

MOUNT WATATIC RESERVATION



January 2008

Ashby Land Trust
Ashburnham Conservation Trust
Town of Ashby
Town of Ashburnham
Massachusetts Department of Fish & Game
Massachusetts Department of Conservation and Recreation



MOUNT WATATIC RESERVATION

RESOURCE MANAGEMENT PLAN APPROVAL

The Resource Management Plan was drafted by a Management Committee made up of representatives from each of the six property owners, and reviewed with an open public process, including a public meeting held in Ashburnham on April 25, 2007. Funding for protection of the Reservation came in part from the Land & Water Conservation Fund (LWCF). LWCF funding requirements include the organization of a land use and management plan, with input and approval from all property owners. The signatures below indicate managing partner / owner approval of the management plan.

Ashby Land Trust

President

Date

Ashburnham Conservation Trust

President

Date

Town of Ashby

Board of Selectmen

Date

Town of Ashburnham

Board of Selectmen

Date

Commonwealth of Massachusetts
Department of Fish and Game

Commissioner

Date



Commonwealth of Massachusetts
Department of Conservation & Recreation

Commissioner

1/11/08

Date



MOUNT WATATIC RESERVATION

Resource Management Plan - January 2008

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Figure 1: Winter View of Mount Watatic from Nutting Hill (M. Przybyla)

Executive Summary

Overview

Mount Watatic Reservation is approximately 281 acres in size, located in the towns of Ashby (Middlesex County) and Ashburnham (Worcester County), Massachusetts. The Reservation includes the summit and the northeast slope of Mount Watatic, and is at the heart of nearly 1000 acres of protected open space. Abutting conservation properties include the 150-acre Watatic Mountain Wildlife Sanctuary and the 263-acre Ashby Wildlife Management Area, both administered by the state Department of Fish & Game (DFG), and a 211-acre block of Ashburnham State Forest, managed by the Department of Conservation and Recreation (DCR). A property along Route 119 was recently acquired by the Town of Ashburnham, with DCR holding a conservation restriction, and an abutting 88-acre property that was acquired by DCR early in 2007. The summit of Mount Watatic is one of the premier hiking destinations in the region as part of the Midstate and Wapack Trails. A **Regional Open Space Map** is available in a separate file on the DCR website.

The proposal to develop a telecommunications facility on the summit of Mount Watatic, as well as a residential subdivision at the base, prompted the

formation of a partnership that resulted in the permanent protection of the Reservation. Acquisition would not have been possible without the Campaign for Watatic. Organized by the Ashby Land Trust, this local fundraising effort gathered \$900,000 through donations received from hundreds of individuals, conservation organizations, corporations and foundations. The acquisition was completed in July of 2002, with six partners holding an undivided interest in the property - the Ashby Land Trust, Ashburnham Conservation Trust, Town of Ashby, Town of Ashburnham, DFG, and DCR. Almost one-third of the funds required for acquisition were provided by a Land & Water Conservation Fund (LWCF) grant awarded by the National Park Service. In order to meet the obligations of the LWCF grant agreement, all partners must participate in the organization of a management plan for the property.

Mount Watatic is a classic monadnock, a residual hill or mountain composed of more resistant bedrock than the surrounding landscape, with a peak elevation of 1832 feet above sea level. The summit area is mostly open with herbaceous and shrub vegetation and a few hardy trees. The slopes are steep and forested, and

there is an extensive wetland system at the base of the mountain on the south side. The mountain rises approximately 650 feet above the surrounding landscape. The property is part of the headwaters of the Souhegan River and is located mainly within the greater Merrimack River watershed.

Notable Natural and Cultural Features

Mount Watatic Reservation hosts an exceptionally rich suite of natural and cultural resources. BioMap Core Habitat, a Natural Heritage & Endangered Species Program (NHESP) designation, includes the summit, a portion of the slope running northeastward from the summit, and a small patch just below the summit on the southeast side. This designation represents the most viable rare plants, rare animals and natural communities known in Massachusetts. The summit also includes an acidic rocky summit/rock outcrop community, which is a NHESP-designated priority natural community. The Reservation includes a red spruce/fir/northern hardwood forest type, uncommon in eastern and central Massachusetts, characterized by spruce trees of significant size and age. It is also a NHESP priority natural community and a potential habitat for the Boreal Chickadee. Other features include rare dragonfly habitat associated with the summit area, steep ledges with potentially unaltered vegetation, and a steeply sloped late-successional forest which provides excellent interior bird habitat. An early-successional (scrub-shrub) habitat is found within the former ski area. More than ten acres of forest on the north facing lower slope contains an almost pure stand of sugar maples, probably established by adjacent seed sources when an entire stand was blown down by the 1938 hurricane. Wetland ecosystems at the base of the mountain include habitat for sundews, pitcher plants, and a variety of uncommon wildlife such as dragonflies, damselflies, salamanders and turtles. The summit is one of the best spots in the northeast to observe the fall hawk migration. A number of additional rare species occurrences and certified vernal pools are located in abutting state conservation lands. A **Priority Natural Resources Map** is located on page 29 of this plan. The Priority Natural Resources Map indicates areas of important natural communities, rare species habitats, and vernal pools. More detailed information on all maps in this plan can be found in Appendix B.



Figure 2: Part of the stone wall network at Mount Watatic (A. Backman)

The network of stone walls indicates that the forested slopes were cleared for wood products and to establish pastureland. The mountain was used as a landmark and a sacred site by the indigenous Algonquins. Given the complex environmental characteristics and favorable site location criteria of much of the Mount Watatic region, the property must be considered to contain exceptionally high archaeological potential, both for numbers of sites yet to be discovered, as well as for sites that retain integrity and research value.

Recreation and Public Access

Hiking is by far the most popular visitor activity. Two long-distance hiking trails, the Midstate Trail and the Wapack Trail, join together at Route 119 and share the same stretch of trail through Mount Watatic Reservation. The summit area provides a dramatic spot for scenic views of the surrounding landscape. Hunting is permitted in the abutting DFG Wildlife Management Areas, the abutting Ashburnham State Forest, and the Mount Watatic Reservation subject to DFG regulations. The management partners have observed a general increase in all public recreation uses of this area. Some of this increase is the result of publicity generated by the successful land protection effort. A **Recreation / Public Access Map** is located on page 17 of this plan. The Recreation / Public Access Map contains detailed information about the location and condition of roads and trails at the facility. The map also has information on many components of property infrastructure including

parking lots, buildings, gates and the locations of the former ski slopes.

The Watatic Management Committee organized a simple visitor survey that was administered in the fall of 2004. Approximately two-thirds of the surveys were administered by volunteers in face-to-face interviews in the Route 119 parking area and the remaining one-third of the surveys were filled out by visitors in a post card format and mailed back to DCR. Nearly half of the survey participants came from Ashby or Ashburnham or towns directly abutting them, and a similar number came from other communities in eastern and central Massachusetts. Approximately 40% of the survey responders had been visiting the site for two years or less, including many first time visitors, indicating a steadily increasing number of people who are becoming aware of the Reservation.

Mission Statement and Overall Management Goals

The mission guiding the long-term stewardship of the Mount Watatic Reservation is to conserve and manage important natural, cultural and recreational resources.

The overall management goals for the Mount Watatic Reservation are:

Maintain and enhance native biodiversity.

Provide for sustainable public access for hiking and other low-impact forms of outdoor recreation, including opportunities for enjoying panoramic views from the summit.

Preserve a place to relish the peace and beauty of nature in the heart of an exceptional, protected landscape.

Priority Findings

- Mount Watatic Reservation contains an exceptionally rich and unique range of natural and cultural resources and contributes substantially to the continuity of lands in Ashby and Ashburnham managed for conservation purposes.
- Mount Watatic Reservation is an important link for Central Massachusetts and New Hampshire long-distance hiking trails, including a junction between the Wapack and Midstate Trails. Mount Watatic is a great ‘small’ mountain for families to climb.
- The summit area is one of the most popular destinations in Central Massachusetts for outdoor enthusiasts. The popularity of the site presents a variety of management challenges and opportunities. The partners expect to continue to receive requests for a variety of special uses and events.
- Subjective observation by partner representatives indicates that the number of visitors has increased over the past several years, probably due in part to the publicity surrounding the Campaign for Watatic that led to the successful land protection. The main trailhead parking area on Route 119, which is actually part of Ashburnham State Forest, is frequently filled to capacity with overflow parking along the margin of the state highway. Visitation is expected to gradually increase, concurrent with increases in regional population and as more people become aware of the Reservation.
- Unauthorized Off Highway Vehicle (OHV) use is common and problematic in the Mount Watatic Reservation, and is increasing statewide.
- The steeply sloping topography adds to management challenges related to summit road maintenance, trail maintenance and forest management activities.
- Undivided ownership by six partners and the lack of on-site staff will require extra effort related to coordination and cooperation to provide for adequate resource stewardship and sustainable public access.

Priority Recommendations and Management Needs

These next sections include an assessment of current and future management activities, responsibilities and capacity, and describe two levels of management capacity – the first level addresses current needs and capacity, and the second level describes management needs to implement priority stewardship responsibilities and strategies.

Current Management Capacity and Activities (Level 1)

DCR currently is the only Watatic partner with the capacity to provide ongoing management for Mount Watatic Reservation. The Reservation is part of the much larger 9,000-acre Willard Brook State Forest (SF) Management Unit, which includes Willard Brook, Townsend, Ashburnham, and J. Harry Rich State Forests, Pearl Hill State Park, and the Nashua River Rail Trail. Due to intensively used recreation areas at Willard Brook SF (approximately 41,500 visitors in 2005), Pearl Hill State Park (35,500 visitors in 2005) and the Nashua River Rail Trail (304,750 visitors in 2005), less than 5% of the Willard Brook Management Unit budget, staff time, and management resources can be focused on Mount Watatic Reservation.

Current Principal Management Capacity

- *DCR Willard Brook State Forest Management Unit (2006)*
Year-round and seasonal staff – Forest & Park Supervisor III, Forest & Park Supervisor II, year-round Laborer II, and eleven Seasonal Laborer positions.
- *DCR District/Regional Support Staff*
Regional Management Forester, Bureau of Fire Control Districts 8 & 6, Ranger, Carpenter, Heavy Equipment Operator.
- *Ashby Land Trust and the Ashburnham Conservation Trust*
Volunteered a significant number of work hours to raise funds for acquisition, monitor visitor activities, and conduct visitor surveys.

- *Towns of Ashby and Ashburnham*
Provide emergency services and law enforcement on an as-needed basis, with some support from State Environmental Police Officers (EPOs).
- *DFG Division of Fisheries and Wildlife (DFW or MassWildlife)*
Provides informational support related to rare species management, and vegetation management related to wildlife habitat enhancement.

Current Principal Management Activities (Level 1 Capacity)

- Conduct road repairs along the forest road that leads from the Route 119 parking area towards Nutting Hill and the summit trail to address flooding caused by beaver activity. Beaver management actions are important to maintain forest road access and to prevent the alteration of the adjacent rare Odonate habitat.
- Respond to calls and local concerns, including gate and lock maintenance.
- Cleanup illegal dumping.
- Install signs.
- Maintain and regrade the Route 119 parking area, conducted on an annual or as needed basis. (This parking area is technically part of Ashburnham State Forest.)
- Maintain trails.
- Conduct storm water maintenance on the summit road.

Key Strategies to Support Current Management Capacity

A. Partner Communication & Coordination

The partners recommend formation of a **Watatic Stewardship Committee with one representative and one alternate appointed by each of the six partners**. The mandate of this committee would be to oversee and support long-term implementation of the Resource Management Plan, rather than exercising control over the day-to-day management of the facility. The Stewardship Committee would be an advisory group and would not have the authority to direct management activities of any partner(s). The Stewardship Committee can provide an efficient method for partner communication and decision making related to immediate management and maintenance concerns, and related to requests for

group activities or special events. **A partner subcommittee could be formed to develop and implement alternatives for management-related funding, such as establishing endowments and identifying other private and public sources of funding to help improve management capacity.** One example of this activity could be raising the funds needed to hire a seasonal position to provide a presence on the trail system, to assist lost or injured hikers, provide a basic level of interpretive services, and monitor the trails for environmental and maintenance concerns. An account managed by a nonprofit partner could facilitate flexibility and quicker accessibility to funds.

B. Law Enforcement Coordination

The partners have initiated a process that may lead to all Code of Massachusetts Regulations (CMR) violations, irrespective of the issuing agency, being directed to Ayer District Court in order to establish a consistent law enforcement process. There is also potential for the development of a Mutual Aid Agreement between state (EPOs and state police) and municipal police departments, including New Ipswich, NH. The Agreement could include a description of emergency contact protocol, a process to recover costs of negligent behaviors that trigger an emergency response, and the equitable dispersal of fines between responding departments.

Priority Stewardship Recommendations and Management Needs (Level 2)

The Mount Watatic management partners anticipate that pressures from visitor use will gradually increase as local and regional populations grow, as more land is developed, and as more people become aware of this public recreation resource. Conflicts between visitor use and the preservation of sensitive resources such as the acidic rocky summit natural community must be monitored and managed on a long-term basis.

The management partners recognize the need to enhance management capacity in order to address priority management responsibilities.

- The first priority is to identify and monitor existing and potential areas of resource stewardship and visitor conflict through baseline inventories, and to increase the capacity to

monitor natural and cultural resources and recreational use and activities on a regular basis.

- Boundary marking, improved environmental education through better signage and public outreach, and partner coordination with local and state law enforcement staff related to illegal OHV activity are important management responsibilities.
- Additional management resources are needed to provide visitor contact, monitor the trailhead area, trails and summit activities, undertake basic trail maintenance, and provide first level emergency services (with a potential for contact and coordination with local Emergency Medical Services).

An increased Level 2 management capacity that could begin to address the partner-identified priorities for management of Mount Watatic Reservation includes:

- The addition of a DCR Seasonal Supervisor and Laborer positions, assigned as necessary to the Willard Brook Management Unit, as a requested addition to the DCR staffing plan if adequate operational funding is available.
- DFG resources to organize and administer the identification and monitoring of existing and potential areas of resource stewardship and visitor conflict through baseline inventories.
- Management partners efforts to identify additional strategies for management support from municipal and nonprofit partners, and to foster partnerships with organized park user groups and organizations that can support environmental research and education.

Land Stewardship Zoning Guidelines

DCR applies a Land Stewardship Zoning Guidelines system to its forests, parks and reservations across the Commonwealth. This system provides a framework for the development of management guidelines intended to protect the particular resources located within the property.

The following zones are recommended for application in the Mount Watatic Reservation. Please refer to Section 6 and the Plan appendices for the full explanation and management guidelines associated with the Land Stewardship Zoning Guidelines.

A **Land Stewardship Zoning Map** is located on page 41 of this plan. The Land Stewardship Zoning Map shows the locations of DCR's Land Stewardship Zones which are described below:

- **Zone 2:** The majority of land within the reservation, including wetlands, forested slopes and the summit area.
- **Zone 3:** The former ski area parking lot on the northeast side of the property. This site might be used for future event parking if management and enforcement capacity can provide for on-site coverage during visitor use.
- **Significance Overlay:** The summit area that is identified by the Natural Heritage & Endangered Species Program (NHESP) as BioMap Core Habitat and supports an exemplary acidic rocky summit / rock outcrop community (please see Priority Natural Resources map). Applicable management guidelines include monitoring rare species populations following NHESP guidelines (taking into consideration availability of staff and volunteers), and enforcement of regulations related to authorized and unauthorized summit activities, such as OHV use (taking into consideration availability of staff with enforcement capabilities).

Summary of the Planning Process

The acquisition partners organized an Interim Management Plan in 2002-2003 that included basic guidelines for owner communication, visitor use and resource management. The Watatic Management Committee was formed in May of 2004 with one representative and one alternate from each of the six managing partners. During the summer and fall of 2004 the Management Committee held a series of

open public meetings in the Ashby and Ashburnham Town Halls to discuss various aspects of visitor use and resource management. A Law Enforcement Subcommittee met with local law enforcement officials in 2005. The Management Committee held two additional public planning meetings in 2006. This planning process has resulted in the preparation of a draft Resource Management Plan (RMP) that is intended to meet the obligations of LWCF funding and to establish guidelines for cooperative and sustainable management of the Reservation.

The first draft Resource Management Plan was reviewed by all partners, then revised accordingly. The draft RMP was the subject of a public meeting held on April 25, 2007 in the Ashburnham Town Hall. The public comment period extended to May 9, 2007. Notice regarding the public review process and the draft plan was posted on the DCR website on or about March 21, 2007. Press releases containing this information were distributed to local newspapers in advance of the public meeting. Finally, a public notice regarding the public review process was circulated to town boards and commissions and was included in *The Environmental Monitor*, published by the Executive Office of Environmental Affairs on March 21, 2007.

The Partners Management Committee met on August 29, 2007 to discuss and evaluate comments received and to revise the draft RMP as needed.

Appendix A includes a summary of the public review process, a summary of public comments and major issues, responses to these issues, and a summary of substantive revisions included in the final RMP.



Figure 1.1: From Pratt Mountain (M. Przybyla)

Section 1: Property Description

Acquisition Background - The Watatic Partnership

The proposal to develop a telecommunications facility on the summit of Mount Watatic, as well as a residential subdivision at the base, prompted the formation of a partnership that resulted in the permanent protection of approximately 281 acres of public conservation land. The partnership included the Ashby Land Trust, the Ashburnham Conservation Trust, local officials from the communities of Ashburnham and Ashby, and representatives from the Massachusetts DCR and DFG.

At the time of acquisition there was a significant gap between the appraised fair market value (\$1.6 million) and the agreed upon purchase price (\$2.5 million). By law, the Commonwealth can not pay more than fair market value for real estate. Therefore the acquisition would not have been possible without the Campaign for Watatic. Organized by the Ashby Land Trust, this local fundraising effort gathered \$900,000 through donations received from hundreds of individuals, conservation organizations, corporations and foundations.

Almost one-third of the funds required for acquisition came from a Land & Water Conservation Fund (LWCF) grant awarded by the National Park Service and administered by the Massachusetts Division of

Conservation Services. The original application for the LWCF grant was submitted by the towns of Ashby and Ashburnham. At the Commonwealth's request the towns assigned their rights under the grant to the state so that the MA DCR and DFG could purchase the property. On July 10, 2002 DCR and DFG acquired a 98% interest in the land, while each land trust acquired a one percent undivided interest. Each land trust subsequently transferred one-half of one percent interest to their respective towns, resulting in six partners with undivided interest in the property.

Ownership

MA DCR and MA DFG jointly own a 98% undivided interest; the Towns of Ashburnham and Ashby each own a ½% undivided interest; and the Ashby Land Trust and the Ashburnham Conservation Trust each own a ½% undivided interest.

The property was acquired in 2002 for the purposes of conservation and public recreation. The Reservation is subject to easements for Fitchburg Gas and Electric Light Company and New England Telephone and Telegraph Company. There is also a right-of-way for access between Bennett Road and abutting private

property, located along the entrance to the former ski area.

Management Plan Requirement

In order to meet the obligations of the LWCF grant agreement, all partners must participate in the organization of a management plan for the property. This Resource Management Plan is intended to establish guidelines for partner cooperation and coordinated management of the property that will provide for the protection and stewardship of natural and cultural resources, and ensure consistency between recreation, resource protection and sustainable forest management. The plan is also intended to fulfill the legislative requirement (Chapter 21, Section 2F of the Massachusetts General Laws) regarding preparation of management plans for all state parks, forests and reservations under the management of DCR.

General Property Information

Name: Mount Watatic Reservation

Area: 281.5 acres

Perimeter: 3.3 miles

Location: Towns of Ashby (Middlesex County) and Ashburnham (Worcester County)

DCR Management Unit: Willard Brook State Forest, Great Brook District, Northeast Region, Division of State Parks and Recreation

DFG Management Unit: Northeast Wildlife District, Division of Fisheries and Wildlife

Ecoregion: Worcester-Monadnock Plateau

Watershed: A majority of the property is in the Merrimack River watershed. The western quadrant of the summit area (approximately 5 acres) is in the Millers River watershed.

Legislators:

Ashby – Senator Robert A. Antonioni (Senate District - Worcester & Middlesex),
Representative Robert Rice (House District – Second Worcester)

Ashburnham – Senator Stephen M. Brewer (Senate District - Worcester, Hampden, Hampshire & Franklin)
Representative Robert Rice



Figure 2.1 Forest road (A. Backman)

Section 2: Current Management

Current Management Activities and Responsibilities

DCR currently is the only Watatic partner with the capacity to provide ongoing management for Mount Watatic Reservation. The Reservation is part of the much larger 9,000-acre Willard Brook State Forest (SF) Management Unit, which includes Willard Brook, Townsend, Ashburnham, and J. Harry Rich State Forests, Pearl Hill State Park, and the Nashua River Rail Trail. Due to intensively used recreation areas at Willard Brook SF (approximately 41,500 visitors in 2005), Pearl Hill State Park (35,500 visitors in 2005), and the Nashua River Rail Trail (304,750 visitors in 2005), less than 5% of the Willard Brook Management Unit budget, staff time, and management resources can be focused on Mount Watatic Reservation. The principal management activities at the Reservation include:

- Road repairs along the forest road that leads from the Route 119 parking area towards Nutting Hill and the summit trail, to address flooding caused by beaver activity. Beaver control actions are important to maintain forest road access and to prevent the alteration of the adjacent rare dragonfly habitat. This road is technically part of Ashburnham State Forest.
- Responses to calls and local concerns, including gate and lock maintenance.
- Cleanup of illegal dumping.
- Installation of signs.
- Maintaining and regrading the Route 119 parking area, conducted on an annual or as needed basis. This parking area is technically part of Ashburnham State Forest.
- Storm water management on the summit road.
- Trail maintenance has mainly been conducted on the long-distance hiking trails by Friends of the Wapack.

2006 DCR and DFG/DFW Management Organization

- DCR Northeast Region Division of State Parks & Recreation Director Susan Hamilton, Great Brook District Manager Kathryn Garcia, Willard Brook Management Unit Supervisor Edward Torcoletti, Regional Management Forester Chuck Pernaa
- DFG Division of Fisheries & Wildlife, Northeast Wildlife District Manager Patricia Huckery

Mount Watatic Reservation - Staff and Management Support

- DCR Willard Brook State Forest Management Unit (2006)
Year-round and seasonal staff – Forest & Park Supervisor III, Forest & Park Supervisor II, year-round Laborer II, and eleven Seasonal Laborer positions.
DCR District/Regional Support Staff – Regional Management Forester, Bureau of Fire Control Districts 8 & 6, Ranger, Carpenter, Heavy Equipment Operator.
- DFG provides informational support related to rare species management, and vegetation management related to wildlife habitat enhancement.
- The Ashby Land Trust and the Ashburnham Conservation Trust have volunteered a significant number of work hours to raise funds for the original land protection effort, monitoring visitor activities, and conducting visitor surveys.
- The Towns of Ashby and Ashburnham provide emergency services and law enforcement on an as needed basis, with some support from State Environmental Police Officers, and provide support for environmental compliance via the Conservation Commissions.

- Former ski area parking lot, large enough for approximately 100 vehicles – surface is in poor condition.
- Former ski area pump house adjacent to snowmaking pond – poor condition.
- Earthen dam structure associated with former snowmaking pond.
- Former ski area utility building located at the base of the summit road – a small cinder block structure.
- A slab foundation from former ski area base lodge.
- Summit road (from former ski area parking lot to the summit), associated drainage structures, utility poles and wires – approximately 0.9 miles in length.\
- Miles of boundary – approximately 3.3.
- Size – 281.5 acres.

Recent Improvement Projects

- Removal of remnant structures from former ski area for public safety and aesthetic purposes, conducted by DCR staff in 2003.
- Regrading the Route 119 trailhead parking area, conducted by DCR staff in 2007.
- Trail maintenance conducted on an as needed basis mostly by volunteers from Friends of the Wapack.
- Installation of monuments at the base and summit to recognize successful Mount Watatic land protection effort, conducted by the Ashby Land Trust and members of the Campaign for Watatic in 2004.

Structures and Other Physical Inventory

- Route 119 parking area, gravel surface, space for 10 to 15 vehicles (expansion planned to provide space for an additional 10 vehicles).
- Entrance road from Bennett Road into former ski area parking lot – approximately one-quarter mile in length.



Figure 3.1: View south from Mount Watatic (R. Flashman)

Section 3: Recreation and Public Access

Regional Demographics

During the past half-century local and regional population has increased, spurred by residential, retail and light industrial growth. The pace of residential development has been especially rapid during the past five years. A comparison of 1985 and 1999 land use, focused on the Fitchburg-Leominster-Gardner area, indicates that portions of the landscape developed for residential, commercial and industrial purposes increased by 2.5% during this time period, with a similar loss in the overall percentage of forested and agricultural lands.

The population within 10 miles of Mount Watatic is approximately 93,000 residents. The population of Fitchburg is about 40,000, and Gardner is a bit less than 20,000 out of this total. Winchendon, MA, New Ipswich, NH and Rindge, NH are also important community centers within this radius.

Community Overview – Demographics and Land Use

The **Town of Ashby** is a mostly residential community with a foundation of commercial home-based businesses. In 1998 the Town became the largest employer with the closing of the only large manufacturing facility in town. A historic district,

centered around Ashby's Town Common, was adopted by Town Meeting in 1997. In 1980, 2,311 people lived in Ashby. The population grew to 2,926 in 2004, with the greatest increase occurring during the 1980s. All of Ashby, with the exception of one small industrial zone, is zoned for residential use (mostly two-acre lot zoning). Considering the current zoning, land uses, and status of private undeveloped land, residential development is likely to have the greatest impact on the town and available open space. (Ashby Open Space and Recreation Plan)

In the year 2000 the **Town of Ashburnham** had a population of 5,546. During the 1980s the population rose by 40%. The overall land area of Ashburnham is almost twice that of Ashby, so the resultant population densities of the two towns are very similar. Ashburnham has over 20 lakes and ponds, including the Upper Naukeag Lake that serves as a drinking water supply reservoir for Ashburnham and Winchendon. The scenic landscape and many lakes and ponds make Ashburnham a desirable vacation spot, causing the population to double on a nice summer weekend. The regional school district and Cushing Academy are the largest employers. Similar to Ashby, Ashburnham is part of a larger trend toward increasing single-family home development. (Ashburnham Open Space and Recreation Plan)

Current Recreation Activities

Trails

Hiking is the most popular trail use. Two long-distance hiking trails, the Midstate Trail and the Wapack Trail, join at Route 119 and share the same stretch of trail through Mount Watatic Reservation. Hiking groups sometimes arrive by the busload.

In addition to hiking local residents occasionally use the unpaved forest roads for horseback riding.

There is some winter use of the trails for hiking, cross country skiing, snowshoeing and snowmobiling when snow conditions are favorable.

Unauthorized use of OHVs and 4-wheel drive trucks is common and increasing in frequency.

Hunting

Hunting is permitted in the abutting DFG Wildlife Management Areas and Ashburnham State Forest. Hunting is also permitted in Mount Watatic Reservation subject to DFG regulations, such as no hunting on Sundays, defined seasonal hunting timeframes, and maintaining proper distances from dwellings and roads.

The Summit

The summit area provides a dramatic spot for scenic views of the surrounding landscape, for photography, and for wildlife viewing such as the annual hawk migration.

The partners have received a variety of inquiries related to group activities or other unique uses of the summit area. The six owners have agreed to keep each other informed about these requests, and to filter appropriate requests through DCR's Special Use Permit system.

Current Points of Access

- The Route 119 trailhead parking lot is the main authorized and managed point of access.
- There is Route 119 roadside parking about one-half mile east of the trailhead parking lot, which is also used by hikers who want to take a more direct route to the summit.
- The right-of-way from Bennett Road to the former ski area is an important emergency services access point. Two locked gates are in place along this right-of-way, one located at Bennett Road and one closer to the former ski area parking lot. There is a problem regarding unauthorized access at this location with vehicles driven through abutting private property to go around these gates.
- Old Watatic Road continues to have a problem with unauthorized access point despite gates. Vehicles are driven around the gates or through the fields on the abutting DFW Gilcrest property. This road has been discontinued by the Town of Ashby, from the last house on the road to the end of the road, and is therefore owned by the abutters on either side.
- Binney Hill Road provides access to the Wapack Trail for visitors from New Hampshire.
- Numerous other rough roads provide access from Ashburnham, Ashby and New Hampshire.

This page is intentionally left blank as a placeholder for the **Demographics Map**.

The map is available in a separate file on the DCR website.

This page is intentionally left blank as a placeholder for the **Regional Land Use Map**. The map is available in a separate file on the DCR website.

This page is intentionally left blank as a placeholder for the **Recreation / Public Access Map**.

The map includes Infrastructure items listed above under Structures and Other Physical Inventory, and is available in a separate file on the DCR website.

Organized User Groups

- Friends of the Wapack
- Midstate Trail Committee
- Eastern Mass Hawk Watch
- Boston Swiss Club
- Toah Nipi (Ashburnham based church group)
- Fitchburg Sportsmen's Club
- Various bus touring companies
- Boy Scout and Girl Scout troops
- Various school groups

Recreational Trends

2000 Statewide Comprehensive Outdoor Recreation Plan (SCORP) - statistics from Central Massachusetts:

Activities most widely engaged in by residents: swimming (61%), walking (59%), sightseeing/tours/events (56%), hiking (43%), fishing (34%), picnicking (33%), playground activity (32%), wildlife and nature study (30%)

Central Massachusetts residents had the highest percentage statewide for use of forests and showed the highest interest in use of water resources, especially lakes and ponds.

Preferences for funding initiatives: maintaining existing facilities (94%), improving access for people with disabilities (93%), restoring and improving existing outdoor recreation areas (91%), expanding environmental education programs (87%), providing guides/maps/interpretive information (86%), purchasing new outdoor recreation areas (81%), adding park staff (79%), increasing park police (78%), improving access by public transportation (71%).

2004 The Public's Use of Outdoor Resources in Massachusetts:

A Marketing Research Study Conducted for DCR by the Insight Group - compiled from telephone interviews of 400 park users and 100 non-users of parks

Leading Activities (previous 12 months):

Walking	80%
Picnicking	52%
Swimming	48%
Attending an event	48%
Historic appreciation	43%
Hiking	42%
Bicycling	40%
Boating/sailing	34%
Running/jogging	33%
Dog walking	29%
Nature study	27%
Camping	22%
Fishing	22%
Skating/hockey	14%
Mountain biking	14%
Downhill skiing	10%
Off Highway Vehicles	7%
Cross-country skiing	7%
Hunting	4%
Horseback riding	4%
Snowmobiling	3%

Conclusions of the Public's Use of Outdoor Resources in Massachusetts

- In 2004, 54% of Massachusetts residents surveyed reported using park and recreation facilities, as compared to 42% ten years earlier.
- Three-quarters of current (2004) users are under the age of 55. Park users tend to have attained a higher level of education, are more affluent, and more likely to have children than non-users.
- Green spaces, trails and parks command the most repeat use.
- Amenities that are most important to consumers include knowing that a facility is well maintained, that there are restrooms available, that they will be able to get exercise, that the facility is clean and has ample parking.

Trends and other information specific to Mount Watatic Reservation

The management partners have observed a general increase in all uses of this area. Some is the result of the publicity generated by the purchase of the mountain and the local fundraising efforts to pay for the purchase.

Mount Watatic Visitor Profile – Fall 2004

The Watatic Management Committee organized a simple visitor survey that was administered in the fall of 2004. Approximately two-thirds of the surveys were administered by volunteers in face-to-face interviews in the Route 119 parking area from October 9-November 6, 2004. The remaining one-third of the surveys were filled out by visitors in a post card format and mailed back to DCR. The post card responders visited the mountain between October 8 and November 11, 2004. The following summary includes responses from 266 individuals. The summary is intended to provide a basic profile of fall 2004 visitors, and represents an initial gathering of baseline data that can be compared with future surveys. The results should not be considered as statistically significant.

Where did the visitors come from?

- 22% Ashby / Ashburnham
- 23% MA & NH towns abutting Ashby / Ashburnham
- 22% Central Massachusetts
- 26% Eastern Massachusetts
- 1% Massachusetts / CT River Valley
- 3% New Hampshire
- 2% Other New England / New York
- 1% Other states / other countries

Who accompanied them?

- 10% came by themselves
- 51% came with family members
- 26% came with friends
- 11% came with family & friends
- 2% came with an organized group

How many individuals were in their group?

- 10% came by themselves
- 35% two people
- 35% three to five people
- 14% six to ten people
- 6% more than ten people

How many years have they been visiting Mount Watatic?

- 15% first visit
- 11% two years
- 15% three to five years
- 14% six to ten years
- 15% eleven to twenty years
- 19% more than twenty years

How many times per year do they visit Mount Watatic?

- 15% first visit
- 43% once or twice
- 23% three to five times
- 8% six to ten times
- 11% more than ten times

What was the purpose of their visit?

- 95.5% hiking
- 3.5% other trail use
- 1% other (foliage / hawk watch / peace & quiet)



Figure 4.1: View from the Wapack/Midstate Trails (A. Backman)

Section 4: Natural and Cultural Resources

Regional Context

Geology, Topography and Land Cover

Mount Watatic is located within the Worcester-Monadnock Plateau Ecoregion, which includes the most mountainous and hilly areas of Massachusetts' central upland. The general vegetation types in this ecoregion are transition hardwoods (maple-beech-birch, oak-hickory) with some northern hardwoods (maple-beech-birch). Forested wetlands are common and surface waters are acidic.

Mount Watatic is a classic monadnock, a residual hill or mountain composed of more resistant bedrock than the surrounding landscape, with a peak elevation of 1832 feet above sea level. The summit area is mostly open with herbaceous and shrub vegetation and a few hardy trees. The slopes are steep and forested, and there is an extensive wetland system at the base of the mountain on the south side. The mountain rises

approximately 650 feet above the surrounding landscape.

The composition of the bedrock, together with glacial and post-glacial deposition and erosion, has created a mosaic of landforms, sediments and soils. These topographical and geological characteristics in combination with climatic conditions provide a foundation for a variety of ecosystem types, attracting virtually every form of wildlife known in the northeastern part of the United States. These factors provided Native American hunters and gatherers a rich and diverse subsistence base that would have contributed to the many forms of land use practiced throughout the 12,000 years that humans probably occupied the region.

Protected Land and Open Space

Mount Watatic Reservation is part of a 900-acre block of protected open space managed by DCR and DFG. A 211-acre block of Ashburnham State Forest includes sections of the Wapack and Midstate Trails with a trailhead parking lot off Route 119. Hiking trails climb Nutting Hill within this state forest area. The 150-acre DFG Watatic Mountain Wildlife Sanctuary abuts Ashburnham State Forest and the Reservation, encompassing the northwestern flank of Mount Watatic. Hunting and trapping are not permitted in this area, which has been preserved specifically for the protection of native wildlife species. A 263-acre block of the DFG Ashby Wildlife Management Area abuts the eastern side of the Reservation.

In spite of the general increase in population and housing development, a significant amount of continuity still exists in the undeveloped forested landscape in this region. The **Regional Open Space Map** shows that nonprofit conservation organizations, municipalities and state agencies have been successful at protecting a substantial amount of conservation land.



Figure 4.2 Forested slope (A. Backman)

This page is intentionally left blank as a placeholder for the **Water Resources Map**. The map is available in a separate file on the DCR website.

This page is intentionally left blank as a placeholder for the **Regional Open Space Map**. The map is available in a separate file on the DCR website.

Cultural and Scenic Resources

Land Use History

To the east of Mount Watatic, Paleo Indian hunters and gatherers may have reached the Nashua River drainage sometime between 12,000 to 9,500 years ago. Their history is well documented in the Connecticut River drainage to the west. One therefore would speculate that they roamed and likely lived, even if only in small brief camps, in the intervening area, such as around Mount Watatic. By Late Woodland and Early Historic times the Nashaway, a band of a broader group of Algonquin speaking peoples, inhabited the area prior to colonial settlement. The Nipmuc, Massachusetts and Pennacook tribes may have all hunted or inhabited portions of the area.

The mountain was used as a landmark and sacred site by the indigenous Algonquins. The name comes from the Algonquin word witeoauk meaning “wigwam place.” In fact the domed shape of the mountain resembles a traditional wigwam. Native Americans associated the mountain with Wituomanit, the deity who guarded households from misfortune, and early post contact tales mention native pilgrimages to the summit to make offerings to the deity. (Johnson 1995)

With the displacement of the native population by European settlers the mountain was gradually logged off and turned into pasture land. By the mid-1800s most of the Reservation property and the surrounding area was pasture land, as indicated by extensive stone walls throughout the property, including the vicinity of the summit. By the late-1800s pasture land in the towns to the east had become increasingly scarce. To alleviate the situation cattle drives were conducted in the spring from as far away as Littleton to pasture the animals for the season. The soils and springs on the mountain are ideal for blueberries and the area outside of the pastures were put into blueberry production that provided residents with a cash crop through the Depression years.

Some of the landscape surrounding Mount Watatic was used for subsistence farming, but tax records indicate that most holdings were small, with relatively few livestock and very low assessed values per acre. Conditions for farming were not ideal. (Clark 1999). A changing economy gradually reduced the need for

agriculture in the area. The 1938 hurricane caused extensive damage to forest stands on the mountain and to fences, and blocked access roads. Agricultural activity was abandoned on the mountain and natural forest succession progressed from that point forward.

Archaeological Resources

Given the complex environmental characteristics and favorable site location criteria of much of the Mount Watatic region, the area must be considered to contain exceptionally high archaeological potential, both for the numbers of sites yet to be discovered, as well as for sites that retain high archaeological integrity and research value. The lack of development and low population densities have likely allowed for the survival rate of archaeological sites to be higher here than in most other parts of the state. According to DCR’s staff archaeologist, the Mount Watatic region is “a veritable archaeological museum.”

The potential archaeological resources within the Mount Watatic region are unique records of past human behavior, sometimes resulting from a single activity or event, and sometimes from hundreds and even thousands of years of repeated and recurrent use. The potential survival of many intact and well preserved archaeological sites here makes it one of the most important areas for research about our cultural heritage within the Commonwealth.

Archaeological remains of Colonial and Federal Period farmsteads dot the landscape, often hidden and protected by a shroud of vegetation. The remains of farm complexes featuring a main house, barns of varying sizes, a multitude of out buildings, wells and stone walls that set aside pastures from tilled land and orchards attest to the agrarian base of the region.

One of the more interesting historic archaeological remains in the Mount Watatic region is that of the Shaker compound. The site in Ashburnham contains visible structural remains of building foundations and stone walled enclosures (probably animal pens and gardens). It is likely that the Ashburnham Shaker lot was a satellite of the larger Harvard Shaker Village.



Figure 4.3: Historic photo (date unknown) of women boating with Mount Watatic in the background (provided by R. Flashman)

While the Mount Watatic region never achieved the industrial success of other Central Massachusetts towns like Northbridge, Uxbridge and Blackstone, its watercourses supplied sufficient head of water for small mill operators. The remains of grist and saw mills can be found throughout the region, often in seemingly isolated locations.

Scenic Resources

To date formal historic and scenic landscape inventories have not been prepared for Ashby and Ashburnham. However, it is likely that reasonably good representations of historic and scenic landscapes exist due to the region's continued rural character. Working farms can still be found, and former farms retain much of the integrity of setting as they still can be associated with outbuildings, stone walls, orchards, and open fields.

Visual intrusions caused by modern development on the landscape are relatively modest in the Mount Watatic region. Except in relatively few locations the broader rural landscape retains scenic qualities worthy of preservation.

Natural Resources

Habitat Resources

Land identified as BioMap Core Habitat by the Massachusetts Natural Heritage & Endangered Species Program (NHESP) consists of the most viable rare plants, rare animals and natural communities known in Massachusetts. Supporting Natural Landscapes consist of the most intact lands adjacent to Core Habitat, and serves to buffer and link Core

Habitat areas. Core Habitat areas within the Reservation include the summit, a portion of the slope running northeastward from the summit, and a small patch just below the summit on the southeast side. A large area of Core Habitat located in the abutting Watatic Mountain Wildlife Sanctuary overlaps into the western flank of the focus property. Most (if not all) of the remaining acreage in the Reservation is classified as Supporting Natural Landscape. Please refer to the **Priority Natural Resources Map**.

Areas classified as Living Waters Core Habitat by NHESP consist of water bodies that contain the best freshwater habitats with rare species and exemplary communities. Critical Supporting Watershed areas consist of upland that have the greatest potential to influence or impact the species living in Living Waters Core Habitat. The Reservation includes Critical Supporting Watershed in the Merrimack River basin for Core Habitat downstream in New Hampshire.

This page is intentionally left blank as a placeholder for the **Priority Natural Resources Map**.

The map is available in a separate file on the DCR website.

Additional Notable Natural Features

- Acidic rocky summit / rock outcrop community (NHESP-determined exemplary occurrence of the community type).
- Red spruce – fir – northern hardwood forest type, uncommon in eastern and central Massachusetts. (This area is characterized by spruce trees of significant size and age, and includes NHESP-designated priority habitat, potential habitat for Boreal Chickadee.)
- Rare dragonfly habitat associated with the summit area.
- Steep ledges with potentially unaltered vegetation.
- Steeply sloped late-successional forest (excellent interior bird habitat).
- Early-successional (scrub-shrub) habitat within the former ski area.
- The Reservation is a designated site under the Important Bird Area Program. The site is part of a migration corridor for more than 5000 migratory raptors each year, contains an assemblage of species characteristic of a unique habitat within the state, and is recognized for importance related to long-term research, environmental education and bird conservation. During a nine-hour period on September 17, 2007 1959 hawks and one bald eagle were observed from the summit of Mount Watatic. Twelve bald eagles were observed on 9/12/07. (reports@hawkcount.org)
- More than ten acres of forest on the lower slope near the former ski area that is almost pure sugar maple, probably established by adjacent seed sources when an entire stand was blown down by the 1938 hurricane.
- Part of the headwaters of the Souhegan River in the greater Merrimack River watershed.
- Important sub-watershed for wetland ecosystems at the base of the mountain south side, which include habitat for sundews, pitcher plants, and a variety of uncommon wildlife species e.g. dragonflies, damselflies, salamanders and turtles.
- A number of additional rare species occurrences and certified vernal pools in abutting state conservation lands

Each of the property co-owners has a full set of community and species observation forms and information sheets provided by the NHESP. In addition, a Biological Survey commissioned by the Department of Fish & Game and completed by Frances H. Clark (Carex Associates) in 1999 describes many of the natural resource attributes of Mount Watatic and the surrounding landscape, and is available as a reference for the Mount Watatic management partners.

Forest Resources

The DCR Management Forester has conducted an initial forestry assessment for the focus property. Please refer to the following description of forest stands and accompanying draft map.

Forest Stands

1. The former ski slopes were located in this area. Open areas and wooded areas between old slopes are put together in this type to consolidate into one stand. The old ski slopes are regenerating with numerous hardwood species along with white pine and spruce. The wooded areas between them have some variation as they progress up the slope. Species consist of spruce, white pine, red maple, red oak, and black birch. Size range from saplings to medium sized saw logs. Heights for saw logs range from 1/2 log to 2 1/2 logs. Quality ranges from poor to very good.
2. This stand is a hardwood mix with red oak, black cherry, pin cherry, white birch, yellow birch, black birch, ash, red maple and white pine. Size ranges from small pole to medium saw log, with the greater percentage being large pole to small saw log. Heights are one log to two plus logs. Quality ranges from fair to excellent.
3. This is a mixed hardwood and white pine stand that has been cut. There are scattered saw log size trees but the majority are pole size. Species include red oak, red maple, sugar maple, ash and white pine. Quality ranges from fair to excellent.
4. This stand is white pine/hardwood type. Size ranges from pole to medium saw logs. Heights range from one log to three logs. Quality ranges from fair to excellent. Stocking in this stand does vary from B level to A level but the variations are not distinctive enough to break stand in smaller areas.
5. This is an open area that includes roadway, old parking lots, pond and some old fields.
6. This stand is almost pure sugar maple. The size ranges from pole to small saw log. The heights range from two logs to three logs. The quality of the stand is good to excellent. The stocking is above the A level.
7. This stand is a hemlock/hardwood type with associates of white pine and spruce. The hardwoods include red maple, red oak, white birch, yellow birch, and beech. The size varies from pole to medium saw log with heights of one to two logs. The stand quality is good to excellent. Some logs have been cut in this area.
8. This stand is the ridge top of Mount Watatic. Red oak trees are stunted due to severe site conditions. Most of the trees are not very large and have characteristics of old growth trees. More investigation should be done on this area to determine the age of these trees. Stand #8 has low timber value.
9. This is a mixed stand of hardwoods and white pine. Size is pole size to some small saw logs. Heights are one half log to one and a half log. Stocking is between A and B level. Stand #9 has low timber value.
10. This stand is a mixed hardwood type with red maple, pin cherry, black cherry, white birch and ash. The size is from saplings to poles. Multiple stems from stump sprouts indicate that this area was cut heavily at some point in time. Quality is poor and the heights are relatively short. At this time there is not much timber value in stand #10.

This page is intentionally left blank as a placeholder for the **Forest Stand Map**.
The map is available in a separate file on the DCR website.



Figure 5.1: View from Mount Watatic summit (A. Backman)

Section 5: Mission, Management Goals and Principles

Mission and Overall Management Goals

The mission guiding the long-term stewardship of the Mount Watatic Reservation is to conserve and manage important natural, cultural and recreational resources.

The overall management goals for the Mount Watatic Reservation are:

- *Maintain and enhance native biodiversity.*
- *Provide for sustainable public access for hiking and other low-impact forms of outdoor*

recreation, including opportunities for enjoying panoramic views from the summit.

- *Preserve a place to relish the peace and beauty of nature in the heart of an exceptional protected landscape.*

General Management Principles

- There will be no commercial use of Mount Watatic Reservation.
- There will be no vehicular access to the summit except for access related to rescue, fire suppression, law enforcement, and partner-approved habitat management and maintenance purposes.
- Communication, coordination and cooperation between partners will be organized in a way that enhances the overall management capacity.
- Management of Mount Watatic Reservation will be consistent with adjacent conservation properties.
- Recreational activities will be monitored and managed to ensure public safety and sustainability related to stewardship of natural resources.
- Forest and vegetation management activities may be conducted to improve forest vigor and enhance native biodiversity and will be consistent with forest management of adjacent conservation properties.
- The partners will continue to share information and cooperate related to regional land protection priorities.



Figure 5.2: Mount Watatic team members (A. Backman)



Figure 6.1: Kiosk at Mount Watatic (A. Backman)

Section 6: Management Recommendations

Priority Findings

These priority findings, developed by the Partner Management Committee, will guide the overall management direction of the Mount Watatic Reservation.

- Mount Watatic Reservation contains an exceptionally rich and unique range of natural and cultural resources and contributes substantially to the continuity of lands in Ashby and Ashburnham managed for conservation purposes.
- Mount Watatic Reservation is an important link for Central Massachusetts and New Hampshire long-distance hiking trails, including a junction between the Wapack and Midstate Trails. The Reservation and surrounding conservation lands are also a component of the Quabbin to Cardigan Initiative greenway focus area. Mount Watatic also is a great ‘small’ mountain for families to climb.



Figure 6.2: Trail at Mount Watatic (A. Backman)

- The summit area is one of the most popular destinations in Central Massachusetts for outdoor enthusiasts. The popularity of the site presents a variety of management challenges and opportunities. The partners expect to continue to receive requests for a variety of special uses and events.
- Subjective observation by partner representatives indicates that the number of visitors has increased over the past several years, probably due in part to the publicity surrounding the Campaign for Watatic that led to the successful land protection. The main trailhead parking area on Route 119, which is actually part of Ashburnham State Forest, is frequently filled to capacity with overflow parking along the margin of the state highway. Visitation is expected to gradually increase as the regional population increases and as more people become aware of the Reservation as a public recreation resource.
- Unauthorized Off Highway Vehicle (OHV) use is common and problematic in Mount Watatic Reservation, and is increasing statewide.
- The steeply sloping topography adds to management challenges related to summit road maintenance, trail maintenance and forest management activities.
- Undivided ownership by six partners and the lack of on-site staff will require extra effort related to coordination and cooperation to provide for adequate resource stewardship and sustainable public access.

Management Issues & Concerns

The following management issues and concerns were identified by the Partner Management Committee. Many of these concerns are addressed in the subsequent recommendations. The remainder will be prioritized through long-term coordination of the Partner Stewardship Committee described below in the Partner Coordination section.

- Lack of on-site staff to monitor, maintain and manage the property.
- Increased OHV use, camping and other unauthorized overnight activities, illegal trash dumping.
- Unauthorized and unmonitored access from the Bennett Road emergency / management entrance as well as from multiple access points surrounding the Reservation.
- Increasing level of visitation, and visitation levels that exceeds parking capacity.
- Absence of sanitary facilities.
- Requests for special uses and events involving the summit area and former ski area parking lot.
- Public safety regarding the remaining ski area structures.
- Visitor overuse in some locations causing degradation of understory vegetation.
- Summit road erosion, trail erosion.
- Potential trail conflicts between user groups.
- Potential conflict between trail use (authorized and unauthorized) along the ridge from Mount Watatic to Nutting Hill, and adverse impacts to the acidic rocky summit/rock outcrop community.
- Insufficient trail marking, signage, maps, and property information provided for the public.
- The need for a comprehensive inventory of species and natural communities.
- Invasive species, domestic animals adversely affecting native wildlife species.
- Potential for brush fires.
- Boundary encroachment.
- Municipal rezoning of adjacent Route 119 corridor for 'green' business.

Land Stewardship Zoning Guidelines

State legislation (Chapter 21 Section 2F) that established DCR in 2003 requires the preparation of management plans for all of DCR's parks, forests and reservations. This legislation states that plans will include guidelines for operation and land stewardship, provide for the protection and stewardship of natural and cultural resources, and ensure consistency between recreation, resource protection, and sustainable forest management. The Land Stewardship Zoning Guidelines define three types of zones to address this legislative requirement and to provide a framework for the development and implementation of management guidelines to protect the particular resources located within the property. (General descriptions are provided below. The full text of the Guidelines is included in the appendices.)

A. General Land Stewardship Zoning Guidelines

Zone 1

This zone includes unique, exemplary and highly sensitive resources and landscapes that require special management approaches and practices to protect and preserve the special features and values identified in the specific Resource Management Plan. Examples of these resources include rare species habitat identified by the Natural Heritage & Endangered Species Program as being highly sensitive to human activities, fragile archaeological or cultural sites, and unique or exemplary natural communities. Management objectives emphasize protecting these areas from potentially adverse disturbances and impacts.

Zone 2

This Zone includes areas containing typical yet important natural and cultural resources on which common forestry practices and dispersed recreational activities can be practiced at sustainable levels that do not degrade these resources and that hold potential for improving their ecological health, productivity and/or protection through active management. Examples include terrestrial and aquatic ecosystems characterized by a diversity of wildlife and plant habitats, rare species habitat that is compatible with sustainable forestry and dispersed recreation, agricultural resources, and resilient cultural sites and landscapes. Zone 2 areas may be actively managed provided that the management

activities are consistent with the approved Resource Management Plan for the property.

Zone 3

This zone includes constructed or developed administrative, maintenance and recreation sites, structures and resilient landscapes which accommodate concentrated use by recreational visitors and require intensive maintenance by DCR staff. Examples include areas developed and deemed appropriate for park headquarters and maintenance areas, parking lots, swimming pools and skating rinks, paved bikeways, swimming beaches, campgrounds, playgrounds and athletic fields, parkways, golf courses, picnic areas and pavilions, concessions, and areas assessed to be suitable for those uses.

Significant Feature Overlays

The three land stewardship zones may be supplemented with significant feature overlays that identify specific designated/recognized resource features. These significant features are generally identified through an inventory process or research, and are formally designated. The purpose of these overlays is to provide more precise management guidance for identified resources and to recognize, maintain, protect, or preserve unique and significant values, regardless of the zone in which they occur. Examples of significant feature overlays include Forest Reserves, areas subject to public drinking water regulations, or areas subject to historic preservation restrictions. Specific management guidelines for significant features overlays are provided by resource specialists or by the federal, state, regional, or local agency that has recognized and listed the resource or site.

B. Land Stewardship Zoning Guidelines for Mount Watatic Reservation

The development and application of these Guidelines is a result of a step-by-step analysis of the natural and cultural resources of the Reservation and compatible public access and recreational uses. In a sense they are the culmination of the planning process, and are intended to help guide the long-term management of the Reservation. Please refer to the **Land Stewardship Zoning Guidelines Map**.

The recommended Guidelines for Mount Watatic Reservation are as follows:

Zone 2

The majority of land within the reservation, including wetlands, forested slopes and the summit area.

Zone 3

The former ski area parking lot on the north side of the property. This site might be used for future event parking if management and enforcement capacity allows for on-site coverage during visitor use.

Significant Feature Overlay:

The summit area that is identified by the Natural Heritage & Endangered Species Program (NHESP) as BioMap Core Habitat and supports an exemplary acidic rocky summit / rock outcrop community (please see **Priority Natural Resources Map**). Applicable management guidelines include monitoring rare species populations following NHESP guidelines (taking into consideration availability of staff and volunteers), and enforcement of regulations related to authorized and unauthorized summit activities, such as OHV use (taking into consideration availability of staff with enforcement capabilities).

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Land Stewardship Zoning Guidelines Map.

The map is available in a separate file on the DCR website.

Recommendations are categorized under the following management topics:

- 1. Partner Coordination**
- 2. Natural and Cultural Resource Management**
- 3. Public Access, Recreation and Environmental Education**
- 4. Reservation Maintenance and Improvements**
- 5. Additional Surveys, Studies and Research**

Recommendations for Partner Coordination

Facilitate and strengthen partner cooperation and coordination in order to support and enhance overall management capacity.

Partner Communication & Coordination

Recommendation 1: Form a Watatic Stewardship Committee with one representative and one alternate appointed by each of the six partners, within one-half year following partner approval of this Resource Management Plan. This committee will replace the Partner Management Committee as the vehicle for partner communication and coordination. The mandate of this committee is to oversee and support long-term implementation of the Resource Management Plan, rather than exercising control over the day-to-day management of the facility. The Stewardship Committee is an advisory group and will not have the authority to direct management activities of any partner(s).

Recommendation 2: In order to modify the Resource Management Plan, at least four of the six partners must approve of the modification, including at least one from each category (nonprofit, municipal, state) of partner. Modifications may include adding, deleting or modifying RMP recommendations.

Recommendation 3: The Watatic Stewardship Committee will develop a Memorandum of Agreement (MOA) regarding maintenance of the Reservation to be signed by all partners, and will meet biannually to share management and maintenance concerns, and to evaluate and/or update the Resource Management Plan.

Italicized portions of the following Recommendations subsections are considered to be partner management policies that can serve as the foundation of the MOA.

Recommendation 4: Provide an efficient method for partner communication and decision making related

to immediate management and maintenance concerns, and related to requests for group activities or special events, as follows:

- If the proposed event or activity is not commercial in nature, does not involve vehicular access to the summit, and will not adversely impact resources or normal visitor activities, the Watatic Stewardship Committee representative who has been contacted will forward the request to the Willard Brook SF Supervisor and copy the remaining the Stewardship Committee Representatives. The request can then be reviewed through the DCR Special Use or Recreation Permit process.
- If any Stewardship Committee Representative is the recipient of a request regarding a new type of activity, or a request that might result in adverse impacts, the member will provide e-mail notice to the other Watatic Stewardship Committee members for review and comment.
- If management or maintenance concerns are brought to the attention of one of the ownership partners, the Watatic Stewardship Committee representative will forward the information to the Willard Brook SF Supervisor and copy the remaining Stewardship Committee Representatives.
- Application process by a partner(s) for a local or state permit such as a Notice of Intent will allow for the other partners to review the proposal in advance of filing, and will identify the responsible party in case of violations.
- A partner subcommittee can be formed to develop and implement ideas for management related funding (independent of DCR capital and operational budget), such as alternatives for endowments, benefactors or trustees, and other methods to improve management capacity.

Law Enforcement Coordination

Management Policy 1: *Unless otherwise identified in this Resource Management Plan with specific guidelines, recreation-related DCR regulations (CMRs) and hunting-related DFG regulations (CMRs) will be applicable to property use and management. Additional signs may be required to ensure that hunters will not stray onto the abutting DFG Wildlife Sanctuary.*

Management Policy 2: *There will be no authorized use of the Reservation by Off Highway Vehicles (OHVs), except for partner-approved habitat management and maintenance purposes, and emergency vehicle access. Signs at the base of the summit road will indicate unsafe passage and access by only authorized vehicles.*

Management Policy 3: *There will be no parking in the former ski area access ROW, and no parking at other unauthorized locations as identified by the Partner Stewardship Committee.*

Recommendation 1: Develop a Mutual Aid Agreement between state (EPOs and state police) and municipal police departments, including New Ipswich, NH. The Agreement could include a description of emergency contact protocol, a process to recover costs of negligent behaviors that trigger an emergency response, equitable dispersal of fines between responding departments, and a process to notify the Watatic Partners.

Recommendation 2: Direct all CMR (Code of Massachusetts Regulations) and other state and local law violations, irrespective of the issuing agency, to the Ayer District Court. This procedure will require an application to the court, by law enforcement officials representing the Partners, requesting that the court handle all Mount Watatic Reservation related citation activity, and the subsequent consent of the court.

Recommendation 3: Explore the possibility that the Towns of Ashby and Ashburnham may be able to develop and enforce regulations or bylaws specific to the Reservation, because both towns have an undivided ownership interest in the property.

Recommendation 4: The Law Enforcement Subcommittee will meet to clarify action steps and a timetable for implementation.

Recommendation 5: The partners will request law enforcement personnel to enforce OHV violations to the greatest degree possible, with recommended increases in penalties for subsequent violations. If unauthorized OHV use continues to the detriment of natural resources or Reservation visitors, partners may request that law enforcement staff conduct concerted enforcement initiatives.

Recommendation 6: Unauthorized parking areas should be clearly marked and signed.

Recommendation 7: It may be possible to gain better control over unauthorized OHV access originating

from Old Watatic Road with the installation of a gate and sign, if DFG can maintain adequate access to the Ashby Wildlife Management Area via the Mount Watatic Reservation. All points of unauthorized OHV access should be gated and signed as resources become available

Recommendations for Natural and Cultural Resource Management

Protect and manage important natural and cultural resources, including rare and endangered species habitat and unique natural communities.

Management Policy 1: *Forest management and forest management planning will include preparation of a District Forestry Plan for the mid-state area following completion of the more general Worcester-Monadnock Plateau Ecoregion Forestry Plan. (These projects are part of the requirements for Green Certification of state agency forestry programs, which include third party review under federal and international sustainable forestry guidelines. General goals for sustainable forestry include keeping closely monitoring on forest vigor, and attaining a more balanced age structure with a focus on enhancement of native wildlife diversity. Forest management may include thinning immature stands to promote healthier trees, selection or group selection harvests to maintain northern hardwoods, and shelterwood harvests to encourage white pine and oaks.) DFG and DCR Foresters will work cooperatively to ensure that forest management planning and activities are conducted at the ecosystem level and are consistent throughout abutting conservation properties. Implementation of forest management plan recommendations will be subject to partner review and approval.*

Management Policy 2: *Following partner review and approval, DCR's staff archaeologist will assist with the review of any proposed projects or management activities that could adversely affect cultural resources. Site protection and avoidance of impacts are the best strategies to protect and preserve archaeological resources (or potential archaeological resources). Detailed guidelines for management of historical and archaeological resources are included in the appendices.*

Management Policy 3: Partners may identify priority land protection projects and continue to cooperate on regional land protection initiatives with a general objective to enhance the continuity of conservation lands.

Recommendation 1: Prepare baseline documentation reports as a priority resource management tool. Baseline documentation is a fundamental conservation and management tool that ideally is conducted before other significant management actions are undertaken (given the caveat of limited staff resources). Baseline surveys include permanent photo documentation with GPS coordinates of boundaries (concurrent with boundary marking), important natural communities (e.g. Acidic Rocky Summit, Spruce-Fir Northern hardwood Communities), high use areas, and problem areas for OHV access and use. Monitoring and control is particularly important in areas where intensive visitor use and sensitive resources coexist, such as the summit area. A notebook of prints with captions should be kept by the partners in order to document changes and make future management and legal decisions about property trespass, natural community decline caused by invasive species, visitor use and illegal activities.

Recommendation 2: Seek management guidance from the Natural Heritage & Endangered Species Program (NHESP) regarding high ground recreation activities and potential impacts to the Acidic Rocky Summit/Rock Outcrop Community (such as trampling of mosses and lichens).

Recommendation 3: Prepare a detailed inventory of species and natural communities, following the recent Frances Clark report and include a breeding bird survey. Partners should seek support from environmental programs in colleges and universities and from scientists associated with environmental organizations and local naturalists.

Recommendation 4: Assure protection of the Mountain Fern (*Dryopteris campyloptera*), a NHESP Watch List species in Massachusetts. This fern occurs primarily in northern Berkshire and Franklin counties. Coordinate with DFW regarding GPS documentation.

Recommendation 5: Request additional management guidance as applicable from NHESP regarding rare species habitats and significant natural communities; and incorporate any applicable general guidelines

developed by DCR and NHESP under the Biodiversity Stewardship Initiative.

Recommendation 6: Coordinate beaver management strategies and actions to protect rare species habitat and maintain access for emergency and management vehicles.

Recommendation 7: Prepare a GPS inventory of invasive plants. DFG staff have identified bittersweet, common buckthorn and multiflora rose on the property. Monitor for invasive species and signs of forest disease in the Spruce-Fir Northern Hardwood Community. This is an uncommon community in eastern Massachusetts and the Mount Watatic habitat includes spruce trees of significant size and age. Monitor for signs of the Hemlock Woolly Adelgid.

Recommendation 8: Focus invasive species monitoring and control efforts on important natural communities and along trails and roads.

Recommendation 9: Invasive species management may include prevention using public outreach and visitor education. Partners may utilize the networking capabilities of the New England Invasive Plant Group or similar organization to establish partnerships with environmental organizations and regional college and university environmental programs to support research and invasive species population control. Undivided ownership by the private nonprofit partners may allow for eligibility for funding under the United State Fish and Wildlife Service Landowner Incentive Program.

Recommendation 10: Small-scale Forest Reserves within Mount Watatic Reservation may be identified as part of the regional forest management planning to be undertaken. These areas would not be actively managed, and could be used as a control to compare over the long-term with similar actively managed stands. There are additional areas in the Reservation that will not be actively managed due to steep slopes and other site factors.

Recommendations for Public Access, Recreation and Environmental Education

Provide a safe and clean environment for sustainable, dispersed, non-motorized recreation activities.

Management Policy 1: Support hiking as the primary recreational activity and use for Mount Watatic Reservation. In a fall 2004 survey, over 95% of the respondents visited the Reservation for this purpose. Considering the current lack of on-site staff and the partner's overall stewardship responsibilities and challenges, attempting to offer management support for additional recreational activities or other trail uses is not feasible unless the activity is supported and monitored by a dedicated user group.

Management Policy 2: There will be no authorized use of the premises by OHVs, except for partner-approved habitat management and maintenance purposes, and emergency vehicle access. Signs at the base of the summit road will indicate unsafe passage and access by only authorized vehicles.

Management Policy 3: There will be no overnight use, campfires or other open fires.

Management Policy 4: Use of the former ski area parking and former ski lodge site will only be permitted if the partners can provide staff to monitor the site while the Bennett Road gates are open. Activities that may be supported by the partners include events to raise funds for implementation of Resource Management Plan recommendations, and partner-approved group activities with the overall objective of enhancing environmental education opportunities.

Recommendation 1: Expand the Route 119 trailhead parking area and ensure the project is compatible with adjacent environmental resources.

Recommendation 2: Provide additional information for the Kiosk at the Route 119 trailhead that may include a map showing the conservation properties in the Mount Watatic area, trail map brochures, information on partner ownership, regulations, hunting seasons and emergency contact numbers. Regulations which are particularly important to the partners for management of the Reservation may be

highlighted, such as prohibitions on OHV access and use, overnight use, and campfires or other open fires.

Recommendation 3: Through signage and face-to-face contact, encourage large organized groups who travel to the site by bus, that they should contact the Willard Brook State Forest headquarters in advance of their visit to request a Special Use Permit for organized outings.

Recommendation 4: Establish a Memorandum of Understanding (MOU) with the Friends of the Wapack to clarify guidelines and standards for trail maintenance, including vegetation clearing and management for scenic views. The Friends are currently working on a MOU with the U.S. Fish & Wildlife Service for the section of trail through the Wapack National Wildlife Refuge at the northern end of the trail. This could be used as a model for a Mount Watatic MOU.

Recommendation 5: Snowmobiling may be allowed if a written agreement is established between a responsible snowmobile group and the Partners. The agreement must include Partner-approved performance standards, including identification of designated trails.

Recommendation 6: If forest management activities occur in the future, install wayside interpretive signs to explain the purpose and long-term implications. Investigate the potential for interpretive signs related to the pure sugar maple stand.

Recommendation 7: Promote partner coordination with local schools to support environmental education programs.

Recommendation 8: Investigate preparing a trails and information brochure that will be available at the Route 119 trailhead, at Willard Brook State Forest, and at appropriate locations in the communities.

Recommendations for Reservation Maintenance and Improvements

Provide regular maintenance for existing uses and facilities, remove facilities that are not beneficial for visitors or management purposes, and undertake priority improvements, contingent upon staff, volunteer, and funding resources.

Recommendation 1: Continue grading of the Route 119 trailhead parking area as needed.

Recommendation 2: Maintain the summit road contingent on funding and qualified maintenance support.

Recommendation 3: Remove the abandoned summit road utility poles and associated wires.

Recommendation 4: Demolish and remove the abandoned pump and engine house adjacent to the former ski area snow-making pond, and the utility building at the base of the summit road.

Recommendation 5: Install signage.

- Upgrade informational, directional and boundary signs contingent on funding, staff and sign material availability.
- Install a sign at the base of the summit road indicating unsafe passage and access by only authorized vehicles.
- Install directional signs at the summit to keep visitors on the trail system and away from the summit access road.
- Install sign indicating “no parking / do not block gates” at the Bennett Road right-of-way to the former ski area.
- Install similar signs in other key locations to gain better control of illegal access points.
- Install hunting information signs related to the abutting Wildlife Sanctuary.
- Clearly mark property boundaries, including the private property boundary along the saddle leading from the main summit to the lower summit.

Recommendation 6: Request assistance from recognized trail management organizations to maintain or relocate eroded trails.

Recommendation 7: Utilize the Watatic Stewardship Committee for help and advice to coordinate volunteer activities.

Recommendations for Additional Surveys, Studies and Research

Gather additional information related to resources and visitor use to support sustainable management of the Reservation.

Recommendation 1: The DCR management forester and a forestry intern conducted a GPS inventory of roads and trails during the fall of 2006. The inventory included notes on trail conditions. The next recommended step is to assess this information and compile a list of trail maintenance needs using a Trail Impact Assessment that was developed for use at Mount Wachusett State Reservation by DCR staff. A summary of this assessment process is included in the appendices.

Recommendation 2: Conduct GPS survey of illegal dump site locations, and develop long-term monitoring / enforcement / remediation plan.

Recommendation 3: Conduct visitor surveys on a regular basis so that the partners can assess trends in the amount and types of visitor use in all seasons.

Recommendation 4: Survey environmental education programs in the local schools in order to determine how they are using the Reservation, and to assess how the partners might be able to support and expand on these programs

Recommendation 5: Coordinate with DCR and DFG Management Foresters to identify areas that may be appropriate for designation as Small (patch) Forest Reserves. Small Forest Reserves are portions of state lands where commercial harvesting of wood products will be excluded in order to sustain biological diversity. Reserves may be identified due to the presence of important forest resources such as unique natural communities, steep slopes or other natural attributes that will benefit from a hands-off management approach that leaves the forest canopy intact.

Recommendation 6: Inventory historic stone walls using GPS technology and undertake concurrent historical land use and land records research.



Figure 6.3: Hiking at Mount Watatic (A.Backman)

Management Needs and Recommendations

This section includes an assessment of current and future management activities, responsibilities and capacity, and describes two levels of management capacity – the first level (Level 1) addresses current needs and capacity, and the second level (Level 2) describes management needs to implement priority stewardship responsibilities and strategies.

much larger 9,000-acre Willard Brook State Forest (SF) Management Unit. Due to intensively used recreation areas at Willard Brook SF, Pearl Hill State Park and the Nashua River Rail Trail, less than 5% of the Willard Brook Management Unit budget, staff time, and management resources can be focused on Mount Watatic Reservation.

Current Management Capacity (Level 1)

As described in Section 2: Current Management, DCR currently is the only Watatic partner with the capacity to provide ongoing management for Mount Watatic Reservation. The Reservation is part of the

Current Management Activities with Level 1 Management Capacity

As described in Section 2: Current Management, and repeated here for comparison between Level 1 and Level 2:

- Conduct road repairs along the forest road that leads from the Route 119 parking area towards Nutting Hill and the summit trail to address flooding problems caused by beaver activity. Implement beaver management strategies to maintain forest road access and to prevent the alteration of the adjacent rare Odonate habitat. (This road is technically part of Ashburnham State Forest.)
- Respond to calls and local concerns, including gate and lock maintenance.
- Cleanup illegal dumping.
- Install signs.
- Maintain and regrade the Route 119 parking area, conducted on an annual or as needed basis. (This parking area is technically part of Ashburnham State Forest.)
- Maintain trails.
- Conduct storm water maintenance on the summit road.

Key Strategies to Support Current Management Capacity

A. Partner Communication & Coordination

The partners recommend formation of a Watatic Stewardship Committee with one representative and one alternate appointed by each of the six partners. The mandate of this committee would be to oversee and support long-term implementation of the Resource Management Plan, rather than exercising control over the day-to-day management of the facility. The Stewardship Committee would be an advisory group and would not have the authority to direct management activities of any partner(s). The Stewardship Committee can provide an efficient method for partner communication and provision of advice related to immediate management and maintenance concerns, and related to requests for group activities or special events. **A partner subcommittee could be formed to develop and implement alternatives for management-related funding, such as establishing endowments and identifying other private and public sources of**

funding to help improve management capacity.

One example of this activity could be raising the funds needed to hire a seasonal position to provide a presence on the trail system, to assist lost or injured hikers, provide a basic level of informational services for visitors, and monitor the trails for environmental and maintenance concerns. An account managed by a nonprofit partner could facilitate flexibility and quicker accessibility to funds.

B. Law Enforcement Coordination

The partners have initiated a process that may lead to all CMR violations, irrespective of issuing agency, being directed to Ayer District Court in order to enhance consistency of the law enforcement process. There is also potential for the development of a Mutual Aid Agreement between state (EPOs and state police) and municipal police departments, including New Ipswich, NH. The Agreement could include a description of emergency contact protocol, a process to recover costs of negligent behaviors that trigger an emergency response, and the equitable dispersal of fines between responding departments.



Figure 6.4: Environmental Police (www.mepoa.org)

Priority Stewardship Responsibilities and Management Needs (Level 2)

The Mount Watatic management partners anticipate that pressures from visitor use will gradually increase as local and regional populations grow, as more land is developed, and as more people become aware of this public recreation resource. Conflicts between visitor use and the preservation of sensitive resources such as the acidic rocky summit natural community must be monitored and managed on a long-term basis.

The management partners recognize the need to enhance management capacity in order to address priority management concerns.

- The first priority is to identify and monitor existing and potential areas of resource stewardship and visitor conflict through baseline inventories, and to increase the capacity to monitor natural and cultural resource and recreational uses on a regular basis.
- Boundary marking, improved environmental education through better signage and public outreach, and partner coordination with local and state law enforcement staff related to illegal OHV activity are important management responsibilities.
- Additional management resources are needed to provide visitor contact, monitor the trailhead area, trails and summit activities, undertake basic trail maintenance, and provide first level emergency services (with a potential for contact and coordination with local Emergency Medical Services).



Figure 6.5: Wapack Trail Kiosk at Mount Watatic (A. Backman)

An increased Level 2 management capacity that could begin to address the partner-identified priorities for management of Mount Watatic Reservation includes:

- The addition of a DCR Seasonal Supervisor and Laborer positions, assigned as necessary to Mount Watatic Reservation, as a requested addition to the DCR staffing plan if adequate operational funding is available.

- DFG resources to organize and administer the identification and monitoring of existing and potential areas of resource stewardship and visitor conflict through baseline inventories.
- Management partner efforts to identify additional strategies for management support from municipal and nonprofit partners, and to foster partnerships with organized park user groups and organizations that can support environmental research and education.

Stewardship Opportunities

There are also additional stewardship opportunities that may enhance overall management capacity:

- The partnership between two towns, two nonprofit conservation land trusts, and two state agencies provides unique opportunities for cooperation so that the sum of the partnership management capacity can be stronger than any of the individual partner's management capacities.
- There is a potential to increase management and maintenance capacity through coordination with a variety of volunteers.
- The partners have initiated a process for coordinating local and state law enforcement capabilities.
- There is a potential to provide on-site environmental education opportunities for local school systems regarding the unique environmental resources and values of Mount Watatic.
- There is a potential to coordinate with college and university environmental programs, and scientists associated with environmental organizations, to expand and refine baseline information through research projects and resource inventories. This could enhance the partners' long-term stewardship of Mount Watatic Reservation.

Appendix A. Plan Contributors.

Name	Affiliation	Area of Expertise
<i>Department of Conservation and Recreation</i>		
Allen, Kevin	Office of Cultural Resources	Historic Curatorship Program
Austin, Pat	Watershed Management	Water quality
Backman, Andy	RMP Program	Planning
Baecker, Jim	RMP Program	Planning
Bates, Tom	Blue Hills District	Operations
Bender, Tom	Bureau of Ranger Services	Visitor education and safety
Bertrand, Dan	Office of the Commissioner	Legislative relations
Brown, Maggi	Bureau of Ranger Services	Visitor education and safety
Cavanagh, Paul	RMP Program	Planning
Castle, Mark	South Region	Operations and infrastructure
Church, Peter	South Region	Management and operations
Comeau, Jim	Land Acquisition and Protection Program	Land acquisition
Crawshaw, Don	Engineering	Ponkapoag dam replacement
DiPietro, Paul	Office of Water Resources	Water quality
Echandi, Alexandra	South Region	Natural resources
Farina, Barbara	Architecture Section	Blue Hills' buildings
Fiesinger, Anne	Office of External Affairs and Partnerships	Outreach
Fisher, Sean	Office of Cultural Resources	Archival material
Fox, Wendy	Office of External Affairs and Partnerships	Media relations
Gianferante, Dave	Golf Courses District Manager	Management and operations
Greene, Judy	Office of Cultural Resources	Historic property maps and plans
Haak, Brian	Bureau of Engineering	Infrastructure and engineering
Harris, Jeffrey	Office of Cultural Resources	Archaeological policy
Hart, Rachael	Office of Dam Safety	Dams
Hollenbeck, Kevin	West District Manager	Natural resources
Harlow, Bob	Permitting (former)	Park administration and permitting
Helfeld, Ruth	Landscape Architecture Section	Houghton's Pond ball field project
Jaccopo, John	Blue Hills District	Operations
Jahnige, Paul	Greenways and Trails Program	Trail planning and maintenance
Kimball, Richard	Blue Hills District	Operations
Kirwin, Ken	Bureau of Engineering	Traffic studies and regulations
Kish, Patrice	Office of Cultural Resources	Cultural resources
LaLond, Jack	Operations Coordination	Metropolis Rink agreement
Lloyd, Nathanael	GIS Program	GIS
Lowell, Rob	Bureau of Engineering	Storm water management
Lowry, Kathleen	Universal Access Program	Universal access
MacKenzie, Bob	Blue Hills District	Management and operations
MacKinnon, Ray	Bureau of Ranger Services	Visitor education and safety
McCarthy, Tom	Universal Access Program	Universal access
Moran, Barbara	Office of External Affairs and Partnerships	Web content
O'Brien, Julia	Bureau of Planning and Resource Protection (former)	Planning, property history
Orfant, Joe	Bureau of Planning and Resource Protection	Planning
Ouelette, Steven	South Region Forestry Assistant (former)	Natural resources
Overton, Samantha	Field Services, Administration, and Policy	Urban parks
Pearly, Brian	Permit Program Manager	Use agreements
Plocinski, Loni	GIS Program	GIS and planning

Continued on next page.

Appendix A. Plan Contributors. (Continued)

Name	Affiliation	Area of Expertise
<i>Department of Conservation and Recreation (continued)</i>		
Powers, Sean	Houghton's Pond Waterfront (former)	Beach operations
Provencher, Shaun	RMP Program (former)	Cultural resources
Rayworth, Tim	NE Region Environmental Education Coordinator	Interpretive planning
Rowcroft, Jessica	RMP Program	Cultural resources
Salomaa, William	Office of Dam Safety	Dams
Sorenson, Elizabeth	ACEC Program	ACECs
Straub, Jim	Lakes and Ponds Program	Pond ecology
Survillo, Susan	Bureau of Ranger Services	Visitor education and safety
Tipton, Nat	RMP Program	Demography/visitor surveys
Tworig, Richard	Ponkapoag Golf Course (former)	Golf course operations
Warchalowski, Heather	Coastal Ecologist	Ecology
Yeo, Jonathan	Bureau of Water Supply Protection	Water quality
<i>Other Affiliations</i>		
Backlin, Adam	U.S. Geological Survey, San Diego, CA	Recreation impacts on herpetofauna
Beaulieu, Tim	n/a	Blue Hills herpetofauna
Breines, Raphael	East Bay Regional Park District, Oakland, CA	Recreation impacts on herpetofauna
Calnan, Lt. Kevin T.	Massachusetts State Police, Milton	Public safety
Condon, James	n/a	Blue Hills herpetofauna
Connolly, Marianne	Massachusetts Water Resources Authority (MWRA)	MWRA facilities in the Blue Hills
Elliman, Ted	New England Wild Flower Society	Plants
Fullerton, Becky	Appalachian Mountain Club	AMC library and archives
Garland, Larry	Appalachian Mountain Club	Cartography of AMC Camp
Harper, Lynn	NHESP	Rare species
Hemberger, Allen	Massachusetts DEP – SERO	21E sites
Huguenin, Tara	NHESP	Rare species
Iacovino, Frank	Massachusetts Port Authority	Air traffic over the Blue Hills
Jacobs, Judy Lehrer	Friends of the Blue Hills (FBH)	Public input
Kadis, Irina	Salicicola	Plants of the Blue Hills
Levreault, Stephen	Randolph DPW	Pump Station #6
Lukens, Andrea	Massachusetts Audubon Society	Trailside Museum
McCasland, Don	Blue Hills Weather Observatory	Observatory history and programs
Mello, Mark	Lloyd Center for the Environment	Rare insects
Minton, Trish	Appalachian Mountain Club – Ponkapoag	Ponkapoag Camp
Newby, Paige	Brown University	Historical ecology
Palmer, Thomas	n/a	Plants of the Blue Hills
Rawinski, Thomas	USDA Forest Service	Flora, forest ecology
Rocklen, Carly	Neponset River Watershed Association	Purple loosestrife control
Smith, Norman	Massachusetts Audubon Society	Natural history and MAS facilities
Stuart, Chloe	NHESP (former)	Rare species
Swain, Pat	NHESP	Natural communities
Towle, Charles	Curry College	Water quality
Twining, Jonathan	Eastern Nazarene College	Water resources and wildlife
Woolsey, Henry	NHESP	Rare species
Zupkus, John	Massachusetts DEP – NERO	21E sites

Appendix B. Public Participation.

In accordance with M.G.L. Chapter 21: Section 2F, the Resource Management Plan (RMP) for Blue Hills Planning Unit was developed in conjunction with a public participation process to ensure that interested parties had an opportunity to review the draft RMP and offer input in its development. This appendix identifies the public participation process used to inform and review this RMP.

B.1. THE PUBLIC PARTICIPATION PROCESS

Input into Development of the RMP

Public input into the development of the Blue Hills RMP began in the summer of 2009. A notice of a public meeting and of the DCR's intent to prepare a Resource Management Plan for the Blue Hills Reservation was published in the July 8, 2009 Environmental Monitor. Additional announcements were made on the DCR web page, and press releases were provided to the Quincy Patriot Ledger.

An initial public meeting was convened at the Trailside Museum, Milton, on July 29, 2009. Approximately 70 people attended the meeting, which ran from 6:30–9:00 PM.

On September 23, 2009, The Friends of the Blue Hills (FBH) convened a community forum to “brainstorm opportunities to improve Blue Hills Reservation management” (Anonymous 2009). Over 60 participants attended this session. On September 30, 2009, representatives of the FBH met with a DCR Resource Management Planner to discuss ideas and comments from the forum and provided the planner with written summaries and notes from the forum.

Written input on the plan was solicited at the initial public meeting, the FBH forum, through the Environmental Monitor announcement, on the DCR web page, and in press releases. Between July 8 and December 21, 2009, 40 individuals, organizations, or agencies submitted written comments.

Comments made at public meetings and those submitted in writing are not independent. Some speakers at the public meeting also submitted written comments, often to reiterate or expand upon their verbal comments. It is unknown how many attendees of the public meeting also attended the community forum, or how many attendees of the

community forum also submitted written comments. Because of this, the number of individuals who provided input cannot be determined.

Public Comment on Draft RMP

Notice of a public meeting to present the draft Resource Management Plan for the Blue Hills Planning Unit was published in the November 22, 2010 Environmental Monitor. The meeting was convened at the Ponkapoag Golf Course's club house, Canton, on December 7, 2010. Thirty-four registrants attended this meeting, which ran from 7:00–8:30 PM.

Notice of availability of the draft Resource Management Plan was published in the December 8, 2010 Environmental Monitor. The public comment period on the draft RMP ran from December 9, 2010 – February 7, 2011; 238 sets of written comments were received during this period.

B.2. CHANGES TO THE FINAL DRAFT OF THE BLUE HILLS RESERVATION RESOURCE MANAGEMENT PLAN

All comments received during the public comment period were given consideration. Many included proposed recommendations. Those consistent with DCR's mission and policies, and Massachusetts' regulations and laws were considered for inclusion in the final draft. Many have been added to this plan. Suggested recommendations best implemented by an agency or organization other than the DCR were not included, nor were recommendations applicable only to properties outside of the Blue Hills Planning Unit.

Most comments concerned proposed changes in trail use. These ranged from support for opening all sections of the reservation to mountain bikes, to opposition to opening any additional trails to mountain bikes. Trail use recommendations contained in this plan reflect Goals 1 and 2, as stated in Section 1.4. These goals are:

Goal 1. Make recreation sustainable and appropriate for the Blue Hills Environment.

Goal 2. Protect those natural resources most at risk from misuse, overuse, obsolete practices or avoidable environmental change.

A description of the decision-making process undertaken by the DCR to assess potential changes in trail use at the Blue Hills is provided at the end of this appendix.

The following changes were made to the draft Resource Management Plan. Normal editing activities, such as correcting typographical errors or revising formatting, are not identified.

Executive Summary

The Executive Summary was revised to reflect the new recommendations that were incorporated into the plan as a result of public input.

The term “bi-weekly,” as used in the Management Summary and Action Plan, was replaced with “2x/month” to avoid confusion.

Section 1. Introduction

No changes.

Section 2. Existing Conditions

The acreage of Town Brook Flood Control Site was added to Section 2.2.2.

Revisions to information on the reservation’s state-listed species were made in both the text and in Table 2.3.1. Reference to rare species fact sheets was added to this table, and also to Table 2.3.2.

During the public comment period, additional information on the reservation’s plants, animals, recreation activity, parking spaces, and traffic became available. This information has been incorporated throughout Section 2.

The physical extent of the reconstructed Blue Hills Reservoir was calculated and added to the text and to Figure 2.3.5.

The description of the Houghton’s Pond ball fields was revised to reflect recent site upgrades.

Information on the number of geocaches in each section of the reservation was updated to reflect existing conditions as of January 20th, 2011.

Section 3. Management Resources and Practices

Changes to this section include additional information on DCR’s storm water management plan, updated information on the management of geocaching east of Route 28, an overview of DCR’s Office of Partnerships, the existing Fowl Meadow and Ponkapoag Boag ACEC management plan, and clarification of the roles and responsibilities for road maintenance in the Ponkapoag East section.

Section 4. Recommendations

Table 4.3.1; Goal 1. The following four recommendations were added:

- Reduce trail user conflicts by: developing and distributing trail etiquette literature; posting trail etiquette “Yield” signs at kiosks, bulletin boards, and key locations along trails; revising future trail maps to include information on trail etiquette; and working with the DCR Mounted Unit and partners to offer training in trail etiquette.
- Promote responsible pet ownership by increasing awareness of requirements to keep pets leashed and to pick up and properly dispose of pet waste.
- Continue to encourage all lessees to pursue environmentally sustainable practices consistent with their programming and activities.
- Increase awareness among winter trail users of the need to stay off ski tracks in order to allow for ongoing use by cross-country skiers.

Table 4.3.1; Goal 2. The following two recommendations were added:

- Work with the Massachusetts Division of Fisheries and Wildlife to conduct a study of white-tailed deer populations within the Blue Hills Reservation and to ascertain the extent of their impacts on the reservation’s natural resources; if warranted, discuss deer management options.
- Survey appropriate habitat for remnant populations of the New England cottontail.

The recommendation to “Increase staff awareness of regulations...” was modified.

Table 4.3.1; Goal 3. The following three recommendations were added:

- Prepare and submit MHC Archaeological Site Forms for sites identified in this plan, but not already included in MHC’s inventory.
- With the exception of public safety needs, limit new development along the reservation’s ridgeline to below tree canopy level.
- Conduct a reconnaissance archaeological survey, as resources become available.

The first of these recommendations replaces several individual site form recommendations that were included in the draft.

The recommendation to “Increase staff awareness and protection of cultural resources...” was modified.

Table 4.3.1; Goal 4. The following recommendation was added:

- Establish quarterly, informal meetings to provide park visitors increased opportunities to meet with park administrators to discuss their concerns.

Table 4.3.1; Goal 5. The following three recommendations were added:

- Using new traffic count data, conduct an assessment of pedestrian safety.
- Work with the Massachusetts State Police to develop a speed enforcement plan.
- Install “Share the Road” signs on internal park roads and parkways to increase driver awareness of the presence of cyclists.

The recommendation to “Conduct a traffic volume study on interior reservation roads” was removed because the study has been completed.

Table 4.3.3; Goal 2. The following recommendation was added:

- Inventory Hemenway Pond’s natural resources in order to identify management needs.

Table 4.3.4; Goal 1. The following two recommendations were added:

- Work with the ski area operator to ensure that all portions of the ski slopes have an “erosion-protective cover of vegetation.”
- Explore assigning the cost of maintaining Summit Road, on a proportional basis, to the tenants atop Great Blue Hill.

In addition, the recommendation to conduct an engineering assessment of the ski area’s drainage system was modified.

Table 4.3.4; Goal 5. The following recommendation was added:

- Work with MassDOT to improve pedestrian safety along Route 138.

Table 4.3.5; Goal 3. The following recommendation was added:

- Promote partnerships that help preserve the cultural resources and historic uses of Brookwood Farm.

Table 4.3.6; Goal 1. The following recommendation was added:

- Decrease the amount of litter in the Houghton’s Pond parking lots by establishing an anti-littering awareness campaign, providing additional compacting trash receptacles, and revisiting the timing of existing litter management activities.

Table 4.3.6; Goal 5. The following recommendation was added:

- Work with MassDOT to explore bicycle accommodations on the Ponkapoag Trail Bridge.

Table 4.3.10; Goal 1. The following two recommendations were added:

- Request that MassDOT install “Trail Crossing” signs and distance plaques at the intersection of Route 28 and the Skyline Trail.
- Add the gravel parking lots along Route 28 to DCR’s surface improvement schedule.

Table 4.3.11; Goal 1. The following two recommendations were added:

- Require that Trail Watch members operating in this section receive training in snake biology and conservation, and submit Rare

Species Observation Forms to NHESP for all rare snakes observed.

- Request that MassDOT install “Trail Crossing” signs and distance plaques at the intersection of Route 28 and the Skyline Trail.

The first of these recommendations replaces the recommendation, contained in the draft, to exclude Trail Watch bikes.

Table 4.3.11; Goal 3. The following recommendation was added:

- Investigate permanently closing the portion of Chickatawbut Road between the intersection with Wampatuck Road and the entrance to Pine Hill Cemetery.

Table 4.3.12; Goal 1. The following recommendation was added:

- Require that Trail Watch members operating in this section receive training in snake biology and conservation, and submit Rare Species Observation Forms to NHESP for all rare snakes observed.

This recommendation replaces the recommendation, contained in the draft, to exclude Trail Watch bikes.

Table 4.3.13; Goal 1. The following recommendation was added:

- Require that Trail Watch members operating in this section receive training in snake biology and conservation, and submit Rare Species Observation Forms to NHESP for all rare snakes observed.

This recommendation replaces the recommendation, contained in the draft, to exclude Trail Watch bikes.

Table 4.3.14; Goal 1. The first recommendation was revised as follows:

- Open appropriate, existing trails to mountain bike use, in accordance with *Trails Guidelines and Best Practices Manual* (DCR 2010a). Revisit the impacts of this recommendation on natural resources, golf course operations, trail user conflicts, and public safety in the upcoming Trail System Plan.

Table 4.3.15; Goal 1. The first recommendation was revised as follows:

- Open appropriate, existing trails to mountain bike use, in accordance with *Trails Guidelines and Best Practices Manual* (DCR 2010a). Revisit the impacts of this recommendation on natural resources, trail user conflicts, and public safety in the upcoming Trail System Plan.

Table 4.3.16; Goal 1. The following recommendation was added:

- Open appropriate, existing trails to mountain bike use, in accordance with *Trails Guidelines and Best Practices Manual* (DCR 2010a). Revisit the impacts of this recommendation on natural resources, trail user conflicts, and public safety in the upcoming Trail System Plan.

Appendices

Appendix C. Information was added on methods and data sources used to calculate the extent of the reconfigured Blue Hills Reservoir.

Appendix E. Information on the browsing of state-listed plants by white-tailed deer has been added.

Appendix H. Additional species, and new data sources, were added. Watch List species are now identified.

Appendix J. Two additional public awareness designations, Priority Natural Communities and Watch List plants, were added.

Appendix K. Breeding Bird Atlas data were added. Taxonomy now follows AOU (2011).

Appendix L. An additional data source was added.

Appendix M. An additional data source was added.

Appendix N. An additional data source was added.

Appendix R. Massachusetts Historical Commission inventory numbers were added, as applicable.

Appendixes W. Twenty-one additional Acts of the Massachusetts Legislature, from 1905 to 1961, were added.

Appendix Z. References included in revisions to this RMP were added to the bibliography.

B.3. TRAIL USE ASSESSMENT PROCESS

Many of the comments on the draft RMP concerned proposed changes in trail use. The following description documents the decision-making process undertaken by the DCR to assess proposed changes in trail use at the Blue Hills Reservation.

Under Massachusetts law, management plans for DCR's reservations, parks, and forests "shall provide for the protection and stewardship of natural and cultural resources and shall ensure consistency between recreation, resource protection, and sustainable forest management" (M.G.L. Chapter 21: Section 2F). Therefore, all recreation at the Blue Hills must be consistent with the protection of natural and cultural resources.

At the initial public meeting, and in the months that followed, requests were made to increase mountain biking opportunities on the reservation. In response to these requests, each section of the reservation currently closed to mountain bikes was evaluated for a change in trail use. This included those sections of the reservation east of Route 28 (i.e., Chickatawbut Hill, Quincy Quarries, and St. Moritz) and those sections south of Route I-93 (i.e., Ponkapoag, Ponkapoag East, and West Street). The first step in assessing if trails in these areas should be opened to a new use, such as mountain biking, was determining if such use is compatible with the protection of natural and cultural resources.

The primary natural resources of management concern in the area east of Route 28 are two state-endangered snakes; the copperhead and timber rattlesnake. In 2009, a review of the direct impacts of current and potential trail uses on these species was performed using Google Scholar (<http://scholar.google.com>). Search terms included: hiker, horse, or bike; snake; and mortality. This search identified three documented cases of mountain bikes causing the death of, or injury to, a snake. Haas et al. (2002) documented the death of a southern Pacific rattlesnake (*Crotalus oreganus helleri*) and the maiming of a red racer (*Masticophis flagellum piceus*) struck by mountain bikes. The U.S. Fish and Wildlife Service (USFWS 2002) documented the death of a federally threatened Alameda whipsnake (*Masticophis lateralis euryxanthus*) struck by a mountain bike. No similar

impacts by hikers or equestrians were identified through this literature review.

The literature review was conducted again in 2011. No documentation of hiker- or horse-related impacts to snakes was identified, and no additional reports of bike-related impacts were identified.

In addition to those impacts documented through the literature review, an additional account of a mountain bike running over a snake was identified on the NEMBA list serve ("Bo" 2009). This entry contained the account of a cyclist who had run over a North American racer while riding at the Blue Hills. The snake's fate was not reported.

Taken collectively, the three documented instances of snake mortality or injury, and the entry on the NEMBA list serve indicate that mountain bikes can strike, and potentially kill, snakes. The Massachusetts Endangered Species Act (MESA; 325 CMR 10.05(1)) directs all state agencies to "use their authorities in furtherance of the purposes of MESA and 321 CMR 10.00 ... and use all practicable means and measures to avoid or minimize damage to such species or their habitats." Given the rarity of copperheads and timber rattlesnakes in Massachusetts, and the demonstrated potential of mountain bikes to kill or maim snakes, opening the trails east of Route 28 to mountain bikes was identified as inconsistent with MESA and, therefore, with protection of the reservation's natural resources.

Continuing the existing closure of the area east of Route 28 to mountain bikes is also consistent with International Mountain Bicycling Association guidance, which recommends that mountain bike trails be located "away from rare plants and animals and from sensitive critical habitat of other species" (Marion and Wimpey 2007).

A comprehensive suite of recommendations was developed to decrease the impacts of existing uses on state-listed snakes. Recommendations were made to: close or reroute existing trail segments; modify ongoing landscaping, maintenance, and construction activities; exclude non-emergency vehicles; reinstitute seasonal nighttime road closures; and conduct active habitat management for rare snakes.

Evaluation of opening existing trails in the Ponkapoag, Ponkapoag East, and West Street sections to mountain bikes also began with an

assessment of the consistency of the proposed new trail use with the protection of natural and cultural resources.

State-listed species in the Ponkapoag section are largely restricted to the pond and bog. Discussions with the NHESP indicated that these species are unlikely to be impacted by mountain biking along existing trails outside of the pond's immediate basin. State-listed species in the Ponkapoag East section are associated with vernal pools and adjacent uplands. There are no documented state-listed species in the West Street section.

Assessment of the Ponkapoag, Ponkapoag East, and West Street sections' cultural resources did not identify any conflicts with existing trail use, or with opening these trails to mountain bikes.

Having identified no incompatibilities with natural or cultural resources, recommendations were made to open appropriate trails in the Ponkapoag and Ponkapoag East sections to mountain biking. This recommendation excluded trails in wetlands or vernal pools, and visitor-created informal trails. Use of such trails is inappropriate for all trail users. Opening trails in the West Street section to mountain bikes was not initially proposed due to the isolation of this parcel from the reservation's trail system and because this section's limited trails (0.9 miles) provide little opportunity for recreation. All three sections are now recommended to be opened to mountain bikes.

Some public comments expressed concern about shared trail use. Such shared use is common on DCR properties, such as Ames Nowell, Borderland, Bradley Palmer, Great Brook Farm, Harold Parker, and Wompatuck state parks. Perhaps, most importantly, hikers, equestrians, and mountain bikers currently share the Little Blue, Great Blue, Houghton's Pond, and Buck Hill sections of the Blue Hills Reservation without major incident.

Other concerns about opening existing trails in the Ponkapoag section to mountain bikes included increased user conflicts due to failure to follow standard trail etiquette protocol. Recommendations were developed to address these concerns.

Appendix C. GIS Supplemental Information.

C. 1. METHODOLOGY

The following is a summary of the GIS methodology used by the DCR's GIS Program to generate and present data within the Blue Hills Planning Unit Resource Management Plan (RMP).

Property Boundaries

A DCR GIS Specialist extensively researched the digital boundaries of each property in the Blue Hills Planning Unit. As a result of this research, nearly three-quarters (72%) of the property boundaries within the planning unit were edited with highly accurate data, e.g. surveys and/or hydrographic or town boundaries. The remaining boundaries within the planning unit were edited with reasonably accurate data, e.g. draft parcel data, georeferenced plans and/or orthophotography.

Sections of the Blue Hills Reservation

A DCR GIS Specialist digitized the internal boundaries of each section of the Blue Hills Reservation in ArcGIS. The 2008 Color Orthophotography, Hydrography, and Official Trail datalayers were used as a reference.

Water Resources

The boundaries of Blue Hills Reservoir were adjusted by a DCR GIS Specialist, using ArcGIS, to reflect the final footprint of the Massachusetts Water Resources Authority's (MWRA) covered water storage facilities. The 2008 Color Orthophotography datalayer and imagery from Google Maps were used to digitize the extent of the reconstructed reservoir.

The dam owned by the Town of Milton, located near the intersection of Harland Street and Unquity Road, was digitized in ArcGIS by a DCR GIS Specialist. The 2008 Color Orthophotography datalayer and information from the DCR Office of Dam Safety were used to pinpoint the location of the dam.

The non-community groundwater sources located at the YMCA and Appalachian Mountain Club (AMC) camps were digitized in ArcGIS by a DCR GIS Specialist. The 2008 Color Orthophotography datalayer and information from site visits and the AMC were used to pinpoint the location of the wells.

Historic Resources

Historic resource data were collected by the DCR Office of Cultural Resources over the course of several days in September, 2009 and January, 2010. A GPS application developed by the DCR GIS Program was used to inventory and standardize these data.

The extent of the planning unit's historic parkways was determined through National Register of Historic Places nomination forms.

Infrastructure

The dam owned by the Town of Milton, located near the intersection of Harland Street and Unquity Road, was digitized in ArcGIS by a DCR GIS Specialist. The 2008 Color Orthophotography datalayer and information from the DCR Office of Dam Safety were used to pinpoint the location of the dam.

A DCR GIS Specialist also digitized the athletic courts and fields, bulletin or map boards (i.e., kiosks), parking and picnic areas and playgrounds in ArcGIS using field verified documentation of the resources and the 2008 Color Orthophotography datalayer as a reference.

Nearly half of the Building or Associated Structure datalayer was digitized in ArcGIS by a DCR GIS Specialist. The 2008 Color Orthophotography datalayer and field verified documentation of the buildings and/or structures were used as a reference. A building footprint datalayer, courtesy of the AMC, was also used as a reference.

Demographics

The RMP's demographic information was generated using the following methodology within ArcGIS. First, the Blue Hills Reservation was buffered by 5, 9, 14 and 28 miles using the buffer tool. Next, the Massachusetts and Rhode Island Census Block Group datalayers were analyzed.

The calculate geometry feature was used to determine the area, in acres, of each Census Block Group. The area was then divided into the population of each Census Block Group, using the field calculator feature, to obtain the number of individuals per acre (i.e. the population density) of each Census Block Group. This information, as well

as the Number of Known Park Users datalayer, was used to create the RMP's Demographics map. It is important to note that the dot density feature was used to ensure that the known park user points were displayed at random within each ZIP Code.

Finally, the Census Block Group datalayers were further analyzed to determine the characteristics of the population surrounding the Blue Hills Reservation. Each Census Block Group that intersected with the buffers described above was selected using the select by location tool. The information for the selected Census Block Groups, not presented elsewhere in this RMP, is summarized in Table C.1, below.

Table C.1. Additional 2000 Census Block Group Information, by Buffer Distance.

<i>Race</i>	5 Miles	9 Miles	14 Miles	28 Miles
White	441,337	1,008,296	1,755,365	3,339,207
Black or African American	126,003	189,762	223,974	262,625
American Indian or Alaskan Native	2,044	3,975	5,900	8,956
Asian	36,757	93,370	136,746	184,361
Native Hawaiian or Other Pacific Islander	101	410	702	1,235
Some Other Race (Alone)	26,123	60,655	89,147	134,123
Two or More Races	21,934	47,397	70,849	103,594
<i>Education*</i>				
M Pop. >25	203,317	436,028	722,012	1,284,259
M < H.S.	31,100	61,725	101,686	180,068
M H.S.	55,935	100,051	170,985	315,562
M < Bach.	47,813	87,795	146,613	276,561
M Bach.	41,433	99,398	163,163	287,486
M > Bach.	27,036	87,059	139,565	224,582
F Pop. >25	243,668	499,158	823,094	1,450,519
F < H.S.	36,766	71,384	115,518	201,434
F H.S.	71,079	123,281	209,728	382,353
F < Bach.	63,622	114,154	188,298	356,437
F Bach.	45,291	109,515	177,557	305,174
F > Bach.	26,910	80,824	131,993	205,121
Total >25	446,985	935,186	1,545,106	2,734,778
Total < H.S.	67,866	133,109	217,204	381,502
Total H.S.	127,014	223,332	380,713	697,915
Total < Bach.	111,435	201,949	334,911	632,998
Total Bach.	86,724	208,913	340,720	592,660
Total > Bach.	53,946	167,883	271,558	429,703

* < H.S. = No school, < 11th grade, 12th grade no diploma;
 < Bach. = College < 1 year, college > 1 year no diploma, Assoc.;
 > Bach. = Master, professional school degree, PhD.

It is important to note that by using the select by location tool, an acceptable amount of error was introduced into the demographic information presented in the RMP. Census Block Groups that extended beyond each buffer, similar to what is depicted in Figure D.1, below, were included in the analysis. As a result, the demographic information for each buffer likely includes individuals who live farther away from the Blue Hills Reservation than indicated.

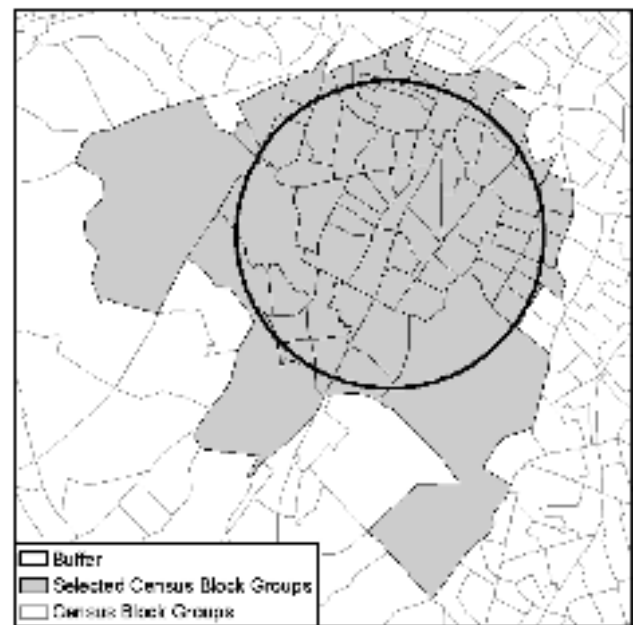


Figure C.1. Selected Census Block Groups.

Trails

A DCR GIS Specialist digitized the bulletin or map boards and parking areas in ArcGIS using field verified documentation of the resources and the 2008 Color Orthophotography datalayer as a reference. The summits were also digitized by a DCR GIS Specialist in ArcGIS, using the USGS Topographic Quadrangle datalayer as a reference.

The trails data were collected by consultants over the course of several weeks in the summer of 2008. A GPS application was developed by the DCR GIS Program in an attempt to standardize these data. However, it is important to note that several of the trails attributes are qualitative and subjective (e.g., trail width and condition). It is assumed that the

individual collecting these data used their best judgment when populating these attributes.

A DCR GIS Specialist created a spatial join between the raw trails datalayer, which included both official (legal) and visitor-created informal trails, and the Section of the Blue Hills Reservation datalayer to determine the trail statistics presented in the RMP. Trail type, length and condition were summed, in miles, by section of the Blue Hills Reservation using the ArcGIS statistics feature.

Land Stewardship Zoning

A DCR GIS Specialist digitized the Zone 1, Zone 2, Zone 3 and Historic Resource datalayers in ArcGIS. The Priority Habitat of Rare Species, Historic Resource and Hydrography datalayers were used as a guide for defining Zone 1 within the Blue Hills Planning Unit. The 2008 Color Orthophotography

datalayer was used to determine the existing developed areas and in turn, the planning unit's Zone 3. Every attempt was made to use "on the ground features," such as trails or wetlands, as the boundary for each zone and/or significant feature overlay in an effort to make the areas easily identifiable for DCR field staff.

The extent of the planning unit's historic parkways was determined through National Register of Historic Places nomination forms.

C. 2. DATALAYERS

A summary of the GIS datalayers used by the DCR GIS Program to generate and display data within the Blue Hills Planning Unit RMP is presented in Table D.2.

Table C.2. Summary of datalayers used to create the Blue Hills Planning Unit RMP.

Datalayer Name	Source	Additional Information
100-Year Flood Zone	MassGIS	http://www.mass.gov/mgis/q3.htm
2000 Census Block Group	MassGIS	http://www.mass.gov/mgis/census2000.htm ; http://www.edc.uri.edu/rgis/data
2008 Color Orthophotography	MassGIS	http://www.mass.gov/mgis/colororthos2008.htm
5, 9, 14 and 28 Mile Buffer	DCR GIS	
500-Year Flood Zone	MassGIS	http://www.mass.gov/mgis/q3.htm
Aquifer	MassGIS	http://www.mass.gov/mgis/aq.htm
Area of Critical Environmental Concern	MassGIS	http://www.mass.gov/mgis/acecs.htm
Athletic Court/Field	DCR GIS	
Blue Hills Reservation	MassGIS	http://www.mass.gov/mgis/osp.htm
Building Footprint	MassGIS; AMC	http://www.mass.gov/mgis/lidarbuildingfp2d.htm
Building or Associated Structure	DCAM; DCR GIS	
Bulletin or Map Board	DCR GIS	
Community Groundwater Source	MassGIS	http://www.mass.gov/mgis/pws.htm
Cultural Resource	DCR GIS	
Dam	DCR GIS	
DCR District Boundary	DCR GIS	
DCR Parkway	DCR GIS	
DCR Property	MassGIS	http://www.mass.gov/mgis/osp.htm
Highway	MassGIS	http://www.mass.gov/mgis/eotroads.htm
Historic Building, Object, Site or Structure	DCR GIS	
Historic Landscape	DCR GIS	
Historic Parkway	DCR GIS	
Hydrography	MassGIS DCR GIS	http://www.mass.gov/mgis/wetdep.htm ; http://www.mass.gov/mgis/hd.htm ; http://www.mass.gov/mgis/hd100_.htm
Land Use (2005)	MassGIS	http://www.mass.gov/mgis/lus2005.htm
Major/Minor Road	MassGIS	http://www.mass.gov/mgis/eotroads.htm
MBTA Commuter Rail Line/Station/Subway Line	MassGIS	http://www.mass.gov/mgis/mbta.htm ; http://www.mass.gov/mgis/trains.htm
NHESP BioMap Core Habitat	MassGIS	http://www.mass.gov/mgis/biocore.htm
NHESP BioMap Supporting Natural Landscape	MassGIS	http://www.mass.gov/mgis/biosnl.htm
NHESP Certified Vernal Pool	MassGIS	http://www.mass.gov/mgis/cvp.htm
NHESP Estimated Habitat of Rare Wildlife	MassGIS	http://www.mass.gov/mgis/esthab.htm
NHESP Living Waters Critical Supporting Watershed	MassGIS	http://www.mass.gov/mgis/lwcsv.htm
NHESP Natural Communities	MassGIS	http://www.mass.gov/mgis/natcomm.htm
NHESP Potential Vernal Pool	MassGIS	http://www.mass.gov/mgis/pvp.htm
NHESP Priority Habitat of Rare Species	MassGIS	http://www.mass.gov/mgis/prihab.htm
Non-Community Groundwater Source	MassGIS; DCR GIS	http://www.mass.gov/mgis/pws.htm
Number of Known Park Users	DCR GIS	
Official Trail	DCR GIS	
Outstanding Resource Waters	MassGIS	http://www.mass.gov/mgis/orw.htm
Parking	DCR GIS	
Picnic Area	DCR GIS	
Playground	DCR GIS	
Section of the Blue Hills Reservation	DCR GIS	
Soils Unfavorable for Paths and Trails	MassGIS	http://www.mass.gov/mgis/soi.htm
State Boundary	MassGIS	http://www.mass.gov/mgis/outline.htm
Summit	DCR GIS	
Surface Water Intake	MassGIS	http://www.mass.gov/mgis/pws.htm
Town Boundary	MassGIS	http://www.mass.gov/mgis/townssurvey.htm ; http://www.edc.uri.edu/rgis/data
US ZIP Codes	ESRI	
USGS Topographic Quadrangle	MassGIS	http://mass.gov/mgis/im_quad.htm
Watershed Boundary	MassGIS	http://www.mass.gov/mgis/watshds.htm
Zone 1, 2 and 3	DCR GIS	

Appendix D. 2010 Land Acquisition, Canton, Massachusetts.



Figure D.1. Topographic map indicating the location of recently acquired parcel, Canton, Massachusetts.

In June, 2010 the Massachusetts Department of Conservation and Recreation (DCR) acquired a 56-acre parcel of land along the banks of Ponkapoag Brook in the Town of Canton. (Figure D.1) Due to the timing of the acquisition, relative to the timing of preparation of this RMP, information on this parcel is preliminary and limited to this appendix.

The acquisition is located within the Blue Hills District of the DCR's South Region. It is to be "managed as a conservation area, with public use directed to the few informal existing trails" (Church 2010).

This parcel was formerly associated with the larger Toka-Renbe Farm, a property once contaminated with PCBs and dioxin (Massachusetts Department of Public Health 1997). Following site cleanup, the U.S. Environmental Protection Agency and the U.S. Department of Justice separated out a 56-acre parcel and offered to sell it to the DCR in order to recover some of the costs associated with site cleanup (Pittore 2010). The property is "free from lingering

clean-up obligations and is not known to have any reportable conditions that are actionable by the DEP" (Pittore 2010).

Multiple easements cross the property, including three Algonquin Gas utility easements and two Town of Canton sewer easements. Corridors associated with these easements provide public access. No additional trails are planned.

Palustrine communities, associated with Ponkapoag Brook and its flood plain, are the most common vegetative cover. Terrestrial communities occur at slightly higher elevations, and along the southern property boundary.

A preliminary list of the parcel's plants is provided in Table D.1. Information is lacking on the parcel's wildlife.

An initial needs assessment identified plant and animal inventories, invasive species control, and boundary marking (Church 2010).

Table D.1. Preliminary List of Plants Observed on 2010 Land Acquisition, Canton, Massachusetts.

The following plants were reported by Kadis (2010a). The sequence of plants is presented alphabetically by family and scientific name. Family, common, and scientific names follow the United States Department of Agriculture (USDA; 2009).

Family		Common Name	Scientific Name	Invasive ^a
Aceraceae	Maple Family	Red maple	<i>Acer rubrum</i>	
Anacardiaceae	Sumac Family	Eastern Poison ivy Poison sumac	<i>Toxicodendron radicans</i> <i>Toxicodendron vernix</i>	
Apiaceae	Carrot Family	Bulblet-bearing water hemlock	<i>Cicuta bulbifera</i>	
Aquifoliaceae	Holly Family	Common winterberry	<i>Ilex verticillata</i>	
Araceae	Arum Family	Calamus Green arrow arum	<i>Acorus calamus</i> <i>Peltandra virginica</i>	
Asclepiadaceae	Milkweed Family	Swamp milkweed	<i>Asclepias incarnata</i>	
Asteraceae	Aster Family	Coastal plain Joe Pye weed	<i>Eupatoriadelphus dubius</i>	
Betulaceae	Birch Family	Gray birch	<i>Betula populifolia</i>	
Caprifoliaceae	Honeysuckle Family	American black elderberry	<i>Sambucus nigra</i> ssp. <i>canadensis</i>	
Clethraceae	Clethra Family	Coastal sweetpepperbush	<i>Clethra alnifolia</i>	
Convolvulaceae	Morning Glory Family	Hedge false bindweed	<i>Calystegia sepium</i> ssp. <i>sepium</i>	
Cornaceae	Dogwood Family	Silky dogwood Blackgum	<i>Cornus amomum</i> <i>Nyssa sylvatica</i>	
Cucurbitaceae	Cucumber Family	Wild cucumber	<i>Echinocystis lobata</i>	
Cyperaceae	Sedge Family	Upright sedge Unid. sedge	<i>Carex stricta</i> <i>Scirpus</i> sp.	
Dryopteridaceae	Wood Fern Family	Intermediate woodfern Sensitive fern	<i>Dryopteris intermedia</i> <i>Onoclea sensibilis</i>	
Ericaceae	Heath Family	Maleberry Highbush blueberry	<i>Lyonia lingustrina</i> <i>Vaccinium corymbosum</i>	
Fabaceae	Pea Family	Groundnut	<i>Apios americana</i>	
Fagaceae	Beech Family	White oak Pin oak Northern red oak	<i>Quercus alba</i> <i>Quercus palustris</i> <i>Quercus rubra</i>	
Osmundaceae	Royal Fern Family	Cinnamon fern	<i>Osmunda cinnamomea</i>	
Poaceae	Grass Family	Bluejoint Reed canarygrass Common reed	<i>Calamagrostis canadensis</i> <i>Phalaris arundinacea</i> <i>Phragmites australis</i>	I I
Polygonaceae	Buckwheat Family	Halberdleaf tearthumb	<i>Polygonum arifolium</i>	
Ranunculaceae	Buttercup Family	King of the meadow	<i>Thalictrum pubescens</i>	
Rhamnaceae	Buckthorn Family	Glossy buckthorn Common buckthorn	<i>Frangula alnus</i> <i>Rhamnus cathartica</i>	I I
Rosaceae	Rose Family	Multiflora rose Swamp rose Allegheny blackberry Black raspberry	<i>Rosa multiflora</i> <i>Rosa palustris</i> <i>Rubus allegheniensis</i> <i>Rubus occidentalis</i>	I
Salicaceae	Willow Family	Eastern cottonwood Quaking aspen Large gray willow Large gray willow Crack willow	<i>Populus deltoides</i> <i>Populus tremuloides</i> <i>Salix atrocinerea</i> <i>Salix cinerea</i> <i>Salix fragilis</i>	
Solanaceae	Potato Family	Climbing nightshade	<i>Solanum dulcamara</i>	
Thelypteridaceae	Marsh Fern Family	Eastern marsh fern	<i>Thelypteris palustris</i>	
Typhaceae	Cat-tail Family	Narrowleaf cattail Broadleaf cattail	<i>Typha angustifolia</i> <i>Typha latifolia</i>	
Utricaceae	Nettle Family	Smallspike false nettle	<i>Boehmeria cylindrica</i>	
Vitaceae	Grape Family	Fox grape	<i>Vitis labrusca</i>	

a. These species have been evaluated by the Massachusetts Invasive Plant Advisory Group (MIPAG 2005) and determined to be invasive (I).

Appendix E. Geologic and Vegetative History of the Blue Hills Reservation.

The Blue Hills' landscape is the result of hundreds of millions of years of geological processes, followed by 16,000 years of soil formation and vegetative change. This appendix identifies those forces known to have shaped the reservation's geology and vegetation. It also identifies current and potential threats to that vegetation.

E.1. GEOLOGY

A variety of geological processes have produced the rocks, soils, and topography of today's Blue Hills Reservation. Chief among these are volcanism, mountain building, and glaciation (Table E.1).

Table E.1. Summary of the geologic history of the Blue Hills.^a

YBP ^b	Geologic Activity
15,000–16,000	Receding glaciers deposit materials that form the soils of the Blue Hills Reservation.
22,000–23,000	Wisconsinan ice sheet covers all of New England.
250–354 Million	The Blue Hills are formed during the Alleghanian mountain building event.
300–315 Million	Pondville conglomerate and the Wamsutta redbeds form along the south margin of what will become the Blue Hills.
440 Million	A volcano erupts and collapses in what will become the Blue Hills.
370–550 Million	The Avalon Terrane, a chain of volcanic islands that includes the area that will become the Blue Hills, breaks away from Gondwana and begins moving northward from its location near today's South Pole.

a. Based on Skehan (1979, 2001).

b. Years before present; all dates are estimates.

Bedrock. Three types of bedrock underlay the reservation: volcanic rock, Pondville conglomerate, and rock associated with the Wamsutta redbeds. These bands of bedrock are oriented in an approximately east–west direction.

The northernmost band includes quartz and granite produced by a volcanic eruption. Magma (i.e., molten rock) that cooled above ground became a type of quartz referred to as the Blue Hills quartz

porphyry, while magma that cooled more slowly below ground became Quincy Granite. The quartz extends from Little Blue Hill eastward to Chickatawbut and Hawk hills; the granite is limited to the northeast corner of the reservation and nearby Quincy.

Heat associated with the reservation's volcanic rocks led to the formation of hornfels, through a process referred to as contact metamorphism. It occurs in pockets along the margin of volcanic and sedimentary rocks.

Immediately south of the hills is a narrow band of Pondville conglomerate. This sedimentary rock is made up of “pebbles, cobbles, and large rounded boulders,” derived from granite and quartz, in a matrix of fine-grained quartz and feldspar (Skehan 1979). It extends from Houghton's Pond to West Street, Braintree.

The southernmost band of bedrock is the Wamsutta redbeds; “massive red sandstones and finely granular red slate” (Skehan 2001). Both the Wamsutta redbeds and Pondville conglomerate occur in a “2.5-mile wide strip of land between the Blue Hills and the Sharon Upland” that is known as the Norfolk Basin (Skehan 2001).

Soils. The reservation's soils are chiefly derived from glacial till. The specific type of soil present in an area is a function of three factors: its location relative to glacial features (e.g., drumlin, outwash plain); the substrate on which the till was deposited (e.g., bedrock, ice, water-deposited materials); and topography (e.g., ridge, slope, depression). Mucky soils (i.e., Freetown Muck, Swansea Muck) developed in areas where organic materials had accumulated. Shallow, nutrient-poor soils, exposed bedrock, rock outcrops, and cliffs are associated with hilltops. Deeper, less rocky soils tend to occur on gentler slopes, in depressions, and in relatively flat areas.

Soils designated as Prime Farmland occur along the western edge of Little Blue Hill; at Brookwood Farm; to the immediate south, west, and north of Houghton's Pond; to the northeast of Great Cedar Swamp; and on portions of Indian Line Farm. Many of these areas were historically used for agriculture.

E.2. VEGETATION

The Blue Hills’ vegetation is dynamic, changing over time in response to climate, cutting, fire, disease, pests, and other factors. Some species have been added, some have been lost, and many have undergone changes in relative abundance.

Today’s forest is not the same as the one that occurred here in the distant past or even at the time that the reservation was established. It is also not the same forest that will be here in the future.

Post-Glacial Vegetation. Review of the Blue Hills’ post-glacial vegetation (Table E.2) reveals a pattern of ongoing change.

Table E.2. Post-glacial vegetation of the Blue Hills.^a

YBP ^b	Dominant Vegetation
685	Oak–Chestnut–Ragweed
4,700	Oak–Hickory–Beech Alder, sedge, and blackgum also present
8,000	Oak–Hemlock–Beech Basswood, elm, and maple also present
10,500	Pine–Oak–Birch Ironwood, hornbeam, ash, and hemlock also present
11,500	Spruce–Alder Fir, sedges, and grasses also present

a. Based on Bartlett (n.d.) and Newby et al. (1985).

b. Years before present; all dates are approximate.

Shortly after the last glacier retreated, some 15,000 years before present (YBP), herbaceous vegetation began to colonize the newly formed soils. This quickly transitioned into an open spruce-woodland. Plants associated with this woodland are now indicative of more northerly climates. Over time spruce and alder decreased in abundance, and pine, oak, and birch became the dominant vegetation. The structure of the forest shifted from an open woodland to a closed-canopy forest. Hemlock and beech increased in abundance and, with oak, became the dominant vegetation by 8,000 YBP. Hickory, a more southerly species, spread into the region while hemlock underwent a rapid decline. By 685 YBP, the Blue Hills was dominated by oak and chestnut. Ragweed pollen, which is associated with open lands, indicates the presence of Native American agriculture in the vicinity of Houghton’s Pond approximately 700 years ago.

Over an approximately 12,000-year period the forests of the Blue Hills transitioned from boreal woodland to the deciduous forest present at the time of European contact.

Historic Changes

Historic documents reveal extensive changes to the forest since European contact.

Forest Management. For 250 years prior to the establishment of the Blue Hills Reservation, man made “successive sweeping cuttings” and “allowed fires to supplement his own destructive action” (Olmsted Brothers 1899). This land use resulted in coppiced oaks, with multiple stems arising from the stumps of felled trees.

Shortly after the reservation was established, the vegetation was described as “a monotonous thicket” (Olmsted Brothers 1899) and “worthless sprout growth” (Woodbury 1901). A variety of forestry activities, including the creation of fire roads and the transplanting of pine seedlings, were conducted to encourage the replacement of coppiced oaks with more “desirable” trees (Woodbury 1901).

Between 1902 and 1918 over 1.5 million pine seedlings were transplanted in the Blue Hills (De Las Casas et al. 1910; Rogers 1911, 1914, 1915, 1917; Woodbury 1902, 1904, 1905, 1906, 1907, 1908, 1909). Large numbers of non-native spruce (e.g., 110,000 in 1910) were also planted throughout the reservation (Woodbury 1910), as was a limited number of eastern hemlock (e.g., 3,000 in 1908; Woodbury 1908). These actions greatly altered the forest’s composition and structure. Stands of non-native spruce and red pine, introduced through these efforts, remain on the reservation.

The last known timber harvest took place in the Houghton’s Pond section in 1987, with white pine, red pine, and white oak cut from the southwest corner of the recreation area (Tomlin 1987).

Chestnut Blight. At the time the reservation was established, American chestnut was a common tree “found throughout on well drained slopes” (Deane 1896). Chestnut blight, a fungal disease that affects American chestnut, was first identified on the reservation in 1912, and by 1913 was widespread (Rogers 1913). By 1919 “the destruction of trees by the chestnut-tree blight became so serious as to be beyond the ability of the forces of the reservation to

remove while they yet had commercial value” (De Las Casas et al. 1919). This tree, which was dominant in the pre-contact forest, has functionally been eliminated from the Blue Hills.

Urbanization. The reservation’s herbaceous species may have declined in abundance due to the indirect effects of urbanization.

A recent study (Primack et al. 2009) compared the current flora of nearby Concord, Massachusetts, with four earlier plant surveys conducted in that town. Sixty-three percent of species recorded in the mid-19th century were either not relocated in the most recent survey, or were found to persist in only one or two populations. Among the plants with the greatest decreases in abundance were buttercups, bluets, bladderworts, dogwoods, lilies, mints, orchids, roses, saxifrages, and violets (Willis et al. 2008); plants known from the Blue Hills (Appendix H).

Associated with observed decreases in floral abundance and diversity was a 2.4° C (4.3° F) increase in temperature. Species that failed to adjust their seasonal activities (e.g., flowering time) in response to the temperature increase exhibited the greatest decreases in abundance (Miller-Rushing and Primack 2008, Willis et al. 2008). The observed temperature increase, based on data from the Blue Hills Meteorological Observatory, was attributed to heat associated with increased urbanization. This increase in temperature may have affected vulnerable species at the Blue Hills, just as it affected those in Concord.

Other environmental changes at the Blue Hills have also been attributed to urbanization. A study of New England lakes (Hodgkins et al. 2002), revealed that ice-out is now occurring 16 days earlier at Houghton’s and Ponkapoag ponds than it did in the mid-1850s. Gotelli et al. (2008) attributed elevated levels of dissolved organic carbon, dissolved organic nitrogen, and a variety of metals in Ponkapoag Bog to urbanization. It is unknown how these physical and chemical changes may be impacting vegetation. Chalmers et al. (2005) reported that atmospheric mercury, likely from Boston, Providence, and New York, was being deposited at the Blue Hills in concentrations higher than recorded at other metropolitan Boston study locations. Potential impacts of this mercury on the reservation’s terrestrial and aquatic systems are unknown.

Current and Potential Threats

The Blue Hills faces several current and potential threats to its forests from a variety of non-native organisms and one native large mammal.

Invasive Plants. Although presently limited in occurrence, invasive plants pose a growing threat to the reservation’s natural resources. Twenty-five species of invasive plants are known from the Blue Hills. Some, such as garlic mustard and Louise’s swallow-wort, have already established monocultures in portions of the reservation, usurping native plant habitat. Others, such as black locust and Japanese barberry exist within communities still dominated by native plants. All represent the loss, or potential loss, of native plant and wildlife habitat.

The magnitude and extent of future impacts of non-native species on the Blue Hills’ native plants and communities will depend on the magnitude of monitoring and control efforts.

Hemlock Woolly Adelgid. This insect decreases the vigor of the hemlocks upon which it feeds, eventually leading to the death of these trees. It is established throughout the reservation. Some of the reservation’s hemlocks are being treated with a systemic insecticide; most are not.

Responses to adelgid infestations elsewhere in New England (e.g., Orwig and Foster 1998) provide insight into the types of changes likely to occur at the Blue Hills. Infestation will likely be followed by the loss of hemlock needles, which results in increased amounts of light reaching the forest floor. Heavily infested trees will die, leading to an increase in downed woody debris and a further increase in the amount of light reaching the forest floor. In response to the increased light, species such as black birch will grow in the newly formed openings, followed by opportunistic herbaceous species and non-native invasive plants. A shift in bird community composition, from forest interior species to forest opening species, will accompany the increased light and shift in vegetation (e.g., Tingley et al 2002).

Examples of the Oak–Hemlock–White Pine Forest natural community will shift toward the White Pine–Oak Forest community type as hemlock become less common on the reservation.

White-tailed Deer. Over-browsing by deer is decreasing the abundance of once-common

herbaceous species (e.g., Canada mayflower, moccasin flower) and preventing forest regeneration in portions of the Blue Hills. Rawinski (2010*b*) reported that “virtually all of the interior forests at Blue Hills are, essentially, dying due to widespread regeneration failure of almost every tree species...” Further, the forest “is disintegrating, lacking the resilience to bounce back from...perturbations.” The full impacts won’t become apparent “until the trees begin to fall over in wind-storms, or are killed by fire or insect pests...”

Over-browsing has the potential to significantly decrease species diversity and suppress canopy cover for decades. The geographic extent of such impacts is currently unknown.

Over-browsing by deer also affects some of the reservation’s rare plants. French and O’Shea (2011) indicated that the NHESP database contains reports of deer browsing multiple populations of lesser snakeroot in 2002, and an additional report in 2007. They concluded “clearly, deer populations at the Blue Hills are impacting state-listed rare plants negatively” and emphasized the need to control the

size of the deer population in order to reduce deer herbivory on rare plants.

Asian Longhorned Beetle. The Asian longhorned beetle represents a significant potential threat to the reservation’s trees. This insect, which is native to China, Japan, and Korea, is a destructive pest (e.g., DCR 2009*b*). It feeds on a variety of hardwoods, including maple, birch, elm, willow, and occasionally on ash and poplar (USDA 2008). Eradication of this pest involves the cutting of host trees. An infestation in Worcester, Massachusetts and surrounding communities has led to the cutting of over 25,000 trees (Associated Press 2009) and restrictions on the movement of wood into and out of the affected area (DCR 2009*a*). A similar infestation at the Blue Hills would likely result in the removal of most of the reservation’s hardwood trees.

In July of 2010, Asian longhorned beetles were discovered in Boston’s Jamaica Plain neighborhood (DCR 2010*b*); less than 5 miles from the Blue Hills. At present, the beetles are not believed to have dispersed from their point of discovery.

Appendix F. Select Regulations Applicable to the Blue Hills Reservation.^a

CMR ^a	Title	Comments
105 CMR 410.000	Minimum Standards of Fitness for Human Habitation (State Sanitary Code, Chapter II)	Addresses many aspects of human habitation; section 410.152 prohibits the continued use of privies unless approved in writing by the local Board of Health.
105 CMR 430.000	Minimum Standards for Recreational Camps for Children (State Sanitary Code, Chapter IV)	Regulates both residential and day camps, such as the Massachusetts Audubon Society and YMCA day camps at the Blue Hills.
105 CMR 435.000	Minimum Standards for Swimming Pools (State Sanitary Code, Chapter V)	Includes regulations for Semi-Public Pools, such as the one at the YMCA Ponkapoag Outdoor Center.
105 CMR 440.000	Minimum Standards for Developed Family Type Campgrounds (State Sanitary Code, Chapter VI)	Regulates campgrounds where three or more families or groups stay overnight or for longer periods (i.e., AMC Ponkapoag Camp).
105 CMR 445.000	Minimum Standards for Bathing Beaches (State Sanitary Code, Chapter VII)	Specifies water quality monitoring and closure posting requirements at bathing beaches (e.g., swim areas at Houghton's and Ponkapoag ponds).
301 CMR 11.00	Massachusetts Environmental Policy Act (MEPA)	Requires the systematic review of any work or activity undertaken by an agency (e.g., the DCR); involving state permitting or financial assistance; or a transfer of state land.
301 CMR 12.00	Areas of Critical Environmental Concern (ACEC)	Specifies procedures for designating ACECs, provides for disseminating information, and establishes general policies for the Commonwealth within ACECs. Requires that state agencies, such as the DCR, acquire useful scientific data; preserve, restore, or enhance the ACEC's resources; and ensure that activities in or impacting the area minimize adverse impacts on natural, cultural, recreational, and scenic resources.
302 CMR 10.00	Dam Safety	Includes information on the size and hazard classification of dams, as well as dam inspection, repair, alteration, and removal.
304 CMR 7.00	Management Plans and Massachusetts Wildlands	Requires a management plan for each state reservation, park, and forest under the control of the Department of Environmental Management. This regulation was superseded by MGL Chapter 21: Section 2F, which requires management plans for all DCR "reservations, parks, and forests."
310 CMR 9.00	Waterways	These regulations protect and promote the public's interest in tidelands, Great Ponds, and non-tidal rivers; preserve and protect the public's rights in tidelands; protect the public health, safety, and general welfare as it may be affected by any project in tidelands, Great Ponds, or non-tidal rivers; support efforts to revitalize unproductive property along urban waterfronts; and foster the rights of the people to values identified in Article XCVII of the Massachusetts Constitution. These regulations define Great Ponds, and assign their control to the DEP. Chapter 91 permits or licenses are required for the construction, alteration, or removal of both temporary and permanent structures, and the placement of fill. Licenses are also required for beach nourishment, dredging, disposal of unconsolidated material below the low water mark, burning rubbish upon the water, and lowering the water level.
310 CMR 10.00	Wetlands Protection Act	Regulates many activities within 100-feet of wetlands and certified vernal pools, and within 200-feet of perennial streams and rivers.
310 CMR 19.00	Solid Waste Management	Regulates the storage, transfer, processing, treatment, disposal, use and reuse of solid waste. Includes requirements specific to the closure of landfills (e.g., the former Quincy landfill).

Continued on next page.

Appendix F. Select Regulations Applicable to the Blue Hills Reservation.^a (Continued)

CMR ^a	Title	Comments
310 CMR 22.00	Drinking Water	Includes regulations for Transient Non-community Water Systems, which provide water to 25 or more persons at least 60 days/year.
314 CMR 4.00	Massachusetts Surface Water Quality Standards	These standards “secure to the Commonwealth the benefits of the Clean Water Act.” They designate the most sensitive uses for which the waters of the Commonwealth shall be enhanced, maintained and protected; prescribe minimum water quality criteria; and contain regulations necessary to achieve designated uses and maintain water quality. These standards include the identification and regulation of Outstanding Resource Waters.
321 CMR 2.00	Miscellaneous Regulations Relating to Division of Fisheries and Wildlife	Addresses a variety of fish and wildlife issues, including scientific collecting permits and the importation, liberation, and transportation of fish, amphibians, reptiles, birds, and mammals.
321 CMR 3.00	Hunting	Regulates hunting and trapping in Massachusetts.
321 CMR 4.00	Fishing	Regulates the taking of freshwater fish in Massachusetts.
321 CMR 10.00	Massachusetts Endangered Species Act (MESA)	MESA protects rare species and their habitats by prohibiting the “Take” of any plant or animal species listed as Endangered, Threatened, or Special Concern. Activities that may alter rare species habitat (e.g., trail maintenance, vista pruning, digging archaeological test pits) are subject to regulatory review. On state-owned land, “all practicable means and measures shall be taken to resolve conflicts between the protection, conservation, and restoration of state-listed species...and other uses of such lands in favor of the listed species.”
333 CMR 10.00	Certification and Licensing of Pesticide Applicators	Requires that anyone applying herbicides, insecticides, or other pesticides on non-residential property (i.e., all DCR properties) must be certified and licensed.
350 CMR 2.00	Use of Reservations and Parkways	Regulations for former MDC reservations and parkways; including leash requirements, prohibition of off-trail use, prohibition of hunting, regulation enforcement by rangers, and the issuance of special use permits. Limits use of reservations to the period from dawn to dusk. An updated version of these regulations is in development.
350 CMR 3.00	Pedestrian Rules	Regulations for former MDC properties related to pedestrian compliance with traffic signals, traffic control devices, traffic pavement markings, police, and rangers. An updated version of these regulations is in development.
350 CMR 4.00	Traffic Rules	Regulations for former MDC properties related to vehicle operator’s compliance with traffic signals, traffic control devices, traffic pavement markings, police, and rangers. Provides rangers the authority to have cars towed. An updated version of these regulations is in development.
350 CMR 5.00	Parking and Penalties Thereof	Regulations for former MDC properties related to parking. Specifies the amount of fines. An updated version of these regulations is in development.
521 CMR 19.00	Architectural Access Board; Recreational Facilities	Accessibility standards for rinks, pools, beaches, playgrounds, picnic areas, campsites, and other indoor and outdoor facilities. Requires that 5% of picnic facilities be accessible.
521 CMR 19.00	Architectural Access Board; Parking and Passenger Loading Zones	Specifies dimensional, pavement marking, and sign requirements for accessible parking spaces and passenger loading zones.
950 CMR 71.00	Protection of Properties Included in the State Register of Historic Places	Requires Massachusetts Historical Commission notification of projects undertaken, funded, or licensed by a state body.

a. A variety of state regulations apply to both the operation of state parks and the behavior of visitors to these parks. This table includes only those regulations directly related to topics addressed in the main body of this RMP.

b. The Code of Massachusetts Regulations, or CMR, “contains regulations promulgated by state agencies” (Massachusetts Trial Court Law Libraries 2010). These regulations “have the force and effect of law like statutes.”

Appendix G. Water Quality Issues at the Blue Hills Reservation.

Although the Blue Hills' surface waters are generally in good condition, this has not always been the case. For decades, excessive nutrients affected water quality, altering ponds' chemical and biological attributes and impacting water-based recreation. In addition, chemical releases have contaminated some soils, thereby creating potential threats to groundwater.

This appendix documents past water quality issues identified during the preparation of this RMP.

G.1. SURFACE WATER

Water quality in the Blue Hills' ponds has historically been affected by human waste, animal waste, and run-off from adjacent uplands (e.g., Amrhein 1991). Nutrient enrichment from these sources led to increased plant growth and unhealthy swimming conditions. Early efforts to address water quality focused on the impacts of nutrient enrichment (e.g., plant growth) rather than the elimination of nutrient sources.

From the 1960s through the 1980s a variety of mechanical and chemical control methods were used to reduce aquatic vegetation in Houghton's, Ponkapoag, and St. Moritz ponds. Mechanical methods of weed control included dragging chains across the bottom of the Ponkapoag swim area (Slein 1975); using a floating, mechanical harvester to remove plants from Ponkapoag (Process Research, Inc. 1974), and limited application of a "hydro rake" to remove plants from the Houghton's Pond swim area (Shaughnessy 1981).

Herbicides were also used to control aquatic vegetation. Although the record of herbicide use at the Blue Hills is incomplete, herbicides appear to have been used periodically in ponds since at least 1960 (Allied Biological Control Corporation 1973).

Endothall, an aquatic herbicide, was used in Houghton's Pond in 1980 and 1982 (DiPietro 1980, McCarran 1982, Amrhein 1991). The Milton Conservation Commission indicated in 1982 that permission to use Endothall was being given "as a stop gap measure," and that the issues of leachate contributions to plant growth, the high density of recreational use, and erosion be addressed at the pond (Ingoldsby 1982).

Organic herbicides were used in Ponkapoag Pond in the late 1960s and early 1970s to control water milfoil in order to promote largemouth bass breeding and feeding areas (South Region, Reservation & Historic Sites Unit 1989). Although initially successful, the milfoil returned following cessation of herbicide use.

An "Aquatic Management Program" took place in the St. Moritz Ponds from 1968 through the early 1970s. Herbicide was used to "abate weed growth and open the pond for recreational sport fishing" (Allied Biological Control 1970). Initial results indicated that "a continuous chemical treatment will be required in the years ahead" and a continuation of the Aquatic Management Program was recommended (Allied Biological Control 1970). This program was not continued.

Mechanical aerators were used at Houghton's Pond in the mid-1970's (e.g., JBF Scientific Corporation 1974, DiPietro 1978). These aerators were not intended to reduce the amount of vegetation, but rather to address low levels of dissolved oxygen associated with this vegetation.

Extensive efforts were made to identify and address nutrient inputs from septic systems. In 1979, septage from the Houghton's Pond sanitary (now the Visitor Center) was found to be "running directly into the brook feeding Houghton's Pond" (Shaughnessy 1979); the sanitary was closed immediately. The next year, a failing septic system at the police station, was found to be leaking sewage into a ditch that carried the effluent into Marigold Brook and then Houghton's Pond (Shaughnessy 1980). These facilities, and most others in the area, were connected to municipal sewer lines. Reductions in the number of septic systems are largely responsible for observed improvements in water quality at Houghton's Pond in recent decades.

Some septic systems remain in use. The comfort station located along Blue Hill River Road in the Houghton's Pond section remains connected to a septic system. It meets Massachusetts' standards for subsurface sewage disposal (Gotham 2010b). A recent review of the police station's plumbing suggests that not all discharges are connected to the sewer. At least one pipe may still be tied-in to a septic system (Haak 2009). Buildings at the

Operations Yard are connected to septic system, as is the Meteorological Observatory. In the Ponkapoag section, the YMCA's Ponkapoag Outdoor Center uses a septic system, and the AMC's Camp Ponkapoag uses two privies.

Additional factors have contributed to water quality problems at the Blue Hills. Some have been eliminated, while others persist.

Domestic animal waste, including manure from the reservation's stables and paddocks, likely impacted the quality of water in Houghton's Pond (Towle 1986, Woodruff 1991). Because the stables (now called the Brian T. Broderick Stables) are inactive, it is unlikely that water quality is currently affected by this facility. Horse and human feces were believed responsible for high coliform counts, eight times the allowable level, recorded at Marigold Marsh and Fisherman's Beach in 1986 (Towle 1986).

Wildlife, including raccoons and foxes, are also believed to have affected water quality. Coliform from these animals, as well as horse and human waste, were identified as the "most probable direct cause of coliform contamination" of the Blue Hills' waters (Towle 1986). Herring gulls were once the main source of fecal coliform in the Blue Hill Reservoir (Morra 1979). They no longer pose a threat to the quality of drinking water, due to the closing of nearby landfills and the shift to covered water storage.

Runoff from salt and sand piles near Houghton's Pond previously affected its water quality (Shaughnessy 1977). This has not been an issue since these materials were moved to a shed in the Operations Yard.

Although mostly eliminated, a number of actual and potential threats remain. DiPietro (2009) suggested that domestic dogs and waterfowl represent the greatest remaining threat to the quality of Houghton's Pond's water. Turtle and otter enclosures at the Trailside Museum have been identified as significant sources of nutrients entering Blue Hills Pond (Baystate Environmental Consultants, Inc. 2006). Eroded areas along pond shores, especially at Houghton's Pond (Conley 1988), serve as pathways for sediments to enter ponds. Twenty-one catch basins discharge storm water into Houghton's Pond, Marigold Brook, or

their buffers. All have the potential to negatively affect water quality.

Unlike most water bodies on the reservation, the St. Moritz ponds still have elevated nutrient levels and plant growth. Phosphate levels associated with accelerated eutrophication were detected in the northern St. Moritz Pond in 2009 (Twining 2009c). Fecal coliform was also detected in two of eight water samples (Twining 2009d). These samples were obtained near an intermittent stream, and from near a storm drain that runs from Willard Street into the pond. The extent to which the stream and storm drain serve as conduits for nutrients and other materials is unknown.

G.2. GROUND WATER

Accidental and intentional releases of chemicals have resulted in contaminated soils and/or sediments at four locations. Three have been remediated. The fourth location, the Nike Launcher Area, remains under investigation.

Information on identified contaminants, remediation activities, and the status of each location is provided below.

Operations Yard. A fuel release was identified while replacing a 1,500-gallon gasoline tank. Two hundred and fifty-two tons of contaminated soils were removed from the site. Additional contaminated soil, in the proximity of building foundations, was left in place (Tighe & Bond 2001). Groundwater monitoring wells were installed, and water samples are periodically collected and analyzed to determine the movement and concentrations of gasoline-related chemicals.

Elevated levels of Volatile Petroleum Hydrocarbons were present in three monitoring wells at the Operations Yard as of December 2009 (Tighe and Bond 2010).

Ponkapoag Golf Course. A fuel release was identified while replacing a 3,000-gallon gasoline underground storage tank at the Ponkapoag Golf Course's maintenance area. Approximately 50 cubic yards of soil were removed from the site, and subsequent water and soil samples were found to have petroleum hydrocarbon concentrations below applicable soil and groundwater standards (Lord Associates 1997).

This site no longer represents a threat to the reservation's water resources.

Indian Line Farm. Indian Line Farm, located to the north of the Ponkapoag Golf Course's driving range, was once a superfund site.

Prior to ownership by the MDC, Indian Line Farm was used to manufacture electric capacitors. Polychlorinated biphenyls (PCBs) associated with this manufacturing were improperly stored and disposed of at the site (Camp Dresser & McKee, Inc. 1999). PCBs are a known carcinogen that may affect the human immune, reproductive, nervous, and endocrine systems (EPA n.d.). A series of underground clay pipes, used to drain a corn field, conveyed PCBs to the adjacent Ponkapoag driving range (Ayers and Lipson 1994). Additional contaminants, including asbestos, lead, and pesticides were also present at the site (Ayers and Lipson 1994, Charter Environmental n.d.).

In 1981, one water and four fish samples were taken from Ponkapoag and analyzed for the presence of chlorinated pesticides, organophosphates, and PCBs (Gershman 1981). The water sample was free of all three contaminants. Chlorinated pesticides were present at low levels in all four fish, organophosphates were absent, and two fish had trace levels of PCBs. These results suggested that PCBs from Indian Line Farm were not impacting Ponkapoag Pond

Remediation of Indian Line Farm included the removal of over 16,000 tons of contaminated soil and the backfilling of excavated areas with soil from the site. A geotextile cap was placed over approximately 2.5-acres of the site, covered with three feet of soil, and seeded (Charter Environmental n.d.). Boulders were placed at the edges of the capped area. Approximately 8 additional acres, adjacent to the cap, were loamed and seeded.

Indian Line Farm no longer represents a threat to the reservation's water resources.

Nike Launcher Area. Past activities at the Nike Battery BO-55 Launcher Area, in the Ponkapoag East section of the reservation, have resulted in contaminated soils and sediments.

An investigation of the site in the mid-1980s revealed methylene chloride, chloroform, lead, trichloroethane, and PCBs (Law Environmental

Services 1986). Only concentrations of PCBs were attributable to the military use of the site, and it was recommended that PCB contaminated soils be removed in conjunction with the demolition of structures. Asbestos, associated with the site's buildings, was also identified at that time. A subsequent review of PCB and trichloroethane data indicated that levels were below reportable concentration limits (GEI Consultants 2007). Concentrations in excess of these limits require notification of the DEP; concentrations below these limits do not.

Recent soil, groundwater, and sediment sampling and analyses identified two metals, beryllium and thallium, in excess of reportable concentration limits in the Launcher Area's soil (GEI Consultants 2007). These two metals, as well as nickel, were detected in sediment samples taken from a small stream near the Launcher Area.

Lead and 4, 4-Dichlor-Diphenyl-Trichloroethane (4, 4-DDT) have also been found in soils in excess of reportable concentrations (GEI Consultants, Inc., 2009). These contaminants are associated with some of the site's buildings.

Two metals, lead and zinc, were found in water samples collected inside the missile silos. Concentrations of compounds in groundwater did not exceed applicable reportable concentration limits. The investigation also identified a possible landfill on the southeast side of the site and possible underground fuel storage tanks near the former barracks.

Contaminants have not been identified in groundwater in excess of reportable concentrations (GEI Consultants, Inc. 2009).

The full extent and environmental impacts of contamination at this site remain unknown and under investigation. However, current conditions "do not pose an Imminent Hazard to health, safety, public welfare, or the environment" (GEI Consultants, Inc. 2009).

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Appendix H. Plants of the Blue Hills Reservation.

The following plants have been identified on the Blue Hills Reservation. The sequence of plants is presented alphabetically by family and scientific name. Taxonomy and common names follow United States Department of Agriculture (USDA 2009). This list does not constitute a complete inventory of the plants of the Blue Hills Reservation or its associated properties.

Family ^a	Common Name ^a	Scientific Name	MESA ^b	Invasive ^c	Source ^d
Aceraceae Maple Family	Striped maple	<i>Acer pensylvanicum</i>			3, 7, 9
	Norway maple	<i>Acer platanoides</i>		I ^c	1, 3, 7, 8
	Sycamore maple	<i>Acer pseudoplatanus</i>		I	1
	Red maple	<i>Acer rubrum</i>			1, 2, 3, 4, 5, 7, 8, 10, 12, 13
	Silver maple	<i>Acer saccharinum</i>			3, 8
	Sugar maple	<i>Acer saccharum</i>			1, 3, 7, 8
Alismataceae Water Plantain Family	European water plantain	<i>Alisma plantago-aquatica</i>			10
	Engelmann's arrowhead	<i>Sagittaria engelmanniana</i>			1, 3, 5, 7
	Grassy arrowhead	<i>Sagittaria graminea</i>			1
	Broadleaf arrowhead	<i>Sagittaria latifolia</i>			1, 3, 5, 7, 9, 10
Amblystegiaceae	Calliergon moss	<i>Calliergon cordifolium</i>			5
	Campylium moss	<i>Campylium radicale</i>			5
	Drepanocladus moss	<i>Drepanocladus</i> sp.			5
	Streamside leptodictyum moss	<i>Leptodictyum riparium</i>			5
	Sanionia moss	<i>Sanionia uncinata</i>			5
	Warnstorfia moss	<i>Warnstorfia fluitans</i> ^f			5
Anacardiaceae Sumac Family	Winged sumac	<i>Rhus copallinum</i>			3, 7, 8
	Smooth sumac	<i>Rhus glabra</i>			2, 3, 7
	Staghorn sumac	<i>Rhus typhina</i>			1, 2, 3, 7, 8, 10, 12
	Eastern Poison ivy	<i>Toxicodendron radicans</i>			1, 2, 3, 4, 5, 7, 8, 10, 12
	Poison sumac	<i>Toxicodendron vernix</i>			1, 3, 5
Apiaceae Carrot Family	Bishop's goutweed	<i>Aegopodium podagraria</i>		I	1
	Wild chervil	<i>Anthriscus sylvestris</i>		L	1
	Bulblet-bearing water hemlock	<i>Cicuta bulbifera</i>			5
	Spotted water hemlock	<i>Cicuta maculata</i>			1, 3, 7
	Queen Anne's lace	<i>Daucus carota</i>			1, 2, 3, 7, 8
	Hydrocotyle	<i>Hydrocotyle</i> sp.			9
	Mayflower marshpennywort	<i>Hydrocotyle umbellata</i>			1
	Wild parship	<i>Pastinaca sativa</i>			1
	Maryland sanicle	<i>Sanicula marilandica</i>			7
	Hemlock waterparsnip	<i>Sium suave</i>			1, 5, 7
Apocynaceae Dogbane Family	Spreading dogbane	<i>Apocynum androsaemilifolium</i>			1, 3, 7, 9, 12
	Indianhemp	<i>Apocynum cannabinum</i>			1
	Periwinkle	<i>Vinca</i> sp.			9
Aquifoliaceae Holly Family	Inkberry	<i>Ilex glabra</i>			3
	Catberry	<i>Ilex mucronata</i>			1, 3, 5
	Common winterberry	<i>Ilex verticillata</i>			1, 3, 4, 5, 8, 10
Araceae Arum Family	Sweetflag	<i>Acorus americanus</i>			3
	Calamus	<i>Acorus calamus</i>			1
	Jack in the pulpit	<i>Arisaema triphyllum</i>			1, 3, 4, 8, 9
	Water arum	<i>Calla palustris</i>			3, 5, 7
	Calla	<i>Calla</i> sp.			9
	Green arrow arum	<i>Peltandra virginica</i>			1, 3, 5, 7, 10
	Skunk cabbage	<i>Symplocarpus foetidus</i>			1, 3, 4, 5, 7, 8, 9, 10

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Appendix H. Plants of the Blue Hills Reservation. (Continued)

Family ^a	Common Name ^a	Scientific Name	MESA ^b	Invasive ^c	Source ^d
Arilaceae Ginseng Family	Bristly sarsaparilla	<i>Aralia hispida</i>			1, 3, 7, 9, 12
	Wild sarsaparilla	<i>Aralia nudicaulis</i>			1, 3, 4, 7, 9, 12
	Angelica tree ^h	<i>Aralia</i> sp.			1
	Castor aralia	<i>Kalopanax septemlobus</i>			1, 3
	Dwarf ginseng	<i>Panax trifolius</i>			1
Asclepiadaceae Milkweed Family	Swamp milkweed	<i>Asclepias incarnata</i>			3, 5
	Poke milkweed	<i>Asclepias exaltata</i>			18
	Fourleaf milkweed	<i>Asclepias quadrifolia</i>			7
	Milkweed	<i>Asclepias</i> sp.			3, 10
	Common milkweed	<i>Asclepias syriaca</i>			1, 3, 7, 8
	Butterfly milkweed	<i>Asclepias tuberosa</i>			1
	Louise's swallow-wort	<i>Cynanchum louiseae</i>		I	10
Asteraceae Aster Family	Common yarrow	<i>Achillea millefolium</i>			3, 7, 8
	Lesser snakeroot	<i>Ageratina aromatica</i>	E		6, 12
	Annual ragweed	<i>Ambrosia artemisiifolia</i>			1, 2, 3
	Western pearly everlasting	<i>Anaphalis margaritacea</i>			3, 7
	Woman's tobacco	<i>Antennaria plantaginifolia</i>			3, 7, 12
	Stinking chamomile	<i>Anthemis cotula</i>			7
	Great burdock	<i>Arctium lappa</i>			18
	Lesser burdock	<i>Arctium minus</i>			1, 7
	Common wormwood	<i>Artemisia vulgaris</i>			1
	Nodding beggartick	<i>Bidens cernua</i>			5
	Purplestem beggarticks	<i>Bidens connata</i>			3, 4
	Crowned beggarticks	<i>Bidens coronata</i>			1, 5
	Small beggarticks	<i>Bidens discoidea</i>			18
	Devil's beggarticks	<i>Bidens frondosa</i>			18
	Beggarticks	<i>Bidens</i> sp.			3
	Threelobe beggarticks	<i>Bidens tripartita</i>			5
	Spotted knapweed	<i>Centaurea stoebe</i> ssp. <i>microanthos</i>		L	7
	Knapweed	<i>Centaurea</i> sp.			3
	Chicory	<i>Cichorium intybus</i>			1, 2, 3, 7, 8
	Thistle	<i>Cirsium</i> sp.			12
	Bull thistle	<i>Cirsium vulgare</i>			1, 2
	Canadian horseweed	<i>Conyza canadensis</i>			1
	Parasol whitetop	<i>Doellingeria umbellata</i>			1
	Great false leopardbane	<i>Doronicum pardalianches</i>			1
	American burnweed	<i>Erechtites hieracifolia</i>			1, 2, 3, 12
	Eastern daisy fleabane	<i>Erigeron annuus</i>			1, 3, 7, 8, 9
	Philadelphia fleabane	<i>Erigeron philadelphicus</i>			1
	Coastal plain Joe Pye weed	<i>Eupatoriadelphus dubius</i>			1, 3, 5, 7
	Spotted trumpetweed	<i>Eupatoriadelphus maculatus</i>			1, 10
	Boneset	<i>Eupatorium perfoliatum</i>			1, 2, 3, 7, 8
	White wood aster	<i>Eurybia divaricata</i>			1, 2, 8, 12
	Bigleaf aster	<i>Eurybia macrophylla</i>			1
	Schreber's aster	<i>Eurybia schreberi</i>			3, 4, 7
	Slender goldentop	<i>Euthamia caroliniana</i>			1
	Flat-top goldentop	<i>Euthamia graminifolia</i>			1, 10, 13
	Flat-top goldentop	<i>Euthamia graminifolia</i> var. <i>graminifolia</i>			7
	Common sneezeweed	<i>Helenium autumnale</i>			7
	Purplehead sneezeweed	<i>Helenium flexuosum</i>			1

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Appendix H. Plants of the Blue Hills Reservation. (Continued)

Family ^a	Common Name ^a	Scientific Name	MESA ^b	Invasive ^c	Source ^d
Asteraceae (continued)	Woodland sunflower	<i>Helianthus divaricatus</i>			3, 7, 12
Aster Family	Orange hawkweed	<i>Hieracium aurantiacum</i>			3, 7, 8
	Meadow hawkweed	<i>Hieracium caespitosum</i>			1, 7, 12
	Canadian hawkweed	<i>Hieracium canadense</i>			2, 3, 4, 7
	Queendevil	<i>Hieracium gronovii</i>			3, 7
	Allegheny hawkweed	<i>Hieracium paniculatum</i>			7, 12
	Mouseear hawkweed	<i>Hieracium pilosella</i>			1, 7
	New England hawkweed	<i>Hieracium sabaudum</i>			1, 12
	Rattlesnakeweed	<i>Hieracium venosum</i>			1, 3, 7, 8, 9, 12
	Hairy cat's ear	<i>Hypochaeris radicata</i>			1, 7
	Virginia dwarf dandelion	<i>Krigia virginica</i>			12
	Canada lettuce	<i>Lactuca canadensis</i>			7
	Prickly lettuce	<i>Lactuca serriola</i>			1
	Common nipplewort	<i>Lapsana communis</i>			1
	Fall dandelion	<i>Leontodon autumnalis</i>			1, 3, 7, 8
	Oxeye daisy	<i>Leucanthemum vulgare</i>			1, 3, 7, 8
	Disc mayweed	<i>Matricaria discoides</i>			7
	Water marigold ^e	<i>Megalonota beckii</i>			18
	Climbing hempvine	<i>Mikania scandens</i>			1
	Whorled wood aster	<i>Oclemena acuminata</i>			1, 3, 8
	Golden ragwort	<i>Packera aurea</i>			3, 9
	White rattlesnakeroot ^g	<i>Prenanthes alba</i>			3
	Tall rattlesnakeroot	<i>Prenanthes altissima</i>			2
	Gall of the earth	<i>Prenanthes trifoliolata</i>			12
	Cankerweed	<i>Prenanthes serpentina</i>	E		12
	Rattlesnakeroot	<i>Prenanthes</i> sp.			3
	Heller's cudweed	<i>Pseudognaphalium helleri</i>			1
	Blackeyed Susan	<i>Rudbeckia hirta</i>			1, 3, 7, 8, 9
	Golden ragwort	<i>Packera aurea</i>			1
	Toothed whitetop aster	<i>Sericocarpus asteroides</i>			3, 7, 12
	Narrowleaf whitetop aster	<i>Sericocarpus linifolius</i>			3, 7
	Wreath goldenrod	<i>Solidago caesia</i>			1, 12
	Canada goldenrod	<i>Solidago canadensis</i>			1, 7
	Early goldenrod	<i>Solidago juncea</i>			12
	Aniscented goldenrod	<i>Solidago odora</i>			12
	Downy goldenrod	<i>Solidago puberula</i>			3, 12
	Wrinkleleaf goldenrod	<i>Solidago rugosa</i>			3, 10, 12, 13
	Goldenrod	<i>Solidago</i> sp.			2, 3, 10
	Bog goldenrod	<i>Solidago uliginosa</i>			1
	Common blue wood aster	<i>Symphyotrichum cordifolium</i>			1
	White panicle aster	<i>Symphyotrichum lanceolatum</i>			1
	Calico aster	<i>Symphyotrichum lateriflorum</i>			1
	New England aster	<i>Symphyotrichum novae-angliae</i>			1
	New York aster	<i>Symphyotrichum novi-belgii</i>			1
	Late purple aster	<i>Symphyotrichum patens</i> var. <i>patens</i>			3
	Hairy white oldfield aster	<i>Symphyotrichum pilosum</i>			1
	Purplestem aster	<i>Symphyotrichum puniceum</i> var. <i>puniceum</i>			3
	Wavyleaf aster	<i>Symphyotrichum undulatum</i>			3, 12
	Common tansy	<i>Tanacetum vulgare</i>			2, 3, 7, 8, 12
	Common dandelion	<i>Taraxacum officinale</i>			1
	Colt's foot	<i>Tussilago farfara</i>		L	1, 13

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Appendix H. Plants of the Blue Hills Reservation. (Continued)

Family ^a	Common Name ^a	Scientific Name	MESA ^b	Invasive ^c	Source ^d
Aulacomniaceae	Aulacomnium moss	<i>Aulacomnium palustre</i>			5, 10
Balsaminaceae Touch-me-not Family	Jewelweed	<i>Impatiens capensis</i>			1, 3, 4, 5, 7, 8, 10, 13
Berberidaceae Barberry Family	Japanese barberry	<i>Berberis thunbergii</i>		I	1
Betulaceae Birch Family	Speckled alder	<i>Alnus incana</i> ssp. <i>rugosa</i>			1, 3, 4, 5, 7, 8, 10
	Hazel alder	<i>Alnus serrulata</i>			1, 5
	Yellow birch	<i>Betula alleghaniensis</i>			1, 3, 4, 7, 8, 9
	Sweet birch	<i>Betula lenta</i>			1, 2, 3, 7, 8, 12
	River birch ^e	<i>Betula nigra</i>			1, 3, 9
	Paper birch	<i>Betula papyrifera</i>			1, 3, 7, 8, 9
	Gray birch	<i>Betula populifolia</i>			1, 2, 3, 4, 5, 7, 8, 9, 12
	American hophornbeam	<i>Carpinus caroliniana</i>			1, 3
	American hazelnut	<i>Corylus americana</i>			1, 3, 8
	Beaked hazelnut	<i>Corylus cornuta</i>			1, 3, 7, 9
Bignoniaceae Trumpet-creeper Family	Hophornbeam	<i>Ostrya virginiana</i>			1, 3, 7, 8, 12
	Southern catalpa	<i>Catalpa bignonioides</i>			1
Blechnaceae Chain Fern Family	Netted chainfern	<i>Woodwardia areolata</i>			1
	Virginia chainfern	<i>Woodwardia virginica</i>			1, 3, 5
Boraginaceae Borage Family	Heliotrope	<i>Heliotropium</i> sp.			9
	Bay forget-me-not	<i>Myosotis laxa</i>			1
Brassicaceae Mustard Family	Garlic mustard	<i>Alliaria petiolata</i>		I	1, 3, 4
	Sicklepod	<i>Arabis canadensis</i>			18
	Garden yellowrocket	<i>Barbarea vulgaris</i>			1
	Hoary alyssum	<i>Berteroa incana</i>			18
	Cabbage	<i>Brassica oleracea</i>			18
	Bulbous bittercress ^g	<i>Cardamine bulbosa</i>			1
	Sand bittercress	<i>Cardamine parviflora</i>			12
	Pennsylvania bittercress	<i>Cardamine pennsylvanica</i>			5
	Spring draba	<i>Drabna verna</i>			18
	Dames rocket	<i>Hesperis matronalis</i>		I	1, 7
	Field pepperweed	<i>Lepidium campestre</i>			1
	Roadside pepperweed	<i>Lepidium ruderalis</i>			7
	Virginia pepperweed	<i>Lepidium virginicum</i>			1
	Onerow yellowcress	<i>Nasturtium microphyllum</i>			1
	Fernald's yellowcress	<i>Rorippa palustris</i> ssp. <i>fernaldiana</i>			18
	Tall tumblemustard	<i>Sisymbrium altissimum</i>			7
	Field pennycress	<i>Thlaspi arvense</i>			7
Bryaceae	Pohlia moss	<i>Pohlia nutans</i>			5
Buxaceae Boxwood Family	Japanese pachysandra	<i>Pachysandra terminalis</i>			1
Cabombaceae Water-shield Family	Watershield	<i>Brasenia schreberi</i>			5
	Brasenia	<i>Brasenia</i> sp.			3
	Carolina fanwort	<i>Cabomba caroliniana</i>		I	15
Callitrichaceae	Twoheaded water-starwort	<i>Callitriche heterophylla</i>			5
Calypogeiaceae	A liverwort	<i>Calypogeia muelleriana</i>			5

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Appendix H. Plants of the Blue Hills Reservation. (Continued)

Family ^a	Common Name ^a	Scientific Name	MESA ^b	Invasive ^c	Source ^d
Campanulaceae	Rampion bellflower	<i>Campanula rapunculoides</i>			7
Bellflower Family	Bellflower	<i>Campanula</i> sp.			9
	Cardinalflower	<i>Lobelia cardinalis</i>			3, 9
	Indian tobacco	<i>Lobelia inflata</i>			1, 7
	Palespike lobelia	<i>Lobelia spicata</i>			9
	Clasping Venus' looking-glass	<i>Triodanis perfoliata</i>			12
Caprifoliaceae	Northern bush honeysuckle	<i>Diervilla lonicera</i>			2, 3, 7, 8, 12
Honeysuckle Family	Japanese honeysuckle	<i>Lonicera japonica</i>		I ^c	1
	Morrow's honeysuckle	<i>Lonicera morrowii</i>		I	1, 7
	Trumpet honeysuckle	<i>Lonicera sempervirens</i>			1
	Tatarian honeysuckle	<i>Lonicera tatarica</i>		L	9
	American black elderberry	<i>Sambucus nigra</i> ssp. <i>canadensis</i>			1, 3, 5, 7, 8
	Mapleleaf viburnum	<i>Viburnum acerifolium</i>			1, 4, 7, 8, 12
	Southern arrowwood	<i>Viburnum dentatum</i>			1, 3, 4, 5, 7, 8, 10
	Nannyberry	<i>Viburnum lentago</i>			1, 3, 8
	Withe rod	<i>Viburnum nudum</i> var. <i>cassinoides</i>			1, 3, 5
	European cranberrybush	<i>Viburnum opulus</i>			7
Caryophyllaceae	Field chickweed	<i>Cerastium arvense</i>			3, 7, 8
Pink Family	Big chickweed	<i>Cerastium fontanum</i> ssp. <i>vulgare</i>			1, 7
	Deptford pink	<i>Dianthus armeria</i>			3, 7
	Sweetwilliam	<i>Dianthus barbatus</i>			18
	Smooth forked nailwort	<i>Paronychia canadensis</i>			18
	Sleepy silene	<i>Silene antirrhina</i>			12
	Bladder campion	<i>Silene latifolia</i> ssp. <i>alba</i>			3, 7, 8
	Maidenstears	<i>Silene vulgaris</i>			3, 7, 12
	Red sandspurry	<i>Spigularia rubra</i>			7
	Grass-like starwort	<i>Stellaria graminea</i>			7
	Common chickweed	<i>Stellaria media</i>			1
Celastraceae	Oriental bittersweet	<i>Celastrus orbiculatus</i>		I	1, 12
Bittersweet Family	Burningbush	<i>Euonymus alatus</i>		I	17
	Spindletree ^f	<i>Euonymus sachalinensis</i>			18
Cephaloziaceae	A liverwort	<i>Cephalozia catenulata</i>			5
	A liverwort	<i>Cephalozia connivens</i>			5
	A liverwort	<i>Cephalozia macrostachya</i>			5
	A liverwort	<i>Cephalozia media</i>			5
	A liverwort	<i>Cephaloziella elachista</i>			5
	A liverwort	<i>Cladopodiella fluitans</i>			5
	A liverwort	<i>Nowellia curvifolia</i>			5
	A liverwort	<i>Odontoschisma denudatum</i>			5
	A liverwort	<i>Odontoschisma prostratum</i>			5
Cistaceae	Longbranch frostweed	<i>Helianthemum canadense</i>			1, 7
Rock-rose Family	Pine barrens goldenheather	<i>Hudsonia ericoides</i>			1
	Narrowleaf pinweed	<i>Lechea tenuifolia</i>			12
Clethraceae	Coastal sweetpepperbush	<i>Clethra alnifolia</i>			1, 2, 3, 4, 5, 7, 8, 10
Clethra Family					
Climaciaceae	American climacium moss	<i>Climacium americanum</i>			5

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Appendix H. Plants of the Blue Hills Reservation. (Continued)

Family ^a	Common Name ^a	Scientific Name	MESA ^b	Invasive ^c	Source ^d
Clusiaceae	Northern St. Johnswort	<i>Hypericum boreale</i>			1
Mangosteen Family	Lesser Canadian St. Johnswort	<i>Hypericum canadense</i>			18
	Orangegrass	<i>Hypericum gentianoides</i>			1, 12
	Large St. Johnswort	<i>Hypericum majus</i>			18
	Dwarf St. Johnswort	<i>Hypericum mutilum</i>			1, 5
	Common St. Johnswort	<i>Hypericum perforatum</i>			1, 3, 7, 8, 12
	St. Johnswort	<i>Hypericum</i> sp.			3, 10
	Virginia marsh St. Johnswort	<i>Triadenum virginicum</i>			1, 5, 10
Commelinaceae	Asiatic dayflower	<i>Commelina communis</i>			7
Spiderwort Family	Virginia spiderwort	<i>Tradescantia virginiana</i>			7
Convolvulaceae	Hedge false bindweed	<i>Calystegia sepium</i> ssp. <i>sepium</i>			3, 7
Morning Glory Family					
Cornaceae	Alternatleaf dogwood	<i>Cornus alternifolia</i>			1
Dogwood Family	Silky dogwood	<i>Cornus amomum</i>			1, 3, 4, 7, 8, 10
	Flowering dogwood	<i>Cornus florida</i>			1, 3, 7, 8, 9, 12
	Redosier dogwood	<i>Cornus sericea</i>			1, 8
	Blackgum	<i>Nyssa sylvatica</i>			1, 3, 4, 5, 7, 8, 9
Cucurbitaceae	Wild cucumber	<i>Echinocystis lobata</i>			1, 3, 7
Cucumber Family	Oneseed bur cucumber	<i>Sicyos angulatus</i>			7
Cupressaceae	Atlantic white cedar	<i>Chamaecyparis thyoides</i>			1, 3, 4, 5, 7, 10
Cypress Family	Common juniper	<i>Juniperus communis</i>			1, 3
	Eastern redcedar	<i>Juniperus virginiana</i>			1, 2, 3, 4, 7, 8, 9, 12
	Arborvitae ⁱ	<i>Thuja occidentalis</i>			3, 8
Cuscutaceae	Scaldweed	<i>Cuscuta gronovii</i>			1, 3, 5, 7, 10
Dodder Family	Fiveangled dodder	<i>Cuscuta pentagona</i>			18
Cyperaceae	Densetuft hairsedge	<i>Bulbostylis capillaris</i>			18
Sedge Family	Thicket sedge ^s	<i>Carex abscondita</i>			18
	Whitetinge sedge	<i>Carex albicans</i> var. <i>albicans</i>			12
	Emmon's sedge	<i>Carex albicans</i> var. <i>emmonsii</i>			12
	Yellowfruit sedge	<i>Carex annectens</i>		I	1
	Prickly bog sedge	<i>Carex atlantica</i> ssp. <i>capillacea</i>			1, 5
	Shortbeak sedge	<i>Carex brevior</i>			18
	Silvery sedge	<i>Carex canescens</i>			5
	Oval-leaf sedge	<i>Carex cephalophora</i>			12
	Longhair sedge	<i>Carex comosa</i>			5
	Fringed sedge	<i>Carex crinita</i>			1
	Slender woodland sedge	<i>Carex digitalis</i>			12
	Northern long sedge	<i>Carex folliculata</i>			1
	Greater bladder sedge	<i>Carex intumescens</i>			1
	American woolyfruit sedge	<i>Carex lasiocarpa</i> var. <i>americana</i>			1
	Spreading sedge	<i>Carex laxiculmis</i>			18
	Broad loseflower sedge	<i>Carex laxiflora</i>			1, 12
	Shallow sedge	<i>Carex lurida</i>			1, 5
	Pennsylvania sedge	<i>Carex pennsylvanica</i>			1, 12
	Rosy sedge	<i>Carex rosea</i>			12
	Broom sedge	<i>Carex scoparia</i>			1, 5
	Sedge	<i>Carex</i> sp.			10
	Awlfruit sedge	<i>Carex stipata</i>			5
	Upright sedge	<i>Carex stricta</i>			1, 3, 5, 10
	Swan's sedge	<i>Carex swanii</i>			12
	Parachute sedge	<i>Carex tonsa</i> var. <i>rugosperma</i>			12

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Appendix H. Plants of the Blue Hills Reservation. (Continued)

Family ^a	Common Name ^a	Scientific Name	MESA ^b	Invasive ^c	Source ^d
Cyperaceae (continued)	Blunt broom sedge	<i>Carex tribuloides</i>			18
Sedge Family	Threeseeded sedge	<i>Carex trisperma</i>			5
	Parasol sedge	<i>Carex umbellata</i>			18
	Velvet sedge	<i>Carex vestita</i>			18
	Ribbed sedge	<i>Carex virescens</i>			12
	Fox sedge	<i>Carex vulpinoidea</i>			1
	Smooth sawgrass	<i>Cladium mariscoides</i>			1, 5
	Yellow nutsedge	<i>Cyperus esculentus</i>			18
	Great Plains flatsedge	<i>Cyperus lupulinus</i>			1
	Flatsedge	<i>Cyperus</i> sp.			10
	Strawcolored flatsedge	<i>Cyperus strigosus</i>			1
	Threeway sedge	<i>Dulichium arundinaceum</i>			1, 5
	Blunt spikerush	<i>Eleocharis obtusa</i>			5
	Bright green spikerush	<i>Eleocharis olivacea</i> var. <i>olivacea</i>			5
	Common spikerush	<i>Eleocharis palustris</i>			5
	Spikerush	<i>Eleocharis</i> sp.			3
	Slender spikerush	<i>Eleocharis tenuis</i>			5, 18
	Tawny cottongrass	<i>Eriophorum virginicum</i>			1, 3, 5, 10
	Thinleaf cottonsedge	<i>Eriophorum viridicarinaratum</i>			5
	White beaksedge	<i>Rhynchospora alba</i>			5
	Brownish beaksedge	<i>Rhynchospora capitellata</i>			10
	Woolgrass	<i>Scirpus cyperinus</i>			1, 5, 13
	Georgia bulrush	<i>Scirpus georgianus</i>			1
	Long's bulrush	<i>Scirpus longii</i>	T		1, 6
	Softstem bulrush	<i>Schoenoplectus</i> <i>tabernaemontani</i>			1
	Bashful bulrush	<i>Trichophorum planifolium</i>			12
Dennstaedtiaceae	Eastern hayscented fern	<i>Dennstaedtia punctilobula</i>			1, 3, 5, 12
Bracken Fern Family	Brackenfern	<i>Pteridium aquilinum</i>			1, 2, 7, 8, 12
Dicranaceae	Dicranella moss	<i>Dicranella heteromalla</i>			5
	Dicranum moss	<i>Dicranum flagellare</i>			5
	Montane dicranum moss	<i>Dicranum montanum</i>			5
	Dicranum moss	<i>Dicranum scoparium</i>			5
Droseraceae	Threadleaf sundew	<i>Drosera filiformis</i>			9
Sundew Family	Spoonleaf sundew	<i>Drosera intermedia</i>			1, 3, 5, 10
	Roundleaf sundew	<i>Drosera rotundifolia</i>			1, 3, 5, 7, 9
Dryopteridaceae	Common ladyfern	<i>Athyrium filix-femina</i>			1, 7
Wood Fern Family	Silver false spleenwort	<i>Deparia acrostichoides</i>			1
	Spinulose woodfern	<i>Dryopteris carthusiana</i>			1
	Crested woodfern	<i>Dryopteris cristata</i>			1
	Intermediate woodfern	<i>Dryopteris intermedia</i>			1
	Marginal woodfern	<i>Dryopteris marginalis</i>			1
	Western woodfern	<i>Gymnocarpium dryopteris</i>			8
	Oak fern	<i>Gymnocarpium</i> sp.			9
	Ostrich fern	<i>Matteuccia struthiopteris</i>			1
	Sensitive fern	<i>Onoclea sensibilis</i>			1, 3, 4, 5, 7, 8, 10, 13
	Christmas fern	<i>Polystichum acrostichoides</i>			1, 9
Elaeagnaceae	Autumn olive	<i>Elaeagnus umbellata</i>		I	1, 13
Oleaster Family					

Continued on next page.

Appendix H. Plants of the Blue Hills Reservation. (Continued)

Family ^a	Common Name ^a	Scientific Name	MESA ^b	Invasive ^c	Source ^d
Elatinaceae Waterwort Family	Small waterwort	<i>Elatine minima</i>			18
Equisetaceae Horsetail Family	Field horsetail	<i>Equisetum arvense</i>			1, 3, 7
	Horsetail	<i>Equisetum</i> sp.			13
Ericaceae Heath Family	Kinnikinnick	<i>Arctostaphylos uva-ursi</i>			1, 3, 7
	Leatherleaf	<i>Chamaedaphne calyculata</i>			1, 3, 4, 5, 7, 10
	Swamp doghobble	<i>Eubotrys racemosa</i>			1, 5, 10
	Creeping snowberry	<i>Gaultheria hispidula</i>			5
	Eastern teaberry	<i>Gaultheria procumbens</i>			1, 3, 4, 7, 8, 12
	Black huckleberry	<i>Gaylussacia baccata</i>			1, 3, 5, 8, 12
	Blue huckleberry	<i>Gaylussacia frondosa</i>			1, 3, 8
	Huckleberry	<i>Gaylussacia</i> sp.			2, 3, 7, 9
	Sheep laurel	<i>Kalmia angustifolia</i>			1, 3, 5, 7, 8, 9, 10
	Mountain laurel	<i>Kalmia latifolia</i>			1, 3, 4, 7
	Bog Labrador tea	<i>Ledum groenlandicum</i>			3, 7
	Highland doghobble	<i>Leucothoe fontanesiana</i>			1
	Maleberry	<i>Lyonia lingustrina</i>			1, 5, 9, 10
	Pink azalea ^g	<i>Rhododendron periclymenoides</i>			10
	Rhododendron	<i>Rhododendron</i> sp.			9
	Swamp azalea	<i>Rhododendron viscosum</i>			1, 3, 4, 5, 7, 8, 10
	Lowbush blueberry	<i>Vaccinium angustifolium</i>			1, 12
	Highbush blueberry	<i>Vaccinium corymbosum</i>			1, 2, 3, 4, 5, 8, 9, 10
	Black highbush blueberry	<i>Vaccinium fuscum</i>			1
	Cranberry	<i>Vaccinium macrocarpon</i>			1, 3, 5, 7, 10
	Small cranberry	<i>Vaccinium oxycoccos</i>			9
	Blue Ridge blueberry	<i>Vaccinium pallidum</i>			1, 2, 3, 4, 8, 12
	Blueberry	<i>Vaccinium</i> sp.			3, 7, 8, 9
	Northern mountain cranberry	<i>Vaccinium vitis-idaea</i>			9
Eriocaulaceae Pipewort Family	Sevenangle pipewort	<i>Eriocaulon aquaticum</i>			3, 5
Euphorbiaceae Spurge Family	Cypress spurge	<i>Euphorbia cyparissias</i>		L	1
Fabaceae Pea Family	American hogpeanut	<i>Amphicarpaea bracteata</i>			12
	Groundnut	<i>Apios americana</i>			3, 5, 7
	Wild indigo	<i>Baptisia</i> sp.			9
	Horseflyweed	<i>Baptisia tinctoria</i>			1, 3, 7, 8, 12
	Sensitive partridge pea	<i>Chamaecrista nictitans</i>			1
	Crownvetch	<i>Coronilla varia</i>			1, 3, 7
	Pointedleaf ticktrefoil	<i>Desmodium glutinosum</i>			1, 9
	Smooth small-leaf ticktrefoil	<i>Desmodium marilandicum</i>			1
	Nakedflower ticktrefoil	<i>Desmodium nudiflorum</i>			12
	Panicledleaf ticktrefoil	<i>Desmodium paniculatum</i>			1
	Prostrate ticktrefoil	<i>Desmodium rotundifolium</i>			3, 9, 12
	Nakedflower ticktrefoil	<i>Desmodium</i> sp.			9
	Perennial pea	<i>Lathyrus latifolius</i>			1
	Roundheaded lespedeza	<i>Lespedeza capitata</i>			1, 12
	Hairy lespedeza	<i>Lespedeza hirta</i>			1, 2, 3, 12
	Shrubby lespedeza	<i>Lespedeza frutescens</i>			1, 12, 18
	Violet lespedeza ^g	<i>Lespedeza violacea</i>			12
	Bird's-foot trefoil	<i>Lotus corniculatus</i>			1, 3, 7
	Yellow sweetclover	<i>Melilotus officinalis</i>			2, 3, 7, 8

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Appendix H. Plants of the Blue Hills Reservation. (Continued)

Family ^a	Common Name ^a	Scientific Name	MESA ^b	Invasive ^c	Source ^d
Fabaceae (continued)	Black locust	<i>Robinia pseudoacacia</i>		I ^c	1, 2, 3, 7, 13
Pea Family	Amberique-bean	<i>Strophostyles helvola</i>			2
	Rabbitfoot clover	<i>Trifolium arvense</i>			7
	Golden clover	<i>Trifolium aureum</i>			1, 7
	Field clover	<i>Trifolium campestre</i>			7
	Alsike clover	<i>Trifolium hybridum</i>			7
	Crimson clover	<i>Trifolium incarnatum</i>			18
	Red clover	<i>Trifolium pratense</i>			2, 3, 7, 8
	White clover	<i>Trifolium repens</i>			1, 3, 7, 8
	Clover	<i>Trifolium</i> sp.			9, 10
	Bird vetch	<i>Vicia cracca</i>			1, 3, 7, 9
Fagaceae	American chestnut	<i>Castanea dentata</i>			1, 2, 3, 4, 7, 8, 9
Beech Family	American beech	<i>Fagus grandifolia</i>			1, 3, 7, 8, 10
	White oak	<i>Quercus alba</i>			1, 2, 3, 4, 7, 8, 12
	Swamp white oak	<i>Quercus bicolor</i>			1, 3, 5, 8, 10
	Scarlet oak	<i>Quercus coccinea</i>			1, 2, 3, 4, 8, 12
	Bear oak	<i>Quercus ilicifolia</i>			1, 2, 3, 7, 8, 12
	Pin oak	<i>Quercus palustris</i>			1, 9
	Dwarf chinkapin oak	<i>Quercus prinoides</i>			1
	Chestnut oak	<i>Quercus prinus</i>			1, 2, 3, 7, 8, 12
	Northern red oak	<i>Quercus rubra</i>			1, 3, 4, 8, 10, 12
	Black oak	<i>Quercus velutina</i>			1, 2, 3, 4, 7, 8, 12
Fontinalaceae	New England fontinalis moss	<i>Fontinalis novae-angliae</i>			5
Fumariaceae	Rock harlequin	<i>Corydalis sempervirens</i>			3, 7, 12
Fumitory Family					
Gentianaceae	Twining screwstem	<i>Bartonia paniculata</i>			18
Gentian Family					
Geocalycaceae	A liverwort	<i>Lophocolea heterophylla</i>			5
Geraniaceae	Spotted geranium	<i>Geranium maculatum</i>			1, 3, 7
	Robert geranium	<i>Geranium robertianum</i>			
Geranium Family	Geranium	<i>Geranium</i> sp.			9
Ginkgoaceae	Ginkgo	<i>Ginkgo</i> sp.			11
Ginkgo Family					
Haloragaceae	Twoleaf watermilfoil	<i>Myriophyllum heterophyllum</i>		I	5, 14
Water Milfoil Family	Low watermilfoil	<i>Myriophyllum humile</i>			1, 14
	Watermilfoil	<i>Myriophyllum</i> sp.			1
	Eurasian watermilfoil	<i>Myriophyllum spicatum</i>		I	18
	Marsh mermaidweed	<i>Proserpinaca palustris</i>			3
Hamamelidaceae	American witchhazel	<i>Hamamelis virginia</i>			1, 3, 7, 8, 9
Witch-hazel Family					
Helodiaceae	Helodium moss	<i>Helodium paludosum</i>			5
Hippocastanaceae	Horse chestnut	<i>Aesculus hippocastanum</i>			7
Horse-chestnut Family					
Hydrocharitaceae	Brazilian waterweed	<i>Egeria densa</i>		L	14
Tape-grass Family	Western waterweed	<i>Elodea nuttallii</i>			14, 16
Hypnaceae	Callicladium moss	<i>Callicladium haldanianum</i>			5
	Herzogiella moss	<i>Herzogiella turfacea</i>			5
	Lindberg's moss	<i>Hypnum lindbergii</i>			5
	Hypnum moss	<i>Hypnum pallescens</i>			5

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Appendix H. Plants of the Blue Hills Reservation. (Continued)

Family ^a	Common Name ^a	Scientific Name	MESA ^b	Invasive ^c	Source ^d
Iridaceae	Harlequin blueflag	<i>Iris versicolor</i>			1, 3, 5, 7
Iris Family	Narrowleaf blue-eyed grass	<i>Sisyrinchium angustifolium</i>			1
	Strict blue-eyed grass	<i>Sisyrinchium montanum</i>			3, 7
	Blue-eyed grass	<i>Sisyrinchium</i> sp.			9
Isoetaceae	Tuckerman's quillwort	<i>Isoetes tuckermanii</i>			18
Quillwort Family					
Juglandaceae	Mockernut hickory	<i>Carya alba</i>			1, 3, 8, 18
Walnut Family	Bitternut hickory	<i>Carya cordiformis</i>			1
	Pignut hickory	<i>Carya glabra</i>			1, 3, 8, 12
	Shagbark hickory	<i>Carya ovata</i>			1, 3, 8
	Hickory	<i>Carya</i> sp.			2, 10
Juncaceae	Tapertip rush	<i>Juncus acuminatus</i>			18
Rush Family	Narrowpanicle rush	<i>Juncus brevicaudatus</i>			18
	Toad rush	<i>Juncus bufonius</i>			1, 5
	Common rush	<i>Juncus effusus</i>			5, 10, 13
	Greene's rush	<i>Juncus greenei</i>			18
	Grassleaf rush	<i>Juncus marginatus</i>			18
	Bayonet rush	<i>Juncus militaris</i>			5
	Brownfruit rush	<i>Juncus pelocarpus</i>			18
	Rush	<i>Juncus</i> sp.			1, 10
	Poverty rush	<i>Juncus tenuis</i>			12
	Common woodrush	<i>Luzula multiflora</i>			1, 12
Jungermanniaceae	A liverwort	<i>Mylia anomala</i>			5
Lamiaceae	Wild basil	<i>Clinopodium vulgare</i>			1
Mint Family	Splitlip hempnettle	<i>Galeopsis bifida</i>			18
	Ground ivy	<i>Glechoma hederacea</i>			1, 3, 7
	American false pennyroyal	<i>Hedeoma pulegioides</i>			12
	Water horehound	<i>Lycopus</i> sp.			10
	Virginia water horehound	<i>Lycopus virginicus</i>			1, 3, 5
	Wild bergamot	<i>Monarda fistulosa</i>			7
	Common selfheal	<i>Prunella vulgaris</i>			3, 7
	Hoary mountainmint	<i>Pycnanthemum incanum</i>			12
	Clustered mountainmint	<i>Pycnanthemum muticum</i>			18
	Marsh skullcap	<i>Scutellaria galericulata</i>			18
	Blue skullcap	<i>Scutellaria lateriflora</i>			1, 3, 5
	Forked blue curls	<i>Trichostema dichotomum</i>			1
Lauraceae	Northern spicebush	<i>Lindera benzoin</i>			1, 3, 4, 8, 9
Laurel Family	Sassafras	<i>Sassafras albidum</i>			1, 2, 3, 7, 8, 9, 12
Lemnaceae	Duckweed	<i>Lemna minor</i>			5
Duckweed Family	Duckweed	<i>Lemna</i> sp.			1, 3
	Common duckmeat	<i>Spirodela polyrhiza</i>			8
Lentibulariaceae	Hiddenfruit bladderwort	<i>Utricularia geminiscapa</i>			14
Bladderwort Family	Humped bladderwort	<i>Utricularia gibba</i>			9
	Common bladderwort	<i>Utricularia macrorhiza</i>			3, 4, 5, 7
	Eastern purple bladderwort	<i>Utricularia purpurea</i>			3, 16
Lepidoziaceae	A liverwort	<i>Bazzania trilobata</i>			5
	A liverwort	<i>Microlepidozia sylvatica</i> ^f			5
Leucobryaceae	Leucobryum moss	<i>Leucobryum glaucum</i>			5

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Appendix H. Plants of the Blue Hills Reservation. (Continued)

Family ^a	Common Name ^a	Scientific Name	MESA ^b	Invasive ^c	Source ^d
Liliaceae	Wild onion	<i>Allium ascalonicum</i>			9
Lily Family	Bluebead	<i>Clintonia borealis</i>			1
	European lily-of-the-valley	<i>Convallaria majalis</i>			1
	Orange daylily	<i>Hemerocallis fulva</i>			1, 3, 7, 8
	Common goldstar	<i>Hypoxis hirsuta</i>			1, 3, 7, 12
	Canada lily	<i>Lilium canadense</i>			1, 3, 7
	Wood Lily	<i>Lilium philadelphicum</i>			3, 7, 9
	Canada mayflower	<i>Maianthemum canadense</i>			1, 2, 3, 4, 5, 7, 8, 12
	Feathery false lily of the valley	<i>Maianthemum racemosum</i> ssp. <i>racemosum</i>			1, 3, 4, 7, 8, 12
	Indian cucumber	<i>Medeola virginiana</i>			1, 3, 8, 9
	Smooth Solomon's seal	<i>Polygonatum biflorum</i>			2, 3, 4, 8
	Hairy Solomon's seal	<i>Polygonatum pubescens</i>			1, 12
	Siberian squill	<i>Scilla sibirica</i>			1
	Claspleaf twistedstalk ^g	<i>Streptopus amplexifolius</i>			2
	Whip-poor-will flower	<i>Trillium cernuum</i>			1, 3
	Trillium	<i>Trillium</i> sp.			9
	Largeflower bellwort ^g	<i>Uvularia grandiflora</i>			9
	Sessileleaf bellwort	<i>Uvularia sessilifolia</i>			1, 3, 7, 8
	Green false hellebore	<i>Veratrum viride</i>			1, 3
Lycopodiaceae	Shining clubmoss	<i>Huperzia lucidula</i>			1, 3, 7
Club-moss Family	Inundated clubmoss	<i>Lycopodiella inundata</i>			18
	Stiff clubmoss	<i>Lycopodium annotinum</i>			1
	Fan clubmoss	<i>Lycopodium digitatum</i>			1
	Rare clubmoss	<i>Lycopodium obscurum</i>			1, 3, 4, 7, 8
	Deeproot clubmoss	<i>Lycopodium tristachyum</i>			3, 7
Lythraceae	Swamp loosestrife	<i>Decodon verticillatus</i>			1, 3, 4, 5, 9, 10
Loosestrife Family	Purple loosestrife	<i>Lythrum salicaria</i>		I	1, 2, 3, 4, 5, 7, 8, 10, 13
Magnoliaceae	Tuliptree	<i>Liriodendron tulipifera</i>			18
Magnolia Family					
Menyanthaceae	Buckbean	<i>Menyanthes trifoliata</i>			1, 3, 5
Buckbean Family	Little floatingheart	<i>Nymphoides cordata</i>			1
Mniaceae	Horn calcareous moss	<i>Mnium hornum</i>			5
	Toothed plagiomnium	<i>Plagiomnium cuspidatum</i>			5
	Rhizomnium moss	<i>Rhizomnium punctatum</i>			5
Monotropaceae	Indianpipe	<i>Monotropa uniflora</i>			1, 3, 7, 8, 9, 12
Indian Pipe Family					
Myricaceae	Sweet fern	<i>Comptonia peregrina</i>			1, 2, 3, 7, 8, 9, 12
Bayberry Family	Northern bayberry	<i>Morella pensylvanica</i>			2, 9
	Sweetgale	<i>Myrica gale</i>			1, 3, 5, 7, 10
Najadaceae	Water-nymph	<i>Najas</i> sp.			16
Water-nymph Family					
Nymphaeaceae	Variegated yellow pond-lily	<i>Nuphar lutea</i> ssp. <i>variegata</i>			1, 3, 5, 7, 8
Water-lily Family	American white waterlily	<i>Nymphaea odorata</i>			1, 2, 3, 4, 5, 7, 8, 16
Oleaceae	White ash	<i>Fraxinus americana</i>			1, 2, 3, 4, 5, 7, 8, 10, 12
Olive Family	Black ash	<i>Fraxinus nigra</i>			1
	Green ash	<i>Fraxinus pennsylvanica</i>			1, 8
	Border privet	<i>Ligustrum obtusifolium</i>		L	1, 3
	European privet	<i>Ligustrum vulgare</i>			7

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Appendix H. Plants of the Blue Hills Reservation. (Continued)

Family ^a	Common Name ^a	Scientific Name	MESA ^b	Invasive ^c	Source ^d
Onagraceae Evening Primrose Family	Broadleaf enchanter's nightshade	<i>Circaea lutetiana</i> ssp. <i>canadensis</i>			4, 9
	Marsh seedbox	<i>Ludwigia palustris</i>			5
	Common evening primrose	<i>Oenothera biennis</i>			1, 2, 3, 7
	Evening primrose	<i>Oenothera</i> sp.			3
	Rattlesnake fern	<i>Botrychium virginianum</i>			1
Ophioglossaceae Adder's Tongue Family					
Orchidaceae Orchid Family	Moccasin flower	<i>Cypripedium acaule</i>			1, 3, 7, 8, 12
	Lady's slipper	<i>Cypripedium</i> sp.			9
	Broadleaf helleborine	<i>Epipactis helleborine</i>			1
	Downy rattlesnake plantain	<i>Goodyera pubescens</i>			1, 3
	Large whorled pogonia ^g	<i>Isotria verticillata</i>			1, 3
	Small green wood orchid	<i>Platanthera clavellata</i>			1
	Palegreen orchid	<i>Platanthera flava</i> var. <i>herbiola</i>			6
	Greater purple fringed orchid	<i>Platanthera grandiflora</i>			1
	Green fringed orchid	<i>Platanthera lacera</i>			18
	Fringed orchid	<i>Platanthera</i> sp.			1
Orobanchaceae Broom-rape Family	American cancer root	<i>Conopholis americana</i>			1
	Beechdrops	<i>Epifagus virginiana</i>			1
	Oneflowered broomrape	<i>Orobanche uniflora</i>			7
Osmundaceae Royal Fern Family	Cinnamon fern	<i>Osmunda cinnamomea</i>			1, 5, 7, 9
	Interrupted fern	<i>Osmunda claytoniana</i>			1, 3, 5, 7, 9, 12
	Royal fern	<i>Osmunda regalis</i>			1, 5, 7, 10
Oxalidaceae Wood-sorrel Family	Common yellow oxalis	<i>Oxalis stricta</i>			3, 4, 7
Pallaviciniaceae	A liverwort	<i>Pallavicinia lyellii</i>			5
Papaveraceae Poppy Family	Celandine	<i>Chelidonium majus</i>			3, 7
Pelliaceae	A liverwort	<i>Pellia epiphylla</i>			5
Phytolaccaceae Pokeweed Family	American pokeweed	<i>Phytolacca americana</i>			2, 3, 4, 7, 8, 12
Pinaceae Pine Family	European larch	<i>Larix decidua</i>			1, 18
	Norway spruce	<i>Picea abies</i>			1, 3, 7
	Red spruce	<i>Picea rubens</i>			3, 8
	Spruce	<i>Picea</i> sp.			1
	Red pine	<i>Pinus resinosa</i>			1, 3, 7, 8, 12
	Pitch pine	<i>Pinus rigida</i>			1, 3, 7, 8, 9, 12
	Eastern white pine	<i>Pinus strobus</i>			1, 2, 3, 4, 5, 7, 8, 10, 12
	Douglas fir	<i>Pseudotsuga menziesii</i>			1
	Eastern hemlock	<i>Tsuga canadensis</i>			1, 3, 7, 8
Plagiotheciaceae	Toothed plagiothecium moss	<i>Plagiothecium denticulatum</i>			5
	Plagiothecium moss	<i>Plagiothecium laetum</i>			5
	Plagiothecium moss	<i>Plagiothecium latebricola</i>			5
Plantaginaceae Plantain Family	Narrowleaf plantain	<i>Plantago lanceolata</i>			1, 7
	Common plantain	<i>Plantago major</i>			1, 7
	Blackseed plantain	<i>Plantago rugellii</i>			7
Platanaceae Plane-tree Family	American sycamore	<i>Platanus occidentalis</i>			1, 3, 8

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Appendix H. Plants of the Blue Hills Reservation. (Continued)

Family ^a	Common Name ^a	Scientific Name	MESA ^b	Invasive ^c	Source ^d
Poaceae Grass Family	Redtop	<i>Agrostis gigantea</i>			18
	Upland bentgrass	<i>Agrostis perennans</i>			18
	Rough bentgrass	<i>Agrostis scabra</i>			18
	Creeping bent	<i>Agrostis stolonifera</i>			18
	Water foxtail	<i>Alopercurus geniculatus</i>			18
	Big bluestem	<i>Andropogon gerardii</i>			18
	Sweet vernalgrass	<i>Anthoxanthum odoratum</i>			1
	Churchmouse threeawn	<i>Aristida dichotoma</i>			18
	Tall oatgrass	<i>Arrhenatherum elatius</i>			18
	Smooth brome	<i>Bromus inermis</i>			18
	Hairy woodland brome	<i>Bromus pubescens</i>			18
	Bluejoint	<i>Calamagrostis canadensis</i>			5, 10
	Sweet woodreed	<i>Cinna arundinacea</i>			1
	Orchardgrass	<i>Dactylis glomerata</i>			1
	Flattened oatgrass	<i>Danthonia compressa</i>			1, 12
	Poverty oatgrass	<i>Danthonia spicata</i>			12
	Wavy hairgrass	<i>Deschampsia flexuosa</i>			1, 12
	Tapered rosettegrass	<i>Dicanthelium acuminatum</i>			12
	Western panicgrass	<i>Dichanthelium acuminatum</i> var. <i>fasciculatum</i>			18
	Northern panicgrass	<i>Dichanthelium boreale</i>			1
	Deertongue	<i>Dichanthelium clandestinum</i>			1
	Variable panicgrass	<i>Dichanthelium commutatum</i>			18
	Starved panicgrass	<i>Dichanthelium depauperatum</i>			12
	Cypress panicgrass	<i>Dichanthelium dichotomum</i>			12
	Broadleaf rosette grass	<i>Dichanthelium latifolium</i>			12
	Slimleaf panicgrass	<i>Dichanthelium linearifolium</i>			12
	Rounded panicgrass	<i>Dichanthelium</i> <i>sphaerocarpon</i>			12
	Eaton's rosette grass	<i>Dichanthelium spretum</i>			18
	Smooth crabgrass	<i>Digitaria ischaemum</i>			12
	Jungle rice	<i>Echinochloa colona</i>			18
	Barnyardgrass	<i>Echinochloa crus-galli</i>			1
	Indian goosegrass	<i>Elusine indica</i>			18
	Purple lovegrass	<i>Eragrostis spectabilis</i>			1
	Red fescue	<i>Festuca rubra</i>			18
	Rattlesnake manna grass	<i>Glyceria canadensis</i>			5
	Atlantic manna grass	<i>Glyceria obtusa</i>			1
	Floating manna grass	<i>Glyceria septentrionalis</i>			18
	Fowl manna grass	<i>Glyceria striata</i>			1
	Common velvetgrass	<i>Holcus lanatus</i>			18
	Rice cutgrass	<i>Leersia oryzoides</i>			18
	Bog muhly	<i>Muhlenbergia uniflora</i>			5
	Roughleaf ricegrass	<i>Oryzopsis asperifolia</i>			18
	Fall panicgrass	<i>Panicum dichotomiflorum</i>			18
	Redtop panicgrass	<i>Panicum rigidulum</i>			18
	Switchgrass	<i>Panicum virgatum</i>			1
	Reed canarygrass	<i>Phalaris arundinacea</i>		I	1, 10, 13
	Timothy	<i>Phleum pratense</i>			1
	Common reed	<i>Phragmites australis</i>		I	1, 2, 3, 5, 8, 13
	Blackseed speargrass ^g	<i>Piptochaetium avenaceum</i>			1, 12
	Little bluestem	<i>Schizachyrium scoparium</i>			1, 12
	Indiangrass	<i>Sorghastrum nutans</i>			18
	Prairie cordgrass	<i>Spartina pectinata</i>			1

Continued on next page.

Appendix H. Plants of the Blue Hills Reservation. (Continued)

Family ^a	Common Name ^a	Scientific Name	MESA ^b	Invasive ^c	Source ^d
Polygalaceae	Racemed milkwort	<i>Polygala polygama</i>			1
Milkwort Family	Purple milkwort	<i>Polygala sanguinea</i>			3, 9
Polygonaceae	Longroot smartweed	<i>Polygonum amphibium</i> var. <i>emersum</i>			1
Buckwheat Family	Halberdleaf tearthumb	<i>Polygonum arifolium</i>			1, 3
	Oriental lady's tearthumb	<i>Polygonum cespitosum</i>			3, 7
	Fringed black bindweed	<i>Polygonum cilinode</i>			12
	Black bindweed	<i>Polygonum convolvulus</i>			1
	Japanese knotweed	<i>Polygonum cuspidatum</i>		I	1, 2, 3, 13
	Marshpepper knotweed	<i>Polygonum hydropiper</i>			18
	Swamp smartweed	<i>Polygonum hydropiperoides</i>			1
	Curlytop knotweed	<i>Polygonum lapathifolium</i>			18
	Pennsylvania smartweed	<i>Polygonum pensylvanicum</i>			18
	Asiatic tearthumb	<i>Polygonum perfoliatum</i>			1
	Spotted lady's thumb	<i>Polygonum persicaria</i>			3, 7
	Dotted smartweed	<i>Polygonum punctatum</i>			1
	Stout smartweed	<i>Polygonum robustius</i>			5
	Arrowleaf tearthumb	<i>Polygonum sagittatum</i>			1, 3, 5
	Common sheep sorrel	<i>Rumex acetosella</i>			1, 7
	Pale dock	<i>Rumex britannica</i>			18
	Curly dock	<i>Rumex crispus</i>			1, 7
	Dock	<i>Rumex</i> sp.			5
Polypodiaceae	Rock polypody	<i>Polypodium virginianum</i>			1, 3, 7, 12
Polypody Family					
Polytrichaceae	Atrichum moss	<i>Atrichum angustatum</i>			5
	Ohio polytrichum moss	<i>Polytrichum ohioense</i>			5
Pontederiaceae	Pickernelweed	<i>Pontederia cordata</i>			1, 2, 3, 4, 5, 7, 16
Water-Hyacinth Family					
Potamogetonaceae	Largeleaf pondweed	<i>Potamogeton amplifolius</i>			5
Pondweed Family	Curly pondweed	<i>Potamogeton crispus</i>		I	18
	Waterthread pondweed	<i>Potamogeton diversifolius</i>			18
	Ribbonleaf pondweed	<i>Potamogeton epihydrus</i>			1, 14
	Floating pondweed	<i>Potamogeton natans</i>			1, 16
	Oakes' pondweed	<i>Potamogeton oakesianus</i>			18
	Pondweed	<i>Potamogeton</i> sp.			4, 7
Primulaceae	American featherfoil ^g	<i>Hottonia inflata</i>			5
Primrose Family	Fringed loosestrife	<i>Lysimachia ciliata</i>			5
	Lowland yellow loosestrife	<i>Lysimachia hybrida</i>			1
	Creeping Jenny	<i>Lysimachia nummularia</i>		I	1
	Whorled yellow loosestrife	<i>Lysimachia quadrifolia</i>			1, 2, 3, 7, 8, 9, 12
	Earth loosestrife	<i>Lysimachia terrestris</i>			1, 3, 5, 7
	Tufted loosestrife	<i>Lysimachia thyrsiflora</i>			5
	Starflower	<i>Trientalis borealis</i>			1, 3, 4, 7, 8, 9, 12
Pyrolaceae	Striped prince's pine	<i>Chimaphila maculata</i>			1, 3, 7, 8, 9, 12
Shinleaf Family	Pipsissewa	<i>Chimaphila umbellata</i>			1, 3, 7, 8, 9, 12
	American wintergreen	<i>Pyrola americana</i>			1

Continued on next page.

Appendix H. Plants of the Blue Hills Reservation. (Continued)

Family ^a	Common Name ^a	Scientific Name	MESA ^b	Invasive ^c	Source ^d
Ranunculaceae Buttercup Family	White baneberry	<i>Actaea pachypoda</i>			1
	Wood anemone	<i>Anemone quinquefolia</i>			1
	Anemone	<i>Anemone</i> sp.			3
	Red columbine	<i>Aquilegia canadensis</i>			1, 3, 12
	Yellow marsh marigold	<i>Caltha palustris</i>			1
	Threeleaf goldthread	<i>Coptis trifolia</i>			1, 5
	Tall buttercup	<i>Ranunculus acris</i>			3, 7, 8
	St. Anthony's turnip	<i>Ranunculus bulbosus</i>			1, 7
	Blisterwort	<i>Ranunculus recurvatus</i>			1
	Creeping buttercup	<i>Ranunculus repens</i>		L ^c	1, 7
	Cursed buttercup	<i>Ranunculus sceleratus</i>			5
	Buttercup	<i>Ranunculus</i> sp.			3, 9
	King of the meadow	<i>Thalictrum pubescens</i>			1, 3, 7
	Waxyleaf meadow-rue	<i>Thalictrum revolutum</i>			18
Rhamnaceae Buckthorn Family	Glossy buckthorn	<i>Frangula alnus</i>		I ^c	1, 3, 4, 7, 8
	Common buckthorn	<i>Rhamnus cathartica</i>		I	1, 3, 7, 10, 12
Rosaceae Rose Family	Churchsteeples	<i>Agrimonia eupatoria</i>			1
	Canadian serviceberry	<i>Amelanchier canadensis</i>			1
	Allegheny serviceberry	<i>Amelanchier laevis</i>			18
	Nantucket serviceberry	<i>Amelanchier nantucketensis</i>	SC ^j		1, 6
	Serviceberry	<i>Amelanchier</i> sp.			1, 3, 8, 12
	Running serviceberry	<i>Amelanchier stolonifera</i>			1
	Purple marshlocks	<i>Comarum palustre</i>			1
	Woodland strawberry	<i>Fragaria vesca</i>			7, 8
	Virginia strawberry	<i>Fragaria virginiana</i>			18
	Strawberry	<i>Fragaria</i> sp.			3
	White avens	<i>Geum canadense</i>			1
	Cream avens ^g	<i>Geum virginianum</i>			7
	Siberian crab apple	<i>Malus baccata</i>			18
	Japanese flowering crabapple	<i>Malus floribunda</i>			1
	Plumleaf crab apple	<i>Malus prunifolia</i>			18
	Apple	<i>Malus</i> sp.			1, 12
	Purple chokeberry	<i>Photinia floribunda</i>			1, 3, 5, 10
	Black chokeberry	<i>Photinia melanocarpa</i>			1, 3
	Silver cinquefoil	<i>Potentilla argentea</i>			1, 7
	Dwarf cinquefoil	<i>Potentilla canadensis</i>			1, 3, 7
	Norwegian cinquefoil	<i>Potentilla norvegica</i>			1
	Sulphur cinquefoil	<i>Potentilla recta</i>			1, 7
	Common cinquefoil	<i>Potentilla simplex</i>			1, 3, 7, 8, 12
	Pin cherry	<i>Prunus pensylvanica</i>			1, 2, 3, 7
	Sandcherry	<i>Prunus pumila</i>			18
	Black cherry	<i>Prunus serotina</i>			1, 2, 3, 4, 7, 8, 10, 12
	Chokecherry	<i>Prunus virginiana</i>			1
	Pear	<i>Pyrus</i> sp.			3
	Jetbead	<i>Rhodotypos scandens</i>			1
	Carolina rose	<i>Rosa carolina</i>			3, 7
	Multiflora rose	<i>Rosa multiflora</i>		I	1, 10, 13
	Swamp rose	<i>Rosa palustris</i>			1, 2, 3, 4, 5, 7
	Virginia rose	<i>Rosa virginiana</i>			8
	Allegheny blackberry	<i>Rubus allegheniensis</i>			1, 12
	Northern dewberry	<i>Rubus flagellaris</i>			1, 8, 12
	Bristly dewberry	<i>Rubus hispidus</i>			1
	Red raspberry	<i>Rubus idaeus</i>			9, 10
	Gray red raspberry	<i>Rubus idaeus</i> ssp. <i>strigosus</i>			1

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Appendix H. Plants of the Blue Hills Reservation. (Continued)

Family ^a	Common Name ^a	Scientific Name	MESA ^b	Invasive ^c	Source ^d
Rosaceae (continued)	Black raspberry	<i>Rubus occidentalis</i>			1, 3, 8, 9
Rose Family	Thimbleberry	<i>Rubus parviflorus</i>			9
	Blackberry	<i>Rubus</i> sp.			2, 3, 4, 7, 9, 13
	American mountain ash	<i>Sorbus americana</i>			8
	European mountain ash	<i>Sorbus aucuparia</i>			3, 7, 8, 9
	White meadowsweet	<i>Spiraea alba</i>			3, 5, 7, 8, 10
	Thunberg's meadowsweet	<i>Spiraea thunbergii</i>			1
	Steeplebush	<i>Spiraea tomentosa</i>			1, 3, 5, 7
Rubiaceae	Common buttonbush	<i>Cephalanthus occidentalis</i>			1, 3, 4, 5, 7, 8, 10
Madder Family	Stickywilly	<i>Galium aparine</i>			1
	Licorice bedstraw	<i>Galium circaeans</i>			1, 12
	Lanceleaf wild licorice	<i>Galium lanceolatum</i>			12
	False baby's breath	<i>Galium mollugo</i>			7
	Sweetscented bedstraw	<i>Galium odoratum</i>			1
	Common marsh bedstraw	<i>Galium palustre</i>			1
	Bedstraw	<i>Galium</i> sp.			10
	Stiff marsh bedstraw	<i>Galium tinctorium</i>			1, 5
	Fragrant bedstraw	<i>Galium triflorum</i>			3, 7
	Azure bluets	<i>Houstonia caerulea</i>			7
	Longleaf summer bluet	<i>Houstonia longifolia</i>			7
	Partridgeberry	<i>Mitchella repens</i>			1, 3, 4, 7, 8, 9
Rutaceae	Amur corktree	<i>Phellodendron amurense</i>		L	1
Rue Family					
Salicaceae	Eastern cottonwood	<i>Populus deltoides</i>			1, 2, 3, 7
Willow Family	Bigtooth aspen	<i>Populus grandidentata</i>			1, 2, 3, 7, 8, 9
	Quaking aspen	<i>Populus tremuloides</i>			1, 2, 3, 7, 8, 12
	White willow	<i>Salix alba</i>			1
	Large gray willow	<i>Salix atrocinerea</i>			1
	Bebb willow	<i>Salix bebbiana</i>			2
	Pussy willow	<i>Salix discolor</i>			1, 3, 8
	Missouri River willow	<i>Salix eriocephala</i>			1
	Black willow	<i>Salix nigra</i>			1, 3, 7, 8
	Bog willow ^g	<i>Salix pedicellaris</i>			1
	Meadow willow	<i>Salix petiolaris</i>			1
	Hybrid crack willow	<i>Salix x rubens</i> (<i>S. fragilis</i> x <i>S. alba</i>)			1
	Silky willow	<i>Salix sericea</i>			1
	Autumn willow ^g	<i>Salix serissima</i>			5
Santalaceae	Bastard toadflax	<i>Comandra umbellata</i>			1, 3, 7, 8, 9
Sandalwood Family					
Sarraceniaceae	Purple pitcherplant	<i>Sarracenia purpurea</i>			1, 3, 5, 9, 10
Pitcher Plant Family					
Saxifragaceae	American golden saxifrage	<i>Chrysosplenium americanum</i>			1
Saxifrage Family					
Scheuchzeriaceae	Rannoch-rush	<i>Scheuchzeria palustris</i>	E		1, 6
Scheuchzeria Family	(Pod-grass)				

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Appendix H. Plants of the Blue Hills Reservation. (Continued)

Family ^a	Common Name ^a	Scientific Name	MESA ^b	Invasive ^c	Source ^d
Scrophulariaceae	Purple false foxglove	<i>Agalinis purpurea</i>			1
Figwort Family	Smooth yellow false foxglove	<i>Aureolaria flava</i> var. <i>flava</i>			3, 7, 9
	Fernleaf yellow false foxglove	<i>Aureolaria pedicularia</i>			1, 7
	Downy yellow false foxglove	<i>Aureolaria virginica</i>			9, 12
	White turtlehead	<i>Chelone glabra</i>			1, 3
	Slender false foxglove	<i>Gerardia tenuifolia</i> var. <i>tenuifolia</i>			3
	Golden hedgehyssop	<i>Gratiola aurea</i>			1, 3
	Butter and eggs	<i>Linaria vulgaris</i>			3, 7
	Allegheny monkeyflower	<i>Mimulus ringulus</i>			1
	Narrowleaf cowwheat	<i>Melampyrum lineare</i>			3, 7, 9, 12
	Canada toadflax	<i>Nuttallanthus canadensis</i>			1, 7, 12
	Canadian lousewort	<i>Pedicularis canadensis</i>			18
	Common mullein	<i>Verbascum thapsus</i>			1, 2, 3, 7, 8, 12
	Germander speedwell	<i>Veronica chamaedrys</i>			18
	Common gypsyweed	<i>Veronica officinalis</i>			18
Simaroubaceae	Tree of Heaven ^b	<i>Ailanthus altissima</i>		I ^c	1, 2, 3, 12, 13
Quassia Family					
Smilacaceae	Cat greenbrier	<i>Smilax glauca</i>			1
Catbrier Family	Smooth carrionflower	<i>Smilax herbacea</i>			1, 7
	Roundleaf greenbrier	<i>Smilax rotundifolia</i>			1, 3, 4, 5, 7, 8
Solanaceae	Carolina horsenettle	<i>Solanum carolinense</i>			1
Potato Family	Climbing nightshade	<i>Solanum dulcamara</i>			2, 3, 5, 7, 10
	Black nightshade	<i>Solanum nigrum</i>			3, 7, 8
Sparganiaceae	American bur-reed	<i>Sparganium americanum</i>			1, 5
Bur-reed Family	European bur-reed	<i>Sparganium emersum</i>			18
	Bur-reed	<i>Sparganium</i> sp.			3, 7
Sphagnaceae	Sphagnum	<i>Sphagnum angustifolium</i>			10
	Sphagnum	<i>Sphagnum capillaceum</i> ^f			5
	Toothed sphagnum	<i>Sphagnum cuspidatum</i> ^f			5, 10
	Sphagnum	<i>Sphagnum fimbriatum</i>			5
	Sphagnum	<i>Sphagnum flavicomans</i>			5
	Sphagnum	<i>Sphagnum imbricatum</i> ^f			5
	Magellan's sphagnum	<i>Sphagnum magellanicum</i>			5, 10
	Prairie sphagnum	<i>Sphagnum palustre</i>			5, 10
	Papillose sphagnum	<i>Sphagnum papillosum</i>			5, 10
	Recurved sphagnum	<i>Sphagnum recurvum</i>			5
	Sphagnum	<i>Sphagnum rubellum</i>			10
	Russow's sphagnum	<i>Sphagnum russowii</i>			5
	Sphagnum	<i>Sphagnum</i> sp.			10
	Sphagnum	<i>Sphagnum squarresum</i>			5
	Torrey's sphagnum	<i>Sphagnum torreyanum</i>			5
Styracaceae	Carolina silverbell	<i>Halesia carolina</i>			1
Storax Family					
Taxaceae	Yew	<i>Taxus</i> sp.			1
Yew Family					
Tetraphidaceae	Tetraphis moss	<i>Tetraphis pellucida</i>			5

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Appendix H. Plants of the Blue Hills Reservation. (Continued)

Family ^a	Common Name ^a	Scientific Name	MESA ^b	Invasive ^c	Source ^d
Thelypteridaceae	Long beechfern	<i>Phegopteris connectilis</i>			1
Marsh Fern Family	Broad beechfern	<i>Phegopteris hexagonoptera</i>			1
	New York fern	<i>Thelypteris noveboracensis</i>			1, 3, 7, 10, 12
	Eastern marsh fern	<i>Thelypteris palustris</i>			1, 3, 5, 7
	Bog fern	<i>Thelypteris simulata</i>			1, 10
Thuidiaceae	Delicate thuidium moss	<i>Thuidium delicatulum</i>			5
Tiliaceae	American basswood	<i>Tilia americana</i>			1, 9
Linden Family					
Typhaceae	Narrowleaf cattail	<i>Typha angustifolia</i>			1, 3, 13
Cat-tail Family	Broadleaf cattail	<i>Typha latifolia</i>			1, 3, 5, 7, 10
Ulmaceae	American elm	<i>Ulmus americana</i>			1, 3, 4, 7, 8, 10
Elm Family	Siberian elm	<i>Ulmus pumila</i>			1
	Slippery elm	<i>Ulmus rubra</i>			5
	Elm	<i>Ulmus</i> sp.			1
Utricaceae	Smallspike false nettle	<i>Boehmeria cylindrica</i>			3, 5
Nettle Family	Canadian clearweed	<i>Pilea pumila</i>			1
	Stinging nettle	<i>Urtica dioica</i> ssp. <i>dioica</i>			1
Verbenaceae	Swamp verbena	<i>Verbena hastata</i>			1, 3, 7
Verbena Family					
Violaceae	Sweet white violet	<i>Viola blanda</i>			3
Violet Family	Northern coastal violet	<i>Viola brittoniana</i>	T		6
	Marsh blue violet	<i>Viola cucullata</i>			1, 3
	Bog white violet	<i>Viola lanceolata</i>			1, 5
	Small white violet	<i>Viola macloskeyi</i> ssp. <i>pallens</i>			1
	Birdfoot violet	<i>Viola pedata</i>			3
	Arrowleaf violet	<i>Viola sagittata</i>			1, 3, 7, 12
	Common blue violet	<i>Viola sororia</i>			1
	A violet	<i>Viola</i> x <i>primulifolia</i>			1
Vitaceae	Amur peppervine	<i>Ampelopsis brevipedunculata</i>		L	17
Grape Family	Virginia creeper	<i>Parthenocissus quinquefolia</i>			1, 2, 3, 4, 8, 12
	Summer grape	<i>Vitis aestivalis</i>			3, 12
	Fox grape	<i>Vitis labrusca</i>			1, 5
	Riverbank grape	<i>Vitis riparia</i>			1
	Grape	<i>Vitis</i> sp.			2, 9
	Pilgrim grape	<i>Vitis</i> x <i>novae-angliae</i>			3, 4, 7, 8
Xyridaceae	Carolina yellow-eyed grass	<i>Xyris caroliniana</i>			5
Yellow-eyed Grass	Yellow-eyed grass	<i>Xyris</i> sp.			3, 9
	Slender yellow-eyed grass	<i>Xyris torta</i>			1

Continued on next page.

Appendix H. Plants of the Blue Hills Reservation. (Continued)

- a. Mosses and liverworts often lack common names for both plants and plant families.
- b. Status of plants listed under the Massachusetts Endangered Species Act (MESA): E = Endangered; T = Threatened; and SC = Species of Special Concern.
- c. These species have been evaluated by the Massachusetts Invasive Plant Advisory Group (MIPAG 2005) and determined to be invasive (I) or likely invasive (L).
- d. Information contained in this table was obtained from the following sources:
 - 1. Kadis and Zinovjev (2009). This report includes information from both the Blue Hills Reservation and the Fowl Meadow portion of the Neponset River Reservation.
 - 2. Hollenbeck and Eck (1986).
 - 3. Eck (1988).
 - 4. South Region, Reservations & Historic Sites Unit (1989).
 - 5. Judd (n.d.).
 - 6. Natural Heritage and Endangered Species Program (2007a).
 - 7. Lutts (1973). This list “includes some plants found outside of the reservation in Quincy, Braintree, Milton, Canton, and Randolph, but assumed to exist in the reservation.”
 - 8. Conley (1988); Appendix 1. A partial list of vegetation found at the Houghton’s Pond area.
 - 9. Friends of the Blue Hills (1979). Some plants in this reference were omitted from this appendix because they could not be identified to genus.
 - 10. ESS Group, Inc. (2007).
 - 11. Observed by RMP Planner.
 - 12. Rawinski (2010a).
 - 13. AECOM (2010).
 - 14. Hellquist (1972).
 - 15. Garrett (2010).
 - 16. Twining (2009e).
 - 17. Echandi (2011a).
 - 18. Palmer (2011).
- e. This invasive or likely invasive species was also recorded on the reservation in the 1890’s (Deane 1896).
- f. This scientific name of this species is not included in the PLANTS database (USDA 2009); the scientific name in this table is presented as listed in the original document.
- g. This species is included in the NHESP’s Plant Watch List (NHESP 2007b). There is no regulatory protection associated with this designation.
- h. Kadis and Zinovjev (2009) list devil’s walkingstick (*Aralia spinosa*). Subsequent examination of this plant (Kadis 2010b) led to its identification as either Japanese angelica tree (*A. elata*) or Chinese angelica tree (*A. chinensis*).
- i. The native form of this plant, which is known only from Berkshire County, is state-endangered in Massachusetts. Most arbovitae, such those recorded on the Blue Hills Reservation, are escaped cultivated varieties and are not state-listed.
- j. The NHESP has proposed that this species be de-listed.

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Appendix I. The Massachusetts Natural Heritage and Endangered Species Program's Management Recommendations and Associated Management Units for the Conservation of State-listed Species on the Blue Hills Reservation.

This appendix summarizes the NHESP's management recommendations for the Blue Hills Reservation, based on information in Box 1 of the *Biodiversity of the Blue Hills* (NHESP 2007a). Refer to Figure I.1, for locations of NHESP management units; used with permission (Haggerty 2009).

Highest Priority Recommendations

Rare Snake Habitat Management Unit

- Reinstitute seasonal nighttime closing of Chickatawbut Road.
- Conduct property-wide population assessment of copperheads and timber rattlesnakes.
- Educate public and officials with regard to snake biology and protection.
- Evaluate location of trails relative to snake dens; reroute or close trails as necessary to avoid contact between visitors and snakes.
- Plan landscaping, maintenance, and construction to avoid impacts to rare snakes.

Upland Woodland Management Unit

- Develop rare species survey and monitoring program.
- Conduct active habitat management and develop a controlled burning program.
- Develop exotic invasive plant monitoring and control program.
- Manage trails, recreation, landscaping, roads, and construction relative to rare plants, insects, and natural communities.
- Reduce deer herbivory on rare plants.

Ponkapoag Pond and Bog Management Unit

- Mitigate the impacts of the dam, water withdrawals, boardwalk, and nutrient runoff to rare species and natural communities.
- Develop exotic invasive plant monitoring and control program.
- Investigate the benefits of active habitat management.

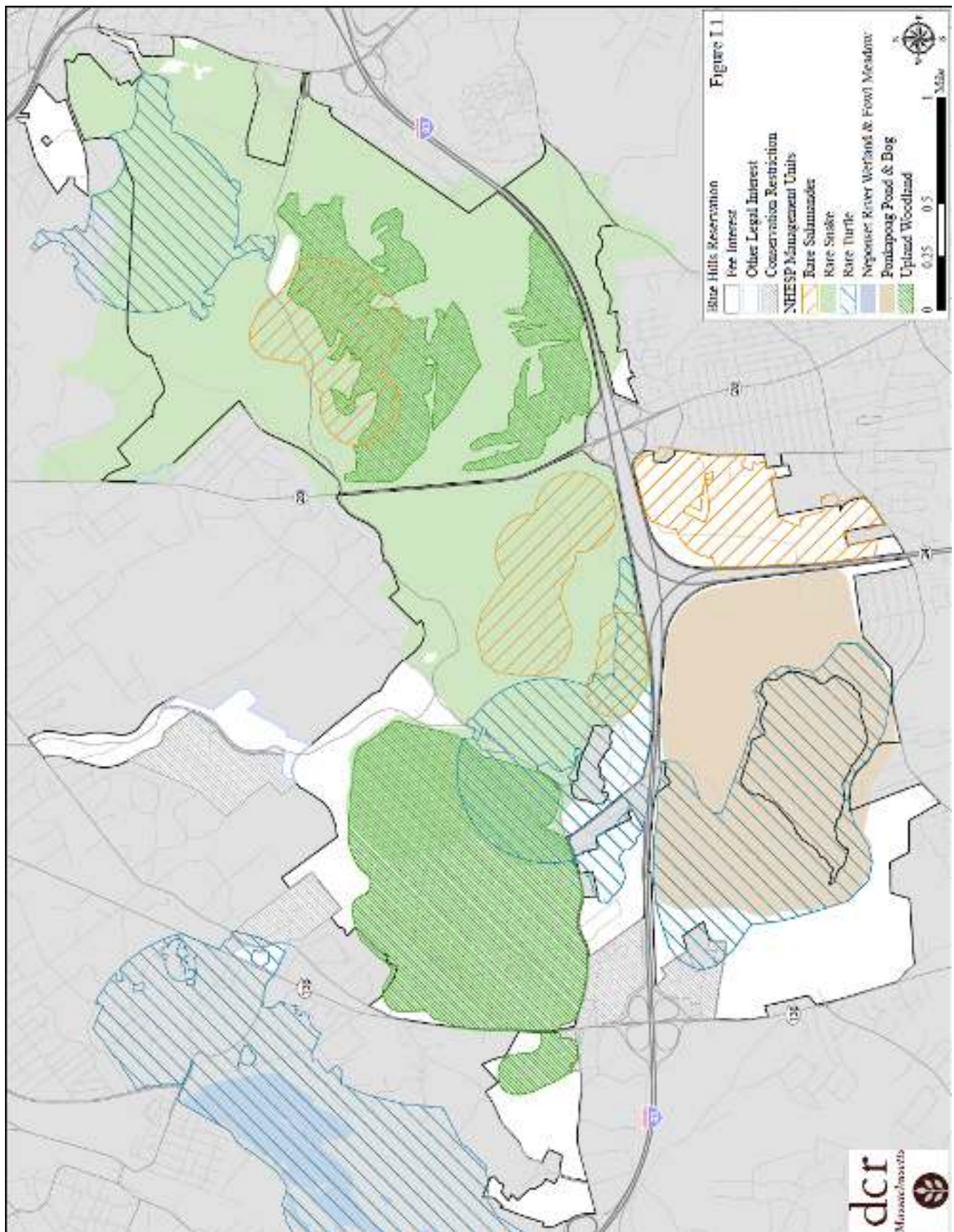
Medium Priority Recommendations

Rare Salamander Habitat Management Unit

- Conduct rare species and vernal pool surveys and monitoring.
- Maintain closed forest canopy adjacent to vernal pools and in the surrounding uplands (to the extent possible).

Rare Turtle Habitat Management Unit

- Create and monitor turtle nesting habitat.
- Educate the public with regard to threats to turtles.
- Conduct forestry, habitat management, and mowing in ways that avoid impacts to rare turtles.



Appendix J. Designations.

Several of the Blue Hills Reservation's features have received special recognition. Such recognition may take the form of a legal designation, designations designed to implement policy, or designations intended to increase public awareness.

The following designations are associated with the Blue Hills Reservation and its resources.

J.1. LEGAL DESIGNATIONS

Area of Critical Environmental Concern. Two sections of the Blue Hills occur within the Fowl Meadow and Ponkapoag Bog Area of Critical Environmental Concern (ACEC). These are the Little Blue Hill and Ponkapoag sections.

An ACEC is a formally designated "area within the Commonwealth where unique clusters of natural and human resource values exist and which are worthy of a high level of concern and protection" (301 CMR, Section 12.03).

The ACEC designation is "directed principally to the actions and jurisdictions of state environmental agencies" (DCR 2007c), and projects by those agencies may be subject to review under the Massachusetts Environmental Policy Act (MEPA; 301 CMR, Section 11.00). In addition, this designation subjects "projects of federal, state, and local agencies and private parties to the closest scrutiny" (301 CMR 12.00; Appendix F).

Great Pond. Ponkapoag and Houghton's ponds are designated Great Ponds and are subject to the Massachusetts Public Waterfront Act (Chapter 91) and associated regulations (310 CMR 9.00; Appendix F.)

As Great Ponds, the land below the natural low water mark is held by the Commonwealth in trust for the public. Activities involving fill, structures (including docks), or the lowering of water levels in Great Ponds are under the control of the Massachusetts Department of Environmental Protection (DEP) and require either a license or permit.

National Historic Landmark. National Historic Landmarks are those places that "possess exceptional value or quality in illustrating and interpreting the heritage of the United States" (NPS

n.d.b). Within the Blue Hills Planning Unit, only the Blue Hills Meteorological Observatory has received this designation.

National Register of Historic Places. Many of the Blue Hills Reservation's buildings and structures (e.g., Redman Farmhouse), are listed in the National Register of Historic Places. The National Register "is the official list of the Nation's historic places worthy of preservation," and includes properties with community, state, or national significance (NPS n.d.a). Information on listed sites is provided in Appendix R.

Outstanding Resource Waters. Ponds and streams that drain into Great Pond Reservoir have been designated as "Outstanding Resource Waters." This includes Blue Hill River, Houghton's Pond, a variety of unnamed perennial and intermittent streams, and their associated uplands.

Under the Massachusetts Surface Water Quality Standards (314 CMR 4.00; Appendix F), the quality of Outstanding Resource Waters is protected by regulating existing and new discharges to these waters and also by regulating dredged or fill materials.

This designation affects storm water management in the Houghton's Pond, Reservation Headquarters, and Operations Yard sections of the reservation.

Priority Habitat. The majority of the Blue Hills Planning Unit has been designated Priority Habitat under MESA (321 CMR 10.00; Appendix F).

Activities that may alter this habitat (e.g., trail maintenance, vista pruning, digging archaeological test pits) are subject to regulatory review by the Massachusetts Natural Heritage and Endangered Species Program (NHESP). With minor exception (see 321 CMR 10.14), habitat conservation plans must be prepared, submitted to, and approved by the NHESP before activities can take place within Priority Habitat.

J.2. POLICY DESIGNATIONS

Environmental Justice Population. Residents of neighborhoods in Randolph that abut the Blue Hills Reservation have been designated an environmental justice population.

This designation is based on one or more of the following conditions being true:

- Median annual household income at or below 65% of the state median;
- 25% or more of the residents are minority;
- 25% or more of the residents are foreign born; or
- 25% or more of the residents lack proficiency in English.

The Executive Office of Energy and Environmental Affairs (EOEEA), formerly the Executive Office of Environmental Affairs (EOEA), established an environmental justice policy “to help address the disproportionate share of environmental burdens experienced by lower-income people and communities of color who, at the same time, lack environmental assets in their neighborhoods” (EOEEA n.d.). This policy “targets EOEA resources to service those high-minority/low-income neighborhoods in Massachusetts where the residents are most at risk of being unaware of or unable to participate in environmental decision-making” (EOEA 2002).

J.3. PUBLIC AWARENESS DESIGNATIONS

Critical Treasure. The Appalachian Mountain Club has designated the Quincy Quarries a Critical Treasure.

This designation refers to properties with one or more of the following characteristics (AMC 2008):

- priority areas with significant natural resource or recreation value threatened by development;
- public lands in need of increased attention; or
- protected lands with adjacent unprotected land in need of protection.

Historic Civil Engineering Landmark. The historic granite railway, in the Quincy Quarries section of the reservation, has been designated a Historic Civil Engineering Landmark by the American Society of Civil Engineers (ASCE). This program recognizes “historically significant local, national, and international civil engineering projects, structures, and sites” (ASCE 2009).

Important Bird Area. The Massachusetts Audubon Society has designated the Blue Hills, and the

nearby Fowl Meadow portion of the Neponset River Reservation, as an Important Bird Area (IBA; Mass Audubon n.d.). The Blue Hills was designated an IBA because of its importance for long-term research and monitoring projects and because it is a site where birds concentrate in significant numbers. This designation is intended to raise public awareness of the Blue Hills’ role in contributing to the protection of significant bird populations in Massachusetts (Mass Audubon 2007).

National Environmental Study Area. The Ponkapoag Board Walk was designated a National Environmental Study Area (NESA) in 1988. This program, which was administered by the National Park Service, recognized physical sites or land resources that were used for “an active program of environmental education” by designating them as a National Environmental Study Area (NPS 1972). The NESA program no longer exists, but a stone marker identifying the NESA designation remains at the start of the board walk.

National Historic Lookout Register. The Forest Fire Lookout Association has included the tower portion of the Blue Hill Weather Observatory (i.e., Milton Fire Tower) in its National Historic Lookout Register. This register recognizes fire towers “meeting those standards of historic and cultural significance established by the American Resources Group.” The observatory’s tower was added to this register because of its history of use for fire detection between 1911 and 1915.

National Natural Landmark. Some documents incorrectly identify Ponkapoag Pond and Bog as a National Natural Landmark. The National Registry of Natural Landmarks (National Natural Landmarks Program 2009) does not include Ponkapoag, or any other portion of the Blue Hills Reservation.

Priority Natural Communities. The NHESP (2002) “actively inventories and tracks the distribution and status of uncommon and exemplary natural communities.” Seventy-two communities are considered conservation priorities in Massachusetts (NHESP 2002); five of which are known to be present in the Blue Hills Reservation (Table 2.3.2).

Species in Greatest Need of Conservation. MassWildlife (2005) has identified 257 animal species as being in greatest need of conservation. This includes federal and state-listed species,

globally rare species, and animals listed as being of regional concern by the Northeastern Association of Fish and Wildlife Agencies. They are considered conservation priorities in Massachusetts. Many have been recorded on the Blue Hills Reservation; they are identified in appendices K, L, M, N, P, and Q.

Watch List. This list (NHESP 2007b) “is an unofficial, non-regulatory list of plants of known or suspected conservation concern that the NHESP is interested in tracking.” It is intended to create awareness and promote the conservation of species on this list. Watch List plants recorded at the Blue Hills are identified in Appendix H.

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Appendix K. Birds of the Blue Hills Reservation.

This list is based on Mass Audubon's *Blue Hills Reservation: a checklist of the birds* (1993), which includes both Blue Hills Reservation and the Fowl Meadow section of the Neponset River Reservation. Additional sources of information are included. Family, common, and scientific names and the sequence in which they are presented follow American Ornithologists' Union (2011).

Family	Common Name	Scientific Name	MESA ^a	Source ^b	BBA ^c
Anatidae Geese, Swans, and Ducks	Canada goose	<i>Branta canadensis</i>		1, 5, 10, 11	X
	Mute swan	<i>Cygnus olor</i>		-	X
	Wood duck	<i>Aix sponsa</i>		1, 2, 5, 6	X
	American black duck ^d	<i>Anas rubripes</i>		1, 2, 3, 5	
	Mallard	<i>Anas platyrhynchos</i>		1, 2, 3, 5	X
	Blue-winged teal	<i>Anas discors</i>		1, 2, 5	
	Northern pintail	<i>Anas acuta</i>		1	
	Green-winged teal	<i>Anas crecca</i>		1, 5	
	Ring-necked duck	<i>Aythya collaris</i>		2, 10	
	Greater scaup	<i>Aythya marila</i>		2, 10	
	White-winged scoter	<i>Melanitta fusca</i>		2	
	Bufflehead	<i>Bucephala albeola</i>		2, 14	
	Common goldeneye	<i>Bucephala clangula</i>		2	
	Hooded merganser	<i>Lophodytes cucullatus</i>		1	
	Common merganser	<i>Mergus merganser</i>		1, 2, 5	
	Red-breasted merganser	<i>Mergus serrator</i>		2	
Phasianidae Pheasants and Turkeys	Ring-necked pheasant	<i>Phasianus colchicus</i>		1, 2, 3	
	Ruffed grouse ^d	<i>Bonasa umbellus</i>		1, 5	X
	Wild turkey	<i>Meleagris gallopavo</i>		7, 13	X
Gaviidae Loons	Common loon ^d	<i>Gavia immer</i>	SC	1, 5	
Podicipedidae Grebes	Pied-billed grebe	<i>Podilymbus podiceps</i>		14	
	Horned grebe	<i>Podiceps auritus</i>		1, 2	
Phalacrocoracidae Cormorants	Double-crested cormorant	<i>Phalacrocorax auritus</i>		1, 5, 11, 14	X
Ardeidae Bitterns and Herons	Great blue heron	<i>Ardea herodias</i>		1, 5, 11	X
	Great egret	<i>Ardea alba</i>		-	X
	Green heron ^d	<i>Butorides virescens</i>		1, 5	
	Black-crowned night-heron ^d	<i>Nycticorax nycticorax</i>		1, 3	
Cathartidae American Vultures	Black vulture	<i>Coragyps atratus</i>		9	X
	Turkey vulture	<i>Cathartes aura</i>		1, 5, 8, 11, 13	X
Pandionidae Osprey	Osprey	<i>Pandion haliaetus</i>		1, 5	X
Accipitridae Kites, Eagles, and Hawks	Bald eagle ^d	<i>Haliaeetus leucocephalus</i>	E	1	
	Northern harrier ^d	<i>Circus cyaneus</i>	T	1, 6	
	Sharp-shinned hawk ^d	<i>Accipiter striatus</i>	SC	1, 4, 6	
	Cooper's hawk	<i>Accipiter cooperii</i>		1, 6, 13	X
	Northern goshawk	<i>Accipiter gentilis</i>		1, 2, 6	
	Red-shouldered hawk	<i>Buteo lineatus</i>		1, 5	X
	Broad-winged hawk ^d	<i>Buteo platypterus</i>		1, 5	X
	Red-tailed hawk	<i>Buteo jamaicensis</i>		1, 4, 5, 6, 8, 11	X
Falconidae Falcons	American kestrel ^d	<i>Falco sparverius</i>		1, 2, 5, 6, 8	
	Merlin	<i>Falco columbarius</i>		1, 6	
	Gyr falcon	<i>Falco rusticolus</i>		6	
	Pergerine falcon ^d	<i>Falco peregrinus</i>	E	1	

Continued on next page.

Appendix K. Birds of the Blue Hills Reservation. (Continued)

Family	Common Name	Scientific Name	MESA ^a	Source ^b	BBA ^c
Rallidae Rails, Gallinules, and Coots	Sora ^d	<i>Porzana carolina</i>		1	
Charadriidae Plovers and Lapwings	Killdeer	<i>Charadrius vociferus</i>		1, 2	X
Scolopacidae Sandpipers and Allies	Solitary sandpiper	<i>Tringa solitaria</i>		1, 5	
	Spotted sandpiper	<i>Actitis macularius</i>		1, 3	X
	Least sandpiper	<i>Calidris minutilla</i>		1, 3, 11	
	Wilson's snipe	<i>Gallinago delicata</i>		1, 2	
	American woodcock ^d	<i>Scolopax minor</i>		1, 5	X
Laridae Jaegers, Gulls, Terns, and Skimmers	Laughing gull ^d	<i>Leucophaeus atricilla</i>		2	
	Ring-billed gull	<i>Larus delawarensis</i>		1, 8, 12	
	Herring gull	<i>Larus argentatus</i>		1, 2, 3, 5, 8	X
	Great black-backed gull	<i>Larus marinus</i>		1, 2, 5	X
Columbidae Pigeons and Doves	Rock pigeon	<i>Columba livia</i>		1, 4, 5, 8	X
	Mourning dove	<i>Zenaidura macroura</i>		1, 2, 3, 4, 5, 8, 11	X
Cuculidae Cuckoos and Allies	Black-billed cuckoo	<i>Coccyzus erythrophthalmus</i>		1, 4, 5	X
	Yellow-billed cuckoo	<i>Coccyzus americanus</i>		1, 5	X
Strigidae Typical Owls	Eastern screech-owl	<i>Megascops asio</i>		1, 5, 10, 13, 15	X
	Great horned owl	<i>Bubo virginianus</i>		1, 5, 10, 15	X
	Barred owl	<i>Strix varia</i>		1, 5, 13	X
	Long-eared owl ^d	<i>Asio otus</i>	SC	1	
	Northern saw-whet owl	<i>Aegolius acadicus</i>		1, 5, 15	
Caprimulgidae Goatsuckers	Common nighthawk	<i>Chordeiles minor</i>		1, 5	
	Eastern whip-poor-will ^d	<i>Caprimulgus vociferus</i>		1, 5	X
Apodidae Swifts	Chimney swift	<i>Chaetura pelagica</i>		1, 3, 5, 6, 8, 11	X
Trochilidae Hummingbirds	Ruby-throated hummingbird	<i>Archilochus colubris</i>		1, 5	X
Alcedinidae Kingfishers	Belted kingfisher	<i>Megasceryle alcyon</i>		1, 2, 5	X
Picidae Woodpeckers	Red-bellied woodpecker	<i>Melanerpes erythrocephalus</i>		11	X
	Yellow-bellied sapsucker	<i>Sphyrapicus varius</i>		1, 5	
	Downy woodpecker	<i>Picoides pubescens</i>		1, 2, 4, 5, 11, 12, 13	X
	Hairy woodpecker	<i>Picoides villosus</i>		1, 5, 11, 13	X
	Northern flicker	<i>Colaptes auratus</i>		1, 2, 3, 4, 5, 11	X
	Pileated woodpecker	<i>Dryocopus pileatus</i>		1	X
Tyrannidae Tyrant Flycatchers	Olive-sided flycatcher	<i>Contopus cooperi</i>		1	
	Eastern wood-pewee	<i>Contopus virens</i>		1, 3, 5, 8, 12	X
	Yellow-bellied flycatcher	<i>Empidonax flaviventris</i>		1	
	Willow flycatcher ^d	<i>Empidonax trailii</i>		1	
	Least flycatcher	<i>Empidonax minimus</i>		1	
	Eastern phoebe	<i>Sayornis phoebe</i>		1, 2, 5, 11, 12, 13	X
	Great-crested flycatcher	<i>Myiarchus crinitus</i>		1, 3, 8, 11, 13	X
	Eastern kingbird	<i>Tyrannus tyrannus</i>		1, 3, 11	X
Laniidae Shrikes	Northern shrike	<i>Lanius excubitor</i>		1, 6	

Continued on next page.

Appendix K. Birds of the Blue Hills Reservation. (Continued)

Family	Common Name	Scientific Name	MESA ^a	Source ^b	BBA ^c
Vireonidae	Yellow-throated vireo	<i>Vireo flavifrons</i>		1	X
Vireos	Blue-headed vireo	<i>Vireo solitarius</i>		1, 11	
	Warbling vireo	<i>Vireo gilvus</i>		1, 11	X
	Philadelphia vireo	<i>Vireo philadelphicus</i>		1	
	Red-eyed vireo	<i>Vireo olivaceus</i>		1, 3, 5, 8, 11, 12, 13	X
Corvidae	Blue jay	<i>Cyanocitta cristata</i>		1, 2, 3, 4, 5, 8, 11, 13	X
Jays, Magpies, and Crows	American crow	<i>Corvus brachyrhynchos</i>		1, 5, 8, 11, 12	X
	Fish crow	<i>Corvus ossifragus</i>		1	X
	Common raven	<i>Corvus corax</i>		12	X
Hirundinidae	Purple martin	<i>Progne subis</i>		1	
Swallows	Tree swallow	<i>Tachycineta bicolor</i>		1, 2, 3, 4, 5, 6	X
	Northern rough-winged swallow	<i>Stelgidopteryx serripennis</i>		1	X
	Bank swallow	<i>Riparia riparia</i>		1	
	Cliff swallow	<i>Petrochelidon pyrrhonota</i>		1	
	Barn swallow	<i>Hirundo rustica</i>		1, 3, 5, 11, 12, 13	X
Paridae	Black-capped chickadee	<i>Poecile atricapillus</i>		1, 2, 3, 4, 5, 8, 11, 12, 13	X
Titmice	Tufted titmouse	<i>Baeolophus bicolor</i>		1, 4, 5, 8, 11, 12, 13	X
Sittidae	Red-breasted nuthatch	<i>Sitta canadensis</i>		1, 5	X
Nuthatches	White-breasted nuthatch	<i>Sitta carolinensis</i>		1, 2, 3, 5, 11, 13	X
Certhiidae	Brown creeper	<i>Certhia americana</i>		1, 5	X
Creepers					
Troglodytidae	Carolina wren	<i>Thryothorus ludovicianus</i>		1	X
Wrens	House wren	<i>Troglodytes aedon</i>		1, 5, 6, 8	X
	Winter wren	<i>Troglodytes hiemalis</i>		1, 13	X
	Marsh wren	<i>Cistothorus palustris</i>		1	
Regulidae	Golden-crowned kinglet	<i>Regulus satrapa</i>		1, 5	
Kinglets	Ruby-crowned kinglet	<i>Regulus calendula</i>		1, 2	
Silviidae	Blue-gray gnatcatcher	<i>Poliophtila caerulea</i>		1, 12	X
Gnatcatchers					
Turdidae	Eastern bluebird	<i>Sialis sialis</i>		1, 6	X
Bluebirds and Thrushes	Veery	<i>Catharus fuscescens</i>		1, 3, 5, 13	X
	Gray-cheeked thrush	<i>Catharus minimus</i>		1	
	Swainson's thrush	<i>Catharus ustulatus</i>		1	
	Hermit thrush	<i>Catharus guttatus</i>		1, 5, 12, 13	X
	Wood thrush ^d	<i>Hylocichla mustelina</i>		1, 3, 5, 11, 12, 13	X
	American robin	<i>Turdus migratorius</i>		1, 2, 3, 4, 5, 8, 11, 12, 13	X
Mimidae	Gray catbird	<i>Dumetella carolinensis</i>		1, 3, 4, 5, 8, 11, 12, 13	X
Mimic Thrushes	Northern mockingbird	<i>Mimus polyglottos</i>		1, 4, 5, 8	X
	Brown thrasher ^d	<i>Toxostoma rufum</i>		1, 3, 4, 5, 8	X
Sturnidae	European starling	<i>Sturnis vulgaris</i>		1, 2, 3, 5, 6, 12	X
Starlings					
Bombycillidae	Cedar waxwing	<i>Bombycilla cedrorum</i>		1, 2, 4, 5	X
Waxwings					
Parulidae	Blue-winged warbler ^d	<i>Vermivora cyanoptera</i>		1	X
Wood Warblers	Golden-winged warbler ^d	<i>Vermivora chrysoptera</i>	E	1, 3	
	Tennessee warbler	<i>Oreothlypis peregrina</i>		1	
	Orange-crowned warbler	<i>Oreothlypis celata</i>		1	
	Nashville warbler	<i>Oreothlypis ruficapilla</i>		1	
	Northern parula ^d	<i>Parula americana</i>	T	1, 3, 11	

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Appendix K. Birds of the Blue Hills Reservation. (Continued)

Family	Common Name	Scientific Name	MESA ^a	Source ^b	BBA ^c
Parulidae (continued) Wood Warblers	Yellow warbler	<i>Dendroica petechia</i>		1, 3, 5, 11	X
	Chestnut-sided warbler	<i>Dendroica pensylvanica</i>		1, 2	X
	Magnolia warbler	<i>Dendroica magnolia</i>		1, 11	
	Cape May warbler	<i>Dendroica tigrina</i>		1	
	Black-throated blue warbler	<i>Dendroica caerulescens</i>		1, 5, 11	
	Yellow-rumped warbler	<i>Dendroica coronata</i>		1, 2, 11	
	Black-throated green warbler	<i>Dendroica virens</i>		1, 3, 5, 11, 13	X
	Blackburnian warbler	<i>Dendroica fusca</i>		1	
	Pine warbler	<i>Dendroica pinus</i>		1, 11, 12, 13	X
	Prairie warbler ^d	<i>Dendroica discolor</i>		1, 4, 8, 12, 13	X
	Palm warbler	<i>Dendroica palmarum</i>		1, 2	
	Bay-breasted warbler	<i>Dendroica castanea</i>		1, 3	
	Blackpoll warbler ^d	<i>Dendroica striata</i>	SC	1, 3	
	Black-and-white warbler	<i>Mniotilta varia</i>		1, 3, 5, 11, 13	X
	American redstart	<i>Setophaga ruticilla</i>		1, 5, 11	X
	Worm-eating warbler	<i>Helminthos vermivorus</i>		1, 3	X
	Ovenbird	<i>Seiurus aurocapilla</i>		1, 3, 5, 11, 12, 13	X
	Northern waterthrush	<i>Parkesia noveboracensis</i>		1	X
	Louisiana waterthrush ^d	<i>Parkesia motacilla</i>		1	X
	Mourning warbler	<i>Oporornis philadelphia</i>		1	
	Common yellowthroat	<i>Geothlypis trichas</i>		1, 3, 4, 5, 8, 11, 12	X
	Hooded warbler	<i>Wilsonia citrina</i>		8	
	Wilson's warbler	<i>Wilsonia pusilla</i>		1	
	Canada warbler ^d	<i>Wilsonia canadensis</i>		1	
Emberizidae Towhees, Sparrows, and Allies	Eastern towhee ^d	<i>Pipilo erythrophthalmus</i>		1, 4, 8, 11, 12, 13	X
	American tree sparrow	<i>Spizella arborea</i>		1, 3, 4, 5, 6	
	Chipping sparrow	<i>Spizella passerina</i>		1, 3, 5, 11, 12, 13	X
	Field sparrow ^d	<i>Spizella pusilla</i>		1, 4, 5, 8, 13	X
	Vesper sparrow ^d	<i>Pooecetes gramineus</i>	T	1, 2	
	Savannah sparrow	<i>Passerculus sandwichensis</i>		1, 2	X
	Grasshopper sparrow ^d	<i>Ammodramus savannarum</i>	T	1	
	Fox sparrow	<i>Passerella iliaca</i>		1	
	Song sparrow	<i>Melospiza melodia</i>		1, 2, 8, 11	X
	Lincoln's sparrow	<i>Melospiza lincolni</i>		1	
	Swamp sparrow	<i>Melospiza georgiana</i>		1, 2	X
	White-throated sparrow ^d	<i>Zonotrichia albicollis</i>		1, 4, 5	
	White-crowned sparrow	<i>Zonotrichia leucophrys</i>		1	
	Dark-eyed junco	<i>Junco hyemalis</i>		1, 2, 5	
Cardinalidae Tanagers, Grosbeaks, and Buntings	Scarlet tanager	<i>Piranga olivacea</i>		1, 3, 5, 8, 11, 13	X
	Northern cardinal	<i>Cardinalis cardinalis</i>		1, 4, 5, 8, 11, 12, 13	X
	Rose-breasted grosbeak	<i>Pheucticus ludovicianus</i>		1, 5, 11, 12	X
	Indigo bunting	<i>Passerina cyanea</i>		1, 3, 4, 5, 8, 12, 13	X
Icteridae Blackbirds, Orioles, and Allies	Bobolink	<i>Dolichonyx oryzivorus</i>		1, 11	
	Red-winged blackbird	<i>Agelaius phoeniceus</i>		1, 8, 11, 12	X
	Eastern meadowlark	<i>Sturnella magna</i>		1, 2, 3, 4, 5	X
	Rusty blackbird	<i>Euphagus carolinus</i>		1	
	Common grackle	<i>Quiscalus quiscula</i>		1, 2, 3, 4, 5, 8, 11, 12	X
	Brown-headed cowbird	<i>Molothrus ater</i>		1, 2, 4, 5, 11, 12	X
	Orchard oriole	<i>Icterus spurius</i>		1	X
	Baltimore oriole	<i>Icterus galbula</i>		1, 3, 5, 8, 11, 12	X

Continued on next page.

Appendix K. Birds of the Blue Hills Reservation. (Continued)

Family	Common Name	Scientific Name	MESA ^a	Source ^b	BBA ^c
Fringillidae	Pine grosbeak	<i>Pinicola enucleator</i>		1, 5	
Fringilline Finches	Purple finch	<i>Carpodacus purpureus</i>		1, 2, 5	X
	House finch	<i>Carpodacus mexicanus</i>		1	X
	Red crossbill	<i>Loxia curvirostra</i>		1	
	White-winged crossbill	<i>Loxia leucoptera</i>		1	
	Common redpoll	<i>Acanthis flammea</i>		1	
	Pine siskin	<i>Spinus pinus</i>		1	X
	American goldfinch	<i>Spinus s tristis</i>		1, 2, 3, 5, 11, 12, 13	X
	Evening grosbeak	<i>Coccothraustes vespertinus</i>		1	
Passeridae	House Sparrow	<i>Passer domesticus</i>		1, 2, 3, 5, 6, 12	X
Old World Finches					

- a. Status of birds listed under the Massachusetts Endangered Species Act (MESA): E = Endangered; T = Threatened; and SC = Species of Special Concern.
- b. Information in this table was obtained from the following sources:
1. Massachusetts Audubon Society (1993). This checklist includes information from both the Blue Hills Reservation and the Fowl Meadow portion of the Neponset River Reservation.
 2. Anonymous (1960a).
 3. Anonymous (1960b).
 4. Morimoto (1986).
 5. Conley (1988).
 6. Smith (1996).
 7. Observed by RMP Planner in 2009.
 8. Anonymous (n.d.).
 9. Smith (2010).
 10. McWade and Conrad (1995)
 11. Trimitsis (2008a).
 12. Trimitsis (2008b).
 13. Joslin (2010).
 14. Zollo (2009).
 15. McWade (2011).
- c. Breeding Bird Atlas (BBA) data for the Norwood 07, Norwood 08, and Norwood 10 blocks, as of January 31, 2011 (Patuxent Wildlife Research Center and the Massachusetts Audubon society 2011); most of the Blue Hills Reservation is located within these blocks. Species identified with an "X" were recorded on or near the reservation during the 2007 – 2010 breeding seasons.
- d. This species has been designated a "Species in Greatest Need of Conservation" by MassWildlife (2006; Appendix J).

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Appendix L. Mammals of the Blue Hills Reservation.

The following mammals occur, or may occur, on the Blue Hills Reservation. Family, common, and scientific names and the sequence in which they are presented follow Cardoza et al. (2009).

Family	Common Name	Scientific Name	MESA ^a	Status ^b	Source ^c
Didelphidae New World Opossums	Virginia opossum	<i>Didelphis virginiana</i>		Probable	1
Sciuridae Tree Squirrels and Marmots	Eastern gray squirrel	<i>Sciurus carolinensis</i>		Confirmed	1, 4, 7
	Red squirrel	<i>Tamiasciurus hudsonicus</i>		Confirmed	1, 4, 6, 7
	Southern flying squirrel	<i>Glaucomys volans</i>		Confirmed	7
	Woodchuck	<i>Marmota monax</i>		Confirmed	1, 4, 10
	Eastern chipmunk	<i>Tamias striatus</i>		Confirmed	1, 2, 3, 4, 7
Castoridae Beavers	American beaver	<i>Castor canadensis</i>		Possible	1
Dipodidae Jumping Mice	Meadow jumping mouse	<i>Zapus hudsonius</i>		Confirmed	2, 7
Cricetidae Mice, Voles, and Lemmings	Meadow vole	<i>Microtus pennsylvanicus</i>		Confirmed	1, 2, 3, 7
	Woodland vole	<i>Microtus pinetorum</i>		Confirmed	1, 2, 3
	Southern red-backed vole	<i>Myodes gapperi</i>		Probable	
	Common muskrat	<i>Ondatra zibethicus</i>		Confirmed	4, 10
	Southern bog lemming ^d	<i>Synaptomys cooperi</i>	SC	Possible	
	White-footed deer mouse	<i>Peromyscus leucopus</i>		Confirmed	1, 2, 3, 7
	North American deer mouse ^e	<i>Peromyscus maniculatus</i>		Unlikely	7
Muridae Old World Rats and Mice	House mouse	<i>Mus musculus</i>		Probable	1
	Brown rat	<i>Rattus norvegicus</i>		Probable	
	Roof (black) rat ^e	<i>Rattus rattus</i>		Unlikely	7
Erethizontidae New World Porcupines	Common porcupine	<i>Erethizon dorsatum</i>		Possible	
Leporidae Hares and Rabbits	Snowshoe hare	<i>Lepus americanus</i>		Possible	
	Eastern cottontail	<i>Sylvilagus floridanus</i>		Confirmed	1, 2, 7
	New England cottontail ^{d, f}	<i>Sylvilagus transitionalis</i>		Possible	1
Soricidae Shrews	Northern short-tailed shrew	<i>Blarina brevicauda</i>		Confirmed	1, 2, 3, 7
	Cinereus shrew	<i>Sorex cinereus</i>		Confirmed	1, 2
Talpidae Moles and Shrew-moles	Star-nosed mole	<i>Condylura cristata</i>		Probable	
Vespertilionidae Vesper Bats	Big brown bat	<i>Eptesicus fuscus</i>		Probable	
	Eastern red bat ^d	<i>Lasiurus borealis</i>		Probable	
	Hoary bat ^d	<i>Lasiurus cinereus</i>		Probable	
	Eastern pipistrelle	<i>Pipistrellus subflavus</i>		Probable	
	Silver-haired bat ^d	<i>Lasionycteris noctivagans</i>		Probable	
	Little brown myotis	<i>Myotis lucifugus</i>		Probable	
	Northern myotis	<i>Myotis septentrionalis</i>		Probable	
Felidae Cats	Domestic cat (feral)	<i>Felis catus</i>		Probable	
	Bobcat ^d	<i>Lynx rufus</i>		Possible	
Canidae Dogs, Foxes, and Wolves	Coyote	<i>Canis latrans</i>		Confirmed	8, 10
	Domestic dog (feral)	<i>Canis lupus familiaris</i>		Possible	
	Gray fox	<i>Urocyon cinereoargenteus</i>		Probable	
	Red fox	<i>Vulpes vulpes</i>		Confirmed	1, 4, 10
Ursidae Bears	American black bear ^d	<i>Ursus americanus</i>		Possible	5

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Appendix L. Mammals of the Blue Hills Reservation. (Continued)

Family	Common Name	Scientific Name	MESA ^a	Status ^b	Source ^c
Mustelidae	North American river otter	<i>Lontra canadensis</i>		Probable	
Weasels, Minks, Martens, and Otters	Fisher	<i>Martes pennanti</i>		Confirmed	9
	Ermine	<i>Mustela erminea</i>		Confirmed	1, 4, 7
	Long-tailed weasel	<i>Mustela frenata</i>		Confirmed	1, 4
	American mink	<i>Neovison vison</i>		Confirmed	7
Mephitidae	Striped skunk	<i>Mephitis mephitis</i>		Confirmed	1, 4
Skunks					
Procyonidae	Raccoon	<i>Procyon lotor</i>		Confirmed	1, 4, 10
Raccoons, Coatis, and Ringtails					
Cervidae	White-tailed deer	<i>Odocoileus virginianus</i>		Confirmed	6, 10
Deer, Elk, and Moose					

- a. Status of mammals listed under the Massachusetts Endangered Species Act (MESA): E = Endangered; T = Threatened; and SC = Species of Special Concern.
- b. Status indicates whether or not these species have been confirmed as occurring on the reservation (Confirmed); are likely to occur on the reservation due to a species' geographic range and habitat requirements (Probable); have a slight chance of occurring on the reservation due to geographic range, habitat requirements, or rarity (Possible); or are unlikely to occur on the reservation because it occurs outside of the species' known range (Unlikely).
- c. Information contained in this table was obtained from the following sources:
 1. Conley (1988).
 2. Eck (1990).
 3. Eck and Hollenbeck (1990).
 4. Friends of the Blue Hills (1980).
 5. N. Smith (2009) reported black bear tracks at the nearby Fowl Meadow portion of the Neponset River Reservation
 6. Species observed by RMP Program staff (2008).
 7. Morley (2009).
 8. Catinella (2009).
 9. Twining (2009a).
 10. Echandi (2011a).
- d. This species has been designated a "Species in Greatest Need of Conservation" by MassWildlife (2006; Appendix J).
- e. Although reported for the Blue Hills by Morley (2009), Cardoza et al. (2009) indicate that this species does not occur in the vicinity of the Blue Hills.
- f. Although not listed under MESA, this species has been designated a candidate for listing under the U.S. Endangered Species Act.

Appendix M. Reptiles of the Blue Hills Reservation.

The following reptiles occur, or may occur, on the Blue Hills Reservation. Family, common, and scientific names and the sequence in which they are presented follow Cardoza and Mirick (2009).

Family	Common Name	Scientific Name	MESA ^a	Status ^b	Source ^c
Chelydridae Snapping Turtles	Snapping turtle	<i>Chelydra serpentina</i>		Confirmed	2, 5, 9, 11
Kinosternidae American Mud and Musk Turtles	Eastern musk turtle	<i>Sternotherus odoratus</i>		Probable	
Emydidae Pond Turtles	Painted turtle	<i>Chrysemys picta</i>		Confirmed	2, 5, 6, 9, 10
	Spotted turtle ^d	<i>Clemmys guttata</i>		Confirmed	2, 4, 9, 10
	Wood turtle ^d	<i>Gleptemys insculpta</i>	SC	Possible	2
	Blanding's turtle ^d	<i>Emydoidea blandingii</i>	T	Confirmed	4, 7
	Eastern box turtle ^d	<i>Terrapene carolina</i>	SC	Probable	
	Red-eared slider	<i>Trachemys scripta</i>		Confirmed	10
Colubridae Harmless Snakes	North American racer ^d	<i>Coluber constrictor</i>		Confirmed	1, 2, 5, 9, 11
	Ring-necked snake	<i>Diadophis punctatus</i>		Confirmed	8, 9, 11
	Eastern hog-nosed snake ^d	<i>Heterodon platirhinos</i>		Confirmed	5
	Milksnake	<i>Lampropeltis triangulum</i>		Confirmed	2, 5, 6, 9, 11
	Northern water snake ^d	<i>Nerodia sipedon</i>		Confirmed	1, 2, 3, 5, 9, 11
	Smooth green snake	<i>Opheodrys vernalis</i>		Probable	2
	DeKay's brown snake	<i>Storeria dekayi</i>		Probable	9
	Red-bellied snake	<i>Storeria occipitomaculata</i>		Probable	2
	Eastern ribbon snake ^d	<i>Thamnophis sauritus</i>		Confirmed	2, 5, 6, 9
	Common garter snake	<i>Thamnophis sirtalis</i>		Confirmed	2, 5, 6, 9, 11
Viperidae Vipers and Pit Vipers	Copperhead ^d	<i>Agkistrodon contortrix</i>	E	Confirmed	4, 9
	Timber rattlesnake ^d	<i>Crotalus horridus</i>	E	Confirmed	4, 5

- Status of reptiles listed under the Massachusetts Endangered Species Act (MESA): E = Endangered; T = Threatened; and SC = Species of Special Concern.
- Status indicates whether or not these species have been confirmed as occurring on the reservation (Confirmed), are likely to occur on the reservation due to a species' geographic range and habitat requirements (Probable), or have a slight chance of occurring on the reservation due to geographic range, habitat requirements, or rarity (Possible).
- Information contained in this table was obtained from the following sources:
 - Hollenbeck and Eck (1986).
 - Conley (1988).
 - McWade and Conrad (1995).
 - NHESP (2007a).
 - Friends of the Blue Hills (1980).
 - Martinez (1996).
 - Mello and Patenaude (1994).
 - McCasland (2009a).
 - Jackson et al. (2010). Species confirmed at the block level are considered "Probable" for the Blue Hills if that block includes a portion of the reservation.
 - Echandi (2010a).
 - Echandi (2011a).
- This species has been designated a "Species in Greatest Need of Conservation" by MassWildlife (2006; Appendix J).

Appendix N. Amphibians of the Blue Hills Reservation.

The following amphibians occur, or may occur, on the Blue Hills Reservation. Family, common, and scientific names and the sequence in which they are presented follow Cardoza and Mirick (2009).

Family	Common Name	Scientific Name	MESA ^a	Status ^b	Source ^c
Ambystomatidae	Blue-spotted salamander ^d	<i>Ambystoma laterale</i>	SC	Possible	
Mole Salamanders	Spotted salamander	<i>Ambystoma maculatum</i>		Confirmed	1, 2, 4, 6, 7, 8, 10, 11, 12
	Marbled salamander ^d	<i>Ambystoma opacum</i>	T	Confirmed	3, 5, 11
Salamandridae	Eastern newt	<i>Notophthalmus viridescens</i>		Confirmed	10, 11
Newts					
Plethodontidae	Northern dusky salamander ^e	<i>Desmognathus fuscus</i>		Probable	8
Lungless Salamanders	Eastern red-backed salamander	<i>Plethodon cinereus</i>		Confirmed	1, 2, 7, 8, 10, 11
	Four-toed salamander ^d	<i>Hemidactylium scutatum</i>		Confirmed	3
	Northern two-lined salamander	<i>Eurycea bislineata</i>		Confirmed	7, 9, 10, 11
Pelobatidae	Eastern spadefoot ^d	<i>Scaphiopus holbrookii</i>	T	Possible	
Spadefoot Toads					
Bufonidae	American toad	<i>Anaxyrus americanus</i>		Confirmed	1, 2, 6, 7, 10, 11
True Toads	Fowler's toad	<i>Anaxyrus fowleri</i>		Probable	1, 6
Hylidae	Spring peeper ^f	<i>Pseudacris crucifer</i>		Confirmed	6, 7, 10, 11, 12
True Tree Frogs	Gray treefrog ^f	<i>Hyla versicolor</i>		Confirmed	8, 11
Ranidae	American bullfrog	<i>Lithobates catesbeianus</i>		Confirmed	1, 7, 8, 11, 12
True Frogs	Green frog	<i>Lithobates clamitans</i>		Confirmed	1, 2, 7, 8, 10, 11
	Pickerel frog	<i>Lithobates palustris</i>		Confirmed	2, 7, 10, 11
	Northern leopard frog ^d	<i>Lithobates pipiens</i>		Confirmed	1, 2, 8, 11
	Wood frog	<i>Lithobates sylvaticus</i>		Confirmed	1, 2, 4, 6, 7, 8, 10, 11, 12

- Status of amphibians listed under the Massachusetts Endangered Species Act (MESA): E = Endangered; T = Threatened; and SC = Species of Special Concern.
- Status indicates whether or not these species have been confirmed as occurring on the reservation (Confirmed), are likely to occur on the reservation due to a species' geographic range and habitat requirements (Probable), or have a slight chance of occurring on the reservation due to geographic range, habitat requirements, or rarity (Possible).
- Information contained in this table was obtained from the following sources:
 - Conley (1988).
 - McWade and Conrad (1995).
 - Natural Heritage and Endangered Species Program (2007a).
 - Twining (2007).
 - Martinez (2008).
 - Twining (2009b).
 - McWade et al. (1996).
 - Friends of the Blue Hills (1980).
 - Beaulieu (2009).
 - Martinez (1996).
 - Jackson et al (2010). Species confirmed at the block level are considered "Probable" for the Blue Hills if the block includes a portion of the reservation.
 - Echandi (2011a).
- This species has been designated a "Species in Greatest Need of Conservation" by MassWildlife (2006; Appendix J).
- Friends of the Blue Hills (1980) reported a "dusty salamander." It is not known if this refers to the northern dusky salamander.
- Friends of the Blue Hills (1980) reported a "tree frog," but did not distinguish between spring peepers and gray treefrogs, both of which are true tree frogs and occur on the reservation.

Appendix O. Fish of the Blue Hills Reservation.

The following fish have been recorded in the waters of the Blue Hills Reservation. Family, common, and scientific names follow NatureServe (2009).

Family	Common Name	Scientific Name	Pond/Stream ^a	Source ^b
Catostomidae	Creek chubsucker	<i>Erimyzon oblongus</i>	PT	9
	Lake chubsucker	<i>Erimyzon sucetta</i>	H	1, 3
Centrarchidae	Banded sunfish	<i>Enneacanthus obesus</i>	P	9
	Pumpkinseed	<i>Lepomis gibbosus</i>	H, P	1, 2, 3, 4, 5, 7, 9
	Bluegill	<i>Lepomis macrochirus</i>	H, P	4, 5, 7, 9
	Largemouth bass	<i>Micropterus salmoides</i>	H, P	1, 4, 5, 7, 9
	Smallmouth bass	<i>Micropterus dolomieu</i>	H	1, 3
	Black crappie	<i>Pomoxis nigromaculatus</i>	P	8
Cyprinidae	Goldfish	<i>Carassius auratus</i>	H	3
	Golden shiner	<i>Notemigonus crysoleucas</i>	H, HS, P	1, 2, 3, 5, 8, 9
Esocidae	Chain Pickerel	<i>Esox niger</i>	H, P, PT	1, 2, 3, 5, 7, 8, 9
	Redfin pickerel	<i>Esox americanus</i>	H, P	3, 5, 7
	Northern pike	<i>Esox lucius</i>	P	6
Ictaluridae	Brown bullhead	<i>Ameiurus nebulosus</i>	H	1, 2, 3, 4
Moronidae	White perch	<i>Morone americana</i>	H	1
Percidae	Swamp Darter	<i>Etheostoma fusiforme</i>	HS, P, PT	9
	Yellow perch	<i>Perca flavescens</i>	H, P	1, 3, 5, 7, 8, 9
Salmonidae	Brown trout	<i>Salmo trutta</i>	H	3
	Rainbow trout	<i>Oncorhynchus mykiss</i>	H	4

a. Fish were identified from Houghton's (H), Hillside (HS), and Ponkapoag (P) ponds, and from Pine Tree Brook (PT).

b. Information contained in this table was obtained from the following sources:

1. Stroud (1952).
2. Anonymous (1962).
3. Dixon (1966).
4. MassWildlife (1983).
5. MassWildlife (1975).
6. MassWildlife (1979a).
7. MassWildlife (1979b).
8. Gershman (1981).
9. Harvard University Museum of Comparative Zoology (2010).

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Appendix P. Butterflies and Moths of the Blue Hills Reservation.

The following butterflies and moths have been recorded on the Blue Hills Reservation. Butterfly taxonomy and common names follow Opler et al. (2009). Taxonomy of Noctuoidea moths follows Lafontaine and Schmidt (2010); other moth taxonomy follows NatureServe (2009).

Family ^a		Common Name ^a	Scientific Name	MESA ^b	Source ^c
BUTTERFLIES					
Hesperiidae	Spread-wing Skippers	Hoary edge	<i>Achalarus lyciades</i>		1, 5, 6
		Silver-spotted skipper	<i>Epargyreus clarus</i>		1, 5, 6, 7, 8, 20
		Wild indigo duskywing	<i>Erynnis baptisiae</i>		9
		Sleepy duskywing	<i>Erynnis brizo</i>		14
		Horace's duskywing	<i>Erynnis horatius</i>		1, 7, 8, 10, 11, 14, 16, 18
		Dreamy duskywing	<i>Erynnis icelus</i>		14
		Juvenal's duskywing	<i>Erynnis juvenalis</i>		1, 9, 10, 11, 14, 16, 18
		Unidentified duskywing	<i>Erynnis sp.</i>		11
		Dun skipper	<i>Euphyes vestris</i>		8
		Common sootywing	<i>Pholisora catullus</i>		17
		Southern cloudywing	<i>Thorybes bathyllus</i>		5, 6
		Northern cloudywing	<i>Thorybes pylades</i>		1, 9
		Unidentified cloudywing	<i>Thorybes sp.</i>		5
	Grass Skippers	Pepper and salt skipper	<i>Amblyscirtes hegon</i>		11
		Delaware skipper	<i>Anatrytone logan</i>		7
		Least skipper	<i>Ancyloxypha numitor</i>		6
		Dusted skipper	<i>Atrytonopsis hianna</i>		9
		Cobweb skipper	<i>Hesperia metea</i>		10, 18
		Peck's skipper	<i>Polites coras</i>		1, 17
		Tawny-edged skipper	<i>Polites themistocles</i>		9, 17
		Little glassywing	<i>Pompeius verna</i>		5, 6, 7, 8
		European skipper	<i>Thymelicus lineola</i>		1, 5, 6
		Northern broken-dash	<i>Wallegrenia egeremet</i>		1, 17
Papilionidae	Swallowtails	Eastern tiger swallowtail	<i>Papilio glaucus</i>		5, 6, 9, 10, 11, 14, 16, 17, 18, 20
		Black swallowtail	<i>Papilio polyxenes</i>		5, 6, 7, 8, 9, 10, 11, 18, 20
		Spicebush swallowtail	<i>Papilio troilus</i>		1, 5, 7, 8, 11, 14, 17, 18, 20
Pieridae	Sulphurs	Orange sulphur	<i>Colias eurytheme</i>		1, 5, 7, 8, 9, 17
		Clouded sulphur	<i>Colias philodice</i>		1, 6, 8, 9
		Cabbage white	<i>Pieris rapae</i>		1, 5, 6, 7, 8, 10, 11, 17
Lycaenidae	Blues	Spring azure	<i>Celastrina ladon</i>		1, 9, 10, 11
		Cherry gall azure	<i>Celastrina serotina</i>		11
		Unidentified azure	<i>Celastrina sp.</i>		5, 6, 7, 11
		Eastern tailed-blue	<i>Cupido cornyntas</i>		5, 6, 7, 8, 9, 14, 16
	Coppers	Bog copper	<i>Lycaena epixanthe</i>		1, 2, 13
		American copper	<i>Lycaena phlaeas</i>		1, 5, 6, 7, 8, 9, 11
	Hairstreaks	Brown elfin	<i>Callophrys augustinus</i>		10, 18
		Juniper hairstreak	<i>Callophrys gryneus</i>		8, 11
		Eastern pine elfin	<i>Callophrys niphon</i>		10, 11
		Henry's elfin	<i>Incisalia henrici henrici</i>		1, 2, 13
		Hessel's hairstreak	<i>Mitoura (Callophrys) hesseli</i>	SC	1, 2, 4, 11, 12, 13
		White M hairstreak	<i>Parrhasius m-album</i>		11
		Banded hairstreak	<i>Satyrrium calanus falacer</i>		1, 5, 6, 8
		Edwards' hairstreak	<i>Satyrrium edwardsii</i>		1, 5, 6, 7, 8
		Oak hairstreak	<i>Satyrrium favonius</i>	SC	12
		Striped hairstreak	<i>Satyrrium lipaprops</i>		1, 6
		Coral hairstreak	<i>Satyrrium titus</i>		7, 8
		Gray hairstreak	<i>Strymon melinus</i>		5, 8, 11, 14, 16

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Appendix P. Butterflies and Moths of the Blue Hills Reservation. (Continued)

Family ^a		Common Name ^a	Scientific Name	MESA ^b	Source ^c		
Nymphalidae	Admirals and Relatives	Viceroy	<i>Limenitis archippus</i>		5, 16, 17		
		Red-spotted purple	<i>Limenitis arthemis</i>		5, 16, 17, 20		
	Longwings	Great spangled fritillary	<i>Speyeria cybele</i>		5, 7		
	Milkweed Butterflies	Monarch	<i>Danaus plexippus</i>		5, 6, 7, 8, 9, 17		
	Satyrs and Wood-Nymphs	Common wood nymph	<i>Cercyonis pegala</i>		7		
		Common ringlet	<i>Coenonympha tullia</i>		9, 17		
		Little wood-satyr	<i>Megisto cymela</i>		9		
	True Brushfoots	Appalachian brown	<i>Satyroides appalachia</i>		1		
		Common buckeye	<i>Junonia coenia</i>		8		
		Mourning cloak	<i>Nymphalis antiopa</i>		1, 11		
		Red admiral	<i>Vanessa atlanta</i>		5, 6, 7, 18		
		Painted lady	<i>Vanessa cardui</i>		5, 6, 7, 8, 11, 18		
		American lady	<i>Vanessa virginiensis</i>		6, 7, 8, 9, 11, 14, 16, 17, 18, 20		
		MOTHS					
		Family	Species # ^d	Common Name ^a	Scientific Name	MESA ^b	Source ^c
Limacodidae		238700-4653	Red-crossed button slug	<i>Tortricidia pallida</i>		14	
	238750-4654	Abbreviated button slug moth	<i>Tortricida flexuosa</i>		14, 16		
	238900-4657	Red-eyed button slug moth	<i>Heterogenea shurtleffi</i>		14		
	239000-4659	Jeweled tailed slug moth	<i>Packardia geminata</i>		14		
	239100-4661	Elegant tailed slug moth	<i>Packardia elegans</i>		20		
	239300-4665	Yellow-shouldered button slug moth	<i>Lithacodes fasciola</i>		14		
	239550-4669	Shagreened slug moth	<i>Apoda biguttata</i>		14, 20		
	239650-4671	Skiff moth	<i>Prolimacodes badia</i>		14, 20		
	239950-4677	Hag moth	<i>Phobetron pithecium</i>		14, 16		
	240150-4681	Crowned slug moth	<i>Isa textula</i>		14, 16, 17, 20		
240350-4685	Purple-crested slug moth	<i>Adoneta spinuloides</i>		14, 20			
Drepanidae	329000-6251	Arched hooktip	<i>Drepana arcuata</i>		4		
Geometridae	329550-7009	Horned spanworm	<i>Nematocampa resistaria</i>		13		
	332200-6273E	Lesser maple spanworm moth	<i>Itame pustularia</i>		13		
	332900-6321B	-	<i>Epelis truncataria</i>		4		
	333300-6326B	Common angle	<i>Macaria aemulitaria</i>		4		
	333550-6342B	Red-headed inchworm	<i>Macaria bisignata</i>		4, 13		
	334250-6347E	White pine angle	<i>Macaria pinistrobata</i>		4		
	337000-6405E	Hollow-spotted angle	<i>Digrammia gnophosaria</i>		13		
	346200-6583E	Pale-winged gray	<i>Anacamptode ephyraria</i>		13		
	346500-6588E	Bent-line gray	<i>Iridopsis larvaria</i>		13		
	346600-6590B	Common gray	<i>Anavitrinelia pampinaria</i>		13		
	347000-6598E	Porcelain gray	<i>Protoaboarmia porcelaria</i>		13		
	348150-6621E	Signate melanolophia	<i>Melanolophia signataria</i>		4		
	349850-6654E	One-spotted variant	<i>Hypagyrtis unipunctata</i>		13		
	353800-6725E	Muzaria euchaena	<i>Euchaena muzaria</i>		13		
	354950-6748B	Hubner's Pero	<i>Pero hubneraria</i>		13		
	355800-6763E	Oak beauty	<i>Nacophora quernaria</i>		4		
	357450-6796B	Pale beauty	<i>Campaea perlata</i>		13		
	357500-6797E	Maple spanworm	<i>Ennomos magnaria</i>		13		
	357600-6798E	Elm spanworm moth	<i>Ennomos subsignaria</i>		13		
	358000-6806E	-	<i>Tacparia atropunctata</i>		4, 13		
	359150-6830E	Coastal swamp metarranthis	<i>Metarranthis pilosaria</i>	SC	2, 12, 13		
	359400-6834E	-	<i>Cepphis decoloraria</i>		13		

Continued on next page.

Appendix P. Butterflies and Moths of the Blue Hills Reservation. (Continued)

Family	Species # ^d	Common Name ^a	Scientific Name	MESA ^b	Source ^c
Geometridae (continued)		-	<i>Probole</i> sp.		4
	362200-6885B	Oak besma	<i>Besma quercivoraria</i>		13
	367250-6974E	Juniper geometer	<i>Patalene olyzonaria</i>		13
	367700-6982B	Large maple spanworm moth	<i>Prochoerode transversata</i>		13
		-	<i>Nemoria</i> sp.		16
	375350-7132B	Common tan wave	<i>Pleuroprucha insulsaria</i>		16
	375700-7139E	Sweetfern geometer	<i>Cyclophora pendulinaria</i>		13, 16
	376650-7158E	Chalky wave	<i>Scopula purata</i>		13
	379250-7206E	White eulithis	<i>Eulithis explanata</i>		13
		-	<i>Synchlora</i> sp.		16
	388800-7388E	Red twin-spot	<i>Xanthorhoe ferrugata</i>		13
	391400-7437B	Bruce spanworm	<i>Operophtera bruceata</i>		13
		-	<i>Eupithecia</i> sp.		4, 13
		-	<i>Lacosoma chiridota</i>		16
Mimallonidae	402700-7659	-			16
Lasiocampidae	404150-7687	Lappet moth	<i>Phyllodesma americana</i>		4
	404850-7701	Eastern tent caterpillar	<i>Malacosoma americanum</i>		13
Saturniidae	408850-7764	Promethea silkmoth	<i>Callosamia promethea</i>		14, 16, 20
Sphingidae	409400-7775	Carolina sphinx	<i>Manduca sexta</i>		15, 16, 17
	411550-7817	Northern pine sphinx	<i>Lapara bombycoides</i>		14, 15
	411850-7824	Blinded sphinx	<i>Paonias excaecatus</i>		15, 20
	411900-7825	Small-eyed sphinx	<i>Paonias myops</i>		14, 15, 16, 20
	411950-7826	Huckleberry sphinx	<i>Paonias astylus</i>		13
	413400-7885B	Snowberry clearwing	<i>Hemaris diffinis</i>		15, 16
	414200-7870	Abbott's sphinx	<i>Sphecodina abbottii</i>		15
	414350-7873	Nessus sphinx	<i>Amphion floridensis</i>		5
	414850-7884	Hydrangea sphinx	<i>Darapsa versicolor</i>		13
	414900-7885	Hog sphinx	<i>Darapsa myron</i>		15
Notodontidae	930019	Common Gluphisia	<i>Gluphisia septentrionis</i>		4, 13
	930024	White furcula	<i>Furcula borealis</i>		14
	930046	White-dotted prominent	<i>Nadata gibbosa</i>		20
	930049	Angulose prominent	<i>Peridea angulosa</i>		14, 16
	930067	Mottled prominent	<i>Macrurocampa marthesia</i>		14, 17, 20
	930075	Oblique heterocampa	<i>Heterocampa obliqua</i>		14
	930082	White-blotched heterocampa	<i>Heterocampa umbrata</i>		14, 16, 20
	930090	Variable oakleaf caterpillar moth	<i>Lochmaeus manteo</i>		14, 20
	930098	Morning-glory prominent	<i>Schizura ipomoeae</i>		14, 16, 17, 20
	930100	Unicorn caterpillar moth	<i>Schizura unicornis</i>		13
	930104	Black-blotched schizura	<i>Schizura leptinoides</i>		14
	930110	White-streaked prominent	<i>Oligocentria lignicolor</i>		14, 16, 20
	930141	Gypsy moth	<i>Lymantria dispar</i>		13
	930152	Cinnamon tussock moth	<i>Dasychira cinnamomea</i>		13
Erebidae	930166	Definite tussock moth	<i>Orgyia definita</i>		14
	930168	White-marked tussock moths	<i>Orgyia leucostigma</i>		13, 16
	930205	Painted lichen moth	<i>Hypoprepia fucosa</i>		13
	930219	Pale lichen moth	<i>Crambidia pallida</i>		13
	930248	Bog Tiger Moth	<i>Grammia speciosa</i>		13
	930297	Tawny holomelina	<i>Virbia opella</i>		13
	930335	Banded woollybear	<i>Pyrrharctia isabella</i>		16
	93034x	Haploa	<i>Haploa</i> sp.		14
	930469	American Idia moth	<i>Idia americalis</i>		13
	930471	Common Idia moth	<i>Idia aemula</i>		13

Continued on next page.

Appendix P. Butterflies and Moths of the Blue Hills Reservation. (Continued)

Family	Species # ^d	Common Name ^a	Scientific Name	MESA ^b	Source ^c
Erebidae (continued)	930475	Forbe's idia	<i>Idia forbesii</i>		13
	930482	Glossy black idia moth	<i>Idia lubricalis</i>		13
	930492	Variable zanclognatha moth	<i>Zanclognatha laevigata</i>		13
	930494	Dark zanclognatha	<i>Zanclognatha obscuripennis</i>		13
	930496	-	<i>Zanclognatha protumnusalis</i>		13
	93049x	-	<i>Zanclognatha</i> sp.		13
	930503	Stone-winged owlet moth	<i>Chytolita petrealis</i>		13
	930505	-	<i>Macrochilo louisiana</i>		2, 13
	930539	Sober renia moth	<i>Renia sobrialis</i>		13
	930547	Ambiguous moth	<i>Lascoria ambigualis</i>		13
	930551	Dark-spotted palthris moth	<i>Palthis angulalis</i>		13
	930562	Baltimore bomolocha moth	<i>Hypena baltimoralis</i>		13
	930588	Green cloverworm moth	<i>Hypena scabra</i>		13
	930591	-	<i>Melanomma auricinctaria</i>		13
	930662	Broken line hypenodes	<i>Hypenodes fractilinea</i>		13
	930663	-	<i>Hypenodes palustris</i>		13
	930670	Spot-edged dysparalis moth	<i>Dyspryalis puncticosta</i>		13
	930679	Common fungus moth	<i>Metalectra discalis</i>		13
	930731	Yellow-spotted graylet	<i>Hyperstrotia flaviguttata</i>		13
	930836	Gerhard's underwing	<i>Catocala herodias gerhardi</i>	SC	19
	930845	Woody underwing	<i>Catocala grynea</i>		13
	930923	Clover looper moth	<i>Caenurgina crassiuscula</i>		16
	930961	Maple looper moth	<i>Parallelia bistriaris</i>		13
	931053	Horrid zale	<i>Zale horrida</i>		13
	931089	Red-lined panopoda	<i>Panopoda rufimargo</i>		14
	931090	Brown panopoda	<i>Panopoda carneicosta</i>		14
Nolidae	931136	Nola moth	<i>Nola clethrae</i>		4
Noctuidae	931186	Formosa looper moth	<i>Chrysanympa formosa</i>		13
	931188	Pitcher plant moth	<i>Exyra fax</i>		2, 13
	931289	Bog lithacodia	<i>Deltote bellicula</i>		4, 13
	931291	Pale lithacodia	<i>Protodeltote albidula</i>		13
	931291	Pale lithacodia	<i>Protodeltote albidula</i>		13
	931401	Closebanded yellowhorn moth	<i>Colocasia propinquinelinea</i>		16
	931445	Speared dagger moth	<i>Acronicta hasta</i>		16, 20
	931455	Lobelia dagger moth	<i>Acronicta lobeliae</i>		16
	931463	Speared dagger moth	<i>Acronicta ovata</i>		14
	931467	Raspberry bud dagger moth	<i>Acronicta increta</i>		14
	931478	Long-winged dagger moth	<i>Acronicta longa</i>		13
	931480	Streaked dagger	<i>Acronicta lithospila</i>		16
	931485	Smeared dagger moth	<i>Acronicta oblinata</i>		13
	931501	Tufted bird-dropping moth	<i>Cerma cerintha</i>		20
	931544	Copper underwing	<i>Amphipyra pyramidoides</i>		13
	931545	Mouse moth	<i>Amphipyra tragopoginis</i>		13
	931964	Pearly wood nymph	<i>Eudryas unio</i>		13
	931979	Eight-spotted forester	<i>Alypia octomaculata</i>		20
	932024	Water-lily borer	<i>Homophoberia cristata</i>		13
	932025	Black wedge-spot	<i>Homophoberia apicosa</i>		13
	932054	Tobacco budworm	<i>Heliothis virescens</i>		16
	932233	Festive midget	<i>Elaphria festivoides</i>		13
	932292	Brown angle shades	<i>Phlogophora periculosa</i>		13
	932333	Yellow-headed cutworm moth	<i>Apamea amputatrix</i>		13
	932443	-	<i>Helotropha reniformis</i>		13
	932467	Pitcher plant borer	<i>Papaipema apassionata</i>	SC	2, 12, 13
	932475	Osmunda borer moth	<i>Papaipema speciosissima</i>		13

Continued on next page.

Appendix P. Butterflies and Moths of the Blue Hills Reservation. (Continued)

Family	Species # ^d	Common Name ^a	Scientific Name	MESA ^b	Source ^c
Noctuidae (continued)	932517	Cattail borer	<i>Bellura obliqua</i>		13
	932547	-	<i>Lithophane thaxteri</i>		2
	932599	Foot path sawfly	<i>Metaxaglaea semitaria</i>		13
	932603	Cranberry blossom worm	<i>Epiglaea apiata</i>		4, 13
	932604	Waxed sawfly moth	<i>Chaetoglaea cerata</i>	SC	12
	932609	Scalloped sawfly	<i>Eucirroedia pampina</i>		13
	932616	Bicolored sawfly	<i>Sunira bicolorago</i>		13
	932669	Decorated owl	<i>Platypolia mactata</i>		13
	932672	American dun-bar moth	<i>Cosmia calami</i>		13
	932707	-	<i>Sutyna privata</i>		13
	932810	Bronzed cutworm moth	<i>Nephelodes minians</i>		13
	932886	Striped garden caterpillar	<i>Trichordestra legitima</i>		16
	9328xx	-	<i>Anarta cordigera</i>		4
	932933	-	<i>Mythimna oxygala</i>		13
	932935	Armyworm moth	<i>Mythimna unipunctata</i>		13
	932945	Many-lined wainscot	<i>Leucania multilinea</i>		13
	933216	Snowy dart	<i>Anicla illapsa</i>		13
	933528	Ipsilon dart	<i>Agrotis ipsilon</i>		13
	933545	-	<i>Hemipachnobia subporphyrea</i>		4, 13
	933546	-	<i>Hemipachnobia monochromatea</i>		2
	933551	European yellow underwing	<i>Noctua pronuba</i>		13
	933560	-	<i>Eurois occulta</i>		13
	933567	-	<i>Aplectoides condita</i>		2, 13
	933572	Smith's dart	<i>Xestia smithii</i>		13
	933573	Norman's dart	<i>Xestia normanianus</i>		13
	933583	-	<i>Xestia elimata</i>		13
	933586	-	<i>Anomogyna dilucida</i>		4
	933586	-	<i>Xestia dilucida</i>		13
	933624	-	<i>Coenophila opacifrons</i>		4
	933624	-	<i>Coenophila subrosea</i>		13
	933629	Pink-spotted dart	<i>Pseudohermonassa bicarnea</i>		13
	933680	Greater red dart	<i>Abagrotis alternata</i>		13

a. Species of moths often lack common names.

b. Status under the Massachusetts Endangered Species Act (MESA): E = Endangered; T = Threatened; and SC = Species of Special Concern. All state-listed species are also considered Species in Greatest Need of Conservation (MassWildlife 2006; Appendix J).

c. Information contained in this table was obtained from the following sources:

- Schweitzer (1986a).
- Schweitzer (1986b).
- Robbins (1978).
- Mello (1996).
- Champagne (2007a).
- Champagne (2007b).
- Champagne (2007c).
- Champagne (2006).
- Nielsen (2006).
- Nielsen (2008a).
- Nielsen (2008b).
- Natural Heritage and Endangered Species Program (2007a).
- Mello and Patenaude (1994).
- Jaffe (2009d).
- Jaffe (2009e).
- Jaffe (2009c).
- Jaffe (2009b).
- Jaffe (2010b).
- Jaffe (2010a).
- Jaffe (2009a).

d. Species numbers for Noctuoidea from Lafontaine and Schmidt (2010), all others from North American Moth Photographers Group (n.d.).

Appendix Q. Damselflies and Dragonflies of the Blue Hills Reservation.

The following dragonflies and damselflies have been recorded on DCR's Blue Hills Reservation. Taxonomy and common names follow Ode News (2000).

Family	Common Name	Scientific Name	MESA ^a	Source ^b
DAMSELFLIES (Zygoptera)				
Calopterygidae	Ebony jewelwing	<i>Calopteryx maculata</i>		1
Broad-wing Damselflies				
Lestiidae	Emerald spreadwing	<i>Lestes dryas</i>		3
Spread-winged Damselflies	Sweetflag spreadwing	<i>Lestes forcipatus</i>		3
	Spreadwing	<i>Lestes</i> sp.		3
	Swamp spreadwing	<i>Lestes vigilax</i>		1
Coenagrionidae	Variable dancer	<i>Agria fumipennis</i>		1, 3
Narrow-winged Damselflies	Aurora damsel	<i>Chromagrion conditum</i>		1, 3
	Familiar bluet	<i>Enallagma civile</i>		1
	Northern bluet	<i>Enallagma cyathigerum</i>		3
	Attenuated bluet	<i>Enallagma daeckii</i>	SC ^c	1, 3
	Atlantic bluet	<i>Enallagma doubledayi</i>		1
	Stream bluet	<i>Enallagma exsulans</i>		3
	Skimming bluet	<i>Enallagma geminatum</i>		1
	New England bluet	<i>Enallagma laterale</i>	SC ^d	1, 2, 3
	Scarlet bluet	<i>Enallagma pictum</i>	T	3
	Orange bluet	<i>Enallagma signatum</i>		1, 3
	Unidentified bluet	<i>Enallagma</i> sp.		1
	Lilypad forktail	<i>Ischnura kellicotti</i>		3
	Fragile forktail	<i>Ischnura posita</i>		3
	Eastern forktail	<i>Ischnura verticalis</i>		1
	Sphagnum sprite	<i>Nehalennia gracilis</i>		3
	Sedge sprite	<i>Nehalennia irene</i>		3
DRAGONFLIES (Anisoptera)				
Aeshnidae	Common green darner	<i>Anax junius</i>		3
Darners	Springtime darner	<i>Basiaeschna janata</i>		1
	Harlequin darner	<i>Gomphaeschna furcillata</i>		1
Corduliidae	Petite emerald	<i>Dorocordulia lepida</i>		1
Emeralds	Prince baskettail	<i>Epiptera princeps</i>		1
	Williamson's emerald	<i>Somatochlora williamsoni</i>		2
Libellulidae	Calico pennant	<i>Celithemis elisa</i>		1, 3
Common Skimmers	Halloween penant	<i>Celithemis eponina</i>		3
	Eastern pondhawk	<i>Erythemis simplicicollis</i>		1, 3
	Hudsonian whiteface	<i>Leucorrhinia hudsonica</i>		1, 3
	Dot-tailed whiteface	<i>Leucorrhinia intacta</i>		1, 3
	Spangled skimmer	<i>Libellula cyanea</i>		1
	White corporal	<i>Libellula exusta</i>		1, 3
	Slaty skimmer	<i>Libellula incesta</i>		1, 3
	Widow skimmer	<i>Libellula luctuosa</i>		1
	Common whitetail	<i>Libellula lydia</i>		1
	Painted skimmer	<i>Libellula semifasciata</i>		1, 3
	Great blue skimmer	<i>Libellula vibrans</i>		1
	Elfin skimmer	<i>Nannothemis bella</i>		1, 3
	Blue dasher	<i>Pachydiplax longipennis</i>		1, 3
	Eastern amberwing	<i>Perithemis tenera</i>		1
	Ruby meadowhawk	<i>Sympetrum rubicundulum</i>		1
	Yellow-legged meadowhawk	<i>Sympetrum vicinum</i>		3

a. Status of damselflies and dragonflies listed under the Massachusetts Endangered Species Act (MESA): E = Endangered; T = Threatened; and SC = Species of Special Concern. All state-listed species are also considered Species in Greatest Need of Conservation (MassWildlife 2006; Appendix J).

b. Information contained in this table was obtained from the following sources:

1. Mello (1996).
2. Mello and Patenaude (1994).
3. ESS Group, Inc. (2007).

c. The NHESP has proposed that the status of this species be upgraded to Threatened.

d. The NHESP has proposed that this species be delisted.

Appendix R. Historic Resources of the Blue Hills Reservation.

Section ^a	Resource ^b	Type ^c	NR ^d	Condition ^e	Date ^f	MHC# ^g
LB	Stone paddock	ST	N	C	-	
LB	Hemenway bench and vista	OB	N	B	1931+	
LB	Royall Street house	BU	N	C	-	
LB	Royall Street garage	BU	N	C	-	
HE	Hemenway Pond retaining wall	ST	N	C	-	
HE	Hemenway Pond entrance pillars	ST	N	C	-	
GB	Blue Hills Reservation Comfort Station	BU	Y	A	1904	MLT.399
GB	Trailside Museum (visitor wing)	BU	N	A	1898	
GB	Trailside Museum – turtle enclosure	ST	N	C	1959	
GB	Trailside Museum – river otter enclosure	ST	N	C	1959	
GB	William F. Rogers Ski Area	LA	N	B	1935-1960	
	Compressor building	BU	N	B	c. 1960	
	First aid building foundation	ST	N	B	c. 1960	
	Lodge	BU	N	B	c. 1960	
	Maintenance garage	BU	N	B	c. 1960	
GB	Canton/Milton town boundary marker	OB	N	A	-	
GB	Blue Hill Meteorological Observatory	LA	N	A	1885-1960	
	Blue Hill Meteorological Observatory (<i>National Historic Landmark</i>)	BU	Y	B	1885	MLT.931
	Rotch Memorial	ST	N	B	1914	
	Blue Hill Meteorological Observatory wall	ST	N	B	1905	
	Blue Hill Meteorological Observatory shed	BU	N	C	-	
	WGBH Building	BU	N	A	1953	
	Summit Road	ST	N	-	-	
	Great Blue Hill pump house	ST	N	C	1913	
GB	Eliot Memorial Landscape	LA	N	C	1905-1939	
	Great Blue Hill observation tower (Eliot Pavilion)	ST	Y	C	1937-1939	MLT.929
	Eliot Memorial Bridge	ST	Y	C	1906	MLT.930
	Charles Eliot Memorial Path	ST	N	B	1904	
GB	House site (Hillside Street and Blue Hill River Road)	SI	N	C	Pre-1895	
GB	Stone well (Base Path)	ST	N	B	c. 1935	
BF	Brookwood Farm	LA	N	C	1710-1960	
	Stone walls	ST	N	B	-	
	Gate Keeper's Cottage (Caretaker's Cottage)	BU	Y	D	c. 1790	CAN.61
	Gardener's Cottage foundation	ST	N	B	c. 1800	
	Garage (tractor shed)	BU	N	A	-	
	Old barn	BU	Y	B	1840-c. 1950	CAN.62
	Culvert	ST	N	B	-	
	Entrance pillars	ST	N	A	-	
	Fields	LA	N	B	-	
	Henry Saltonstall Howe House landscape	LA	N	A	1957	
	Henry Saltonstall Howe House	BU	N	A	1957	CAN.58
	Specimen trees	LA	N	B	-	
	Allée (maple trees along drive)	LA	N	B	-	
HP	Houghton's Pond	LA	N	B	-	
	Visitor center (Sanitary)	BU	N	A	1910	
	Concession (Refreshment pavilion)	BU	Y	B	1930	MLT.398
	Granite stairs	ST	N	C	-	
	Stone retaining wall	ST	N	B	1929	
	Lawn	LA	N	B	-	
	Beach	LA	N	B	-	
HP	Water fountain (Bugbee Path)	OB	N	C	-	

Continued on next page.

Appendix R. Historic Resources of the Blue Hills Reservation. (Continued)

Section ^a	Resource ^b	Type ^c	NR ^d	Condition ^e	Date ^f	MHC#
HQ	Blue Hills Headquarters	LA	N	B	1899+	
	Blue Hills District Office	BU	N	B	pre-1895	
	Stables (Brian T. Broderick Stables); courtyard added in 1903	BU	Y	C	1899	MLT.397
	Police station	BU	Y	A	1904-1939	MLT.396
	Captain's House (Regional office)	BU	N	B	1900	
	Water fountain	OB	N	A	-	
	Drive	LA	N	A	-	
	Lawn	LA	N	A	-	
	Mature trees	LA	N	A	-	
	Hydrant	OB	N	A	-	
HQ	Quincy/Milton town boundary marker	OB	N	A	-	
OP	Operations Yard	LA	N	B	1932+	
	Blue Hills Maintenance Garage	BU	N	B	1932	
	Carpenter Shop	BU	N	B	1941	
	Office – Operation Supervisor/Deputy District Manager	BU	N	B	1960+	
	Repair Shop/Lawn Mower #1	BU	N	B	1937	
	Repair Shop/Lawn Mower #2	BU	N	B	1937	
BH	Cellar hole (Bugbee Path)	ST	N	B	Pre-1895	
BH	Stable (Randolph Avenue Stable)	BU	N	C	1908	
CH	CCC Camp SP-1	LA	N	C	1933-1937	
	Finished walls	ST	N	B	1933-1937	
	Raised foundation	ST	N	B	1933-1937	
	Mess Hall foundation	ST	N	C	1933-1937	
	Concrete bunker	ST	N	B	1933-1937	
CH	Pakomet Spring	LA	N	D	1936-1937	
CH	Glover site	LA	N	B	Pre-1895	
CH	Nike Battery BO-55 Integrated Fire Control Area (Norman Smith Environmental Education Center at Chickatawbut Hill)	LA	N	A	1953-1954	
	Dining Hall	BU	N	A	1953-1954	
	Office	BU	N	A	1953-1954	
	Dormitory	BU	N	A	1953-1954	
	Tank house	BU	N	A	1953-1954	
	Radar pad	ST	N	A	1953-1954	
CH	Chickatawbut Overlook	LA	Y	B	1935-1937	
	Chickatawbut Overlook	ST	N	B	1935	
	Stairs	ST	N	B	c. 1935	
	Grills (2)	OB	N	B	c. 1935	
	Pavilion	ST	N	B	1934	
	Observation Tower	ST	Y	B	1935	QUI.918
QQ	Quincy Quarries	LA	N	B	-	
	Granite Rail Quarry compressor house	BU	N	C	c. 1900	QUI.311
	Granite Rail Quarry 1a	ST	N	B	-	
	Granite Rail Quarry 1b	ST	N	B	-	
	Granite Rail Quarry 1c	ST	N	B	-	
	Swingle's Quarry	ST	N	B	-	
	Berry's Quarry	ST	N	B	-	
	Grotto ruin	ST	N	F	-	
	Bunker Hill Quarry	ST	N	B	-	
	Granite Railway terminus	ST	Y	B	c. 1826	QUI.932
	Elevated railway fill	ST	N	B	c. 1826	
QQ	Bunker Hill Lane house	BU	N	C	-	
QQ	Bunker Hill Lane garage	BU	N	C	-	

Continued on next page.

Appendix R. Historic Resources of the Blue Hills Reservation. (Continued)

Section ^a	Resource ^b	Type ^c	NR ^d	Condition ^e	Date ^f	MHC#
SM	St. Moritz ski jump	ST	N	B	c. 1935	
SM	Furnace Brook Parkway	LA	Y	A	1904-1907	QUI.AS
	Tree canopy	LA	Y	A	1904-1907	QUI.9084
	Extension	ST	Y	A	1904-1907	QUI.9081
	Extension greenspace miters	ST	Y	A	1904-1907	QUI.9087
	Extension miters	ST	Y	A	1904-1907	QUI.9085
	Extension culvert	ST	Y	A	1904-1907	QUI.9086
PO	Indian Line Farm stone walls	ST	N	F	-	
PO	Ponkapoag Golf Course	LA	E	B	1932-1970	CAN.Q
	Course 1	ST	E	B	1932	CAN.940
	Course 2	ST	E	A	1956	
	Club House/Locker Building	BU	E	B	1932-1958	CAN.336
	Pro House	BU	E	B	1932	CAN.337
	Shelters	ST	N	B	1969-1970	CAN.941
	Maintenance Facility	BU	N	B	1980	CAN.335
	Pump House A	ST	N	-	1932-1956	CAN.942
	Pump House B	ST	E	D	-	CAN.943
	Drainage system	ST	E	-	1932-1956	CAN.945
	Redman Farm corn crib	ST	N	B	c. 1820	
	Redman Farmhouse	BU	Y	B	c. 1820	CAN.42
	Allée (Maple Avenue)	LA	N	B	-	CAN.944
	Stone walls	ST	N	-	-	
	Trails	ST	N	-	-	
	Ezekiel Fisher saw/grist mill site	SI	E	C	-	
PO	Carpenter's House	BU	N	C	-	
PO	Randolph Street cellar hole	SI	N	F	-	
PO	Fisherman's Beach foundation pad	SI	N	F	1900+	
PO	AMC Ponkapoag Camp	LA	Y	B	1921-1960	RAN.C
	Cottage #1 (cabin 1) ^h	BU	Y	B	1922	RAN.20
	Cottage #2 (cabin 2) ^h	BU	Y	B	1926	RAN.21
	Cottage #3 (cabin 3) ^h	BU	Y	B	1929	RAN.22
	Cottage #4 (cabin 4) ^h	BU	Y	B	1930	RAN.23
PO	Boy Scout Camp	SI	N	B	c. 1953	
PO	Ponkapoag Cabin Site A	SI	N	B	-	
PO	Ponkapoag Cabin Site B	SI	N	B	-	
PO	YMCA Ponkapoag Outdoor Center (former Camp Dorchester)	LA	N	B	1923+	
PE	Nike Battery BO-55 Launcher Area	LA	N	D	1953-1954	
	Maintenance garage	BU	N	B	1953-1954	
	Sentry station	BU	N	C	1953-1954	
	Barracks foundation	ST	N	B	1953-1954	
	Generator building	BU	N	D	1953-1954	
	Garage	BU	N	D	1953-1954	
	Derrick	ST	N	B	1953-1954	
	Silos (3)	ST	N	B	1953-1954	
	Elevated shed	ST	N	B	1953-1954	

Continued on next page.

Appendix R. Historic Resources of the Blue Hills Reservation. (Continued)

Section ^a	Resource ^b	Type ^c	NR ^d	Condition ^e	Date ^f	MHC# ^g
RE	Blue Hills Reservation Parkways	LA	Y	B	1897-1930	BRA.V CAN.AG MLT.V QUI.AR
	Green Street	ST	Y	A	1930s	CAN.925 MLT.967
	Blue Hill River Road – segment one	ST	Y	A	c. 1900	CAN.924
	Blue Hill River Road – segment two	ST	Y	A	c. 1900	MLT.966
	Hillside Street	ST	Y	B	1897	MLT.964
	Unquity Road	ST	Y	A	1897	MLT.963
	Pine Tree Brook culvert	ST	Y	A	1902	MLT.968
	Chickatawbut Road	ST	Y	A	1897	BRA.927 MLT.965 QUI.9077
	Chickatawbut Road entrance gates	ST	Y	C	c. 1939	BRA.929
	Chickatawbut Overlook	ST	N	B	1935	
	Wampatuck Road	ST	Y	A	1905	QUI.9078
RE	Blue Hills Reservation culvert system	ST	Y	-	1920	BRA.928 CAN.926 MLT.969 QUI.9079
RE	Blue Hills Reservation stone wall system	ST	N	-	-	

a. Codes used to identify the different sections of the reservation are as follows: BF = Brookwood Farm; BH = Buck Hill; CH = Chickatawbut Hill; GB = Great Blue Hill; HE = Hemenway Pond; HP = Houghton's Pond; HQ = Reservation Headquarters; LB = Little Blue Hill; OP = Operations Yard; PE = Ponkapoag East; PO = Ponkapoag; QQ = Quincy Quarries; and SM = St. Moritz. The code "RE" is used to reference resources that occur across all, or most, of the reservation.

b. Secondary names are indicated in parentheses.

c. Resource types include the following: BU = Buildings; LA = Landscape; OB = Objects; SI = Sites; and ST = Structures.

d. NR = the National Register of Historic Places. Entries in this column indicate whether the resource is included in the National Register; Y = Yes, N = No, and E = Eligible (i.e., received a positive Determination of Eligibility).

e. Windshield-level Condition Assessment using Park Heritage Landscape Inventory definitions: A = Excellent: Resource is in pristine condition, regular maintenance and upkeep being performed. No evidence of major disturbance and deterioration by natural and/or human forces. No immediate corrective action is required to maintain the current condition. B = Satisfactory: Resource is physically stable and needs only minor repairs and regular maintenance. Clear evidence of minor disturbances and deterioration by natural and/or human forces. If left to continue without appropriate maintenance, the resource will deteriorate to Unsatisfactory condition. C = Unsatisfactory: Resource is heavily deteriorated with clear evidence of major disturbance and rapid deterioration by natural and/or human forces. Physically unstable constructed or vegetative features are noted. Immediate corrective action is required to prevent loss of significant historic features. If left to continue without appropriate corrective action, the resource will deteriorate to Non-Functioning condition. D = Nonfunctioning: Resource has undergone significant deterioration that prevents it from functioning as originally intended, and may contain an immediate health or safety risk. Immediate corrective action is required to prevent total loss of the resource. If left to continue without appropriate corrective action, the resource will deteriorate to Critical Failure condition. F = Critical Failure: Resource is deteriorated beyond repair, collapsed, or in ruins. May contain an immediate health or safety risk. (Note: historic features previously identified as a "ruin" and are managed as such, may have condition A-F depending on physical stability.) A dash (-) indicates a lack of information on condition.

f. Date of construction, if known. A dash (-) indicates a lack of information on the date of construction.

g. Massachusetts Historic Commission number assigned to resource.

h. Only these Appalachian Mountain Club cottages are included in the "Ponkapoag Camp of the Appalachian Mountain Club" listing.

Appendix S. Significant Reservation Events.

Year(s)	Event
1893	The Metropolitan Parks Commission (MPC) is established to “acquire, maintain, and make available to inhabitants of said district open spaces for exercise and recreation.”
1893–1894	Blue Hills Reservation is established with a 933 acre acquisition. Additional acquisitions bring the reservation’s size to 3,953 acres.
1895	Development of park infrastructure begins at Houghton’s Pond with the construction of two bath houses; picnic tables are soon added. Over time, additional recreation infrastructure is added at this site, including a small building and bicycle stand (1889), a sanitary (1910), ball field (1911), concession (1930), bath house and beach (1935), and baseball diamonds and tennis courts (1937).
1897–1907	Initial development of Great Blue Hill for park purposes begins with the construction of a superintendent’s house at the western base of the hill. This is soon followed by a street car waiting room and platform, sanitary, refectory, Eliot Memorial Bridge, and a bandstand.
1898	Reservation expands south of the Blue Hill River, with the donation of the 697 acre Henry L. Pierce estate located to the east, north, and west of Ponkapoag Pond.
1899	A strip of land along Randolph Avenue, Milton is granted to the Norfolk County Commissioners for streetcar tracks. Additional transfers for public projects occur throughout the reservation’s history.
1899–1905	Development of administrative facilities at Hillside Street, including a stable (1899), superintendent’s house (1900), and a combined police station and superintendent’s office (1904). An existing farm house is renovated for use as a police and employee dormitory (1905).
1911–1923	Permission is granted for the Newsboy’s Association, Boy Scouts of America, Appalachian Mountain Club, and the Young Men’s Christian Association to establish camps.
1919	The Metropolitan District Commission (MDC) is created by the combining of the MPC with the Metropolitan Water and Sewer Commission.
1933	Ponkapoag Golf Course, an 18-hole Donald Ross design, opens. Nine additional holes are added in 1938 and nine more in 1956.
1933–1937	Civilian Conservation Corps is active on the reservation, constructing recreational facilities, improving infrastructure, and conducting forestry activities.
1937	Acquisition of the Little Blue Hill area expands the reservation westward, toward the Neponset River Reservation.
1949	Blue Hills Reservoir constructed from an existing wetland and surrounding uplands, requiring re-alignment of a portion of Chickatawbut Road. Reservoir again reconstructed in 2008–2009.
1954–1958	Portions of reservation taken by the state for the construction of Routes 128 and 24.
1954–1966	U.S. Army uses portions of the reservation for the Nike Battery BO-55 Launcher Area (Ponkapoag East) and the Nike Battery BO-55 Integrated Fire Control Area (Chickatawbut Hill).
1959	Trailside Museum opens to educate the public about the nature of the Blue Hills.
1964	A small piece of the Quincy Quarries (i.e., the northern rail terminus) is protected by the MDC; this land is transferred to the City of Quincy in 1968. Additional land protection efforts at the quarries follow.
1976	Brookwood Farm (70 acres) donated to the MDC.
1980’s	Renewed emphasis on land protection through acquisition of land and conservation restrictions. This continues today.
1984	Indian Line Farm is acquired by eminent domain; investigation and remediation of contaminants occur for more than a decade.
1987–1996	Acquisition of Town Brook Flood Control Site and associated easements.
1997	Water is pumped from former quarries north of Ricciuti Drive in Quincy. These quarries are subsequently filled, and multi-purpose recreation fields are established. Mitigation continues today.
2004	Department of Conservation and Recreation is created through the merger of the MDC and the Massachusetts Department of Environmental Management.

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Appendix T. Buildings and Associated Structures of the Blue Hills Reservation.

Section ^a	Name ^b	Ownership ^c	Year Constructed ^d	Building Condition ^e	Building Type ^f	Historic ^g	Status ^h
LB	Royall Street – house – 25 Royall Street	DCR	-	4	WL	Y	U
LB	Royall Street – garage – 25 Royall Street	DCR	-	4	WL	Y	V
GB	Trailside Museum – museum and two additions – 1904 Canton Avenue	DCR	1898	4	WL	Y	U
			1956		WL		U
			1975		WL		U
GB	Blue Hills Reservation Comfort Station – 1880 Canton Avenue	DCR	1904	1	WL	Y	U
GB	Trailside Museum – storage shed (barn)	DCR	-	2	WL	N	U
GB	Trailside Museum – N-Star Rocky Outcrop Exhibit	DCR	2008	1	WL	N	U
GB	Trailside Museum – maintenance garage	DCR	-	2	WL	N	U
GB	Trailside Museum – red-tailed hawk enclosure	MAS	2008	1	FE	N	U
GB	Trailside Museum – turkey vulture/great horned owl enclosure	MAS	2008	1	FE	N	U
GB	Trailside Museum – snowy owl enclosure	MAS	2008	1	FE	N	U
GB	Trailside Museum – deer shed	MAS	-	3	WL	N	U
GB	Trailside Museum – unidentified animal structure (2)	MAS	-	1	WL	N	U
GB	Trailside Museum – duck blind	DCR	-	3	WL	N	U
GB	Trailside Museum – turtle enclosure	DCR	1959	4	CO	Y	U
GB	Trailside Museum – river otter enclosure	DCR	1959	4	CO	Y	U
GB	William F. Rogers Ski Area – compressor building	DCR	c. 1960	4	UM	Y	U
GB	William F. Rogers Ski Area – lodge – 4001 Washington Street	DCR	-	4	WL	Y	U
GB	William F. Rogers Ski Area – ski school	DCR	c. 1960	3	WL	N	U
GB	William F. Rogers Ski Area – beginner area – upper shed – A-frame	SBHM	2008	3	WL	N	U
GB	William F. Rogers Ski Area – beginner area – lower shed	SBHM	-	5	WL	N	U
GB	William F. Rogers Ski Area – maintenance garage	DCR	c. 1960	4	UM	Y	U
GB	William F. Rogers Ski Area – chair lift building	SBHM	-	2	WL	N	U
GB	William F. Rogers Ski Area – chair lift operator's building	DCR	-	3	WL	N	U
GB	William F. Rogers Ski Area – shed at bottom of "Big Blue"	SBHM	-	2	WL	N	U
GB	William F. Rogers Ski Area – pulley platform	DCR	-	3	WC	N	U
GB	William F. Rogers Ski Area – building adjacent to pulley platform	DCR	-	3	WC	N	U
GB	William F. Rogers Ski Area – ski patrol building	DCR	-	3	WL	N	U
GB	William F. Rogers Ski Area – shed with crescent	SBHM	2008	2	WL	N	U
GB	William F. Rogers Ski Area – unidentified building	DCR	-	3	UM	N	U
GB	Meteorological Observatory	DCR	1885	2	UM	Y	U
GB	Meteorological Observatory – shed	DCR	-	3	WL	Y	U
GB	Meteorological Observatory – kite shed	DCR	1999	2	WL	N	U
GB	Great Blue Hill pump house	DCR	1913	6	UM	Y	V
GB	WGBH building	WGBH	1953	2	UM	Y	U
GB	Motorola building	WGBH	-	2	CP	N	U
GB	State police building	SP	-	3	UM	N	U
GB	DEP Photochemical Assessment Monitoring Station (PAMS)	DEP	2001	1	ME	N	U
GB	Fuel cell shed	BHO	-	2	WL	N	U
GB	Great Blue Hill observation tower (Eliot Pavilion)	DCR	1937-1939	3	UM	Y	U
GB	Eliot Memorial Bridge	DCR	1905	4	UM	Y	U
GB	Water tower	TOM	-	-	ME	N	U
BF	Gate Keeper's Cottage (Caretaker's Cottage)	DCR	1820	6	WL	Y	V
BF	Garage (tractor shed)	DCR	1997	3	WC	Y	U
BF	Old barn and two additions	DCR	1840	4	WC	Y	U
			c. 1920				
			c. 1950				
BF	Post and beam shed	NBSS	2009	1	WC	N	U
BF	Garage/sugar shack	DCR	-	2	WL	N	U
BF	Greenhouse	BCF	c. 2007	2	WL	N	U
BF	Henry Saltonstall Howe House	DCR	1957	3	WL	Y	U

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Appendix T. Buildings and Associated Structures of the Blue Hills Reservation. (Continued)

Section ^a	Name ^b	Ownership ^c	Year Constructed ^d	Building Condition ^e	Building Type ^f	Historic ^g	Status ^h
HP	Visitor center (Sanitary) – 840 Hillside Street	DCR	1910	2	WC	Y	U
HP	Concession (Refreshment pavilion) – 860 Hillside Street	DCR	1930	2	UM	Y	U
HP	William J. Scannell Bath House ⁱ – 848 Hillside Street	DCR	1968	5	UM	N	U
HP	Comfort station – Blue Hill River Road	DCR	1968	3	UM	N	U
HQ	Blue Hills District Office – 725 Hillside Street	DCR	pre-1895	2	WL	Y	U
HQ	Stables (Brian T. Broderick Stables) – 705 Hillside Street	DCR	1899	6	WC	Y	U
HQ	Police station – original building, addition, and garage – 685 Hillside Street	DCR	1904	3	UM	Y	U
		DCR	1916		UM		U
		DCR	1939		UM		U
HQ	Captain's House (Regional Office) – 695 Hillside Street	DCR	1900	2	WL	Y	U
HQ	Tool shed – TrailWatch	DCR	2007	1	WL	N	U
OP	Blue Hills Maintenance Garage – 665 Hillside Street	DCR	1941	3	UM	Y	U
OP	Carpenter Shop – 665 Hillside Street	DCR	1941	3	WL	Y	U
OP	Office – Operation Supervisor/Deputy District Manager – 665 Hillside Street	DCR	1960+	3	WL	N	U
OP	Repair Shop/Lawn Mower #1 – 665 Hillside Street	DCR	1937	3	UM	Y	U
OP	Repair Shop/Lawn Mower #2 – 665 Hillside Street	DCR	1937	4	UM	Y	U
OP	Salt storage shed – 665 Hillside Street	DCR	1981	4	WC	N	U
UN	Max Ulin Memorial Skating Rink – 11 Unquity Road	DCR	1962	3	UM	N	U
UN	Pine Tree Brook Reservoir dam	DCR	-	3	CO	N	U
UN	Pine Tree Brook spillway	TOM	-	3	CO	N	U
BH	Stable (Randolph Avenue Stable) – 1333 Randolph Avenue	DCR	1909	4	WC	Y	U
CH	Norman Smith Environmental Education Center at Chickatawbut Hill ⁱ – dining hall	DCR	1953-1954	2	UM	Y	U
CH	Norman Smith Environmental Education Center at Chickatawbut Hill ⁱ – office	DCR	1953-1954	2	UM	Y	U
CH	Norman Smith Environmental Education Center at Chickatawbut Hill ⁱ – dormitory	DCR	1953-1954	2	UM	Y	U
CH	Norman Smith Environmental Education Center at Chickatawbut Hill ⁱ – tank house	DCR	1953-1954	2	UM	Y	U
CH	Norman Smith Environmental Education Center at Chickatawbut Hill ⁱ – garage	DCR	-	1	UM	N	U
CH	Norman Smith Environmental Education Center at Chickatawbut Hill ⁱ – shed	MAS	-	2	WL	N	U
CH	Norman Smith Environmental Education Center at Chickatawbut Hill ⁱ – bird blind	MAS	-	2	WL	N	U
CH	Norman Smith Environmental Education Center at Chickatawbut Hill ⁱ – tower	DCR	1980	2	WC	N	U
CH	Water tank (620,000 gallon)	MWRA	c. 1964	-	ME	N	U
CH	Water tank (150,000 gallon)	MWRA	c. 1932	-	ME	N	U
CH	Chickatawbut Overlook – tower	DCR	1935	4	UM	Y	V
CH	Chickatawbut Overlook – pavilion	DCR	1934	4	WL	Y	U
CH	Blue Hills Reservoir – covered storage tank 1	MWRA	2009	1	CO	N	U
CH	Blue Hills Reservoir – covered storage tank 2	MWRA	2009	1	CO	N	U
CH	Blue Hills Reservoir – MWRA building	MWRA	2010	1	CO	N	C
QQ	Granite Rail Quarry compressor house	DCR	c. 1900	5	UM	Y	U
QQ	Quincy Youth Baseball comfort station and concession building	COQ	c. 2003	1	UM	N	U
QQ	Dugouts (8)	COQ	c. 2003	1	FE	N	U
QQ	Cell tower building (AT&T mobility fixed asset site # 10000074)	AT&T	c. 1990	-	CP	N	U
QQ	Shed	UNK	-	4	WL	N	V

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Appendix T. Buildings and Associated Structures of the Blue Hills Reservation. (Continued)

Section ^a	Name ^b	Ownership ^c	Year Constructed ^d	Building Condition ^e	Building Type ^f	Historic ^g	Status ^h
QQ	57 Bunker Hill Lane – house	DCR	-	5	WL	Y	V
QQ	57 Bunker Hill Lane – garage	DCR	-	5	WL	Y	V
SM	Mayor William T. Shea Memorial Rink ⁱ – 651 Willard Street	DCR	1962	3	UM	N	U
SM	St. Moritz Horseshoe Club shed	SMHC	-	5	WL	N	U
PO	Ponkapoag Golf Course – club house and two additions – 2167 Washington Street	DCR	1932 1948 1958	2	WL	Y	U
PO	Ponkapoag Golf Course – pro house (pro shop and ticket house)	DCR	1932	3	WL	Y	U
PO	Ponkapoag Golf Course – snack shack – course 1	DCR	-	3	ME	N	U
PO	Ponkapoag Golf Course – snack shack – course 2	DCR	-	3	ME	N	U
PO	Ponkapoag Golf Course – starter shed	DCR	-	2	WL	N	U
PO	Ponkapoag Golf Course – ball rental shed – practice fairway	AGLC	2008	-	WL	N	U
PO	Ponkapoag Golf Course – shelter – (7)	DCR	1970	3	CP	Y	U
PO	Ponkapoag Golf Course – trash sheds (7) ^j	DCR	-	3	WL	N	U
PO	Ponkapoag Golf Course – maintenance garage	DCR	-	3	UM	N	U
PO	Ponkapoag Golf Course – maintenance garage shed	DCR	-	3	WL	N	U
PO	Ponkapoag Golf Course – chemical shed	DCR	-	3	WL	N	U
PO	Ponkapoag Golf Course – chemical locker	DCR	-	3	ME	N	U
PO	Ponkapoag Golf Course – pump house A	DCR	-	4	UM	Y	U
PO	Ponkapoag Golf Course – pump house B	DCR	-	6	WL	Y	U
PO	Redman Farm – farmhouse – 2173 Washington Street	DCR	c. 1820	2	WL	Y	U
PO	Redman Farm – corn crib	DCR	c. 1820	3	WL	Y	U
PO	Carpenter’s house – 22 Turnpike Street	DCR	-	4	WL	Y	U
PO	John P. Metropolis Skating Rink ⁱ	DCR	c. 1972	2	UM	N	U
PO	Ponkapoag dam spillway	DCR	2009	1	CO	N	U
PO	Pump Station No. 6 – Turner Drive	TOR	-	-	UM	N	U
PO	AMC Ponkapoag Camp – cabin 1 – Spang	AMC	1922	-	WL	Y	U
PO	AMC Ponkapoag Camp – cabin 1 shed	AMC	-	-	WL	N	U
PO	AMC Ponkapoag Camp – cabin 2 – Hickey	AMC	1926	-	WL	Y	U
PO	AMC Ponkapoag Camp – cabin 3 – Bourbeau	AMC	1929	-	WL	Y	U
PO	AMC Ponkapoag Camp – cabin 4 – Stose	AMC	1930	-	WL	Y	U
PO	AMC Ponkapoag Camp – cabin 5 – Wilkie	AMC	-	-	WL	N	U
PO	AMC Ponkapoag Camp – cabin 6 – Gorlin	AMC	-	-	WL	N	U
PO	AMC Ponkapoag Camp – cabin 7 – Folsom	AMC	-	-	WL	N	U
PO	AMC Ponkapoag Camp – cabin 8 – Godfrey	AMC	-	-	WL	N	U
PO	AMC Ponkapoag Camp – cabin 9 – Dienes	AMC	-	-	WL	N	U
PO	AMC Ponkapoag Camp – cabin 10 – Duncan	AMC	-	-	WL	N	U
PO	AMC Ponkapoag Camp – cabin 11 – Sheldon	AMC	-	-	WL	N	U
PO	AMC Ponkapoag Camp – cabin 11 shed	AMC	-	-	WL	N	U
PO	AMC Ponkapoag Camp – cabin 12 – Hamfmann	AMC	1929	-	WL	N	U
PO	AMC Ponkapoag Camp – cabin 13 – Lakeview	AMC	-	-	WL	N	U
PO	AMC Ponkapoag Camp – cabin 14 – Turner	AMC	-	-	WL	N	U
PO	AMC Ponkapoag Camp – cabin 15 – Marian	AMC	-	-	WL	N	U
PO	AMC Ponkapoag Camp – cabin 16 – Jones	AMC	-	-	WL	N	U
PO	AMC Ponkapoag Camp – cabin 17 – Rogers	AMC	-	-	WL	N	U
PO	AMC Ponkapoag Camp – cabin 19 – Nunn	AMC	-	-	WL	N	U
PO	AMC Ponkapoag Camp – cabin 20 – Smith	AMC	-	-	WL	N	U
PO	AMC Ponkapoag Camp – cabin 21 – Pine	AMC	-	-	WL	N	U
PO	AMC Ponkapoag Camp – cabin 22 – North	AMC	1926	-	WL	N	V
PO	AMC Ponkapoag Camp – cabin 23 – main lodge	AMC	-	-	WL	N	U

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Appendix T. Buildings and Associated Structures of the Blue Hills Reservation. (Continued)

Section ^a	Name ^b	Ownership ^c	Year Constructed ^d	Building Condition ^e	Building Type ^f	Historic ^g	Status ^h
PO	AMC Ponkapoag Camp – gentlemen’s privy	AMC	-	-	WL	N	U
PO	AMC Ponkapoag Camp – ladies’ privy	AMC	-	-	WL	N	U
PO	AMC Ponkapoag Camp – storage building – former privy	AMC	-	-	WL	N	U
PO	AMC Ponkapoag Camp – Susan Rapson Lemish Nature Center	AMC	-	2	WL	N	U
PO	AMC Ponkapoag Camp – spring house	AMC	-	-	WL	N	U
PO	AMC Ponkapoag Camp – former ice house – used as a tool shed	AMC	-	-	WL	N	U
PO	YMCA Ponkapoag Outdoor Center – lodge	YMCA	-	2	WL	N	U
PO	YMCA Ponkapoag Outdoor Center – shed at lodge	YMCA	-	2	WL	N	U
PO	YMCA Ponkapoag Outdoor Center – bath house	YMCA	1995	3	WL	N	U
PO	YMCA Ponkapoag Outdoor Center – arts and crafts cabin	YMCA	-	3	WL	N	U
PO	YMCA Ponkapoag Outdoor Center – nature cabin	YMCA	-	3	WL	N	U
PO	YMCA Ponkapoag Outdoor Center – storage cabin	YMCA	-	3	WL	N	U
PO	YMCA Ponkapoag Outdoor Center – pool house	YMCA	c. 1968	3	UM	N	U
PO	YMCA Ponkapoag Outdoor Center – pool well shed	YMCA	c. 1968	3	UM	N	U
PO	YMCA Ponkapoag Outdoor Center – swimming pool	YMCA	c. 1968	3	CO	N	U
PO	YMCA Ponkapoag Outdoor Center – main well pump shed	YMCA	-	3	WL	N	U
PO	YMCA Ponkapoag Outdoor Center – pavilion 1	YMCA	-	2	WC	N	U
PO	YMCA Ponkapoag Outdoor Center – pavilion 2	YMCA	-	2	WC	N	U
PO	YMCA Ponkapoag Outdoor Center – pavilion 3	YMCA	c. 1994	2	WC	N	U
PE	Nike Battery BO-55 Launcher Area – maintenance garage	DCR	1953-1954	4	UM	Y	U
PE	Nike Battery BO-55 Launcher Area – sentry station	DCR	1953-1954	6	UM	Y	V
PE	Nike Battery BO-55 Launcher Area – generator building	DCR	1953-1954	6	ME	Y	V
PE	Nike Battery BO-55 Launcher Area – garage	DCR	1953-1954	6	UM	Y	V
PE	Nike Battery BO-55 Launcher Area – silos (3)	DCR	1953-1954	6	CO	Y	V
PE	Nike Battery BO-55 Launcher Area – elevated shed	DCR	1953-1954	5	ME	Y	V
PE	North Randolph Little League – concession	NRL	-	-	CO	N	U
PE	North Randolph Little League – Cady Field dugouts (2)	NRL	-	3	CO	N	U
PE	North Randolph Little League – Wakeling Field dugouts (2)	NRL	-	3	UM	N	U
TB	Town Brook FCS – Braintree Dam and spillway	TOB	-	-	CO	N	U

a. Codes used to identify sections of the reservation are as follows: BF = Brookwood Farm; BH = Buck Hill; CH = Chickatawbut Hill; GB = Great Blue Hill; HP = Houghton’s Pond; HQ = Reservation Headquarters; LB = Little Blue Hill; OP = Operations Yard; PE = Ponkapoag East; PO = Ponkapoag; QQ = Quincy Quarries; SM = St. Moritz; TB = Town Brook Flood Control Site; and UN = Unquity Road.

b. Official and common names are used, if known. In the absence of official or common names, descriptive terms are used. (e.g., Royall Street house). Street addresses are included, if known. Not all buildings and structures on the reservation have street addresses.

c. Not all buildings and structures on the Blue Hills are owned by the DCR. Other possible owners include: AGLC = Auburn Golf Learning Center; AMC = Appalachian Mountain Club; AT&T = AT&T Mobility; BCF = Brookwood Community Farm; BHO = Blue Hill Observatory; COQ = City of Quincy; DEP = Massachusetts Department of Environmental Protection; MAS = Massachusetts Audubon Society; MWRA = Massachusetts Water Resources Authority; NBSS = North Bennet Street School; NRL = North Randolph Little League; SBHM = Ski Blue Hills Management LLC; SMHC = St. Moritz Horseshoe Club; TOB = Town of Braintree; TOM = Town of Milton; TOR = Town of Randolph; UNK = Unknown ownership; and WGBH = WGBH Educational Foundation.

d. Year of construction, if known.

e. Building System and Equipment Condition Code as used in the Massachusetts Capital Asset Management Information System (CAMIS); the following codes are used: 1 = Excellent – Easily restorable to like new condition, minimal routine maintenance; 2 = Good – Routine maintenance required; 3 = Adequate – Some corrective and preventative maintenance required; 4 = Fair – Excessive corrective maintenance and repair required; 5 = Poor – Renovation needed; and 6 = Fail – Non-operational, replacement required. A dash (-) indicates a lack of information on condition.

f. Building Type refers to the construction materials. Possible materials include: CO = Concrete, poured at site; CP = Concrete, precast off-site; FE = Fencing (e.g., structures made from chain-link fence); ME = Metal; UM = Unconsolidated masonry (i.e., brick, cement block, or stone and mortar); WC = Wood, commercial and industrial; WL = Wood, light duty.

g. Entries in this column indicate if the building or structure is a historic resource listed in Appendix R; Y = Yes, and N = No.

h. The status of buildings and structures are classified as C = under construction; U = in use; or V = vacant.

i. Building named by an Act of the Massachusetts Legislature. (See Appendix W.)

j. These sheds are scheduled to be removed.

Appendix U. Parking Areas of the Blue Hills Reservation.

Section ^a	Parking Area	Paved ^b	Striped ^b	HP Spaces ^{c,d}	Restricted Spaces ^{c,e}	Other Spaces ^e	Grand Total	Comments
LB	Route 138 Park and Ride	Y	Y	0	0	116	116	Operated by Mass DOT.
LB	Royall Street house	N	N	0	3	0	3	Residential parking.
GB	Great Blue Hill – radar pad	N	N	0	16	0	16	Former Air Force CPS-9 weather radar location.
GB	Hillside Street at Accord Path	N	N	0	0	11	11	
GB	Trailside Museum – grounds	Y	N	0	3	0	3	Parking for MAS vehicles.
GB	Trailside Museum – north lot	Y	Y	5	0	100	105	
GB	Trailside Museum – south lot	Y	Y	4	10	73	87	Ten spaces are reserved for museum employees.
GB	Weather Observatory	Y	N	0	3	0	3	Staff parking.
GB	William F. Rogers Ski Area - ski lodge	Y	Y	1	4	0	5	Four staff parking spaces.
BR	Brookwood Farm – conference lot	Y	N	0	20	0	20	Restricted to use by meeting attendees.
BR	Brookwood Farm – public lot	N	N	0	0	10	10	
BR	Brookwood Farm – residence	Y	N	0	3	0	3	Residential parking.
HP	Houghton’s Pond – ball fields (south) lot	Y	Y	7	0	88	95	Closed from mid-November through mid-April.
HP	Houghton’s Pond – main (north) lot	Y	Y	10	0	261	271	Includes spaces along Hillside Street.
HP	Houghton’s Pond – Site 5 (west) lot	Y	Y	5	0	75	80	
HQ	Blue Hills District Office	Y	N	0	17	0	17	Only three spaces are striped.
HQ	Bugbee Path at Hillside Street	Y	N	0	0	9	9	
HQ	Lot opposite State Police Barracks	Y	Y	0	4	11	15	Four spaces are reserved for the State Police. Lot partially striped.
HQ	South Region Office	Y	N	0	24	0	24	Staff parking.
HQ	South Region Office – Short-term	Y	N	0	0	4	4	Ten-minute public parking.
HQ	State Police Barracks	Y	Y	0	22	0	22	Reserved spaces are for police cruisers, staff, and those with police business.
OP	Blue Hills District Operations Yard	Y	N	0	17	0	17	Staff vehicle and equipment parking.
UN	Max Ulin Memorial Skating Rink	Y	Y	4	0	83	87	
UN	Unquity Road at Base Path	N	N	0	0	8	8	
UN	Pine Tree Brook , southwest of Harland St.	N	N	0	0	2	2	
BH	Bouncing Brook Path	N	N	0	0	7	7	
BH	Bugbee Path	N	N	0	0	8	8	
BH	Skyline Trail	N	N	0	0	26	26	
CH	Blue Hill Reservoir – MWRA	N	N	0	0	0	0	Employee parking along pavement; no lot.
CH	Blue Hill Reservoir – Public	Y	N	1	0	4	5	Not yet open for use.
CH	Braintree Pass Path	Y	N	0	0	9	9	
CH	Chickatawbut Overlook	Y	Y	0	0	34	34	
CH	Norman Smith Environmental Education Center at Chickatawbut Hill ^f	Y	Y	1	1	23	25	One space reserved for resident.
CH	Sawcut Notch Path	N	N	0	0	4	4	
QQ	Athletic field parking – Ricciuti Drive	Y	Y	6	0	283	289	Includes four lots; only two of which are striped.
QQ	Granite Rail Quarry compressor house	Y	N	0	0	12	12	
QQ	Quarry access parking – Ricciuti Drive	Y	Y	1	0	5	6	
QQ	57 Bunker Hill Lane	N	N	0	2	0	2	Residential parking.
SM	St. Moritz Horseshoe Club	N	N	0	14	0	14	Restricted to use by St. Moritz Horseshoe Club.
SM	Mayor William T. Shea Memorial Rink	Y	Y	4	0	83	87	

Continued on next page.

Appendix U. Parking Areas of the Blue Hills Reservation. (Continued)

Section ^a	Parking Area	Paved ^b	Striped ^b	HP Spaces ^{c, d}	Restricted Spaces ^{c, e}	Other Spaces ^e	Grand Total	Comments
PO	Ponkapoag Golf Course – Redman Farm	Y	Y	7	0	173	180	
PO	Ponkapoag Golf Course – Garage	Y	N	0	10	0	10	Staff parking.
PO	“Carpenter’s House”	N	N	0	3	0	3	Residential parking.
PO	Fisherman’s Beach	N	N	0	0	22	22	
PO	AMC Ponkapoag Camp	N	N	0	22	8	30	Restricted spaces at cabins.
PO	Ponkapoag Trail at the I-93 access ramp	Y	N	0	0	11	11	
PO	YMCA Ponkapoag Outdoor Center ^f	N	N	0	10	18	28	Restricted spaces are adjacent to main lodge.
PE	Nike Battery BO-55 Launcher Area	Y	Y	0	4	0	4	Inside fenced yard at maintenance garage.
PE	North Randolph Little League	Y	Y	2	0	21	23	
WS	West Street	N	N	0	0	5	5	
Total		-	-	58	212	1,607	1,877	

a. The sections of the Blue Hills are: BF = Brookwood Farm; BH = Buck Hill; CH = Chickatawbut Hill; GB = Great Blue Hill; HP = Houghton’s Pond; HQ = Reservation Headquarters; LB = Little Blue Hill; OP = Operations Yard; PE = Ponkapoag East; PO = Ponkapoag; QQ = Quincy Quarries; SM = St. Moritz; UN = Unquity Road; and WS = West Street.

b. Y = yes; N = no.

c. The number of spaces was determined through direct counts of striped spaces; by measuring lot dimensions and identifying the number of 8-foot wide spaces that could fit; or, for the AMC cabins, by assigning one parking space to each visitor’s cabin and three to the caretaker’s cabin.

d. The number of accessible spaces is based on counts of spaces with HP signs or pavement markings. The dimensions of these spaces and their associated aisles (if any) may not meet current codes.

e. Restricted spaces are not available for use by the general public. Reasons for the restrictions are identified in the Comments column.

f. These camp facilities are closed to the general public. When in use, parking is provided for campers, staff, and appropriate visitors; some of this parking is restricted.

Appendix V. Informational Signs of the Blue Hills Reservation^a.

Section ^b	Location	DCR Sign Type ^c	Sign text ^d , Description, or Comments
GB	Trailside Museum lawn	Gateway Main Identification	<i>Trailside Museum, Blue Hills Reservation.</i> Secondary signs (e.g., <i>Chickatawbut Hill Summer Camp, Sign up Today!</i>) may be attached to the main sign frame
GB	Main gate	N/A	<i>Welcome to Blue Hills. Don't forget to stamp your park passport.</i> Sign over DCR and MAS passport stamp boxes.
GB	Trailside Museum	N/A	Pond Walk sponsor sign.
GB	Trailside Museum	N/A	<i>Turtles of the Blue Hills.</i>
GB	Trailside Museum	N/A	<i>Welcome to the Blue Hills Trailside Museum Pond.</i>
GB	Trailside Museum – red-tailed hawk enclosure	N/A	<i>Red-tailed Hawk</i> interpretive sign.
GB	Trailside Museum – turkey vulture/great horned owl enclosure	N/A	<i>Turkey Vulture</i> and <i>Great Horned Owl</i> interpretive signs.
GB	Trailside Museum – snowy owl	N/A	<i>Snowy Owl</i> interpretive sign.
GB	Trailside Museum – deer shed	N/A	<i>White-tailed Deer</i> sign.
GB	Trailside Museum – duck blind	N/A	National Wildlife Federation <i>Schoolyard Habitats</i> sign.
GB	Trailside Museum – duck blind	N/A	<i>Duck Food</i> ; sign over dispenser.
GB	Trailside Museum – river otter enclosure	N/A	<i>North American River Otter</i> interpretive sign.
GB	Trailside Museum south parking lot entrance	N/A	<i>"blue hills ski area, ski-bluehills.com, 781-828-5070."</i> No DCR information on sign.
GB	Route 138, south Trailside Museum south parking lot entrance	N/A	<i>Season Passes on Sale Now</i> banner suspended between utility pole and tree. This is a temporary sign.
GB	Ski Area – steps from parking lot	N/A	<i>Rules and Regulations</i> , attached to tree.
GB	Ski Area at summit Road	N/A	<i>Blue Hills Ski Area Rules and Regulations.</i> Posts made from downhill skis.
GB	Weather Observatory	N/A	<i>Power of Hydrogen</i> interpretive sign.
GB	Weather Observatory – Kite Shed	N/A	<i>Kite Shed – World's First Continuous Sounding of Atmosphere by Kite.</i>
GB	Skyline Trail	Internal Park Information	<i>Skyline (East), Houghton's Pond; Wolcott Path, North Skyline, Trailside Museum, Great Blue Hill</i> ; sign with directional arrows.
GB	Hillside Street, east of Route 138	N/A	Circular Trailside Museum "fox" sign with direction arrow.
GB	Intersection of Hillside Street and Blue Hill River Road	N/A	Three-panel sign. <i>Blue Hills Reservation</i> on central panel; side panels indicate direction of facilities.
GB	Hillside Street, east of intersection with Blue Hill River Road	N/A	Event banners (e.g., <i>First Day Hikes</i>) suspended between two permanent metal posts.
BF	Gate Keeper's Cottage	Cantilevered Identification	<i>Brookwood Farm, Blue Hills Reservation.</i>
BF	Sugar Shack	N/A	<i>Brookwood Farm Maple Syrup</i> ; oval, wooden sign.
HP	Intersection of Hillside Street and Blue Hill River Road	Main Identification	<i>Blue Hills Reservation.</i>
HP	Pathway northeast of Concession Stand	Internal Park Information	<i>Concession Stand, Restrooms</i> directional sign.
HP	Entrance to north parking lot	Main Identification	<i>Houghton's Pond, Blue Hills Reservation.</i>
HP	Entrance to north parking lot	N/A	<i>Houghton's Pond Main Parking Lot</i> ; sign reverses to <i>Lot Full.</i>
HP	Playground	Rules and Regulations	<i>Welcome to Houghton's Pond Recreation Area.</i>
HP	Playground	Interpretive Wayside	<i>Houghton's Pond</i> low-profile interpretive sign.
HP	Visitor Center	Site/Facility Identification	<i>Houghton's Pond, Visitor Center.</i>

Continued on next page.

Appendix V. Informational Signs of the Blue Hills Reservation^a. (Continued)

Section ^b	Location	DCR Sign Type ^c	Sign text ^d , Description, or Comments
HP	Beach	Rules and Regulations	<i>The Following are Prohibited on the Beach, and Los Siquenes son Prohibido en la Playa</i> bilingual signs.
HP	Bathhouse	Secondary Identification	<i>The William J. Scannell Bathhouse.</i>
HP	Site 1	N/A	<i>Picnic Site 1</i> ; green metal sign mounted to tree.
HP	Site 2	N/A	<i>Camp Group Picnic Area</i> ; white metal sign mounted to tree.
HP	Site 3	N/A	<i>Picnic Site 3 Reserved</i> ; green metal sign mounted to tree.
HP	Site 4	N/A	<i>Picnic Site 3</i> ; white metal sign mounted to two wooden posts.
HP	Site 4	N/A	<i>Picnic Site 4 Reserved</i> ; green metal sign mounted to tree.
HP	Site 4	N/A	<i>Picnic Site 4</i> ; white metal sign mounted to two wooden posts.
HP	Intersection of Blue Hill River Road and Ponkapoag Trail	Site/Facility Identification	<i>Houghton's Pond, Picnic Sites and Ball Fields</i> ; does not mention reservation's name.
HP	Entrance to western parking lot	N/A	<i>Picnic Site 5</i> ; white metal sign mounted to two wooden posts.
HP	Site 5	Rules and Regulations	<i>Welcome to Houghton's Pond Recreation Area.</i>
HP	Site 5	N/A	<i>Picnic Site 5 Reserved</i> ; green metal sign mounted to tree.
HQ	District Office	Cantilevered Identification	<i>Brian T. Broderick, Blue Hills District Office.</i>
HQ	Hillside Street, opposite main entrance	Road Marker Lead-in	<i>Reservation Headquarters.</i>
HQ	Main Entrance	Main Identification	<i>Blue Hills Reservation, Headquarters.</i>
HQ	Brian T. Broderick Stables	N/A	<i>Massachusetts State Police, Mounted Police Stables, Blue Hills District.</i> Sign includes a mixture of State and MDC police text.
HQ	West side of driveway	N/A	<i>Reservation Headquarters.</i>
HQ	Regional Office	N/A	<i>Blue Hills Reservation, Maps & Information.</i>
HQ	Hillside Street	N/A	<i>Massachusetts State Police</i> , illuminated sign.
HQ	Hillside Street, opposite State Police	N/A	<i>Visitor Parking.</i>
OP	Main Entrance	N/A	<i>Blue Hills Operations.</i>
OP	Office	N/A	<i>Deputy District Manager.</i>
OP	Office	N/A	<i>Operations Supervisor.</i>
UN	Ulin Rink	Site/Facility Identification	<i>Max Ulin Memorial Skating Rink.</i> Sign lacks name of reservation or operator.
UN	Unquity Road	N/A	<i>RT. 138, RT. 128 Canton; RT. 28, RT. 93, Randolph, Quincy</i> ; sign with directional arrows.
BH	Chickatawbut Road at Hillside Street	N/A	<i>Chickatawbut Road.</i>
BH	Hillside Street at Chickatawbut Road	N/A	<i>Hillside Street.</i>
BH	Southwest corner of Route 28 and Chickatawbut Road intersection	Gateway Main Identification	<i>Blue Hills Reservation.</i>
BH	Northwest corner of Route 28 and Chickatawbut Road intersection	N/A	<i>Chickatawbut Road.</i>
CH	CCC Camp	N/A	<i>Blue Hills Camp 1933-1937, Civilian Conservation Corps.</i>
CH	Southeast corner of Route 28 and Chickatawbut Road intersection	Main Identification	<i>Blue Hills Reservation.</i>

Continued on next page.

Appendix V. Informational Signs of the Blue Hills Reservation^a. (Continued)

Section ^b	Location	DCR Sign Type ^c	Sign text ^d , Description, or Comments
CH	Southeast corner of Route 28 and Chickatawbut Road intersection	N/A	<i>Welcome to Milton, Settled in 1640.</i> This sign is possibly located within the Mass DOT right of way.
CH	Pakomet Spring	Gateway Main Identification	<i>Blue Hills Reservation.</i>
CH	Entrance to Education Center	Cantilevered Identification	<i>Norman Smith Environmental Education Center, Massachusetts Audubon Society, Massachusetts Department of Conservation and Recreation.</i>
CH	Overlook	Interpretive Wayside	<i>Civilian Conservation Corps (1933-1941);</i> low-profile interpretive sign.
CH	Overlook	N/A	<i>Chickatawbut Picnic Overlook Area;</i> wooden sign attached to tree.
CH	Northeast of intersection of Chickatawbut and Wampatuck Roads	N/A	<i>Wampatuck Road.</i>
CH	South of intersection of Chickatawbut and Wampatuck Roads	N/A	<i>Route 128, Houghton's Pond. State Police;</i> sign with directional arrows.
CH	Chickatawbut Road and Willard Street	Gateway Main Identification	<i>Blue Hills Reservation.</i>
QQ	Ricciuti Drive	N/A	<i>The Future Home of Mini Fenway Park.</i>
QQ	Field Entrance	N/A	<i>Quarry Hills Baseball Fields;</i> road marker lead-in.
QQ	Ball Fields	N/A	<i>Quincy Youth Baseball.</i>
QQ	Ball Fields	N/A	<i>Baseball Fields, Use By Permit Only.</i>
QQ	Wampatuck Road at Hayden Street	N/A	<i>Wampatuck Road.</i>
SM	Shea Rink	Site/Facility Identification	<i>William T. Shea, Skating Rink.</i> Text not as required by Act of the Legislature. Rink operator name is also lacking.
SM	Skyline Trail	N/A	<i>Minichello Bridge,</i> brown wooden sign with routed white letters.
PO	Redman Farmhouse – front yard	Site/Facility Identification	<i>Ponkapoag Golf Course, Blue Hills Reservation.</i>
PO	Redman Farmhouse – north entrance	N/A	<i>NEPRWA: Neponset River Watershed Association.</i>
PO	Metropolis Rink	N/A	<i>In Memory of Canton Fire Fighter, John P. Metropolis.</i>
PO	Metropolis Rink – along Route 138	N/A	<i>Canton Recreation Department</i> sign board.
PO	Pro House	N/A	<i>Golf Shop; Golf Club Repair Center.</i>
PO	Pro House	N/A	<i>Welcome to Ponkapoag Golf Club;</i> includes greens fees information.
PO	Ponkapoag Trail at intersection marker 5176	N/A	<i>Welcome to the Ponkapoag Outdoor Center. YMCA of Greater Boston.</i>
PE	North Randolph Little League	N/A	<i>Cady Field;</i> metal sign on backstop of north field.
PE	North Randolph Little League	N/A	<i>Wakeling Field;</i> metal sign on backstop of south field.
PE	North Randolph Little League	N/A	Score board bearing the following: <i>Sudbury Farms, Roche Brothers, Randolph Youth Softball & Baseball Assoc.</i>
PE	North Randolph Little League	N/A	Multiple commercial advertising signs attached to the outfield fencing.

a. Excludes regulatory signs, standard trail markers, and identification signs on camp buildings.

b. Codes used to identify sections of the reservation are as follows: BF = Brookwood Farm; BH = Buck Hill; CH = Chickatawbut Hill; GB = Great Blue Hill; HP = Houghton's Pond; HQ = Reservation Headquarters; LB = Little Blue Hill; OP = Operations Yard; PE = Ponkapoag East; PO = Ponkapoag; QQ = Quincy Quarries; SM = St. Moritz; and UN = Unquity Road.

c. Sign types from Department of Conservation and Recreation, graphic standards manual (DCR n.d.a).

d. Italicized text taken directly from sign. In some instances, additional text occurs on the sign (e.g. listing of rules and regulations).

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Appendix W. Acts of the Massachusetts Legislature that Directly Address the Blue Hills Planning Unit.

Year	Chapter	Title	Comments
1905	368	An Act making additional appropriations for the care of reservations in the control of the Metropolitan Park Commission.	This Act included \$1,500 “for a new shop building in the Blue Hills Reservation.”
1909	130	An Act making appropriations for the care of reservations in the control of the Metropolitan Park Commission.	Provided that “a sum not exceeding seven thousand dollars” is spent “for water pipes in the Blue Hill Reservation” (sic).
1916	235	An Act to provide for the construction of a parkway connecting the Blue Hills Reservation with Granite Street in the Town of Braintree.	Directed the construction of a “parkway or boulevard not less than sixty feet in width” from the intersection of West Street at Farm River to Granite Street.
1917	345	An Act authorizing the Metropolitan Park Commission to protect the Blue Hills Reservation from damage by insects and tree diseases.	Authorized the expenditure of \$43,000 “for the purpose of protecting and preserving the woods of Blue Hills Reservation from gypsy and brown tail moths and from damage by other insects, and from tree diseases.”
1923	126	An Act making appropriations for the maintenance of departments, boards, commissions, institutions and certain activities of the Commonwealth for interest, sinking fund, and serial bond requirements and for certain improvement projects.	Included \$28,125 for the widening of Blue Hill River Road.
1925	211	An Act making appropriations for the maintenance of departments, boards, commissions, institutions and certain activities of the Commonwealth for interest, sinking fund, and serial bond requirements and for certain permanent improvements.	Reauthorized \$28,125 for the widening of Blue Hill River Road.
1927	230	An Act authorizing the Metropolitan District Commission to create and maintain a pond for skating in Blue Hills Reservation in the City of Quincy.	The MDC was “hereby authorized to construct a dam and flood lands for a skating pond in Blue Hills Reservation in the City of Quincy at or near Willard Street in said city.” This created the St. Moritz ponds.
1927	311	An Act providing for an investigation by the Department of Public Works of the cost and expediency of constructing a certain section of the so-called circumferential highway located in the City of Cambridge, and authorizing expenditures for constructing certain other parts of said highway.	Included funding “for widening and reconstructing Blue Hill River Road in the Blue Hills Reservation.”
1927	343	An Act in addition to the general appropriation Act making appropriations to supplement certain items contained therein, and for certain new activities and projects.	Included \$1,500 for “constructing a skating pond in the Blue Hills Reservation.”
1931	406	An Act authorizing the Metropolitan District Commission to construct a rest room and comfort station in the Blue Hills Reservation in the City of Quincy.	The MDC was “authorized and directed to construct a rest room and comfort station adjacent to the skating pond...near Willard Street.”
1931	416	An Act authorizing the Metropolitan District Commission to construct and maintain a public golf course in that part of the Blue Hills Reservation known as Redman Farm.	Authorized the MDC to “construct, maintain and operate and eighteen hole public golf course, including locker and public service buildings.” It also authorized making “reasonable charges for the use of said golf course and locker and service buildings.”

Continued on next page.

Appendix W. Acts of the Massachusetts Legislature that Directly Address the Blue Hills Planning Unit. (Continued)

Year	Chapter	Title	Comments
1931	460	An Act in addition to the general appropriation Act making appropriations to supplement certain items contained therein, and for certain new activities and projects.	Included \$80,000 for construction of Ponkapoag Golf Course and \$5,000 for construction of a “restroom and convenience station” near the St. Moritz ponds.
1935	383	An Act authorizing the Metropolitan District Commission to lay out and construct a parkway from Administration Road in the City of Quincy to Granite Street in the Town of Braintree.	Authorized construction of the section of Chickatawbut Road between its intersection with Wompatuck Road and Granite Street.
1937	234	An Act making appropriations for the maintenance of departments, boards, commissions, institutions and certain activities of the Commonwealth for interest, sinking fund, and serial bond requirements and for certain improvement projects.	Authorized \$20,000 for the “expense of supplies and services necessary for procuring Works Progress Administration funds for continuing the construction of additional facilities at the Ponkapoag Golf Course.”
1941	419	An Act making appropriations for the maintenance of departments, boards, commissions, institutions and certain activities of the Commonwealth for interest, sinking fund, and serial bond requirements and for certain improvement projects.	Authorized \$10,000 of additional facilities at the Ponkapoag Golf Course.
1948	273	An Act authorizing additional club house facilities at Ponkapoag Golf Course in the Blue Hills Reservation in the Town of Canton.	The MDC was “authorized and directed to provide additional club house facilities at the Ponkapoag Golf Course...by adding to and remodeling the existing club house or by constructing a new club house.”
1948	669	An Act in addition to the general appropriation Act making appropriations to supplement certain items contained therein, and for certain new activities and projects.	Authorized \$50,000 for the construction of “certain additional club house facilities at Ponkapoag Golf Course.”
1950	602	An Act authorizing and directing the Metropolitan District Commission to construct an outdoor public artificial ice-skating rink in the Blue Hills Reservation or vicinity.	Authorized construction of a rink of “standard size for playing ice hockey” that “shall be available at specified hours for fancy, speed, and general public skating.” This Act also authorized the charging of “moderate fees” to cover maintenance and operation costs.
1955	706	An Act making appropriations for the fiscal year nineteen hundred and fifty-six for the maintenance of departments, boards, commissions, institutions and certain activities of the Commonwealth, for interest, sinking fund and serial bond requirements and for certain permanent improvements.	Authorized \$75,000 “for the enlargement of the club house and for certain miscellaneous improvements” at the Ponkapoag Golf Course.
1960	507	An Act making appropriations for the fiscal year nineteen hundred and sixty-one for the maintenance of departments, boards, commissions, institutions and certain activities of the Commonwealth, for interest, sinking fund and serial bond requirements and for certain permanent improvements.	Authorized \$40,000 for the maintenance and use of the Trailside Museum.

Continued on next page.

Appendix W. Acts of the Massachusetts Legislature that Directly Address the Blue Hills Planning Unit. (Continued)

Year	Chapter	Title	Comments
1961	495	An Act making appropriations for the fiscal year nineteen hundred and sixty-two for the maintenance of departments, boards, commissions, institutions and certain activities of the Commonwealth, for interest, sinking fund and serial bond requirements and for certain permanent improvements.	Authorized \$40,000 for the maintenance and use of the Trailside Museum.
1962	204	An Act designating the Metropolitan District Commission skating rink in the St. Moritz section of the Blue Hills Reservation in the City of Quincy as the Mayor William T. Shea Memorial Rink.	Requires that a "suitable marker bearing said designation shall be erected at said rink."
1962	669	An Act authorizing and directing the Metropolitan District Commission to convey a certain parcel of land to the City of Quincy for cemetery purposes.	Authorized the transfer of approximately 42 acres of the Blue Hills Reservation to the City of Quincy for the Pine Hill Cemetery.
1962	791	An Act in addition to the general appropriation Act making appropriations to supplement certain items contained therein, and for certain new activities and projects.	Authorized \$10,000 for the maintenance and use of the Trailside Museum.
1963	748	An Act authorizing the Metropolitan District Commission to acquire by gift certain land in the City of Quincy in the vicinity of the site of the first railway in America.	Authorized the MDC to accept a gift of land and to "acquire by gift or otherwise any real or personal property in the City of Quincy needed for the restoration of the site of the said railway and all other works and historical items pertaining thereto and thereafter to preserve and maintain the same."
1965	681	An Act authorizing the Metropolitan District Commission to construct, enlarge and improve its recreational facilities.	General Act that allowed the MDC to construct and enlarge recreational facilities and to charge "reasonable" fees to cover the costs of their operation and maintenance.
1966	581	An Act directing the Water Resources Commission to make certain flood control improvements for the protection of the Towns of Avon, Braintree, Holbrook and Randolph.	Included the construction of an 850-foot-long low-head earthen dam and spillway along the Blue Hill River in Braintree.
1967	568	An Act directing the Water Resources Commission to make certain flood control improvements in the Town of Braintree.	Amended Chapter 581 of the Acts of 1966 to authorize construction of a low-head earthen dam along the Blue Hill River at West Street in Braintree.
1968	454	An Act relative to the acquisition of certain land in the City of Quincy on which the first railway in America was situated.	Directed the MDC to convey land on Mullin Street to the City of Quincy.
1968	635	An Act providing for a lease of certain land by the Metropolitan District Commission to the Citizenship Training Group, Inc.	Leased the former Nike IFC atop Chickatawbut Hill to Citizenship Training Group, Inc. for "not less than five years."
1969	770	An Act designating the Metropolitan District Commission Little League Ball Field being constructed in the City of Quincy as the Sergeant Robert Allen Curry Ball Field.	Requires that a "suitable marker bearing said designation shall be erected and maintained at said ball field."

Continued on next page.

Appendix W. Acts of the Massachusetts Legislature that Directly Address the Blue Hills Planning Unit. (Continued)

Year	Chapter	Title	Comments
1970	677	An Act directing the Water Resources Commission to make certain flood control improvements for the protection of the Towns of Avon, Braintree, Holbrook and Randolph and directing the Metropolitan District Commission to transfer certain land in the Blue Hills Reservation to the Town of Braintree.	Authorized and directed the Commission to “cause the removal of all trees, vegetation, top soil and peat strata down to a clean, firm base.” For “said purposes the Metropolitan District Commission is hereby authorized and directed to enter into an agreement to allow the Commission to perform said work on such lands that are owned by the Metropolitan District Commission.” At “the completion of the work...the Metropolitan District Commission is hereby further authorized and directed to transfer to the Town of Braintree...that portion of the Blue Hills Reservation presently owned by said commission which lies south of route 128.”
1970	725	An Act to provide for a recreation program for the Metropolitan Parks District.	Provided “the sum of nine hundred and fifty thousand dollars for construction of a covered skating rink and related facilities in the Town of Canton.”
1972	287	An Act designating the Metropolitan District Commission skating rink in the Town of Canton as the John P. Metropolis Skating Rink.	Requires that “a suitable marker bearing said designation shall be erected and maintained at said skating rink.”
1972	514	An Act making appropriations for the fiscal year nineteen hundred and seventy-three for the maintenance of departments, boards, commissions, institutions and certain activities of the Commonwealth, for interest, sinking fund and serial bond requirements and for certain permanent improvements.	Provided \$50,000 for the maintenance and use of the Trailside Museum.
1973	439	An Act making appropriations for the fiscal year nineteen hundred and seventy-three to supplement certain existing appropriations and for certain new activities and projects.	Specified a \$312,536 reimbursement to the Citizenship Training Group, Inc. for rehabilitation of former Nike IFC. This Act also provided \$48,500 for the maintenance and use of the Trailside Museum and the Chickatawbut Hill Center.
1973	559	An Act providing for the granting of certain easements by the Metropolitan District Commission to the Town of Canton.	Granted permanent and temporary easements for the construction, maintenance, and operation of a sanitary sewer system.
1973	1180	An Act to provide for a capital outlay program for the Commonwealth.	Authorized and directed the MDC to expend up to \$2,000,000 to provide flood control along Furnace Brook and Blacks Creek in Quincy, Town Brook in Braintree and Quincy, and the Braintree Dam (i.e., Town Brook FCS) by constructing any necessary new facilities and by dredging, reconstructing and rehabilitating existing facilities.
1974	431	An Act making appropriations for the fiscal year nineteen hundred and seventy-five for the maintenance of departments, boards, commissions, institutions and certain activities of the Commonwealth, for interest, sinking fund and serial bond requirements and for certain permanent improvements.	Provided \$98,500 for the maintenance and use of the Trailside Museum.

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Appendix W. Acts of the Massachusetts Legislature that Directly Address the Blue Hills Planning Unit. (Continued)

Year	Chapter	Title	Comments
1975	684	An Act making appropriations for the fiscal year nineteen hundred and seventy-six for the maintenance of departments, boards, commissions, institutions and certain activities of the Commonwealth, for interest, sinking fund and serial bond requirements and for certain permanent improvements and increasing certain taxes to provide the means for defraying such appropriations.	Provided \$98,500 for the maintenance and use of the Trailside Museum and Chickatawbut Hill Center.
1976	363	An Act making appropriations for the fiscal year nineteen hundred and seventy-seven for the maintenance of departments, boards, commissions, institutions and certain activities of the Commonwealth, for interest, sinking fund and serial bond requirements and for certain permanent improvements.	Provided \$98,500 for the maintenance and use of the Trailside Museum and Chickatawbut Hill Center.
1976	508	An Act authorizing the Metropolitan District Commission to use certain parcels of land within its Blue Hills Reservation for water supply purposes.	Identified two Quincy and three Braintree parcels to be used for pipelines, pumping stations, blow-off chambers, air release valves, and other appurtenances.
1977	114	An Act authorizing the transfer of certain land in the Town of Braintree from the Metropolitan District Commission to the Department of Public Works for highway purposes.	Allowed for the transfer of land at Granite Street and Wood Road for the construction of Route 37.
1977	363	An Act making appropriations for the fiscal year nineteen hundred and seventy-eight for the maintenance of departments, boards, commissions, institutions and certain activities of the Commonwealth, for interest, sinking fund and serial bond requirements and for certain permanent improvements.	Provided \$98,500 for the maintenance and use of the Trailside Museum and Chickatawbut Hill Center.
1978	367	An Act making appropriations for the fiscal year nineteen hundred and seventy-nine for the maintenance of departments, boards, commissions, institutions and certain activities of the Commonwealth, for interest, sinking fund and serial bond requirements and for certain permanent improvements.	Provided \$150,000 for the maintenance and use of the Trailside Museum and the Chickatawbut Hill Center.
1979	87	An Act designating the bathhouse at Houghton's Pond within the Blue Hills Reservation as the William J. Scannell Bathhouse.	Requires that the name be "identified on a suitable marker attached to the building."
1979	366	An Act making certain appropriations for the fiscal year nineteen hundred and eighty prior to action on the general appropriation bill for said year.	Provided \$12,500 for the maintenance and use of the Trailside Museum and the Chickatawbut Hill Center.
1980	472	An Act relative to the leasing of certain land controlled by the Metropolitan District Commission.	Allowed for construction and maintenance for water supply and water works; structures for transmitting electric power or intelligence; or transmitting, receiving, and amplifying television and radio signals.

Continued on next page.

Appendix W. Acts of the Massachusetts Legislature that Directly Address the Blue Hills Planning Unit. (Continued)

Year	Chapter	Title	Comments
1980	523	An Act authorizing the Metropolitan District Commission to sell and convey a certain parcel of land in the Town of Randolph to the Randolph Chapter #39, Disabled American Veterans Building Corporation.	Conveyed 21,473 square feet of the reservation in the Ponkapoag East section to the Disabled American Veterans for construction of a building.
1981	808	An Act making appropriations for the fiscal year ending June thirtieth, nineteen hundred and eighty-two to provide for supplementing certain existing appropriations and for new activities and projects.	Provided \$50,000 for the maintenance and use of the Trailside Museum and the Chickatawbut Hill Center.
1983	289	An Act making appropriations for the fiscal year nineteen hundred and eighty-four for the maintenance of departments, boards, commissions, institutions and certain activities of the Commonwealth, for interest, sinking fund and serial bond requirements and for certain permanent improvements.	Provided \$225,000 for the maintenance and use of the Trailside Museum and the Chickatawbut Hill Center.
1983	723	An Act providing for a capital outlay program for the Commonwealth.	<p>Provided \$75,000 for repairs to and renovations of Metropolis Rink, and \$2,370,000 for the study, preparation of plans, and repairs and improvements to the Meteorological Observatory, Redman Farmhouse, Houghton's Pond concession, Eliot Tower, police headquarters, stable, Ponkapoag boardwalk, and Chickatawbut tower and pavilion.</p> <p>Also provided \$4,000,000 for the acquisition of land for flood control improvements and developments in the Town Brook Basin, including at least \$1,110,000 for the replacement and construction of culverts in Braintree.</p>
1984	372	An Act pertaining to the Metropolitan Water District and the Metropolitan Sewer District of the Metropolitan District Commission.	<p>Established the MWRA, which acquired responsibility for the Blue Hills Reservoir and associated structures.</p> <p>Section 8(m) regulates "any building, construction, excavation or crossing within an easement or other property interest held by the Authority or in the immediate vicinity of a water or sewer main or other facility which is operated by the Authority." Permits, referred to as Section 8(m) Permits, are required for such activities.</p>
1985	668	An Act authorizing the Division of Capital Planning and Operations to transfer control of Willard Street in the City of Quincy to the Metropolitan District Commission.	Transferred the care, custody, and control from the Department of Public Works to the MDC.
1986	142	An Act making appropriations for the fiscal year ending June thirtieth, nineteen hundred and eighty-six to provide for supplementing certain existing appropriations and for certain other activities and projects.	Provided \$150,000 for the maintenance and use of the Trailside Museum and the Chickatawbut Hill Center.
1986	206	An Act making appropriations for the fiscal year nineteen hundred and eighty-seven for the maintenance of departments, boards, commissions, institutions and certain activities of the Commonwealth, for interest, sinking fund and serial bond requirements and for certain permanent improvements.	Included specific funding for interpretive programs at the Blue Hills. It also included \$225,000 to study, prepare plans, and repair or replace the Trailside Museum's roof, and \$535,000 for the maintenance and use of the Trailside Museum and Chickatawbut Hill Center.

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Appendix W. Acts of the Massachusetts Legislature that Directly Address the Blue Hills Planning Unit. (Continued)

Year	Chapter	Title	Comments
1986	225	An Act authorizing the Division of Capital Planning and Operations to grant a permanent easement in the Blue Hills Reservation to the Town of Milton.	Granted a 52,774 square-foot easement for a sanitary sewer line.
1986	653	An Act authorizing the Division of Capital Planning and Operations to sell, lease, or rent an easement in a certain parcel of land in the Town of Milton.	Authorized the Deputy Commissioner of the Division of Capital Planning and Operations to sell, lease, or grant an easement in Milton to Thomas W. Hamilton for the purpose of property access.
1987	564	An Act providing for an environmental enhancement and protection program for the Commonwealth.	Included \$10,200,000 for studies, plans, and land acquisition for a greenbelt from Castle Island, Boston to the Blue Hills Reservation. Also included \$10,200,000 to acquire land for the construction of flood control improvements and developments in the Town Brook Basin in the City of Quincy.
1989	530	An Act authorizing the Deputy Commissioner of Capital Planning and Operations to convey a certain parcel of land.	Conveyed 79,804 square feet of land along Randolph Street to the Town of Canton for a water tower.
1989	543	An Act authorizing the Division of Capital Planning and Operations to lease the Blue Hill Ski Area for recreational purposes.	Allowed for a 10-year lease of the William F. Rogers Ski Area.
1991	375	An Act improving public golfing facilities relative to Ponkapoag Golf Course.	Established the Ponkapoag Recreational Fund, which allows retaining a portion of greens fees in order to maintain the golf course.
1991	412	An Act to consolidate certain police forces in the Commonwealth.	Consolidated the MDC Police force, the Division of the State Police force, the Capitol Police force, and the Division of Law Enforcement of the Registry of Motor Vehicles into the Massachusetts State Police. This effectively ended the nighttime gating of parking lots and roads within the Blue Hills and reduced law enforcement presence on the reservation's trails.
1992	23	An Act making appropriations for the fiscal year ending June thirtieth, nineteen hundred and ninety-two to provide for supplementing certain existing appropriations and for certain other activities and projects.	Provided \$300,000 for the maintenance, equipment, or capital improvement of Ponkapoag Golf Course.
1992	380	An Act relative to the disposition of certain state owned property at the "Ponkapoag Outdoor Center." So-called, at the Blue Hills Reservation in the Town of Canton.	Allowed for a 30-year lease of what is now the YMCA of Greater Boston's Ponkapoag Outdoor Center.
1993	422	An Act authorizing the Division of Capital Planning and Operations to grant easements over certain park and conservation land in the Towns of Canton and Milton to the Massachusetts Water Resources Authority.	Conveyed five permanent sewer easements and associated temporary construction easements to the MWRA.
1994	50	An Act authorizing the City of Quincy to lease a certain parcel of land to Quarry Hills Associates, Inc.	Allowed the City of Quincy to lease the former sanitary landfill and adjacent parcels for a period of up to fifty years. This helped bring about the redevelopment of Ricciuti Drive.
1994	85	An Act relative to bond authorizations for certain emergency capital projects by the Commonwealth.	Section 44 of this Act allowed for the Department of Environmental Management to lease historic properties, thereby establishing the Historic Curatorship Program.

Continued on next page.

Appendix W. Acts of the Massachusetts Legislature that Directly Address the Blue Hills Planning Unit. (Continued)

Year	Chapter	Title	Comments
1998	230	An Act authorizing the transfer of certain state owned land in the Town of Canton.	The MDC was allowed to transfer a certain parcel of land to the care and control of the Massachusetts Highway Department.
1998	275	An Act providing for the lease of Commonwealth land in the City of Quincy.	Established a 50-year renewable lease with the Athletes Reaching Out Foundation for 12-acres of the Quincy Quarries (i.e., Mini-Fenway Park).
1998	289	An Act making certain appropriations for the fiscal year 1998 to provide for certain capital and supplemental appropriations.	This Act proposed \$170,000 for study for repair and replacement of Ponkapoag Dam and \$400,000 for Ponkapoag boardwalk. Both were vetoed.
2000	384	An Act making appropriations for the fiscal year 2001 to provide for supplementing certain existing appropriations and for certain other activities and projects.	This Act directed Mass Highway and the Metropolitan District Commission to “take all steps necessary and appropriate to fill an illegal dumping ground known as the Granite Rail Quarry.”
2002	183	An Act relative to Mini-Fenway Park, Inc.	This Act updated Chapter 275 of the Acts of 1998 to substitute Mini-Fenway Park, Inc. for the Athletes Reaching Out Foundation.
2002	236	An Act providing for the preservation and improvement of the environmental assets of the Commonwealth.	According to this Act, \$2,000,000 shall be expended on improvements to the Trailside Museum and \$12,000,000 shall be expended for the renovation and reconstruction of the Leo J. Martin and Ponkapoag golf courses.
2002	240	An Act directing the Division of Capital Asset Management and Maintenance to convey a certain parcel of land in the Town of Randolph.	Conveyed 3.2 acres off High Street to the Hart Family Limited Partnership. Limits the use of this land to “surface parking, recreation, and open space purposes.” Also requires that parking and appropriate signage be provided for Blue Hills patrons.
2002	324	An Act authorizing an alternative method of construction for the Blue Hills and Spot Pond area covered water storage tanks.	MWRA “may utilize such alternative means of procurement for the design and construction of covered storage tank systems.”
2004	5	An Act amending certain appropriation acts.	This Act requires that the fair cash value of all DCR properties, including the Blue Hills Reservation, is determined every four years.
2004	291	An Act modernizing the transportation system of the Commonwealth.	Provided funding for “signalization and road reconstruction at the intersection of Unquity Road and Blue Hills Parkway in Milton.”
2007	183	An Act relative to volunteers at state parks.	Allows non-profit organizations to “charge, solicit or receive donations or funds” at an event or activity on a state park if those funds are used “only for supporting or improving a facility or program” of the DCR. This Act also allows the DCR to enter into agreements with non-profit organizations “regarding volunteers participating in the stewardship on department property.”
2008	182	An Act making appropriations for the fiscal year 2009 for the maintenance of the departments, boards, commissions, institutions and certain activities of the Commonwealth, for interest, sinking fund and serial bond requirements and for certain permanent improvements.	Included in the Act were allowances for the issuance of 25-year leases for Ponkapoag Golf Course, Blue Hills Meteorological Observatory, and the William F. Rogers Ski Area.

Continued on next page.

Appendix W. Acts of the Massachusetts Legislature that Directly Address the Blue Hills Planning Unit. (Continued)

Year	Chapter	Title	Comments
2008	302	An Act making appropriations for fiscal year 2008 to provide for supplementing certain existing appropriations and for certain other activities and projects.	This added the Caretaker's Cottage and barn at Brookwood Farm to the list of historic structures that may be leased through DCR's Historic Curatorship Program.
2008	312	An Act providing for the preservation and improvement of land, parks, and clean energy in the Commonwealth.	This Act identified that funding of "not less than \$2,000,000 shall be expended for capital improvements to the Trailside Museum" and that "\$300,000 shall be expended for clean up, planning and design of a multi-use recreational field within or adjacent to the Blue Hills Reservation in the Town of Canton."
2008	446	An Act designating a certain education center on Chickatawbut Hill in Milton (sic) as the Norman Smith Environmental Education Center at Chickatawbut Hill.	Requires that the DCR "shall erect and maintain suitable markers bearing the designation."

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Appendix X. Blue Hills Reservation Work Plans; Modified from DCR (2010c).

May - June

Section	Site	Type ^a	Mow/Trim ^{b, c}	Weed, Grassy ^d	Weed, Paved ^e	Trash Barrel ^f	Litter Removal ^g	Beach Sanitizing ^h	Ball Field ⁱ	Playground ^j	Bathroom ^k	Sweep ^l	Catch Basins ^m
LB	Green Street	P	E14/AN	-	-	E7	E14	-	-	-	-	E45	A
LB	Route 138 Commuter Lot	F	N/R	-	-	-	N/R	-	-	-	-	-	-
GB	Blue Hill River Road	P	E14/AN	-	-	E7	E14	-	-	-	-	E45	A
GB	Blue Hill Weather Observatory	P	N/R	-	-	-	N/R	-	-	-	-	-	-
GB	Eliot Tower area	F	N/R	-	-	N/R	N/R	-	-	-	-	-	-
GB	Hillside Street	P	E14/AN	-	-	E7	E14	-	-	-	-	E45	A
GB	Trailside Museum ⁿ	F	-	-	-	-	E14	-	-	-	N/R	E45	A
BF	Blue Hill River Road	P	E14/AN	-	-	E7	E14	-	-	-	-	E45	A
BF	Hillside Street	P	E14/AN	-	-	E7	E14	-	-	-	-	E45	A
HP	Blue Hill River Road	P	E14/AN	-	-	E7	E14	-	-	-	-	E45	A
HP	Hillside Street	P	E14/AN	-	-	E7	E14	-	-	-	-	E45	A
HP	Houghton's Pond Recreation Area	F	E14	-	-	E7	E7	E14	E7	E7	E1	-	A
HQ	District Office (includes HQ)	F	E14	-	-	NR	NR	-	-	-	N/R	-	-
HQ	Hillside Street	P	E14/AN	-	-	E7	E14	-	-	-	-	E45	A
OP	Hillside Street	P	E14/AN	-	-	E7	E14	-	-	-	-	E45	A
OP	Operation's Yard	F	N/R	-	-	-	N/R	-	-	-	-	N/R	N/R
UN	Max Ulin Memorial Skating Rink	F	N/R	-	-	-	N/R	-	-	-	-	-	N/R
UN	Unquity Road	P	E14/AN	-	-	E7	E14	-	-	-	-	E45	A
BH	Hillside Street	P	E14/AN	-	-	-	E14	-	-	-	-	E45	A
BH	Chickatawbut Road	P	E14/AN	-	-	-	E14	-	-	-	-	E45	A
CH	Chickatawbut Road (includes overlook)	P	E14/AN	-	-	E7	E14	-	-	-	-	E45	A
CH	Wampatuck Road	P	E14/AN	-	-	-	E14	-	-	-	-	E45	A
QQ	Quincy Quarries	F	N/R	-	-	-	N/R	-	-	-	-	-	-
SM	Daniel Michael Shea Memorial Park	F	-	-	-	-	-	-	-	E7	-	-	-
SM	Mayor William T. Shea Memorial Rink	F	N/R	-	-	-	N/R	-	-	-	-	N/R	-
SM	Sergeant Robert Allen Curry Little League Ball Field	F	E14	-	-	E14	-	-	N/R	-	-	-	-
SM	Wampatuck Road	P	E14/AN	-	-	E7	E14	-	-	-	-	E45	A
SM	Willard Street	P	E14/AN	-	-	E7	E14	-	-	-	-	E45	A
PO	Indian Line Farm	F	-	-	-	E7	E90	-	-	-	-	-	A
PO	Ponkapoag Golf Course	F	N/R	-	-	-	N/R	-	-	-	N/R	N/R	N/R
PO	Redman Farmhouse	F	N/R	-	-	-	N/R	-	-	-	-	-	-
PE	North Randolph Little League Ball Fields ^o	F	-	-	-	-	-	-	-	-	-	-	-
WS	West Street	F	N/R	-	-	-	N/R	-	-	-	-	-	-
RES	Blue Hills Reservation	F	E14/AN	-	-	E7	E14	-	-	-	-	E45	A

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**Appendix X. Blue Hills Reservation Work Plans; Modified from DCR (2010c).
(Continued)**

Summer

Section	Site	Type^a	Mow/Trim^{b, c}	Weed, Grassy^d	Weed, Paved^e	Trash Barrel^f	Litter Removal^g	Beach Sanitizing^h	Ball Fieldⁱ	Playground^j	Bathroom^k	Sweep^l	Catch Basins^m
LB	Green Street	P	E14	-	-	-	E14	-	-	-	-	E30	AN
LB	Route 138 Commuter Lot	F	N/R	-	-	-	N/R	-	-	-	-	-	-
GB	Blue Hill River Road	P	E14	-	-	E1	E14	-	-	-	-	E30	AN
GB	Blue Hill Weather Observatory	P	N/R	-	-	-	N/R	-	-	-	-	-	-
GB	Eliot Tower area	F	N/R	-	-	N/R	N/R	-	-	-	-	-	-
GB	Hillside Street	P	E14	-	-	E1	E14	-	-	-	-	E30	AN
GB	Trailside Museum ⁿ	F	-	-	-	-	AN	-	-	-	N/R	-	AN
BF	Blue Hill River Road	P	E14	-	-	E1	E14	-	-	-	-	E30	AN
BF	Hillside Street	P	E14	-	-	E1	E14	-	-	-	-	E30	AN
HP	Blue Hill River Road	P	E14	-	-	E1	E14	-	-	-	-	E30	AN
HP	Hillside Street	P	E14	-	-	E1	E14	-	-	-	-	E30	AN
HP	Houghton's Pond Recreation Area	F	E14	-	-	E1	E1	2W	E7	E7	E1	-	AN
HQ	District Office (includes HQ)	F	E14	-	-	-	E14	-	-	-	E1	E30	AN
HQ	Hillside Street	P	E14	-	-	E1	E14	-	-	-	-	E30	AN
OP	Hillside Street	P	E14	-	-	E1	E14	-	-	-	-	E30	AN
OP	Operation's Yard	F	N/R	-	-	-	N/R	-	-	-	-	N/R	N/R
UN	Max Ulin Memorial Skating Rink	P	E14	-	-	NR	E14	-	-	-	-	-	AN
UN	Unquity Road	P	E14	-	-	NR	E14	-	-	-	-	-	AN
BH	Hillside Street	P	E14	-	-	E1	E14	-	-	-	-	E30	AN
BH	Chickatawbut Road	P	E14	-	-	E3-4	E14	-	-	-	-	E30	AN
CH	Chickatawbut Road (includes overlook)	P	E14	-	-	E3-4	E14	-	-	-	-	E30	AN
CH	Wampatuck Road	P	E14	-	-	E1	E14	-	-	-	-	E30	AN
QQ	Quincy Quarries	F	N/R	-	-	-	N/R	-	-	-	-	-	-
SM	Daniel Michael Shea Memorial Park	F	-	-	-	-	-	-	-	E7	-	-	-
SM	Mayor William T. Shea Memorial Rink	F	E14	-	-	E1	E14	-	-	E7	-	E30	AN
SM	Sergeant Robert Allen Curry Little League Ball Field	F	E14	-	-	E14	-	-	N/R	-	-	-	-
SM	Wampatuck Road	P	E14	-	-	E1	E14	-	-	-	-	E30	AN
SM	Willard Street	P	E14	-	-	E1	E14	-	-	-	-	E30	AN
PO	Indian Line Farm	F	-	-	-	-	AN	-	-	-	-	-	AN
PO	Ponkapoag Golf Course	F	N/R	-	-	-	N/R	-	-	-	N/R	N/R	N/R
PO	Redman Farmhouse	F	N/R	-	-	-	N/R	-	-	-	-	-	-
PE	North Randolph Little League Ball Fields ^o	F	-	-	-	-	-	-	-	-	-	-	-
WS	West Street	F	N/R	-	-	-	N/R	-	-	-	-	-	-
RES	Blue Hills Reservation	F	E14	-	-	-	E14	-	-	-	E1	E30	AN

Continued on next page.

Appendix X. Blue Hills Reservation Work Plans; Modified from DCR (2010c).

- a. Types of sites are either recreation facilities (F) or parkways (P).
- b. Work associated with mowing and edge trimming a site.
- c. The frequency with which maintenance activities are performed are reported as 2W = twice weekly, A = annually, AN = as needed, or for every "x" number of days (E7 = every 7 calendar days). The code N/R indicates that the frequency of this activity is not reported. When this occurs, maintenance frequencies are assumed to be as reported for the entire Blue Hills Reservation.
- d. Weeding around trees, fences, and park furniture, but not pavement or pathways.
- e. Weeding pathways, curbs, sidewalks, and other infrastructure.
- f. Emptying trash barrel and replacing bag.
- g. General litter removal, by hand.
- h. Raking or sifting of sand to locate debris, which is then removed from site.
- i. Field striping and general maintenance.
- j. Weekly informal inspection of playgrounds; formal inspections are conducted annually.
- k. Restrooms are cleaned throughout the day, every day that they are open.
- l. Mechanized sweeping of streets and parking areas.
- m. Cleaning of catch basins.
- n. Mass Audubon maintains the Trailside Museum's grounds; the DCR maintains the parking lots and comfort station.
- o. North Randolph Little League maintains these fields.

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Appendix Y. Land Stewardship Zoning Guidelines, Department of Conservation and Recreation, February, 2006.

Background

In July, 2003 state legislation established the Department of Conservation and Recreation (DCR), consisting of a Division of Urban Parks and Recreation, a Division of State Parks and Recreation, and a Division of Water Supply Protection. This legislation essentially merged the former Department of Environmental Management (DEM) and the Metropolitan District Commission (MDC). In addition, it required the preparation of management plans for state parks, forests and reservations under the management of the DCR (Chapter 21, Section 2F). This legislation states that management plans shall include guidelines for operation and land stewardship, provide for the protection and stewardship of natural and cultural resources, and shall ensure consistency between recreation, resource protection, and sustainable forest management.

As part of addressing this legislative requirement, land stewardship zoning guidelines will be incorporated into the development and implementation of DCR Resource Management Plans. These Land Stewardship Zoning Guidelines (Guidelines) represent a revision of the previous Land Stewardship Zoning system developed by Executive Office of Environmental Affairs (EOEA) agencies in the early 1990s, and which had been applied to the preparation of management plans for state parks, forests and reservations under the management of the former DEM.

These revised Guidelines provide a general land stewardship zoning framework for the development of Resource Management Plans for all state reservations, parks, and forests. They do not apply to Division of Water Supply Protection properties which have a separate legislative mandate and established planning procedures.

Overview of Guidelines

The Guidelines define three types of zones to address the legislative requirement to provide for the protection and stewardship of natural and cultural resources and to ensure consistency between recreation, resource protection, and sustainable

forest management. The Guidelines are intended to provide a general land stewardship zoning framework that is flexible and that can guide the long-term management of a given DCR property or facility. The three zones may be supplemented with significant feature overlays that identify specific designated/recognized resource features (such as Forest Reserves, Areas of Critical Environmental Concern, or areas subject to historic preservation restrictions). DCR parks, forests, and reservations are also subject to specific policy guidelines and/or performance standards (such as Executive Order No. 181 for Barrier Beaches) and applicable environmental laws and regulations of the Commonwealth.

Application of the three-zone system to a particular DCR park, forest or reservation is facilitated by the development and application of Geographic Information Systems (GIS) technology. GIS resource overlays provide a general screen whereby lands of special resource significance and sensitivity can be mapped and identified. General landscape features such as forested areas, wetlands, streams and ponds can also be mapped as part of this overlay approach. Further, additional data regarding recreational uses and developed facilities and sites can be added. This type of mapping and data collection, based on the best information currently available, provides the basis for subsequent analysis and ultimately the development and application of appropriate land stewardship zoning guidelines to a specific state park, forest or reservation.

Land Stewardship Zoning Guidelines provide a foundation for recommendations that will address resource stewardship and facility management objectives, and are intended to cover both existing DCR property or facility conditions and desired future conditions for that property or facility. Proposals for changing applied Land Stewardship Zones in a previously approved Resource Management Plan should be submitted to the DCR Stewardship Council for review and adoption.

Land Stewardship Zones

Zone 1

General Description

This zone includes unique, exemplary, and highly sensitive resources and landscapes that require special management approaches and practices to protect and preserve the special features and values identified in the specific Resource Management Plan. Examples of these resources include rare species habitat identified by the Natural Heritage & Endangered Species Program as being highly sensitive to human activities, fragile archaeological or cultural sites, and unique or exemplary natural communities. Management objectives emphasize protecting these areas from potentially adverse disturbances and impacts.

General Management Guidelines

- Only dispersed, low-impact, non-motorized, sustainable recreation will be allowed provided that the activities do not threaten or impact unique and highly sensitive resources.
- Existing trails and roads will be evaluated to ensure compatibility with identified resource features and landscape, and will be discontinued if there are suitable sustainable alternatives. New trails may be constructed only after a strict evaluation of need and avoidance of any potential adverse impacts on identified resources. New roads may only be constructed to meet public health and safety needs or requirements; however, the project design and siting process must avoid any potential adverse impacts on identified resources and demonstrate that there are no other suitable alternatives.
- Vegetation or forest management will be utilized only to preserve and enhance identified resource features and landscapes.

Zone 2

General Description

This zone includes areas containing typical yet important natural and cultural resources on which common forestry practices and dispersed recreational activities can be practiced at sustainable levels that do not degrade these resources, and that hold potential for improving their ecological health, productivity and/or protection through active management. Examples include terrestrial and aquatic ecosystems characterized by a diversity of wildlife and plant habitats, rare species habitat that is compatible with sustainable forestry and dispersed recreation, agricultural resources, and resilient cultural sites and landscapes. Zone 2 areas may be actively managed provided that the management activities are consistent with the approved Resource Management Plan for the property.

General Management Guidelines

- Management approaches and actions may include a wide range of potential recreational opportunities and settings that are consistent and compatible with natural resource conservation and management goals.
- Utilize Best Management Practices for forestry and other resource management activities to encourage native biodiversity, protect rare species habitats, unique landforms, and cultural resources.
- Protect and maintain water quality by providing for healthy functioning terrestrial and aquatic ecosystems.
- Provide a safe, efficient transportation network with minimal impact on natural and cultural resources while serving public safety needs and allowing visitors to experience a variety of outdoor activities.
- New trails may be allowed dependent upon existing area trail densities, purpose and need, physical suitability of the site, and specific guidelines for protection of rare species habitat and archaeological resources.

- Sustainable forest management activities may be undertaken following guidelines established through ecoregion-based assessments, district level forestry plans, current best forestry management practices, and providing for consistency with resource protection goals.
- Roads may be constructed if access for resource management or public access is needed and construction can be accomplished in an environmentally protective manner. Existing roads will be maintained in accordance with the DCR road classification system and maintenance policy.
- Additional site-specific inventory and analysis may be needed prior to any of the management activities described above to ensure that no adverse impacts occur to previously undocumented unique and sensitive resources and landscape features.

Zone 3

General Description

This zone includes constructed or developed administrative, maintenance and recreation sites, structures and resilient landscapes which accommodate concentrated use by recreational visitors and require intensive maintenance by DCR staff. Examples include areas developed and deemed appropriate for park headquarters and maintenance areas, parking lots, swimming pools and skating rinks, paved bikeways, swimming beaches, campgrounds, playgrounds and athletic fields, parkways, golf courses, picnic areas and pavilions, concessions, and areas assessed to be suitable for those uses.

General Management Guidelines

- The management approach and actions will emphasize public safety conditions and provide for an overall network of accessible facilities that meets the needs of DCR visitors and staff.
- Maintenance of these facilities and associated natural and cultural resources, and new construction or development, will meet state public health code, and state building code and environmental regulations.
- Shorelines and surface waters may be used for recreation within constraints of maintaining public safety and water quality.
- Historic restoration, rehabilitation or reconstruction for interpretation or adaptive reuse of historic structures will be undertaken only in conjunction with a historic restoration plan.
- To the greatest extent possible, construction will include the use of “green design” for structures, such as use of low-flow water fixtures and other water conservation systems or techniques, solar and other renewable energy sources, and the implementation of Best Management Practices to protect the soil and water resources at all facilities.

Significant Feature Overlays

General Description

The three land stewardship zones may be supplemented with significant feature overlays that identify specific designated/recognized resource features. These significant features are generally identified through an inventory process or research, and are formally designated. The purpose of these overlays is to provide more precise management guidance for identified resources and to recognize, maintain, protect, or preserve unique and significant values, regardless of the zone in which they occur. Examples of significant feature overlays include Forest Reserves, areas subject to public drinking water regulations, or areas subject to historic preservation restrictions.

Management Guidelines

Specific management guidelines for significant features overlays are provided by resource specialists or by the federal, state, regional, or local agency that has recognized and listed the resource or site.

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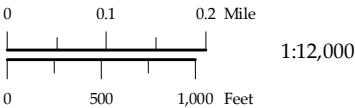
Zollo, V. 2009. Randolph to Sharon, South Shore Bird Club trip, 11/22/09. November 22, 2009. <<http://groups.google.com/group/massbird>> Accessed August 26, 2010.

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Mount Watatic Reservation
2001 Orthophotography

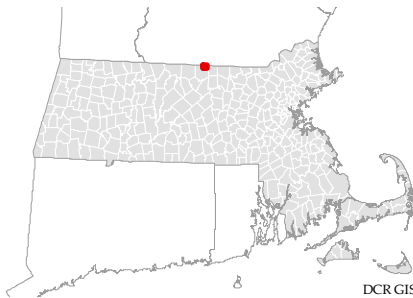
- Mount Watatic Reservation
- Abutting Open Space
- Town Boundary

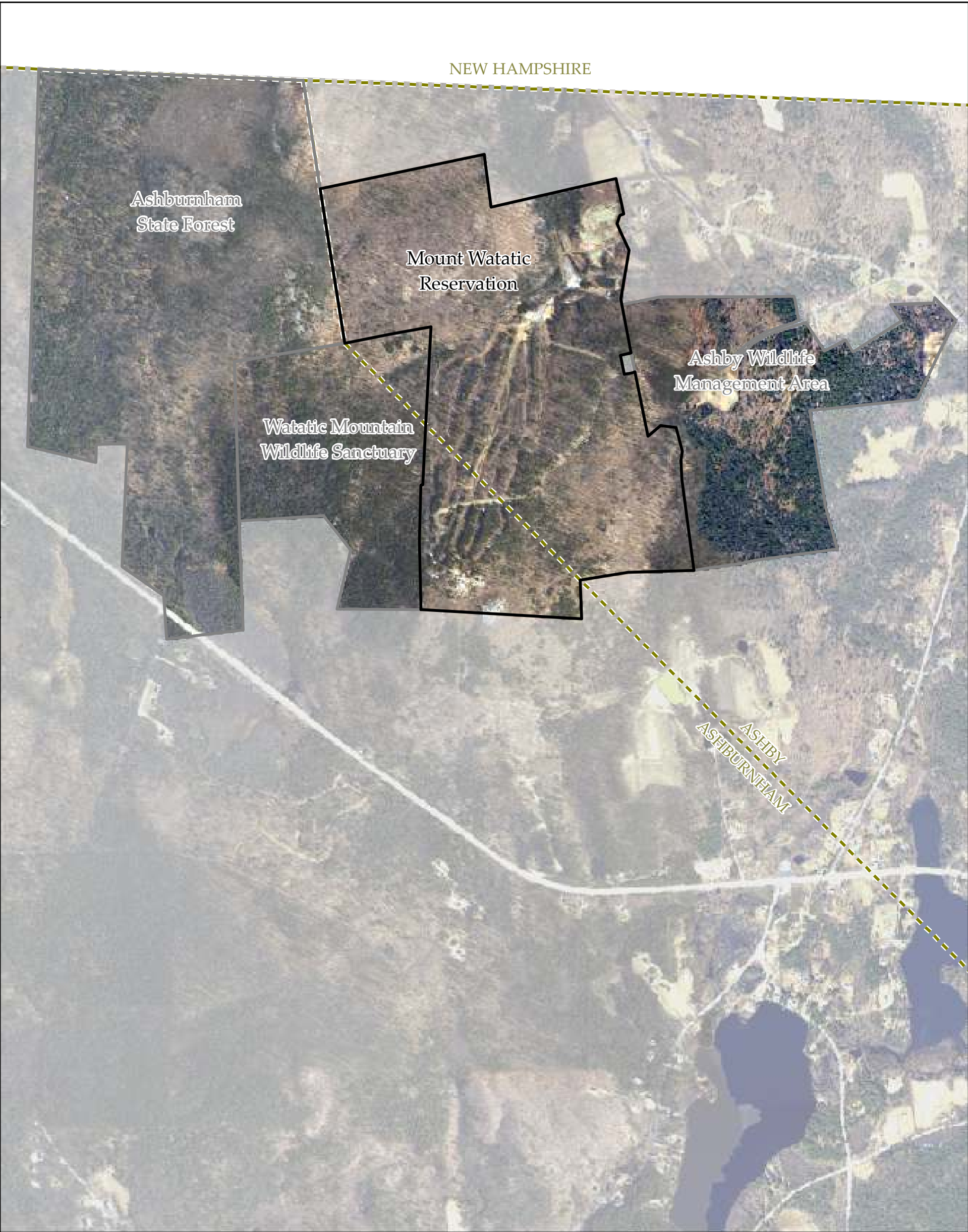


Geographic data supplied by: Office of Geographic and Environmental Information (MassGIS) and DCR GIS, Commonwealth of Massachusetts Executive Office of Energy and Environmental Affairs.



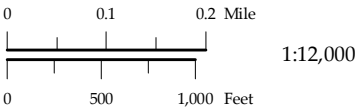
This is a report-sized version of a larger map. Please refer to the full-sized map for more detailed information.





Mount Watatic Reservation
2005 Orthophotography

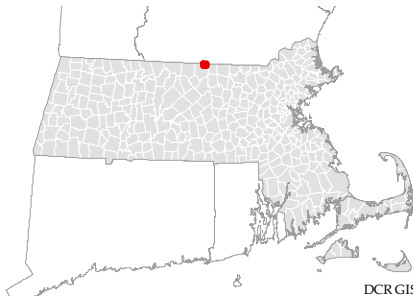
- Mount Watatic Reservation
- Abutting Open Space
- Town Boundary

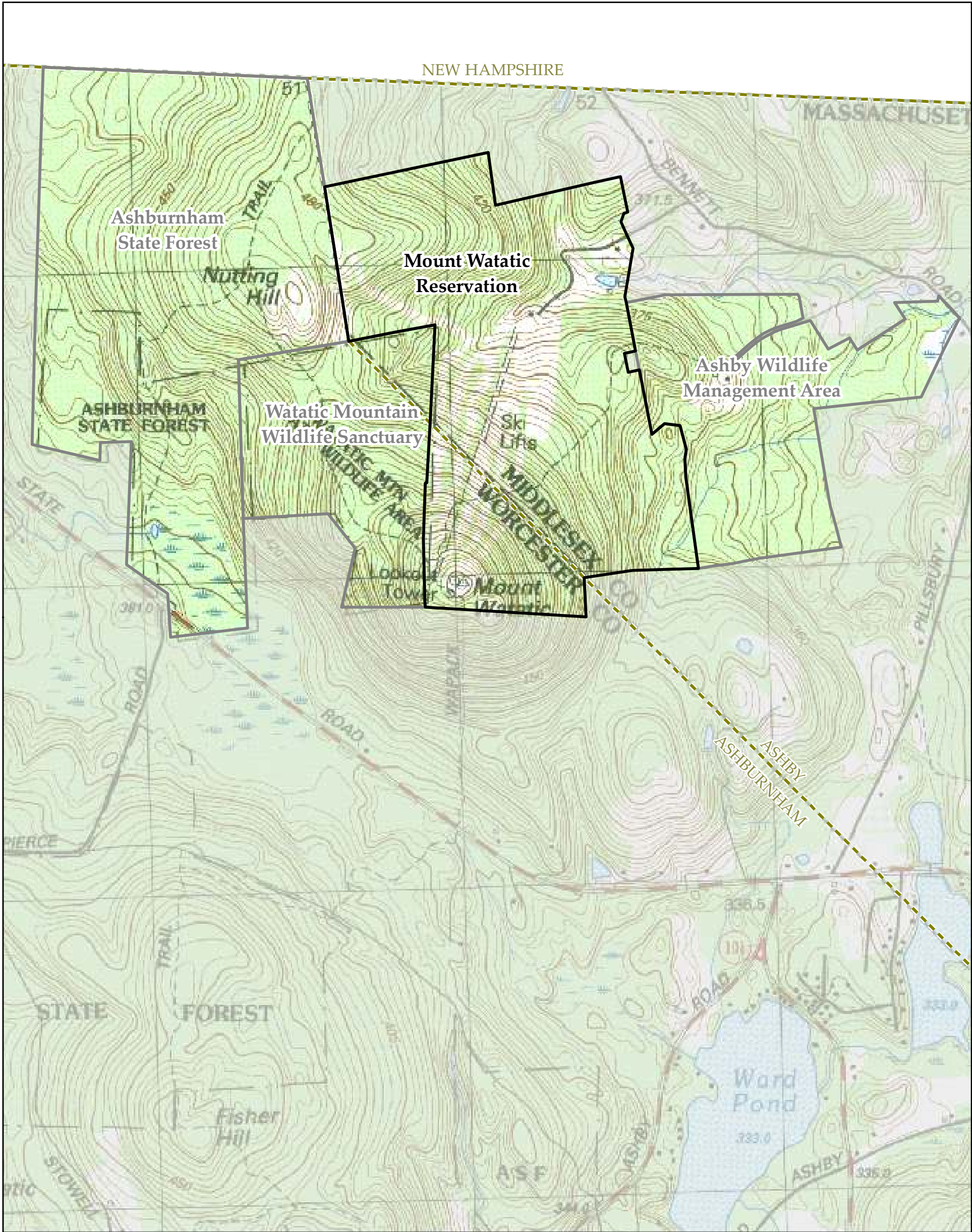


Geographic data supplied by: Office of Geographic and Environmental Information (MassGIS) and DCR GIS, Commonwealth of Massachusetts Executive Office of Energy and Environmental Affairs.



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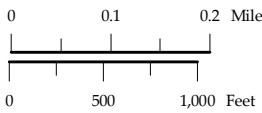


Mount Watatic Reservation

USGS Topographic Quadrangles

- Mount Watatic Reservation
- Abutting Open Space
- Town Boundary

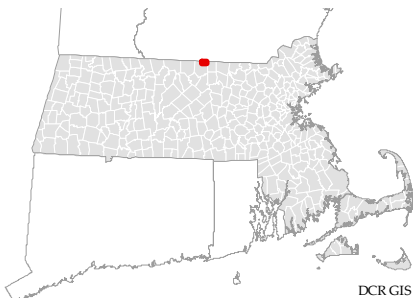
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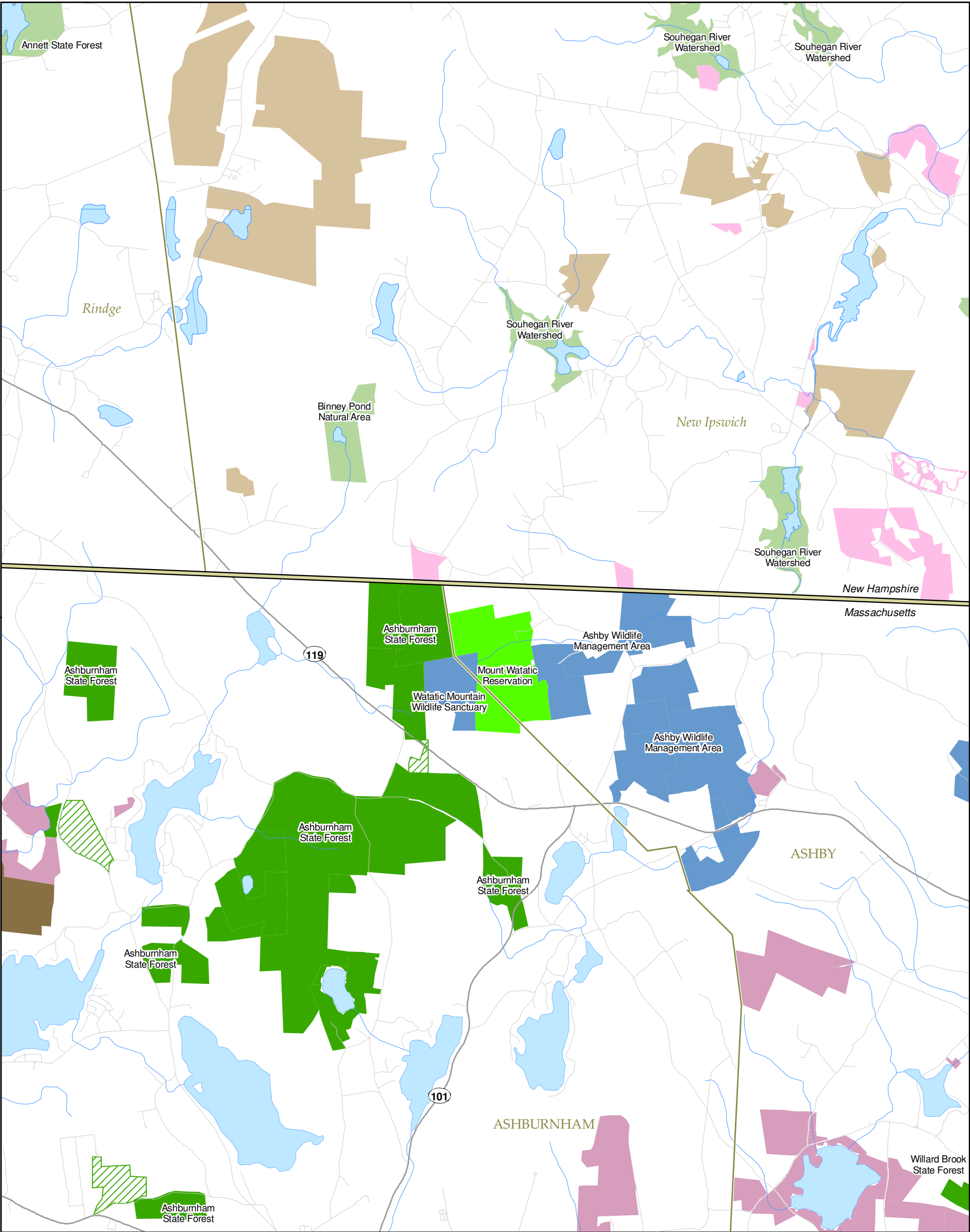
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This is a report-sized version of a larger map. Please refer to the full-sized map for more detailed information.



DCR GIS Jan-07

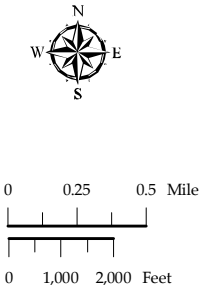


- Town Boundary
 - Interstate Boundary
 - Major Road
 - Minor Road
 - River or Stream
 - Lake or Pond
 - Massachusetts Fee Interest
 - Mount Watatic Reservation
 - DCR State Parks
 - Department of Fish and Game
 - Municipal
 - Non-Profit
- Massachusetts Deed Restriction
 - DCR State Parks
 - Non-Profit
 - New Hampshire Open Space
 - State Agency
 - Municipal/County
 - Other Public/Quasi-Public Entity
 - Private Organization

Mount Watatic Reservation

Regional Open Space

Geographic data supplied by: Office of Geographic and Environmental Information (MassGIS) and DCR GIS, Commonwealth of Massachusetts Executive Office of Energy and Environmental Affairs and New Hampshire GRANIT.



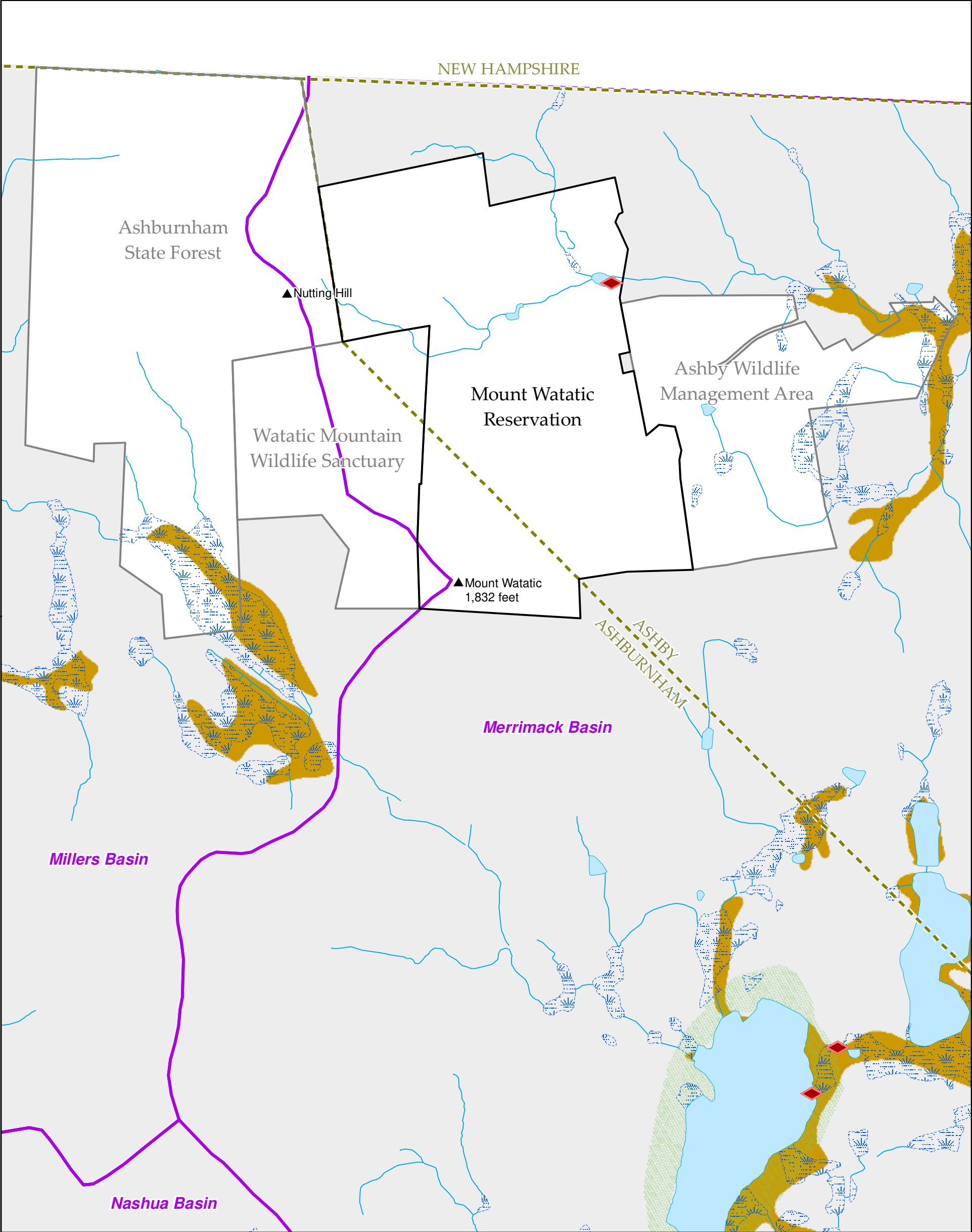
1:44,000



This is a report-sized version of a larger map. Please refer to the full-sized map for more detailed information.




DCR GIS Jan-07





Mount Watatic Reservation


Water Resources





This is a report-sized version of a larger map. Please refer to the full-sized map for more detailed information.


 Dam


 Shoreline


 Wetland Limit


 Hydrologic Connection


 Open Water


 Wetland


 Town Boundary


 Mount Watatic Reservation

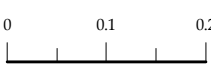
 Abutting Open Space

 Major Drainage Basin

 100-Year Flood Zone

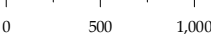
 Medium Yield Aquifer





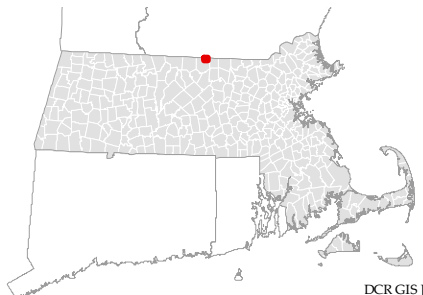
0 0.1 0.2 Mile

1:12,000

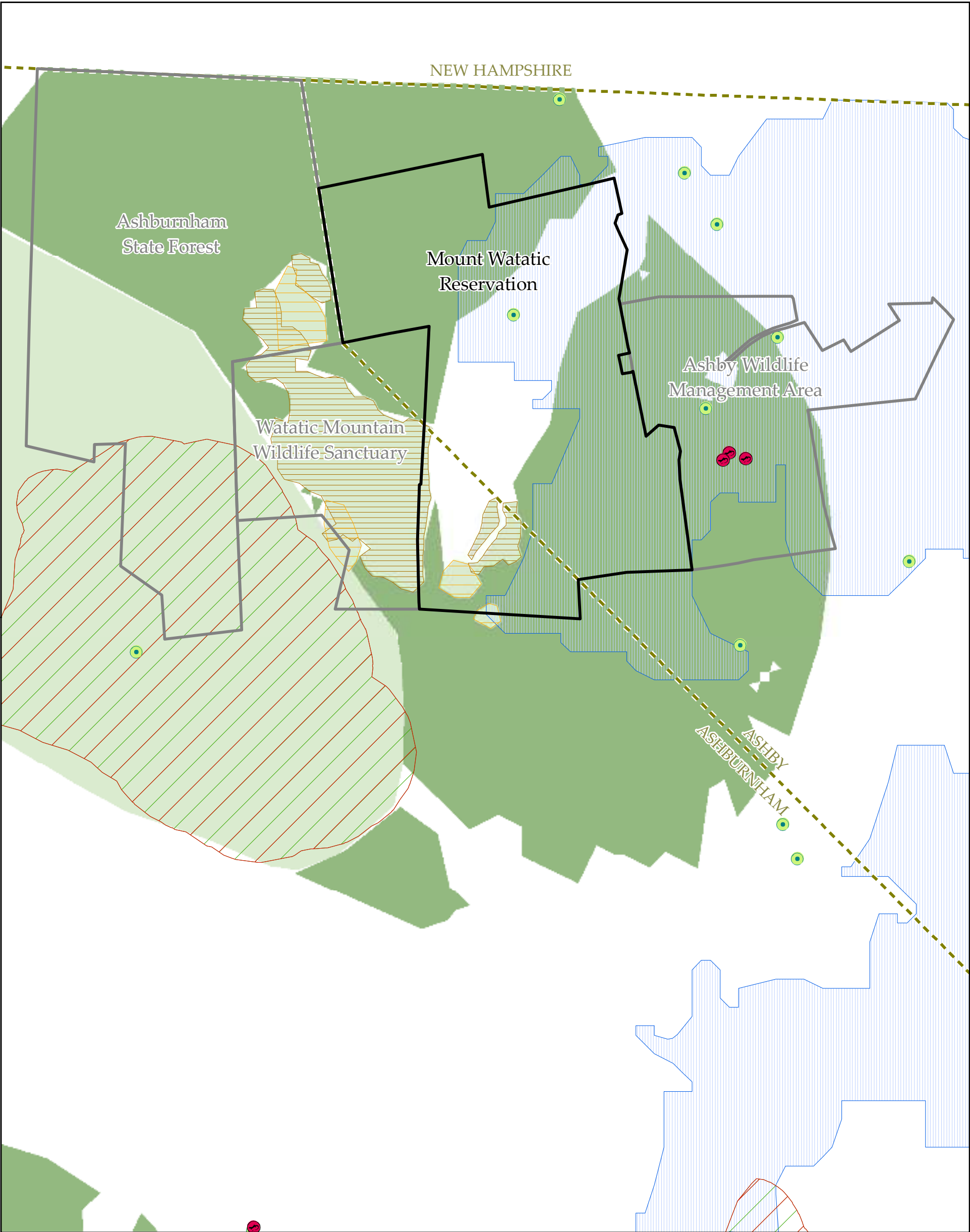


0 500 1,000 Feet

Geographic data supplied by: Office of Geographic and Environmental Information (MassGIS) and DCR GIS, Commonwealth of Massachusetts Executive Office of Energy and Environmental Affairs.



DCR GIS Jan-07



NHESP Certified Vernal Pool

NHESP Potential Vernal Pool

NHESP Priority Habitat of Rare Species

NHESP Estimated Habitat of Rare Wildlife

NHESP Living Waters Critical Supporting Watershed

NHESP Natural Community

Acidic Rocky Summit / Rock Outcrop Community

Red Spruce - Fir - Northern Hardwoods Forest

NHESP BioMap Core Habitat

NHESP BioMap Supporting Natural Landscape

Mount Watatic Reservation

Abutting Open Space

Town Boundary

Mount Watatic Reservation

Priority Natural Resources

Natural Heritage & Endangered Species Program Data

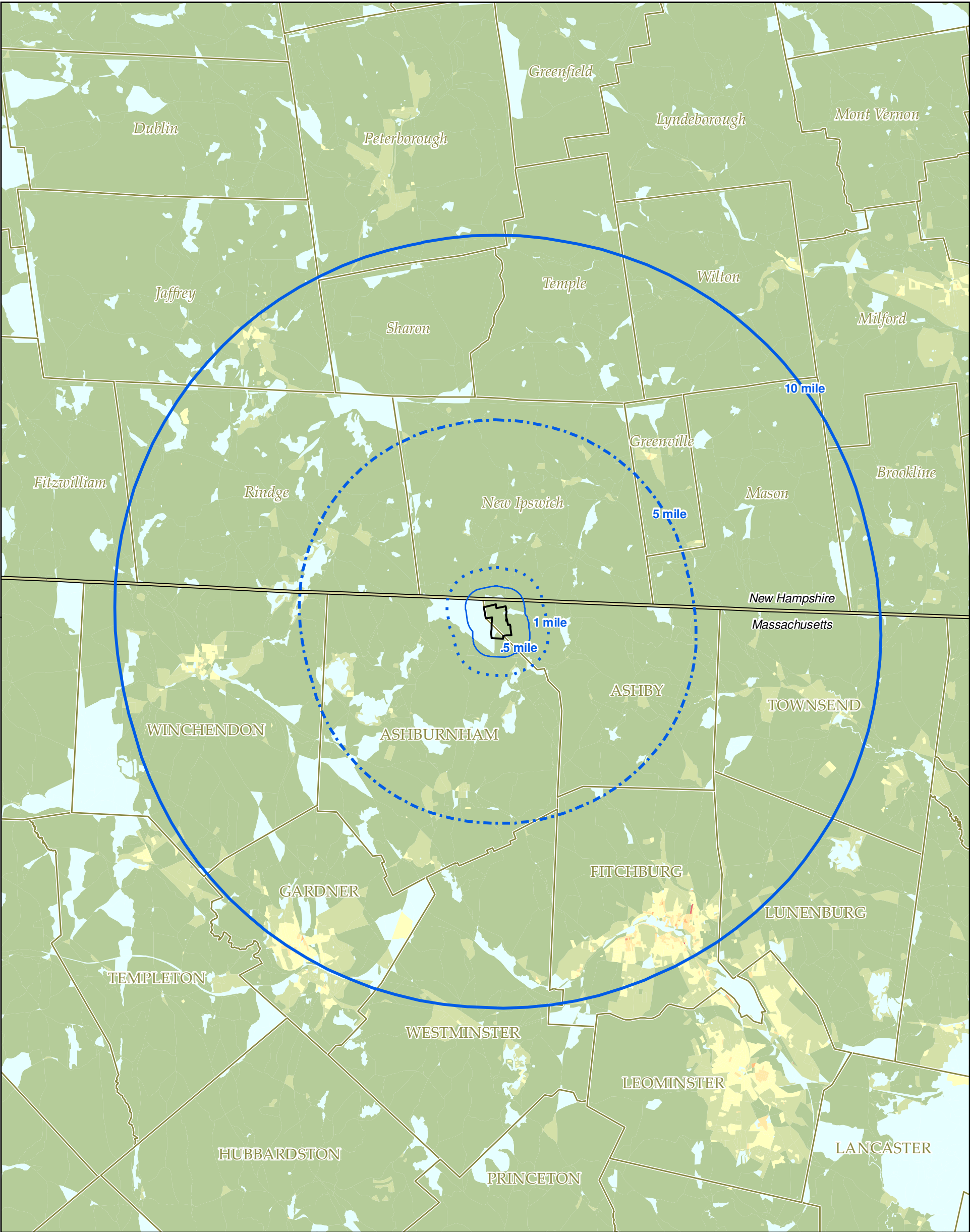
00.10.2 Mile

05001,000 Feet

1:12,000

This is a report-sized version of a larger map. Please refer to the full-sized map for more detailed information.

DCR GIS Jan-07



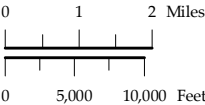
Mount Watatic Reservation

Demographics

US Census 2000 Block Level Data

Census Block (2000) Population per acre	Interstate Boundary	MA Residents		NH Residents	
	Mount Watatic Reservation				
Uninhabited	Town Boundary				
< 1	Measurement Interval (.5, 1, 5, 10 Mile)				
1 - 5		.5 Mile	90	50	
6 - 20		1 Mile	300	190	
21 - 50		5 Mile	6,620	4,960	
51 - 100		10 Mile	73,770	19,510	
101 +					

Rounded to the nearest 10 residents.

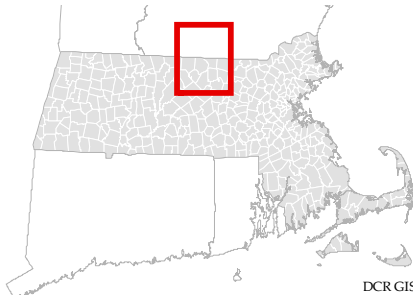


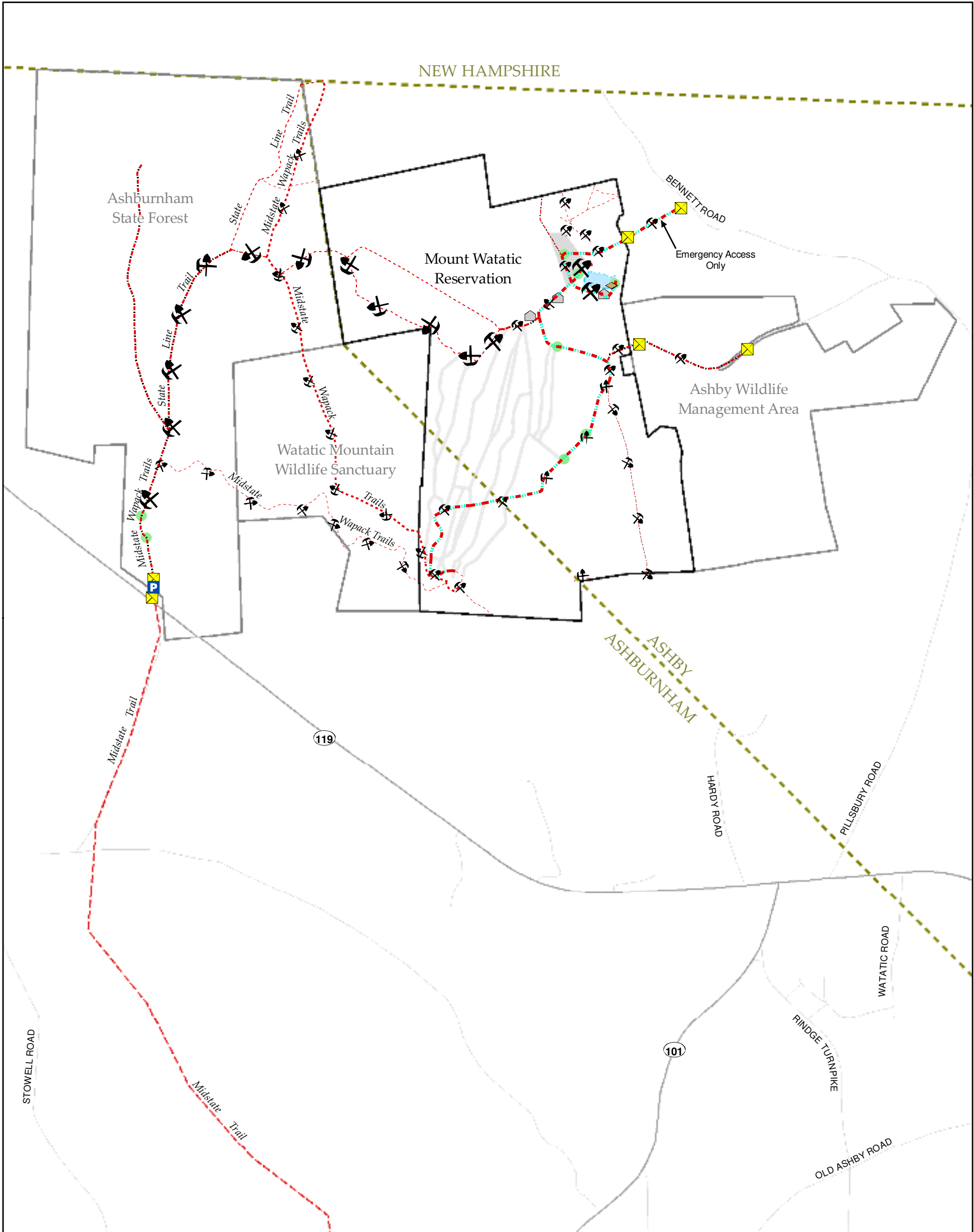
1:166,000

dc
Massachusetts



This is a report-sized
version of a larger map.
Please refer to the
full-sized map for more
detailed information.





Trail Condition - Fair*

Trail Condition - Poor*

Dam

Gate

Parking Area

Structure or Foundation

Road Culvert

Former Ski Area Parking Lot

Former Snow Making Pond

Mount Watatic Reservation

Abutting Open Space

Former Ski Slope

Town Boundary

Major Road

Minor Road

Trail, Natural, 0 - 5'

Trail, Natural, 5' - 10'

Trail, Natural, 10' - 15'

Forest Rd./Trail, Natural, 3' - 5'

Forest Rd./Trail, Natural, 5' - 10'

Forest Rd./Trail, Natural, 10' - 15'

Forest Rd./Trail, Proc. Gravel, 10' - 15'

Admin. Rd., Proc. Gravel, 15' - 20'

Midstate Trail (Outside of Property)

Mount Watatic Reservation

Recreation / Public Access

Infrastructure

00.10.2 Mile

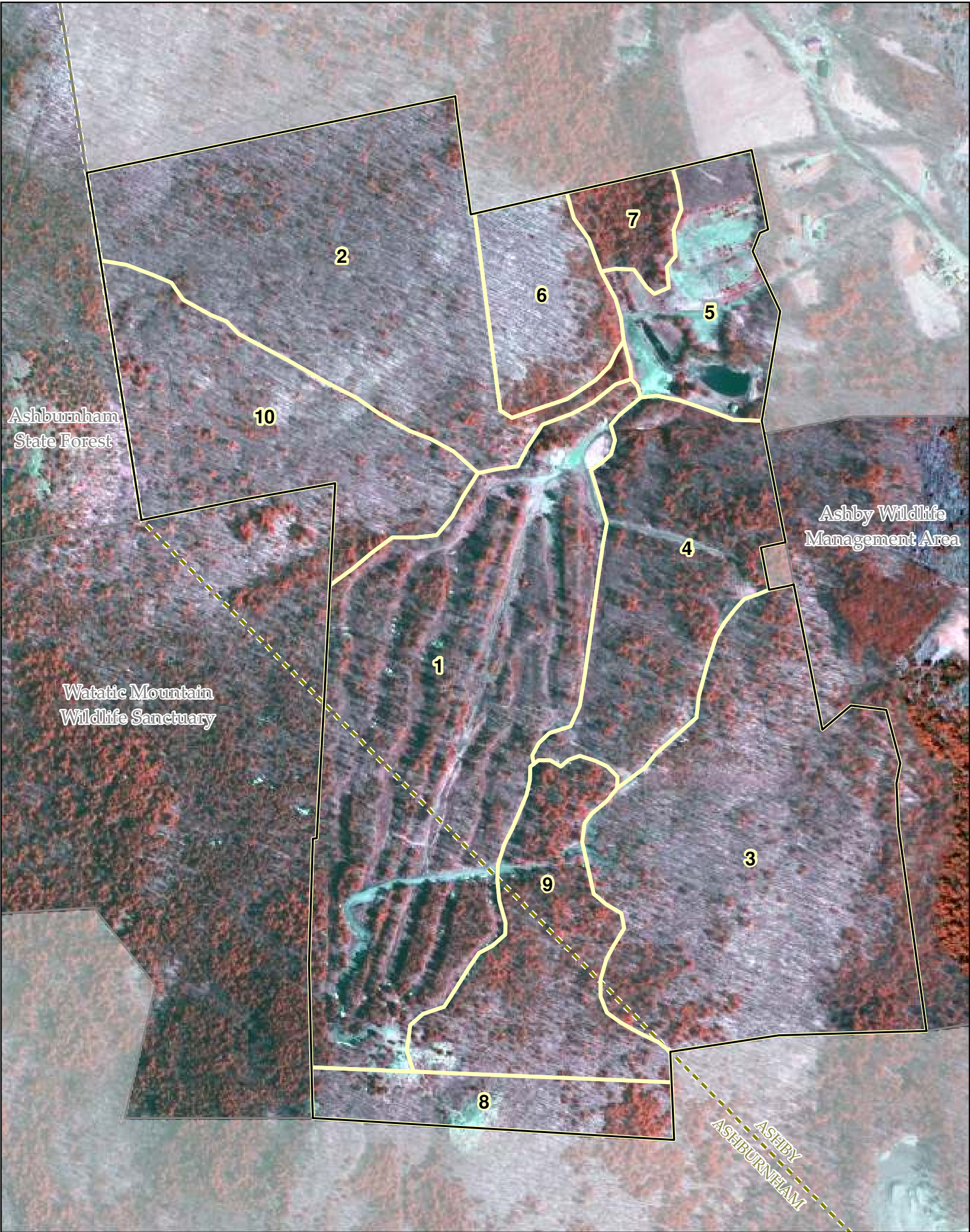
05001,000 Feet

1:12,000

This is a report-sized version of a larger map. Please refer to the full-sized map for more detailed information.

DCR GIS Jan-07

* Trails without a condition symbol are in good condition.
Geographic data supplied by: Office of Geographic and Environmental Information (MassGIS) and DCR GIS, Commonwealth of Massachusetts
Executive Office of Energy and Environmental Affairs.



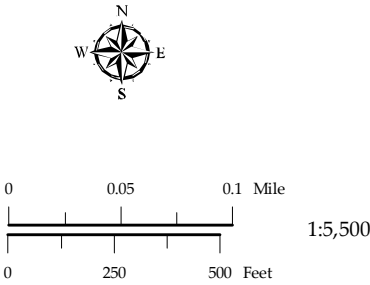
Mount Watatic Reservation

Forest Stands

2005 Near Infrared Orthophotography

- Mount Watatic Reservation
- Abutting Open Space
- Forest Type Boundary
- Town Boundary

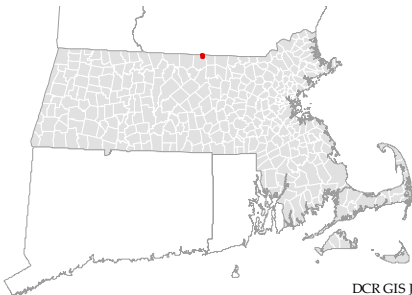
Geographic data supplied by: Office of Geographic and Environmental Information (MassGIS) and DCR GIS, Commonwealth of Massachusetts Executive Office of Energy and Environmental Affairs.

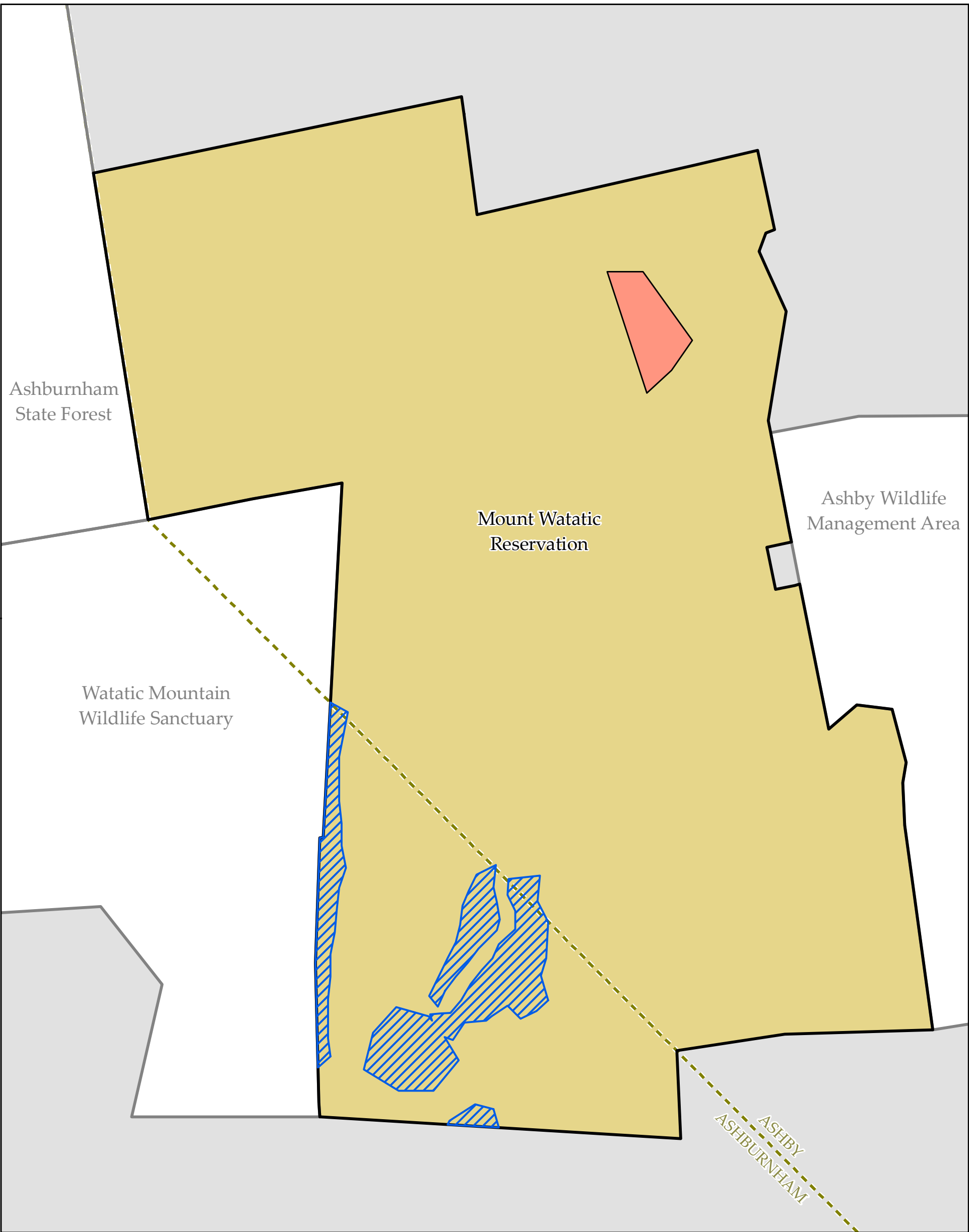


dc
Massachusetts









This is a report-sized version of a larger map. Please refer to the full-sized map for more detailed information.



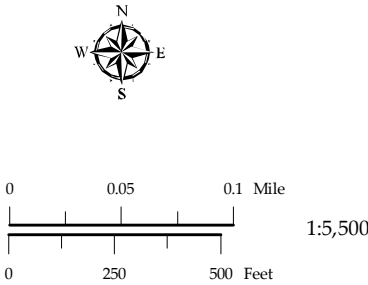


Mount Watatic Reservation

Land Stewardship Zoning

-  Significance Overlay
 - Acidic Rocky Summit/ Rock Outcrop Community
 - Red Spruce - Fir - Northern Hardwoods Forest
-  Zone 3
-  Zone 2
-  Mount Watatic Reservation
-  Abutting Open Space
-  Town Boundary

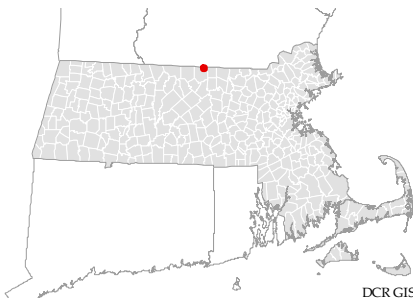
Geographic data supplied by: Office of Geographic and Environmental Information (MassGIS) and DCR GIS, Commonwealth of Massachusetts
Executive Office of Energy and Environmental Affairs.

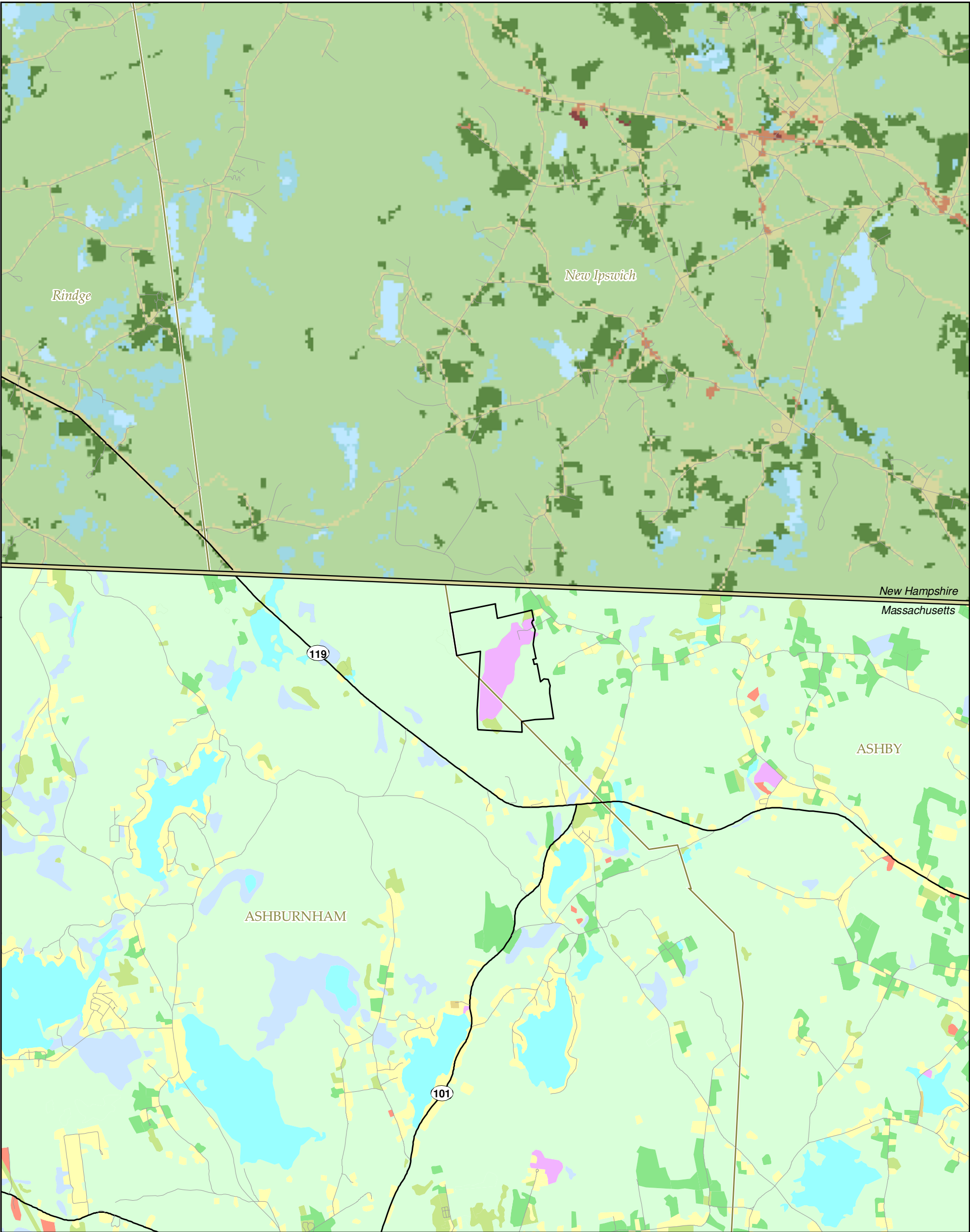


dcr
Massachusetts



This is a report-sized version of a larger map. Please refer to the full-sized map for more detailed information.





Mount Watatic Reservation

Town Boundary

Interstate Boundary

Major Road

Minor Road

New Hampshire Land Use (2001)

Water

Low Intensity

Medium Intensity

High Intensity

Forest

Agriculture

Wetland

Massachusetts Land Use (1999)

Forest

Agriculture

Open Land

Wetland

Water

Recreation*

Low Density Residential

High Density Residential

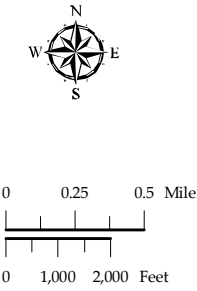
Intensive Use

* Mount Watatic Reservation no longer contains an active recreation site.

Geographic data supplied by: Office of Geographic and Environmental Information (MassGIS) and DCR GIS, Commonwealth of Massachusetts
Executive Office of Energy and Environmental Affairs and MRLC Consortium.

Mount Watatic Reservation

Regional Land Use



1:44,000

dc

r

Massachusetts

This is a report-sized version of a larger map. Please refer to the full-sized map for more detailed information.

