

Eisenhaures Pond Park Natural Resource Inventory and Conceptual Trail Plan



Prepared for the Town of North Reading Land Utilization Committee

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Introduction

The Mass Audubon Ecological Extension Service has completed this Concept Plan for Eisenhaures Pond Park to assist the North Reading Land Utilization Committee in determining the best and most feasible ways to increase public access to the park. The land was purchased by the Town in 2005 with the intent of creating a public park. Our work included several field visits in different seasons to characterize the natural resources of the park and to investigate opportunities for trails and points of access. We also met with the Land Utilization Committee and members of the public to gather input on our work.

In this report, we first describe the park setting, existing conditions of natural and cultural resources. We then provide a conceptual plan complete with recommendations for improving access to the park and the trail network. We note points to consider for the ecological management of the property. The report also includes several maps illustrating main concepts, as well as photographs documenting existing conditions.

Locus

The Eisenhaures Pond Park area comprises roughly 73.6 acres located in central North Reading (Figure 1). It lies within the confines of four main roads. Starting from the south and working clockwise around the park these are: Park Street, Central Street, North Street, and Haverhill Street. The majority of the property lies west of Eisenhaures Pond, with frontage along the entire western and southern shore, and the southwestern portion of the pond (Figures 2 & 3). The Park is primarily forested with gently rolling terrain and an overall northeast aspect. Upland knolls are bordered by several rocky wetland swales that drain into the southeast and northwest corners of the pond.

Within the larger landscape, the park provides the largest block of open space between the Ipswich River to the south and Harold Parker State Forest to the north and northeast (Figure 1). The park is also in close proximity to conservation land off near the corner of Haverhill Street and Foley Drive.

Existing Conditions

Natural Communities

Natural communities are groups of organisms that interact with each other and co-occur regularly in the landscape. Because they are dominated by plants, natural communities are classified by the dominant vegetation present. To describe natural communities in Eisenhaures Pond Park, we used the Massachusetts Natural Heritage and Endangered Species Program community classification system (Swain and Kearsely, 2000). Below we describe the natural communities found at the park and provide a list of dominant vegetation present.

Uplands are dominated by a Mixed Oak forest and consist primarily of White Pine (*Pinus strobus*) and Red, Black and White Oak (*Quercus rubra*, *Q. velutina*, *Q. alba*). The understory and herbaceous layers are thin, and dominated by regenerating White Pine with scattered Oaks, and scattered Sheep Laurel (*Kalmia latifolia*), Partridgeberry (*Mitchella repens*), seedlings of black oak (*Q. velutina*), and Low-bush Blueberry (*Vaccinium angustifolium*) respectively.

The rocky wetland swales consist of hardwood swamps and shrub swamps. They are dominated by Red Maple (*Acer rubrum*) with occasional Yellow Birch (*Betula allegheniensis*). Shrub swamps include a mix of Speckled Alder (*Alnus rugosa*), High-bush Blueberry (*Vaccinium corymbosum*), and Sweet Pepperbush (*Clethra alnifolia*). The herbaceous layer in both of these type of swamps contain a suite of hydrophytic species such as Royal Fern (*Osmunda regalis*), Sensitive Fern (*Onoclea sensibilis*), and High-bush and Low-bush Blueberry (*Vaccinium corymbosum*, *V. angustifolium*).

Two of the forested wetlands in the park contain pools of open water. One of these pools has been identified by the Massachusetts Natural Heritage and Endangered Species Program as a potential vernal pool. The other likely functions as a vernal pool as well. Vernal pools are temporary bodies of water that fill in the spring, and in New England often fill again in the fall. Pools in this region typically dry out completely in the summer though some do not. Those pools that do hold water during the summer often have such low water levels that dissolved oxygen plummets. Both conditions, the lack of water or low oxygen content, prohibit the presence of fish in these aquatic habitats. Many amphibians lay their eggs only in vernal pools (perhaps in response to the absence of fish) and are known as *obligate vernal pool species*. Wood Frog and Spotted Salamander are two obligate vernal pool species commonly found in Massachusetts.

Vernal pools are ephemeral bodies of water which, in addition to functioning as breeding habitat, also provide a source of water and vital early spring feeding grounds for a variety of wildlife - which often come to feed on the abundance of protein found in the form of amphibians in their various life stages. Additional food sources in the pool include a host of macro-aquatic invertebrates, such as damselfly and dragonfly larvae, as well as a suite of other aquatic organisms. Furthermore, vernal pools provide aquatic connections across a terrestrial landscape, functioning as a wildlife corridor for aquatic species moving across otherwise inhospitable terrain. Those pools that meet certain biological and physical criteria can be designated as Certified Vernal Pools. While the certification of a pool establishes that it functions biologically as a vernal pool, certified vernal pools are protected only if they fall under the jurisdiction of the Massachusetts Wetlands Protection Act Regulations (310 CMR 10.00).

Mammals

We observed signs of White-tailed Deer and Beaver in the park. Deer scat was observed throughout the property, and chew marks on trees were seen in wetlands along the northwest shore of the pond (photo #1).

The varied natural communities within the park offer a variety of habitats for a suite of other wildlife. Mature trees offer potential cavity nesting sites for Opossum and Raccoon, while the pond and wetlands likely provide habitat for Mink and River Otter. Other species that may be found in the park include: Red and Gray Fox, Eastern Chipmunk, Red Squirrel, Gray Squirrel, Skunk, Eastern Cottontail, Shrews, Moles as well as various mice species. Although the park is surrounded by development, the residential density is low enough that species requiring a larger range, such as Fisher and Eastern Coyote, may also be present from time to time.

Avifauna

During site visits, we observed the following species: Black-capped Chickadee, Tufted Titmouse, Downy Woodpecker, White Breasted Nuthatch, and Brown Creeper. This community of birds was seen foraging in the woods north of off First Street. These species are all year-round residents in Massachusetts, and are likely found in Eisenhaures Pond Park throughout the year. Each of these species is also likely to use the park for breeding habitat.

Other year-round residents that are likely to be found on the property include: Canada Goose, Mallard, Red-tailed Hawk, Eastern Screech-Owl, Great Horned Owl, Northern Flicker, Blue Jay, American Crow, Carolina Wren, Cedar Waxwing, Northern Cardinal, Purple Finch, and House Finch.

During migration periods, especially in the Fall when young-of-the-year embark on their first journey south, a wide variety of bird species *could* be seen in mixed woodland/wetland open space like that at Eisenhaures Pond Park. The wooded uplands are likely to attract a variety of neo-tropical migrants (birds that breed in North American and winter in the Caribbean or Central and South America). In the fall, the pond may attract a suite of waterfowl, and perhaps Osprey or Bald Eagle.

Cultural Resources

In addition to the natural resources on the property, there are also remnants of our cultural past. Several old foundations, wells and numerous stone walls are located on the property (photo #s 14, 15, 17, 23, 32, 33, 35, 43, 44, 45, 47 & 48). These tell of past habitation and farming on the property. These cultural features merit protection just as natural resources do, and therefore should not be altered.

Discovering cultural features is akin to discovering treasures and is often a powerful experience for visitors. We suggest the Land Utilization Committee consult with local historians and develop a plan to interpret the local land-use history, and to provide the public with an educational experience through signage or an interpretive trail. However, the abandoned wells do present somewhat of a hazard. At a minimum we suggest using downed wood to cordon the wells off to call people's attention to them. We strongly advise that the Land Utilization Committee consult with the Historic Commission to investigate the archaeological significance of the wells, and fill them with sand/gravel if warranted.

Existing Entrance Points

Residential development on the perimeter of the park and the in-holdings within the park limit public access to the property. Currently, there are six entrances (Figure 4). Two of the entrances are located off North Street: one off Magnolia Street and another at the corner of Appian Way. A third entrance lies at the end of Eisenhaure Lane (near the intersection with Oscar's Way), and a fourth nearby off Burnham Drive. Another entrance near Burnham Drive is located at the end of Oakdale Road. The sixth entrance is located at the end of Yankee Way, in the northeast corner of the park.

In the conceptual plan below, we provide a more detailed description of each entrance, and make recommendations for establishing two trail heads on the property.

Existing Trails

Presently, there are two main trails on the property (see Figure 4). The most developed trail with the highest use is accessed from the corner of Appian Way and Third Street. This trail leads east adjacent to a wetland swale and crosses over an upland knoll before looping back to the street corner. Several spurs break off of the trail loop: some follow planned roads that were never developed, while others are narrow foot paths that lead to abutter's back yards.

Another well developed trail lies along the western and southern margins of the pond. Beginning at Magnolia Street, it travels south through uplands and bordering vegetated wetlands, crossing wetlands in two rocky swales (photos #47 & 48). The trail then turns to the east, leading to the entrance at the corner of Eisenhaure Lane and Oscars Way. Here, the trail passes through a narrow strip of town-owned land running between the back yards of houses on Burnham Drive and the wetland border of the pond. The trail ends on an earthen dam at the outlet of the pond. Beavers periodically reinforce this dam, occasionally raising the water level and flooding the path. A “beaver deceiver” type flow-structure has been placed in the outlet to help with maintaining a consistent water level. In addition, a small wooden bridge has been placed over the outlet to facilitate passage by foot.

Two small spurs fork off of the main trail. One spur runs north off of First Street, and dead-ends in the back yards of abutting residences. The other spur is located off of the trail that runs along the southern margin of the pond. This spur leads south to Oakdale Road, and links to an existing trail at the end of Burnham Drive.

Conceptual Plan

Our vision for the Eisenhaures Pond Park is to provide sufficient public access and to build a more comprehensive trail network. It is our goal that access points:

- suit the needs of the citizenry;
- respect the neighborhood;
- limit impacts to natural resources.

Similarly, we aim to develop a trail network that:

- provides visitors with an optimum experience;
- respects abutters;
- protects natural resources.

Achieving these goals involves incorporating existing trails when possible, relocating poorly sited trails, and closing trails that are inconsistent with the use of the property. Below we describe opportunities to improve access to the property, and lay-out the framework of a proposed trail network.

Improve Access

As described above, there are currently six entrances used to access the park. However, these entrances are not clear: none are marked and some appear to be on private property. Furthermore, most existing entrances are not suited to accommodating parking or to increased foot traffic.

After exploring all of the possibilities, which are described in detail below and shown on Figure 5, we recommend Burnham Drive and Yankee Lane be designated as primary access points. This will create eastern and western trail heads at previously existing entrances. Locating trail heads at these two points will also take advantage of small, existing town-owned parcels shown on assessor’s maps. At the same time, locating trail heads at these locations will not stress unimproved roads that would be poorly suited to increased traffic flow. However, we advise the Land Utilization Committee to consult with the Planning Department and Fire Department to ensure proper development of parking spaces in the cul-de-sacs at the end of Burnham Drive and Yankee Lane so that any improvements that fall within safety requirements and all other town regulations and ordinances.

Opportunities and Constraints for Improving Existing Entrances

1. Magnolia Street

This entrance lies in the northwest corner of the park off North Street. The trail is located at the northwest corner of the pond, where there is parking for one vehicle on the side of the road. Wetlands and a rocky swale in the vicinity prohibit the expansion of additional parking spaces. Furthermore, the road is ill-suited to increased traffic as it is relatively unimproved and winds through residences scattered among forests and wetlands.

2. Corner of Appian Way & Third Street

This entrance lies in the central-west portion of the property. It is accessed off of First Street, which forks off Magnolia Street approximately 1/10 of a mile south of North Street. First Street leads to Appian Way, and Third Street branches off Appian Way. The entrance lies at the corner of Appian Way, where Third Street branches to the west.

Although there appears to be ample space to provide additional parking at the entrance, as noted above the roads here are ill-suited to increased traffic for they are relatively unimproved, and wind through residences scattered among forests and wetlands. Additionally, assessor's parcel data shows that portions of First Street and Appian Way, which provide access to several homes on the western margin of the park, are located on private property (Figure 6). Therefore, this site is not a strong option for establishing a trail head.

3. Lloyd Road

This short cul-de-sac, which leads from North Street towards the north edge of the pond has the potential for additional parking. However, the town-owned land at the end of the road consists of densely vegetated wetlands. A trail here would require extensive boardwalks to protect the wetland resources. Therefore, this is not a viable option for establishing a trail head.

4. End of Eisenhaure Lane

The Eisenhaure Lane trail entrance is located on a maintained lawn with a granite bench overlooking the pond, which appears to be part of an abutter's garden. As described above, the eastern terminus of the trail leads across an earthen dam with evidence of beaver activity.

Though this is currently one of the most commonly used access points, we recommend closing the trail over the beaver dam and keeping the small park for its attractive view onto the pond. The trail is located in a bordering vegetated wetland. This is an important natural resource which attenuates flood waters, protects water supply, improves water quality, and provides wildlife habitat. The current trail layout requires the adventurous to cross the beaver dam (and a recently installed pre-fabricated foot bridge) and is not suitable for a dedicated trail: on the far side of the beaver dam, the trail runs right behind the backyards of houses on Burnham Drive, detracting from the quality of the visitor experience.

5. Burnham Drive

The Burnham Drive cul-de-sac is located west of Tower Hill Road. Here, an existing trail leads a short way west connecting with a trail extending from the end of Oakdale Road north towards the pond. This existing entrance provides a good opportunity for creating a trail head. Several parking spaces could be designated in the extension of the roadway at the end of the cul-de-sac shown on assessor's maps (Figure 6). Additionally, the trail could be relocated slightly to the northeast to minimize disturbance to abutting residences. Locating a

trail head here would provide access within walking distance for those in the neighborhood, a compensation for those who currently use the access at the end of Eisenhaure Lane.

6. Oakdale Road

Oakdale Road is a little traveled, narrow dirt road on the southern side of the park. It winds through residences scattered among forests and wetlands. It is unclear if the road is a public way or a private drive. Though the road leads to an existing trail, it is ill-suited to increased traffic and too narrow to allow for increased parking. Therefore, we do not recommend using this entrance to improve access to the park.

7. Yankee Lane

Yankee Lane is a cul-de-sac on the western side of the property located off of Central Street. An existing entrance leads from the end of the road into the northern section of Eisenhaures Pond Park. Although there is parking for several cars in the cul-de-sac, there is good potential to designate several more in the parcel at the end of the cul-de-sac shown on assessor's maps (see Figure 6). Improving the Yankee Lane entrance would provide the public with good access for minimal effort for trail and parking space construction.

Improve Trail Network

Improving the network of trails within the property is also an important component of the conceptual plan. When considering a trail network, we consider both the visitor experience and protecting natural resources. For Eisenhaures Pond Park, we suggest modifications to existing trails, creating trail loops, and constructing appropriate wetlands crossings. We also recommend posting signs at trail heads and blazing trails.

Create Trail Loops

We conceptualize a series of trails that loop through the various natural communities on the property. In this way, visitors will have the opportunity to connect a series of shorter trail segments to create loops of various lengths. Visitors will be able to go for a shorter or longer walk, depending on the time available, and will not have to go on an "out-and-back" type of walk which can be unsatisfying.

To promote a connection with nature, we suggest that trails be located a sufficient distance from each other so that travelers on one path cannot see through the woods to visitors on another. We also recommend that trails be located as far away from residences as possible. This will serve two functions: it will help to maintain good relations with abutters; and it will enhance the visitor's experience by minimizing contact with the built environment.

Close Poorly Located Trails

We recommend closing two trails: one at the end of Eisenhaure Lane, and another near the corner of First Street and Appian Way. The trail off Eisenhaure Lane is located in a bordering vegetated wetland. Bordering vegetated wetlands are important natural resources, and at Eisenhaure Pond they function to attenuate flood waters, protect water supply, improve water quality, and provide wildlife habitat. Furthermore, as noted above, this trail is close to abutting residences - in essence it is in the back yard of these properties. For both of these reasons, this trail is poorly suited to increased foot traffic and therefore we recommend its closure.

We also recommend closing the northern-most section of a trail spur located off First Street. The trail appears to be located on a planned road that was not developed. It is not part of any trail loops, and leads to the back yards of several abutting residences. Although a portion of this trail is recommended for access to

Yankee Lane, closing the northern-most section of the trail and allowing the forest to regenerate will provide a larger area within the park that has limited human disturbance.

Modify Wetland Crossings

Several existing trails cross wetlands and intermittent streams. These crossings are either on improvised structures (such as pallets laid in the substrate), across stones, or directly through the wetlands at-grade (see photos #16, 26, 29, 47, 48). These crossings are hazardous to visitors or damaging to wetland and aquatic resources. We describe several possible solutions to improving wetland crossings, and depict their locations in the map on Figure 5.

When trails that cross at-grade through wetlands cannot be located outside of the bordering vegetated wetland, we recommend that they be replaced with a “bogwalk” - boards laid across and affixed to logs set in the ground.

Other crossings will require the construction of a boardwalk or bridge, such as the crossing off First Street (photo #26), or the rocky swale in the southeast corner of the pond (photos #47, 48). However, it may also be possible to reconfigure the stones in the rocky swale so that they are easier to cross. This would allow visitors to navigate the crossing more easily while maintaining the historic nature of the crossing, which appears to be associated with the old well and foundations found nearby.

Any type of improvements to wetland crossings will require the Land Utilization Committee to consult with the Conservation Commission, who have jurisdiction over wetland resource areas and the type of work that take place there, including wetland crossings.

NOTE: The estimated trail construction costs for a ~3 foot wide trail are as follows: natural surface, \$5.00/linear foot; bogwalk, \$20.00/square foot; boardwalk or bridge, \$200/linear foot.

Final Trail Improvement Recommendations

Historic and more recent casual and unmanaged use of the property has led to an unorganized network of trails. It will be important to encourage new users and those already familiar with the park to stay on designated trails and discontinue use of the trails to be closed. A trail map, available on the town website and displayed in a kiosk at the entrances, should clearly show trails and trailheads, the boundaries of the property, and the location of private lands within and adjacent to the park. Trails should be well marked with blazes and maintained regularly so the proper pathway is clear to see and easy to follow. We recommend placing logs and a small amount of brush across closed trails to discourage their continued use. Small “Trail Closed” signs can be placed in the center of closed trails until they have revegetated.

Management Recommendations

Below, we provide recommendations to protect the natural resource values of Eisenhaure’s Pond Park. We propose the ecological monitoring and management of several natural communities within the park, and suggest the development of allowable and prohibited uses of the property. We also call attention to existing conditions that require immediate attention because of their threat to natural resources.

Aquatic & Wetland Resources

The most important natural resources at the park are Eisenhaure's Pond and its bordering vegetated wetlands, and other wetlands on the property including two rocky swales. Uplands adjacent to the pond are also important. Together, these elements of the landscape affect the overall water quality of the pond.

We recommend that the Land Utilization Committee work in conjunction with the Conservation Commission to better protect aquatic resources and wetland functions. A primary objective in achieving this goal is to improve the trails where they cross or come close to wetland resources. Wetland crossings should be improved with bogwalk, bridging or boardwalk so that soils in the wetland are not disturbed by users. Wherever possible, trails should be pulled away from the pond and wetland edges. This will help to reduce sedimentation of the wetlands, nutrient loading from runoff and animal waste, and loss of wetland function due to soil compaction.

In addition to improving the trail system, we suggest that Eisenhaures Pond be monitored annually for basic indicators of water quality including temperature, turbidity, dissolved oxygen, pH, nitrogen, phosphorous, bacteria and macro-invertebrates. These measurements serve as indicators of the overall health of the aquatic ecosystem and can alert managers to changes in the landscape immediately surrounding the pond, and changes to the habitat quality of the pond. The Ipswich River Watershed Association may have an active group interested in partnering with the Land Utilization Committee to conduct monitoring.

The Land Utilization Committee should conduct a survey of the two pools of water that likely function as vernal pools. This requires observing the pool in early spring for the presence of obligate vernal pool species - notably Wood Frogs (*Rana sylvatica*) and Mole salamanders (*Ambystoma spp.*). Instructions for conducting a vernal pool survey and for certifying a pool through the Mass Natural Heritage and Endangered Species Program are included in the appendix of this report. Additionally, to further protect these pools we recommend that trails near their edges be relocated at least 50-feet from their mean annual high water marks. This will help to protect the aquatic and wetland resources which are especially important for these pools to function as breeding habitat for amphibians.

Invasive Plants

Overall, we observed few invasive plant species during our site walks at Eishenhaure's Pond. A few stems of Glossy Buckthorn (*Rhamnus frangula*), Shrub Honeysuckle (*Lonicera sp.*), Multiflora Rose (*Rosa multiflora*), and Japanese Barberry (*Berberis thunbergii*) were observed in scattered upland locations. The low abundance of invasive plants at the property is surprising given historic disturbance on the property and dense development surrounding the park.

Invasive plants can pose a threat to wildlife because they often out-compete, displace, or contribute to the decline of native plants and compromise the habitats of native animals. Many invasive species, such as those listed above, are already widespread and common in Massachusetts. Their control often involves the use of herbicides. Given the current low level of invasion, we recommend that any non-native invasive plants be removed manually, with a root-wrench or similar tool, to reduce the threat of further invasion. We have provided an index to some common invasive plant species and their recommended treatment in the appendix of this report. Again, the North Reading Conservation Commission should be consulted regarding the treatment of invasive plants that are found in resource areas under their jurisdiction.

Locations Requiring Immediate Attention

During our site visits, we noted several areas that require immediate attention due to the threat to natural resources (Figure 7). These include: dumping spots, forts, ATV use, improvised wetland crossings, and fire circles. These sites are documented with photographs found in the end of this report.

Evidence of recent ATV use was observed throughout the western portion of the park. Illegally dumped materials were found at several locations along dirt roads in the interior of the property. Stone fire rings and make-shift wooden “forts” were also found in several locations on the property. These uses reduce the natural resource values of the property and seem to be inconsistent with the intention of providing users with a nature experience. We recommend that the Land Utilization Committee disassemble the forts, disperse the stone fire rings, and investigate the source of the ATV traffic and educate townspeople about the acceptable uses of the property.

Develop Allowable and Prohibited Use Policies for the Property

To properly protect the natural resource values of the property and maximize the visitor’s experience of the park, we highly recommend that the Land Utilization Committee develop a list of allowable and prohibited uses of the property. Once established, the uses should clearly be posted at trail heads, and publicized through the town website and in the local newspaper.

Uses to consider include: on-leash and off-leash dog walking, cross-country skiing, horseback riding, bicycling, picnicking, fishing, swimming, skating, hunting, motorized or non-motorized boating, use of ATVs and other motorized vehicles, fire circles, open fires, camping, and paintball. The Land Utilization Committee should monitor the property at least annually to evaluate uses and address management issues as needed.

Locate Boundaries

Many of the recommendations made in this report rely on a clear understanding of the location of the park’s boundaries on the ground, for example: locating trails, addressing encroachment issues, and conducting ecological management. To our knowledge, there is no recent recorded plan of surveyed park boundaries. The Town of North Reading Assessor’s Office, Planning Board, or some other town office may have this information, and we recommend that the Land Utilization Committee consult with town offices first.

If a recent recorded plan of the property is not available, we suggest that the Land Utilization Committee conduct a document search for registered deeds and plans at the Middlesex South Registry of Deeds. We advise starting with a document search on *abutting* properties, rather than the parcels that comprise the park. Plans of abutting properties were likely to have been required at the time they were developed. This “hole in the donut” approach will facilitate the identification of property lines, and illustrate which boundaries have been surveyed and which have not.

Ideally, the Land Utilization Committee would commission a survey of the Eisenhaure Pond Park property by a civil engineer or similar professional. Although plans of abutting parcels may exist, they may not be accurate. Commissioning a survey of the property is the best insurance for acquiring an accurate boundary line. However, we recognize that this may not be financially feasible. In the mean time, referring to registered plans of abutting properties is an initial step in locating boundary lines, and will allow the Land Utilization Committee to focus on those property lines for which no boundary has been determined.

Conclusion

Eisenhaures Pond Park is a valuable component of the ecological landscape with a variety of habitat types including the pond, upland forests, and wooded swamps. For residents of North Reading, the park offers a respite from the built environment, with overall relatively little natural disturbance within the park despite the surrounding development.

A network of existing trails lead to many interior portions of the property, including the shoreline of the pond, woodlands, interior wetlands, as well as historic cultural features. However, current access to the park is limited, access points are unclear, and parking is inadequate.

We recommend improving two main access points to the property: one in the east off Burnham Drive and one in the west of Yankee Lane. We also recommend slight modifications to the trail network. These include the closure of several small sections of trails, a proposed trail to better link western and eastern sections of the park, and the construction of boardwalks or bridges across sensitive wetlands. These proposed trail modifications will create a network of trail loops and help protect natural resources.

There do not appear to be critical management issues at this time, although we do make a few recommendations for monitoring natural resources and unintended use of the property. We recommend that the exact location of property boundaries be identified in the field. And we also suggest that the Land Utilization Committee consider establishing policies or guidelines regarding the use of the property to ensure the enjoyment of the property by visitors, and the protection of natural resources.

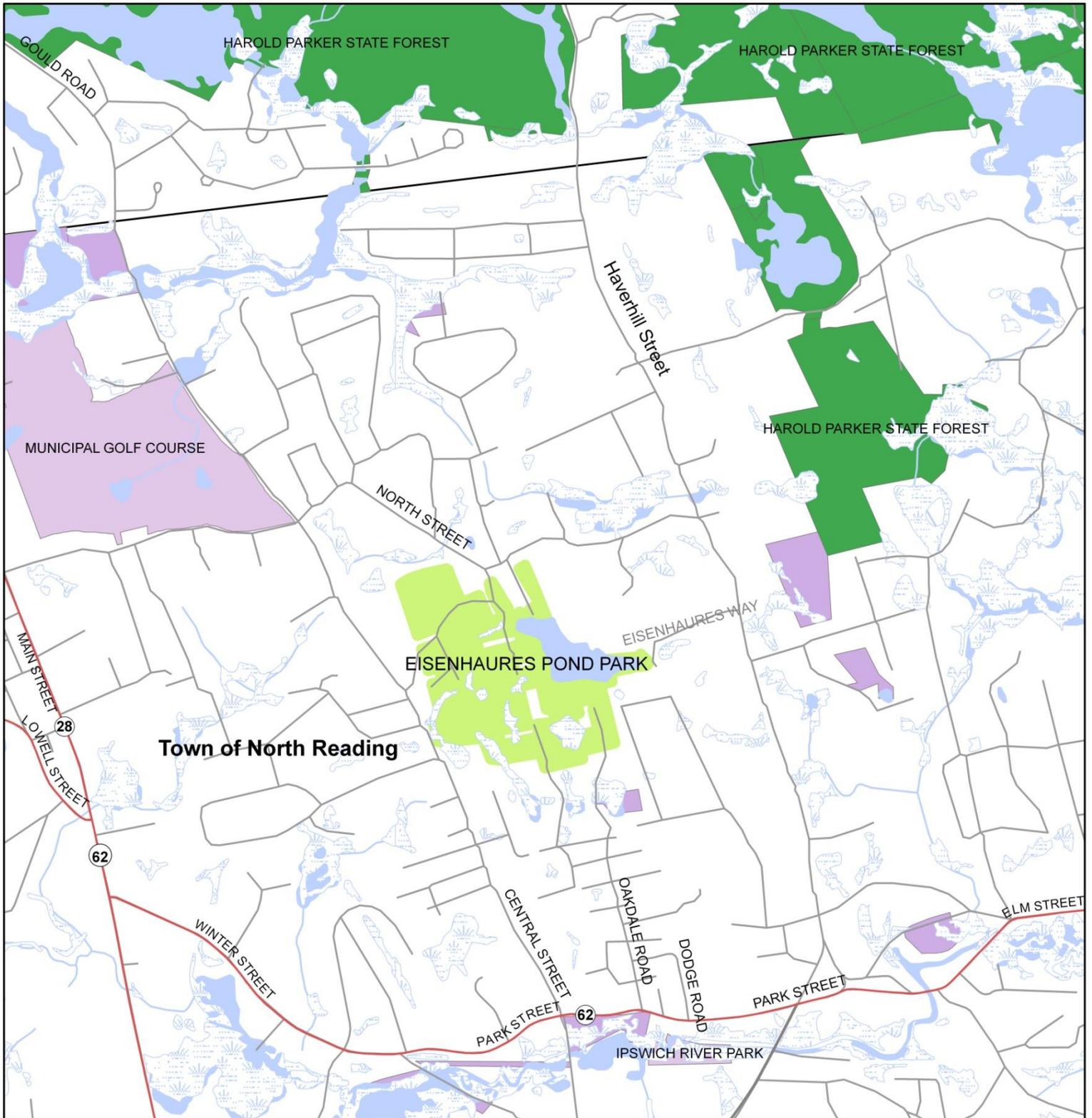


Figure 1. Eisenhaures Pond Park

Locus Map & Contiguous Open Space

- Park boundaries
- DCR
- Municipal
- Land Trust
- Conservation Organization



Data Source: EOT-OTP Roads, hydrology, and Open Space from Mass GIS. Boundaries are approximate and subject to verification in the field.



Figure 2. Eisenhaures Pond Park
Orthophoto

0 250 500 1,000
Feet



 Park boundaries

Data Source: Parcel boundaries and 2008 orthophoto from Mass GIS. Boundaries are approximate and subject to verification on the ground.



Figure 3. Eisenhaures Pond Park
Topographic map

0 250 500 1,000
Feet



 Park boundaries



Figure 4. Eisenhaures Pond Park

Existing Trails and Entrances

- Trail
- Roads



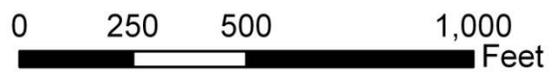
Data Source: Orthophoto, EOT-OTP roads, and town parcel data from Mass GIS. Trails from Mass Audubon. Boundaries are approximate and subject to verification on the ground.



Figure 5. Eisenhaures Pond Park

Conceptual trail plan

- Recommended trail
- — Proposed bog/board walk
- - - Proposed trail closure
- 1 Potential trail head
- P Explore parking expansion
- Roads



Data Source: Orthophoto, EOT-OTP roads, and town parcel data from Mass GIS. Trails and monitoring points from Mass Audubon. Boundaries are approximate and subject to verification in the field.



Figure 6. Eisenhaures Pond Park

Assessor's Parcels

- Eisenhaures Pond Park parcels
- Potential trail head and parking expansion
- Proposed trail network
- Hydrologic features
- Roads



Data Source: EOT-OTP roads and town parcel data from Mass GIS. Boundaries are approximate and subject to verification on the ground.



Figure 7. Eisenhaures Pond Park

Monitoring points

- Fort/structure
- Cultural feature
- ATV, Erosion
- Dumping
- PVP
- Existing trails



Data Source: Orthophoto, EOT-OTP roads, and town parcel data from Mass GIS. Trails from Mass Audubon. Boundaries are approximate and subject to verification on the ground.



1. Evidence of beaver activity at Eishenhaure Pond Park.



2. Trash in woods off trail along southern margin of pond.



3. Dirt road in relatively good condition leading into property.



4. Dirt road in relatively good condition leading into property.



5. Trash dumped along First Street in Eisenhaures Pond Park.



6. ATV trails in Eishenhaures Pond Park off First Street



7. ATV trails in Eishenhaures Pond Park off First Street.



8. ATV trails in Eishenhaures Pond Park off First Street



9. ATV trails in Eishenhaures Pond Park off First Street.



10. Mature oak canopy with significant White pine regeneration in the understory. Thinning the pine will promote a more diverse canopy structure in the future.



11. ATV trails in Eishenhaures Pond Park off Third Street.



12. ATV trails in Eishenhaures Pond Park off Third Street.



13. ATV trails in Eishenhaures Pond Park off Third Street.



14. ATV trail in Eishenhaure's Pond Park off Third Street.



15. ATV trail in Eishenhaure's Pond Park off Third Street



16. ATV trail through wetlands. This type of crossing is damaging to wetland resources.



17. ATV trail in woods off Third Street.



18. ATV trail in woods off Third Street.



19. Woodland pool, which likely functions as a vernal pool, in woods of Third Street.



20. Woodland pool, which likely functions as a vernal pool, in woods of Third Street. Note narrow opening in foreground of photo where ATVs have entered and exited the wetland.



21. ATV trails in woods off Third Street.



22. ATV trails in woods off Third Street.



23. ATV trails in woods off Third Street.



24. Improvised trail created by ATV driving through woods off Third Street.



25. Improvised trail created by ATV driving through woods off Third Street.



26. ATV trail through Rocky swale in woods off Third Street.
Note planks placed in stream bed. This type of use is damaging to wetlands.



27. Remnants of lean-to in woods off Third Street. The site was likely used for games of paintball combat.



28. Remnants of lean-to in woods off Third Street. The site was likely used for games of paintball combat.



29. ATV trail through wetlands in western portion of the property.



30. Wetlands in woods off Third Street.



31. ATV trail in woods off Third Street.



32. Old foundation in woods off Third Street.

Cultural features such as these are interesting to visitors and present an opportunity for interpretation.



33. Old well in woods off Third Street. We recommend erecting some type of structure to that provides interpretive history and alerts visitors to this potential hazard.



34. Trail in right-of-way, part of the planned development. Note utility pole and wires to right in photo.



35. Trail in right-of-way, part of the planned development. Note utility pole and wires to left in photo.



36. View of Eisenhaures Pond from bench at the intersection of Eisenhaures Lane and Oscar's Way.



37. Path and footbridge across beaver dam at eastern end of Eisenhaures Pond, at the intersection of Eisenhaures Lane and Oscar's Way.



38. Trail on existing right-of-way from planned development. View is south along trail towards Oakdale Road.



39. Trail on existing right-of-way from planned development. View is north towards the pond.



40. View of Eisenhaures Pond from trail on southern margin of pond.



41. Footpath on southern margin of Eisenhaures Pond.



42. Trash, debris, and remnants of forts on south side of pond. The forts are likely used for paintball combat.



43. Stones from old foundation on southern margin of pond.



44. Old well in woods off Third Street. We recommend erecting some type of structure to provide interpretive history and alerts visitors to this potential hazard.



45. Stones from old foundation on southern margin of pond.
Cultural features such as these are interesting to visitors and present an opportunity for interpretation.



46. Northern watersnake basking on rocks near the shores of Eishenhaures Pond.



47. Rocky swale at the southwest corner of Eishenhaures Pond Park.
An existing footpath along the margin of the pond follows stones across the stream.



48. Stepping stones across the rocky swale at southwest corner of Eisenhaures Pond.
The stones are difficult to negotiate and the crossing would benefit from improvements.

Invasive Plant Species Management Recommendations

Species	Control Recommendations		Notes
	Manual	Chemical	
Common Barberry	Plants can be hand-pulled or removed with a weed wrench.	A 2% foliar spray or a 30% cut and paint treatment can be used with a Glyphosate solution.	Common barberry reproduces by seed and vegetatively. Seeds have a very high germination rate.
Common Buckthorn	Seedlings can be hand-pulled and larger plants can be removed with a weed wrench.	A 25% solution of Triclopyr is recommended for cut and paint treatment and 20% solution of Triclopyr is recommended for basal bark treatment. A 2% foliar spray of Glyphosate or triclopyr can also be used.	Reproduces by seed.
Glossy Buckthorn	seedlings can be hand-pulled and larger plants can be removed with a weed wrench.	Cut and paint with a 20% solution of Glyphosate or 25% triclopyr. A 2% foliar spray can be used while there are leaves.	Reproduces by seed.
Honeysuckle shrubs	small plants can be hand pulled or removed with a weed wrench. Care should be taken to remove all roots and not to spread berries.	Foliar spraying can be done as long as there are leaves present a 2% solution of triclopyr or Glyphosate is recommended. A 25% solution for cut and paint treatments can be used, put the solution right into the hollow stem and around the stem edge. This is best during the fall when all of the plant fluids are headed towards the root system.	The seed bank is short lived and is believed to be viable for approximately 1 year. The berries are mildly poisonous if eaten.
Japanese Barberry	Small plants can be removed by hand pulling or using a weed wrench.	A 2% foliar spray can be used when leaves are present (April). Both Glyphosate or a triclopyr solution can be used. A 25% cut and paint solution of Glyphosate or triclopyr can be used, it is most effective in the fall when sap flow is towards the root system.	Japanese Barberry spreads by seeds and vegetatively. The seeds have a 90% germination rate.

Species	Control Recommendations		Notes
	Manual	Chemical	
Japanese Honeysuckle	Plants can be hand pulled for small infestations. Care should be taken to remove all roots, vegetation should be bagged.	A 2% foliar spray of triclopyr or Glyphosate can be used from July- Oct.	Japanese honeysuckle has a long photosynthetic season. It spreads by seed and vegetatively.
Multiflora Rose	Hand pulling small plants are recommended as long as all the roots are removed. It is not recommended for established plants.	Foliar application is best when near flowering time. A 2% of triclopyr or Glyphosate can be used. Cut and paint or basal bark applications can also be applied in the fall. A 25% solution of triclopyr or glyphosate is recommended for cut and paint and 20% of triclopyr can be used for basal bark treatments.	Seeds of multiflora rose are viable for up to 20 years. It flowers from April to June and fruits seeds July- deck. It reproduces by seed and vegetatively.
Oriental Bittersweet	Seedlings are easy to hand pull. Bigger vines can be removed by unwinding them from their host and using a weed wrench to uproot them. This can be done year round, but use caution when berries are present.	You can foliar spray with a 2% solution of Glyphosate or Triclopyr. A 20% solution can be used for basal bark treatment. A 25% solution is recommended for cut and paint treatments, both Glyphosate or Triclopyr can be used.	The seeds are viable for several years.

Species	Control Recommendations		Notes
	Manual	Chemical	
Japanese Knotweed	Due to its extensive root system hand pulling Japanese Knotweed is not recommended as an efficient form of control.	A 2% solution of Triclopyr or Glyphosate is recommended for foliar spraying and is recommended to be done soon after flowering. For cut and paint techniques a 25% solution of Glyphosate or triclopyr is recommended.	The majority of literature recommends spraying after flowering; this makes it harder for the plant to have enough reserves to re-sprout that year. When the plant is in flower (August) there are a lot of bees around this species; care should be taken to avoid spraying bees when present and if possible, efforts should be made to spray multiple times a year before flowering.
Phragmites	Plants can be cut. The shoots should be removed to prevent re sprouting.	A 2% solution of Glyphosate is recommended. Since Phragmites is an aquatic species an aquatic safe herbicide must be used.	The best results are when the herbicide is applied in the late summer or early fall when Phragmites is actively growing and in full bloom. Inflorescences develop in late June. Phragmites reproduces by seed and vegetatively.
Purple Loosestrife	Plants can be removed by hand pulling. All roots should be removed.	An aquatic safe herbicide (Rodeo) should be used. A 2 % foliar spray is recommended in late August early September.	Galerucella spp. beetles are recommended for bio control agents.

Foliar spray- This method is usually applied with a type of sprayer (backpack, mist blower, or tank). The percent of solution depends on the target species, the time of year, and type of sprayer. Glyphosate will target all species while Triclopyr will only target broadleaf plants and will have minimal impact if any on grasses.

Cut and paint- The stem of the plant is cut so a cross section is showing. The outer edge of the stem is then painted in herbicide; if the stem is hollow herbicide can be injected into the hollow stem. Triclopyr or Glyphosate can be used for treatment.

Basal bark- Herbicide is applied to the outer surface of the stem. Triclopyr is used because Glyphosate will not penetrate the stem. There should not be any standing water present or moisture on the stem. The application can be made with a paint brush from the base of the stem to about 1 foot up the stem.

Recommended herbicides:

Triclopyr- Triclopyr is a selective herbicide that will affect broad leaf plants and will have minimal to no impact on monocots. This is due to the fact that it stimulates cell growth elongation. Since monocots grow naturally by elongating their cells it will have little to no affect where since dicots grow laterally, they burst their cell walls and cause damage to the plant when they are stimulated for cell elongation. Since this herbicide can be mixed with water or oil it can be used for foliar sprays, cut and paint, or basal bark applications. It is recommended to use this herbicide when there is a dense native grass understory surrounded a target plant.

Glyphosate- Glyphosate is a broad spectrum herbicide meaning it will kill most plants it is applied to. It is an amino acid inhibitor so it inhibits the growth of plants. Foliar sprays should be applied while the plant is actively growing but cut and paint applications can be done during the fall/winter months. This herbicide can be used for foliar sprays and cut and paint applications. Since water is used as the base of the solution it cannot be used for basal bark treatments because water based solutions will not penetrate the bark layer. During cut and paint treatments the herbicide will need to be applied before the cambium layer seals for it to be effective.