



Figure 4.1: Wetland meadow in the Beaver Brook North Reservation, 2005 (Pressley Associates)

Chapter 4

Recommendations

Introduction

This chapter provides a summary of recommendations for both Beaver Brook and Beaver Brook North Reservations that are intended to protect existing resources and facilitate improved public access to the expanded reservation. It begins with a discussion of overall goals for the expanded reservation, followed by specific recommendations organized into four sections: natural resource, cultural resource, site and recreational resource, and management recommendations. Each recommendation includes an assessment of the issue followed by a narrative recommendation. Some of the recommendations are general and apply to both reservations, while others are specific to either Beaver Brook or Beaver Brook North. Costs associated with the capital improvements needed to achieve these recommendations are included in Chapter 5.

Site conditions recorded in 2005-2006 provided the baseline information for these recommendations; a few significant changes implemented between 2006 and 2009 have been noted, such as the completion of the Metropolitan Parkway, building demolition and stabilization of MetFern Cemetery.

Management Goals

This Resource Management Plan for the Expanded Beaver Brook Reservation is intended to meet specific management goals that address the importance of the reservation as an historical, cultural, scenic, and recreational landscape:

- Preserve and enhance the extensive wetlands and natural communities for the health and diversity of the flora and fauna;
- Preserve the cultural and historic resources of the expanded reservation, including its cultural landscapes, archaeological sites, and historic buildings and structures;
- Manage the new Beaver Brook North Reservation as an ecological preserve open to the public;
- Enhance and refine existing access, including the network of trails throughout the property;
- Maximize environmental education opportunities afforded by the reservation;
- Ensure the public's enjoyment of the reservation by promoting its diversity of flora and fauna, extensive views, cultural resources, and opportunities for solitude in a natural setting;
- Strengthen the reservation boundaries and prevent/resolve inappropriate encroachments or intrusions.

- Assess the environmental impacts of the proposed nine hole golf course on both the reservation and DCR's conservation easement;
- Identify opportunities for strengthening the open space network around the reservation by identifying potential parcels for acquisition or conservation easement, and maintaining key connections to other public open space systems;
- Decrease any non-point pollutants presently entering the reservation or Beaver Brook;
- Provide opportunities for public education to promote the natural and cultural resources of the reservation;
- Continue to strengthen DCR's relationship with constituency groups, with a particular focus on joint ventures with neighbors and communities abutting the reservation;
- Determine areas most suitable/desirable for recreation, education, and natural/cultural resource preservation.

Natural Resource Recommendations

The natural resources of the expanded Beaver Brook Reservation, including plant communities, wildlife, and habitats are an important characteristic of the reservation. This RMP recommends that they be managed with a light hand exclusively to protect sensitive resources, perpetuate habitat diversity, and to monitor the health and condition of the ecosystems. Natural resource recommendations related to public use, management of invasive or nuisance species, habitat enhancements, and public education, are described below in priority order. Unless specifically mentioned, these recommendations apply to both the Historic Beaver Brook and the Beaver Brook North Reservations.

Public Access

Assessment:

In order to sustain the health, diversity, and quality of the habitats within the reservation, recreational use should be balanced with the preservation of the significant natural resource areas. Similarly, intensive use by specific groups can severely limit the experience of the reservation by others, as in the case of dogs running off-leash in lower field at Beaver Brook Reservation. Creating this balance between resources and users requires that 1.) in sensitive areas, recreational use is focused on passive activities (e.g. walking and bicycling) and limited to within the existing major trail system; 2.) recreational use is limited or prohibited from areas extending beyond the existing major trail system; 3.) other inappropriate activities (e.g.

motorized vehicle usage) are prohibited; and 4.) intensive use by single groups is balanced with the needs of all park users.

Recommendations:

Posting informative signage and/or kiosks at all points of entry to inform the public of access hours and rules/regulations is critical to focusing public utilization of the properties. Specifically, the following information should be posted at each site entry point:

- A map of the site with primary trails clearly marked;
- Notification that the expanded Beaver Brook Reservation is open from dawn to dusk to pedestrians and bicyclists only;
- Notification that all dogs must be leashed at all times; dog walkers must clean up after their dog; and that failure to do so will result in banning dogs from the reservation.
- Notification that no motorized vehicles are allowed-Police Take Notice. It may be prudent to offer a police phone number for pedestrians/cyclists to call if they witness motorized vehicles. Property Owners abutting the Beaver Brook Reservation should also be encouraged to contact police if motorized vehicles are observed or heard within the expanded Reservation;
- Notification that pedestrians and bicyclists should not veer from marked pathways;
- Other information regarding deer ticks, Lyme disease, and/or poison ivy could be included to inform the public of these potential hazards and to deter pedestrians/cyclists from veering from the posted trail system.

During LEC's site inspections, numerous secondary trails, which appear to have been recently created were observed extending from the primary trail system into natural, formerly undisturbed areas. Posting signage at the entry points of the secondary trails that diverge from the primary trails, particularly in the North Reservation, may further reduce usage of the secondary trails. Naming the primary trails on the map posted at the entryways and posting trail name signage along the primary trails should also promote compliance.

It may be prudent to offer plastic bag dispensers and/or small disposal containers for dog feces, provided adequate resources are available for routine maintenance. DCR should consider engaging the dog-walking community in a focused discussion on the off-leash use of fields and trails so that these areas can be shared with other park users.

Public Education

Assessment:

Both properties contain ample opportunities for public education related to natural resources, biological interactions, and management techniques associated with the expanded Beaver Brook Reservation. Public education materials, signage, and programs focused on the natural resources of the Beaver Brook Reservation will promote a greater understanding of the distinctive characteristics of the reservation and explain why the DCR's rules, regulations, and recreational policies are in place, and will thus encourage compliance and enhanced resource stewardship.

Recommendations:

Natural resource information may be incorporated with the aforementioned signage presented at the entry points, and can be further implemented as educational signage along the trails. Several options for educational signage are outlined below:

1. Placards posted on or near specimen trees, shrubs, and/or herbaceous plants demarcating the common and scientific plant names along trails;
2. Appropriately placed, informative signs providing information on key 'umbrella' species or high profile animal species whose presence is indicative of quality habitat (e.g. owls, salamanders, wood ducks, etc.);
3. Appropriately place, informative signs or kiosks describing the fundamentals and importance of habitats, ecosystems, vernal pools, avian migration, food webs, seasonal changes, etc.

Invasive Species Management

Plants

Assessment:

LEC observed numerous invasive/exotic species that have established throughout the different habitat types contained within the expanded reservation. Invasive exotic species tend to form monocultures within different habitat types and displace native plant species. This results in significant reductions in habitat diversity and native food supply and variety for wildlife. While it can be challenging to completely remove these invasive/exotic species, efforts should be made to significantly reduce their numbers, or at least limit further establishment and displacement of native plants. *Galerucella* beetles are currently being used to control Purple Loosestrife at DCR's Fowl Meadow.

Recommendations:

Managing invasive plants should be primarily focused on those natural habitat areas located in Zones 1 and 2 within the expanded Beaver Brook Reservation (see Chapter 3). A three-pronged Integrated Pest Management (IPM) approach that includes physical, chemical, biological, or a combination of these measures, will insure effective, species-specific, invasive species elimination and control. These activities should be conducted in such a manner as to minimize interference with biological interactions such as reproduction, feeding, and avian migration. Only those holding a Massachusetts Pesticide Applicator's license can legally apply pesticides on DCR properties.

1. Apply **physical removal** of invasive species to those trees, shrubs, and/or groundcover plants in sensitive areas where chemical and biological applications are not appropriate or feasible. Hand or machine removal of the entire plant, including the root system is ideal; however, cutting plants at the base combined with precise chemical application of the stump may be the most effective and/or cost-conscious way of managing invasive plants.
2. Precise **chemical application** of a 25% solution of glyphosate (commercially sold as Round-up) can be applied to the stumps. This herbicide is generally considered safe, as it binds with the soil particles and becomes inert following several days. Applying glyphosate directly to cut stumps immediately following cutting is especially effective in the fall months. As plants tend to draw nutrients into the root systems for storage over winter, they draw in the glyphosate which targets the plants' root systems. The precise application to the plant stump also reduces the potential for chemical application to non-target species that may occur with spray application. The combination of cutting and herbicide application will likely be the most effective way of managing the majority of invasive woody species contained within the site.
3. **Biological control** of invasive species should be limited to the control of Purple Loosestrife (*Lythrum salicaria*). Large stands of Purple Loosestrife are contained within the reservation's emergent marsh habitats, particularly in the Beaver Brook North Reservation. Though an exotic species themselves, the use of *Galerucella* spp. beetles as a biological control for *L. salicaria* has proven effective, with a success rate of up to 90% in other areas of North America without visible environmental repercussions.¹ The U.S. Department of Agriculture – Animal Plant Health Inspection Service has approved the release of *Galerucella* for *L. salicaria* control and the beetles have been released

in over 30 states. Additionally, the Minnesota, Michigan, and Wisconsin Departments of Natural Resources have been releasing the beetles since 1994 to manage *L. salicaria* and Massachusetts has been using them effectively since 2000.²

Galerucella spp. is host-specific to Purple Loosestrife and has not had a measurable, adverse effect on any native plants. The beetle larvae feed upon young *L. salicaria* buds and leaves, and teneral (newly emerged) adult beetles appear in July and August and immediately begin to feed on the leaves, stems, and flowers. Adult and larval leaf damage greatly reduces the photosynthetic capability of *L. salicaria*, possibly leading to reduced starch stores in the roots which can result in winter plant mortality. Photosynthetic inhibition results in reduced stem height and root length, both essential to overall plant vigor. With heavy defoliation, the host plant becomes skeletonized and turns brown. Heavily defoliated plants may die or produce fewer shoots the following year. The resultant weakening and/or death of the loosestrife plants provide an opportunity for previously out-competed native plant species to return.



Figure 4.2: Duck Pond and Purple Loosestrife in the original Beaver Brook Reservation, 2005 (Pressley Associates).

Canada Goose (*Branta canadensis*) Management Beaver Brook Reservation

Assessment:

In urban and suburban areas, Canada Geese tend to congregate where open water abuts manicured lawn areas. This preferred habitat in a suburban or urban setting allows the geese to see potential predators as they move from the open water habitat to the lawn area to feed on the abundance of short grass. Opportunities to effectively manage *B. canadensis* are

somewhat limited to the northern parcel of Beaver Brook Reservation, where Duck Pond is bordered by lawn grass along its eastern edge.

Recommendations:

1. Re-vegetate a 10 to 15-foot band of the existing lawn grass along Duck Pond as a wetland buffer with warm season grasses to create a tall herbaceous plant community that will obstruct the geese's visual range, and deter them from using the site to feed, while maintaining recreational views of Duck Pond.
2. Halting public feeding of waterfowl is essential to deterring nuisance geese from inhabiting the area. Artificially feeding waterfowl tends to interfere with migration patterns, as individuals will remain at the site with an abundance of food. This, coupled with a lack of natural predators allows the habitat system to "support" a larger population of waterfowl than it normally would. This typically results in increased nesting occurrences, interaction with humans, and waste. Goslings will also return to the same nesting habitat in which they were reared. Breaking this cycle of re-population is critical to managing Canada Geese associated with the Beaver Brook Reservation.

Establishing strategically-placed signs or information on kiosks informing the public not to feed the waterfowl will also support the overall geese management. Conformance with this rule is more likely when the public is educated as to the reasons why the rules are in place.

Wildlife Habitat Enhancement

Beaver Brook North Reservation

Assessment:

Several opportunities to enhance wildlife habitat exist within the Beaver Brook North Reservation; particularly within those areas recently cleared and/or slated for re-vegetation. Invasive species management will inherently improve and enhance wildlife habitat associated with the site, as will establishing native plant communities, habitat maintenance, and the addition of appropriately placed avian and bat nesting/roosting boxes. Several areas on the Beaver Brook North Reservation have undergone or are slated for demolition and/or clearing, including the former debris site. The resulting open land offers a unique opportunity for habitat creation by establishing native plant communities via seed and/or planting woody plant stock. Establishing a dense plant community will also deter invasive exotic species from further establishing within the landscape,

such as Purple Loosestrife, European Buckthorn (*Rhamnus cathartica*), Multiflora Rose (*Rosa multiflora*), etc.



Figure 4.3: Potential new wetland habitat in the former debris site, Beaver Brook North Reservation, 2009. Note that a small portion of the site has self-seeded in Common Cattail and other wetland species (Pressley Associates).

Recommendations:

1. The former debris (dump) site presents an opportunity to create a new wetland habitat, given the relative topographic grades and seasonal water table (Figure 4.3 and 4.4). Establishment of a wetland includes excavation to an appropriate sub-grade to intercept hydrology, placement of an appropriate soil mixture containing at least 12% organic material, and installation of a native, wetland plant community. The type of wetland created depends on the financial resources available for such an endeavor, and ranges from sowing a wetland seed mixture to supplementing the seed mixture with sapling trees and shrubs, placed up to 5 to 10 feet apart on center. Annual inspection of the created wetland by a qualified Botanist or Wetland Scientist is recommended to monitor plant mortality and recommend replacement and to insure no invasive species are established within the site. Monitoring the groundwater level of the debris area over a calendar year will also provide additional data to determine an appropriate and sustainable planting solution.
2. Two habitats will require regular maintenance in order to avoid succession to forest. They include the meadow and successional shrub habitats. In the absence of natural 'maintenance' such as herbivore grazing and fire, these habitats will ultimately undergo succession and transform into forest over time. In an effort to maintain these habitats, which contribute to the reservation's habitat heterogeneity, routine maintenance in the form of mowing and brush-cutting will be required. All habitat maintenance should be conducted during the fall months following the growing season to avoid interrupting natural biological interactions. Field habitat should be mowed once annually, while brush-cutting successional shrub habitat should occur every 3+/- years.
3. Several existing habitats associated with the expanded reservation could be enhanced by the introduction of wildlife nesting and roosting boxes. Specifically, interior forest (upland and wetland), emergent marsh, and successional shrub habitats can all benefit from carefully sized and placed bird and bat boxes. The Cornell University Laboratory of Ornithology provides informative details of avian box design, placement, and maintenance dependant on the target species, and additional information is available for the construction and placement of bat roosting boxes. A qualified Wildlife Biologist should determine the appropriate location and placement of nesting/roosting boxes. Maintenance typically includes annual inspection and scolding the boxes with boiling water to insure proper function and to eliminate parasites. Bird boxes placed within the emergent marsh will provide nesting habitat for tree swallow (*Tachycineta bicolor*), while forest-dwelling species including Owls, Woodpeckers, and Wrens will likely utilize such nesting boxes in upland forest habitats. Nesting boxes placed within the successional shrub habitat will benefit Eastern Bluebirds (*Sialis sialis*), among other species.

Continuing Site Investigation and Education

Assessment:

The diverse ecosystems of the expanded reservation provide many educational opportunities for local school groups as well as further study and research by local college and university students.

Recommendations:

1. Encourage study topics and educational programs ranging from simple biological principals such as habitat diversity, food webs, vernal pool studies, to more complex investigations including reservation management, and invasive species control.
2. Where appropriate, consider implementing natural resources recommendations through Masters and Doctorate programs through local colleges and universities.

See also additional public education recommendations below, and the recommendations for further research and study.

Cultural Resources Recommendations

Beaver Brook Reservation

Cultural Landscape

Assessment:

Beaver Brook Reservation is a cultural landscape eligible for listing on the National Register of Historic Places, and composed of a number of specific features including buildings, structures, vegetation, circulation systems, constructed water features, site furnishings, and archaeological resources. As the first reservation in the Metropolitan Park System, it is recommended that Beaver Brook Reservation be managed as a cultural landscape that includes active and passive recreational uses and natural communities.

Recommendations:

1. Maintain the historic character of the cultural landscape, including open lawns and specimen trees, water bodies, views, historic circulation systems, historic buildings and structures, and archaeological remains. The recommendations that follow include specific actions needed to preserve, protect, and provide public enjoyment of specific features that contribute to the character and significance of the reservation.



Figure 4.4: Specimen trees and grass in Beaver Brook Reservation, 2005 (Pressley Associates).

Historic Buildings

Assessment:

The **picnic pavilion** and **restroom** building constructed by the former MDC along Trapelo Road contribute to the character and significance of the reservation. The pavilion accommodates fixed peripheral seating as well as picnic tables and is heavily used in summer. The restroom should be fully evaluated for universal access.

In the northern parcel, the historic **Stearns Barn** is visible from Trapelo Road and contributes to the historic significance of the reservation. It is not currently accessible to public. The historic **Copeland House** along Mill Street is situated in a picturesque setting adjacent to the lower Mill Pond and appears in good condition. It currently functions as DCR staff residence.

Recommendations:

1. Retain and maintain the picnic pavilion in good condition.
2. Retain and maintain the historic restroom in good condition. Evaluate design alternatives to make it more fully accessible while also meeting the *Secretary's Standards*.
3. Retain and maintain the historic Copeland House without additional alterations. Preserve and maintain the building's setting/landscape. Use of the house as DCR staff residence is a compatible use and provides additional security for the reservation.
4. Conduct building condition assessment of Stearns Barn and undertake necessary repairs and stabilization.



Figure 4.5: Historic picnic pavilion from spay pool, Beaver Brook Reservation, 2005 (Pressley Associates).

Dams

Assessment:

Both dams contribute to the historic significance of the reservation and are structurally essential to maintain the two historic mill ponds. Pedestrian access over the dams does not meet current standards for universal access. The historic millstones are hidden by overgrown vegetation. The dam sites may also have sensitive archaeological resources.

Recommendations:

1. Undertake a detailed structural assessment of the two dams to determine specific repairs needed as well as code requirements and routine and cyclic maintenance needs.
2. Any structural or code-related improvements to the dams should be accomplished to respect their historic character, meet the *Secretary's Standards*, and include an archaeological assessment prior to ground disturbance.
3. Retain and maintain both dams with regular seasonal repairs as needed, coordinated through the DCR's Office of Dam Safety.
4. Clear the mill stones on the dams from volunteer growth and use them to interpret the historic significance of the site.

Archaeological Sites

Assessment:

Two prehistoric sites in the southern Waverley Oaks section, and the archaeological remains of 17th and 18th century fulling and grist mills in the northern section require specific management treatments to ensure their conservation and

preservation. Active management will enhance these features and better incorporate and integrate them into the landscape.

Recommendations:

1. Care should be taken not to plant or otherwise cause surficial alterations to the toe of the esker south of Beaver Brook in the Waverley Oaks portion of the reservation.
2. Undertake vegetation management in and around the two historic mill sites in the Mill Street section of the reservation. Vegetation should be cut flush to the ground without pulling up root systems. If appropriate, depending on the specific plant species, cut stems should be treated with an herbicide according to the DCR IPM plan.

Ponds

Assessment:

The Duck Pond and Mill Pond reflect the historic character of the reservation and continue to be major attractions of the Mill Street parcel. Visitors regularly feed the ducks in both ponds and the ponds also attract a large Canada Geese colony creating a nuisance. Due to the high level of pedestrian use in concentrated areas of the ponds and along Beaver Brook, some areas are adversely affected by soil compaction, exposing tree roots and causing erosion into the water body.

Recommendations:

1. Periodically monitor water quality of the ponds with regard to temperature variations, chemical components, and species and consider assessing the larger watershed to ensure protection of the Beaver Brook watercourse.
2. Retain and maintain the two mill ponds as contributing resources within Beaver Brook Reservation.
3. Depending on the outcome of the water quality evaluation, DCR should consider developing a policy related to feeding waterfowl.
4. Correct compaction and erosion in specific areas bordering the two ponds and along Beaver Brook.

Cascade

Assessment:

The cascade below the Duck Pond with a constructed overlook structure was photographed in several historic publications and has been a much publicized feature throughout the history of the reservation. It continues to be one of the attractions of the northern parcel. It suffers from insufficient vegetation management and path maintenance to the overlook structure.

Given the topographic change, this feature cannot be universally accessible.

Recommendations:

1. Retain and preserve the cascade and overlook.
2. Improve the path to the overlook and restore compacted areas with additional plantings.
3. Provide safety features on the overlook structure near the cascade in addition to improving the path accessing it.

Stone walls

Assessment:

Stone walls along Mill Street between the driveway to the Copeland House and the maintenance access along Mill Street in the northern parcel separates the parking area from the reservation. A similar stone wall wraps around the southern parcel along Trapelo Road and Waverley Oaks Road with an entrance way to the parking area along Waverley Oaks Road. Sections of this wall along Waverley Oaks Road have deteriorated with dislocated stones. The stone walls add character to the reservation boundary and are visible from the adjacent roads.

Recommendations:

1. Conduct structural evaluation of the stone walls along the boundary and undertake necessary repairs.
2. Develop a protocol for regular inspection and maintenance of the stone walls as they are extant historic features.

Waverley Oaks

Assessment:

The "Waverley Oak" trees in the southern parcel have been recorded in many historic publications and were an essential component of the original Reservation. It is not likely that any of the original oaks remain, but many of the original trees may have been replaced with new trees so that isolated specimen oaks still exist.

Recommendations:

1. The existing oak trees contribute to the historic landscape character of the reservation and should be protected with regular pruning and maintenance, with a long-term program for replacement.
2. The oak trees can also provide a physical feature to interpret the historic landscape of the reservation.

Beaver Brook North Reservation

Cultural Landscape

Assessment:

The former Met State Hospital is a cultural landscape and is listed on the National Register of Historic Places. Historic buildings associated with the former hospital located on the Beaver Brook North Reservation have been demolished by DCAM, but the historic carriage roads and MetFern Cemetery are extant features identified in the nomination. The former Administration Building and Administration lawn remain on land now owned by the City of Waltham, on which DCR holds a conservation easement.

Recommendations:

1. Maintain the extant historic features of the former Hospital as described below.

Buildings

Assessment:

Historic buildings associated with the former Metropolitan Hospital have been demolished as part of the reuse agreement. They included the non-contributing Furcolo building located along the town lines of Lexington and Waltham, the Power Plant, Garage, Incinerator, and Mortuary/Laboratory south of Metropolitan Parkway. The former **MSH Administration Building** in Lot 2 is within the City of Waltham's land originally proposed for a future golf course on which DCR holds a conservation easement. Due to a long period of abandonment, this building is becoming increasingly threatened so that urgent attention is needed.

Recommendations:

1. If the City of Waltham does not pursue a 9-hole golf course, DCR should work collaboratively with the City to determine a new use for the former MSH Administration Building, including a portion for a DCR visitor/interpretive center.
2. Once a new use is determined, DCR should coordinate with the City of Waltham regarding the rehabilitation of the former MSH Administration Building consistent with the *Secretary's Standards*.
3. Re-vegetate the sites cleared from the demolition of MSH buildings as meadows and maintain in an open condition.
4. Develop interpretive programs that include information on former Metropolitan State Hospital complex and campus.

MetFern Cemetery

Assessment:

When the initial RMP field survey was done in 2005, MetFern Cemetery appeared severely deteriorated due to deferred maintenance and apparent damage caused by private construction vehicles, which resulted in some collapsed graves, damaged stone markers, and damage to the perimeter stone wall. At that time, other threats included volunteer woody vegetation, which had taken hold in the western half of the cemetery. In response to these threats, DCR prepared and began implementation of the draft "MetFern Cemetery Preservation/ Maintenance Plan." In 2009, the cemetery is in vastly improved condition; damaged grave sites have been loamed and reseeded, portions of damaged stone walls have been partially reset; a dry laid field stone wall has been built along the entire length of the road way, with several 6 foot openings to provide access for vegetation management machinery; and poison ivy and other early successional woody species have been eradicated. The Cemetery is now part of the regular maintenance regime of a crew from DURP's North Region, out of Wicklow Street, Medford and is one of the most attractive areas in the Beaver Brook North Reservation.

Recommendations:

1. Continue to implement the recommendations contained in the MetFern Cemetery Preservation/Maintenance Plan.
2. Perform regular maintenance and monitoring of the cemetery.
3. Provide continued visual recognition of the site by maintaining the boundary wall along the carriage road and if appropriate in the future, provide an interpretive sign demarcating the cultural significance of the cemetery, in consultation with family members.

Carriage Road System

Assessment:

The existing trail system includes sections of the historic carriage roads that were historically part of the former Metropolitan State Hospital and are considered contributing resources. Pedestrians and mountain bicyclists use the former carriage roads to traverse the new reservation. The historic character is compromised somewhat by overgrown vegetation and insufficient maintenance. The southern sections of the carriage road were widened substantially by heavy equipment in the vicinity of the debris removal sites, but by 2009, vegetation had recovered along the edges of the carriage roads near the former debris sites. Vehicular access to the carriage road was

compromised by the construction of the Metropolitan Parkway, as the connection at the north parkway is impassible to due to the curb, bikeway, and steep grade. Last, there is evidence of substantial uncontrolled motorized vehicle use along carriage roads and trails in the vicinity of the debris areas.

Recommendations:

1. Undertake changes to the connection between the carriage road to the north segment of the Metropolitan Parkway by installing a curb cut and regrading the entrance to the carriage road. Install a gate to prevent unofficial vehicular access to the carriage road. This is a high priority for implementation.
2. Retain and preserve the historic carriage roads with a rural character that reflects the low-intensity passive use recommended for Beaver Brook North Reservation. Where possible, the carriage roads should be maintained with an 8-10' width to allow for maintenance and emergency vehicle access, and occasional vehicular access to the cemetery. Shoulders should be minimally maintained with natural vegetation.
3. Re-vegetate the shoulders of the carriage road in the vicinity of the debris removal areas, where necessary, to re-establish the historic width and character.
4. Develop clear regulations and signage related to unauthorized motorized vehicle use; install barriers where needed and monitor regularly.



Figure 4.6: North parkway, bikeway and carriage road entrance, Beaver Brook North Reservation, 2009 (Pressley Associates).



Figure 4.7: Former carriage road in Beaver Brook North Reservation, 2005 (Pressley Associates).

Site and Recreational Resources Recommendations

Beaver Brook Reservation

Buildings and Structures

Assessment:

The restroom facility and the picnic pavilion structure in the south, Waverley Oaks parcel are both historic structures and function well to support the active play area.

Recommendations:

See cultural resource recommendations above.

Site Access and Circulation

1. Vehicular Circulation System

Assessment:

Beaver Brook Reservation is bordered by Trapelo Road, Mill Street, and Waverley Oaks Road resulting in heavy vehicular traffic around the property. The three parking areas located along Waverley Oaks Road, Wilson Road, and Mill Street provide sufficient parking for the reservation users. There is adequate visual access to the three parking areas from the approach roads. Visitors to the popular spray pool also park along Trapelo Road. Lowell Path in the southern parcel also functions as a maintenance route for service vehicles.

The northern parcel has two gated service entrances located along Trapelo Road and Mill Street but has no designated service route inside the property. Traffic on Mill Street and

Trapelo Road is likely to increase following the completion of redevelopment of the McLean Hospital and former Metropolitan State Hospital properties.

Recommendations:

1. Actively participate in long term planning and traffic safety related to Trapelo Road and Mill Street corridors. In particular, the intersection of Trapelo Road and Mill Street should be evaluated to ensure the maximum safety for pedestrians, given the location of the spray pool and play area adjacent to Trapelo Road. Any proposals to widen Trapelo Road or Mill Street would likely adversely affect the reservation.
2. Retain and maintain the existing parking areas, including measures to control direct runoff from the parking areas into the water bodies.



Figure 4.8: Parking area along Waverley Oaks Road in Beaver Brook Reservation, 2005 (Pressley Associates).

2. Pedestrian Circulation System

Assessment:

The pedestrian path network functions well in the southern Waverley Oaks parcel, except for a few desire lines cutting across the central wooded area across the stream. There is heavy pedestrian movement between the parking areas, particularly from the parking area to the open field along the stream, resulting in erosion, compaction problems, and disturbance to the wooded habitat. In the northern Mill Street parcel, pedestrian trails, except Plympton Path, are not cleared regularly which forces reservation users to create paths of their own, further disturbing the habitat. The condition of the Two Bridges Trail, Brookside Trail, and parts of Toboggan Run and Plympton Path in the northern Mill Street parcel are adversely affected by volunteer vegetation. The existing parking area on Mill Street also lacks a clear connection to the designated trail

system. The heavy vehicular traffic on Trapelo Road discourages the use of pedestrian connections between the two parcels.

Recommendations:

North (Mill Street) Parcel

1. All the trails need regular maintenance to decrease loss of paths to invasive woody vegetation.
2. Undertake erosion control measures along the steep slopes of the western boundary along Toboggan Run to reduce soil and vegetation loss.
3. Provide path connections from the parking area to the trail system along Duck Pond to control access to the pond.
4. Extend and maintain the path connection from the Plympton Path to the picnic area north of Duck Pond.
5. Improve pedestrian trails in areas with soil compaction and address inadequate drainage to eliminate muddy conditions.

South (Waverley Oaks Road) Parcel

1. Replace the volunteer paths through the central wooded area with a designated pedestrian path to protect the natural area and provide the stream with buffer vegetation to reduce runoff from the intersecting path.
2. Restrict access to the natural area along the MBTA tracks to protect the wetlands and to avoid unsafe access to the MBTA property.

Site Features and Furnishings

1. Bridges and Dams

Assessment:

The three bridges in the southern Waverley Oaks parcel are in good to fair condition. The bridge north of the play area lost its railing as a result of a fallen tree branch. The five bridges in the northern, Mill Street, parcel including the two over the dams are in fair to poor condition. The Duck Pond and Mill Pond dams are both currently listed in poor condition in the DCR Dam Safety database. The two bridges on Two Bridge Trail are enveloped by overgrown vegetation and one of them has missing planks endangering public use. The bridges over the dams are not level and have loose boards making access difficult. The bridge north of Mill Pond lacks hand rails creating a safety issue.

Recommendations:

1. Evaluate the structural conditions of the bridges in the northern, Mill Street parcel and improve them for public use with sufficient safety features.
2. Clear the volunteer vegetation near bridges so that they are visually accessible to the reservation users.
3. Once the results of the 2006 DCR dam inspection is complete, undertake further study and evaluation to improve both the condition and safety of these features, given their historical and recreational importance. Any improvements to the dams should also consider their historic character, meet the Secretary's Standards, and assess potential archaeological impacts.

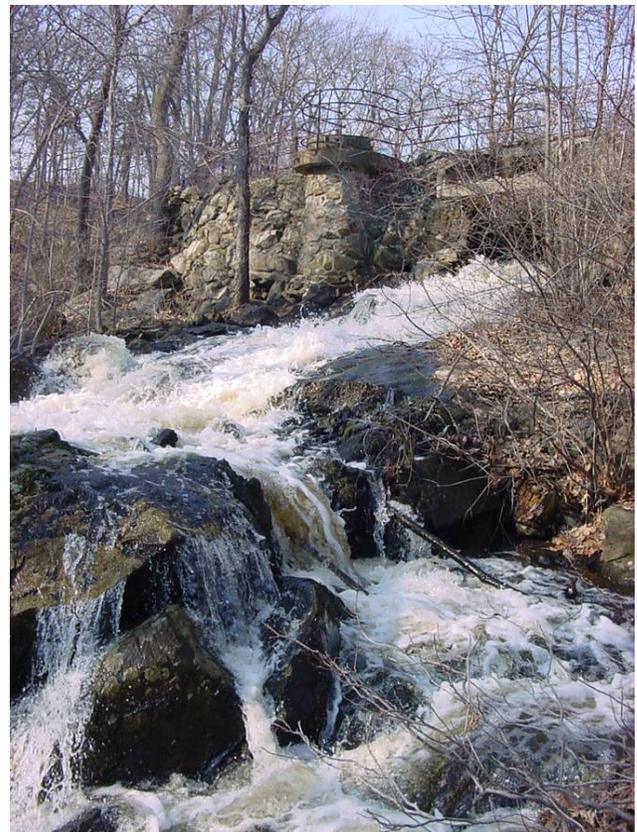


Figure 4.9: Historic dam, overlook and cascade, 2005 (Pressley Associates).

2. Fences and Walls

Assessment:

Stone walls define the reservation boundary along Mill Street in the northern parcel and along Trapelo Road and Waverley Oaks Road in the southern parcel. Sections of the wall along Waverley Oaks Road are deteriorated. The western and

northern boundaries of the northern parcel and the eastern boundary of the southern parcel are secured by chain link fence with few gate panels. Sections of the chain link fence are deteriorated and allow access from adjacent residential properties into the reservation in the northern parcel. Timber fence borders Wilson Road up to the parking area.

Recommendations:

1. Retain all stone walls in good condition. Restore the failing stone walls along Waverley Oaks Road and along Mill Street as they are contributing historic features.
2. Secure the deteriorated sections of the chain link fence and display notice to use designated reservation entrances.

3. Site Furnishings

Assessment:

The site furnishings in the northern parcel are limited to picnic tables, benches, sign posts, and an information board. The wooden bench overlooking Duck Pond on the dam is deteriorated and covered by volunteer growth. The railings on top of the dam do not provide sufficient safety protection for small children. There are no trash cans in the northern, Mill Street parcel.

The site furnishings in the southern parcel are in good condition and compliment the varied recreational opportunities of the site. The drinking fountains near the play area and ball field are in fair condition. Trash cans along Lowell Path are in good condition. The engraved granite plaque and granite boulder are not very visible as they are located amidst mown lawn without any landscape treatment.

Recommendations:

North (Mill Street) Parcel

1. Maintain consistent site furnishings compatible with the historic character of the reservation.
2. Implement regular inspection and repair to the benches and picnic tables.
3. Clearly display no garbage policy in the northern parcel with bag your own garbage messages to protect the visual and environmental quality of the reservation.
4. Update the information displayed on the information board.

South (Waverley Oaks) Parcel

1. Maintain consistent site furnishings compatible with the historic character of the reservation.
2. Emphasize the granite plaque and inscribed boulder on site with better landscape treatment around them. Provide compatible landscape treatment around the engraved granite plaque near the tennis courts and granite boulder in the open field along the stream.

4. Site Utilities

Assessment:

The reservation does not have any site lighting as public use is restricted to dawn to dusk. The municipal infrastructure provides water supply to the rest rooms and drinking water fountain in addition to sewage disposal from the rest rooms in the southern parcel.

Recommendations:

1. Maintain the utility facilities in the southern parcel to support active recreation.

Recreational Uses

1. Passive Recreation

Assessment:

The open field along the stream and shaded paths provide passive recreational opportunities in the southern parcel and it is heavily used for dog-walking, walking, and picnicking. Dog stations and trash cans installed along Lowell Path promote the use of the southern parcel by dog owners. The northern parcel is popular for duck feeding, bird watching, and picnicking.

Recommendations:

1. Retain the northern, Mill Street parcel exclusively for passive recreation to protect the scenic quality of the cultural landscape and the natural habitat.
2. Provide improved site interpretation to enhance passive recreation in the reservation.
3. Clearly display the DCR dog policy in the northern and southern parcels.
4. Re-evaluate duck feeding in the north parcel, consistent with the natural resource recommendations related to Canada Geese management.

2. Active Recreation

Assessment:

Opportunities for active recreation are limited in the northern parcel. Almost half of the southern parcel is maintained as a park for active recreation. Given the high public use of this parcel, the vegetation appears regularly maintained, complimenting the recreational facilities on the property. The lawn areas provide a pleasing backdrop to the active play area, tennis courts, and ball field. Park users pursue jogging, cycling, and roller-skating actively along Lowell Path. The two tennis courts secured with chain link fence are in good condition. However, there are some areas of weed growth and wet patches following rain on the courts. The baseball field is in fair to poor condition. The diamond boundary is not clearly pruned and the turf field has dispersed worn patches. The spray pool and playground are in good condition. The playground is equipped with separate play structures for toddlers and infants and shaded seating for adults. Both the existing ball field and the playground are considered historically significant. The spray pool is well used in summer and the boulders in the spray pool function as an interesting play area even when the water is not running.

Recommendations:

1. Provide active recreation facilities exclusively on the southern, Waverley Oaks parcel. The development of additional recreational facilities is not appropriate for the Beaver Brook Reservation.
2. Control the weed problem on the tennis courts. Resurface the courts to eliminate storm water collection.
3. Rehabilitate the baseball diamond to required dimensions and maintain the turf field to reduce worn patches.
4. Inspect, repair and paint the play equipments on a regular basis. Upgrade worn parts of the play structure and swing sets.
5. Inspect the boulders in the spray pool regularly to smoothen the rough edges and clean slippery spots.



Figure 4.10: Existing tennis courts, Beaver Brook Reservation, 2005 (Pressley Associates).

Views

Assessment:

The northern, Mill Street parcel is very scenic, due to the picturesque character of the ponds, open lawns, cascading brook, and natural vegetation. The lawn area at the primary entrance extending down to Duck Pond and around the Copeland House provides a wide view into the reservation for pedestrians as well as motorists traveling along Mill Street. Views down stream from the dams are blocked by uncontrolled natural vegetation. Lowell Path in the southern parcel provides scenic vistas of the reservation mixed with recreational use.

Recommendations:

1. Undertake selective clearing to open up views from the dams and around the cascade in the northern parcel to improve the visual quality of the reservation.
2. Maintain the open lawns in both parcels to retain the character of the reservation.

Beaver Brook North Reservation

Buildings

Assessment:

All of the former MSH buildings located within the Beaver Brook North Reservation have been demolished. The Reuse Plan provides for the opportunity to develop a small DCR visitor's center including restrooms and display space in the second floor of the former MSH Administration Building, now owned by the City of Waltham. However, this building has been abandoned for some time and is severely deteriorated.

Recommendations:

1. The reservation may benefit from a visitor facility with restrooms, drinking water, interpretive exhibits, public program space, and user information. Consistent with the 1994 MSH Reuse Plan, this RMP recommends a visitor center in the historic former MSH Administration Building (Figure 4.10). This will create the least impact on the reservation grounds, represents an appropriate use of the historic building, and is consistent with the terms of the Reuse Plan. The City of Waltham should conduct a structural integrity analysis of the building as soon as possible to determine reuse feasibility and to determine major repair work needed and issues associated with ADA compliance for both the first and second floors. The originally proposed uses for the building included a City of Waltham Golf Club and DCR visitor center. The DCR visitor facility could also contain staff offices, such as for a park ranger. However, with the future of the Waltham golf course uncertain, it is imperative that a new compatible use is found so the building can be stabilized. Because this is a historic building, all improvements should meet the *Secretary's Standards for Rehabilitation*.
2. On site storage for maintenance equipment will facilitate easier site management. This can be potentially combined with the maintenance facility for the proposed Waltham golf course.
3. The green design principles developed by the U.S. Green Building Council (USGBC) can be used to guide new development, including both the rehabilitation of existing buildings or new construction.



Figure 4.11: Former MSH Administration Building, 2009 (Pressley Associates).

Site Access and Circulation

1. Vehicular Circulation System

Assessment:

The development of Metropolitan Parkway connecting Trapelo Road and Concord Avenue provides vehicular access into the North Reservation. The parkway design includes two separate segments - the north segment from Concord Avenue and the south segment from Trapelo Road - which were connected with an emergency access road by DCAM in 2005-2006. The North Reservation has an internal carriage road system following the carriage roads that was part of the former Met State Hospital grounds, but is now primarily used by pedestrians, dog walkers and mountain bikers. The carriage roads start from behind the location of the former Incinerator building, around the central open wetland, crosses the stream near the open meadow in the south, traces along MetFern Cemetery and the former debris sites and loops back to the former MSH Incinerator site. However, construction of the parkway and bikeway has cut off DCR maintenance vehicular access to the carriage road due to the curb and steep grade. The water tower atop Mackerel Hill is accessible from roads on the Gaebler School property.

Recommendations:

Metropolitan Parkway

1. Once completed, the DCR will be responsible for ongoing regular maintenance of the Metropolitan Parkway, including sweeping, plowing and snow removal, maintenance of the drainage system, and maintenance of the new street trees and lighting system.
2. Design and construct the DCR parking area east of the former MSH Administration Building as a modified version of the 2004 Judith Nitsch plan, since it appears likely it will be constructed before the Waltham golf course parking is constructed. This modified layout provides for access from the emergency access connector road constructed by DCAM in 2006 (see Figure 4.12).
3. Work collaboratively with the City of Waltham regarding the implementation of their parking area in the vicinity of the former MSH Administration Building.
4. Install a curb cut, service gate, and re-grade the entrance to the carriage road from the north parkway to provide maintenance and emergency vehicle access.
5. Monitor the condition of the new parkway. Develop a cooperative maintenance agreement with AvalonBay Communities, Inc. regarding the parkway maintenance.

- Undertake additional re-vegetation along the Metropolitan Parkway to minimize the opportunity for invasive species.

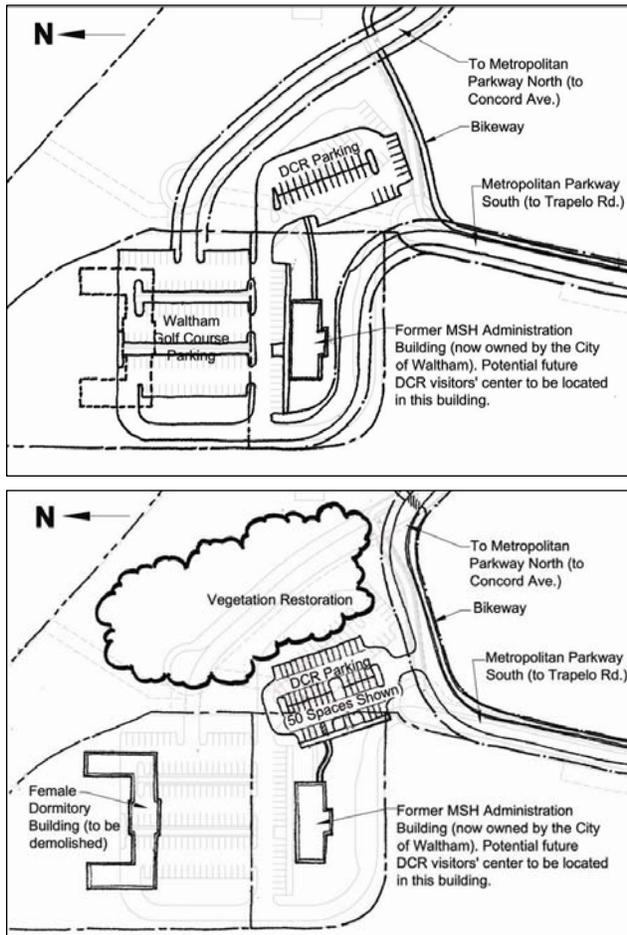


Figure 4.12: Top – 2004 layout of the DCR and City of Waltham parking areas in relation to the north and south parkway segments (redrawn from Judith Nitsch Engineering, Inc.). Bottom – Conceptual layout for the proposed DCR parking area adjacent to the existing access road constructed by DCAM in 2006 (Pressley Associates).

Mackerel Hill

- If the cell tower on Mackerel Hill is to remain, establish a service access easement agreement with the cell tower vendors and City of Waltham regarding vehicular access to the top of Mackerel Hill from the Gaebler School.

2. Pedestrian Circulation System (includes mountain bikes)

Assessment:

The pedestrian circulation system currently consists of the former carriage roads and narrow trails created by pedestrians

and mountain bikes. The steep slopes on the north side of Mackerel Hill suffer from frequent erosion and settlement problems along the pedestrian path. Pedestrian entrances and connections are not defined causing undesirable intrusions into the habitat zones. Construction activities and building demolition have eliminated some connections between the new parkway and the historic carriage roads. Development of a designated and delineated pedestrian and shared use trail system is a priority for this property, with clearly visible entrances and connections to adjacent open space, and the parkway/bikeway. Several additional opportunities for enhanced recreational pedestrian access exist between the north and south sections of the property, Walnut Street, Dawes Street, Royal Street, and Porter Road.

Recommendations:

- Delineate a shared use trail system that utilizes the existing carriage roads as well as the rustic [single track] trails, connecting to Rock Meadow and easily accessible to the bikeway at both Trapelo Road and Concord Avenue.
- Designate Mackerel Hill as a temporarily pedestrian-only trail and undertake erosion control measures along the Mackerel Hill trail, including installing water bars and re-routing the trail where necessary so it can be re-opened for shared use including mountain bikes. Access to the water tower should be prohibited for security reasons.
- Implement critical connections to re-establish access to the trail and carriage road system altered by the construction of the Metropolitan Parkway. This includes a trail connection from the north parkway through the open meadow and a proposed second connection from the south parkway over a small brook (requiring the construction of a pedestrian bridge over the brook).
- Evaluate alternatives for a wetland boardwalk that provides pedestrian access to Walnut Street and Dawes Street through the open wetlands located north of the parkway.
- Loop the pedestrian path system around the AvalonBay development property to meet the parkway near the former location of the garage and near the proposed parking lot at the junction of north and south segments of the parkway.
- Improve the trail connection to Rock Meadow with improved landscape treatment and signage.
- Promote public awareness to discourage development of additional volunteer trails on Mackerel Hill and in the vicinity of the significant wetlands and vernal pools.

8. Consistent with the terms of the Reuse Plan, retain pedestrian access to the MetFern Cemetery via the footpath from the Gaebler property as well as the primary carriage road.
9. Develop collaborative management strategies with established recreational users related to the evaluation and treatment of trails in the North Reservation.
10. Coordinate with the Friends of the Western Greenway on the designation of the greenway connector trail from Rock Meadow to Walnut Street, passing the cemetery and large emergent marsh.
11. Enhance the path connection to Rock Meadow visually with improved landscape treatment at the stream crossing.
12. Establish clear rules, signage, and barriers related to unauthorized motorized vehicle use.



Figure 4.13: Bridge connecting the North Reservation to Rock Meadow, 2005 (Pressley Associates).

Site Features and Furnishings

1. Structures

Assessment:

The wooden bridge across Beaver Brook connecting to Rock Meadow is in poor condition. This is a critical connection to the adjacent open space. A pedestrian bridge is also needed near the south parkway to re-establish a link to the trail network.

Recommendations:

1. Stabilize the bridge connecting the reservation to Rock Meadow and provide safety railings if needed.

2. Construct a pedestrian bridge over the small brook near the south parkway to re-establish trail connection (see Recommendations map for exact location).

2. Fences and Walls

Assessment:

The stone walls scattered in the property are in fair to poor condition. The chain link fence around cell tower equipment affects the visual quality of the vista atop Mackerel Hill.

Recommendations:

1. Stabilize the stone walls, where needed as they contribute to the physical interpretation of previous land uses.
2. Develop a landscape treatment for Mackerel Hill crown to minimize the visual impact of the cell tower fence. This will depend on the long term plan for both the water tower and cell tower.

3. Site Furnishings

Assessment:

The new light fixtures along Metropolitan Parkway have a compatible base, but the cobra head lamp is not compatible with the historic character of the reservation. There are no other furnishings on the property other than the wooden bench in poor condition along the path connection to Rock Meadow.

Recommendations:

1. Maintain the light fixtures along the parkway in conjunction with parkway maintenance.
2. Provide adequate rustic benches along the pedestrian path to promote passive use of the reservation.
3. Provide dog stations near the proposed DCR parking area with clearly posted rules related to leashed dogs.
4. Provide site interpretation elements along the pedestrian trails and near parking areas to promote cultural and ecological significance of the property.
5. Create two wetland viewing areas overlooking the large emergent [cattail] marsh: one at the proposed wetland restoration area in the former debris site, and one adjacent to the main carriage road.

4. Site Utilities

Assessment:

The existing metal utility poles are currently non functional and poses hazardous conditions along the pedestrian trails. The lead-lined water tower atop Mackerel Hill affects the visual quality of the reservation and presents a safety and liability issue, which has been identified as high priority for DCR Operations staff. The existing cell tower structure has an undesirable visual effect that is not compatible with the natural scenery and the income from the tower does not benefit the reservation.



Figure 4.14: Abandoned utility pole in the North Reservation prior to removal, 2005 (Pressley Associates).



Figure 4.15: Downed utility pole adjacent to existing trail, Beaver Brook North Reservation, existing in 2009 (Pressley Associates).



Figure 4.16: Water tower on Mackerel Hill in the North Reservation, 2005 (Pressley Associates).

Recommendations:

1. Remove all existing utility poles with minimum disturbance to the surrounding landscape. This is a high priority for the reservation given their hazardous condition and should be undertaken as quickly as possible. Note that in 2009, several utility poles have been removed, but some downed poles remain in the vegetation.
2. Assess the cost and feasibility (operational, environmental, public use, and visual issues; and potential positive and negative costs) of removing the water tower. Once this is determined, develop alternatives for the treatment of the water tower:
 - a. Removing the water tower and restoring the Mackerel Hill summit to natural conditions with views.
 - b. Retaining the water tower and further developing leased cell tower use. This alternative should only be pursued if it presents a demonstrable public benefit to the reservation through increased revenue that directly benefits Beaver Brook.

Recreational Uses

1. Passive Recreation

Assessment:

The reservation is not heavily used because the DCR does not promote access due to the ongoing construction activity. However, the public review process for the RMP did reveal a vociferous community of mountain bicyclists, who have an established history of use and maintenance of the existing trail system. Bicyclists, pedestrians and dog-walkers informally enter the site from Elsie Turner Park and Rock Meadow conservation

land. Nature walks conducted by the Massachusetts Audubon Society and Friends of the Western Greenway are creating increased public awareness about the reservation.

Recommendations:

1. Develop an environment friendly passive recreation program with least impact on the natural habitat of the reservation.
2. Provide improved site interpretation to enhance passive recreation and resource stewardship.



Figure 4.17: Bicyclists on the main carriage road, Beaver Brook North Reservation, 2009 (Pressley Associates).

2. Active Recreation

Assessment:

Active and intensive recreation uses are not promoted in the North Reservation. However, there is ample evidence of past motorized trail bike use in the property, especially around Mackerel Hill and the former debris site with adverse impacts on terrain and habitat. Mountain biking associations have indicated their desire to develop an environmentally sensitive recreation policy and trail system for the site.

Recommendation:

1. Prohibit motorized uses on the property as per DCR Reservation Regulations. Create public awareness and community watch programs to implement the recreation policy.
2. Designate a shared use trail system that includes both the existing carriage roads and most of the narrow [single track] trails that can accommodate both mountain bikes and pedestrians.

3. Develop collaborative programs with established recreational associations to participate in the evaluation, designation, and maintenance of trails in the reservation.

Views

Assessment:

The scenery of Beaver Brook North Reservation is marked by natural areas with varying terrain such as Mackerel Hill, uplands, meadows, and wetlands. Parts of the property have been altered due to the construction of the Metropolitan Parkway, demolition of unused buildings, and the removal of the debris sites.

Recommendations:

1. The disturbed sites associated with demolished buildings and the dump site should be replanted with native vegetation and managed as open meadows to blend with the surrounding natural scenery.
2. To utilize the views enhancing the visual quality of the reservation, maintain proper sight lines along the trails.
3. Undertake selective clearing to open up views from Mackerel Hill.
4. Provide selective views into the central open wetlands from the trails around them.
5. Vegetation treatments are recommended to buffer views from the reservation to adjacent land uses such as residential development, roadway, and golf course.



Figure 4.18: Existing trail bordering the large wetland, Beaver Brook North, 2009 (Pressley Associates).

Management Recommendations

Public Access and Recreational Issues

Beaver Brook Reservation

Assessment:

Public use of Beaver Brook Reservation is well established with existing parking areas and facilities that create distinct experiences in the Mill Street and Waverley Oaks parcels.

Recommendations:

1. DCR should retain and continue existing recreation uses at the Beaver Brook Reservation, which provide a diverse range of passive and active uses for park users.

Beaver Brook North Reservation

Assessment:

The North Reservation is in a state of transition without clear direction related to current public access and uses and their potential effect on natural or cultural resources. The land has not been actively used, although comments received on the draft RMP indicate that there is an established mountain biking constituency. The site is also used informally for dog walking and jogging. However, recreational policies are not yet established and the long term effect of increased public use is not yet known. Furthermore, without active management or DCR presence, the site may be perceived as abandoned property and thus susceptible to inappropriate uses such as inappropriate dumping, storage of construction materials or debris, and homeless encampments.

As Beaver Brook North Reservation evolves, issues associated with public use and recreation will also change, requiring DCR to remain flexible and adaptable to changing conditions.

Recommendations

1. Clearly communicate and post current and future public access policies related to Beaver Brook North Reservation, including allowable uses, entrances, and rules and regulations. This will likely require a dynamic policy, updated or revised seasonally and yearly as the property becomes more widely recognized as public open space and the adjacent redevelopment is completed.
2. Develop a clear and defensible recreation policy for the new reservation, particularly with respect to trail use and if appropriate, seasonal closures for habitat and wildlife protection.

3. Develop an operational strategy to provide access to the cemetery for individuals who are not able to walk the distance from the parkway. This could include providing a vehicular gate at the entrance to the carriage road that can be opened by DCR operations staff by special request.
4. Monitor the site on a regular basis related to potential inappropriate uses, such as dumping and unauthorized motorized vehicle use, and take immediate action if such uses are observed.
5. Remove the existing encampment (visible in 2005-2006) located south of the debris site near the cemetery.

Surrounding Land Uses and Property Issues

Assessment:

The expanded Beaver Brook Reservation is part of a regional open space system, called the Western Greenway, which is a significant recreational and open space resource for the communities of Belmont, Lexington, and Waltham. Both the ecological and recreational linkages to these adjacent properties should be a priority objective for the future management of the expanded Beaver Brook Reservation. In addition to the adjacent municipal and private open space, the redevelopment of the former Metropolitan State Hospital campus will have an effect on Beaver Brook North Reservation, particularly through the construction of the Metropolitan Parkway, AvalonBay Communities' residential development, the use and management of Waltham's conservation land (originally proposed as a 9-hole golf course), redevelopment of the Gaebler School, and the potential development of a golf club/visitor center or other use in the former MSH Administration Building.

The construction of the new Metropolitan Parkway includes changes to the intersection at Trapelo Road, so that the Parkway has a single entry/exit closer to Forest Street, instead of the separate entrance and exit farther down Trapelo Road opposite Doty Street and south of Shade Street. While simplifying the intersection is a positive improvement, the reality of site conditions results in a severely obstructed view of outbound traffic, making it unsafe to make a left turn from the Parkway onto Trapelo Road.

In the past, DCR has pursued an interest in acquiring conservation restrictions along Beaver Brook. This program is no longer active. In 2009, Lot 1, located at the northwest corner of Beaver Brook North had been successfully acquired.

Recommendations:

1. Maintain, enhance, and promote recreational trail connections with adjacent open space properties, particularly Rock Meadow Conservation Land and the new bikeway associated with the Metropolitan Parkway.
2. Actively monitor construction activities associated with the AvalonBay residential development, particularly with respect to use of the parkway, equipment and materials storage, tree protection, and protection of the adjacent Beaver Brook North Reservation. Damage to DCR land or resources, including the new parkway should be reported immediately to the appropriate officials at DCAM, so that immediate repair or restitution can be implemented.



Figure 4.19: 2008 aerial photograph showing the current intersection of the Metropolitan Parkway South with Trapelo Road opposite Forest Street in Waltham, with the former MSH entrance forming a Y opposite Doty Street (Mass GIS).

3. Work actively and collaboratively with the City of Waltham and DCAM related to the future use and rehabilitation of the Administration Building, construction of the proposed parking area, site restoration in the area of the demolished Female Dormitory, site restoration of the area of former roads at the intersection of the Metropolitan Parkway and Trapelo Road, and the redevelopment of the Gaebler School to achieve the City's and the DCR mutual goals related to conservation, preservation, and recreation for Beaver Brook North Reservation.

4. If and when it proceeds, DCR should review the schematic design and construction documents for the Waltham golf course, to ensure that the project meets the requirements of the Reuse Plan and its associated documents, particularly the Second Amendment and Conservation Easement. These documents require that the mature vegetation and wetlands be protected, and that detailed, additional wildlife, aquatic habitat, and water-quality monitoring studies be undertaken prior to construction.
5. Work with the City of Waltham and others to evaluate and resolve safety issues at the Waltham intersection of the Metropolitan Parkway and Trapelo Road due to curvature, slope and alignment of Trapelo Road, as well vegetation and utility poles that block sight lines. Ideally, an evaluation and solution that includes the Forest Street and Doty Street intersections with Trapelo Road will greatly improve vehicular and pedestrian safety in this location.
6. Consider re-activating the voluntary acquisition of conservation easements along Beaver Brook that would provide a protected 10-15' vegetated buffer along the watercourse, and/or work with local Conservation Commissions to develop public information and education programs related to landscape maintenance practices within the wetland setback.
7. Develop long-term plan to include Lot 1 in Beaver Brook North, with connecting trail as part of the Western Greenway.

Operations and Maintenance

Assessment:

Without adequate staff, ongoing maintenance and operation of Beaver Brook Reservation is limited, and a serious need exists related to the 254-acre Beaver Brook North Reservation. Better communication and collaboration is also needed between operations and field staff and the development activities on Beaver Brook North Reservation, as well as with the City of Waltham regarding the condition of their property on which DCR holds a conservation easement.

Recommendation:

1. Recognize the significance of the both Beaver Brook Reservation and Beaver Brook North Reservation and advocate for increased operations funding to meet the maintenance and management needs of both properties.

2. Pursue a formal maintenance agreement with AvalonBay Communities, Inc. related to the maintenance of the new Metropolitan Parkway.

Park Staff

Assessment:

Beaver Brook Reservation does not have any permanently assigned year-round staff and is maintained by staff members from the DCR North Region, Fells District, who also care for many other DCR parks and parkways in the region. Beaver Brook North Reservation is a new acquisition and is not yet staffed. The Reuse Plan requires that DCR assume maintenance and repair responsibility for the Metropolitan Parkway and its access road once construction is complete, which have had an immediate effect on DCR operations since Fall-Winter 2006.



Figure 4.20: Metropolitan Parkway in the North Reservation, 2006 (Pressley Associates).

Recommendations:

1. Develop an immediate and long-term staffing and operations plan for the entire Reservation that provides adequate site maintenance for both the 59-acre Beaver Brook Reservation and the 254-acre Beaver Brook North Reservation, education and interpretation programs, and seasonal staff needed to supervise the spray pool and play area (see Chapter 6 for more detail).
2. Assign DCR staff to actively coordinate with DCAM, AvalonBay, and the three municipalities as the development and construction activities on the former Met State Hospital land concludes to ensure that all of the

conditions of the Reuse Plan have been met, and that all disturbed areas have been adequately restored to native vegetation in areas on or near the DCR reservation and the area covered by the conservation easement. Coordinate with DCAM regarding completion of the site clean up and restoration at the debris removal sites including finish grading, removal of silt fencing, re-vegetation, and carriage road restoration.

Public Education and Interpretation

Assessment:

The expanded Beaver Brook Reservation offers opportunities for interpretation of both natural and cultural resources. The mix of woodlands, meadows, wetlands, pools, and riparian buffers along the stream support many diverse species of flora and fauna, which are described in the section devoted to natural resources. The elevation gradation varying between Mackerel Hill and the low lying stream course demonstrates the function of a sub-watershed with additional potential for environmental interpretation. Historic features such as the MetFern Cemetery, Copeland House, Stearns Barn, stone walls, and mill ponds, dams and associated mill foundations provide a visual connection to the history of the landscape and its previous land uses. There is immense potential to develop environmental programs, which could also promote environmental stewardship in the community.

Recommendations:

1. Develop and provide environmental programs and stewardship activities within the expanded reservation. Specific cultural and environmental themes to develop include:
 - Native American land use;
 - The history of the Waverley Oaks and the development of the Metropolitan Park System;
 - Early industrial uses (including various types of milling operations and ice harvesting);
 - Metropolitan State Hospital;
 - Wetlands ecology, systems, and vernal pools;
 - Plant and animal species identification;
 - Habitat diversity, food webs, and invasive species management;
 - Environmental stewardship and reservation management.
2. Develop collaborative approach or partnership with nearby environmental organizations (such as Mass Audubon) and

institutions (such as Bentley College) related to environmental monitoring, inventory, and programs. This could provide an ongoing database of resource information and public programs that supports the mission of DCR and its partners.

3. Collaborate with Belmont on the continued development of the Waverley Trail, which interprets the history of the Waverley Oaks and their role in the history of landscape preservation in Massachusetts and the development of the Waverley Square area.

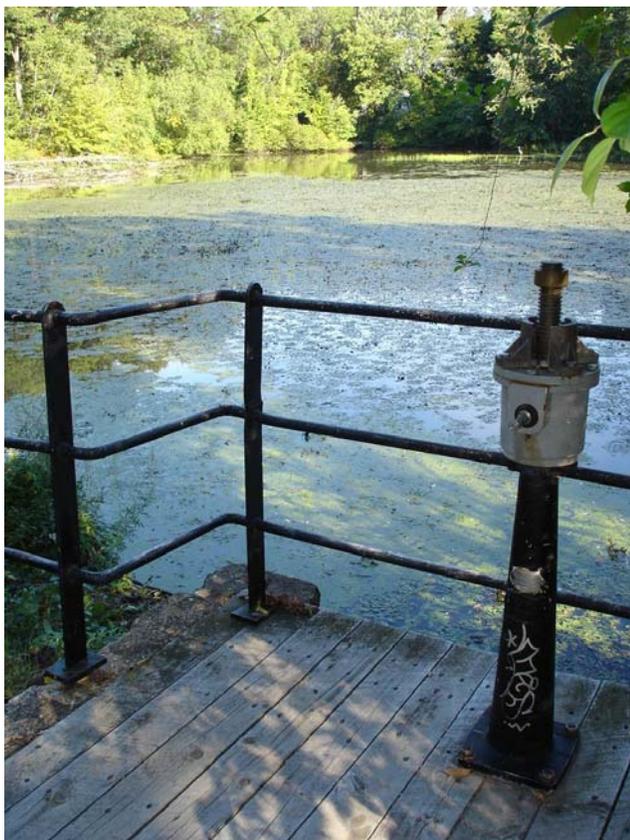


Figure 4.21: Dam over Mill Pond in Beaver Brook Reservation, 2005 (Pressley Associates).

Recommendations for Further Study

Following are recommendations for future research to improve the condition and use of the expanded Beaver Brook Reservation. They include more detailed studies and evaluations, which are outside the scope of the RMP.

General Recommendations

1. Develop a user survey of dog owners and work collaboratively with dog walkers to develop a leash policy for the expanded reservation that meets the needs of all users, and which can be effectively monitored and managed by DCR.

Beaver Brook Reservation

1. Conduct structural and code compliance evaluation of the **bridges and dams** in the reservation in coordination with the DCR Dam Safety Program and improve them to meet DCR standards, including safety and accessibility where feasible.
2. Document the history of the reservation and prepare a **National Register of Historic Places nomination** focused on Beaver Brook's role as the first public reservation in the Metropolitan Park System. Consider preparation of a Cultural Landscape Report to document and analyze the reservation and provide more detailed treatment recommendations for the landscape.
3. Undertake periodic **water quality monitoring** in ponds and along the Beaver Brook watercourse to understand the impact of surrounding land use on the aquatic system.
4. Undertake **structural evaluation of Stearns Barn** and implement emergency stabilization work to prevent further decline and deterioration.

Beaver Brook North Reservation

1. Assess the cost and feasibility of removing the **water tower** and fully evaluate two alternatives: a.) removal with an abatement and demolition plan, and site restoration with minimum impact on Mackerel Hill, and b.) retention and enhanced cell tower use provided this has a demonstrable public benefit to the reservation including retained revenue.
2. Undertake additional **trail evaluations** in the North Reservation in collaboration with trail users to determine specific trails needing boardwalks, drainage improvements or re-routing, and to determine appropriate trail uses.

3. Coordinate with Lexington, Waltham and Belmont on **traffic monitoring** and mitigation related to the use of the Metropolitan Parkway.
4. Conduct **rare species inventory and monitoring** to understand the impact of human activities in the reservation on habitat zones and to identify known or potentially occurring rare species. Continue to evaluate and certify the potential vernal pools.
5. Complete additional **design** work necessary to implement the priority improvements identified in this RMP, particularly the DCR **parking area** and critical **trail connections**.
6. Conduct a **recreational user study** of the Beaver Brook North Reservation to more accurately determine existing uses and as a baseline for assessing changes over the next five to ten years. Update the survey after the completion of the AvalonBay development and golf course construction, if implemented.
7. Prepare an accurate GIS **base map**, particularly focused on locating existing and proposed trails in the North Reservation.

Related Land Areas

1. Work with the City of Waltham on a **traffic/safety study** of the Trapelo Road/Metropolitan Parkway south intersection, and implement safety improvements to the intersection.
2. If the City of Waltham's 9-hole golf course does not proceed, DCR should work collaboratively with the City on a **reuse and rehabilitation plan for the former MSH Administration Building** with a strategy for immediate stabilization work to arrest further deterioration, and site restoration of the area of the former female dormitory on Waltham land covered by the DCR conservation easement.
3. Work collaboratively with the City of Waltham, DCAM and AvalonBay to complete debris removal related to the original Met State entrance off Trapelo Road, and the location of the

Endnotes

¹ Blossey, 2001, Blossey and Schroeder, 1995.

² Blossey, 1997.