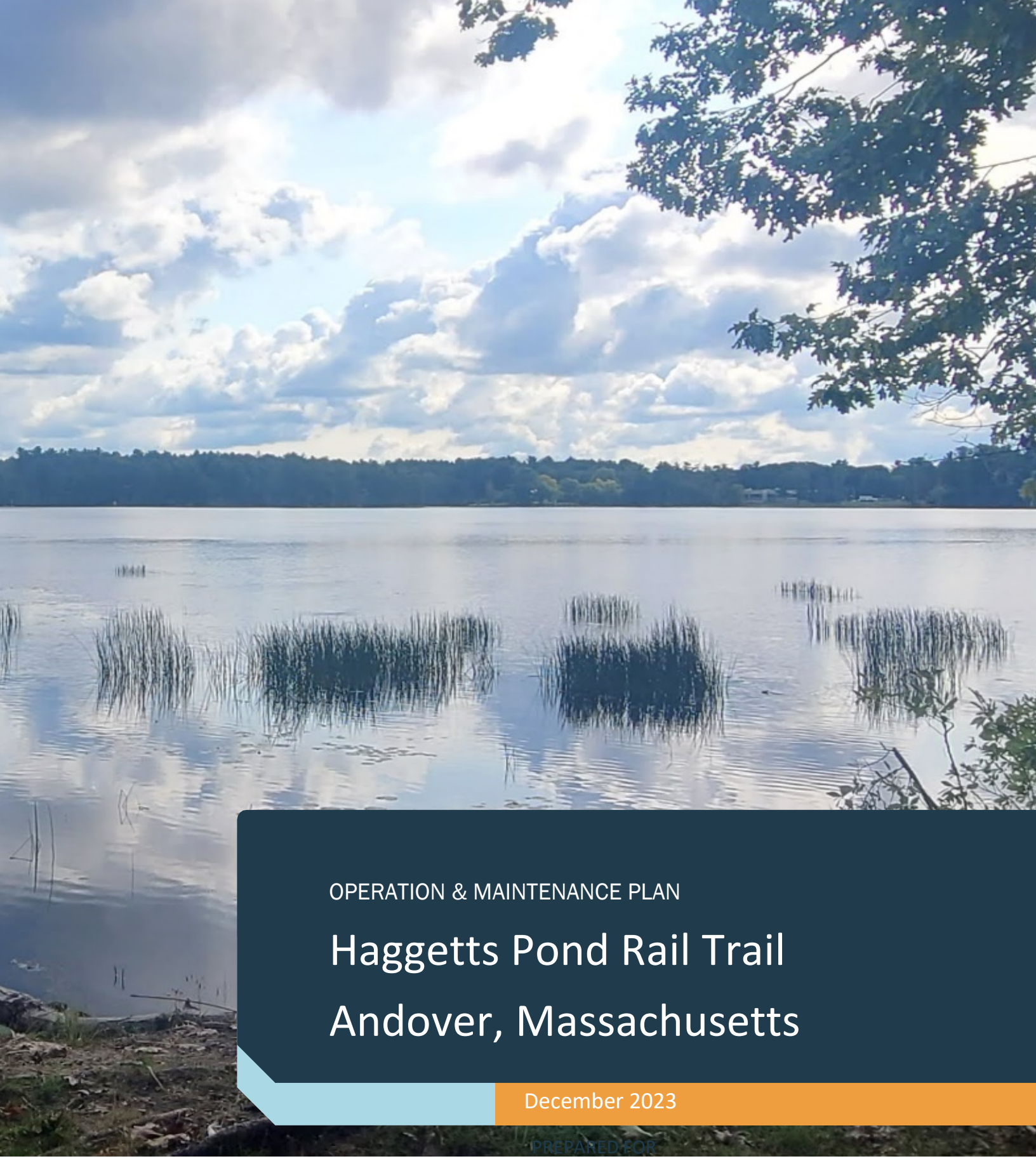

OPERATION & MAINTENANCE PLAN

# Haggetts Pond Rail Trail
# Andover, Massachusetts

December 2023

PREPARED FOR

Town of Andover Department of Public Works

# Operation & Maintenance Plan

## Maintenance: Routine

Routine maintenance is the day-to-day regimen of litter pick-up, trash, and debris removal, week and dust control, trail sweeping, sign replacement, tree and shrub trimming and other regularly scheduled activities. Routine maintenance also includes minor repairs and replacement such as fixing cracks and potholes or repairing broken boardwalk and/or fencing.

### MAINTENANCE RESPONSIBILITY

The enforcement of the Long-Term Operation and Maintenance Plan will be the responsibility of the Owner, the Town of Andover, Massachusetts.

### REQUIREMENTS FOR ROUTINE INSPECTIONS AND MAINTENANCE OF THE RAIL TRAIL AND PARKING LOT AREAS

***Rail Trail***

***Trail user safety***

Safety is central to all maintenance operations and is the single most important trail maintenance concern. Items for consideration include scheduling and documentation of inspections, the condition of fencing, and trail surfaces, proper and adequate signage, and removal of debris.

***Trails inspection***

Trails inspections are integral to all trail maintenance operations. Inspections will occur on a regularly scheduled basis, the frequency of which will depend on the amount of trail use, location, age, and the type of construction. All trail inspections are to be documented. During the first year of operation, it is recommended that the trail be inspected monthly.

***Trail sweeping***

Trail sweeping is one of the most important aspects of trail maintenance, helping ensure trail user safety. Trail sweeping shall be performed by blowing debris such as leaves and pine needles off of the trail. This should be done at a minimum during the Fall and Spring.

***Trash removal***

Trash removal from trail corridors is important from both a safety and protection of environmentally sensitive areas and includes removing ground debris and emptying trash containers and the dog waste

receptacles. Trash removal will take place on a regularly scheduled basis, the frequency of which will depend on trail use. It is recommended that trash removal occur weekly once the trail is completed and schedules be adjusted based on the use and needs.

***Tree and shrub pruning***

Tree and shrub pruning will be performed for the safety of trail users keeping the trail free from low overhanging branches and encroaching branches. Pruning - (Annually) Prune woody vegetation 3-feet back from sides of trail – 14-feet vertical clearance – remove invasive vines. Trimming of Trees/Limbs - (Annually) Evaluation/ removal of unhealthy or dead trees and limbs. All trimmed and felled limbs and trees should remain on site outside the limits of the trail and wetland areas to support habitat value.

***Mowing of vegetation***

Trails maintenance personnel will mow vegetation along trail corridors as needed to maintain the trail shoulders and edges of the parking areas. At a minimum, mowing/weed whacking shall occur annually, after October 15th.

***Trail edging***

Trail edging maintains trail width and improves drainage. Problem areas include trail edges where berms tend to build up, and where uphill slopes erode onto the trails. Removal of this material will allow proper draining of the trail surface, allow the flowing action of the water to clean the trail, and limit standing water on the trail surfaces. Proper drainage of trail surfaces will also limit ice build-up during winter months.

***Rail Trail and Parking Lot Pavement***

Properly constructed asphalt pavement using an appropriate mix design requires minimal maintenance. Providing proper drainage is also a key to reducing maintenance costs. Maintenance is generally divided into two categories, preventative maintenance and corrective maintenance. Preventive maintenance is performed on a regularly scheduled basis to improve the life of the pavement and decrease the rate of deterioration. Corrective maintenance is performed to correct a specific pavement failure or distress area.

The path or trail should be inspected on an annual basis to determine the overall condition of the drainage, asphalt pavement, signage, and vegetation growth.

Drainage areas should be improved or repaired where problems are noted. Vegetation should be removed from the pavement and surrounding areas where it will affect use of the path. Signage should be repaired, replaced or upgraded.

The asphalt pavement should be inspected for cracks, raveling, disintegration, and premature signs of failure. Cracks which are wide enough (generally 1/4 inch to 1/2 inch) should be thoroughly cleaned, dried and filled with a sealant. The best method is to rout the cracks, clean the crack with compressed

air, and pour hot crack filling material into the crack. The crack fill should be left 1/4 inch below the surface of the pavement.

Preventive maintenance should include sealing the surface of the asphalt pavement. Surface seals are used to retard oxidation of the asphalt, restore skid resistance, seal small cracks, provide additional moisture protection to the pavement, and retard raveling of aggregate from the surface. Common surface seals include fog seals, rejuvenators, and slurry seals. The type of seal used will depend on the age and condition of your pavement. In general, a fog seal will improve the moisture resistance of the pavement, reduce future oxidation and fill small cracks.

***Boardwalk***

Trail Surface, boardwalk - (periodically as required) Replace damaged areas. Inspection shall include foundations, surface, and structural elements of the boardwalk to ensure safety for all users.

A newly built deck that uses pressurized wood will need time to dry completely before a sealer can be applied. The chemicals used to treat the wood leave moisture behind, and depending on the climate, it can take a few months until it's dry enough to seal. It is recommended use a non-toxic EPA approved formula to seal the boardwalk deck as needed to protect the decking.

***Long-term Management of Open Field Habitats***

Two large, open fields are currently maintained on parcels owned by the Andover Water Department and the Andover Conservation Commission. Fields are maintained annually by *ad hoc* management agreements. Trails currently exist along the south margin of both open field areas.

Locking access gates and post-and-rail fencing with time of year closure signage is proposed at the trail connections with the proposed rail trail to limit public access to these field habitats during ecologically sensitive seasons (April 1 through October 15).

The annual mowing of these field is to occur after October 15th annually.

**REQUIREMENTS FOR ROUTINE INSPECTIONS AND MAINTENANCE OF STORMWATER BEST MANAGEMENT PRACTICES**

All stormwater Best Management Practices (BMP's) are to be inspected and maintain as follows:

***Water Quality Inlets***

Water quality structures will require periodic inspection and cleaning to maintain operation and function. Owners should have these units inspected on a quarterly basis and after periods of intense precipitation. Inspections of the units can be done by using a clear Plexiglas tube ("sludge judge") to extract a water column sample. When sediment depths exceed 12" then cleaning of the unit is required.

Maintenance of these units should be done by a vacuum truck that will remove the water, sediment, debris, floating hydrocarbons and other materials in unit. The proper cleaning and disposal of the removed materials and liquid must be followed.

Inlet and outlet pipes must be checked for any obstructions and if any obstructions are found, they must be removed. Structural parts of the Stormceptor® will be repaired as needed.

***Existing Catch Basins***

Regular maintenance is essential. Deep sump catch basins remain effective at removing pollutants only if they are cleaned out frequently. Inspect or clean deep sump basins at least four times per year and at the end of the foliage and snow removal seasons. Sediments must also be removed four times per year or whenever the depth of the deposits in the catch basin sump is greater than or equal to one half the depth form the bottom of the invert of the lowest pipe in the basin.

***Pipe Outlet Protection***

The outlet protection should be checked at least annually and after every major storm. If the riprap has been displaced, undermined or damaged, it should be repaired immediately. The channel immediately below the outlet should be checked to see that erosion is not occurring. The downstream channel should be kept clear of obstructions such as fallen trees, debris, and sediment that could change flow patterns and/or tailwater depths on the pipes. Repairs must be carried out immediately to avoid additional damage to the outlet protection apron.

***Sediment Forebays***

Sediments and associated pollutants are removed only when sediment forebays are actually cleaned out, so regular maintenance is essential. Frequently removing accumulated sediments will make it less likely that sediments will be resuspended. At a minimum, inspect sediment forebays monthly and clean them out at least four times per year. Stabilize the floor and sidewalls of the sediment forebay before making it operational, otherwise the practice will discharge excess amounts of suspended sediments.

When mowing grasses, keep the grass height no greater than 6 inches. Set mower blades no lower than 3 to 4 inches. Check for signs of rilling and gullying and repair as needed. After removing the sediment, replace any vegetation damaged during the clean-out by either reseeding or resodding. When reseeding, incorporate practices such as hydroseeding with a tackifier, blanket, or similar practice to ensure that no scour occurs in the forebay, while the seeds germinate and develop roots.

***Bioretention/Rain Garden Areas***

Premature failure of bioretention areas is a significant issue caused by lack of regular maintenance. Ensuring long-term maintenance involves sustained public education and deed restrictions or covenants for privately owned cells. Bioretention areas require careful attention while plants are being established and seasonal landscaping maintenance thereafter.

In many cases, a landscaping contractor working elsewhere on the site can complete maintenance tasks. Inspect pretreatment devices and bioretention cells regularly for sediment build-up, structural damage, and standing water.

Inspect soil and repair eroded areas monthly. Re-mulch void areas as needed. Remove litter and debris monthly. Treat diseased vegetation as needed. Remove and replace dead vegetation twice per year (spring and fall).

Proper selection of plant species and support during establishment of vegetation should minimize—if not eliminate—the need for fertilizers and pesticides. Remove invasive species as needed to prevent these species from spreading into the bioretention area. Replace mulch every two years, in the early spring. Upon failure, excavate bioretention area, scarify bottom and sides, replace filter fabric and soil, replant, and mulch. A summary of maintenance activities can be found on the following table:

**Bioretention Maintenance Schedule**

| **Activity** | **Time of Year** | **Frequency** |
|---|---|---|
| Inspect & remove trash | Year round | Monthly |
| Mulch | Spring | Annually |
| Remove dead vegetation | Fall or Spring | Annually |
| Replace dead vegetation | Spring | Annually |
| Prune | Spring or Fall | Annually |
| Replace entire media & all vegetation | Late Spring/early Summer | *as needed |

Because the soil medium filters contaminants from runoff, the cation exchange capacity of the soil media will eventually be exhausted. When the cation exchange capacity of the soil media decreases, change the soil media to prevent contaminants from migrating to the groundwater, or from being discharged via an underdrain outlet. Using small shrubs and plants instead of larger trees will make it easier to replace the media with clean material when needed.

Plant maintenance is critical. Concentrated salts in roadway runoff may kill plants, necessitating removal of dead vegetation each spring and replanting. The operation and maintenance plan must include measures to make sure the plants are maintained.

***Drainage Channels***

The maintenance and inspection schedule should take into consideration the effectiveness of the drainage channel. Inspect drainage channels the first few months after construction to make sure that there is no rilling or gullying, and that vegetation in the channels is adequate. Thereafter, inspect the channel twice a year for slope integrity, soil moisture, vegetative health, soil stability, soil compaction, soil erosion, ponding, and sediment accumulation.

Regular maintenance tasks include mowing, fertilizing, liming, watering, pruning, weeding, and pest control. Mow/weed whack channels at least once per year. Do not cut the grass shorter than three to four inches. Keep grass height under 6 inches to maintain the design depth necessary to serve as a conveyance. Do not mow excessively, because it may increase the design flow velocity.

Remove sediment and debris manually at least once per year. Re-seed periodically to maintain the dense growth of grass vegetation. Take care to protect drainage channels from snow removal procedures and off-street parking.

***Subsurface Infiltration Chamber Systems***

Subsurface Infiltration Chamber Systems perform an important role, as they provide 80% TSS removal at the end of the treatment train system. Maintenance is required for the proper operation of the Subsurface Infiltration Systems The use of pretreatment BMPs such as deep-sump hooded catch basins will minimize failure and maintenance requirements.

After construction, the infiltration system should be inspected after every major storm for the first few months to ensure proper stabilization. Water levels in the access ports should be recorded over several days to check the drainage of the systems. It is recommended that a logbook be maintained showing the depth of water in the systems at each observation in order to determine the rate at which the system dewaters after runoff producing storm events. Once the performance characteristics of the system have been verified, the monitoring schedule can be reduced to an annual basis, unless the performance data suggests that a more frequent schedule is required.

Preventive maintenance on the systems should be performed at least twice a year, and sediment should be removed from any, and all pretreatment and collection structures. Sediment should be removed when deposits approach within six inches of the invert heights of connecting pipes, or in sumped inlet structures.

The system is designed with access covers such that a vacuum truck tube that can be used to remove sediment.

## SNOW DISPOSAL AND PLOWING PLANS

Snow removal and disposal is not anticipated for the proposed trail or parking areas.

# POST CONSTRUCTION PHASE INSPECTION SCHEDULE AND EVALUATION CHECKLIST

| INSPECTION DATE | STRUCTURE | INSPECTION FREQUENCY REQUIREMENTS | COMMENTS | **Recommendation** |
|---|---|---|---|---|
| | Trail | Twice Year and After Major Storm Events | | |
| | Parking Areas | Twice Year and After Major Storm Events | | |
| | Trash & Dog Waste Receptacles | Weekly | | |
| | Fencing | Twice Year and After Major Storm Events | | |
| | Catchbasins | Twice Year and After Major Storm Events | | |
| | Water Quality Units | Twice Year and After Major Storm Events | | |
| | Subsurface Infiltration/Detention System | Twice Year and After Major Storm Events | | |
| | Pipe Outlets | Twice Year and After Major Storm Events | | |

# References

**Jed Wagner**
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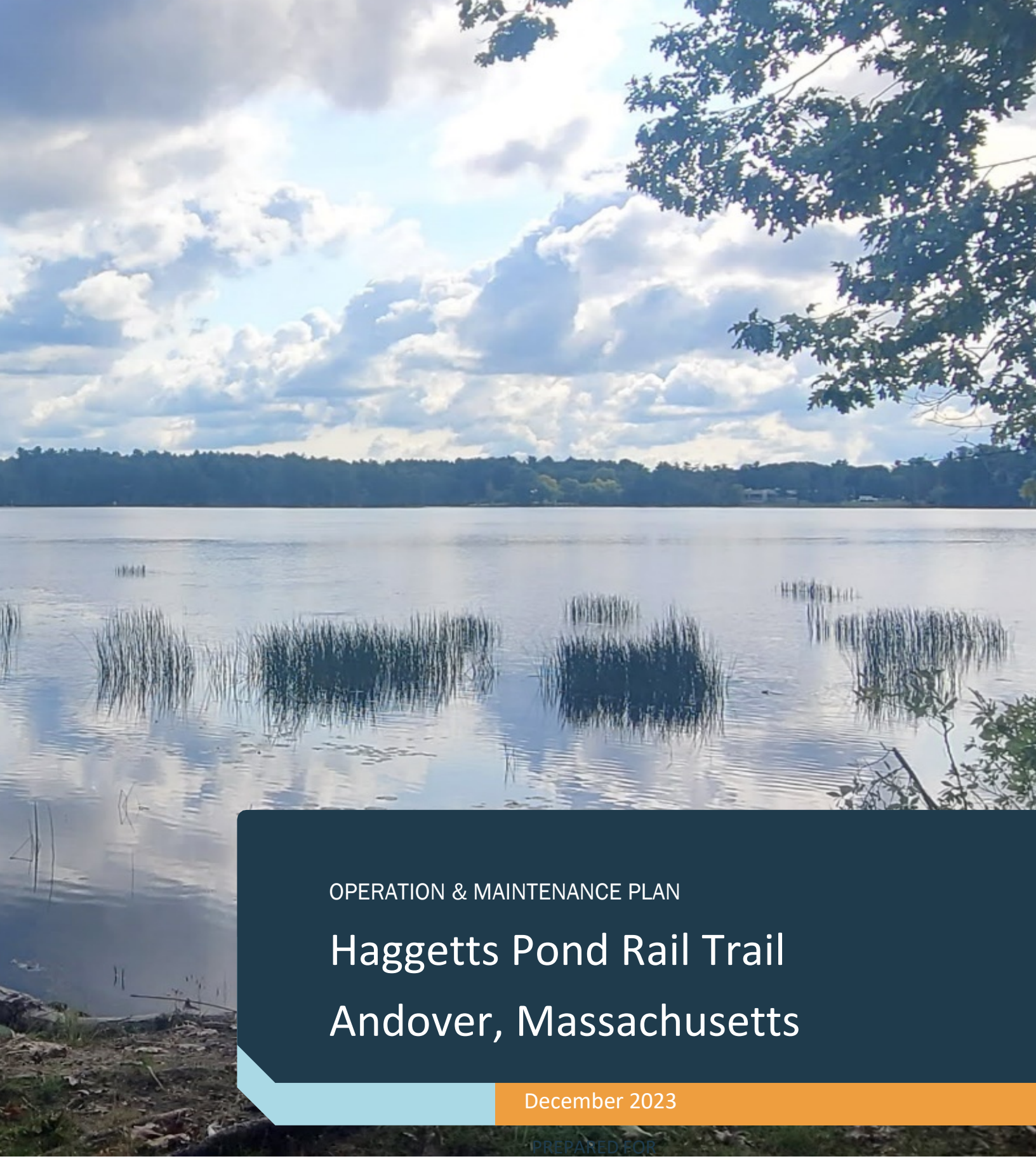

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