles of maintainable boundary line and a goal of a 10-year return frequency, 25.7 miles/year need to be maintained. After 7 years of maintenance, there remain nearly 84 miles to go which requires an average of just under 28 miles per year be maintained for the remaining 3 years.
C14	Develop scope of work and manage contracted property boundary survey work.	DWSP will not receive funding through the Stewardship funds for survey projects. Plan to make some funding will be available from our own budget next fiscal year.
C15	Document and pursue resolution of all property boundary encroachments.	Encroachment reporting has been ongoing. Rangers have investigated multiple reports of encroachments and address any issues properly. Ranger Encroachment Program responsibility and duties have transitioned from former ranger Pat Cunningham to our new transfer Jason Taylor. Newly implemented Tiered letter system has resolved issues in most cases. Encroachment Management Hub monitoring has been developed and implement for all DWSP staff. Reporting training was provided by Erica Teft and DCR Ranger staff at JAH.
C16	Identify, plan, and oversee non-forest or other unique habitat restoration, field reclamation, and maintenance work.	Fields were mowed according to the FY2021 Mowing Plan. Agricultural use permits ongoing. Pollinator seed sown at JAH. No new non-forest restoration projects proposed or started this FY at Wachusett.
C17	Identify, prioritize, and implement terrestrial invasive plant (TIP) control projects in line with the Terrestrial Invasive Plant Management Strategy (TIPMS). Respond as needed to newly discovered and controllable TIP populations.	Control efforts this year continued to be focused on small infestations of new species, including Canada thistle, Japanese stiltgrass, common teasel, and mile-a-minute vine. Draft TIPMS in progress.
C18	Collect data and maintain datasets, GIS datalayers, and related maps and reports of rare and listed plants and communities.	Ongoing as needed. No new occurrences on Wach/Sud section properties.
C19	If available, use unmanned aerial system (UAS) to document forest conditions, map openings, identify invasive plant populations, assess internal road conditions, or conduct other activities.	Contract with DOT was set up and UAS flights were used to monitor the gull roost. We have not received approval from EEA to expand the UAS flights to other projects for forestry.
C20	Continue to work with DCR Asian Longhorned Beetle Program and USDA to oversee beetle eradication in watershed areas.	Ongoing as needed.
C21	Hazardous Tree Removal	A relationship with DCR Bureau of Forestry was established that allows us to coordinate the removal of roadside hazardous trees utilizing their existing contract. A total of 28 hazardous trees were removed through the BOF contract. There were also numerous calls responded to from abutters regarding their concerns over potential hazardous trees on DWSP property as well as numerous calls requesting the clean up of trees and limbs that fell from DWSP property onto abutting private land.
C22	Maintain deer exclosures and sample vegetation periodically to assess impacts of herbivore browsing.	Ongoing as needed.
C23	Organize, inventory, and categorize permit, lease, and easement information and enter information into the database.	No work was done to organize and inventory permit/lease/easement information and enter information into a database due to staffing vacancy.
C24	Participate in process to transfer lands surrounding Framingham Reservoirs 1 and 2 to DCR Parks.	A Stearns and Brackett Reservoir draft Stewardship Plan report was completed for review. The consultant contract ends in June 2021 which will bring the report process to an end.
D. Wildlife Management		
D1	Continue the active harassment of gulls within the Pathogen Control Zone at Wachusett Reservoir, using human presence, boats, pyrotechnics, passive scare devices, and other techniques. Continue to identify and test new harassment techniques.	Program was conducted successfully from September 16th 2020 to April 16th 2021 without violations of fecal water quality standards. The program continued until 4-16 at which time fewer birds were observed at the North and bacteria counts were low or zero. Bird Harassment Program Manual documenting policies, procedures and task completed.
D2	Observe and document the nocturnal roost of gulls on the reservoir weekly during the months of September- March.	Gull roost numbers in FY21 ranged from 0 to a high of 1,700 at the end of December. Roost counts were not conducted in February or early March due to the absence of gulls as a result of full ice cover. Two UAS flights were done at Wachusett this year. We experimented with not only the use of an optical camera, but a thermal camera to capture images of the gull roost. The UAS technology has been a great help to the BHP- particularly at Quabbin where there is limited access to the roost.

Task No.	Description	Final Report Comments
D3	Control Canada geese populations at Wachusett Reservoir by treating eggs during nesting season to prevent hatching.	A total of 67 eggs from 13 Canada goose nests were treated around Wachusett Reservoir in FY21. A total of 74 eggs from 14 Canada goose nests were treated at Sudbury Reservoir in FY21.
D4	Identify places in MA where human derived food is available and work to prevent feeding through educational signage, interaction and enforcement.	Surveys were conducted in quarters 2 and 3. No new human-derived food resources for birds were discovered. Regular problem areas continued to be monitored. There was minimal interaction/enforcement due to Covid. Existing signage was inventoried and looks to be in good shape.
D5	Aquatic Mammal Control: Remove beaver and muskrat in the Aquatic Wildlife Pathogen Control Zone at Wachusett.	Natural Resources Section contracted with Integrated Wildlife Control in FY21 to trap beaver. There were 3 beaver trapped in the pathogen zone (all in Carville Basin) in quarter 2. Another 3 beaver were trapped elsewhere on the reservoir; 7 were trapped in Stillwater and Quinapoxet Basins; and 2 were trapped with an emergency permit at Allard St in W. Boylston.
D6	Respond to problems of burrowing animals on dams and dikes; take appropriate action.	Three woodchuck burrows were treated on the dikes in FY21.
D7	Research and manage for common loons on DWSP waterbodies; provide nesting platforms, capture and sample birds for contaminants.	Research and management for common loons on DSWP waterbodies continued and the annual report was completed for the 2020 season. The lead tackle and fishing line recycling program continues with public outreach, canisters maintained and 2020 collection was completed and totals recorded.
D8	Continue long-term wildlife resource monitoring program.	A 5-year progress report summarizing long-term monitoring plot data was compiled in FY21. Data collection is ongoing.
D9	Work with MA Department of Fisheries and Wildlife (DFW) to survey for and document breeding bald eagles on the reservoir.	Reported the active status of the Wood Island eagle nest to Wood Island. Two chicks successfully hatched.
D10	Plan for the White-tailed Deer Management Program on DWSP lands at Wachusett and Sudbury; Administer the applications, permits, and orientations for the Wachusett Reservoir Zone Deer Hunt	Hunting was conducted at Wachusett and Sudbury beginning in October and ending on Dec 31st this year. A total of 330 permits were given out for the Reservoir Zone at Wachusett and a total of 611 permits were issued at the Sudbury. The annual Deer report was completed and submitted to staff and presented at the MWRA Trust Board in Q4
D11	Coordinate with the Massachusetts Natural Heritage and Endangered Species Program concerning rare species occurrences and protection	American kestrel nestboxes were monitored and maintained in FY21 with 3 of the 5 sites active. Whip-poor-will surveys were completed using NHESP protocols and 8 of these birds were heard during the survey.
E. Public Access Management		
E1	Proactively patrol watershed lands to ensure compliance with DCR regulations and policies. Tally visitor contact and produce quarterly and annual summary reports. Conduct trend analysis on visitor statistics and rule violations.	Visitor Contacts: 26,295, Violations: 1,786, Written Warnings: 98, Citations: 286. Parking tickets: 17. FY21 Q3&Q4 are the first quarters with the fields of parking tickets from the Ranger electronic log, in previous yearly reports they were classified as a 2a12 violation for motor vehicles on property restricting/blocking access.
E2	Continue to cooperate with state, environmental, and local police for help with enforcement when required.	Rangers have continued to work with and assist all local, state and environmental law enforcement agencies with any needs or requests. DCR Rangers and Massachusetts Environmental Police met and coordinate plans and make preparations for joint enforcement on Opening Day of Fishing, which we hope to continue annually. Rangers continue to update Law Enforcement and MWRA Security on any ongoing issues on Watershed property.
E3	Continue to use DCR social media accounts for advertisement of interpretive programs, including general or emergency information (such as closings).	Ongoing
E4	Develop public outreach regarding allowed uses on DCR Wachusett lands.	Rangers continue to inspect the conditions and placement of all signage with in the Watershed. We have posted many No Parking after Dark signs in areas that we felt appropriate and had issues. Seasonally update postings with information for public about rules, hunting and fishing seasons.
E5	Continue updates and improvements to access points with signs, gates and improved parking areas. Conduct regular inspections of gates and access barriers.	Rangers regularly inspect all signage, parking and gate conditions while proactively patrolling the watershed lands. Rangers replace and relocate signage when necessary and fill out work order requests. Multiple vandalism incidents with destruction of interior and exterior reservoir gates breached to gain access. Gates were replaced.
E6	Regularly evaluate and modify policies within the current Public Access Plan and publish annual appendices with policy modifications or to regulate new proposed uses on DWSP lands.	Ongoing. Progress on the Sudbury PAP remained on hold through Q4.
E7	Continue to conduct "special operations" such as night operations, ATV, and snowmobile operations, as needed.	Rangers have conducted late and early morning shifts to patrol and observe any activity that may be ongoing not with in hours permitted. Rangers utilizes snowmobiles and snow shoes to conduct patrols throughout areas within the Watershed. Rangers conduct early morning and late evening off hours scheduled patrols of all Watershed lands.
E8	Enforce rules and regulations of 313 CMR 11.09 through the use of citations. Issue written warnings and/or non-criminal citations for repeat offenders and serious violations.	Annual totals of Violations: 1,785, Written Warnings: 98, Citations: 289. Parking tickets: 17. Rangers dealt with repeat offenders for fishing in No Trespass/Fishing zones. Rangers were able to locate individuals while on patrol.
E9	Evaluate and modify, if necessary, specific access plan policies as part of the Wachusett Reservoir Watershed 2021 Public Access Plan update	After being on hold for the entire year, approval has been granted to continue to move forward with the Sudbury Public Access Plan process with public meeting to be scheduled in the fall of 2021. A draft public survey for the Wachusett Reservoir Public Access Plan Update is being developed.
F. Watershed Security		
F1	Maintain an active presence in the watershed. Monitor watershed lands, roadways, and railways for unusual or suspicious activities; provide appropriate response.	Rangers are continuously proactively patrolling all Wachusett/Sudbury lands and monitoring visitor activity. DCR Rangers issue verbal, written warnings and citations to address violations.
F2	Continue ongoing communication and coordination with local, state, and federal emergency responders; coordinate with MWRA on all security issues.	Rangers communicate and properly notify all proper authorities when necessary. Rangers contact all local and state Law Enforcement when needed. Rangers communicate with MWRA Security and Command staff.
F3	Continue program of enhancing security infrastructure around Wachusett Reservoir.	Rangers are continuously proactively patrolling all Wachusett/Sudbury lands and monitoring visitor activity. DCR Rangers issue verbal, written warnings and citations to address violations. Fencing along the North dike recommended to be replaced and is nearing completion.
F4	Inspect, maintain, and monitor gates, barways, and signage throughout the watersheds for security and access control.	Rangers while proactively patrolling the watershed lands regularly inspect all signage, parking and gate conditions. Rangers replace and relocate signage when necessary and fill out work order requests. Multiple vandalism and destruction of interior and exterior reservoir gates, breached to gain access. Damaged gates were replaced.
G. Infrastructure		

Task No.	Description	Final Report Comments
G1	Assess Wachusett and Sudbury dams, spillways, and dikes monthly. Forward all significant issues to the Regional Director and the MWRA. Coordinate with MWRA on biannual dam safety inspections for compliance with 302 CMR 10.00.	Performed monthly assessments, coordinated with watershed maintenance staff, and issued monthly summary reports to MWRA. Reviewed the Phase I inspection reports for Wachusett, North Dike, and South Dike prepared by MWRA's consultant (GEI). MWRA discovered a seepage at Sudbury Dam, piezometer and toe drain flow data were compiled and provided for their consultant.
G2	Assess DWSP smaller dams semi-annually; review maintenance plans and revise as necessary.	Performed assessment of smaller dams and prepared a summary report. Prepared work requests for maintenance work at Unionville, Muschpauge, Tenney's, Marlborough Filter Beds, Edwards Pond, and East Wauschacum Pond.
G3	Continue maintenance plans for the improvement of the Wachusett and Sudbury dams and dike structures. Monitor conditions and maintenance activities and revise plans, as necessary.	Ongoing. Performed monthly assessments, coordinated with watershed maintenance staff, and issued monthly summary reports to MWRA.
G4	Conduct annual inspection/evaluation of Wachusett internal roads, drainage structures and shoreline access points; update GIS data layers as needed and develop list of maintenance and repairs needs.	On-going inspections of internal roads, drainage structures, and shore access points. Maintaining GIS data and updating/standardizing.
G5	Develop annual plan for internal road repair/reconstruction projects.	Inspected roads, determined work priority levels, prepared work requests, and coordinated work with MEOs and maintenance crews. Parking area and rain garden were constructed at Gate 28.
G6	Monitor the stability of River Street in Clinton.	MWRA's contractor (ETL) began construction work to rebuild this section of road. DCR no longer monitoring.
G7	Conduct road and dam maintenance/repair projects using in-house staff and resources. Provide oversight to ensure protection of water resources.	Ongoing. Road maintenance and repair projects occurred inside Gate 30, Gate 28 (parking area), Gate 8, Shaft 1 (walkway), and along the Wachusett Auxiliary Spillway.
G8	Conduct regular inspection and maintenance of all DWSP BMPs.	Minor BMP maintenance is ongoing, including vegetation management. Plans have been prepared for more intensive BMP maintenance work at Gate B1. As funding allows, Gate 25 and WB10 outlet control structures are being modified by installing a gate valve to allow us to control water levels as needed. An RFR for BMP maintenance services was posted to Commbuys and we are waiting for contractor responses.
G9	Evaluate Sudbury watershed access, internal roads and develop work plan, as necessary.	No work has been accomplished on the Sudbury watershed access due to staffing vacancy.
G10	Provide supervision, coordination, oversight, and technical support or assistance for all engineering, construction, and renovation work in Section.	The abatement of several buildings slated for demolition has been completed.
G11	Maintain records regarding property plans & data; reservoir and facility construction and maintenance operations.	Limited work performed due to lack of staffing and tele-working. CE staff has a hard drive with the scanned plans and provides plans to others as needed.
G12	Implement annual Major Projects	Ongoing - see specific tasks below
G12.1	Address Stillwater barn structural deficiencies	Due to many circumstances beyond our control, the roof repairs and structural repairs did not happen this fiscal year. However, The Office of Cultural Resources has earmarked funding for FY22 that will hopefully address these deficiencies.
G12.2	Plan for de-leading of Stillwater Farmhouse	Deleading and painting of farmhouse exterior is complete. Going forward, we will need to conduct an assessment on the condition of the clapboards and determine what repairs are necessary for the integrity of the structure.
G12.3	Oversee construction of ADA walkway at Dam Promenade	No progress made on construction of this project. We are going to work on completing a portion of it in-house.
G12.4	Oversee demolition of derelict buildings, including: Kush buildings (Sterling); Hulick Arena (Sterling); Radio Shack (Clinton); Grove Street buildings (Clinton)	Hazardous materials abatement work was completed on Kush, radio shack and Grove Street garages in April, which will allow demolition plans to proceed. Radio shack will probably be done in-house by DWSP staff; Hulick is ready at any point. An NOI for Grove Street garage was drafted, and will need to involve a contractor due to floor drain (will need UIC plan closure, overseen by LSP). Planning and permitting for Kush property to begin in FY22.
G13	Coordinate with WM to provide access to water quality monitoring stations and perform occasional maintenance activities at stream gages	Access being cleared on regular basis by WM
G14	Evaluate and coordinate the monitoring of facilities for compliance with state and federal regulations. Develop and update required documents, as necessary	Awaiting final determination on signage and sign-off on record-keeping responsibilities. Logging of inspections should begin in FY22. Need to find mechanism to install alarm for air boat shed. Once completed, registration of tight tank can be finalized and servicing of oil/water separator can commence.
G15	Maintenance of forest roads, dams, dike, fields, parking areas, drainage structures, snowplowing, boat launch areas, and other management activities.	Group received new CAT Skidsteer and multiple new attachments for heavy equipment (snowblower, rubber plow blade for forest roads and auger).
G16	Prioritize and schedule online workorders for division staff and add to daily work plan.	Watershed Maintenance responded to 308 work requests in FY21.
G17	Assist division staff with specific workorders as needed.	Ongoing, work orders are monitored and completed as they come in.
G18	Maintenance of grounds at MWRA facilities as needed. Clinton (Cosgrove), Oakdale (Shaft One)	Ongoing maintenance completed as needed.
G19	Conduct building maintenance activities, including painting, carpentry, cleaning, minor repairs, and other routine maintenance	Building Maintenance responded to 92 work requests in FY21.
G20	Inspect all Wachusett facilities, buildings, related structures and building utility systems. Determine needed costs of materials for maintenance, repair and replacement of parts as needed.	Team is continuing to streamline package delivery protocols, has and will continue to re-evaluate cleaning and sanitizing protocols to stay ahead of Covid and other transmissible infections. Many worn tools and equipment were replaced. Purchased new truck for janitors to replace old van.
H. Watershed Protection Act		
H1	Continue implementation of the WsPA.	The Watershed Protection Act continues to be successfully implemented in the Wachusett Reservoir watershed. The main staff person responsible for Wachusett WsPA retired after 27 years of service. Staff from Boston, Quabbin and Wachusett provided interim support until the position is posted and filled.

Task No.	Description	Final Report Comments
H1.1	Review and track all WsPA applications and activity in the EQ electronic database	Staff successfully implemented the provisions of the Watershed Protection Act while working remotely during the Covid 19 pandemic emergency. A total of 43 completed applications were processed in FY21: 21 Advisory Opinions, 19 Determinations of Applicability, and 3 Variances. All were tracked using shared spreadsheet while access to database was not available remotely.
H1.2	Issue decisions within timeframes as required by the regulations.	Forty WsPA decisions were issued in the Wachusett Reservoir watershed in FY21: 30 Exemptions, 3 Non-jurisdictional, 2 Not Prohibited, 4 Prohibited/Denied, and 1 Variance. Notices of Non-Compliance were also sent to sites that were violating WsPA regulations.
H1.3	Develop detailed SOP for WsPA application, review, decision, and monitoring process	Detailed Standards of Operation were developed for Watershed Protection Act implementation in preparation for staff transition. Key person implementing the WsPA in the Wachusett watershed retired after 27 years of service.
H2	Convene the Watershed Protection Act Working Group regularly to discuss policy and address specific problems related to the WsPA	Two full WsPAWG meetings were held during FY21, on 10/22/20 and 2/25/21. There were also continual meetings and discussions amongst Quabbin, Wachusett, and Divisional staff regarding implementation of the Watershed Protection Act. Division and Quabbin staff covered Wachusett WsPA duties during the last four months of the Fiscal Year due to the ongoing vacancy.
H3	Review permits for watershed towns on a monthly basis with letters sent to property owners of affected parcels.	Review of 2020 building permits from all communities except West Boylston was completed in the first three quarters. Task not completed in the fourth quarter due to vacancy. West Boylston Town Hall remains closed. An SOP that describes the review process and contact protocols was completed.
H4	Review property transfers for seven towns on a monthly basis with letters sent to new property owners of affected parcels informing them of the WsPA and how they may obtain additional information.	Review of 2020 property transfers from all communities was completed in the first two quarters. Task not completed in the third and fourth quarter due to vacancy. An SOP that details how this is done and how new owner letters are composed was completed.
H5	Review files from previous year on an ongoing basis, including contact with owners and site visits as needed.	Review and inspection of all variances allowed staff to satisfactorily resolve 48 (of 55) historic variances. Regular inspections of active variances has improved compliance. Additional work needs to be done to resolve remaining historic variances and other decisions and to carefully monitor all active projects to make sure conditions are being followed.
H6	Provide Town Halls with WsPA maps, brochures and applications on a regular basis.	No trips were made to the Town Halls.
I. Education and Outreach		
I1	Review, implement, and amend the Wachusett Interpretive Services Plan.	Refined the Interpretive Services Plan to include virtual programming, templates for virtual field trips aligned with state curriculum and Next Generation Science Standards, and teacher resource templates.
I2	Coordinate Educational and Outreach programs	Best practices were developed for virtual programming. A series of videos were posted online. Video companion educational packets were sent to watershed schools and shared with educators across the state. Virtual presentations were provided to libraries. Participated in DCR initiatives- Girl Scout Weekend, April Vacation Trip Tip and Parks as Classrooms. Trip-tip self-guided Explore the Watershed walking tour was promoted via social media for outreach during school vacation.
I3	Maintain and enhance kiosks and bulletin boards throughout the watershed.	Kiosk posters were replaced as needed. New posters were reviewed following thematic guidelines and posted. New Gate 39 poster installed under a collaboration with Clinton Greenway Conservation Trust. Kiosk posters were revised to include digital commonwealth links to historical photos and posted online.
I4	Perform inventory of signage and make recommendations for improvements and additions of stewardship signs	Rangers have posted new signage and replaced old worn out signs as necessary. Several new No trespassing signs have been posted throughout Sudbury and Wachusett Reservoirs as needed. Rangers have received new No Parking after dark signs for several lots around Wachusett and Sudbury Reservoirs. No Trespassing signs were removed from the North Dike for contractors to install new fencing along the Dike. New signage will be requested to replace and update the old signs. Rangers regularly inspect all kiosks while out on patrol. We have had several instances when kiosks had been vandalized or damaged. Some kiosk's were found with stickers pertaining to groups associated with white supremacy.
I5	Analyze and update current brochures. Determine need for new brochure topics and develop as needed.	Current brochures were reviewed and updated as necessary. The dog waste brochure has been modified for use in Sudbury Reservoir watershed.
I6	Partner with other organizations on watershed programs	Digital resources were shared with Watershed Educators. Connections continued to be made remotely with Environmental Educators through MEES, NAAEE through virtual meetings, virtual conferences, and webinars. Partnered with NRW on virtual presentation Birding for All ages for Boylston Library. Collaborated with Easy Walks Massachusetts on presentation for Clinton Library. Cross promoted Sterling Open Space Committee and Princeton Hikes on self guided walking brochure.
I7	Provide educational materials, teacher training, and support for Mass Envirothon.	The Envirothon program transitioned to a successful, entirely virtual platform for this school year. Water related workshops were presented remotely. In lieu of in person May competition, event also transitioned to a remote project video submission and virtual awards ceremony.
I8	Maintain and update website.	Watershed Management maintains a robust, up-to-date website with information for visitors and people interested in the watershed protection programs. The Quabbin and Wachusett Reservoir pages are some of the most visited sites amongst DCR's web presence. Watershed staff maintain a good working relationship with DCR, EEA, and EOTTS staff to provide current information to the public. Posted entire series of newly created interpretive videos available from watershed education staff: https://bit.ly/3pl6oBT .
I9	Organize existing photographs and develop an inventory of new photos for Sudbury Watershed	No activity has taken place for this task this year due to lack of access to the shared W drive.
I10	Investigate the possibility of creating a water quality/stormwater mural on the Rail Trail Route 190 overpass abutments	No work has occurred on this task due to telework.
J. Water Quality and Hydrologic Monitoring		

Task No.	Description	Final Report Comments
J1	Continue routine sampling of tributaries for bacteria, turbidity, nutrients, and field parameters.	<p>Routine tributary sampling was completed every two weeks (bacteria, turbidity, field parameters).</p> <p>Monthly nutrient and TSS sampling completed as planned.</p> <p>All WQ data through May 2021 has been reviewed and uploaded to the database, data for June will be uploaded pending delivery from MWRA.</p>
J2	Continue sampling of the reservoir for plankton, pH, temperature, dissolved oxygen, chlorophyll a, and nutrients. Conduct reservoir bacteria transect sampling in conjunction with gull harassment program.	<p>A total of 79 phytoplankton samples were analyzed this fiscal year and 38 profiles were collected in conjunction with phytoplankton and nutrient sampling. Data from MWRA remote sensing buoys are monitored and used to augment sampling programs as necessary.</p> <p>Wachusett aquatic biology staff assisted the Quabbin EQ section with phytoplankton collection and performed analysis from July - October due to retirement of Quabbin staff. A total of 52 Quabbin phytoplankton samples were analyzed in FY21. Wachusett and new Quabbin aquatic biology staff remain in close communication regarding plankton and other water quality monitoring activities.</p> <p>All quarterly nutrient samples were successfully collected this fiscal year.</p> <p>Twelve Transects sampling events performed in FY 2021. No transects collected Dec - Feb due to snow/ice.</p>
J3	Produce annual water quality report and sampling plan.	Draft report produced and will be finalized pending review.
J4	Maintain continuous stream flow gages in all four watersheds through USGS contract. Coordinate with USGS to ensure proper performance of all gages, and accurate and timely reporting of data.	Staff plate at Quinapoxet River was damaged; subsequently repaired by USGS. Responsibilities were temporarily transferred to EA4 and accountant at end of this quarter in anticipation of departure of EA5.
J5	Augment hydrologic data in Wachusett watershed through monitoring of stream flows, groundwater levels, and precipitation. Take snow pack measurements. Develop and maintain accurate rating curves.	<p>11 Discharge measurements taken, at least 1 at each flow monitoring location to confirm and update ratings.</p> <p>3 new ratings created in FY2021, and all others were confirmed accurate for discharges measured.</p> <p>All HOBO data through the end of May 2021 has been processed and imported to the database. All stations functional.</p> <p>Six new Mayfly Loggers with Hydros 21 sensor were purchased through UMass ISA. To be installed next FY. Once reliability is verified HOBO units will be decommissioned. Testing of Hydros21 sensor (Gen 2) is ongoing. Stroud confirmed that the new sensors are functional and accurate. This work is scheduled to resume along with the deployment of additional Mayfly stations.</p> <p>Groundwater measured monthly for all months in FY2021 and data sent to OWR and USGS.</p>
J6	Determine needs for stormwater sampling based on analysis of historical data. Sample storm events as determined necessary.	This analysis is on hold until this becomes a higher priority or staff time is available.
J7	Generate solute loading estimates for flow monitored tributaries using Flux, RCMODEL, or other statistical software. Expand to include smaller tributaries and Quabbin transfer when sufficient data has been collected.	No progress made. Expected time to complete this did not materialize due to staffing absences/coverage and other unexpected projects with higher priority (Database migration).
J8	Continue contract to work with UMass to use results of water quality models and other watershed/water quality analyses to help to make watershed management decisions. Project will include topics in Quabbin/Ware watersheds as appropriate.	Kickoff Zoom meeting for new FY22-23 ISA with UMASS (presentations of progress to date and discussions of future direction). Staff assigned to work directly with professors and students.
J9	Identify and outline system-wide water quality issues. Bring to ResOPs and/or WQSAT for discussion and integrate into water quality modeling work with UMass.	Cooperative effort with Quabbin staff and MWRA to address concerns related to potential golden-brown algae bloom and elevated concentrations of total coliform. Staff worked with MWRA and UMASS to coordinate efforts to research and answer questions related to HABs and DBPs.
J10	Work with local DPWs, massDOT, UMASS, MWRA, and others to reduce applications of road salt in the watershed and prevent additional increases in chloride concentrations in tributaries and the reservoir.	Partnership/regional approach on salt reduction listed as a goal in both Princeton and Sterling Municipal Vulnerability Preparedness Plans. Watershed staff successfully designed and implemented a new grant program in FY21 to support efforts in Wachusett municipalities to reduce the amount of salt used by local Departments of Public Works. Proper accounting procedures were followed to place grant application on MMARS, receive applications, select recipients, and administer the contract. Three towns received a total of \$58,592 through this program: Holden (\$20,000), West Boylston (\$18,592), and Princeton (\$20,000). The FY22 Work Plan has another \$100,000 available for a second round of grants, once again with a maximum amount of \$20,000 reimbursement per project.
J11	Activities concerning cyanobacteria/harmful algal blooms	Webinars and presentations on HABs were viewed during virtual conferences, keeping staff up to date with current research and methods for HAB monitoring. In addition to routine phytoplankton sampling which includes assessment for cyanobacteria, DCR staff collected samples for cyanotoxin analysis as part of MWRA's UCMR4 compliance. Educational materials were distributed to ranger and interpretive staff and trail cameras were deployed as a pilot program to monitor for short-lived, isolated blooms. Background research for a HABs response plan is ongoing.
J12	Continue to develop database backed tools and applications (R,GIS,MS Access, SQL Server) to facilitate data management, review and analysis, writing reports and modeling efforts.	All MS Access back-end databases were successfully migrated to SQL Server. Front-end databases were recreated in access for read-write and read-only permissions. This project was a major undertaking and culmination of work over the last 2+ years. Major improvements in performance were gained, and staff access to data during telework was made available. Several ipad based field collection applications were created to move away from paper based field recording. This has streamlined several workflows (HOBO data collection, Short-term forestry, Conductivity Blitz, Well Monitoring). Data management is now more efficient, less prone to error, and more timely. All other data management applications (R-Shiny - WAVE, WIT, TribTools) were updated to work with new SQL Server database workflows. The monthly Water Quality Report was finalized and distribution began again starting for the month of May 2021.
J13	Complete data compilation/interpretation for 30+ Year Water Quality Report (1988-2018) and publish. Include assessment of impacts of climate change on water quality and hydrology.	This 450+ page document is the culmination of nearly 34 years of work and will provide an historic framework upon which to base long-term trend analysis. Work will continue in FY22 once the new EAV is hired.

Task No.	Description	Final Report Comments
J14	Increase understanding of reservoir dynamics by collecting profiles in South Basin, Andrews Harbor, etc. in late summer or early fall when the interflow is well established.	Analysis of limited data collected in 2019 confirms the close relationship between thermocline and interflow depth. Additional spatial and temporal data collection will be necessary to quantify this relationship across the reservoir and through the year.
J15	Conduct benthic macroinvertebrate sampling, continue identification and assessment of historic samples.	Identification continues as time and resources allow.
J16	Continue cooperative study of current population status, life history, and sustainable yield of lake trout.	Continued monitoring of fish populations in collaboration with MassWildlife. The Lake Trout mark-recapture program continued in Nov 2020 and was successful in capturing 114 fish which were weighed and measured. These data will be added to the DCR and MassWildlife databases and used for modeling populations and creating growth curves.
J17	Develop a study to identify trends in the long-term phytoplankton and water quality data sets and identify variables influencing these dynamics.	Collaboration with UMass/RWU continues to incorporate phytoplankton and chlorophyll a into the CE-QUAL-W2 model.
J18	Update and maintain water quality and hydrologic monitoring SOP document	Annual updates to SOPs were completed to account for new equipment, new data collection workflows, and improved QA/QC processes.
J19	Conduct basic fish monitoring in the reservoir in collaboration with MA DFW. Assess goals and explore optimal sample methods with MA DFW.	Continued monitoring of fish populations, specifically lake trout and rainbow smelt in the reservoir and assisted MassWildlife with sampling activities in tributaries.
J20	Ongoing field/lab equipment/supply management (including maintenance and calibration)	Routine calibrations performed on Turbidimeters/YSI probes. Calibration forms updated to allow for better record keeping/tracking. Expired lab chemicals, expired sample trips, and obsolete lab equipment was cleaned out of the lab.
K. Watershed Monitoring and Assessment		
K1	Continue to review local records and conduct watershed surveillance to identify potential issues in the watershed that could impact water quality. Work with local boards and land owners when problems are identified. Document all work in EQ database.	Regular review of watershed boards minutes and agendas and MEPA monitor review. Stormwater BMP comments submitted through MEPA for 1 project in Southboro. Iron bacteria signage developed and placed at two locations along Quinapoxet River. Letters sent to all area flight schools and airports reminding of the importance of the reservoir as a drinking water supply. Conversations with several pilots and Directors of Sterling and Fitchburg airports regarding AVGAS concerns. Continued research and reviewed updated information on PFAS, artificial turf and MDAR aerial mosquito spraying.
K2	Provide technical assistance to state and municipal boards and commissions.	Compiled agendas and minutes from past conservation commission meetings during 2020 and 2021. Information will be entered into a database once either a new one is developed or a connection to the old one is re-established.
K3	Review files in EQ database and resolve any inconsistencies with paper records. Maintain records of all water quality related issues and EQ actions taken in EQ database. Make improvements to structure and data as needed	EQ database use remains complicated by Covid-19 restrictions and lack of remote access. Staff are documenting activities using a variety of methods and will eventually add to database.
K4	Maintain, verify and improve Wetlands and Waterbodies GIS datalayer using plans, field observations and other available data as part of the Wachusett Watershed Hydrology Mapping Project.	Editing continued on the the seven hydrology GIS datalayers within the Quinapoxet River subwatershed in support of the Wachusett Watershed Hydrology Mapping Project. Editing completed for 13 subbasins.
K5	Finalize Quinapoxet District EQA and use recommendations to develop tasks for FY22 Work Plan.	Quinapoxet District EQA completed.
K6	Monitor hazardous materials spills and releases until considered complete for Wachusett and Sudbury watersheds	3 new release sites for Wachusett, 11 new release sites for Sudbury to be added into EQ database upon return or access is granted. All new and ongoing clean ups monitored on a weekly basis. Princeton PFAS issue: high concentrations found in sheet flow runoff in Cobb Brook subbasin. Meeting scheduled with DEP to discuss this property and potential future PFAS issues in the watershed.
K7	Inspect all agricultural operations in Wachusett Quinapoxet District and compile an inventory of agricultural sites in Sudbury using iPad app	All ag operations in the Reservoir District have been inspected this year using the iPad app. Two manure storage violations were observed and letters were sent to owners. Large watershed ag operations were monitored throughout the year through very active social media accounts. Sudbury inventory has not been started.
K8	Develop and implement outreach strategies and programs for topics identified through EQAs	A Road Salt powerpoint has been completed for use with town boards and commissions. Iron bacteria outreach/educational signage placed at several areas along the Quinapoxet River downstream of the Holden landfill
K9	Monitor placement and additions of turf fields in both watersheds and remain up to date on all research and studies of PFA concentrations resulting from turf fields	Recent studies and research has been reviewed for PFAS concerns in addition to toxics from crumb rubber and newer use of cork for fields.
K10	Continue to communicate with MassDOT on roadway projects. Emphasize need for contractor to maintain safe conditions at all times. Investigate possibility of requiring contractor to have absorbent materials at work area for the duration of the project.	No work has occurred on this task this quarter.
L. Aquatic Invasive Species		
L1	Inspect reservoirs, lakes, ponds, and tributaries for presence of AIS.	Thirteen watershed ponds were surveyed in FY21 with no new detections of AIS. Occurrence of one new non-native species, water lettuce, was discovered in the Stillwater River and managed immediately via hand-pulling.
L2	Conduct surveys, gather information, and make recommendations for management actions on an individual basis if/when new infestations are found in accordance with the updated Wachusett AIS management plan.	One new non-native species - Pistia stratiotes (water lettuce) - was discovered in FY21. Hand-harvesting was immediately conducted to remove the threat. Notifications to MWRA and others were undertaken in accordance with the Wachusett AIS management plan. Monitoring will continue in this area.
L3	Administer AIS control contracts as appropriate and conduct aquatic vegetation surveys in conjunction with management of the Lily Ponds, South Meadow Pond complex, and Clamshell Pond.	Contracts for management of South Meadow Pond complex have been transferred to DWSP. Herbicide treatments of South Meadow Pond continued for two invasive species; Potamogeton crispus (curly-leaf pondweed) and Hydrilla and Orders of Conditions were extended for the next three years of management. Management of Najas minor (brittle naiad) in the three Lily Ponds continued in FY21; fewer than 4 acres required treatment. Surveys of Clamshell Pond resulted in no observations of Egeria densa for the third year since treatment and low numbers of Trapa natans were observed and removed.

Task No.	Description	Final Report Comments
L4	Continue to use appropriate methods to prevent the spread of Phragmites along the reservoir shoreline.	Removal of Phragmites via cutting and pulling has significantly reduced the above-ground biomass. Lower levels of effort are required annually, but management using these techniques continues. Monitoring of all sites is ongoing to ensure regrowth does not occur.
L5	Perform aquatic vegetation surveys prior to reservoir AIS management projects. Provide results to MWRA and contractors to guide 2020-2021 plant removal efforts.	The partnership between MWRA and DCR on AIS removal in Wachusett Reservoir continued in FY21. Successful management of <i>Myriophyllum spicatum</i> (variable milfoil) in several areas of the reservoir led to inclusion of this species as a target for removal in all managed areas going forward, including full-scale removal operations in Quinapoxet Basin. DCR continues to coordinate data gathering and reporting from MWRA contractors conducting DASH and QA in Wachusett and Sudbury Reservoirs.
L6	Monitor, advise, and assist contractors with plant removal operations as necessary, including boat decontamination inspections and data management through ArcGIS Online apps.	DCR continues to maintain data submission portals and viewers via ArcGIS Online.
L7	Enforce the decontamination procedures for all watercraft entering the reservoir by inspecting each vessel and collecting completed decontamination certification forms.	All watercraft were inspected prior to launch in the reservoir.
L8	Educate ranger and interpretive staff on AIS topics for incorporation into routine education program.	A video presentation on AIS prevention and management activities was developed and distributed to ranger and interpretive staff.
L9	Monitor beaver activity; if necessary make recommendations to NR for removal where contributing to spread of invasive plants or causing water quality impacts due to flooding abutting property	Reporting of observed beaver activity continued as needed.
	M. Wastewater Management	
M1	Provide plan review and interpretation, if requested, to Boards of Health.	Responded to nine inquiries ranging from input on proposed septic system bylaw changes and revisions to earth removal bylaws to site-specific inquiries regarding regulatory review and implementation.
M2	Compile septic system information (installation date, repair date, location, etc) from watershed communities in wastewater database. Include linked electronic plans where available.	95 septic repair and Title 5 Inspection sites were remotely entered. Limited activity with communities with some town offices closed and fewer BoH meetings.
M3	Obtain sewer connection information from Holden and West Boylston; add to Wastewater database and GIS datalayer	Holden sewer connections provided to GIS staff - West Boylston town offices closed.
M4	Continue to provide management support, with the MWRA, of the Rutland-Holden trunk sewer and Rutland Holden Relief trunk sewer. Coordinate inspections and maintenance projects for the sewer lines. Prepare and submit quarterly bills to the user communities in a timely manner.	Replacement of the metering devices (channels) at Stations C & D to take place in FY22 under MWRA's oversight. Metering discrepancies will be reviewed and addressed in late FY22 or early FY23, depending on timing of project completion. Quarterly bills were all issued in accordance with internal timelines. Repairs to MH 79, 80 and the line between the two manholes to be undertaken in FY22. Studies will need to be conducted to attempt to find the source of the high hydrogen sulfide that has caused the deterioration of the manholes and line between them.
M5	Research and provide sewer management information for legal issues regarding the Trunk and Relief sewer lines, as necessary. Work with legal and MWRA to research the option of transferring ownership of sewer lines to MWRA or the communities (would require legislative action).	No action has been taken in FY21; Rutland had indicated they might be interested in taking over the trunk and relief lines (and spurs) in Rutland IF all noted repairs/upgrades from the I/I report were completed. Rutland applied for grant funding to accomplish this work, but was not a recipient.
M6	Evaluate and manage new trunk line connections. Monitor trunk line for encroachments; resolve any problems.	There have been no new requests for connections in FY21.
M7	Address I/I issues within trunk and relief sewers per DEP requirements (this is dependent upon DEP acceptance of our I/I submittal).	Discussions continue; I/I study needs to be undertaken in the Holden portion of the trunk and relief line. Upon completion of that study (to take place in spring of FY22, hopefully), DCR and MWRA can begin discussions with the impacted communities regarding any necessary repairs as a result of the study.
	N. Stormwater Management	
N1	Treat direct discharges at Rt 110 Sterling	The 25% design was submitted to MassDOT. Tighe & Bond also submitted to MassDOT the cost figures for the vertical curve modification. After consultation with MWRA and GZA the lowering of the road elevation near Gate 36 would not impact North Dike.
N2	Continue to work with towns and private landowners for regular maintenance of BMPs to ensure proper performance	No activity has occurred on this task this year due to W drive inaccessibility.
N3	Work with watershed towns to ensure compliance with MS4 requirements.	Ongoing communications as needed; dog waste brochure link provided to Southborough Trails Loop Committee and outreach designed for kiosks; link to stormwater brochures provided to Marlboro and Southboro Conservation Agents. Printed copies to be provided in new homeowner letter package in Southboro.; attended Environmental Partners MS4 Audit webinar. Culvert assessment certification obtained and 12 culverts assessed.(when complete will allow for potential DER grants to towns for culverts in need of replacement). Provided the Town of Southborough Conservation Commission all DWSP brochures in pdf and word formats for use in new property owner packages. Turnover of DPW Directors throughout the year with one position still vacant.
N4	Maintain, verify and improve Streams and Pipes GIS datalayer using plans, field observations and other available data as part of the Wachusett Watershed Hydrology Mapping Project.	Ongoing progress. Ongoing field work conducted in support of the Hydrology Mapping Project. Collaborated with Town of Holden Engineering staff to resolve drainage structure connections. Collaborated with Town of Holden Engineering staff to resolve drainage structure connections.
N5	Maintain, verify and improve Drainage Structures GIS datalayer using plans, field observations and other available data. This is part of the Wachusett Watershed Hydrology Mapping Project.	Culvert assessment training was completed to assist towns with upcoming grant opportunities for replacement; 54 culverts were assessed (53 West Boylston, 1 Sterling) this year.
N6	Modify subbasin lines in ArcGIS based on stormwater mapping results	Ongoing progress. Subbasin boundaries were indicated through attribute information entered while editing GIS datalayers.
N7	Conduct regular inspections of all construction sites greater than one acre.	30 sites monitored, 369 inspections conducted, with 7 sites completed and 8 new sites added.
N8	Continue work with local DPWs to identify locations of concern, evaluate options for BMP installation, and ways to cooperatively implement recommendations.	COVID and DPW Director turnovers impacted DPW's ability to perform projects above their regular duties throughout this year. No roadway projects were proposed where BMP installation was possible.

Task No.	Description	Final Report Comments
	O. Emergency Response	
O1	Coordinate Emergency Spill Response training with MWRA and local responders.	Although COVID impacted training, all planned classes were conducted. 75 people attended five courses, totalling 44 training hours. The attendees included staff from Wachusett, Quabbin, NR, MWRA and WBFD.
O2	Update contact list and information in Comprehensive Emergency Management Plan, EAPs, and other emergency response plans.	The Wachusett/Sudbury Comprehensive Emergency Management Plan is mostly complete. Working with DWSP-GIS to update map grids. Once completed the plan will be finalized. Emergency contact information has been updated as necessary
O3	Organize and maintain emergency response supplies and services.	Trailers and supplies were inventoried. Emergency response supplies and boom received from MWRA was placed at Response Shed (33 Sterling St).
O4	Develop multi-year Training and Exercise Plan.	FY21-23 Training and Exercise Plans was developed
O5	Provide and coordinate ICS, emergency response and safety trainings to appropriate staff. Work with other agencies to provide trainings and exercises	No trainings were conducted due to COVID
O6	Evaluate, monitor and oversee spill clean-ups that impact or threaten water resources of DWSP property. Work with appropriate local, state and federal agencies to ensure that containment, cleanup, and mitigation of the spill are proceeding in a manner that protects drinking water quality	No report of releases
	P. Support	
P1	Prepare and submit to MWRA and the Water Supply Protection Trust Annual Work Plans, budgets, progress reports, and program goals and objectives. Track Section progress in meeting program goals.	All work plan, budget and progress report documents were completed and submitted on time. Continued weekly documentation of staff progress.
P2	Administer the Payment in Lieu of Taxes (PILOT) program.	A total of \$8,367,913 was distributed in Payments in Lieu of Taxes to 31 Watershed System communities. Within the Wachusett watershed, \$3,502,986 or 42% of the total, went to seven towns. The five towns in the Sudbury watershed received \$835,459, or 10% of the total PILOT.
P3	Configure and maintain both internal and externally facing ArcGIS Online applications. Work with staff to generate field data collection tools using Survey123 and/or Collector for ArcGIS. Maintain existing field data collection tools for staff; maintenance includes archiving of data (as needed) and ensuring that Surveys and Maps remain functional through upgrades to ArcGIS Online and mobile apps.	Many new projects were undertaken and completed over the past year. Major accomplishments include the Ranger Daily e-Log and Citation Management Hub, a rollout of the new Encroachment Monitoring system to all staff, the LAP StoryMap which supported remote LAP meetings, improvements to existing projects as new technology and capabilities emerge and a continued growth in the use of GIS throughout DWSP.
P4	Publish hosted feature layers, tile layers and tile packages on an as-needed basis to support projects. Ensure that all public-facing data has proper metadata added as per the EEA ArcGIS Online Best Practices.	AGOL layers update on an as-needed basis.
P5	Develop staff training plan for migrating from ArcMap to ArcGIS Pro. Provide staff with a variety of self-paced training options via the Esri Training Catalog.	No progress made.
P6	Train staff in GIS on an as-needed basis to provide them with knowledge needed to complete basic GIS-related tasks.	GIS-W trained LAP staff in the use of the LAP StoryMap. Due to the pandemic and the need for virtual LAP meetings, the StoryMap is now the foundation of every LAP meeting.
P7	Assist staff with GIS project requests by providing maps, data analysis, data exports and data collection.	GIS-W completed maps and statistics for the Quinapoxet EQA Report, created Dashboards for the Bird Harassment Program, created a risk assessment map/analysis for sewer pump stations, included 13 proposed acquisitions in the LAP StoryMap, and created a Short-term Forestry Monitoring survey for EQ.
P8	Maintain and update the GIS database on the shared G Drive as needed; ensure all data is current and available to staff and has updated FGDC-compliant metadata. If new data is added to the G Drive, ensure that a layer file is created and data is added into the Data Viewer.	Through remote work, GIS was able to support staff needs and provide data access even without VPN. We have a lot of work to do in the coming year with the network drive consolidation to SharePoint and OneDrive, however we are well-positioned to do so with our already heavy use of ArcGIS Online.
P9	Use GPS equipment to capture and maintain data for all staff. Coordinate use of GPS equipment and download and process all GPS data.	GPS equipment used to capture Sterling WPR exclusion area. Data was downloaded, processed and mapped. Provided on an as-needed basis. Additional Bad Elf GPS was ordered for EQ. A new iPad equipment order was placed so that each Ranger vehicle will get a RAM Mount, wireless keyboard and charger to assist with their new Daily Log survey.
P10	Create parcel maps for Land Acquisition Coordinator meetings with landowners and MWRA board. Create Story Map for Land Acquisition Panel meetings, with one potential property per page. Should be provided to LAP meeting attendees prior to meeting.	GIS-W provided to the MWRA and each landowner a proposed parcel acquisition map. Also created five sections per page in the LAP StoryMap for each of the 13 proposed acquisitions.
P11	Complete GIS-related special projects	GIS-W provided maps/data to the Town of Southborough Emergency Management to assist in equipment acquisition analysis. GIS-W was able to keep up with technology by taking several self-paced training seminars in ArcGIS Online, Collector, and Survey123.
P12	Operate administrative offices, including answering phones, greeting visitors, etc.	Administrative Staff began coming into the office twice per week to process the incoming and outgoing mail and assist with tasks that need to be completed in the office.
P13	Provide payroll assistance and personnel services for all Section employees.	Services have been maintained throughout the pandemic. SSTA and payroll is monitored on a weekly basis.
P14	Provide contract administration, financial management, record-keeping, purchasing of goods and services, and other financial support services.	A total of 241 encumbrances were processed and a total of 826 invoices were paid in FY2021. Included within these numbers are encumbrances for medical supplies for the rangers, an LCD display monitor for the Barr Room, 2 desktop printers for the labor yards and multiple heavy equipment attachments.
P15	Coordinate with EEA IT to provide local MIS support for the Section. Update IT Plan as required addressing technology needs for the coming year.	Progress was made with VPN access being set up for all whose hardware would permit it. Laptops are on request from IT and were scheduled to be deployed this quarter but have not arrived as of yet. Migrations are planned to move data storage from server based to cloud based hosting early next fiscal year.

Task No.	Description	Final Report Comments
P16	Administer Logging Permit program, including mailings, bid openings, financial management, database management, permit and key issuance, etc.	Staff continue to schedule office visits to process mail, certified mail and process forestry performance bonds as needed.
P17	Plan and implement vehicle and equipment purchases and leases.	Overall, many new pieces of equipment for our watershed maintenance group was purchased in FY21. A critical piece of equipment to apply liquid brine was purchased as we received the new Ford F-550 truck with liquid tanks and applicators.
P18	Inspect, provide regular maintenance, and repair vehicles, boats and other motorized equipment, utilizing Fleet Wave system. Maintain up-to-date records of all vehicles and equipment in Fleet Wave system.	Garage staff responded to 225 work orders. Continue to provide regular maintenance and repair of the Fleet. Mechanics coordinated with Fleet Response with Mobile Inspection Unit to inspect our vehicle and heavy equipment fleet.
P19	Complete watershed-wide vulnerability assessment to identify potential impacts of climate change on the water supply	Culvert assessment training was completed to assist towns with upcoming grant opportunities for replacement; 54 culverts were assessed (53 West Boylston, 1 Sterling) this year.

Quabbin/Ware FY 21 Final Report



Update on all tasks in Quabbin/Ware workplan for July 1, 2020 to June 30, 2021.

Task #	Task Description	Final Report Comments
A. Land Acquisition		
A1	Acquire land. Coordinate due diligence and other tasks/services from DCR and private contractors to complete survey, appraisal, title, engineering, and environmental assessments for proposed acquisitions. Negotiate WPR language, purchase prices, and conditions of sale with sellers of property.	Staff continues to work on due diligence and negotiations for acquisitions for FY21 and FY22. Several projects are in the various stages of due diligence.
A2	Develop individual parcel presentation materials and meet with MWRA Board for approval.	One Quabbin project was approved by the MWRA Board on January 20: A 150 acre WPR.
A3	Communicate with and convene LAP meetings to review parcels and prioritize land purchases.	Two online LAP meetings were held to assess the pursuit of several land acquisitions in the watersheds.
A4	Use the LAP Prioritization Model to identify priority parcels in the watersheds.	Model used to identify high priority parcels.
A5	Continue to solicit and work with landowners in donating conservation interests in land and assist in advising landowners on the tax incentives available when donating conservation interests.	Three WPR donations have been secured. One on Ware and two on Quabbin. A third project is the transfer of a donation of the fee interest in a Ware WPR property belonging to the the Rutland Land Conservancy.
A6	Establish regularly scheduled land/legal meetings to address attorney assignments and project logistics.	Meetings held as needed.
B. Watershed Preservation Restrictions		
B1	Monitor WPRs on a regular basis, following monitoring procedures	WPR Coordinator and Regional Monitors completed 28 WPR monitoring visits. All Forest Legacy monitoring visits and reports completed.
B2	Complete baseline documentation reports for new WPRs prior to acquisition or within a reasonable time after acquisition, following EOEEA specifications. Baselines will be done in-house or through appropriate contracts.	No Baseline Reports completed this year. One draft Baseline completed in-house is out for landowner review.
B3	Meet with Restriction Stewardship Working Group and confer with legal to respond to enforcement issues and requests to exercise reserved rights.	Continued working with Restriction Working Group. Finalized Reserved Rights, Enforcement, and Amendment Procedures.
B4	Track changes in landownership for WPRs.	WPR Coordinator and Regional Monitors completed landownership checks.
B5	Explore additional ways to reach out to landowners through the use of social media and web-based content.	NR webpages updated.
B6	Implement WPR records procedure with DCR records manager.	Ongoing. WPR Coordinator continued working on inputting WPR records into Inter-Agency Stewardship Database (LIS).
C. Land Management		
C1	Implement the system-wide comprehensive Land Management Plan.	Plan implemented.

Task #	Task Description	Final Report Comments
C2	Prepare forest harvest proposals for next fiscal year including data on proposed harvest areas, characteristics of stands, soils, cultural resources, wetlands, wildlife, unique features, and priority habitats. Proposals shall also include information on lot layout, landings, stream crossings, wetland crossings, and stonewall crossings.	Seventeen forest harvest proposals were drafted and reviewed internally. Two proposals were dropped after review. Fifteen proposals were presented at advisory committee meetings.
C3	Plan and conduct an internal review of proposed logging operations for the coming year, including assessments of silviculture, water quality, wildlife, and other potential impacts/benefits. Review lots to ensure consistency with aspects of the CLMP, including wildlife, forestry objectives, and environmental quality.	Internal review of 5 Ware River lots and 12 Quabbin lots completed; includes map preparation, site walk coordination, development of comments and recommendations, and compilation and distribution to forestry staff. Built and published a FY22 ArcGIS Online storymap for public review and comment; sent letters to Select Boards in affected towns.
C4	Present annual forest harvest proposals at a public meeting. Accept public comment and respond as needed.	Annual lot proposals presented to both the Quabbin Watershed Advisory Committee and Ware River Watershed Advisory Committee. Did not receive any public comments.
C5	Plan, lay out, mark products for removal, prepare maps and permits, establish photo monitoring points, file Forest Cutting Plans, seek bids, award permits, and properly advertise and post forest management operations consistent with the Forest Cutting Practices regulations, the LMP, and approved harvest proposals.	Nine timber sales were marked and sold. Cutting plans were prepared for 9 timber sales. Two cutting plans were amended and one was extended. Photo points were established for 5 forestry projects. Participation in the Quabbin continuous forest inventory (CFI) project and the marking of additional tallies on oak salvage sales impacted the number of timber sales marked this year.
C6	Provide supervision and oversight of all forest harvesting operations on DWSP property. Assure compliance with applicable DCR and NHESP regulations and restrictions, approved BMPs, and all Permit conditions. Maintain adequate site visit records. Monitor post-harvest and collect photo point images consistent with internal policy.	Fourteen active timber harvest were supervised. Photo point images were collected on 32 harvest.
C7	Monitor water quality at active harvesting stream crossing sites to measure effectiveness of BMPs.	Continued monitoring at Lot WR 19-19-2 (baseline) and Lot S11SQ (post-harvest). Post-harvest monitoring completed at Lot 1056. No monitoring at Lot 1058 because of low flow (harvest suspended since 10/27/20).
C8	Continue to implement long-term paired watershed monitoring to assess impact of DWSP forest management on tributary water quality.	EQ has completed a full year of post-treatment water quality monitoring as part of the long-term paired watershed study, collecting monthly grab samples as well as hitting targets for quarterly storm-event sampling. EQ staff continues to analyze and process data from these events, using new workflows and tools to automate loading calculations. Field equipment (YSI field probes, ISCO samplers) continues to be maintained. New collaborations have developed between DCR-EQ and UMASS labs to expand the paired-watershed analysis to new frontiers (e.g. HAA precursor study, isotopic analysis). Progress has been made on reporting and will be a focus on FY22.
C9	Conduct periodical regeneration and invasive species surveys to monitor forest health and development resulting from silvicultural activities or other natural disturbances and processes.	Regeneration and invasive species data was collected on CFI plots.
C10	Conduct periodic reviews and monitoring of land management activities to assure compliance and consistency with land management plans.	See comments for CFI project, which dominated the data collection and forest monitoring effort at both watersheds this year.

Task #	Task Description	Final Report Comments
C11	Collect data and maintain GIS datalayers related to forest structure, composition, regeneration, roads, boundary information, stone walls, wetlands, streams, and other data to guide the land management program. Maintain GIS data documenting the location, extent, and intensity of all silvicultural operations.	All forester continue to collect GIS data on forest resources. Rich MacLean has created some tools to facilitate this data collection and has started preparation for data move as the network drive is retired.
C12	Complete assessments on all new land acquisitions, including descriptions of fire/access roads, bridges, restoration needs, and forest conditions. Integrate these lands into land management, public access, and other watershed management programs.	No new acquisitions at Quabbin and Ware River.
C13	Locate, mark, and maintain property boundaries periodically or as needed.	Six miles of boundary were marked.
C14	Develop scope of work and manage contracted property boundary survey work.	Six survey contracts were completed with assistance from the CE group.
C15	Document and pursue resolution of all property boundary encroachments.	Several new encroachments discovered through DWSP survey efforts. Encroachments entered into central hub site.
C16	Identify, plan, and oversee non-forest or other unique habitat restoration, field reclamation, prescribed fire implementation and maintenance work.	Barre Heath was burned in Q4 and post burn monitoring was conducted. Pollinator gardens at Quabbin were set up and a delayed mowing regime was implemented. Seeding of the areas will be done in the fall of Fiscal FY22. Hayfield and brush mowing was completed. VCS conducted a follow-up treatment of invasive buckthorn at Twin Hill in the Ware River.
C17	Maintain the non-silvicultural lands described in the land management plan (e.g., viewsheds, gravel pits).	Internal DWSP gravel and sand inventories have been replenished and stockpiled in both watersheds for our near-term road infrastructure support. FY22 planning completed to Plan this fall to open the Barre pit Rt. 62. for additional resources for north Ware River watershed infrastructure maintenance.
C18	Identify, prioritize, and implement terrestrial invasive plant (TIP) control projects in line with the Terrestrial Invasive Plant Management Strategy (TIPMS). Respond as needed to newly discovered and controllable TIP populations.	Efforts in FY21 included treatments (by NR staff, seasonals, and Q Forestry staff) of Japanese stiltgrass in the Pelham, New Salem, and Prescott blocks of Quabbin (all infestations occurring within roads that are mowed annually; traffic appears to be spreading the impacts around DWSP lands); treatment of invasive vines and shrubs impacting a rare species population below Quabbin Dike; final treatment of buckthorn at the Twin Hill fields at Ware River (contracted); first round of control of bittersweet infestations in recently cut red pine plantations at the entrance to Quabbin Cemetery (Keevan, Siener, and Beard); both Beard and MacLean initiated mowing treatments of Japanese knotweed at sites within their management areas affected by forestry operations; and trial of hardware cloth girdling treatment for Japanese knotweed. Staff renewed applicator licenses as needed. NR staff attended 4 session course for Invasive Plant Management Certification.
C19	Collect data and maintain datasets, GIS datalayers, and related maps and reports of rare and listed plants and communities.	Annual rare plant population monitoring was conducted as needed at various sites around Quabbin. Reports were submitted to NHESP as required. Substantial coordination with NHESP staff regarding monitoring and population protection efforts.
C20	If available, use a UAS (unmanned aerial system) to document forest conditions, map openings, identify invasive plant populations, internal road conditions, or other activities.	While drones were used to count gulls at Quabbin Reservoir, no work was done using drones on these projects.
C21	Complete 2020 Continuous Forest Inventory	All Quabbin CFI plots were measured as planned, with only some growing season re-checks needed by the end of the FY. Overall a successful project. Cleaned and organized data will be available for analysis during FY22. All paper data sheets from 1970 through 2020 have been scanned and saved to cloud backup as well.
C22	Implement Quabbin Park Cemetery Management Plan	FOTL will be handing over most QPC burial duties to the F&P III for next fiscal. Update of QPCMM planned for FY22.
C23	Implement Quabbin Park Operation and Maintenance Plan	New F&P III is doing a fantastic job with QP maintenance. Pollinator fields are progressing. QPO&M Plan updated planned for FY22.

Task #	Task Description	Final Report Comments
C24	Implement Quabbin Road Management Plan	Road work and repairs continued throughout the year.
C25	Implement Ware River Road Management Plan	Limited road work. Repairs were done after heavy storms. Awaiting new CMF to start in WR to include in roadplan.
C26	Begin watershed-wide vulnerability assessments	DCR hired in-house Climate Change expert to advise DWSP. Anticipate in FY22 we will be targeting EO 594 requirements with her assistance. Restarted CREAT Risk Assessment training.
D. Wildlife Management		
D1	Continue the active harassment of birds within the Bird Harassment Zone at Quabbin Reservoir, using human presence, boats, pyrotechnics, passive scare devices, and other techniques. Continue to identify and test new harassment techniques.	Cloud-based Bird Harassment Program Dashboard provides MWRA access to daily reports and weekly reporting while providing the additional information collected by Natural Resources section staff. Annual BHP report (2020-2021) completed July 2021 for submittal August 2021.
D2	Observe and document the nocturnal roost of gulls on Quabbin Reservoir.	UAS flights were conducted at Quabbin weekly for 26 weeks and finished in the beginning of April. The UAS program has been very successful and a very useful tool for the Bird Harassment Program. The total number of gulls counted at the roost was 4,104. The weekly roost counts varied from zero (Oct. 6th and 15th) to 780 (Dec. 29th). The average number of birds was 186 gulls/ weekly count.
D3	Control Canada geese populations on Quabbin Reservoir (focus in the Bird Harassment Zone) by treating eggs during nesting season to prevent hatching.	The Canada goose control zone was surveyed for active nests; there was 1 nest located and 7 eggs were treated to prevent hatching.
D4	Identify places in MA where human derived food is available and work to prevent feeding through educational signage, interaction and enforcement.	Surveys continued to identify new areas where human-derived food is made available to gulls.
D5	Remove beaver and muskrat in the Aquatic Wildlife Pathogen Control Zone at Quabbin. Address beaver concerns outside the control zone.	Four beaver were removed from the Wildlife Pathogen Control Zone. No beaver were required to be removed outside of the control zone. No Muskrat were observed.
D6	Respond to problems of burrowing animals on dams and dikes; report problems and take appropriate action.	Sites were inspected after reports of potential animal burrows. No treatment was necessary.
D7	Research and manage for common loons on DWSP waterbodies; provide nesting platforms, capture and sample birds for contaminants.	Research and management for common loons on DSWP waterbodies continued and the annual report was completed for the 2020 season. Lead tackle and fishing line canisters was completed for the 2020 season and totals recorded. One adult loon was captured, banded for identification, and sampled for containments during the 2020 breeding season.
D8	Continue long-term wildlife resource monitoring program.	Long-term wildlife resource monitoring that includes vegetation surveys, owl monitoring, breeding bird surveys and whip-poor-will surveys were conducted on the habitat restoration areas on the Quabbin and Ware River Watersheds. The annual Breeding Bird Surveys were completed at Prescott and Petersham established routes in June. In addition bird surveys were done at the habitat restoration areas on Quabbin and Ware River watersheds and grassland fields at Ware River. The Prescott beaver survey took place in November and there were 15 active beaver sites documented on the Prescott Peninsula; 14 were within interior routes and 1 was found in a cove tucked along the northwest shoreline. The 2020 Prescott Beaver Survey Report was completed.
D9	Work with DFW to survey and document breeding bald eagles around Quabbin Reservoir.	Cooperative work continues with DFW to survey and document breeding bald eagles around the Quabbin Reservoir. Final counts have not been determined yet.
D10	Administer the applications, permits, and orientations for the annual Quabbin Controlled Deer Hunt; analyze results of hunt.	Deer hunting was conducted in New Salem, Pelham and Hardwick during the 2-week shotgun season in December at Quabbin. Analysis of the hunt data is ongoing but so far 28 deer have been reported by hunters (12 in Pelham, 8 in Hardwick and 8 in New Salem). Final deer report was completed and shared with staff ahead of the 2021 deer hunt planning meeting. Results were presented at the MWRA Trust board meeting. Quabbin ended up with over 685 applications to hunt in 2020. 500 bonus antlerless deer permits were issued to hunters.

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D11	Coordinate with the Massachusetts Natural Heritage and Endangered Species Program concerning rare species occurrences and protection.	We continued our collaboration with NHESP to document rare species for their occurrences and protection through snake board surveys, acoustical bat recordings, Whip-poor-will surveys, and loon and eagle nest monitoring.
D12	Develop and implement a deer management plan for Quabbin Park	Still pending Commissioner approval. No activity this quarter.
E. Public Access Management		
E1	Proactively patrol watershed lands to ensure compliance with DCR regulations and policies. Tally visitor contacts and produce quarterly and annual summary reports. Conduct trend analyses on data collected (e.g., rule violations, access permits, encounters).	Rangers tallied a total of 46,599 visitor contacts for FY21. Quabbin Watershed 34,267 visitor contacts . Ware River Watershed 12,332 visitor contacts . Rangers tallied a total of 1,877 violations for FY21. Quabbin Watershed 627 violations. Ware River Watershed 1,250 violations .
E2	Continue to cooperate with state, environmental, federal, and local police for help with enforcement when required.	Rangers cooperate with State, Environmental, Federal, and local PD as needed. Ranger Captain has bi-weekly check-ins with MEP. Rangers have been working with MSP on the weekends for traffic control in Quabbin Park and reservoir patrols. New MSP-Marine Unit arrived at Quabbin this Quarter. Ranger have begun to coordinate with this new group.
E3	Use Agency social media accounts for advertisement of interpretive programs, including general info or emergency info (e.g., closings).	IS section continues to provide updates to DCR External Affairs office.
E4	Continue public access updates and improvements with signs and gates. Conduct regular inspections of locks, signage, gates, and access barriers. Develop, install, and maintain appropriate signage throughout the watersheds, including walkway signs and signs indicating access restrictions. Develop and distribute materials to inform visitors of access rules, policies, and general watershed protection information. Update and maintain kiosks and bulletin boards with appropriate visitor information.	Rangers continued public access updates and improvements with signs and gates as needed. Rangers conducted regular inspections of locks, signage, gates, and access barriers and reported or made recommendations as needed. Rangers developed, installed, and maintained appropriate signage throughout the watersheds. Rangers have been working with the Sign Shop to improve signage as needed. Rangers continue to develop and distribute materials to inform visitors of access rules, policies, and general watershed protection information.
E5	Continue to implement Quabbin Public Access Management Plan policies. Enforce rules and regulations of 313 CMR 11.09 through the use of citations. Issue written warnings and/or non-criminal citations for repeat offenders and serious violations. Complete semi-annual Compliance and Enforcement Reporting to MassDEP.	Rangers tallied a total of 46,599 visitor contacts for FY21. Quabbin Watershed 34,267 visitor contacts . Ware River Watershed 12,332 visitor contacts . Rangers tallied a total of 1,877 violations for FY21. Quabbin Watershed 627 violations. Ware River Watershed 1,250 violations .
E6	Continue to conduct "special operations" such as night operations, ATV, and snowmobile operations, as needed	Rangers have been utilizing bikes, snowshoes, skis, foot patrols, and ATV including a collaborative ATV patrol with MSP. ATV/UTV replacement project underway.
E7	Operate the shoreline and boat fishing program in designated portions of Quabbin Reservoir in a manner that minimizes threats to water quality and accommodates visitors with accessibility needs. Implement the Quabbin Boat Seal program at BLAs and produce annual report.	Has been a trying year for BLA's in general. Staff absence and BLA supervisor being out for the entire season. FOTL filled in for F&P III. A few issues with the electronic tag in/out due to phone booster issues. Seem to be worked out and operating proper.
E8	Provide ongoing support and consultation to DCR's Division of Parks regarding Comet Pond beach. Maintain boat ramp launch at Long Pond and boat ramp launch and parking lot at Comet Pond.	Comet pond boat ramp jersey barriers were removed in spring. New Kiosks were installed at both Long Pond and Comet pond.

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E9	Coordinate and/or support special programs and events, including Memorial Day services, public meetings, paraplegic hunts, and Tuesday Tea events.	Held in-person Quabbin Park Cemetery Memorial Day event. Annual Tuesday picnic is scheduled for August.
E10	Continue to implement universal accessibility projects throughout the Quabbin/Ware Region.	No project conducted this year.
E11	Continue to control and monitor research and other public access through an internal review process and permit system. Maintain electronic databases for permit issuances, access notification, and any problems.	Eighteen research permit renewals were issued and 8 new research applications were approved. Received annual reports from most researchers. Researchers not submitting an annual report did not have the permit renewed.
E12	Manage public access permits for large groups, short-term vehicles, etc.	We issued very few permits this fiscal year as a result of the agency COVID-19 restrictions. Starting May 29th we were able to issue permits and have issued 1 wedding, 2 school, 2 former residents and 7 general group permits for Quabbin and Ware. The online permitting process seems to be working well.
E13	Finalize Ware River Public Access Management Plan Update	WRPAMP update process paused; restart pending guidance from DCR Commissioner.
E14	Implement social media trial program	There has been no indication that DWSP will be able to implement a social media presence.
F. Watershed Security		
F1	Continue regular ranger patrols to provide watershed security. Perform regular security checks at key access points and MWRA facilities. Use daily logbooks to record all encounters and violations. Produce periodic reports.	Rangers submitted daily field logs. Ranger Captain and Lieutenants reviewed e-logs daily and generated weekly reports. Ranger Captain submitted weekly reports to ARD. Captain submitted monthly and quarterly reports based on information captured through daily field e-logs and incident reports submitted from field rangers. The addition of the MSP-Marine Unit this Quarter increased infrastructure security patrols on the Reservoir.
F2	Inspect, maintain, and monitor gates, barways, and signage throughout the watersheds for security and access control. Install barriers (such as guardrails or fences) as needed to protect properties and control public access.	Rangers continued public access updates and improvements with signs and gates as needed. Rangers conducted regular inspections of locks, signage, gates, and access barriers and reported or made recommendations as needed. Rangers developed, installed, and maintained appropriate signage throughout the watersheds. Rangers have been working with the Sign Shop to improve signage as needed.
F3	Coordinate security monitoring and related activities at high vulnerability locations with MWRA.	Rangers patrolled daily, multiple times a day. E-logs were kept and issues documented and reported in a timely manner.
F4	Work with local state and federal responders to ensure current agency emergency contact information.	Rangers cooperated with State, Environmental, Federal, and local PD as needed. Ranger Captain had bi-weekly check-ins with MEP.
G. Infrastructure		
G1	Conduct monthly inspections and issue findings on Winsor Dam and spillway and Goodnough Dike. Implement basic maintenance activities as needed. Coordinate inspections with MWRA and consultants. Plan for or conduct dam repair work as called for in dam inspection reports.	Monthly inspection of Quabbin Dams continued with findings shared with designated DCR-DWSP and MWRA staff. Masonry repairs to parapet walls at Winsor Dam and upstream wall of the Spillway Bridge. Contract was awarded to Baker Mason Contractor, Inc. Repair work was completed in June. Phase I dam inspection/evaluation for the Quabbin Dams was conducted by GEI, Inc. on 10/28/2020. Staff from DCR-DWSP and MWRA were in attendance to provide support and answer any questions.
G2	Conduct periodic inspections and issue findings on DCR's bridges and small dams in the Quabbin/Ware Region. Assure compliance with all dam safety requirements for small dams on DWSP lands, including the review of new or updated Emergency Action Plans.	In addition to the Quabbin Dams and Brigham Pond Dam which are documented elsewhere, conducted site visit to Asnacomet Pond Dam and Demond Pond Dam on 6/16/2021. A site visit to Demond Pond Dam was conducted on 3/31/2021. Conducted site visits to Asnacomet Pond Dam on 9/11/2020 and 12/10/2020. A site visit to Demond Pond Dam was conducted on 12/10/2020. Site visits to Peppers Mill Pond were conducted on 11/3/2020 and 12/2/2020.

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G3	Provide oversight and technical support or assistance for engineering, construction, and renovation work in the Quabbin/Ware Region.	In June, Brown Electric was awarded a \$20,120 contract to upgrade electrical systems at the Quabbin Tower. Work included the install of new wiring and circuitry to power two (2) new exhaust fans installed inside at the Tower observatory. The fans will operate to exhaust when the Tower experiences elevated humidity and temperature levels. The fans are expected to help control excessive moisture build-up and penetration that is rapidly deteriorating building conditions. In addition, exterior building obstruction lights were replaced with new, FAA-certified L-810 LED (Night Vision Compatible) Steady-Burning lighting. A new breaker, photo-cell sensor and fixtures were installed and new wire was run thru existing conduit. Ventilation in tower now operational. Quabbin cemetery garage clapboard and rotted sill work finished. Area 2 bathroom's new plumbing and sinks replaced.
G4	Maintain records regarding reservoir and facility construction, as well as maintenance and repair operations. Provide surveying and drafting services, maintain records, and respond to in-house and other requests for information related to land ownership, property lines, buildings, and construction projects.	CE was involved with many initiatives related to plans, records, archives, surveys, boundary maintenance, road infrastructure and more. With surveying funding, CE & Forestry were able to contract surveys on six (6) unique properties that were identified as high priority to resolve or document encroachments or illegal activity. In addition CE provides ongoing in-house support for surveying services for projects like staff gage implementation for EQ and other boundary delineations for Forestry. A FY21 Summary of surveying and monitoring equipment purchases is attached to this row. In FY21 CE was able to upgrade and restore many pieces of obsolete or broken equipment. The newly purchased equipment will prove it's worth for years to come.
G5	Conduct building maintenance activities, including painting, carpentry, cleaning, minor repairs, and other routine maintenance.	New Institution Maintenance Foreman hired this year. A variety of maintenance and cleaning projects completed including work in the QAB, the Tower, and at the BLAs.
G6	Conduct periodic inspections of drinking water sources and septic systems at the various Regional office buildings. Assure compliance with applicable state and federal regulations.	PWS water quality monitoring and reported was completed in accordance with the sampling schedule for the QAB admin building during FY21. A monitoring waiver for perchlorate monitoring was granted. No monitoring at Oakham or New Salem Field Offices this FY. Routine RTCR sampling was conducted monthly in FY21. TC was not present in any samples collected in FY21. Diagnostic first-draw samples for Pb and Cu were collected at all Blue Meadow Road facilities. Results were posted at taps. QAB PWS remains in compliance with PWS sampling and reporting. Monthly RTCR sampling completed. Samples collected and results reported for monitoring for Pb and Cu, Na, Mn, Fe, NO3N, perchlorate, VOCs, and SOCs. Na results provided to MassDPH and Belchertown BoH. Monitoring waiver for perchlorate granted. Annual Statistical Report for QAB PWS submitted on eDEP.
G7	Conduct periodic inspections, maintenance, or oversight of heating systems, fuel pump operations, and fuel deliveries.	•In May, Northeast Petroleum was awarded an \$18,000 contract to install a new, gravity-drop fill pipe system and overfill alarm on the gasoline storage tank. A rusting fill pipe and spill bucket necessitated the need to overhaul the fill pipe system. Northeast Petroleum was also called upon on multiple occasions to troubleshoot and restore proper operation to the Fuel Master/WEX Card Reader system. The WEX Card system suffers from a poor cellular service signal that triggers repeated communication attempts that ultimately suspends pump operation into a "Memory Full" failure. The ultimate solution to this problem is to run Ethernet cable underground so that communication could be made directly thru the DCR Network.
G8	Develop specifications, bid packages and contracts for facility and infrastructure projects scheduled for FY21	Ready Mix Concrete awarded to Graves. Paperwork being submitted, to award Pipe Contract, for EJ Prescott and Ferguson Waterworks. Fire Equipment scheduled for Annual Testing and to start Replacing outdated Sprinkler Heads beginning April 26.
G9	Conduct maintenance and management activities in Quabbin Park, including roads, roadsides, parking areas, drainage structures, fields, vistas, snowplowing, and other management activities.	Mowing in the parks will continue. Started using the Kubota tractor to cut back the Perennial/Naturalized areas. Preparation for the Winter season is underway.

Task #	Task Description	Final Report Comments
G10	Continue to conduct routine operational and maintenance activities in the Quabbin Park cemetery, coordinate with local funeral homes and other entities for burials, and provide administrative support services. Conduct Quabbin Park Cemetery business and record keeping.	Maintenance in the Cemetery is ongoing. Six burials, 3 cremations and two reinternments completed this year.
G11	Conduct maintenance activities on DWSP roads, including grading, culvert and ditch maintenance, mowing sides of forest roads, and snowplowing. Continue to collect data on road conditions and culvert locations. Continue to use BMPs in road maintenance activities. Continue to seek out and explore alternative funding opportunities to complete stream crossing upgrades and improvements.	Planned activities were delayed due to the frequent rain/storm events that impacted the area.
G12	Continue to investigate improved Emergency Spill Response access.	Project on hold.
G13	Assess gravel pits and gravel resources on DWSP lands in the Quabbin/Ware Region. Annually review and monitor gravel extraction and site closure and Best Management Practices (BMPs).	Permitted two pits, one in Quabbin and one in Ware River. Completed and issued GMP for Hardwick site. Conducted regular inspections of all pits, monitored crushing by subcontractor at Hardwick location. Flagged additional field limits at new pits. Started Barre GMP. Started evaluation for next site.
G14	Investigate sedimentation on and around Hangar ramp.	No activity this year.
G15	Upgrade Admin building security	New keyless security system installed this year at the QAB. Most external and internal doors fitted with an electronic access point. Phase II of the project to be completed in FY 22.
H. Watershed Protection Act		
H1	Implement the Watershed Protection Act regulations in 14 Quabbin Reservoir and Ware River Watershed towns. Review and process all WsPA applications, and track the status of applications and associated projects using an Access database. Inspect sites throughout the duration of any activity to ensure compliance. Investigate and resolve violations of WsPA regulations.	Received and processed 36 cases in the Ware River Watershed and 8 in the Quabbin Watershed. Investigated several violations in the Ware Watershed and one in the Quabbin Watershed. Conducted multiple site inspections in the Ware and Quabbin Watersheds. Field numerous calls from town boards, consultants, and home owners.
H2	Continue to review or evaluate public notices, local board agendas and minutes, and information provided by local sources for additional jurisdictional activities or enforcement actions.	Reviewed agendas and minutes for all the towns in both watersheds. Contacted several towns regarding projects within WsPA jurisdiction.
H3	Convene WsPA Working Group meetings.	Two full WsPAWG meetings were held during FY21, on 10/22/20 and 2/25/21. There were also continual meetings and discussions amongst Quabbin, Wachusett, and Divisional staff regarding implementation of the Watershed Protection Act. Division and Quabbin staff covered Wachusett WsPA duties during the last four months of the Fiscal Year after the retirement of Nancy McGrath while a replacement could be identified and hired.
H4	Educate and interact with local boards and officials in the watersheds about watershed protection regulations. Educate local officials, realtors, prospective buyers, land development consultants, and homeowners on WsPA regulations and procedures.	Fielded calls from town officials, developers, engineering firms, and homeowners and assisted them with the Watershed Protection Act.
H5	Provide technical assistance support to local boards through contact, meetings, and/or through regulatory review process.	Provided brochures to Lake Association and explained the contents of each brochure and attended several town meetings to assist them with the Watershed Protection Act.

Task #	Task Description	Final Report Comments
H6	Modernize the current Access database into a web-based platform.	No activity on this task this year.
I. Education and Outreach		
I1	Implement the Interpretive Services Plan for the Quabbin Watershed.	Current plan is being reviewed in anticipation of an update.
I2	Staff and operate the Visitor Center at Quabbin to educate visitors about watershed management and related topics. Coordinate with visiting groups to provide orientation at the Visitor Center and in Quabbin Park. Maintain records on Visitor Center activities.	Visitor Center reopened 4 days a week on May 29th. To date, 1337 calls have been received and 1254 visitors have come through the VC.
I3	Continue established programs of public education, including school programs and field trips on DWSP properties. Expand outreach efforts in Quabbin Park. Expand the Quabbin Reservoir watershed curriculum using materials developed by MWRRA, MassDEP, EPA, ProjectWild, Project Learning Tree, Project WET, and other appropriate watershed resources. Continue to support watershed school system teachers through in-service workshops and offerings for school groups.	The ability to offer remote programs (both and school and public) and create more robust materials for the DCR website and youtube channel will help further our educational outreach. Quabbin IS staff will also be doing outreach to schools this fall to provide information about the programs we can offer remotely as well as outdoor programs. Hopefully in the spring we will once again be able to offer group programs within the Visitor Center.
I4	Collaborate with other organizations and watershed communities to reach more diverse audiences. Identify specific groups and their educational needs.	IS staff offered a variety of remote programs throughout the year.
I5	Develop watershed exhibits and portable displays for use in talks and presentations, both in the Quabbin Visitor Center and in watershed communities.	A new and updated orientation film for the Visitor Center provides an excellent overview of the history and management of the Quabbin Reservoir for visitors. https://www.youtube.com/watch?v=JHiW6KX9-Gc .
I6	Maintain self-guided Quabbin Park interpretive walkways focusing on natural resource management and water quality protection; include interpretive signs with information related to watershed protection programs, forest succession, history of the reservoir, wildlife. Utilize outside sources of assistance (e.g., Student Conservation Association) for walkway maintenance.	Two SCA crews implemented the updates to the trail system, including closing trails, adding official trail markers and trail head signs. As well, trails were cleared. The planning and work will improve the visitor experience in the park. As well it will hopefully cut down on lost visitors and the creation of unauthorized trails. The updates to the Quabbin Park Trail System and eventual updates to maps will provide a better visitor experience and hopefully prevent visitor getting lost or creating unauthorized trails.
I7	Improve the educational signage regarding drinking water protection in the Quabbin Visitor Center and in Quabbin Park.	Interpretive signs in the park are in the process of being inventoried
I8	Continue to support and participate in the Envirothon, America's leading natural resource education program for high school students.	Quabbin Interpretive Services staff continue to serve on the steering committee. An in-person event is planned for 2022.
J. Water Quality and Hydrologic Monitoring		
J1	Provide environmental oversight for Regional activities to minimize adverse water quality impacts. Conduct pre-project reviews of all DWSP projects and activities within 100' wetland buffers.	Wetlands delineation and permitting was completed in FY21 to prepare for trail improvements in the Ware River watershed (SCA project, July 2021) and to begin wetlands delineation and permitting for bridge improvements in Quabbin watershed (Macedonia, summer 2021).

Task #	Task Description	Final Report Comments
J2	Continue routine and non-routine water quality sampling and analysis (including algae and nutrients) in order to track water quality parameters and trends in the reservoir and tributaries. Continue analyses for nutrients and calcium on selected tributaries. Review water quality data and prepare annual report summarizing changes over time. Modify sampling plan as needed.	Water Quality report completed and submitted. Routine sampling continues.
J3	Perform Shaft 8 Intake Zone Inspections prior to MWRA diversions.	One sanitary inspection completed prior to diversion in December 2020.
J4	Monitor plankton in Quabbin Reservoir.	Phytoplankton sampling has been accomplished following the established monitoring plan, adjusting frequency based on exceedance of early monitoring triggers when necessary. Reports including phytoplankton densities and reservoir profiles have been distributed to DCR/MWRA as soon as possible following sampling. Wachusett staff have supported training in phytoplankton enumeration and reporting. Purchasing an updated microscope and camera has not been completed. Phytoplankton densities were low during the end of 2020, and until May of 2021. Densities of the taste and odor causing taxa <i>Chrysosphaerella</i> exceeded early monitoring triggers, and on two dates treatment consideration levels at both 202 and 206. <i>Chrysosphaerella</i> densities have dropped to below early monitoring triggers on June 21 at 206, and July 6 at 202. Aside from the chrysophyte aggregation, phytoplankton are typically present at low densities and are dominated by diatoms.
J5	Collect, interpret, and manage data on reservoir elevations, water transfers and releases. Share data with DWSP staff and MWRA.	The reservoir elevation at the start of the Fiscal Year (July 1, 2020) was 528.33 ft. The elevation steadily dropped from July to November, reaching a low of 523.68 ft on November 23. It then steadily increased through the winter and spring seasons, peaking at 527.61 ft on June 2. The elevation did not reach high enough levels at any point during FY21 for any flows to be observed over the upper or lower spillways. The Stevens meter, DCR's water level measurement instrument installed at the Winsor Dam Intake Building, was out of service after an electrical storm that took place on July 22, 2020. A replacement Stevens product was ordered and installed on May 10, 2021. The instrument, which provides internet-accessible real-time data, was out of service for a total of 292 days. Manual readings were recorded at 7:00 AM from Monday to Friday on a weekly basis during that time period. Transfer from Quabbin to Wachusett was active on several occasions throughout FY21 (July 1 - October 18, October 20 - December 3, March 9 - April 16, April 22 - April 26, and May 17 - June 30), sending 44,061 MG in total. Notable Swift River release activity includes Ross Valve use from July to October 2020, and again in June 2021.
J6	Conduct short-term water sampling of forest harvesting operations on DWSP lands.	In Ware River watershed, baseline samples collected at Lot 19-19-2 in Barre in First Quarter, awaiting start of logging for further activities. In Quabbin watershed, post-harvest sample collected at Lot 1056 in Hardwick through 12 months ending in May 2021. FL S11SQ stream crossing SC-4 was monitored starting in November, after active logging began, and continues into FY22.
J7	Investigate re-establishing wind monitoring station to help determine wind impacts to changes in water quality parameters	Wind monitoring station deferred to focus efforts on maintaining and reviewing data from the MWRA monitoring buoy. Using workaround to import data while awaiting availability in MWRA data portal.
J8	Continue improvements to database app for compiling of water quality, quantity, and other relevant data for data and trend analyses.	DCR-EQ migrated database records to a SQL server platform. This necessitated the development of new data-import/data-processing scripts, research into SQL workflows, and internal discussion on data structure and formatting. Data import scripts are now being refined and modified to point to the SQL backend. Front-end tools are also being refined. The water-quality database has been central to DCR-Umass collaborative projects on trend analysis in tributary monitoring.
J9	Implement streamflow monitoring at selected sites. Coordinate flow monitoring with annual water quality sampling plan.	DCR-EQ continues to maintain stream gages at four core water-quality sites and two long-term forestry study sites in the Quabbin Reservoir. Streamflow measures are taken at varying stream stages to develop site-specific stage-discharge rating curves. More than 4 streamflow measurements have been made at each site. Development of rating curves is ongoing. Field comparisons at USGS gage locations show excellent agreement between DCR flowmeter and USGS discharge data (<2% difference). Routine data download of stream pressure transducers is ongoing.

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J10	Work with MWRA to install continuous water quality monitoring buoy at Quabbin Reservoir	Buoy deployed and maintained since April 27. DCR providing boat support for MWRA to perform buoy troubleshooting and maintenance. Real-time data access via MWRA data portal still pending. DCR staff collaborated to allow timely review of reservoir profile data.
K. Watershed Monitoring and Assessment		
K1	Complete Environmental Quality Assessments in the Quabbin Reservoir and Ware River watersheds according to a prescribed schedule. Present EQAs to ARD and RD.	In Ware River watershed, completed data collection for EQA, prepared and submitted draft EQA to EQ EAIV. Macrophyte surveys have begun, continuing into September. The Survey123 app was used to map the presence of an invasive in Comet Pond (first found in 2018). Monthly zooplankton tows at the reservoir core monitoring sites have been completed, and oblique tows at the BLAs are scheduled for July. No invasive zooplankton have been found. In Quabbin watershed, EQA data analysis and report writing completed for submittal in August.
K2	Prioritize recommendations in completed EQAs as necessary and complete short- and long-term remedial actions.	Monitoring potential threats in Watershed including construction sites, farms, spills and AST/UST. Long-term recommendations remain ongoing.
K3	Use site inspections, environmental quality assessments, local board meetings, and information from Watershed Rangers to identify and mitigate possible violations of state and federal regulations. Monitor progress and pursue enforcement if needed.	In Ware River watershed, numerous sites for land development, construction, spills, and violations were monitored, many continuing into FY22. No sites requiring monitoring in the Quabbin watershed.
K4	Conduct routine inspections of the Winsor basin/CVA intake area. Inspect MWRA CVA screen washing when necessary. Report debris and aquatic organisms trapped on screens.	Thirty-three CVA inspections were conducted this year, along with ice surveys during the winter.
K5	Coordinate with other agencies to exchange information and review projects in watershed.	Reviewed MEPA Environmental Monitor for projects in watersheds throughout the year.
K6	Monitor MassDEP databases regularly for new c.21E information.	Database monitored regularly. One new site in Quabbin watershed identified, inspected; file and site review completed.
K7	Review periodic reports on closed landfills in the watersheds. Coordinate with town and/or MassDEP to review monitoring reports.	No new reports on closed landfills.
K8	Review and comment on Yearly Operational Plans related to herbicide use. Monitor and inspect no-spray and limited spray zones along rights-of-way.	Reviewed National Grid YOP in both watersheds and Providence and Worcester YOP in Ware River watershed. Comments submitted on each YOP.
K9	Work with loggers and utility rights-of-way contractors to reduce the risk of introducing invasive species into the watersheds.	All logging equipment is inspected before it is allowed to work on DWSP property.
K10	Monitor ROW maintenance, repair, or replacement projects on DCR lands for water quality problems.	Continued to issue short term access permits and monitor any access issues. Coordinated logistics for work on Bassett Island in Quabbin watershed.
K11	Continue to identify, map, and monitor locations of agricultural operations that could impact water quality through the EQA process.	Mapping completed in the EQA process for each watershed.
L. Aquatic Invasive Species		
L1	Continue program to monitor AIS in tributaries and other water bodies. Review and update the AIS monitoring and AIS emergency action plan.	EQ staff have begun pond survey work. AIS monitoring programs are incorporating Survey123 for field work. Emergency action plan to be updated in FY22.

Task #	Task Description	Final Report Comments
L2	Continue the Quabbin Boat Seal program to minimize the risk of AIS infestation of Quabbin Reservoir. Conduct Cold Weather Decontamination Program and Boat Inspection Program. Maintain database; investigate and pilot test electronic data collection.	Cold Weather Quarantine and Boat Decontamination programs inspected and sealed private boats entering the Quabbin reservoir. Records continue to be collected using ArcGIS and iPad workflows and organized in a central Access database. Multiple DCR teams (EQ, BLA staff, Rangers, Admin, GIS) have worked together to ensure accurate record-keeping and streamline data-entry and data-management processes.
L3	Implement a program of detection, monitoring and control of invasive aquatic species and other macrophytes in the Quabbin and Ware River watersheds, including education and training of Boat Launch Area attendants and other appropriate staff. Work in conjunction with the DCR Lakes and Ponds, MWRA and MWRA contractors. Evaluate and make changes in program as needed.	Limited progress this year. New EQ staff familiarizing themselves with roles and procedures.
L4	Implement Quabbin/Ware Region's AIS Management Plan.	No activity on this task this year.
M. Wastewater Management		
M1	Identify potential problem sites or areas through review of local records, water quality data, and other pertinent information.	Continued monitoring spill mitigation, agricultural operations, and other potential contamination in Ware River watershed. No activity requiring follow-up in Quabbin watershed.
N. Stormwater Management		
N1	Advise local boards on stormwater management issues related to construction activities.	In Quabbin watershed, reviewed repair plans for Glen Valley Rd, Petersham. In Ware River watershed, monitored new subdivision Brintnal Estates, inspected Evergreen Road Bridge, inspected Brice Lemon Estates. Site walks with local boards and contractors ongoing.
N2	Continue to collect data on and update maps of culverts and other stormwater conveyance structures in the Quabbin and Ware River watersheds. Maintain culvert database.	The development and implementation of the Road Infrastructure Management Experience (RIME) ArcGIS Hub Site served as an invaluable tool in the efforts to inventory & inspect stream crossings throughout the Quabbin & Ware River watersheds. Throughout FY21, a total of 118 culverts and 7 bridges were inspected across the two watersheds. 84 of these culverts were assigned an "Excellent", "Good", or "Satisfactory" condition. 6 of these bridges were assigned an "Excellent", "Good", or "Satisfactory" condition.
O. Emergency Response (Preparedness)		
O1	Develop and/or update Emergency Response materials for the Quabbin and Ware River watersheds, with up-to-date contact information, emergency procedures, and roles/responsibilities.	With the arrival of MSP - Marine Unit on Quabbin Reservoir this Quarter, the Emergency Contact lists and emergency procedures were updated for Management, MWRA, and MSP. State Control and MEMA will be updated in Q1 by the Ranger Section.
O2	Update SOPs for spill response and dumping and define DCR staff roles in both assessment and response. Work with MWRA to maintain emergency response trailers and/or other spill response supplies and equipment.	BLA staff completed BLA specific spill response trainings conducted by TIGRE training on site. New PFD protocols implemented this quarter. FOTL working as Fishing Area Supervisor due to IA.
O3	In conjunction with MWRA, coordinate spill response and/or incident command system (ICS) training to staff.	ER trailers monitored regularly and stocked with new supplies.
O4	Coordinate cleanup operations for any spills and dumping that impact or threaten water resources or DWSP property. Work with the appropriate local, state and federal agencies to ensure that spill containment, cleanup, and mitigation is conducted in a manner that protects water quality.	Contacted DEP-WERO with courtesy call for sheen on water at boat cove. Contacted DEP-CERO with notification of material /dumped/discarded on DWSP property in Hubbardston. Coordinated pickup of material by hazardous waste disposal contractor. Attended DEP BWSC advisory committee meeting for updates to MCP regulations. Attending training and received OPA-90 certification.

Task #	Task Description	Final Report Comments
O5	Develop and implement spill response plans for all timber harvesting operations on DWSP lands.	Ten spill plans were developed
O6	Develop comprehensive Emergency Preparedness Program to include natural disasters, accidents, and intentional events.	No activity on this task this year.
P. Support		
P1	Operate administrative offices, including answering phones, greeting visitors, etc.	Ongoing
P2	Manage payroll through SSTA and HR/CMS.	Ongoing
P3	Provide contract administration, financial management, record-keeping, purchasing of goods and services, and other financial support services.	Contract administration, financial management, recordkeeping, and purchasing of goods and services were ongoing activities throughout the quarter and continue through the close out period for the fiscal year end.
P4	Coordinate with EOEEA IT to provide local MIS support for the Quabbin/Ware Region. Develop an annual IT Plan with input from Regional staff that addresses technology needs for the coming year.	Dropbox subscription expired and IT elected not to renew it. Renewed Smartsheet subscription.
P5	Provide personnel services and assistance for all Quabbin/Ware Region employees.	Ongoing
P6	Prepare annual work plans, budgets, quarterly progress reports, and program goals; track progress and submit reports to Division Director, MWRA, and the Water Supply Protection Trust Board.	Budget development, monitoring, and reporting were ongoing activities throughout the fiscal year. A working group was established during fiscal year 2021 for budget and project monitoring. The group met monthly throughout the second half of the fiscal year, and bi-weekly during the final quarter, to monitor the status of projects and strategize and adapt to changes in the environment and project plans.
P7	Provide GIS and GPS services and associated mapping for all Regional plans, reports and projects, as needed. Keep GIS datalayers updated as new information becomes available. Begin implementation of ArcGIS Online and GIS mobile device applications for selected staff.	Even with COVID and working remotely, we made many large GIS-related accomplishments this year. Some of these accomplishments include: Completing the cemetery database and publishing it to ArcGIS Online for future data management; development of a Daily e-Log for the Ranger program; development of a new trail inventory that aligns with DCRS for easier future collaboration on a state-wide trail app; a new way for forestry and CE staff to manage boundary work; getting the EQ section more involved in the use of ArcGIS Online and field data collection apps like Collector and Survey123. We continue to support staff and the growth of GIS use throughout the region.
P8	Update digital information, including all new DWSP land purchases, WsPA maps and parcels, and provide analyses for use in DWSP reports and publications.	WsPA Affected Parcel layer in AGOL updated; this layer powers the public-facing WsPA Viewer. New parcel layers also added to the G drive database, which is distributed to staff via the network and OneDrive.
P9	Plan and implement vehicle and equipment purchases in coordination with WA.	Internal team (WM, Finance, ARD) meet bimonthly this quarter to monitor supply chain issues affecting FY21 Vehicle delivery and upfitting. Many issues arose and were solved for by the team. Region acquired all vehicles ordered in FY21 with modifications due to supply chain issues (e.g., radio installations were delayed). Coordinated with Wachusett to acquire older Ranger trucks.
P10	Conduct truck, boat, and equipment inspections and maintenance as needed, utilizing the Facility Asset Management Information System (FAMIS). Maintain up-to-date records of all vehicles and equipment (in FAMIS and file system).	FMAIS system replaced by Fleetwave. All inspections done and documented. New telematics installed in all DWSP vehicles.

Task #	Task Description	Final Report Comments
P11	Maintain vital records collection for former Quabbin valley towns, issue official records and conduct genealogical and historical research upon request. Manage audio-visual collection of the Region including photographs, slides, oral history tapes and media coverage of Regional activities and Quabbin-related topics.	The Quabbin IS staff continue to work to create usable access to slides and photos.
P12	Administer the Payment in Lieu of Taxes (PILOT) program	A total of \$8,367,913 was distributed in Payments in Lieu of Taxes to 31 Watershed System communities. Within the Quabbin watershed, \$2,919,275, or 35% of the total, went to ten towns. Twenty-three percent of this watershed total, or \$662,153 (or 8% of the total PILOT), was for land annexed from the four towns disincorporated due to the construction of the reservoir. The five towns in the Ware River watershed received \$1,043,036, or 12% of the total PILOT.
P13	Assemble a working group to develop a scope that defines a vulnerability assessment for the watershed system and develop timeline for completion.	No activity this year.
P14	Maintain ArcGIS Online environment for all staff to successfully complete projects.	Ongoing
P15	Configure and maintain both internal and externally facing ArcGIS Online applications. Work with staff to generate field data collection tools using Survey123 and/or Collector for ArcGIS. Maintain existing field data collection tools for staff; maintenance includes archiving of data (as needed) and ensuring that Surveys and Maps remain functional through upgrades to ArcGIS Online and mobile apps. Add GIS-Q as additional staff.	Several large field data collection projects were completed this year, with the result that two sections who were under-utilizing their ArcGIS Online accounts and iPads are now using these things daily (or multiple times per week). This was a huge accomplishment. This includes the Daily e-Log and Citation Management system for the Rangers, and multiple Collector/Survey123 projects for the EQ section. A new (authoritative) trail inventory was created and can now be maintained by staff using ArcGIS Online, ArcGIS Pro or Collector. The Metes & Bounds project ensures that forestry and engineering staff have access to accurate boundary data in the field and can easily keep track of when boundaries have been visited.
P16	Publish hosted feature layers, tile layers and tile packages on an as-needed basis to support projects. Ensure that all public-facing data has proper metadata added as per the EEA ArcGIS Online Best Practices. Add GIS-Q as additional staff.	Hosted feature layers updated on an as-needed basis. We have begun preparing for data consolidation that will occur as a result of network drives being shut down by IT.
P17	Provide staff with training in desktop and mobile GIS applications.	Provided training as needed.
P18	Train staff in field data collection applications as needed for specific projects. Assist with setting up Collector and Survey123 to work with Bad Elf Pro+ GPS units, or with the Arrow 100 GNSS receiver. Add GIS-Q as additional staff.	We continue to support field data collection efforts by purchasing additional iPads or replacement iPads for Quabbin/Ware River staff. There are now 27 iPads distributed throughout the Quabbin/Ware River region for this purpose.
P19	Keep current in new and emerging GIS technologies by attending webinars, taking self-paced trainings and attending conferences (where possible).	DWSP staff attended the ESRI conference this year.
P20	Train staff in GIS on an as-needed basis to provide them with knowledge needed to complete basic GIS-related tasks.	Provided training as needed.

Wachusett/Sudbury Watershed Ranger Activity FY2021

Visitor Contacts: 26,295

Violations: **1,785**

Parking Tickets: 17

313 CMR 11.09	CONDENSED CMRs	# of Violations	Written Warning	Citation
Wachusett				
2a1	Entrance/Exit only through gates or designated areas.	49	5	9
2a2	Allowed on Watershed land 1 hour before sunrise to 1 hour after sunset	300	13	14
2a3	No powered boats except in designated areas.	0	0	0
2a4	No acts which may pollute the water system. No litter thrown or left. Must use sanitary facility.	20	2	3
2a5	All acts injuring the property are prohibited. No person shall injure, deface, destroy remove or carry off any property, including historic artifacts and natural materials. No removal of gravel, topsoil, stones, boulders or other material. No building or constructing any object or structure on property. Collection of berries and mushrooms is allowed for personal use only.	26	1	0
2a6	No cooking or fires.	26	0	6
2a7	No wading or swimming in reservoir except wading while using boots to launch boats in designated areas.	247	7	47
2a8	No wading or swimming in Tributary or Surface Waters, except in designated areas.	18	2	5
2a9	No organized sport activities.	2	0	0
2a10	Division and employees of are not responsible for damage to or loss of property sustained by fishermen, or for any loss of life which may be incurred in connection with public use of the reservoirs and watershed system	0	0	0
2a11	No profanity or other disorderly conduct offensive to general public. No possession or drinking alcoholic beverages	35	5	6
2a12	No Motorized Vehicles. No recreational vehicles, except snowmobiles in designated areas. Motor vehicle parking in designated areas only. Operators of motor vehicles shall obey all regulatory signage unless otherwise directed. No willfully obstructing the free passage of vehicles or persons within the system.	136	3	94
2a13	No animals, except for horses and dogs at Ware River designated areas.	318	3	16
2a14	Bicycles, skis and other non-motorized transportation permitted in designated areas only.	115	2	4
2a15	No landing aircraft or causing to descend except in an emergency.	3	0	0
2a16	No parades, games, fairs, bazaars, carnivals, fishing derbies, gifts or solicitation for raising funds without written approval.	1	1	0
2a17	No lotteries, raffles, gambling or games of chance. No possession of machinery for the former.	0	0	0
2a18	No groups of more than 25 people without written permit.	0	0	0
2a19	No engaging in business, sale or display of goods or wares without written permit.	2	0	0
2a20	No commercial signs or advertising.	0	0	0

313 CMR 11.09	CONDENSED CMRs	# of Violations	Written Warning	Citation
2a21	No persons (unless authorized by law, license, or permit) shall have possession of or discharge any weapon, firearm, fireworks or other explosive on or within the watershed system except at times and areas designated. All forms of target shooting are prohibited.	0	0	0
2a22	No hunting, shooting, or trapping animals except at designated times and areas.	1	0	0
2a23	All persons within the watershed system shall obey the lawful directions of regulatory signs, police officers, DCR Rangers, or persons in charge, or of Federal or Commonwealth wardens or enforcement officers.	94	8	38
2a24	Any part of the watershed lands may be closed for the public access at any time by the commissioner.	176	12	25
2a25	The possession of all types of metal detectors or similar devices is prohibited on all of the Watershed System property.	6	0	0
2d1	Persons in compliance with Commonwealth Fish and Game Laws and Regulations will be allowed to fish from shore of Wachusett Reservoir in areas designated by the commission or its designee.	111	17	13
2d2	Boating is prohibited in Wachusett Reservoir.	2	2	0
2d3	Fishing from the shoreline of the Reservoir shall be allowed only during a season designated by the Commission or its designee.	82	5	1
2d4	Any violation of 313 CMR 11.09 will be deemed sufficient cause for revocation of fishing privileges for not less than one year	1	0	0
Sudbury				
2e1	Persons in compliance with Commonwealth Fish and Game Laws and Regulations will be allowed to fish from shore of Sudbury Reservoir in areas designated by the commission or its designee.	12	1	7
2e2	Boating is prohibited on Sudbury Reservoir.	2	0	1
TOTAL VIOLATIONS		1,785	89	289

Quabbin Watershed Ranger Activity FY2021

Visitor Contacts: 34,267

Violations: **627**

Parking Tickets: 60

313 CMR 11.09	CONDENSED CMR's	# of Violations	# Written Warning	# Citation
1a	No Taking/Diverting Water.	1	0	0
1b1	No construction, filling, dredging, altering land w/out provisions to prevent erosion.	0	0	0
1b2	No construction, establishing, maintaining agricultural facilities or animal manure without adequate provision to prevent manure/other pollutants from entering Waters of Watershed System.	0	0	0
1b3	No engaging in any other activity that could degrade water quality.	0	0	0
1c	No person's property condition should result in discharge of any Pollutants into waters of Watershed system.	0	0	0
1d	Records of board of health or health agent concerning Watershed open to inspection by DCR/DEP.	0	0	0
1e	Person's causing incident/situation threatening pollutants to watershed shall notify DCR/DEP.	0	0	0
2a1	Entrance/Exit only through gates or designated areas.	16	0	1
2a2	Allowed on Watershed land 1 hour before sunrise to 1 hour after sunset (with permitted night fishing exception).	6	0	0
2a3	No powered boats except in designated areas.	0	0	0
2a4	No acts which may pollute the water system. No litter thrown or left. Must use sanitary facilities.	51	0	6
2a5	All acts injuring the property are prohibited. No person shall injure, deface, destroy remove or carry off any property, including historic artifacts and natural materials. No removal of gravel, topsoil, stones, boulders, or other material. No building or constructing any object or structure on property.	20	0	0
2a6	No cooking or fires.	20	0	0
2a7	No wading or swimming in reservoir except wading while using boots to launch boats in designated BLAs.	44	0	0
2a8	No wading or swimming in Tributary or Surface Waters, except in designated areas.	3	0	0
2a9	No organized sport activities except by written permission.	0	0	0
2a10	DCR/DWSP and employees are not responsible for damage to property, injury, or loss of life sustained by fishermen while using the reservoirs within the watershed system	0	0	0
2a11	Breach of peace, profanity or other disorderly conduct offensive to general public. No possession or drinking alcoholic beverages	16	0	0
2a12	No Motorized Vehicles. No recreational vehicles, except snowmobiles in designated areas. Motor vehicle parking in designated areas only. Operators of motor vehicles shall obey all regulatory signage unless otherwise directed. No willfully obstructing the free passage of vehicles or persons within the system.	92	0	60
2a13	No animals, except for horses and dogs at Ware River designated areas.	148	1	3

313 CMR 11.09	CONDENSED CMR's	# of Violations	# Written Warning	# Citation
2a14	Bicycles, skis and other non motorized transportation permitted in designated areas only.	21	0	1
2a15	No person shall bring land or cause to descend any aircraft within the Watershed except in an emergency.	4	0	0
2a16	No parades, games, fairs, bazaars, carnivals, fishing derbies, gifts or solicitation for raising funds without written approval.	0	0	0
2a17	No lotteries, raffles, gambling or games of chance. No possession of machinery, instruments or equipment for the former.	0	0	0
2a18	No groups of more than 25 people without written permit.	50	0	0
2a19	No engaging in business, sale or display of goods or wares without written permit.	0	0	0
2a20	No commercial signs or advertising.	0	0	0
2a21	No persons (unless authorized by law, license, or permit) shall have possession of or discharge any weapon, firearm, fireworks or other explosive on or within the watershed system except at times and areas designated. No target shooting.	2	0	0
2a22	No hunting, shooting, or trapping animals except at designated times and areas.	0	0	0
2a23	All persons within the watershed system shall obey the lawful directions of regulatory signs, police officers, DCR Rangers, or persons in charge or of Federal or Commonwealth wardens or enforcement officers.	31	1	1
2a24	Any part of the watershed lands may be closed for the public access at any time to protect the lands and waters.	3	0	0
2a25	The possession of all types of metal detectors or similar devices is prohibited on all of the Watershed property.	2	0	0
<i>Special Regulations for Quabbin</i>				
2b1	Persons in compliance with Commonwealth Fish and Game Laws and Regulations will be allowed to fish from shore in areas designated by the Commission or its designee. A valid state fishing or sporting license is required by any person renting or launching a boat at any commission facility subject to 313 CMR 11.09. Reasonable fees for the use of boats, for rental of outboard motors for fishing purposes, or use of Commission facilities including parking and boat ramps, may be charged by the Commission.	14	0	0
2b2	Persons permitted to fish from boats shall at all times be responsible for the sanitary conditions of the boat. Persons under 16 years of age must be accompanied by a person possessing a valid fishing license in order to boat on Quabbin Reservoir.	0	0	0

313 CMR 11.09	CONDENSED CMR's	# of Violations	# Written Warning	# Citation
2b3	Only boats of a minimum length of 12 feet, and of a type considered safe by the Commission representative in charge, shall be used. No inboard motors, collapsible boats, sailboats, pontoon boats, square stern canoes, or similar craft will be permitted in the water except in areas designated for boating by the Commission or its designee. Outboard motors shall have a rating of not more than ½ the BIA or OBC rated horsepower for the boat and shall not exceed 20 horsepower, except that outboard motors for Commission boats less than 14 feet six inches shall not exceed 10 horsepower. Boats less than 14 feet shall be limited to 3 occupants, and boats of that length and in excess thereof may be licensed to carry 4 occupants. No boats shall carry more than 4 occupants. Canoes and Jon boats of a minimum of 12 feet, and a type considered safe by the Commission representative in charge, shall be used only in areas designated for boating by the Commission on Pottapaug Pond above the regulating dam and at Gate 31 above the regulating dam. Canoes less than 16 feet and Jon boats less than 14 feet six inches in length will be limited to 2 occupants, and canoes and Jon boats in excess thereof may be licensed to carry 3 occupants. All boats must be in compliance with current Commonwealth Boating Laws. All boats must be clean and contain no refuse of any kind. Commission personnel shall have the right to inspect all private boats launched at Commonwealth facilities and may deny access in order to protect water quality or safety of occupants. Chock blocks must be used on vehicles when removing boats from the reservoir.	5	0	1
2b4	No person shall operate a motor boat at a speed other than responsible and proper or in such a manner as to annoy or endanger the occupants of other boats.	0	0	0
2b5	All privately owned boats, motors and other equipment must be removed from the property of the Commission each day.	1	0	0
2b6	Boats shall not leave the mooring areas before dawn and must at the time posted at each mooring area. The beaching of boats at any point except at the designated mooring and landing areas is strictly prohibited except in cases of extreme emergency.	8	0	0
2b7	Any violation of 313 CMR 11.09 can result in loss of fishing privileges for not less than one year	0	0	0
TOTAL VIOLATIONS		552	2	73

Ware River Watershed Ranger Activity FY2021

Visitor Contacts: 12,332

Violations: 1,250

Parking Tickets: 16

313 CMR 11.09	CONDENSED CMRs	# of Violations	# Written Warning	# Citation
1a	No Taking/Diverting Water.	1	0	0
1b1	No construction, filling, dredging, altering land w/out provisions to prevent erosion.	0	0	0
1b2	No construction, establishing, maintaining agricultural facilities or animal manure without adequate provision to prevent manure/other pollutants from entering Waters of Watershed System.	0	0	0
1b3	No engaging in any other activity that could degrade water quality.	2	0	0
1c	No person's property condition should result in discharge of any Pollutants into waters of Watershed system.	0	0	0
1d	Records of board of health or health agent concerning Watershed open to inspection by DCR/DEP.	0	0	0
1e	Person's causing incident/situation threatening pollutants to watershed shall notify DCR/DEP.	0	0	0
2a1	Entrance/Exit only through gates or designated areas.	0	0	0
2a2	Allowed on Watershed land 1 hour before sunrise to 1 hour after sunset (with permitted night fishing exception).	0	0	0
2a3	No powered boats except in designated areas.	1	0	0
2a4	No acts which may pollute the water system. No litter thrown or left. Must use sanitary facilities.	111	0	2
2a5	All acts injuring the property are prohibited. No person shall injure, deface, destroy remove or carry off any property, including historic artifacts and natural materials. No removal of gravel, topsoil, stones, boulders, or other material. No building or constructing any object or structure on property.	90	4	0
2a6	No cooking or fires.	78	2	0
2a7	No wading or swimming in reservoir except wading while using boots to launch boats in designated BLAs.	0	0	0
2a8	No wading or swimming in Tributary or Surface Waters, except in designated areas.	605	0	0
2a9	No organized sport activities except by written permission.	0	0	0
2a10	DCR/DWSP and employees are not responsible for damage to property, injury, or loss of life sustained by fishermen while using the reservoirs within the watershed system	0	0	0
2a11	Breach of peace, profanity or other disorderly conduct offensive to general public. No possession or drinking alcoholic beverages	37	1	1
2a12	No Motorized Vehicles. No recreational vehicles, except snowmobiles in designated areas. Motor vehicle parking in designated areas only. Operators of motor vehicles shall obey all regulatory signage unless otherwise directed. No willfully obstructing the free passage of vehicles or persons within the system.	130	3	16
2a13	No animals, except for horses and dogs at Ware River designated areas.	116	0	0

313 CMR 11.09	CONDENSED CMRs	# of Violations	# Written Warning	# Citation
2a14	Bicycles, skis and other non motorized transportation permitted in designated areas only.	0	0	0
2a15	No person shall bring land or cause to descend any aircraft within the Watershed except in an emergency.	1	0	0
2a16	No parades, games, fairs, bazaars, carnivals, fishing derbies, gifts or solicitation for raising funds without written approval.	0	0	0
2a17	No lotteries, raffles, gambling or games of chance. No possession of machinery, instruments or equipment for the former.	0	0	0
2a18	No groups of more than 25 people without written permit.	0	0	0
2a19	No engaging in business, sale or display of goods or wares without written permit.	1	0	0
2a20	No commercial signs or advertising.	2	0	0
2a21	No persons (unless authorized by law, license, or permit) shall have possession of or discharge any weapon, firearm, fireworks or other explosive on or within the watershed system except at times and areas designated. No target shooting.	15	0	0
2a22	No hunting, shooting, or trapping animals except at designated times and areas.	0	0	0
2a23	All persons within the watershed system shall obey the lawful directions of regulatory signs, police officers, DCR Rangers, or persons in charge or of Federal or Commonwealth wardens or enforcement officers.	4	0	0
2a24	Any part of the watershed lands may be closed for the public access at any time to protect the lands and waters.	1	0	0
2a25	The possession of all types of metal detectors or similar devices is prohibited on all of the Watershed property.	3	0	0
<i>Special Regulations for Ware River</i>				
2b5	All privately-owned boats, motors and other equipment must be removed from Watershed Property of DCR each day.	1	0	0
2c1	WRW Fishing Designated Areas	9	1	0
2c2	WRW PWR Boats/PWR Canoes Prohibited	0	0	0
2c3	WRW Boat Motor Restrictions	11	1	0
2c4	WRW Revocation of Fishing License	0	0	0
TOTAL VIOLATIONS		1,219	12	19

FY2021 Final Expenditures

**DCR Division of Water Supply Protection
Office of Watershed Management
FY2021 Expenditures**

Object Class	Object	Object Name	Total Expenditures	FY2021 Budget	Expended vs Budget Variance
AA	A01	Salaries: Inclusive	\$9,447,145	\$10,853,257	(\$1,406,112)
	A06	Stand-By-Pay	\$0		\$0
	A07	Shift Differential Pay	\$22,652	\$25,000	(\$2,348)
	A08	Overtime Pay	\$220,875	\$275,000	(\$54,125)
	A10	Holiday Pay	\$42,873	\$40,000	\$2,873
	A11	Salaries-Supplemental	\$0		\$0
	A12	Sick-Leave Buy Back	\$35,329	\$35,000	\$329
	A13	Vacation-In-Lieu	\$116,374	\$55,000	\$61,374
	A14	Stipends, Bonus Pay and Awards	\$0	\$1,000	(\$1,000)
	AA1	Salaries: Supplemental	\$15,429	\$20,000	(\$4,571)
AA Total			\$9,900,677	\$11,304,257	(\$1,403,581)
BB	B01	Other Out Of State Travel	\$160		
	B02	In-State Travel	\$258		
	B03	Overtime Meals	\$0		
	B05	Conference, Training, Registration and Membership Dues	\$2,862		
	B10	Exigent Job Related Expenses	\$1,265		
	B11	Employer Refund of Non-Tax Benefits	\$0		
	B91	Employee Reimbursement Accounts Payable	\$64		
BB Total			\$4,609	\$20,000	(\$15,391)
CC	C01	Contracted Faculty	\$1,866		
	C04	Contracted Seasonal Employees	\$40,072		
	C98	ReimbTravel/Other expenses CC special Contact/Emp	\$65		
CC Total			\$42,003	\$50,000	(\$7,997)
DD	D09	Non-Fringe Benefit Cost Recoupment (payroll tax)	\$0		
	D09	Fringe Benefits Costs Recoupment	\$3,643,715		
	D15	Workers' Compensation Chargebacks	\$224,063		
	D21	Health Ins Costs of Employ/Leave in Excess of 1 Yr Chgback	\$0		
DD Total			\$3,867,779	\$4,355,678	(\$487,899)
EE	E01	Office & Administrative Supplies	\$11,288		
	E02	Printing Expenses & Supplies	\$7,693		
	E04	Central Reprographics Chargeback	\$520		
	E06	Postage	\$5,000		
	E12	Subscriptions, Memberships & Licensing Fees	\$294		
	E13	Advertising Expenses	\$504		
	E14	Exhibits/Displays	\$1,696		
	E15	Water Treatment - Office Water	\$967		
	E19	Fees, Fines, Licenses, Permits & Chargebacks	\$50,654		
	E20	Motor Vehicle Chargeback	\$38,417		
	E22	Temp Use Space/Confer-Incidental Includes Reservation Fees	\$0		
	E30	Credit card Purchases	\$1,295		
	E53	S&J: Non-reportable to claimant, sole payee	\$10,000		
	EE2	Conference, Training and Registration Fees	\$2,685		
EE Total			\$131,013	\$130,000	\$1,013
FF	F01	Food, Beverages & Preservation	\$0		
	F03	Laundry and Cleaning Supplies	\$181		
	F05	Laboratory Supplies	\$2,835		
	F06	Medical & Surgical Supplies	\$13,993		
	F09	Clothing & Footwear	\$56,946		
	F10	Facility Furnshings	\$374		
	F11	Laundry & Cleaning Supplies	\$11,346		
	F13	Live Animals & Related Supplies	\$6,057		
	F16	Library and Teaching Supplies and Materials	\$487		
	F18	Recreation, Religious & Social Supplies & Materials	\$18,931		
	F19	Manufacturing Supply & Materials & Raw Materials	\$5,680		
	F21	Navigational & Nautical Supplies	\$8,448		
	F24	Motor Vehicle Maintenance and Repair Parts	\$98,253		
	F27	Law Enforcement & Security Supplies	\$6,940		
FF Total			\$230,471	\$225,000	\$5,471
GG	G03	Electricity	\$55,617		
	G05	Fuel For Vehicles	\$115,492		
	G06	Fuel For Buildings	\$101,720		
	G08	Sewage Disposal & Water	\$2,547		
	G11	Natural Gas	\$670		
	GG1	Natural Gas Supply	\$0		
GG Total			\$276,045	\$325,000	(\$48,955)
HH	HH1	Financial Services	\$16,621		
	HH2	Engineering, Research and Scientific Services	\$160,000		
	HH3	Media Design, Editorial and Communication Services	\$35,312		
	HH4	Health and Safety Services	\$0		
	H09	Attorneys/Legal Services	\$8,220		
HH Total			\$219,974	\$350,000	(\$130,026)

**DCR Division of Water Supply Protection
Office of Watershed Management
FY2021 Expenditures**

Object Class	Object	Object Name	Total Expenditures	FY2021 Budget	Expended vs Budget Variance
JJ	JJ2	Auxiliary Services	\$0		
	J27	Laundry Services	\$10,253		
	J33	Photographic & Micrographic Services	\$0		
	J44	Surveyors	\$59,136		
	J50	Instructors/Lecturers/Trainers	\$0		
	JJ1	Legal Support Services	\$4,953		
JJ Total			\$74,342	\$35,000	\$39,342
KK	K02	Educational Equipment	\$0		
	K03	Programmatic Facility Equipment	\$57,119		
	K04	Motorized Vehicle Equipment	\$604,587		
	K05	Office Equipment	\$199		
	K06	Printing, Photocopying, and Micrographics Equipment	\$2,932		
	K07	Office Furnishings	\$576		
	K09	Medical Equipment	\$5,485		
	K10	Law Enforcement & Security Equipment	\$618		
	K11	Heavy Equipment	\$347,286		
	K12	Television Broadcasting Equipment	\$0		
KK Total			\$1,018,801	\$1,010,000	\$8,801
LL	L11	Heavy Equipment Lease-Purchase	\$26,851		
	L23	Programmatic Facility Equipment Rental or Lease	\$67,119		
	L24	Motorized Vehicle Equip. Rental or Lease	\$0		
	L25	Office Equipment Rental or Lease	\$2,604		
	L26	Printing/Photocopy & Micrographics Equip Rent/Lease	\$18,272		
	L31	Heavy Equipment Rental or Lease	\$0		
	L42	Educational Equipment Maintenance & Repair	\$0		
	L44	Motorized Vehicle Equipment Maintenance & Repair	\$44,419		
	L45	Office Equipment Maintenance & Repair	\$195		
	L46	Print, Photocopying & Micrograph Equipment Maint/Repair	\$2,464		
	L50	Law Enforcem/Security Equipment Maintenance/Repair	\$0		
	L51	Heavy Equipment Maintenance/Repair	\$10,737		
	L63	Programmatic Equipment Maintenance & Repair	\$7,508		
LL Total			\$180,171	\$250,000	(\$69,829)
NN	N15	Building/Vertical Structure Construction	\$0		
	N16	Major Const/Renovation Bldg & Land Improvements	\$2,168		
	N17	Major Building Maintenance and Land Improvements	(\$769)		
	N19	Land Acquisition and Eminent Domain	\$928		
	N21	Highway Horizontal/Lateral Constssruction	\$0		
	N22	Highway Horizontal/Lateral Maintenance & Improvements	\$161,071		
	N23	Highway Maintenance Materials	\$62,267		
	N41	State Park & Recreation Facilities Construction	\$0		
	N50	Non-Major Facility Infrastructure Maintenance and Repair	\$201,459		
	N52	Facility Infrastructure Maintenance & Repair Tools & Supplies	\$120,539		
	N60	Lawn & Grounds Equipment Maint & Repair	\$6,355		
	N61	Lawn and Grounds Equipment	\$7,851		
	N63	Rental or Lease of Facility	\$0		
	N64	Garden Expenses, Tools and Supplies	\$29,607		
	N70		\$4,796		
	N71	Exterminators/Integrated Pest Management	\$7,694		
	N72	Hazardous Waste Removal Services	\$277,000		
	N73	Non-Hazardous Waste Removal Services	\$65,784		
	N74	Snow Removal and Groundskeeping Services	\$39,820		
	N98	Reimbursement for Travel/Other Expense Infrs Projects	\$0		
	NN1	Engineering, Research and Scientific Services	\$209,493		
NN Total			\$1,196,062	\$1,373,000	(\$176,938)
PP	P01	Grants to Public Entities	\$38,592		
PP Total			\$38,592	\$100,000	(\$61,408)
TT	T04	Payments and Refunds	\$129,260		\$129,260
TT Total			\$129,260	\$130,000	(\$740)
UU	U01	Telecommunications Services Data	\$0		
	U02	Telecommunications Services - Voice	\$96,891		
	U03	Software & Information Technology Licenses (IT)	\$391		
	U04	Information Technology (IT) Chargeback	\$41,383		
	U05	Information Technology (IT) Professionals	\$0		
	U06	Information Technology (IT) Cabling	\$620		
	U07	Information Technology (IT) Equipment	\$16,598		
	U09	Information Technology (IT) Equip Rental Or Lease	\$0		
	U10	Information Tech (IT) Equipment Maintenance & Repair	\$9,576		
	U11	Information Technology (IT) Contract Services	\$3,720		
UU Total			\$169,179	\$215,000	(\$45,821)
Grand Total			\$17,478,977	\$19,872,935	(\$2,393,958)

FY2021 Final Revenue

**DCR Division of Water Supply Protection
Office of Watershed Management
FY21 Revenue Summary**

Revenue Budget	Description	July	August	September	October	November	December	Total Collected Revenue Period 1-6
2010/0300/WMP1/DCR/0500	INTERMENT FEES	\$535.00	\$1,029.00	\$1,266.00	\$60.00	\$0.00	\$75.00	\$2,965.00
2010/0300/WMP1/DCR/3148	FISH & BOATING/DEER HUNT	\$4,243.00	\$4,485.00	\$4,730.00	\$1,749.00	\$0.00	\$0.00	\$15,207.00
2010/0300/WMP1/DCR/4000	RENTS	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
2010/0300/WMP1/DCR/4500	FORESTRY SALES	\$19,410.00	\$31,481.00	\$55,660.00	\$49,414.00	\$21,912.60	\$15,200.00	\$193,077.60
2010/0300/WMP1/DCR/6900	MISCELLANEOUS	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
2010/0300/WMP1/DCR/6901	PRIOR YEAR REFUNDS/ REIMBURSEMENTS	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
2010/0300/WMP1/DCR/6995	HYDROPOWER/TR LINES	\$60,277.81	\$42,329.08	\$62,816.64	\$48,003.64	\$36,901.10	\$21,261.42	\$271,589.69
TOTALS		\$84,465.81	\$79,324.08	\$124,472.64	\$99,226.64	\$58,813.70	\$36,536.42	\$482,839.29

Revenue Budget	Description	January	February	March	April	May	June	Total Collected Revenue Period 7-12	TOTAL REVENUE FY21
2010/0300/WMP1/DCR/0500	INTERMENT FEES	\$0.00	\$30.00	\$0.00	\$475.00	\$775.00	\$0.00	\$1,280.00	\$4,245.00
2010/0300/WMP1/DCR/3148	FISH & BOATING/DEER HUNT	\$0.00	\$4,020.00	\$8,670.00	\$25,535.00	\$42,108.00	\$44,094.00	\$124,427.00	\$139,634.00
2010/0300/WMP1/DCR/4000	RENTS	\$0.00	\$120.23	\$0.00	\$0.00	\$0.00	\$0.00	\$120.23	\$120.23
2010/0300/WMP1/DCR/4500	FORESTRY SALES	\$40,731.00	\$49,294.04	\$15,498.00	\$11,935.00	\$35,204.00	\$55,304.00	\$207,966.04	\$401,043.64
2010/0300/WMP1/DCR/6900	MISCELLANEOUS	\$0.00	\$300.00	\$0.00	\$200.00	\$0.00	\$0.00	\$500.00	\$500.00
2010/0300/WMP1/DCR/6901	PRIOR YEAR REFUNDS	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
2010/0300/WMP1/DCR/6995	HYDROPOWER/TR LINES	\$3,460.06	\$2,516.08	\$0.00	\$23,625.77	\$24,136.00	\$21,619.00	\$75,356.91	\$346,946.60
TOTALS		\$44,191.06	\$56,280.35	\$24,168.00	\$61,770.77	\$102,223.00	\$121,017.00	\$409,650.18	\$892,489.47

Notes

Does not include Special Assessment Revenues-MWRA Assessment & Debt Service Reimbursement.

	FY21	FY21
<u>Category</u>	<u>Projected</u>	<u>Actual</u>
Hydropower/Transmission	\$450,000	\$346,947
Forestry	\$500,000	\$401,044
Recreation	\$210,000	\$139,634
Internment/Rents/Misc.	\$50,000	\$4,865
TOTAL	\$1,210,000	\$892,489

FY2021 Final Land Acquisition

**DCR Division of Water Supply Protection
FY2021 Office of Watershed Management Land Acquisitions**

Land acquisition activities were limited in FY21 due to the Covid-19 State of Emergency. DCR utilized \$575,500 of MWRA funds on land acquisition in FY21 to purchase the control of 37.1 acres of land, all in fee with no Watershed Preservation Restrictions (WPR). Both acquisitions were in the Wachusett Reservoir watershed; no acquisitions were made in the Quabbin Reservoir or Ware River watersheds.

Owner	Town	File #	Acres Fee	Acres WPR	Total Acres	Date Recorded	Price
<i>Wachusett Reservoir Watershed</i>							
Kittredge	West Boylston	W-001226	1.0	0.0	1.0	9/23/2020	\$192,500
Pellecchia	Sterling and Leominster	W-001229	36.1	0.0	36.1	6/30/2021	\$325,000
TOTAL FY21 LAND ACQUISITIONS			37.1	0.0	37.1		\$517,500

FY2021 Final

Payments in Lieu of Taxes

**DCR Division of Water Supply Protection
Office of Watershed Management**

FY2021 Payments in Lieu of Taxes (PILOT)

The total PILOT paid under MGL c. 59, s. 5G for Fiscal Year 2020 was \$8,367,912.90.

This figure represents a 0.15% increase of \$12,226 over the FY20 PILOT of \$8,356 million. This increase is less than the 1.5% estimated increase provided to MWRA in the FY2021 Work Plan. Most towns tax rates were below those utilized to derive the estimated figure of \$8.47 million stated in the FY21 Work Plan.

FY21 PILOT utilized the valuations set by the Department of Revenue (DOR) in 2017 that were subsequently adjusted in FY20 using DOR's Equalized Valuation method (EQV). EQV adjustments are made every other year by DOR. The FY21 figures also incorporated 255.5 acres of fee acquisitions made in FY20.

Four towns saw their PILOT increase. Two of these were due solely to an increase in tax rates. The other two communities had their valuations increased due to 85 acres of land acquisitions; this impact was expected and minimal. Three additional communities in which DCR purchased 171 acres of land in fee had no impact to PILOT from these acquisitions.

The hold harmless clause maintained payment levels in FY21 for the rest of the watershed communities, totaling \$1,970,863.



Department of Conservation and Recreation
 Division of Water Supply Protection
 Office of Watershed Management
 FY21 Payments in Lieu of Taxes
 March 2021 Final

Community	2017 DOR Property Valuation	2020 DOR Property Valuation	FY20 PILOT	Assessed Acres	Valuation per Acre	2019-2020 Acquisitions (acres)	Added Valuation for Acquisitions	Total 2021 Property Valuation	FY21 Tax Rate	FY20 Minimum PILOT Due	FY21 PILOT	Hold Harmless	Increase	% Increase
Barre	\$6,196,400	\$6,586,200	\$186,168.60	5,420.9	\$1,215	0	\$0	\$6,586,200	\$18.00	\$118,551.60	\$186,168.60	\$67,617	\$0	0.0%
Belchertown	\$11,835,800	\$12,615,800	\$257,074.40	3,190.2	\$3,955	0	\$0	\$12,615,800	\$18.13	\$228,724.45	\$257,074.40	\$28,350	\$0	0.0%
Belchertown - Annexed Lands	\$1,576,600	\$1,680,500	\$50,625.10	670.0	\$2,508	0	\$0	\$1,680,500	\$18.13	\$30,467.47	\$50,625.10	\$20,158	\$0	0.0%
Berlin	\$1,900,900	\$2,034,200	\$56,632.13	46.6	\$43,690	0	\$0	\$2,034,200	\$25.95	\$52,787.49	\$56,632.13	\$3,845	\$0	0.0%
Boylston	\$29,059,700	\$32,468,400	\$595,938.71	2,758.2	\$11,772	0	\$0	\$32,468,400	\$16.98	\$551,313.43	\$595,938.71	\$44,625	\$0	0.0%
Clinton	\$5,701,400	\$6,598,800	\$205,948.72	469.2	\$14,063	0	\$0	\$6,598,800	\$27.10	\$178,827.48	\$205,948.72	\$27,121	\$0	0.0%
Framingham*	\$5,502,600	\$6,367,600	\$261,930.91	235.4	\$27,055	0	\$0	\$5,260,000	\$30.09	\$158,273.40	\$261,930.91	\$103,658	\$0	0.0%
Hardwick	\$7,274,600	\$7,662,300	\$122,443.55	4,686.9	\$1,635	0	\$0	\$7,662,300	\$15.73	\$120,527.98	\$122,443.55	\$1,916	\$0	0.0%
Hardwick - Annexed Lands	\$36,900	\$38,900	\$941.41	150.0	\$259	0	\$0	\$38,900	\$15.73	\$611.90	\$941.41	\$330	\$0	0.0%
Holden	\$32,372,600	\$36,147,200	\$919,615.57	3,814.9	\$9,475	95.49	\$904,791	\$37,052,000	\$17.40	\$644,704.80	\$919,615.57	\$274,911	\$0	0.0%
Hubbardston	\$21,254,800	\$24,037,200	\$356,231.30	8,644.1	\$2,781	27.25	\$75,775	\$24,113,000	\$14.81	\$357,113.53	\$357,113.53	\$0	\$882	0.2%
Leominster	\$162,800	\$179,000	\$8,688.49	42.5	\$4,205	0	\$0	\$179,000	\$18.13	\$3,245.27	\$8,688.49	\$5,443	\$0	0.0%
Ludlow	\$221,800	\$228,100	\$10,524.06	50.8	\$4,490	0	\$0	\$228,100	\$21.08	\$4,808.35	\$10,524.06	\$5,716	\$0	0.0%
Marlborough	\$1,984,300	\$2,179,000	\$112,802.46	570.4	\$3,820	0	\$0	\$2,179,000	\$24.47	\$53,320.13	\$112,802.46	\$59,482	\$0	0.0%
New Salem	\$16,884,600	\$17,936,900	\$520,470.61	22,462.7	\$799	0	\$0	\$17,936,900	\$19.63	\$352,101.35	\$520,470.61	\$168,369	\$0	0.0%
New Salem - Annexed Lands	\$5,812,600	\$6,161,400	\$201,603.91	11,580.0	\$532	0	\$0	\$6,161,400	\$19.63	\$120,948.28	\$201,603.91	\$80,656	\$0	0.0%
Northborough	\$4,934,100	\$5,410,700	\$103,466.89	360.9	\$14,994	0	\$0	\$5,410,700	\$17.12	\$92,631.18	\$103,466.89	\$10,836	\$0	0.0%
Oakham	\$9,675,500	\$9,781,900	\$147,067.60	2,537.1	\$3,856	0	\$0	\$9,781,900	\$13.02	\$127,360.34	\$147,067.60	\$19,707	\$0	0.0%
Orange	\$479,400	\$520,400	\$10,796.09	82.8	\$6,285	0	\$0	\$520,400	\$20.05	\$10,434.02	\$10,796.09	\$362	\$0	0.0%
Pelham	\$11,306,000	\$11,717,500	\$338,086.39	5,974.0	\$1,961	0	\$0	\$11,717,500	\$21.42	\$250,988.85	\$338,086.39	\$87,098	\$0	0.0%
Pelham - Annexed Lands	\$813,200	\$842,800	\$38,096.61	1,080.0	\$780	0	\$0	\$842,800	\$21.42	\$18,052.78	\$38,096.61	\$20,044	\$0	0.0%
Petersham	\$10,525,200	\$10,684,400	\$296,721.61	12,230.2	\$874	0	\$0	\$10,684,400	\$15.31	\$163,578.16	\$296,721.61	\$133,143	\$0	0.0%
Petersham - Annexed Lands	\$5,255,300	\$5,332,600	\$203,305.78	10,000.0	\$533	0	\$0	\$5,332,600	\$15.31	\$81,642.11	\$203,305.78	\$121,664	\$0	0.0%
Phillipston	\$140,500	\$146,100	\$11,912.74	162.8	\$898	0	\$0	\$146,100	\$16.11	\$2,353.67	\$11,912.74	\$9,559	\$0	0.0%
Princeton	\$14,859,200	\$16,990,900	\$269,305.77	3,030.3	\$5,607	57.42	\$321,953	\$17,312,900	\$16.12	\$279,083.95	\$279,083.95	\$0	\$9,778	3.6%
Rutland	\$20,933,800	\$23,314,000	\$525,860.45	6,489.0	\$3,593	0	\$0	\$23,314,000	\$16.70	\$389,343.80	\$525,860.45	\$136,517	\$0	0.0%
Shutesbury	\$7,398,700	\$7,185,600	\$299,391.54	4,861.6	\$1,478	0	\$0	\$7,185,600	\$22.61	\$162,466.42	\$299,391.54	\$136,925	\$0	0.0%
Southborough	\$17,383,800	\$18,108,700	\$301,690.94	1,310.6	\$13,817	0	\$0	\$18,108,700	\$16.21	\$293,542.03	\$301,690.94	\$8,149	\$0	0.0%
Sterling	\$44,254,600	\$48,193,300	\$810,129.37	5,144.5	\$9,368	66.90	\$626,711	\$48,820,000	\$16.52	\$806,506.40	\$810,129.37	\$3,623	\$0	0.0%
Templeton	\$50,800	\$55,200	\$1,082.18	92.1	\$600	0	\$0	\$55,200	\$16.11	\$889.27	\$1,082.18	\$193	\$0	0.0%
Ware	\$6,669,600	\$7,064,400	\$193,261.40	4,845.0	\$1,458	0	\$0	\$7,064,400	\$20.18	\$142,559.59	\$193,261.40	\$50,702	\$0	0.0%
Ware - Annexed Lands	\$4,491,700	\$4,757,600	\$167,580.62	3,865.0	\$1,231	0	\$0	\$4,757,600	\$20.18	\$96,008.37	\$167,580.62	\$71,572	\$0	0.0%
Wendell	\$1,322,200	\$1,332,800	\$31,800.61	654.7	\$2,036	0	\$0	\$1,332,800	\$24.54	\$32,706.91	\$32,706.91	\$0	\$906	2.8%
West Boylston	\$20,540,500	\$22,416,500	\$683,581.59	2,930.7	\$7,649	8.48	\$64,861	\$22,481,400	\$18.46	\$415,006.64	\$683,581.59	\$268,575	\$0	0.0%
Westborough	\$2,796,700	\$2,997,200	\$54,908.70	190.8	\$15,710	0	\$0	\$2,997,200	\$18.54	\$55,568.09	\$55,568.09	\$0	\$659	1.2%
TOTAL	\$331,609,200	\$359,774,100	\$8,355,686.80			255.5	\$1,994,091	\$360,660,700		\$6,397,049	\$8,367,912.90	\$1,970,863	\$12,226	0.15%

NOTES:

1. Watershed PILOT, per MGL c. 59 s.5G, is determined by multiplying the DOR valuation by the local commercial tax rate.
2. The process used by MA Department of Revenue (DOR) for valuing State Owned Land (SOL – which includes DCR Watershed Management) under MGL c. 58 changed in FY 19. Under the new process, DOR determined a base year SOL valuation for each community as of January 1, 2017. After a hearing and appeal process, base year SOL valuations were finalized. Going forward under the new process, the base year valuations will be adjusted every two years by a percentage equal to the change in a city or town's equalized cash value (EQV). Valuations are also updated annually to include the value of any acquisitions and/or dispositions in a community.
3. "Hold Harmless" is a provision in the legislation that requires any payment never to be less than the previous year's payment. Therefore, if either valuations or tax rates drop, the municipality is guaranteed a consistent payment.
4. Framingham*: The valuation for Framingham changed in FY21 due to DOR adjustment for lands surrounding Stearns and Brackett Reservoirs (Framingham #1 and #2) which are no longer part of the drinking water supply system. These lands have not been part of the Watershed PILOT calculation since their removal from the water supply system in 2007.