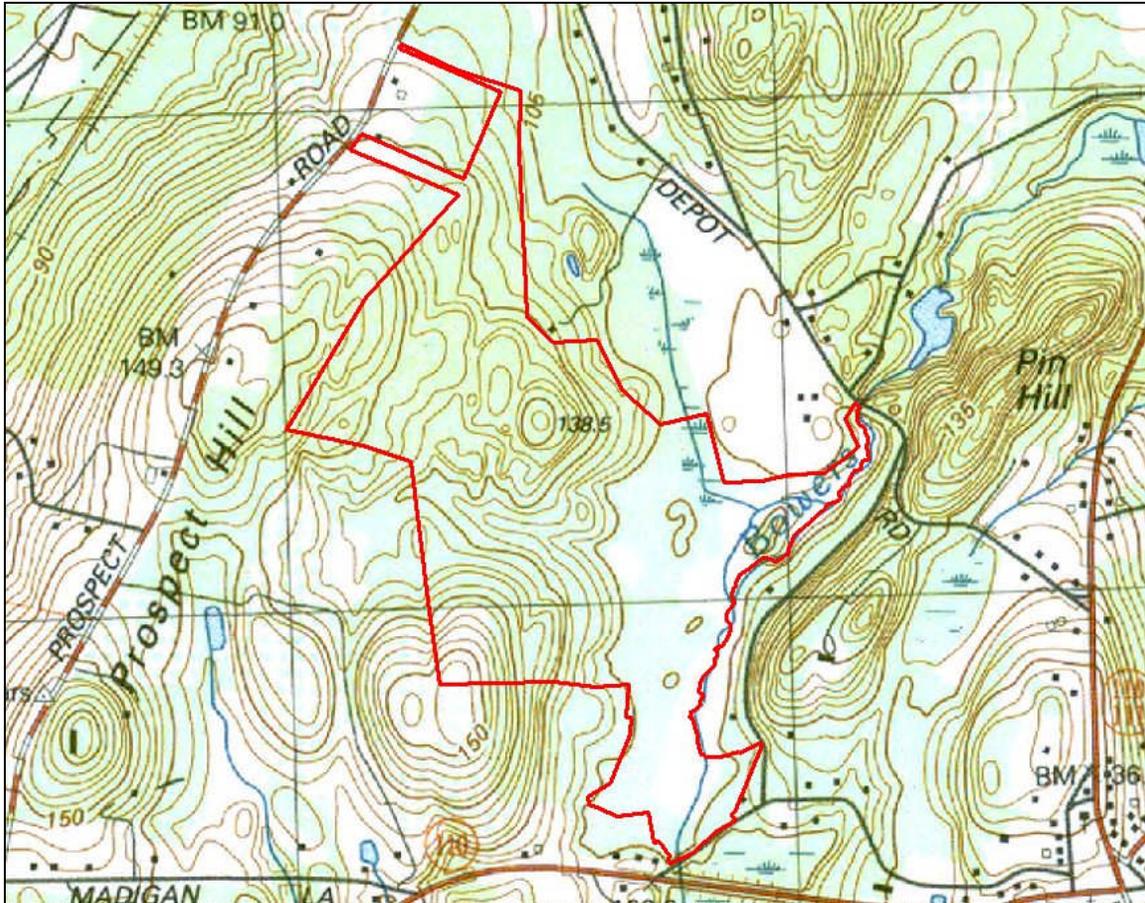


# PROSPECT HILL CONSERVATION AREA

Harvard, MA



## Site Assessment and Management Plan

October 7<sup>th</sup> and 20<sup>th</sup>, 2008

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PROSPECT HILL CONSERVATION AREA  
Site Assessment and Management Plan

**Table of Contents**

- 1. Introduction**
- 2. Acquisition History**
- 3. Current & Planned Uses**
- 4. Regional Landscape & Abutting Lands**
- 5. Topography, Geology and Soils**
- 6. Historic & Scenic Resources**
- 7. Ecological Resources**
- 8. Boundaries, Roads & Trails**

**Appendices**

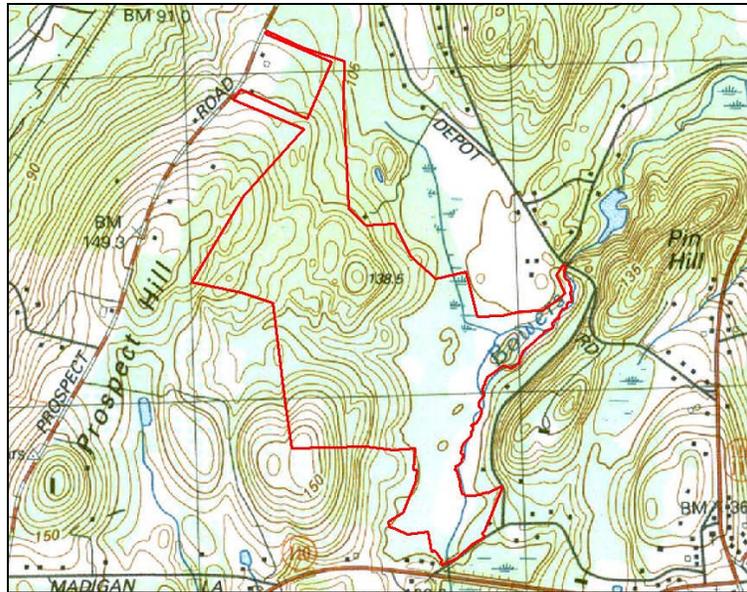
- A: Sources**
- B: Deeds**
- C: Plans**
- D: Species List**
- E: NHESP Letter**

# PROSPECT HILL CONSERVATION AREA

## Site Assessment and Management Plan

### 1. Introduction

The 155 acre Prospect Hill Conservation Area was assembled by the Town of Harvard in a series of transactions between 1911 and 2004. The eastern side of the property is largely wetland abutting Bowers Brook. The western side of the property is wooded upland with an eastern and north-eastern aspect (see topographical map, below). There is a small clearing at the height of land in the southwestern corner. Access is via a trail head along Prospect Hill Road, and from the edge of the soccer fields off of Depot Road. The property is used for hiking, horseback riding, cross country skiing and snowmobiling.



USGS Topographical Map, Ayer Quad, Revised 1988. Source: MassGIS

This Site Assessment and Management Plan was prepared for the Town of Harvard Conservation Commission at the request of the Land Stewardship Committee. Specifically, the Committee requested that the report:

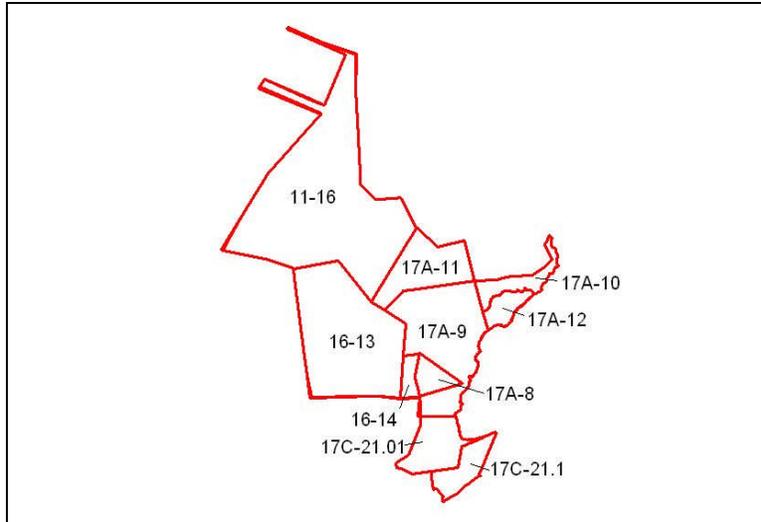
- Describe and evaluate the property's resources and natural communities
- Identify any unique or rare natural communities or habitats warranting further study
- Recommend uses based on the resources identified
- Review trail locations and uses, and make recommendations for sustainability
- Summarize threats and propose remedies

Information for this plan was developed from a variety of MassGIS Datalayers and other sources (see Appendix A) and two site visits in October of 2008. Preliminary findings were presented to the Stewardship Committee at a meeting on December 8<sup>th</sup>, 2008.

PROSPECT HILL CONSERVATION AREA  
Site Assessment and Management Plan

**2. Acquisition History**

The Prospect Hill Conservation Area is comprised of nine tax parcels, shown in the map below.



Assessor's Parcels 2007. Source: MassGIS

**Parcel 17C-21.01** (listed as 17C-21.02 in the assessor's database) has been owned by the town since 1911. There is no registry book and page reference in the assessor's records.

**Parcels 17A-10** and **17A-12** were donated to the town in 1963 by Rachel W. Barton and the estate of Gretchen O. Warren (Book 4382, Page 98, 7/1/1963).

**Parcel 16-14** was donated to the town by Margaret B. Horne in 1966 (Book 4636, Page 414, 1/18/1966).

**Parcel 17C-21.1** was donated to the town by Agnes Cotton Newick in 1967 (Book 4816, Page 491, 12/7/1967).

**Parcel 11-16** was donated to the town by Hazel W. Newman in 1971 (Book 5178, Page 394). Note that the scanned copy of this deed available from the registry of deeds on line is incomplete.

**Parcel 17A-9** was donated to the town by Rachel W. Barton I early 1972 (Book 5188, Page 397, 1/13/1972).

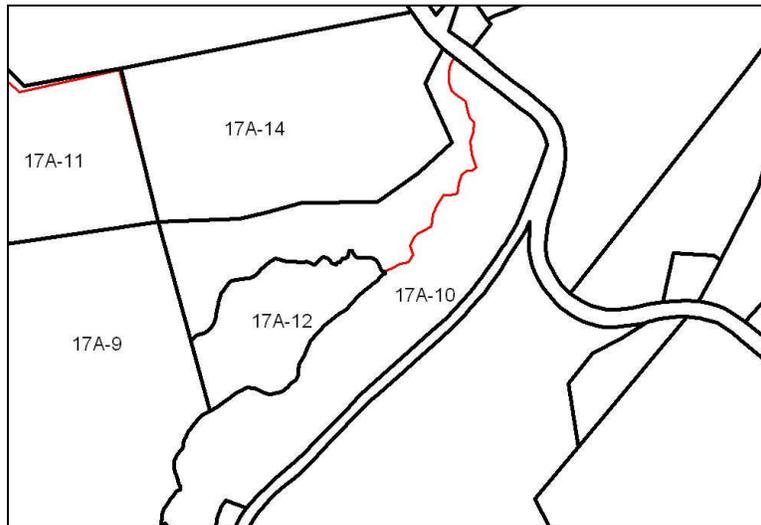
**Parcel 17A-11** was taken by the town by eminent domain in 1972 (Book 5215, Page 330, 4/25/1972).

**Parcel 16-13** was acquired in 2004 from the Harvard Conservation Trust. HCT acquired the land with the intent of transferring it to the town, and holds a conservation restriction on this property (Book 34130, Page 218, 7/16/2004).

## PROSPECT HILL CONSERVATION AREA Site Assessment and Management Plan

**Parcel 17A-8**, surrounded by the above town-owned parcel, is listed as “owner unknown” in the assessor’s records.

The assessor’s maps appear to be missing a boundary line, shown in red in the map below. The missing boundary follows Bowers Brook, and is shown in the plan of land referenced in the deed from Barton and the estate of Warren (see plan in Appendix C).



Assessor's Parcels 2007. Source: MassGIS

The deeds for four of the parcels (17A-9, 16-14, 11-16 and 17C-21.1) specifically reference Massachusetts General Law Chapter 40 Section 8C, placing the lands under the control of the Town of Harvard Conservation Commission. Parcel 16-13 was conveyed “for conservation purposes in perpetuity”, and is further protected by a conservation restriction held by the Harvard Conservation Trust. 17A-11 was conveyed “for recreation and conservation purposes”. 17A-10 and 17A-12 were simply conveyed “to the inhabitants of the Town of Harvard”.

### **Reccomendations:**

- 1) Work with the assessor to gather information on the prior ownership of Parcel 17C-21.01 (town owned since 1911), and locate deed or order of taking for this parcel at the registry of deeds.
- 2) Acquire Parcel 17A-8 (owner unknown) on behalf of the town under the control of the conservation commission,
- 3) Reconcile the plan for parcels Parcels 17A-10 and 17A-12 with the assessor’s map.
- 4) Place conservation restrictions on parcels 17A-11, 17A-10 and 17A-12 and possibly 17C-21.01 and 17A-8 to prevent the future sale of these parcels, or incompatible uses.

PROSPECT HILL CONSERVATION AREA  
Site Assessment and Management Plan

**3. Current & Planned Uses**

The property is currently used for hiking, horseback riding, cross country skiing and snowmobiling.

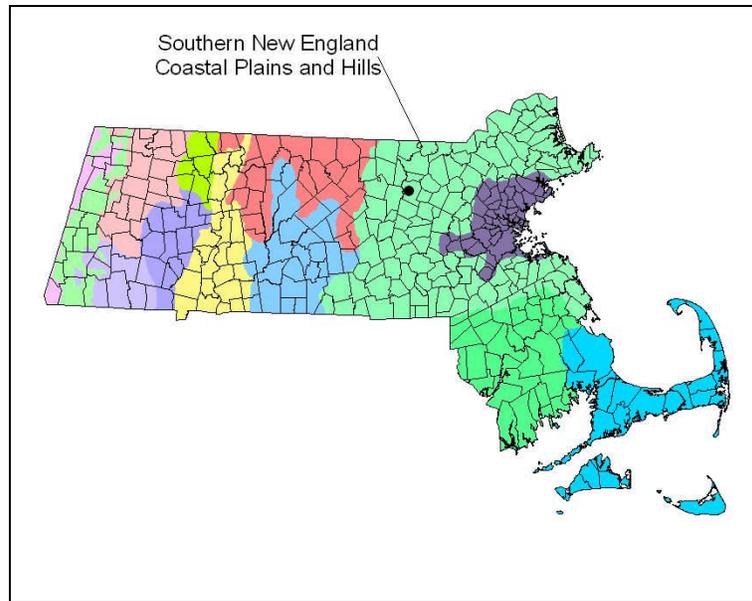
The Stewardship Committee of the Conservation Commission identified two potential future uses of the property: silviculture, and management to protect or enhance natural communities and wildlife habitat.

In particular, the Committee has contemplated the creation of an area with 'old growth' characteristics and an area with 'early succession' characteristics on the property. The old growth area would be managed to retain larger live trees, standing snags and coarse woody debris, with a relatively open understory. The early succession area would be periodically mowed to encourage the growth of saplings, shrubs and herbs that provide cover and browse for various species.

# PROSPECT HILL CONSERVATION AREA Site Assessment and Management Plan

## 4. Regional Landscape & Abutting Lands

The property lies within the Southern New England Coastal Plains and Hills Ecoregion of Massachusetts (see map below).



US EPA Ecoregions 1999. Source: MassGIS

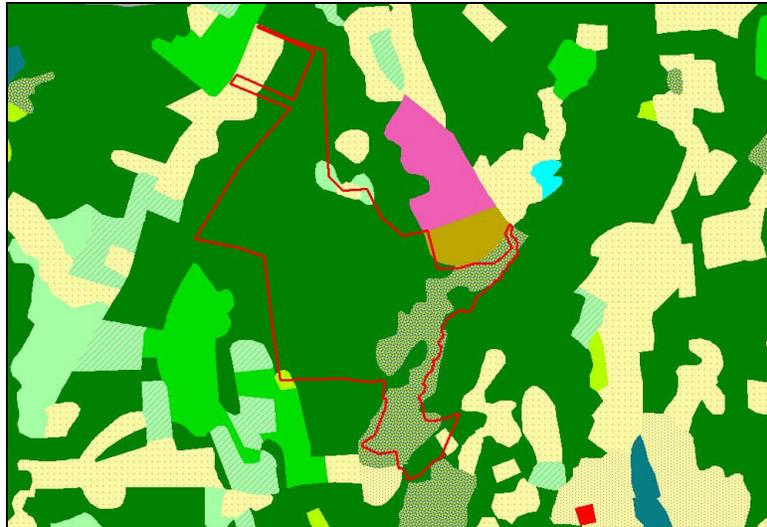
Ecoregions are areas of relatively homogeneous topography, geology, soils, and plant and animal habitats as designated by the Massachusetts Ecological Regions Project for the US Environmental Protection Agency and the Massachusetts Department of Environmental Protection.

As the Southern New England Coastal Plains and Hills is the largest of the 13 Ecoregions in the state, it encompasses a wide variety of topography and bedrock. It is generally rolling terrain with many rivers and ponds, and reservoirs created to power 18<sup>th</sup> and 19<sup>th</sup> century textile mills and other manufacturing. It is the third most developed Ecoregion in the Commonwealth (BioMap, Massachusetts NH&ESP, 2001).

The map on the following page shows the predominant land uses in and around the Prospect Hill Conservation Area. Much of the area is forested (dark green). The abutting and nearby open lands (light green) are orchards. The beige lightly stippled areas are low density residential development. The town transfer station (brown) abuts the property along its eastern boundary. The transfer station in turn abuts athletic fields which provide access to Prospect Hill and parking.

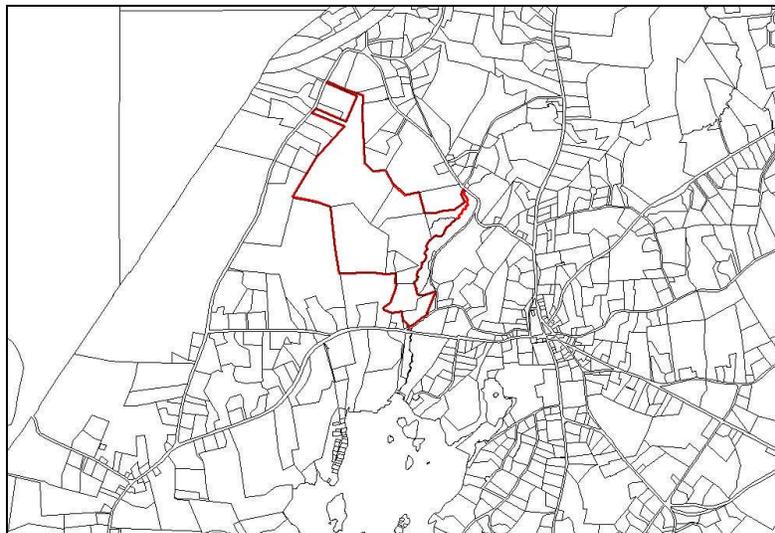
# PROSPECT HILL CONSERVATION AREA

## Site Assessment and Management Plan



Land Use 1999. Source: MassGIS

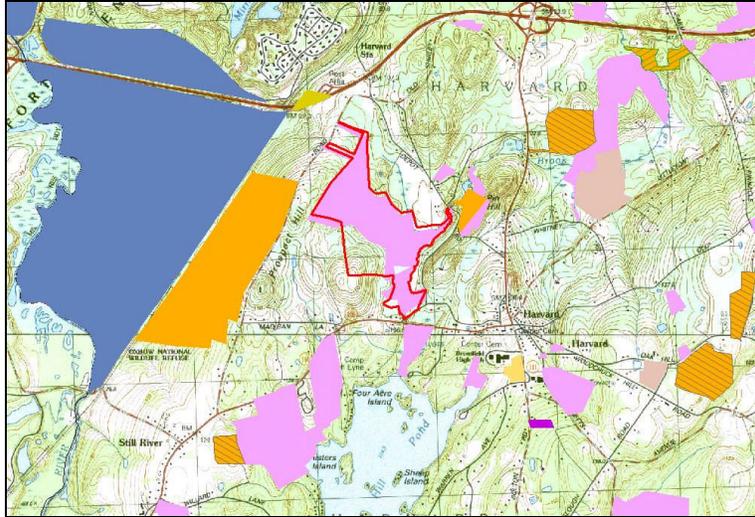
The assessor's parcel map below shows the highly fragmented ownership of the abutting lands. There are very few large parcels remaining in this section of Harvard.



Assessor's Parcels 2007. Source: MassGIS

The map on the following page shows the conserved lands around Prospect Hill. The largest are the Oxbow National Wildlife Refuge to the west (shown in blue), and the Fruitlands Museum (gold) just across Prospect Hill Road. There are a number of municipally owned lands (pink) and private lands protected by conservation restrictions (striped gold) nearby.

# PROSPECT HILL CONSERVATION AREA Site Assessment and Management Plan

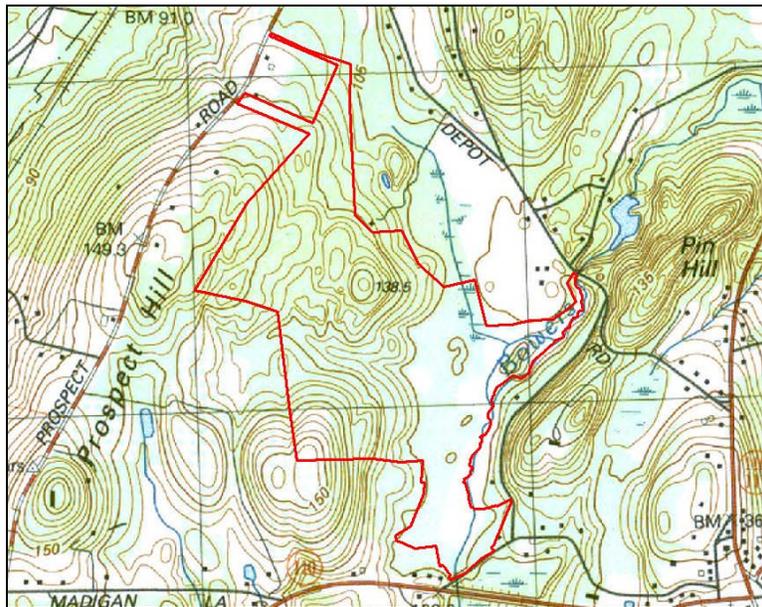


Protected & Recreational Open Space 2009. Source: MassGIS

PROSPECT HILL CONSERVATION AREA  
Site Assessment and Management Plan

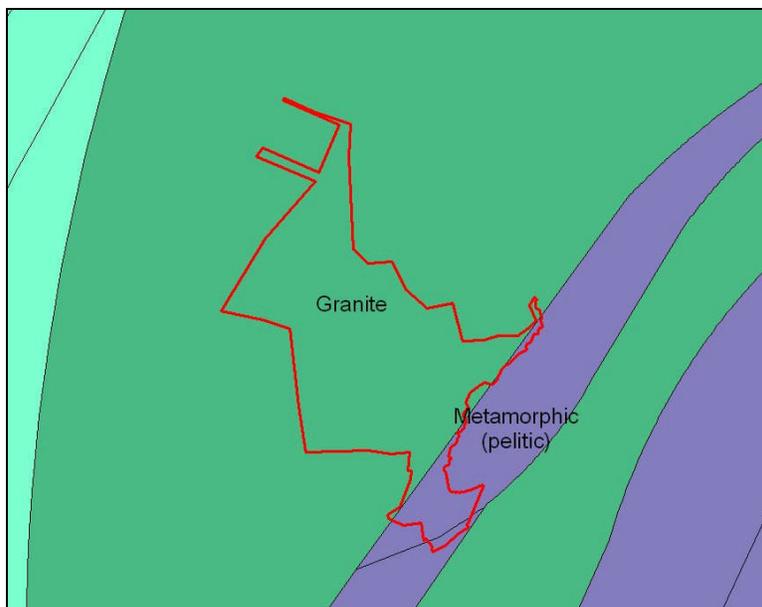
5. Topography, Geology & Soils

The property generally slopes to the east and to north from the top of Prospect Hill. The high point of land is in the southwestern corner. There is a small plateau near the center of the property to the west of a 138 foot knob. The uplands drain to the east into wetlands abutting Bowers Brook (see topographical map below).



USGS Topographical Map, Ayer Quad, Revised 1988. Source: MassGIS

The uplands are underlain by granite bedrock, a hard igneous rock common across new England. Under the wetlands lies pelitic metamorphic rock created from clays and mud (see bedrock map, below).

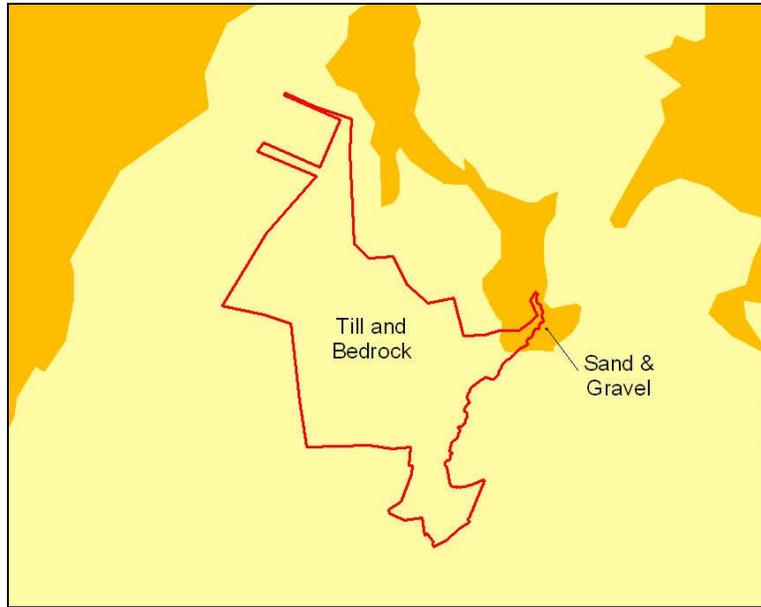


Bedrock Lithology 2004. Source: MassGIS

# PROSPECT HILL CONSERVATION AREA

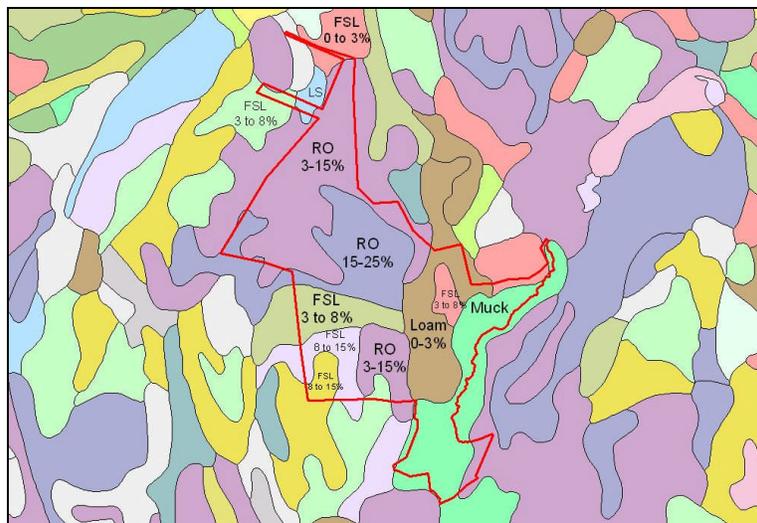
## Site Assessment and Management Plan

This bedrock is largely buried under glacial till. Bedrock outcrops occur across the property. The surficial material in the easternmost extent of the property along Bowers Brook near the transfer station is sand and gravel (see surficial geology map on the following page). The bedrock and these surficial deposits are the parent material for the soils on the property, and largely determines their texture, acidity and mineral content.



Surficial Geology 1999. Source: MassGIS

From the height of land in the southwestern corner to the north, there is a large area of fine sandy loams (FSL in the map below) with slopes ranging from 3 to 15%. Soils with frequent rock outcrops (RO) predominate on the remaining uplands. The wetlands are a combination of loam and muck soils.



Soils 2008. Source: MassGIS

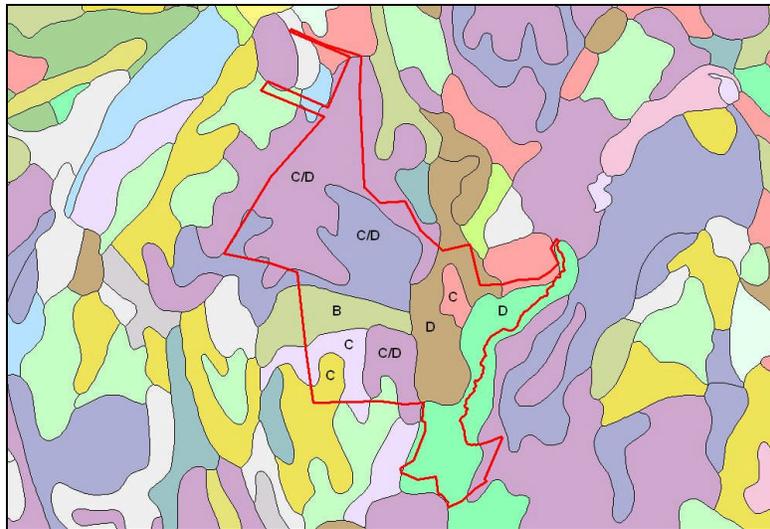
Soils are classified in a variety of ways, and each soil unit may be ranked by its suitability for various uses such as agriculture, construction or septic systems. Given the current and

## PROSPECT HILL CONSERVATION AREA Site Assessment and Management Plan

contemplated uses of the Prospect Hill Conservation Area (recreation, silviculture and habitat management), the most important attribute of these soils is their drainage classification, or hydrologic group.

A hydrologic group is grouping of soils having the same runoff potential. Soils are classified into one of four groups: A, B, C, D. Soils classified as “A” have low runoff potential, and are typically found on deep, well-drained sands or gravels. “B” soils have moderately fine to moderately coarse textures and so have moderate infiltration rates. “C” soils have slow infiltration rates either because of an underlying layer that impedes downward movement of water, or because of the fine texture of the soil. “D” soils have the highest runoff potential. These soils have very slow infiltration rates because of their high clay content, a permanent high water table, a claypan or clay layer at or near the surface, or nearly impervious underlying material such as bedrock.

At Prospect Hill, the low-lying wetland soils fall within hydrological group “D” (except for the small knob of upland, classified as “C”). Most of the upland soils are classified as group “C/D”, and these areas coincide with the rock outcrops shown in the earlier map of soil types. The fine sandy loams from the height of land north are classified into groups “C” and “B”.



Soils 2008. Source: MassGIS

PROSPECT HILL CONSERVATION AREA  
Site Assessment and Management Plan

**6. Historic & Scenic Resources**

**Historic Resources:** The area around the Prospect Hill Conservation Area, particularly Prospect Hill and Bowers Brook, was an early focus of both Native American and European activity. The summary below is based on a Massachusetts Historical Commission Reconnaissance Survey Town Report for the Town of Harvard (1983).

The town of Harvard was assembled from parts of Lancaster, Groton and Stow in 1732. The area around Prospect Hill and Bare Hill were the first to be settled by Europeans, around 1680. At that time, there were small, seasonal Native American fishing and hunting camps at Bare Hill Pond and other small ponds, as well as along the Nashua River. The area north of Bare Hill Pond was then known as the Indian Planting Field. A Native American transportation route followed the Bowers Brook valley north from Bare Hill Pond, and lead to the west of Prospect Hill (along what is now Prospect Hill Road) towards Lancaster where there were permanent camps of the Nashaway group of the Nipmuck tribe.

The first permanent European settlements were established by Lancaster residents at Still River, Bare Hill and Prospect Hill in the early 1700s. During this Colonial Period (1675 to 1775), most of the population was engaged in farming, focusing on sheep, cattle and grains (presumably along with fruits and vegetables for their own consumption). Among the various early industries were a tannery, an iron works, and several mills, including one along Bowers Brook (at “Prescott site”).

During the Federal Period (1775 to 1830), residential development was focused in Harvard Center, a “turnpike village” at Still River, and at the Shaker Village established in 1791. Manufacturing continued to expand slowly, but agriculture continued to be the dominant enterprise for Harvard’s citizens during the Federal Period as well as the Early Industrial Period (1830-1870) and the Late Industrial Period (1870-1915). Dairying became an important component of the economy by 1865, and increased some seven-fold over the next



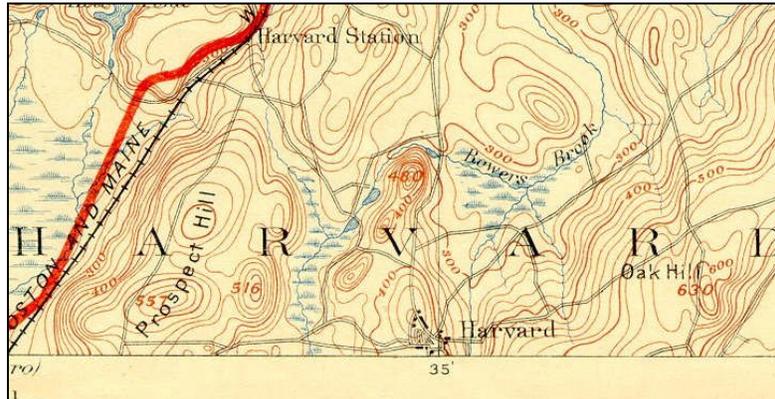
Old cairn on outcrop in the Prospect Hill Conservation Area.

## PROSPECT HILL CONSERVATION AREA Site Assessment and Management Plan

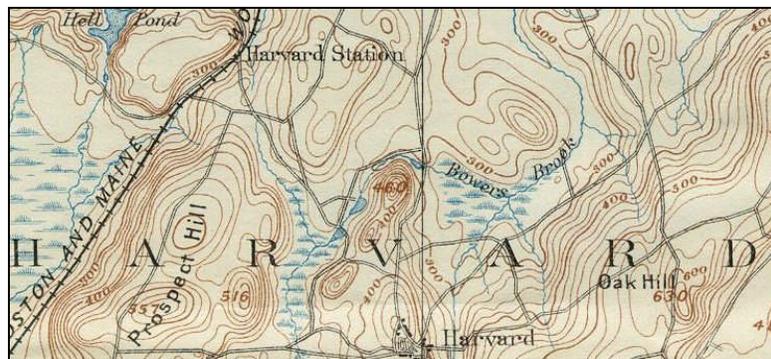
40 years. Fruit cultivation also began to expand during the Early and Late Industrial Periods. By 1905, Harvard was the Commonwealth's leading cider apple producer.

The Prospect Hill property shows evidence of various agricultural uses. There are stonewalls throughout the property that likely enclosed pastures and haymows, and cultivated fields where the topography and soils permitted. There is an old woods road that runs roughly north-south across the property, with smaller side roads and connecting trails. There is a small clearing in the southwestern corner of the property, likely the remnants of an orchard or pasture that was once much larger. There are old clearings in the northwest corner of the property as well, just off of Prospect Hill Road.

While there has been considerable residential development around Prospect Hill in recent decades, the system of roads has remained largely unchanged since the late 1800s. The USGS topographical maps on the following pages show the Prospect Hill area in an 1893 map (surveyed in 1887) and a 1938 map (surveyed in 1931). The basic road network established in the 1800s remains to this day.



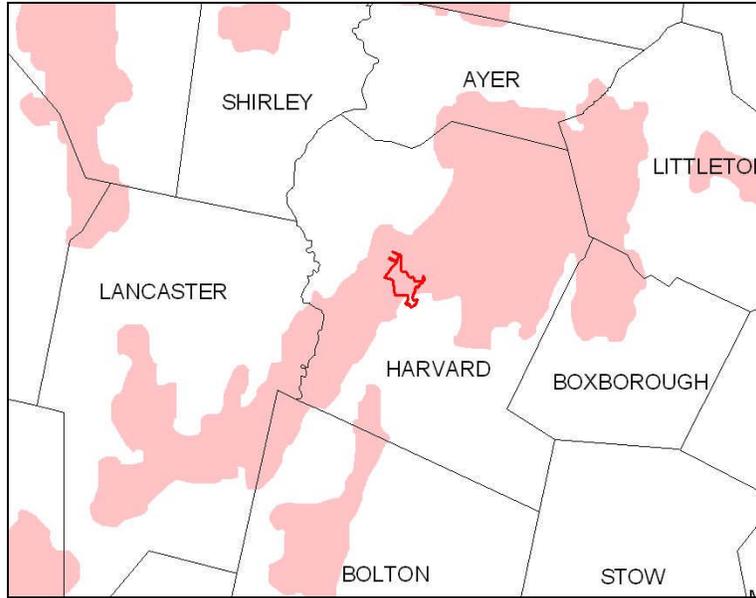
USGS Topo 1893. Source: University of New Hampshire Digital Collections



USGS Topo 1936. Source: University of New Hampshire Digital Collections

**Scenic Resources:** The Prospect Hill Conservation Area lies within a band of land running from Littleton to Lancaster and extending into Ayer and Boxborough that has been designated as Scenic Landscape by the Massachusetts Department of Environmental Management, and is included in the Massachusetts Landscape Inventory (see map on the following page).

PROSPECT HILL CONSERVATION AREA  
Site Assessment and Management Plan

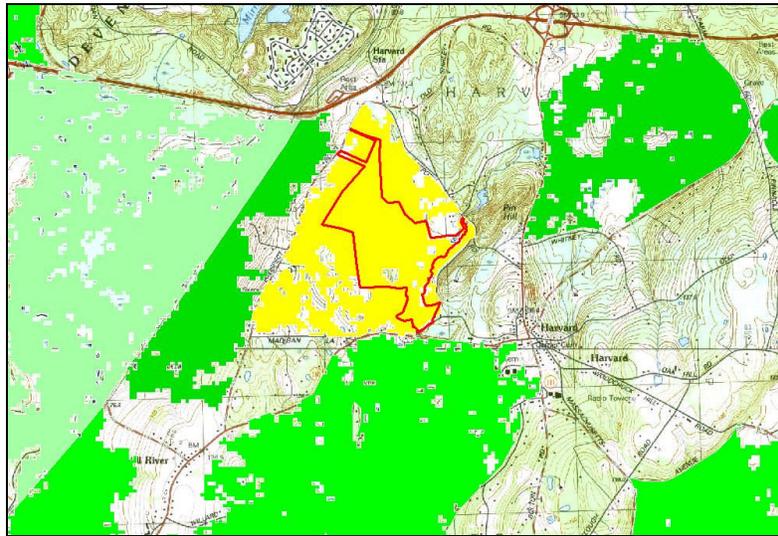


Scenic Lands Datalayer 1999. Source: MassGIS

PROSPECT HILL CONSERVATION AREA  
Site Assessment and Management Plan

7. Ecological Resources

The property is part of a 400 acre block of contiguous natural lands mapped by the Massachusetts Resource Identification Project- lands remaining in predominantly natural not separated by roads, train tracks or utility transmission lines (block shown in yellow in the map below). These larger blocks of land create larger habitats that can support a broader array of species, reduce isolation of plant and animal populations, and are less subject to negative “edge effects” such as the invasion of exotic species.

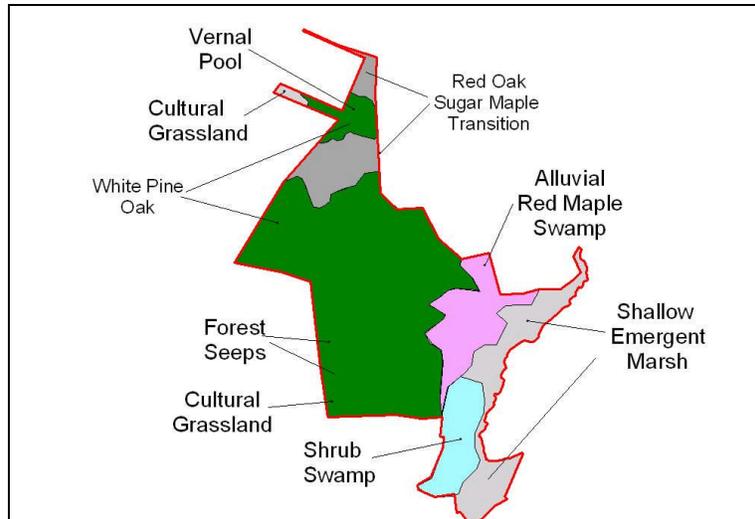


MRIP Contiguous Natural Lands 1999. Source: MassGIS

There are some 105 **natural community** classifications in Massachusetts. Each natural community is defined by its dominant vegetation and other readily identifiable characteristics such as hydrology and surficial geology. Each is associated with a suite of plants and animals based on species occurrence reports by community compiled over the past 20 years. By classifying an area into its natural community type, it is then possible to speculate on what plants and animals-including rare species- might be found there without direct observation of the species. In the case of animals, they might use a given natural community for any of a variety of functions varying by the season, including feeding, breeding, nesting or overwintering.

There are eight natural communities found within the Prospect Hill Conservation Area, shown in the map on the following page. The table below the map shows the State Rank and the number of rare plant or animal species associated with each community. The **State Rank** reflects both the rarity and security of the community within the state, with S1 being the rarest and most imperiled, and S5 being the most common and secure.

**PROSPECT HILL CONSERVATION AREA**  
**Site Assessment and Management Plan**



Natural Community	State Rank	Associated Rare	
		Plants	Animals
Alluvial Red Maple Swamp	S3	1	6
Woodland Vernal Pool	S3	0	6
Shallow Emergent Marsh	S4	1	8
Forest Seep	S4	2	0
Red Oak-Sugar Maple Transition	S4	0	0
Shrub Swamp	S5	0	4
White Pine-Oak	S5	0	0
Cultural Grassland	nr	2	6

The natural community descriptions and rankings are from the Classification of the Natural Communities of Massachusetts (2001. Swain, P.C. & J.B. Kearsley. Version 1.3. Natural Heritage & Endangered Species Program, Massachusetts Division of Fisheries & Wildlife. Westborough, MA).

The rare species count includes species that might be found in these communities and which are listed on the Massachusetts List of Endangered, Threatened and Special Concern Species as published in the Code of Massachusetts Regulations (as of August 8, 2008) after elimination of those 1) endemic to certain areas (Sunderland Spring Planarian, found only in Sunderland MA), 2) that are believed to have been extirpated from the county (such as the Eastern Spadefoot toad), 3) with known populations only found in the extreme west or south of the state, or found only near the shore, 4) with specific habitat requirements not found in or near the Prospect Hill Conservation Area (e.g. sandplain grasslands), 5) requiring other natural communities not found nearby (e.g. heathlands), and 6) those requiring larger areas of a particular community type.

The Shallow Emergent Marsh Natural Community has the potential to support the largest number of rare animals, followed by the Woodland Vernal Pool and Alluvial Red Maple Swamp, and the Shrub Swamp. The Forest Seep- with no associated rare animals- might host

**PROSPECT HILL CONSERVATION AREA**  
**Site Assessment and Management Plan**

two rare plant species. The table below lists the individual species associated with each Community, with the state status shown in parentheses.

<b>Natural Community</b>	<b>Associated Rare</b>	
	<b>Plants (status)</b>	<b>Animals (status)</b>
Alluvial Red Maple Swamp	Cat Tail Sedge (I)	Wood Turtle (SC) Blanding's Turtle (I) Ski-Tipped Emerald (SC) Coppery Emerald (E) Kennedy's Emerald (E) Mocha Emerald (E)
Woodland Vernal Pool		Wood Turtle (SC) Blanding's Turtle (I) Blue-Spotted Salamander (SC) Marbled Salamander (I) Intricate Fairy Shrimp (SC) American Clam Shrimp (SC)
Shallow Emergent Marsh	Ovate Spike Sedge (E)	Wood Turtle (SC) Blanding's Turtle (I) American Bittern (E) Northern Harrier (I) Common Moorhen (SC) Least Bittern (E) Pied-Billed Grebe (E) King Rail (I)
Forest Seep	Leafy White Ochis (I) Swamp Oats (I)	
Shrub Swamp		Wood Turtle (SC) Blanding's Turtle (I) Blue-Spotted Salamander (SC) Marbled Salamander (I)

Endangered species (E) are those in danger of extinction throughout all or a significant portion of their range. Threatened (I) species are declining or rare and likely to become endangered. Species of Special Concern (SC) are those that have been documented to have suffered a decline that could threaten the species if continued, or species that occur in such small numbers or with such specialized habitat requirements that they could become threatened.

There are four animal species in the above list that are found in more than one of the Natural Communities mapped on the property, shown in the table below. With multiple

**PROSPECT HILL CONSERVATION AREA**  
**Site Assessment and Management Plan**

habitats in close proximity, this increases the likelihood that these species may be found on the property now or in the future.

	<b>Red Maple Swamp</b>	<b>Shallow Marsh</b>	<b>Shrub Swamp</b>	<b>Woodland Vernal Pool</b>
<b>Wood Turtle (SC)</b>	x	x	x	x
<b>Blanding's Turtle (T)</b>	x	x	x	x
<b>Blue Spotter Salamander (SC)</b>			x	x
<b>Marbled Salamander (T)</b>			x	x



Potential vernal pool in the Prospect Hill Conservation Area.

**Species Observations:** Appendix D lists plant species observed during the various site visits for this Site Assessment and Management Plan. Appendix E is a letter from the Natural Heritage & Endangered Species Program stating that there are no recorded observations of state-listed plants or animals in the vicinity of this site.

In early 2007, the Nashaway Trackers-a group of volunteer animal trackers- conducted a series of surveys for mammals in the Prospect Hill Conservation Area. These surveys focused on carnivores requiring fairly large territories, particularly bobcat, fisher, mink, weasel and river otter. These species are indicators of ecosystem health as their presence suggest high prey density and connectivity to other open lands. During their visits between January and April 2007, Nashaway Trackers documented the tracks or other sign of each of these species along with ruffed grouse and cottontail rabbit. Many more common species were observed as well, including deer, skunk, opossum, coyote, raccoon, and red and grey squirrel.

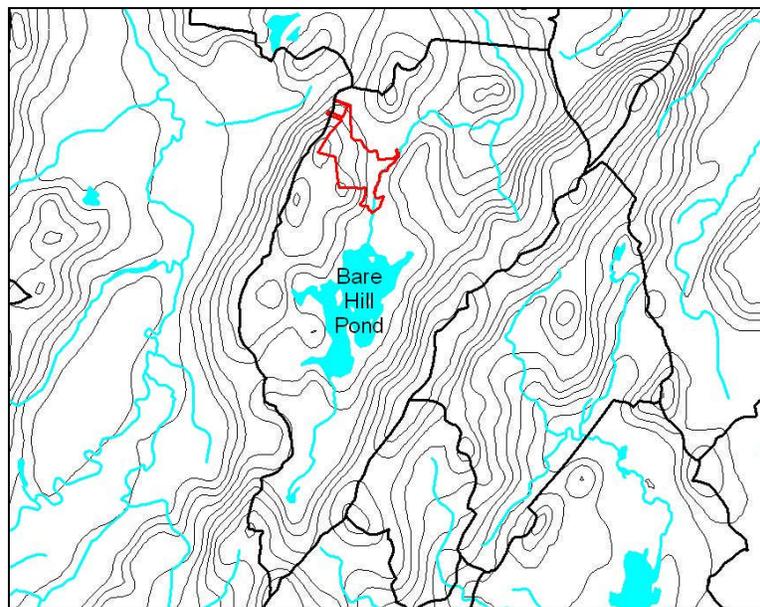
As a result of these surveys, Nashaway Trackers concluded that the Prospect Hill Conservation Area (referred to as 'PH/DH') "supports several medium-sized carnivores with home ranges much larger than the area spanned by PH/DH, suggesting good connectivity to neighboring habitat. The presence of two different individual fishers, probably a male and a female, suggest that it may be breeding grounds for this species. The

## PROSPECT HILL CONSERVATION AREA Site Assessment and Management Plan

presence of bobcat, rare in Eastern MA, and requiring a particularly large home range, is perhaps the strongest indicator of habitat quality and connectivity.”

**Threats to Ecological Resources:** Beginning in 1978, there have been a series of draw downs of Bare Hill Pond which lies to the south of the Prospect Hill Conservation Area (see map on the following page showing watershed sub basins and 30 foot contour lines). Most recently, these draw downs have been done in the fall to lower the water level in the pond during the winter to help control invasive aquatic species.

Changes in the water level of Bowers Brook or in the wetlands within the Prospect Hill Conservation Area may submerge burrows and low lying nests, or leave them too far above the waterline. Over the long term, fluctuating water levels may inundate some plants within the wetlands, or leave the soils too dry to support others.



30 foot contours, watershed sub basins. Souce: MassGIS

The Town of Harvard transfer station abuts the property along its eastern edge near Bowers Brook (see aerial photograph on the following page). The soils under the transfer station are loose sands and gravels (see Surficial Geology map in Section 5). These porous soils will allow materials to leach or seep into the nearby brook and wetlands. Parts of the transfer station are paved or highly compacted. Spilled materials such as motor oil can run off these areas and into the porous soil, or directly into the wetland or brook.

PROSPECT HILL CONSERVATION AREA  
Site Assessment and Management Plan



Aerial photograph taken April 2005. Source: MassGIS

**Recommendations:**

- 1) Rare Species: Look for evidence of rare plants and animals in the appropriate natural communities. Visit the vernal pool in the spring and summer to look for evidence of use by the indicator species: fairy shrimp, wood frogs or mole salamanders.
- 2) Bare Hill Draw Downs: Contact the Bare Hill Pond Watershed Management Committee to discuss future plans for draw downs, and ensure that they are aware of the potential impact that draw downs may have on the Conservation Area.
- 3) Abutting Transfer Station: Contact the administrator of the transfer station to review spill prevention measures, and discuss how the layout of the station might be revised to create a buffer zone between potential spill and seepage sources and the nearby Bowers Brook and wetlands.
- 4) Invasive Species: There are a number of invasive plant species on the property, including bittersweet, barberry, buckthorn, autumn olive and multiflora rose (see Species List in Appendix D). None occur in dense stands. The early succession areas (the Cultural Grassland Natural Communities) are the most susceptible to invasive plants as periodic mowing creates opening for these plants. Invasives can spread outward from these areas because periodic mowing only effects the plants within the fields. The wetlands are likely the most imperiled by invasives, as both phragmites and loosestrife can quickly spread, form dense stands that choke out other vegetation, and are very difficult to control. These areas- the field edges and wetlands- should be periodically visited to look for invasives.

**PROSPECT HILL CONSERVATION AREA**  
**Site Assessment and Management Plan**

- 5) **Silviculture:** The property is well stocked with black and red oak, much of it saw timber and veneer sized. Because of the poorly drained soils, any harvesting would likely need to be done in the winter to minimize erosion and other soil damage. Consult with the local DCR Service Forester and one or more consulting foresters to review the stocking of the property, access routes, and the potential net income from a harvest. Visit recently harvested sites nearby to assess impact on recreational uses and ecological resources.
  
- 6) **Habitat Management:** There are a number of areas within the White Pine-Oak natural communities that already have many of the attributes of an old growth forest. On some of the larger rock outcrops within these communities, white pines and oaks have been windthrown and some are standing dead.

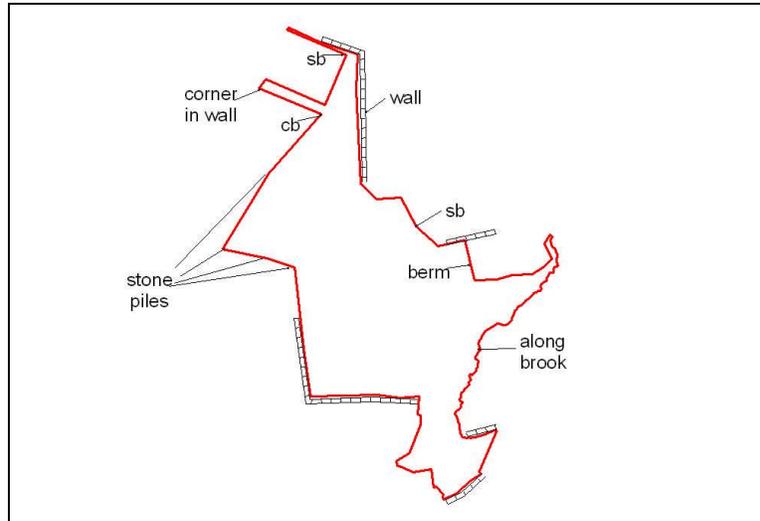
There are two small early succession areas on the property - one near the entrance off of Prospect Hill Road and the other at the height of land in the southwest corner. Both have been created and maintained by periodic mowing. There are also several early succession areas abutting or nearby the Conservation Area, particularly along the edges of the orchards. Based on the work of the Nashaway Trackers, it appears these areas together are sufficient to support a relatively high density of prey species for the indicator carnivores they surveyed.

Because of the cost of creating and maintaining early succession areas, consider creating new areas a) only as a by product of a commercial timber harvest, which will require clearing for log landings, or b) to replace abutting early succession areas lost to development or other non-compatible uses.

PROSPECT HILL CONSERVATION AREA  
Site Assessment and Management Plan

8. Boundaries, Roads and Trails

**Boundaries:** The map below shows the boundaries of the Prospect Hill Conservation Area. Note that 'sb' stands for stone bound and 'cb' stands for concrete bound. None of the boundary lines are blazed, and several corners and points of inflection have no monuments.



The only significant area of encroachment is along the northern boundary (see aerial photograph below).



Aerial photograph taken April 2005. Source: MassGIS

## PROSPECT HILL CONSERVATION AREA Site Assessment and Management Plan

A large area has been cleared for pasture and fenced. There is a chicken coop along the edge of the treeline within the Prospect Hill Conservation Area (see aerial photograph below and ground photograph following).



Aerial photograph taken April 2005. Source: MassGIS

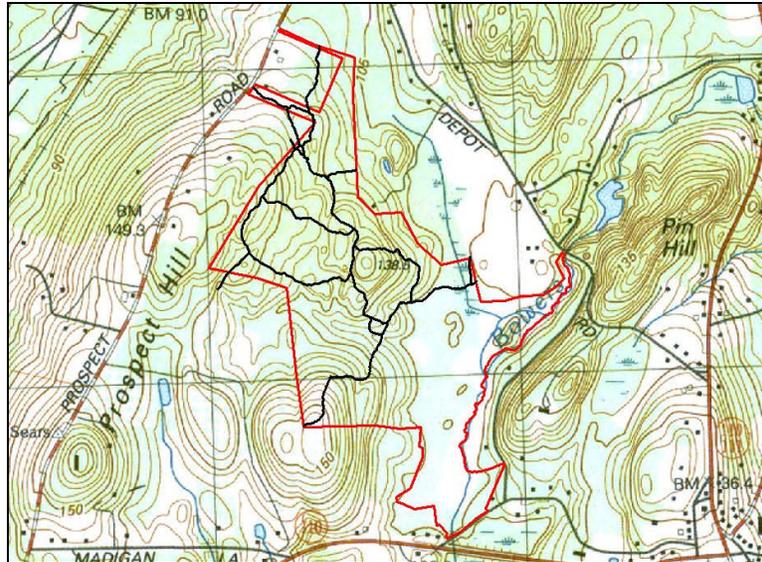


Fence, coop and clearing within Prospect Hill Conservation Area

This encroachment appears to be longstanding: the cleared area is apparent on an aerial photograph from 2001. The abutting property was recently sold, and has been surveyed and monumented by the new owner.

## PROSPECT HILL CONSERVATION AREA Site Assessment and Management Plan

**Roads and Trails:** Access to the Prospect Hill Conservation Area is via a trail head along Prospect Hill Road, and from the edge of the soccer fields off of Depot Road. The map below shows the existing network of roads and trails (recorded with a Trimble XT receiver and post processed, with a precision of +1 meter).



USGS Topographical Map, Ayer Quad Revised 1988. Source: MassGIS

The Prospect Hill Road trailhead is marked with a routed, painted sign (see picture, below).



There is no parking area or pull-off. There is an old woods road leading past the sign to an old clearing. There is parking at the soccer fields. Trail access is at the far corner of the fields, and is not well marked.

## PROSPECT HILL CONSERVATION AREA Site Assessment and Management Plan

The trails are generally in good condition. Many of the trail markers have grown in to the trees or have fallen off. The trails are muddy where they cross small brooks or seasonal drainage swales, or where the soils are saturated for much of the year.

### **Reccomendations:**

- 1) Boundaries: Mark the boundaries along the area of encroachment on the northeastern boundary while the survey markers are still visible. To minimize the impact on the abutters view, trees could be blazed and painted or hung with signs facing in towards the Conservation Area.
- 2) Trail Markers: Re mark the trails with metal or plastic signs.
- 3) Trail Damage: Reroute portions of trails to avoid wet areas. Where it isn't possible to avoid wet soils, install boardwalks. Boardwalked trails may need to be closed to equestrian use. The northernmost section of trail that runs across private property is heavily damaged by hooves. The soils here are hydric, and appear to be perennially wet, making this trail suitable for winter use only.
- 4) Prospect Street Access: Create a small parking lot in the old field along Prospect Hill Road, past the existing sign.
- 5) Soccer Fields Access: Post a sign similar to the one along Prospect Hill Road at the edge of the parking lot at the soccer fields, and mark a trail along the edge of the soccer field into the Conservation Area.

PROSPECT HILL CONSERVATION AREA  
Site Assessment and Management Plan

**Appendix A: Sources**

MassGIS Datalayers:

2001 Aerial Photograph  
2005 Aerial Photograph  
Aquifers  
Areas of Critical Environmental Concern  
Assessor's Parcels  
Bedrock Lithology  
Ecoregions  
Hydrology 1: 12,000  
Land Use  
MRIP Contiguous Natural Lands  
NHESP BioMap  
NHESP Certified Vernal Pools  
NHESP Estimated Habitat of Rare Wildlife  
NHESP Living Waters  
NHESP Potential Vernal Pools  
NHESP Priority Habitats of Rare Species  
Priority Natural Communities  
Protected and Recreational Open Space  
Public Water Supplies  
Scenic Landscapes  
Soils  
Surficial Geology  
USGS Topographical Map

Publications:

Classification of the Natural Communities of Massachusetts, Swain, P.C. & J.B. Kearsley.  
Version 1.3. 2001. Natural Heritage & Endangered Species Program.

BioMap, Massachusetts, 2001. Natural Heritage & Endangered Species Program.

Reconnaissance Survey Town Report for the Town of Harvard, 1983. Massachusetts  
Historical Commission

Massachusetts List of Endangered, Threatened and Special Concern Species as published in  
the Code of Massachusetts Regulations August 8, 2008

Online Resources:

University of New Hampshire Digital Collections, Historical USGS Maps

PROSPECT HILL CONSERVATION AREA  
Site Assessment and Management Plan

**Appendix B: Deeds**

PROSPECT HILL CONSERVATION AREA  
Site Assessment and Management Plan

**Appendix C: Plans**

PROSPECT HILL CONSERVATION AREA  
Site Assessment and Management Plan

Appendix D: Species List  
Observed October 7<sup>th</sup> and 20<sup>th</sup>, 2008

**Trees**

American Beech (*Fagus grandifolia*)  
American Chestnut (*Castanea dentata*)  
American Elm (*Ulmus americana*)  
Black Birch (*Betula Lenta*)  
Black Cherry (*Prunus serotina*)  
Black Oak (*Quercus velutina*)  
Canadian Hemlock (*Tsuga Canadensis*)  
Chestnut Oak (*Quercus prinus*)  
Hickories (*Carya spp.*)  
Ironwood (*Ostrya virginiana*)  
Large-toothed Aspen (*Populus grandidentata*)  
Musclewood (*Carpinus caroliniana*)  
Paper Birch (*Betula papyrifera*)  
Red Cedar (*Juniperus virginiana*)  
Red Maple (*Acer rubrum*)  
Red Oak (*Quercus rubra*)  
Scarlet oak (*Quercus coccinea*)  
Sugar Maple (*Acer saccharum*)  
Swamp Dogwood (*Cornus amomum*)  
White Ash (*Fraxinus americana*)  
White Oak (*Quercus alba*)  
White Pine (*Pinus strobus*)  
White Spruce (*Picea glauca*)  
Yellow Birch (*Betula allegheniensis*)

**Shrubs, Vines and Ground Covers**

Arrow-wood (*Viburnum dentatum*)  
Black Raspberry (*Rubus occidentalis*)  
Blueberry (*Vaccinium spp.*)  
Brier (*Smilax spp.*)  
Buckthorn (*Rhamnus spp.*)  
Burning bush (*Euonymus atropurpurea*)  
Climbing Nightshade (*Solanum dulcamara*)  
Clubmoss (*Lycopodium spp.*)  
Common Juniper (*Juniperus communis*)  
Dewberry (*Rubus spp.*)  
Goldenrod (*Solidago spp.*)  
Grape (*Vitis spp.*)  
Hazelnut (*Corylus spp.*)  
Honeysuckle (*Lonicera spp.*)  
Maple-leaved Viburnum (*Viburnum acerifolium*)  
Multiflora Rose (*Rosa floribunda*)  
Olive (*Elaeagnus spp.*)  
Oriental Bittersweet (*Celastrus orbiculata*)

PROSPECT HILL CONSERVATION AREA  
Site Assessment and Management Plan

**Appendix D: Species List**  
**Observed October 7<sup>th</sup> and 20<sup>th</sup>, 2008**

Partridge-Berry (*Mitchella repens*)  
Pipsissewa (*Chimaphila* spp.)  
Poison Ivy (*Rhus radicans*)  
Sarsaparilla (*Aralia nudicaulis*)  
Smooth Alder (*Alnus rugosa*)  
Spice-bush (*Lindera benzoin*)  
Wintergreen (*Gaultheria procumbens*)

**Ferns**

Bracken Fern (*Pteridium aquilinum*)  
Cinnamon Fern (*Osmunda cinnamomea*)  
Common Polypody Fern (*Polypodium virginianum*)  
Hayscented Fern (*Dennstaedtia punctilobula*)  
Marsh Fern (*Thelypteris palustris*)  
Royal Fern (*Osmunda regalis*)  
Sensitive Fern (*Onoclea sensibilis*)

**Forbs**

Indian Cucumber Root (*Medeola virginiana*)  
Meadow Rue (*Thalictrum* spp.)  
Milkweed (*Asclepias syriaca*)  
Nodding Ladie's Tresses (*Spiranthes Cernua*)  
Smartweed (*Polygonum* spp.)  
White Wood Aster (*Aster divaricatus*)  
Wild Oats (*Uvularia sessifolia*)

PROSPECT HILL CONSERVATION AREA  
Site Assessment and Management Plan

**Appendix E: NHESP Letter**