

T o w n o f H u b b a r d s t o n

OPEN SPACE AND RECREATION PLAN

2018-2025



Prepared by:

Hubbardston Open Space Committee

CREDITS

OPEN SPACE COMMITTEE CONTRIBUTORS

Present Members:

Bob Hatch – Chair
Stephanie Frend - Secretary
Jassy Bratko
Susan Worth
Rick Jones
Pat Taylor
Mark Kresge

Past Contributing O.S.C. Members

Joe Cataldo
Charles Clark
Susan Fox
Leslie Greiner

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Kendall Daly
Scott LeBlanc

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Tom Bratko
Tom Colyer
Cathy Hansgate
Keith Tetrault
Allison Smith

INFORMATION ASSISTANCE

Raeanne Siegel, Town Administrator
Tim Kilhart, Highway Superintendent
Jeff Bourque, Tree Warden
Diane Peterson, Regional Assessor
Sheri Bean, Montachusett Regional Planning Commission

TECHNICAL ASSISTANCE

Benjamin Morse, Worcester Polytechnic Institute
Ryan Weitz, Worcester Polytechnic Institute
Janet Morrison, North County Land Trust
Jason Stanton, Montachusett Regional Planning Commission

PLAN REVIEW AND ADVICE

Melissa Cryan, Division of Conservation Services
Executive Office of Environmental Affairs, 251 Causeway Street, Boston, MA 02114

AUTHOR

Jassy Bratko, Open Space Committee

EDITED BY

Sue Fox
Bob Hatch
Mark Kresge

“Readability”Notes

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Section 1: Plan Summary

Located in central Massachusetts, just seven miles from Route 2 and within an hour's commute of several important urban areas, Hubbardston is one of a growing list of towns that is struggling to maintain the rural character cherished by residents while accommodating the growth demand which is spreading steadily westward from the Route 495 corridor. While this growth has slowed dramatically since the housing crisis that began in 2007, an improving economy will undoubtedly renew the development pressure in the town. Hubbardston is on the very edge of the Boston metropolis and it must be ready to face the next phase of development.

In the years since the last Open Space and Recreation Plan was written, the town has accomplished many of its seven year goals. Major improvements and additions have been made to town owned conservation areas, grants have been received, a donation account has been set up for trail improvements, a wildlife meadow has been created, a new basketball court is about to be built on the town recreation field and relationships have been developed with other conservation organizations resulting in the imminent preservation of several major tracts of land.

This update summarizes the demographic and physical changes to the community since the previous plan. It reviews and updates the open space and recreation properties and facilities and incorporates community survey results into the discussion. Finally, it presents a vision of Hubbardston's future recreational and open space ideals, and summarizes needs, challenges, and goals.

The seven year goals continue to make numerous specific suggestions toward the overall recommendation: that the town strives to achieve a healthful balance between conservation and protection of open space resources and residential and commercial growth, thereby enhancing and protecting the quality of life for the residents who value and treasure Hubbardston's forests, fields, clean water and fresh air. The community aspires to continue to be quiet, safe, and sparsely developed, but with small-town, family-oriented amenities in an unspoiled setting. This overall recommendation, based on survey responses, has remained unchanged since the first open space plan was written.

This update highlights some needs with regard to stewardship and maintenance of public recreation holdings throughout the town and water quality protection issues. Other needs concern development of new recreational opportunities, e.g. bicycle and hiking trails, and improvement of existing facilities, e.g. access for the physically challenged and older adults. A survey made available to the public on the town website and via paper copies around the community elicited 130 responses which are repeatedly referred to in this updated plan. Specific actions are presented in the Seven Year plan (Section 9:).

Ultimately, the goal of the Open Space Committee is to preserve key parcels of land for conservation and, where those parcels are to be owned by the town, to manage them appropriately for wildlife, agriculture, recreation and aesthetics.

Section 2: Introduction**2.1 Statement of Purpose**

Hubbardston's previous Open Space and Recreation Plans have provided valuable guides for the town as it endeavored to meet the open space and recreational needs of its residents. They were also a necessary requirement to secure funding in the form of state Self-Help Conservation (now LAND grant) and Urban Self-Help Outdoor Recreation (now PARC) grants which have helped the town to achieve some of its goals. The plans encouraged preservation of the town's rural character by advocating conserving key parcels of land for open space, managing them appropriately for multi-use recreation, agriculture, timber harvest and wildlife management, introducing an open space residential by-law and outlining the need for additional recreational opportunities.

This document is an updated version of those plans. The purpose of this update is: 1) to provide an accurate, current assessment of open space and recreational opportunities and needs for Hubbardston residents, 2) to discuss some of the obstacles and problems the town may be encountering in achieving its stated goals and 3) to create a five-year action plan that optimizes those opportunities and satisfies those needs.

2.2 Summary of Actions since the Original Plan**2.2.1 Open Space Committee Formed**

After the 2001-2006 open space plan was approved, the Open Space Committee of nine members was formed by a vote at the next annual town meeting. Appointed by the Selectboard, this committee is still intact and functions as a very active citizen volunteer group in Hubbardston. Its stated mission is to seek grants, raise funds, propose Town expenditures and seek other ways to facilitate the implementation of the Open Space and Recreation Plan.

With the cooperation of other town boards, the overwhelming support of town residents and the hard work of many volunteers, many of the goals and objectives of the previous plans have been met or are in progress. Following is a summary of the accomplishments outlined in the 2006-2015 document.

2.2.2 Malone Road Acquisition

The Malone Road Conservation Area was created through land purchase using a combination of funds from a state Self-Help Conservation grant, grants from private foundations, Community Preservation Act (CPA) funds and private donations. A management plan for the new conservation area was incorporated into the existing Mt. Jefferson Conservation Area Management Plan.

2.2.3 Mount Jefferson and Malone Road Conservation Area Management

Working under the guidance of the Conservation Commission, the Open Space Committee has continued to manage both the areas for recreation, timber harvest, agriculture, water protection and wildlife habitat. The first timber harvest was successfully completed on a portion of the Mt. Jefferson Conservation Area. The revenues from that harvest were deposited into the Fund for Hubbardston Preservation and were used in subsequent years to enhance the recreation facilities of the area. Revenues from leasing the hayfields at the Mt. Jefferson Conservation Area are also deposited into this fund. The Fund for Hubbardston Preservation was established shortly after town acquisition of the Mt. Jefferson Conservation Area. All revenues from the conservation areas are deposited in this fund and can only be used for open space protection and management, recreation needs and historic preservation.

The committee has continued to improve the conservation land for recreation. In 2009 funds were secured from a Recreational Trails Grant to relocate a portion of the badly eroded Behind the Chimney Trail, build two new bridges on the relocated section, erect a trail head sign at the picnic area and produce updated trail maps. Improvements to the picnic area were made using monies from the Fund for Hubbardston Preservation. Some of the improvements included removal of many dead or badly damaged trees, removing brush and debris from around the historic house foundation and erecting a split rail fence around the area for safety. The preservation fund was also used in 2014 to relocate problem sections of the Gates Hill Trail. The committee has worked with Eagle Scouts to build bridges, picnic tables and improve trails. Most recently it has partnered with DCR and Americorps to build two culverts in a very wet section of the Gates Hill Trail in June 2015.

The Malone Road Conservation Area was purchased in 2007. An abandoned house and two old sheds on the property were removed with the help of the Hubbardston Fire Department who used them for training exercises in a controlled burn. The Open Space Committee applied for CPA funds to reclaim an overgrown meadow for wildlife habitat and to create a delineated area for parking. Members and volunteers also created two new trails in this area and are currently working on plans to develop a wheelchair accessible trail in the near future.

The Committee also tried to balance the desires of two bird enthusiasts who wish to manage the conservation area hayfields for grassland bird species such as bobolinks, with the need of the farmer leasing the fields who needs to produce a viable forage crop from those same fields. After much debate and meetings with the Conservation Commission and the Selectboard, it was decided to delay mowing on one large field until after July 1st while allowing mowing at the discretion of the farmer on the remaining fields. These decisions, which were overwhelmingly supported by a vote at town meeting, remain a matter of dispute and debate with a small minority of the town residents. Balancing the needs of a multi-use area can be challenging.

The Committee continues to make land preservation a top priority by working with landowners, land trusts and other conservation organizations. Currently it is participating in a multi-town, multi-organization landscape conservation Forest Legacy project. If successful this project will conserve a number of key parcels within the town. The committee is currently in the process of applying for another LAND grant to conserve an additional piece of property abutting the town owned conservation areas. The committee also serves as an informational resource to landowners who wish to preserve their land through means other than town acquisition.

2.2.4 Basketball Court and Curtis Field Recreation Areas

The Parks Commission has completed the basketball court on the Curtis Recreation Field using CPA funds appropriated by the town. Both of these recreational facilities (the field and the court) were mentioned on the previous open space plan surveys.

2.2.5 Low Impact Development Bylaw Study

The Planning Board formed an Ad hoc committee to create a low impact development bylaw. According to the chair of the Planning Board it was decided after much research, that a LID by-law was unnecessary in Hubbardston for three reasons. Most components of

such a by-law already exist in the town's current laws making any new by-law mostly redundant. Any LID by-law passed would not be able to address ANR lot development and, finally, most of the storm water runoff in the town is currently coming directly from the roads. At a meeting to gather input for this plan, members of the planning board suggested passing a general by-law to address potential storm water runoff on individual ANR lot development.

2.2.6 By-law Enforcement Improvement

Lack of enforcement of current by-laws has been a major issue in the town in past years. Some residents and businesses have correctly assumed that, if they simply ignore the by-laws there will be no consequences from the town. This has led to situations where sand and gravel is removed illegally, commercial buildings are erected without obtaining a building permit, businesses are run in residential areas without the correct permits in place and some of those who do have special permits do not feel obligated to abide by the conditions of the permit. The town has historically allowed this to happen because some officials have felt it does not have the finances to fund the necessary research or legal issues involved in enforcement. The result of this lack of enforcement has been that the wishes of town residents, who voted by-laws in place, have been ignored to the benefit of those who profit from ignoring them. Recently there has been an effort to address this problem. At the 2014 Annual Town Meeting the town voted to fund the wages and/or expenses of a trial program to provide additional building code, zoning and by-law enforcement for the Building Commissioner.

2.2.7 Chapter 40B Analysis

The Planning Board is currently being proactive about avoiding the possibility of any “unfriendly” 40B development which could ignore any of the Hubbardston Zoning by-laws. It should be noted here that no development is currently being planned. Chapter 40B, or the Comprehensive Permit Act of 1969, is a program created by Massachusetts in 1969 to allow developers to override local zoning bylaws in order to increase the stock of affordable housing in municipalities where less than 10% of the housing stock is defined as affordable. The goal of Chapter 40B is to allow working families and seniors to remain in their communities when they might otherwise be priced out of the conventional housing marketing. The statute was designed to permit the development of multifamily and affordable housing in suburban and rural parts of the state. The town currently has only 4% designated affordable housing and is therefore vulnerable to a forced 40B development that overrides the town zoning which has been put in place to protect its rural atmosphere. Although there are no current proposals to build a 40B it is in the town's best interest to be prepared if such a development should be proposed.

Currently about 40% of the town is permanently protected and owned by such entities as Department of Conservation and Recreation Division of Water Supply Protection and the City of Fitchburg for water protection for the Quabbin and Wachusett Reservoirs and the Fitchburg water supply. The Planning Board has hired Richard Heaton of H&H Associates to conduct a study to see if enough land in the town is designated as unbuildable to qualify for an exemption from the 10% affordable housing mandate. At the time of writing the town is close to reaching that exemption but does not yet qualify. The Planning Board is also working with Mr. Heaton to update the town's affordable housing plan and educate town officials so it will be prepared to review any 40B presented in the future. These projects are currently ongoing.

2.2.8 Open Space Plan a Valuable Guide

The town's previous Open Space Plans provided invaluable tools and guides for Hubbardston's open space and recreation efforts. Different town committees and boards have worked to accomplish many of the goals set forth. This updated five-year plan will also provide a guide that will assist the town to build on its past accomplishments and seek input from town residents and policymakers in developing new goals.

2.2.9 Open Space and Recreation Plan Update Approach and Participation

This Open Space and Recreation Plan update was developed using the previous plans as a guide. One individual volunteered to compile the document. Each draft section was subject to review and discussion by the entire group before completion of the final draft text. The final draft was then submitted to all town boards, committees, commissions and the town administrator for review and comment.

2.2.9.1 Boards Involved

The author consulted with the Conservation Commission, the Board of Health, the Planning Board, the Assessors, the Parks Commission, the Agricultural Commission, the Council on Aging, the Selectboard and the Town Administrator to incorporate their expertise and any ideas that might be pertinent to their work. An email message was sent to remaining town boards for their input.

2.2.9.2 Town Survey

As part of the effort to gather current community information, and to invite comments and opinions from residents regarding recreation preferences, a citizen questionnaire/survey was prepared by the Open Space Committee. Two volunteers from Worcester Polytechnic Institute put the survey on Survey Monkey, an online survey company. Residents were asked to complete the survey online or to mail in paper copy responses. Paper copies were made available at multiple locations throughout the town including the town offices, library and several different businesses. Residents were notified of this survey through the Town News email, on the town website and with notices in the Gardner News and the Barre Gazette. A copy of this survey, and a summary of the results, can be seen in [Appendix I](#). A total of 131 questionnaires were returned which included 106 online and 25 paper copies. The Open Space Committee reviewed and compiled the results, attempting to characterize results as clearly as possible. Much of the information gleaned from this citizen questionnaire is presented in this update.

2.2.9.3 State and Federal Documents

In order to update such things as community demographics, land use statistics and current environmental issues facing the town, the author researched state and federal documents and reports as well as the records of various town departments and boards. Every attempt has been made to ensure accuracy with regard to statistics and facts.

2.2.9.4 Update Summary

The actual work of compiling this Open Space and Recreation Plan update was an endeavor that took place throughout 2014 and into the beginning of 2015. Participants are noted at the beginning of this document.

Section 3: Community Setting

3.1 Regional Context

The Town of Hubbardston is located in the hills of northern Worcester County, Massachusetts. Towns bordering Hubbardston are: Gardner and Westminster on the northeast, Princeton and Rutland on the southeast, Barre on the southwest, and Phillipston and Templeton on the northwest. Hubbardston is 19 miles northwest of Worcester and 56 miles northwest of Boston, with the urban areas of Gardner, Leominster, and Fitchburg nearby. This convenient location to urban centers of employment has contributed to the changing demographics of the town. The past years have witnessed the transformation and growth of a rural, small-industry based community into an increasingly suburban, commuter/bedroom community. Figure 1 locates Hubbardston in Massachusetts; Figure 2 is a map depicting the bordering communities.

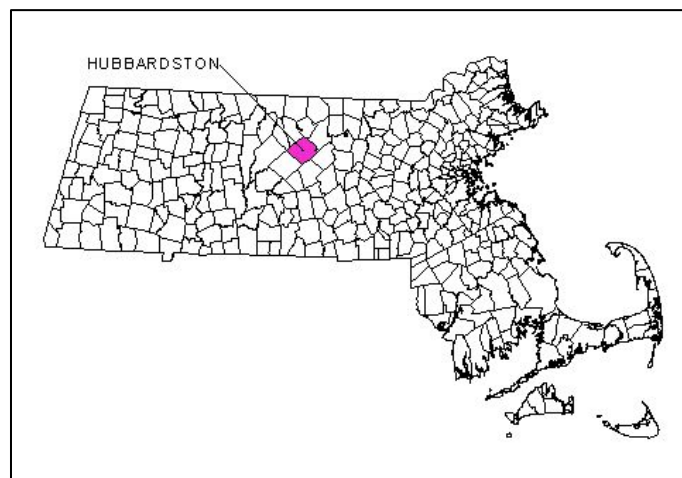


Figure 1 Location in Massachusetts

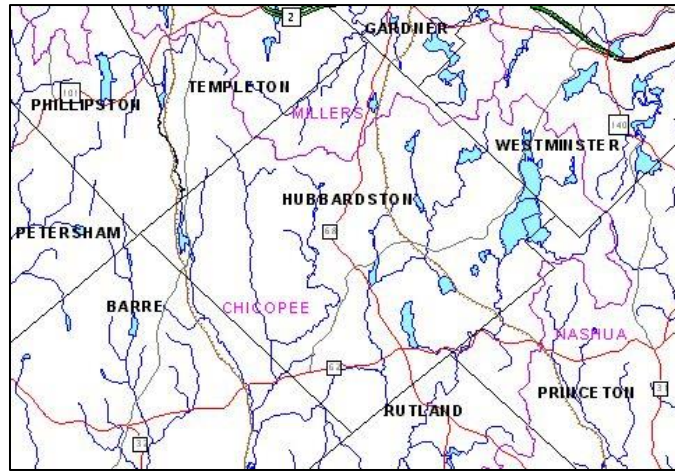


Figure 2 Bordering Towns

3.2 Geographic Context

The hilly terrain and numerous streams found here powered many of the small mills and industries of the nineteenth century. Geographical location and the geological framework of Hubbardston contribute to the production of some of the best drinking water in Massachusetts. The cities of Fitchburg, Gardner, and Metropolitan Boston derive a substantial amount of their drinking water from surface and ground water sources located in Hubbardston.

The town's rich biological diversity is also attributable to its location. The boundary of two eco-regions, the Worcester Plateau and the Lower Worcester Plateau, divides Hubbardston in half. Eco-regions are defined by geology, hydrology, climate, and biological diversity. Where two eco-regions co-mingle, habitats and associated wildlife are much more diverse. Figure 3 provides a base-map overview of Hubbardston.

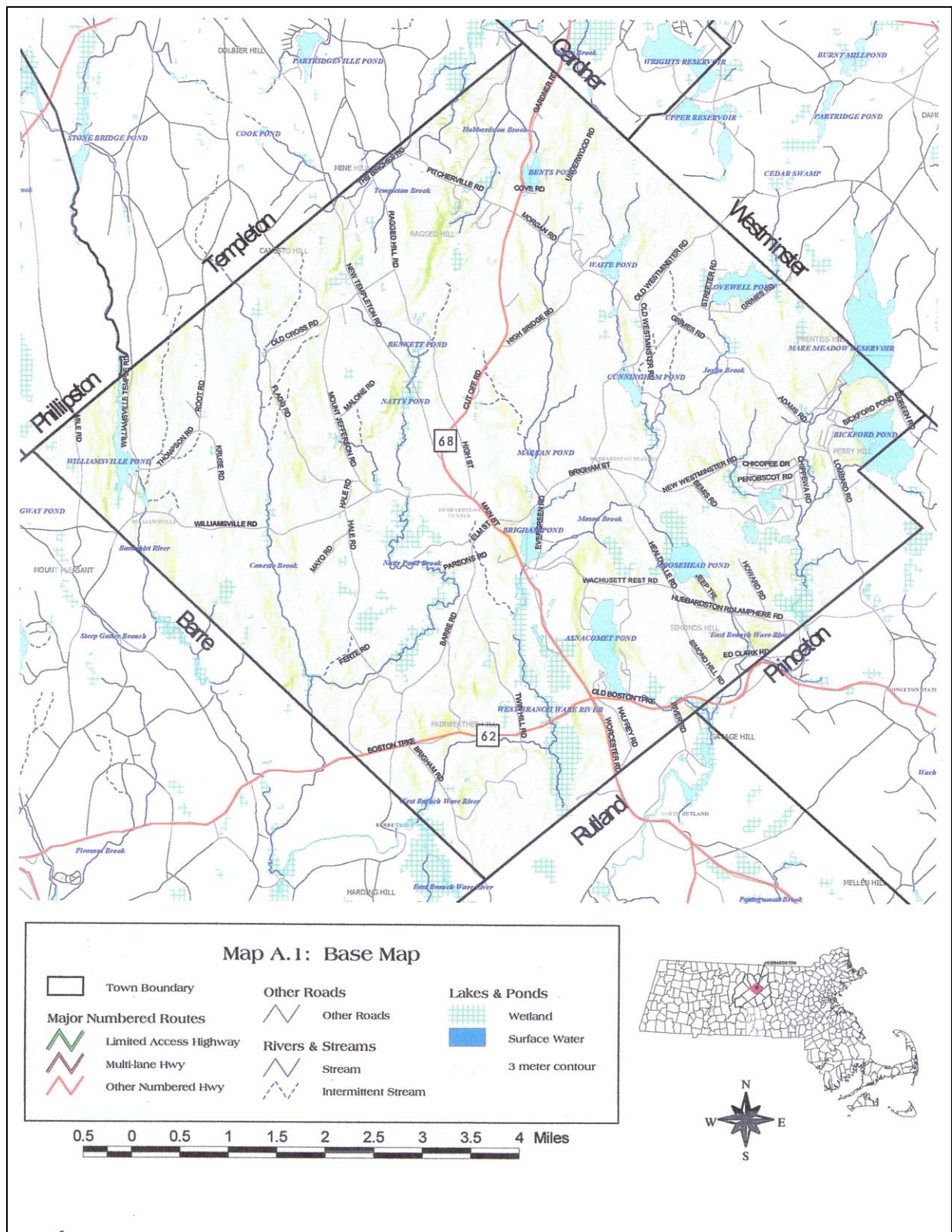


Figure 3 Base Map

3.3 History

3.3.1 Early Years

Originally, Hubbardston was part of a district that included Rutland, Barre, Paxton, Hubbardston, Oakham and a portion of Princeton purchased from the Indians in 1686. This district was owned by thirty-three individuals who, in 1715, decided to set off in lots a tract six miles square. The area to be known as Hubbardston was called the Northeast Quarter and became a town on June 13, 1767. The little "notch" in the southeast corner of approximately 500 acres was deeded to Princeton in 1810 "for the convenience of the families living there."

Early surveys in the 1700s divided the town into "great farms," "house lots" and reserved land for churches, schools and a town common. The first European settlers came here in 1737 and there was a greater influx of people during the 1760s. The town was incorporated in 1767. The first colonial census in 1776 documented a population of 488 people. Many of the local settlers participated in the Revolutionary War. Hubbardston was sympathetic to Shays Rebellion and one of the leaders of the rebellion, Captain Adam Wheeler, was from Hubbardston. Eighty men from the town marched to Worcester under Wheeler's command and took control of the courthouse to protest the widespread foreclosures and seizures of property by creditors that occurred during the cash poor eighteenth century.

Despite the troubled time period, the town grew to a population of 1,113 at the beginning of the next century. This rapid increase in population from 1760 to 1800 was greater in Hubbardston than in any other town in Worcester County.

3.3.2 1800's

The beginning of the 1800's saw the expansion of the town's educational and road systems that were started in the late 1700's. A total of seven school districts were established, each having its own school. Hubbardston's road system expanded toward the neighboring towns to accommodate the great amount of travel through town in all directions. The town's early economy was based on agriculture and lumbering and small scale chair, boot and shoe manufacturing. The early settlers extensively used the town's numerous waterways for powering the many mills and manufacturing sites located here. Historians describe the community at that time as being poor, sparsely settled and almost wholly agricultural, but having sawmills, potash works and cottage industries such as the making of palm leaf hats. By the 19th century, dairy and berry farming and market gardening were major pursuits in the town, and immigrants from Ireland, French Canada, England, Sweden and Russian Finland had moved into town to work with earlier settlers. Tourism was another active industry in Hubbardston and two hotels were destinations for summer vacationers. This era also saw the coming of the railroad in 1873, a Fire Company in 1829 and a library.

3.3.3 1900's

Hubbardston continued to grow, reaching a population high of 1,825 in 1850, but then declined to around 1,400 in 1900. The mid-century Civil War had a large impact, with 120 men joining the Union Army and 44 of them losing their lives. The period from 1850 to 1890 saw many of the original families of the town disappear and the younger population move on, as industrial urban opportunities grew and enticed them to other parts of the county. From 1910 to 1930 the rate of population decline slowed, probably due to the influx of immigrants who purchased abandoned farms and worked both at agriculture and industrial employment. In 1940, Hubbardston had a rural population of 55.9%, the second highest in the county.

In 1926, the Massachusetts legislature passed the Ware River Act by which the Ware River was impounded for the purpose of drinking water collection. Funds were appropriated for the construction of a 12-mile long aqueduct from Ware River to Wachusett Reservoir. The Metropolitan District Water Supply Commission (MDWSC) was set up to run the project. Considerable watershed acreage was taken by eminent domain. In addition to large tracts of land which were taken and inundated in the region to the west, some 20,250 acres were taken by the MDWSC in the towns of Hubbardston, Barre, Oakham, and Rutland. The MDC began buying the land in 1928 and continued for the next 10 to 15 years, although the Ware River intake works were completed in 1931. Coinciding with the Great Depression, this action, whereby the state took ownership of thousands of acres, had a great impact on Hubbardston's economy and population, an impact which continues to this day.

The first half of the 1900s brought two world wars, again resulting in the loss of some of Hubbardston's young citizenry and community change. Yet more dramatic change came about after World War II when automobile ownership became commonplace. Ultimately, it became not only possible but economically feasible for residents to commute to a job in "the city" and enjoy living in a rural environment. Consequently, Hubbardston's population increased as it became a bedroom community to the surrounding urban areas.

Our location continues to attract new families now as it did in the 1700s, but probably for different reasons than entrepreneurial ambitions. Since 1975, Hubbardston has grown dramatically but the number of businesses and services that were available in the nineteenth century did not accompany this growth. At the present time there are several small industries, retail and service businesses, along with numerous home-based endeavors.

3.4 Population Characteristics

3.4.1 Population Trends

Between 1990 and 2000 the town grew rapidly and, for at least the second time in its history, it was the fastest growing community in Worcester County. The Rate of Development By-Law, which restricted the number of new dwelling units to no more than 28 per calendar year, was adopted in 2001 in response to this rapid population increase and to allow the town to plan for future growth. While Hubbardston continues to grow, Table 1 Population Change shows that its growth has slowed down dramatically in the last 10 years. As of January 1st, 2013 the population was 4524. There can be no doubt that, in addition to the Rate of Development By-Law, the recent decrease in the growth rate has been caused by the Great Recession that has affected the entire country.

Table 1 Population Change

Community	Population			Change		% Change	
	1990	2000	2010	'90-'00	'00-'10	'90-'00	'00-'10
<i>Hubbardston</i>	2,797	3,909	4,382	1,112	473	39.8%	12.1%
TOTALS	215,571	228,005	236,475	12,434	7,470	5.8%	3.7%

Source: 1990, 2000 & 2010 U.S. Census

Table 2 shows the number of new house building permits from 2006-2017. The pace of new home construction slowed dramatically following the financial crisis of 2007, but has since rebounded to a relatively consistent average of approximately ten new 1 & 2 family dwellings per year.

Table 2 Building Permit Applications

Year	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
No. of Permits	19	18	4	N/A	N/A	7	9	15	12	8	8	8

Table 3 illustrates that the average age of Hubbardston residents is increasing and it is slightly higher than the state or national average. This, coupled with the slow-down in housing construction, would account for the dramatic decrease in the number of students enrolled at Hubbardston Center School (K-6). According to the Massachusetts Department of Education the current enrollment of the school is 312 compared to a high of 509 in 2001.

Table 3 Median Age

	1990	2000	2010
Community	Median Age	Median Age	Median Age
Hubbardston	32.0	35.9	41.6
Montachusett	32.9	37.4	41.4
Massachusetts	33.5	36.5	39.1
National	32.9	35.3	37.2

Sources: U.S. Department of Commerce; 1990, 2000 & 2010 U.S. Census

3.4.2 Population Density

The population density per square mile of land in Hubbardston is 106, a 12% increase from 2000. Population and housing density is greatest in the Hubbardston center area along Rte. 68. The density reflects zoning regulations and lot dimensions, particularly lot size. Hubbardston has approximately 41 square miles of land.

3.4.3 Income and Employment Trends

Between the years 2007-2011 the town's median household (Table 4 Median Household Income) income was \$83,333. This is significantly higher than the county state or national level and is a fact that is of surprise to many residents who don't consider Hubbardston to be an affluent town. The number of Hubbardston residents with income below the poverty rate is significantly lower than the state rate. It is interesting to note here that 37% of the 2014 survey respondents and high percentages of previous survey respondents, said they moved to Hubbardston because of the inexpensive housing.

Table 4 Median Household Income

Community	1990	2000	2007-2011	% Change: 2000 to present
Hubbardston	42,650	61,462	83,333	35.2%
Montachusett Region	38,901	54,629	75,344	37.9%
Worcester County	35,774	47,874	65,772	37.4%
Massachusetts	36,247	50,502	65,981	30.7%
United States	29,243	41,994	52,762	25.6%

Sources: 2010 U.S. Census; American Community Survey 2007-2011

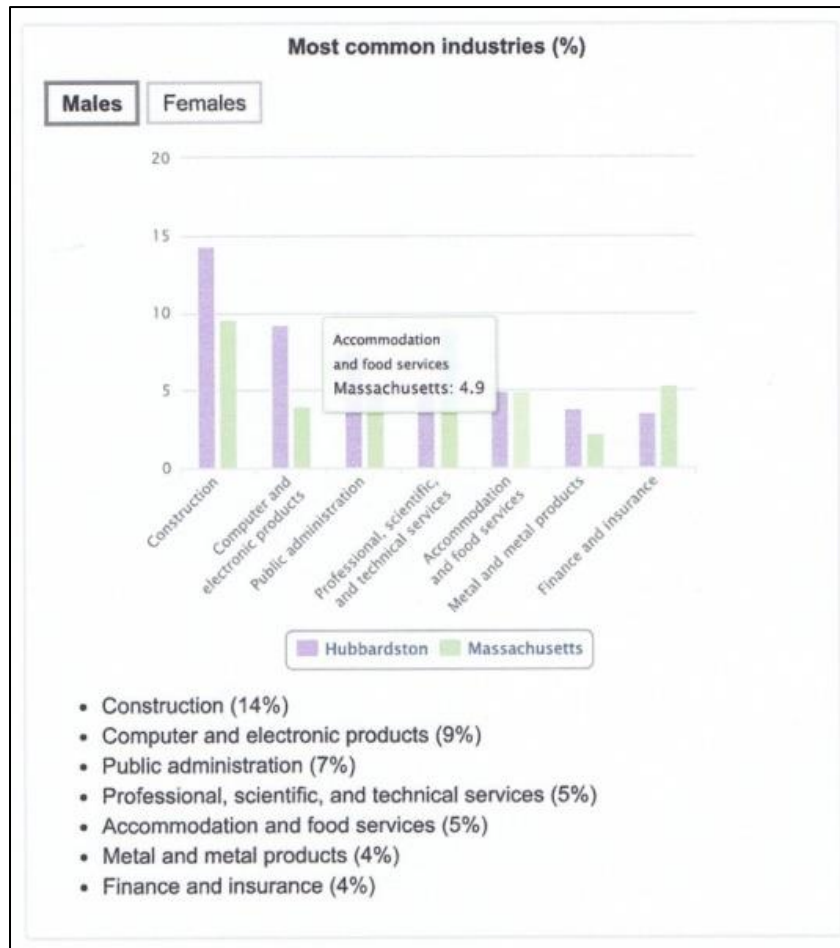


Figure 4 Employment Distribution Male / Female

Source City Data

The vast majority of employed residents commute to work, with a mean travel time of 36 minutes ¹. Although Hubbardston is home to some small and home-based businesses, most residents spend their working days away from the community. Worcester, Fitchburg, Leominster, and cities along the Route 495 corridor, as well as Keene, N.H., are all accessible points with a multitude of employment opportunities. Anecdotal community information indicates that many residents, especially those in the building trades, travel as far as Boston and environs, as well as other New England states, for lucrative job opportunities. Figure 1 shows that the highest percentage of residents is employed in the construction industry.

A common thread running through the community over the years seems to be a desire to live in a quiet, rural, affordable town while making the necessary sacrifice in commuting time and costs for means of employment. An examination of these social and demographic characteristics points to a community made up of families in which one or both parents work outside of Hubbardston. Responses to the Open Space and Recreation survey regarding age and family size reflect similar demographic trends. The largest number (48%) indicated they were families with children while 18% indicated they were couples with no children and 14% were seniors. These are similar percentages to the responses from the survey in 2006.

¹ <http://www.bestplaces.net/transportation/city/massachusetts/hubbardston>

Planning for the open space and recreation needs of Hubbardston must continue to balance the needs of the large number of working families as well as those households which are childless and have less demanding obligations. Planning must also take into account the change in recreational styles and needs of an increasing population of aging and senior residents.

3.5 Growth and Development Patterns

3.5.1 Initial Development

As European settlement of the “frontier” pressed westward during the seventeenth and eighteenth centuries, it tended to follow the “paths of least resistance”. In central Massachusetts, where forests were dense and terrain was rough, this meant using the established paths and clearings of Native Americans. These paths often followed streams and ridgelines, originally functional for hunting and gathering from the wild landscape. As settlement became permanent, these original footpaths became cart-paths, and cart-paths became roads. Much of Hubbardston’s current infrastructure still follows these same paths.

The economic framework that drove this settlement, agriculture and cottage industries, also provided the original patterns of development: a vibrant Main Street developed in the center of town, residential villages sprung up around mills and farmhouses dispersed amongst the fields and pastures of Hubbardston’s open land.

3.5.2 Periods of Abandonment and Growth

Hubbardston went through a period of relative abandonment during the nineteenth and early twentieth centuries as the economic forces of the region shifted to centralized industries and wars took men from farms and factories. Times and needs changed significantly following the two world wars. Automobiles were prevalent; most employment was to be found in urban areas. Improved automobile transportation infrastructure and the resultant mobility meant that people could choose to live further from the urban areas in which they worked. Consequently, by the 1950s, consistent with a pattern that was occurring throughout the northeastern United States, many of Hubbardston’s residents were commuting to nearby cities for work, and people could choose to live in the outlying areas of town. Single-family homes situated on individual lots became the norm. Between 1950 and 1990, the town’s housing pattern stabilized. Then, in a trend noted in many small Massachusetts towns in the early 1990’s, a sudden growth spurt occurred. The past few years have seen a leveling-out of growth, a by-product of pro-active planning by the town and a nationwide downturn in new housing construction.

3.5.3 Town Evolution – Farm to Residential

Hubbardston has thus evolved from a landscape which was predominantly made up of large expanses of wetlands, second-growth forest, and farm properties with a centrally-located social and business sector to a residential community made up of 2+ acre house lots, many in developments, sprinkled amongst fewer and fewer remaining fragmented, undeveloped parcels. The zoning policy adopted by the town, a minimum of two acres per lot with a 200-foot frontage requirement, has led to a consumptive sprawling growth pattern. On the other hand, Hubbardston’s zoning by-laws provide for several growth-management protections, including an Aquifer Favorability Protection District, site plan review for all special permit uses, a general wetlands by-law to control activities affecting wetlands, a Rate of Development Bylaw and an Open Space Residential Bylaw. In addition much of the town is affected by the Watershed Protection Act or Cohen Bill.

3.5.4 Commercial and Industrial Development

Land available for commercial and industrial development in Hubbardston is strictly limited under the current zoning by-laws. A small retail and social center remains, but several small businesses are located well away from the town center. This is a result of the formation of the “Town Center” zoning district, which prohibits mixed uses such as retail stores and restaurants and requires two-acre lots, intended to preserve the agrarian residential character of the town center. The current zoning provides for a commercial-use district along Route 68 and, because there is a natural extension here, northward from the town center, there is the potential for this Commercial zone to erode any town-center vitality which may exist, by spreading out and relocating the focus of daily activities even further from the town’s core. Several small commercial enterprises are presently situated along Route 68, and there has been construction of one new retail plaza since the last plan was written. There are plans being made to build a new senior center and public safety building north of the town center on Rt. 68, close to the Curtis Recreation Field.

3.5.5 Demand for Recreation Land and Facilities

The growth in family homes translates into demand for more land and facilities for recreation. Homes situated far from open space and recreational opportunities mean a need for more attention to parking facilities. Additionally, the types of open space uses and recreational patterns are changing in response to community demographics. Once taken for granted, open space for simple outdoor

enjoyment has now become more precious. Unstructured outdoor play is more and more being replaced by organized and centralized recreation, one outcome of a predominance of young families with children in which both parents work outside of the home.

3.6 Infrastructure

3.6.1 Transportation and Access

3.6.1.1 Rail

The railroad played a major role in the Hubbardston's early infrastructure. The final passenger train was removed from the Boston, Barre & Gardner railroad in 1953. Although the railroad line, now owned by Providence and Worcester Railroad, a Class II mid-sized, freight-hauling railroad, still passes through Hubbardston, it no longer has a significant impact on the long-term development pattern of the town, except with regard to the actual physical location of the tracks and adjoining property affecting land availability.

3.6.1.2 Commuter Rail

While there are no passenger rails within the Town of Hubbardston, the recent MBTA Wachusett Commuter Extension Project and Westminster Layover Facility may encourage Boston bound commuters to take another look at the inexpensive housing in Hubbardston². The project consists of a new Wachusett Station, new Westminster Layover Facility and upgrades to the existing rail line to accommodate the extension of commuter rail service 4 miles west from Fitchburg to Wachusett.

The new station will be conveniently located in close proximity to Route 2 at Route 31 in West Fitchburg. This project will:

- improve mass transit options to the communities west of Fitchburg,
- improve the region's economy by reducing the commute time from the Montachusett Region to the Boston area job market,
- increase the supply of commuter rail parking for riders in the western part of the region, and
- Improve the operation and capacity of the Fitchburg Line Train Layover Facility.

The existing rail line between Fitchburg Station and the Westminster Layover facility will be upgraded to accommodate the extension of commuter rail service to Wachusett Station. Commuter Rail service to Wachusett Station is expected to commence in Fall 2016. Given that one of the stated purposes of this project is to improve mass transit options to communities west of Fitchburg, it is not unreasonable to assume that Hubbardston may experience some future growth because of this.

3.6.1.3 Highways

The principal highway providing access to Hubbardston is State Route 2, the old Mohawk Trail, which runs across northern Massachusetts. State Route 140 and Interstate 190 connect the region to Worcester. The major routes in and out of Hubbardston are Routes 68 (south to Holden, access to Worcester; north to Gardner, access to Route 2), and Route 62 (east to Princeton, west to Barre). Other busy routes are Elm Street/Barre Road, Williamsville Road, New Templeton Road, and New Westminster Road.

3.6.1.4 Streets and Roads

Since the 1960s, Hubbardston's system of streets, roads, and highways has been the infrastructure aspect which has had the most impact upon the town's growth and land use patterns. When Hubbardston entered its long growth period at the second half of the twentieth century, the lay-out of the streets and roads initially resembled the well-traveled routes of the prior century. An increase in new road construction began in the 1960s with the development of the Pinecrest area subdivision. Following a lull in the 1970's and 1980's, new road construction over the past 20 years took place in conjunction with a few new housing developments such as Blueberry Farms, Rolling Woods and some condominiums. Besides those new roads, the primary focus for the past 25 years or so has been on maintenance and improvement of existing roads and bridges. Residents have long complained about the degenerating condition of the roads in Hubbardston. In 2013 the town approved borrowing \$2.5 million for improvements to Healdville, Ragged

² Commuter Rail Extension http://www.mbt.com/about_the_mbt/t_projects/default.asp?id=25985

Hill and Hale Roads. An influx of increased state roads funds since about 1994 resulted in an increase in important maintenance projects, such as repair of one bridge on New Westminster Road and improvement to a badly-deteriorated segment of Elm Street.

All of the highly-accessible roadways in and out of town have seen enormous single-family home building pressure over the past 30 years. The result is an infrastructure which is increasingly encroaching upon open space. There has been a noticeable increase in traffic on Rte. 68 in the last few years. This is obviously partly due to the increase in population but may be due to the increase in population of neighboring Rutland, Templeton and Gardener. The impact of this traffic increase to the town center remains to be seen.

According to Tim Kilhart, Director of the Department of Public Works (DPW) the following work has been done since 2007:

- 2007 - crack sealed Williamsville Rd. and Burnshirt Rd
- 2008 - paved portions of Brigham St. and New Westminster Rd
- 2009 - paved portions of New Templeton Rd. and Cross Rd.
- 2010 - paved all of Rt. 62 (Old Boston Turnpike)
- 2013 - paved all of Healdville Rd., most of Grimes Rd., Ragged Hill Rd and Hale Rd
- 2017 – new bridge on Healdville Rd
- 2016 – new bridge on Burnshirt Rd

The town is in the process of engineering Rt. 68 Gardner Rd. and Worcester Rd. for future paving projects. It is anticipated that the Healdville Rd. bridge will be replaced during the 2015 construction season. Some of the worst roads are Old Princeton Rd., George Howard Rd., Old Westminster Rd. and Old Colony Rd.

3.6.1.5 Public Transportation

Public transportation is non-existent in Hubbardston, another factor which should be noted in a discussion of long-term planning with regard to open space. Parking is always an important consideration for recreational areas and has been the topic of debate within the town in regards to the Curtis Recreation Field. Major improvements were made to the parking area after the town received funding from an Urban Self-Help Grant in 2001. However, many users of this facility complain of a lack of parking spaces available when the area is being used for soccer and baseball. The town may need to consider locating future active recreational facilities in other areas of town to alleviate further congestion. Although the town is a member of the Montachusett Regional Transit Authority/Massachusetts Association of Regional Transit Authorities (MARTA or MART), there is no fixed route service. However, MART provides Councils-On-Aging service to the community for elderly and disabled residents.

3.6.1.6 Pedestrian and Cycling Options

The vast majority of Hubbardston's roads are quiet country roads, which inherently lend themselves to both walking and cycling. Runners, walkers, and bikers are frequently seen enjoying most of Hubbardston's roads. Rte. 68, which runs through the center of Hubbardston (Gardner Rd to the north of the center and Worcester Rd to the south of the center) is quite busy and this section of town does have limited sidewalks and space for bicycles. As you progress outside the center of town on Rte. 68, in either direction, there is ample room to provide space for pedestrians and bicycling.

3.6.1.7 Water and Sewer

There is no public water supply or sewer system in Hubbardston. All residents are served by private wells and septic systems.

3.7 Long-Term Development Patterns

3.7.1 Zoning Regulations

Current delineated zones in Hubbardston are: Residential-Agricultural, Town Center, Commercial, and Light Industrial [see Figure 5, zoning map]. Table 5 describes some of the pertinent requirements of Hubbardston's zoning regulations.

Table 5 Lot Sizes

Type	Minimum Lot Size (ft²)	Minimum Frontage (ft.)
-------------	--	-------------------------------

Single Family*	80,000	200
2 Family	110,000	250
Multi-Family	special permit	special permit
Lt. Industrial	100,000	300

* Commercial, Town Center, and Single Family Residential requirements are equal.

Hubbardston has attempted to be proactive in recent years to help preserve open space through zoning. Important changes to the town's zoning by-laws since the 2001 Open Space and Recreation Plan include the adoption of the Senior Residential By-Law in 2002 which allows clustered senior (age 55 and older) housing development with set-aside conservation land. There are currently two of these senior residential developments, Moosehorn Pond and Madison Green.

The Open Space Residential Bylaw was adopted in June, 2006. It allows denser "cluster" housing on smaller lots, with a certain amount of the property set aside for conservation (per Massachusetts "Smart Growth" policies) and the Rate of Development Bylaw. As yet there have been no approved developments of this nature but as demand for housing increases in the area this type of development may become more commonplace in the town.

As noted before, the Planning Board is currently being proactive regarding any future proposed 40B development in Hubbardston that would have the ability to ignore local zoning laws.

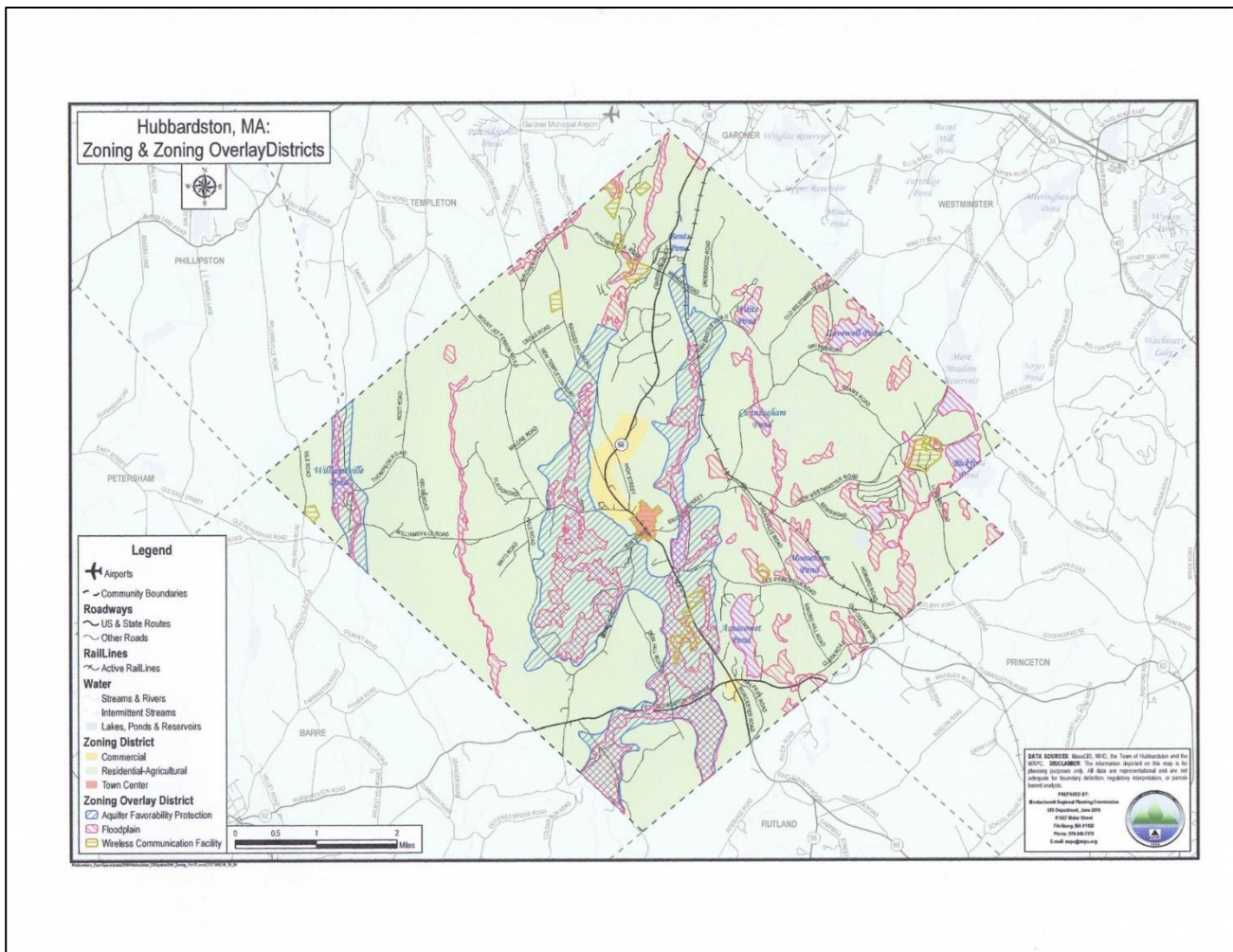


Figure 5 Zoning

3.7.2 Build-Out Analysis

In 2001, the Massachusetts Executive Office of Environmental Affairs worked with MRPC and developed a detailed “build-out” document estimating the impact on land use if all developable lands were utilized according to zoning regulations in place during the late 1990’s. According to Sheri Bean, the Transportation Planner for that office, these estimates have not been changed, as of February 2015.

The build-out consists of a series of 4-5 GIS maps that visually show Hubbardston’s development patterns and future growth projections [e.g. see Figure 6, Development Pattern Map.] These maps act as storyboards that unfold a picture of land use decisions the community had made to date and what these decisions might mean for the community in the future. These build-out maps project the default scenario for growth by graphically illustrating what the community may look like if all remaining developable lands were developed, to their maximum potential. Thus, the build-out provides a good basis for decisions about future development and potential impacts on the community.

Appendix B explains the methodology and presents the build-out projections and statistics in chart form. Given the zoning and land use controls in place in 2001, maximum dwelling units could expand to 4,618 and the number of residents could grow to 13,489, including 3,003 school children. Obviously this would strain the town support services, school system, and infrastructure. Where residents currently rely on private water and septic systems, a population increase as envisioned by the build-out analysis would probably result in the need for development of public water and sewer system, and therefore a dramatic impact on water quality management. Alternatively, zoning build-out analyses typically demonstrate that septic outputs on numerous contiguous lots of, for example, 1.5 to 2 acres, will, over time, result in nitrate concentrations approaching or exceeding the drinking water standard. These analyses are based solely on septic outputs and ignore additional contributions to nitrate concentrations from animal pens.

All of the environmental issues and challenges addressed in Section 4: of this report could potentially become more problematic under a maximum build-out scenario. With increased residences could come increased numbers of outbuildings, paved driveways, a demand for more commercial and retail services, increased traffic and the like - in short, the end of the quiet, rural town with numerous open spaces that is treasured by Hubbardston residents.

While new housing construction permits hit highs of 52 and 37 in 1999 and 2000, respectively, the pace of new home construction slowed dramatically as previously illustrated in Table 2. In 2001, with an eye toward managing unplanned growth, the town passed the Rate of Development By-Law which limits building permits to 28 annually, with no more than five of these permits being granted to any one builder. It is no surprise that this measure has resulted in reduction of the number of new houses being built and discouraged applications for new subdivisions. On the other hand, developers are allowed to apply for waivers to this bylaw, and in fact have done so twice since 2004; developers were granted permission to build more condominium units at the Moosehorn and Madison Green senior residential housing projects. The national economy and collapse of the housing industry in 2007 has also helped the dramatic slow-down in residential development. Hubbardston remains on the very edge of the expanding Boston metropolis and the next building boom will most definitely change the character of the town.

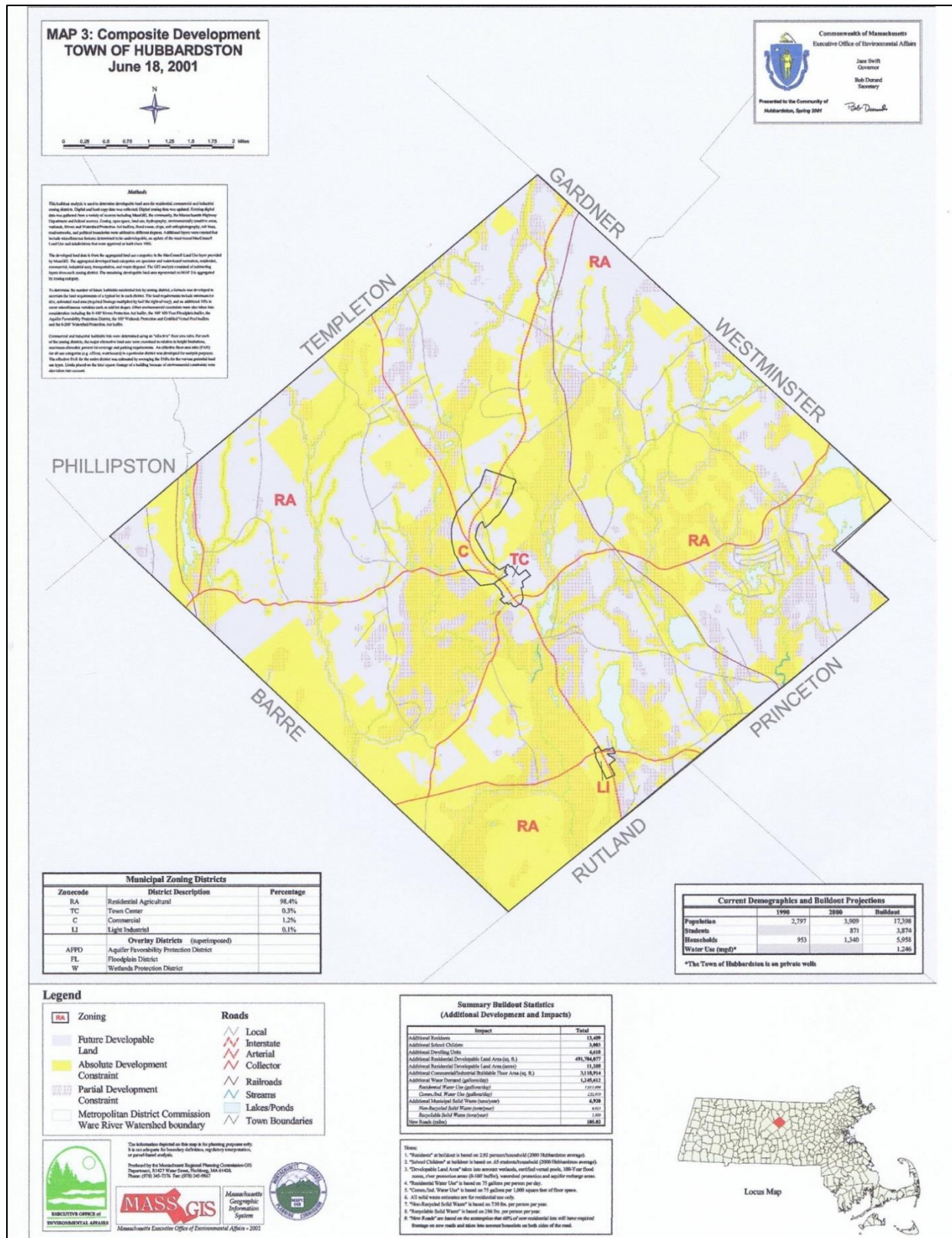


Figure 6 Development Pattern Map

3.7.3 Traffic Counts

Another indication of growth may be linked to traffic flow. The state highway department and Montachusett Regional Planning Commission have conducted traffic counts at various locations in town. Along Hubbardston's main thoroughfare, Route 68, daily vehicle counts have remained surprisingly stable since 1997. In 1997, approximately 6,000 vehicles per day were counted at the Gardner line; in 1998, a little further south at the Brigham Street intersection, a total of about 6,300 vehicles per day was noted. In 2010 this same location had a factored vehicle count of 6200. Similarly, a count at the Gardner/Hubbardston town line on Route 68 in August, 2005, also resulted in a (factored) vehicle count of 6,300. Then in July, 2006, a count north of Morgan Street—also along Route 68/Gardner Road—resulted in a raw count of 7,096 vehicles, which resulted in a factored vehicle count of 6,200 vehicles.

Traffic count numbers for the portions of Route 62 which pass through Hubbardston have also been fairly static over the past few years. At the Barre/Hubbardston town line in 2004, 1,800 vehicles per day were recorded; near the same area (south of Elm Street on Barre Road) in July 2006, a raw count of 2,002/factored count of 1,700 vehicles per day was recorded. A similar pattern emerged when 1,400 vehicles per day were counted at the Hubbardston/Princeton town line on Route 62 in 2004, and an MRPC count on "Route 62 east of Route 68 [Princeton Road]" in summer 2006 found 1,395 raw/1,200 factored vehicles per day.

Interestingly these figures do not seem to match up to empirical observations of many residents, especially those who travel on Rt 68 on a daily basis or who live nearby. Empirical observations suggest a substantial and noticeable increase in traffic in the last two years.

See Appendix C Traffic Count 2010 for Massachusetts Highway Department data for Hubbardston, 2010 Traffic Count

3.8 Community Setting Summary

Although Hubbardston's geographical and geophysical setting places some limits on its population and economic growth, the town experienced an influx of new residents and new construction from the 1970's through the 1990's. Distance from urban and economic/retail centers ceased to be seen as problematic. New residents were drawn by the affordability of land and housing, the appeal of large tracts of undeveloped open space, and the perceived safety as compared to larger urban landscapes.

Like so many other small towns in Massachusetts, the town found itself increasingly challenged to provide necessary services and meet the needs of the growing community with a budget already strained by state-imposed taxation and spending restrictions. With an eye toward the future, key townspeople, committee and board members, and employees took an active role in developing growth-management by-laws and protecting open space. Since 2004 growth has slowed dramatically but Hubbardston is positioned on the very edge of the Boston metropolis. It is anticipated that, with the improving economy, growth will bounce back to the levels seen after the Rate of Development By-Law was passed. Further pressure to develop may come from the new Wachusett Train Station in Fitchburg.

Section 4: Environmental Inventory, Issues, and Analysis

4.1 Environmental Introduction

One of the primary goals of open space protection is environmental protection therefore an inventory and analysis of the Hubbardston's environmental status is especially important and a lengthy topic. As a town approaches its "carrying capacity" in terms of infrastructure and services to its citizens - police and fire protection, roads and road maintenance, solid waste disposal, clean drinking water, etc. - open space protection is one tool that can be used to decrease expansion of some town services and at the same time remove the pressure on and over-use of the town's existing natural resources. Hubbardston residents often express their desire to live in a rural community. Open space protection provides the balance between infrastructure needs and other human needs for solitude, clean air, clean water, outdoor recreation and a healthy natural environment. For many residents the open space within the town is a primary source of their recreation. The town's geography, natural resource base, and existing protected open space, however, present their own management issues and challenges.

4.2 Geology, Topography, & Soils

The underlying geology of Hubbardston has been one of the primary influences on the natural and man-made landscape seen in town today. Geology affects topography by creating the varying elevations, and affects soil formation by providing some of the parent materials with their different fertility and drainage characteristics. Soils, in turn, affect the type of vegetation supported *and* the type of development that can occur. Geology, topography, and soils all affect surface and groundwater hydrology, also important to both the natural and man-made environments.

4.2.1 Bedrock Geology

Formations: The *bedrock* geology of Hubbardston was formed approximately 350 to 400 million years ago, during the Devonian and the slightly older Silurian epochs, within the Paleozoic era. This bedrock was originally sedimentary, having been deposited when ancient seas covered the area, but later tectonic events to the west and east folded and heated the bedrock, which then became metamorphic. This bedrock occurs in two distinct formations running north to south through Hubbardston. These are the Paxton formation on the east side of town, and the Littleton formation on the west, with a third formation, the Fitchburg formation, interspersed in the Littleton. These formations are composed of sulfidic mica schist. The rocks are soft, and can break down into clays that can hold water tightly, thus making less water available to residential wells.

4.2.2 Groundwater Resources

Well Yields: Despite the clays in the bedrock, well yields in Hubbardston are adequate for residential development on the minimum required lot size of 80,000 square feet. Aquifers in the town are bedrock aquifers; thus, wells in the town are bedrock artesian wells. The average residential well depth is around 100 to 150 feet deep; although well depths can range up to 400 feet deep when low yields (1 to 1.5 gallons per minute) require some storage capacity. However, well yields in the northwestern section of town are higher, with 20-30 gallons per minute capacity. Thus, well yields in the town are quite variable, but on the average, wells in the town need to be deeper than in other surrounding towns.

Well Water Quality: Because of the iron sulfide in the bedrock formations, sulfuric acid forms when the bedrock decomposes, causing a low pH in ground water of 6.2 to 6.5. The iron and manganese in the bedrock affect secondary standards of taste and odor, causing a rusty appearance in well water. The iron sulfide can also cause a sulfur smell in water from about one out of every six wells in the town. The Paxton formation also contains arsenic, a naturally occurring element under these geological conditions. Radon gas is also likely to be a natural by-product of the geological character of our region. Both arsenic and radon, although present and with potential public health effects under certain conditions, must be evaluated on a structure-by-structure basis.

4.2.3 Aquifers and Recharge Areas

An aquifer is an underground layer of rock, sand, or gravel that contains water in sufficient quantities to supply a well. The stratified glacial deposits in the region's stream valleys form the best aquifers in the Otter River watershed. Templeton and Hubbardston Brooks flow through a landscape characterized by rich sand and gravel deposits that are extensively mined. The drainage basin for Hubbardston Brook contains a medium-yield aquifer, and, according to Hubbardston's Executive Order 418 Community Development Plan, the Department of Environmental Protection has delineated this as a Zone II Aquifer Recharge Protection Area.

4.2.4 Flood Hazard Areas

Floodplains are considered to be the lowlands adjacent to streams, rivers, or lakes which are susceptible to flooding. Floodplains serve two primary functions: channeling of floodwaters downstream, and impeding the flow of floodwater throughout the area. Floodways adjacent to water bodies serve as channels for diverting high waters. At the outer edge of the floodplain, the flood fringe is subject to flooding less often and at more shallow depths.

Floodplains are determined by the frequency of a flood that covers a specified area, e.g. a 100-year floodplain may flood every 100 years. Flood frequencies are calculated by plotting a graph of the occurrence and size of all known floods for a specific area and thus determining how often floods of a particular size will occur.

The 100-year flood plain areas (those designated as Zone A by FEMA flood insurance maps) in Hubbardston occur along all mapped streams and ponds in Hubbardston, although the widths of the floodplains vary with the topology. Figure 7 (Flood Zone Map 4) shows these areas. The most extensive floodplain areas occur along the East and West Branches of the Ware River, and the lands adjacent to Moosehorn Pond, all in the southern portion of town.

4.2.5 Surficial Geology

The *surficial* geology of the town is more variable than the *bedrock* geology. In many ways, the topography, soils and hydrology of the town have been more influenced by the surficial geology, created by the most recent geologic event - the great glaciers of the Pleistocene Epoch 10,000-15,000 years ago. These glaciers churned over the landscape and left behind remnants that can still be seen today. River courses follow distinct north-south routes, the same direction as glacial movement, large deposits of sand and gravel are prevalent from outwash from glacial melt-water, and huge boulder erratically carried from northerly mountaintops are strewn across town.

Most of Hubbardston is covered by unsorted rocks, stones, and soils called “till”. Till is eroded geologic materials deposited as glaciers retreat. Where glaciers scoured over bedrock, bedrock outcrops remained. Where they rode over loose material on top of bedrock, rounded hills, called “drumlins,” were formed. Depressions carved out by the glaciers created today’s ponds, bogs, wetlands, and stream valleys. Since the glaciers, wind and water erosion have left numerous alluvium deposits along flood plains. Figure 8 shows the correlation between the surficial geology and the hydrology of the town.

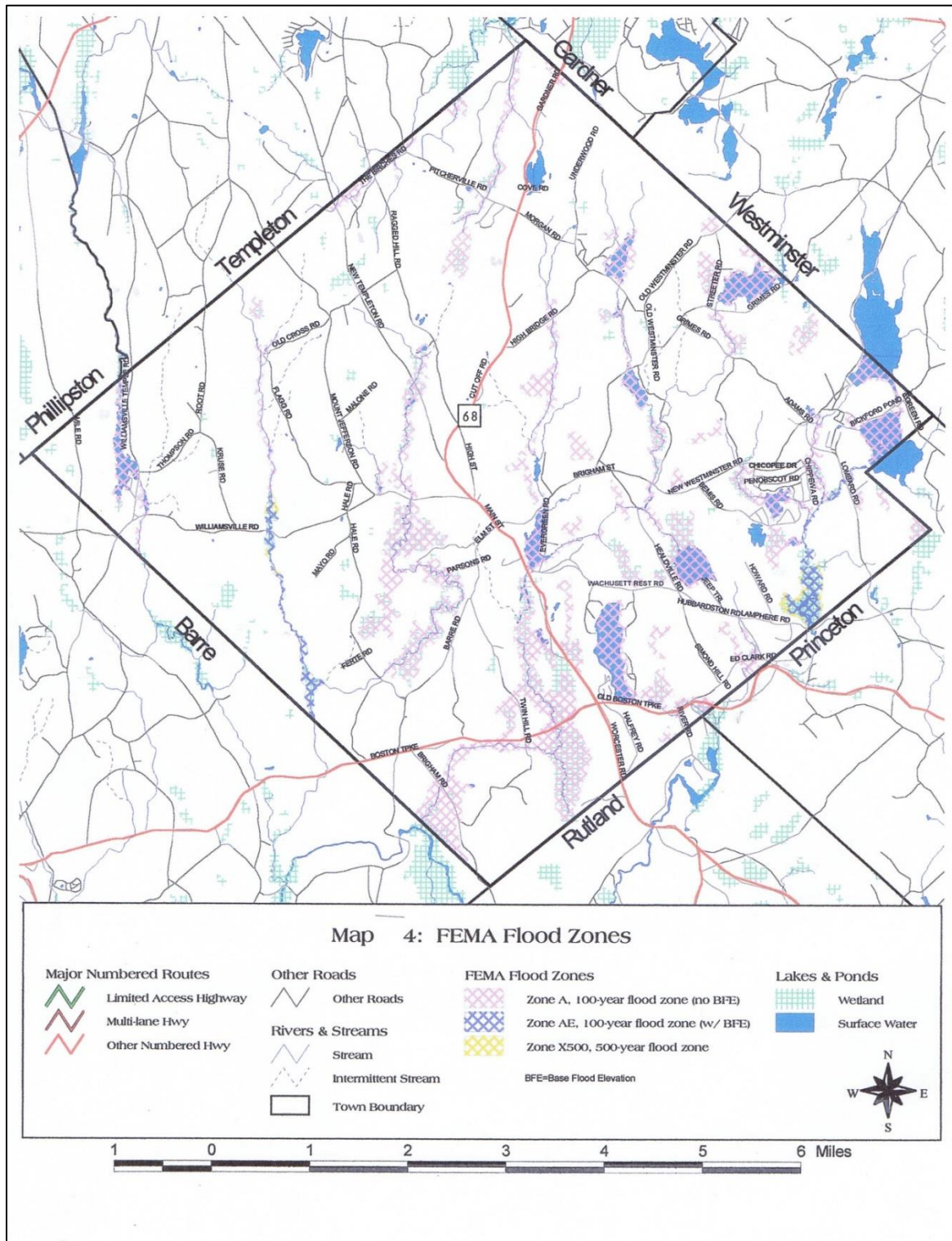


Figure 7 Map 4, Flood Zones

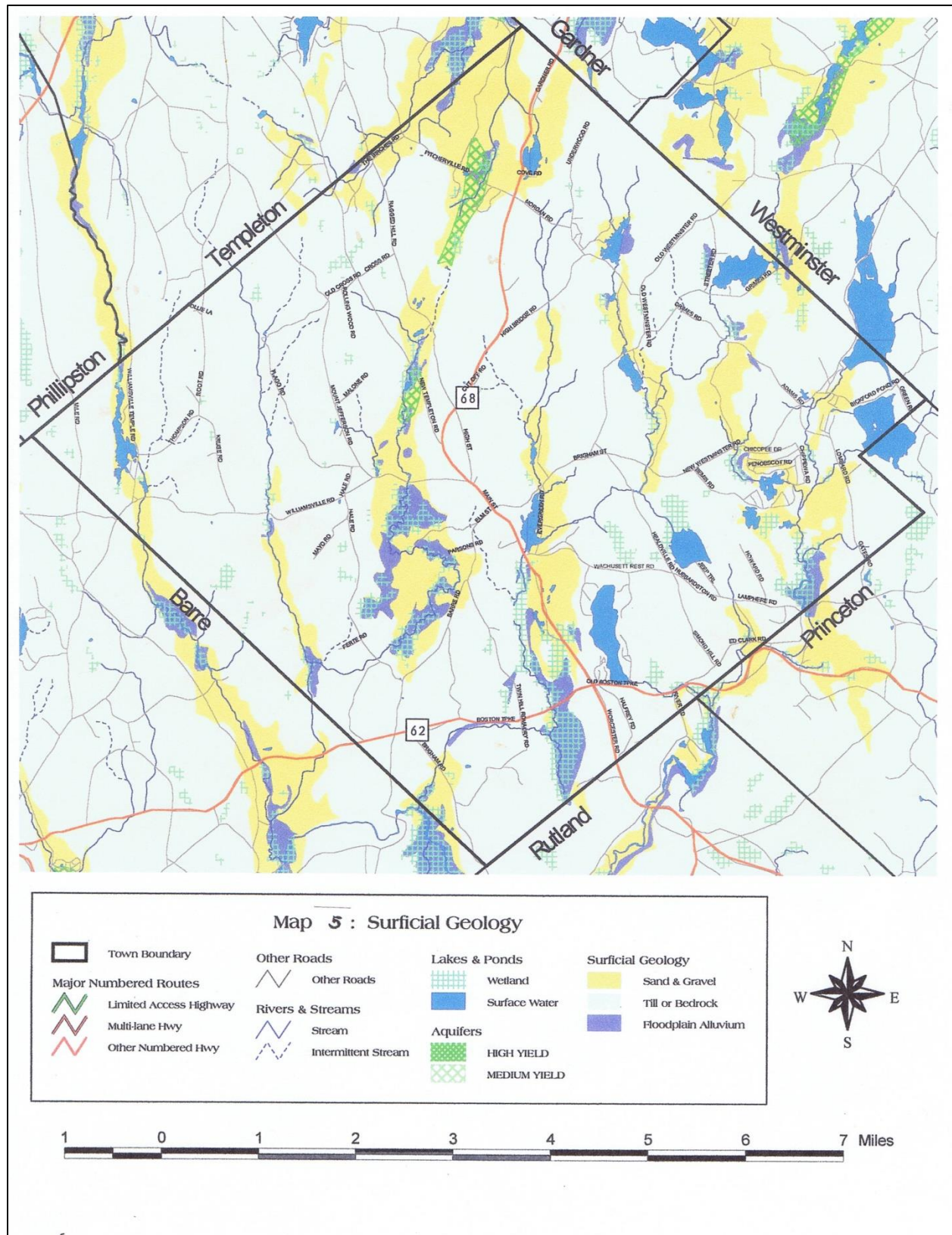


Figure 8 Surficial Geology (Map 5)

4.2.6 Topography

Hubbardston's terrain is comprised of rolling hills with elevations from 780 feet above sea level along the West Branch of the Ware River to 1,313 feet above sea level at the peak of Canesto Hill, at the Templeton border. The terrain is relatively level in eastern parts of town at around 1,000 feet. (Refer to Figure 3 Base Map for reference to Hubbardston's topography.) Slopes range from 0%, up to 25%, with 8% - 15% predominating. The steep slopes over 15% are more susceptible to erosion, and thus, are a constraint to development.

4.2.7 Soils

Due to glacial deposits of soil materials from distant origins, soils in Hubbardston are partially non-indigenous. However, the parent material of the underlying bedrock has influenced the soils acidity and rusty appearance.

Wetlands cover much of the town of Hubbardston. A look at the town's soil structure illustrates this well. Approximately 34% of Hubbardston's soils consist of Bucksport/Wonsqueak and Pillsbury/Peacham Associations, characterized by the poorly- to very - poorly-drained organic soils (mucks). These soils' qualities, such as wetness, low strength (bearing capacity) and stoniness (Pillsbury/Peacham) severely limit a site's development capabilities for septic suitability and buildings.

Much of the remaining soils in town consist of well-drained to excessively well-drained soils. Approximately 38% of these soils consist of Peru/Marlow and Woodbridge/Paxton Associations, generally considered significant for agriculture. These areas are gently sloping to very steep, with very deep, well- drained to excessively well-drained soils on drumlins. Formed in compact glacial till, these soils have the following qualities: 1) friable fine sandy loam, 2) sandy loam surface soil and subsoil with moderate permeability over very firm, fine sandy loam, or 3) sandy loam substratum (hardpan) at 15 to 30 inches, with moderately slow to very slow permeability. Use limitations in these associations are related to wetness, slow permeability in the substratum, slope and stoniness. They have a perched, seasonal high water table at 18 to 24 inches.

4.3 Landscape Character

According to land use statistics available prior to the first Open Space Plan, Hubbardston's land use is dominated by forests, a landscape that is exactly opposite to that of a century ago. Today, over 80% of Hubbardston's land is covered by woodlands, wetlands, and other mixed habitat. Just over 7% is open land, pastures, and crop land. Nearly 3% of town is under water, and about 4.5% is developed as low-density residential. Table 6 shows a summary of land breakdown by type. Table 7 shows a complete breakdown of land use in town, by land type and usage. Figure 9 graphically denotes the town's land use / type on a town map as of 2015.

Table 6 Land Use Summary

Land Type	Per Cent of Available Land
Forest, wetlands, & mixed	86.4%
Agriculture	3.9%
Residential	5.7%
Commercial, industrial, transportation	1.3%
Water	2.7%
The Land Use Summary Statistics tables aggregate land use areas on a town-by-town basis for the Commonwealth of Massachusetts. The statistics were generated from the polygon attribute table from MassGIS for the years for which land use data have been collected statewide, 1971, 1985, and 1999. The 21-class MacConnell land use categories were used as the basis of the tables, which summarize acreage of each land use type, "developed" vs. "undeveloped" land, and change from 1971 to 1985 and 1985 to 1999.	

Table 7 Land Use Data

Land Use Type	Acres	Percentage of Town
Crop Land	535	1.99%
Pasture	640	2.39%
Forest	21736	81.02%
Non-forested Wetland	673	2.51%
Mining	214	0.80%
Open Land	801	2.99%
Participation Recreation	11	0.04%
Spectator Recreation	2	0.01%
Water-based Recreation	2	0.01%
Multi-family Residential	13	0.05%
Medium-density Residential	34	0.13%
Low-density Residential	1187	4.42%
Commercial	80	0.30%
Industrial	31	0.12%
Urban Open	95	0.35%
Transportation	7	0.03%
Waste Disposal	9	0.03%
Water	731	2.72%
Woody Perennial	27	0.10%
Total:	26829	100%

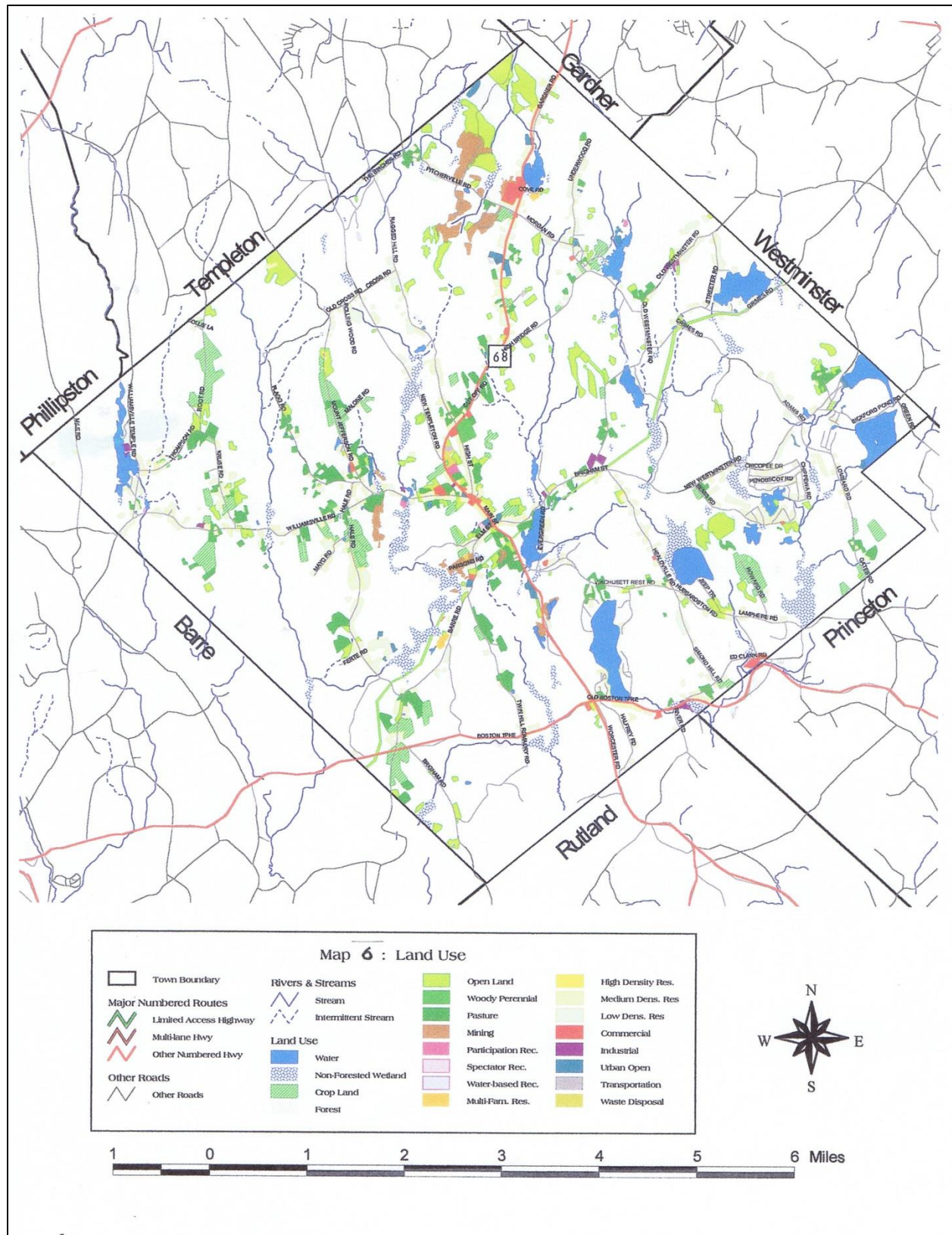


Figure 9 Land Use Map

4.3.1 Watershed Status a Major Factor

One of the reasons that Hubbardston is predominantly undeveloped is because of its placement in the state's watershed system. The DCR Division of Water Supply Protection is responsible for the stewardship of over 92,000 acres of critical lands and 45.6 square miles of reservoir surface water within the watersheds of the Quabbin, Wachusett, and Sudbury Reservoirs, and the Ware River in order to protect the municipal drinking water supply for current and future generations. Hubbardston is part of the approximately 60,000-acre Ware River watershed (also wholly or partly situated in the towns of Rutland, Phillipston, Oakham, Barre, Templeton, Princeton, and Westminster), and DCR-DWSP owns approximately 23,000 acres of that total acreage. DCR land acquisition and water supply efforts have created some large, un-fragmented and undeveloped tracts of land in Hubbardston. A large acreage is also owned by the City of Fitchburg for water protection.

4.4 Water Resources

Hubbardston's surface drainage network of streams, ponds, and wetlands is the direct result of the topography. The drainage network is perhaps the most important environmental feature that should be considered in open space planning. Phil Lewis, a Wisconsin land-use design expert who based his state's open space protection plan on drainage networks, refers to them as a "string of pearls" where rivers and streams are the "string" and ponds, wetlands, endangered species habitats, rich floodplains, historic sites, etc. are the "pearls". Protection of these networks thus provides prime wildlife habitat, recreational opportunities, water supply protection, historic preservation, and other important aspects.

The drainage network can be partitioned into drainage basins, often called watersheds. A watershed is the land area over which water from precipitation collects and flows to a particular stream or river and its tributaries. Drainage basins can be subdivided into smaller sub-basins surrounding a particular river or stream. Hubbardston is located at the "top" of three of the state's twenty-seven major watershed basins: the Chicopee, Millers, and Nashua River Basins. Most of Hubbardston lies within the Chicopee River Basin (Ware River Watershed) (90%), with the remainder of Hubbardston in the Millers River Basin (Otter River Watershed) (9%) and the Nashua River Basin (less than 1%). The Chicopee and Millers River Basins are part of the Connecticut River Drainage System.

4.4.1 Rivers and Streams

Various rivers and streams in the drainage system make their way through Hubbardston. The Burnshirt River enters Hubbardston from Templeton, to the northwest, and then travels for almost six miles through Hubbardston, combining with Canesto and Natty Pond Brooks and entering the Ware River before flowing into Barre. The East and West Branches of the Ware River are also significant watercourses within Hubbardston. The West Branch originates in Hubbardston and flows for five miles south before entering Rutland. The East Branch begins in Westminster, flows for almost three miles in Hubbardston and continues southward to Princeton. The Ware River ultimately supplies drinking water to Quabbin Reservoir or directly to the Wachusett reservoir through the Quabbin Aqueduct during the nine high-water months from October through June. Diversions of water from the river are conveyed into the Quabbin Reservoir through the two-way Quabbin Tunnel. Water flows west from the Ware River to the Quabbin during the high-water months and east from The Quabbin to Wachusett the rest of the year.

Numerous streams and brooks are tributaries to these rivers, some of which are small and join to form the larger streams. Canesto Brook, Hubbardston Brook, Joslin Brook, Mason Brook, Natty Pond Brook and Templeton Brook are a few of the most significant tributaries

4.4.2 Ponds

There are fifteen ponds in Hubbardston that range in size from 2 to 127 acres (see Table 6) and a few other small ponds which are smaller than two acres. These ponds are great recreational assets in Hubbardston, providing opportunities for boating, swimming, and fishing and other pastimes. In the 2001, 2006 and 2014 citizen questionnaire, Comet Pond was ranked as one of the primary open space recreational opportunities in town.

Table 8 Ponds of Hubbardston

Name	Acreage
Asnacomet Pond	127
Bemis (Road) Pond	16.4

Bennet Pond	2
Bents (Sawyers) Pond	28.7
Bickford pond	163 (Half is in Princeton)
Brigham Pond	46.9
Cunningham Pond	27
Cushman (Perry Hill) Pond	23
Lovewell Pond	81.6
Marcan (Marean) Pond	62
Mare Meadow Reservoir (southern [main] portion)	240 (most of which lies in Westminster)
Mossehorn Pond	67.4
Natty Pond	3
Tannery Pond	5
Waite Pond	34.4
Williamsville Pond	57

4.4.3 Wetlands

Wetlands are a very important resource for wildlife habitat, water purification, groundwater recharge, and flood control. Many species of flora and fauna only occur in wetlands. Numerous types of wetlands exist in Hubbardston, comprising approximately 1,200 acres. Figure 10 (Map 7) illustrates these wetlands and their associated habitat types.

4.4.4 Vernal Pools

Vernal pools, or areas of pooled water that dry up for periods during the year, are prevalent and very well documented resources in this community. The Natural Heritage & Endangered Species Program (NHESP) of Massachusetts Division of Fisheries and Wildlife (DFW) has established criteria for certification of vernal pools. Hubbardston has 311 Certified Vernal Pools, more than any other township in the Commonwealth. Vernal pools host a unique biotic community; they are fish-less and thus lack a heavily predatory trophic system, so many species of animals, especially reptiles and amphibians, rely on these abundant resources for breeding grounds and specialized food sources. Many other animals whose life cycles are predominantly or entirely terrestrial depend upon vernal pools for nesting materials and food sources (e.g. certain bird species, certain small mammals), for use as watering holes (e.g. deer), and grazing of emergent vegetation (e.g. moose, small mammals). Vernal pools also act as storage “tanks” for groundwater, allowing surface water to slowly percolate into the ground over time and recharge aquifers. Vernal pools are also displayed in Figure 10.

4.4.5 Bogs

Hubbardston also has numerous non-forested wetlands and bogs. A large bog is located around Natty Pond, and another just south of Cunningham Pond along Joslin Brook. Bogs provide unique habitats for many species of wildlife, with deep mats of sphagnum moss (which become peat), Labrador tea, pitcher plants and other plant species. Shrub swamps, with thickets of dogwood, willow, and alder, are also very common in the lower and more level valleys in the southern part of town. Shrub swamps often have wet meadows associated with them. These wetland habitats are displayed in Figure 10.

4.5 Vegetation

4.5.1 Introduction

The plant life of this region is determined by land use, climate, elevation, topography / aspect, and soils/geology. As described earlier, Hubbardston is divided into two eco-regions - the Worcester Plateau and the Lower Worcester Plateau - as defined by these factors. This means that Hubbardston has a diverse variety of trees and plants.

Hubbardston's landscape is dominated by secondary growth forests that have grown back since the time more than 100 years ago when there was substantial clearing of land for timber and agriculture. A majority of these forests are considered "upland," or sites that are fairly dry and well-drained. Oak, hickory, and ash trees dominate the uplands, interspersed with black cherry, basswood, yellow and black birches, and sugar maple. Large stands of white pine are also common in Hubbardston's upland forests. Understory shrubs include witch hazel, striped maple, hazelnut, blueberries, and a variety of ferns and other herbaceous plants.

North-facing slopes and damper, protected areas are dominated by beech, red maple, birch, and green ash. Groves of hemlocks fill valley bottoms, especially at the toes of north-facing slopes. These places are also known to accommodate some balsam fir and red spruce—softwood trees common to more northerly regions, found here at the southernmost limit of their range. Large, forested wetland complexes are very prevalent along Natty Pond Brook, the lower stretches of Joslin Brook, and at the headwaters of the East Branch of the Ware River. These areas have important wildlife and flood control values. Hubbardston woodlands are facing serious threats from three invasive pests: Hemlock Woolly Adelgid, Emerald Ash Borer and the Asian Long Horned Beetle. (See Section 4.9 Environmental Challenges and Issues).

4.5.2 Public Shade Trees

Shade trees exist on all Hubbardston's roadways. On many of the small back roads, branches of large trees that span the road. All cemeteries in town are bordered by shade trees. One public shade tree of note, is a giant Beech tree on the Mt Jefferson public parcel. This tree is located just behind the main parking area. The diameter of the shaded portion of this magnificent tree is approximately 100'!!

In addition, there are 2 other main sites with public shade trees in Hubbardston, Curtis Recreation Field and Millenium Park. Shade trees play an important role in beautifying the recreation field and providing much needed shade for spectators. Lilac bushes were planted in the very early years of the field along a boundary line and three maple trees were planted around 2005 using funds from a state grant. Similar funds were used to plant trees at Millenium Park. It is likely that more trees will be deemed beneficial for both locations in future years should funding permit.

Efforts are currently underway to beautify the town center and a Town Center Committee has been formed. Some years ago crab apple trees were planted in locations along Main St. by the town. It is very likely planting public shade trees could be a component of any plans to improve the area.

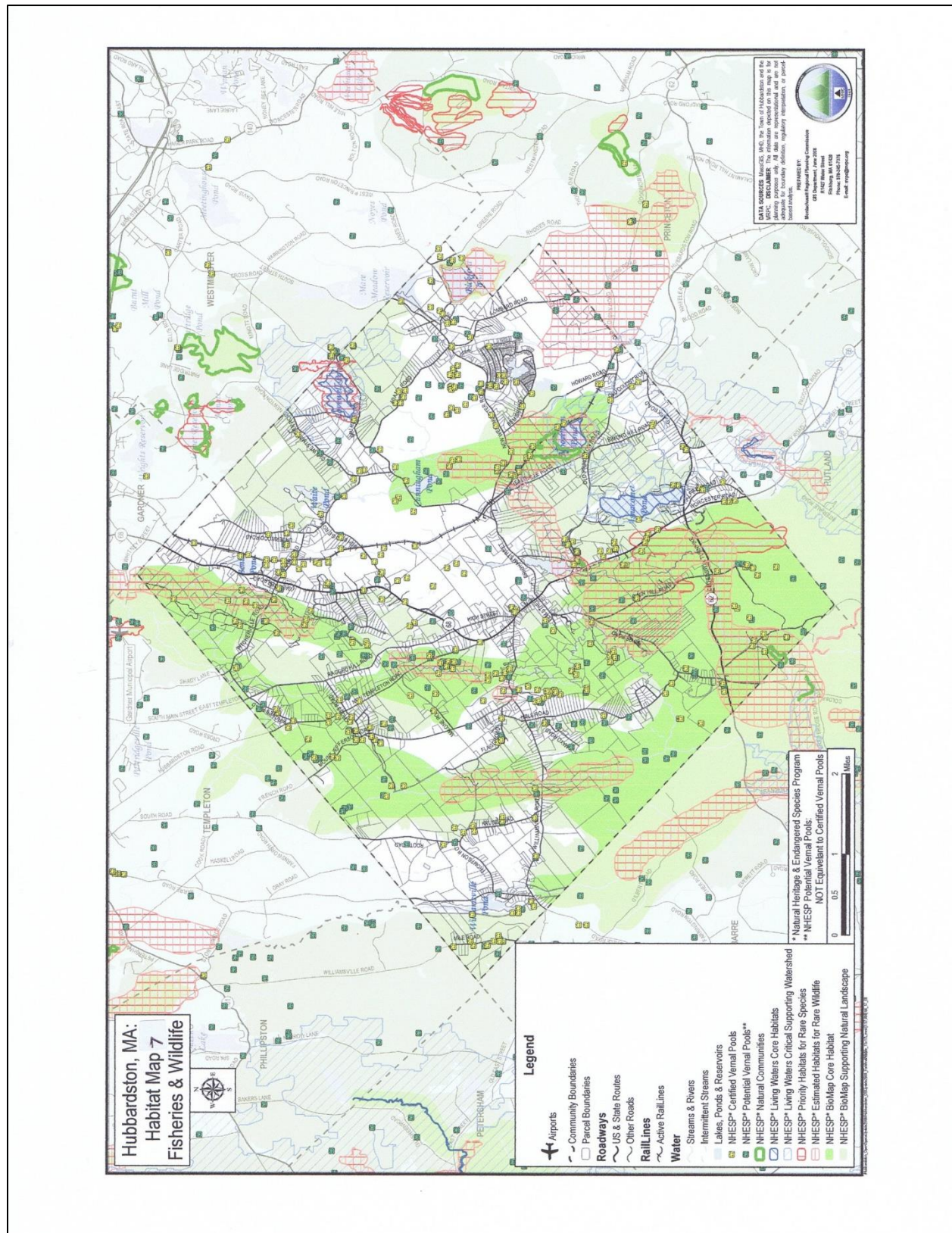


Figure 10 Wetlands, Wildlife, and Core Habitat of Hubbardston

4.5.3 Fields and Open Land

Many open fields remain throughout Hubbardston. Hayfields, pastures, other cropland and open fields are important components of the town's character. These are also key habitats, especially for migrating and nesting songbirds and waterfowl. Some bird species, such as Bobolink and Killdeer, rely on open fields and clearings for nest sites. A number of neo-tropical migrant bird species, many of them declining in population, use early-successional cropland for nesting. These areas, dominated by birch, cottonwood/aspen, and other small saplings, provide great cover and food sources for these birds. Many of these lands are privately owned and managed and working with landowners is one way to help protect these resources for the future.

4.5.4 Vegetation Core Habitats

The Massachusetts Natural Heritage and Endangered Species Program (NHESP) has developed a BioMap identifying site-specific "Core Habitats" which exist in Hubbardston. The map identifies the most critical sites for biodiversity conservation, and a summary of each site highlights characteristic natural communities and their associated plant and animal species. Four core habitats are identified: BM518, which also extends into Rutland and Barre, includes riparian habitat and extensive upland forest along the Ware and Burnshirt Rivers and several brooks; BM609, much of which is in the Hubbardston Wildlife Management Area, contains a variety of wetlands, including a Level Bog (dwarf shrub peatland); BM647, which contains a high-quality example of a classic northern Kettlehole Level Bog (acidic dwarf shrub peatland); BM622, which comprises the shoreline and waters of Bickford Pond.

The BioMap/Core Habitat report for Hubbardston identifies three rare plants which are present in BM518: Bartram's Shadbush (*Amelanchier bartramiana*), classified as "Threatened," and Dwarf Mistletoe (*Arceuthobium pusillum*) and New England Blazing Star (*Liatris scariosa* var. *novae-angliae*), both species of "Special Concern." Two plant species documented in towns adjacent to Hubbardston, Thread Rush and Great Laurel, have not been documented but may be present. Further exploration of likely habitats of rare plants is needed in order to complete the assessment of the town's important natural resources.

4.6 Biodiversity and Wildlife

Combine Hubbardston's great structural diversity of habitats with its large expanses of protected, undisturbed land, and it's easy to see why one of the town's biggest assets is its fish and wildlife resources, both game and non-game species. State biologists recognize this area for its impressive biodiversity. Sportsmen enjoy its ample fish and game opportunities [see Section 5:]. Naturalists, birdwatchers, photographers and others appreciate the opportunity to study and observe a variety of wild creatures. Both citizens and visitors alike utilize and benefit from the presence of a rich mix of native animals.

4.6.1 Migrant Birds

Non-developed areas of Hubbardston are utilized as feeding and resting areas for many migrant bird species and for nesting by still more neo-tropical migrant birds that use Massachusetts as their breeding grounds. Passage migrants that occur in Hubbardston and which are considered Threatened or of Special Concern in the state include Northern Parula and Blackpoll Warbler. It is likely, although not confirmed, that Cooper's Hawk and Sharp-shinned Hawk, species of Special Concern, nest in Hubbardston. Meanwhile, it should be noted that many migrant bird species, although not on the state's endangered species list, are considered to be declining in population and/or uncommon, and therefore merit some attention on the part of town planners. These species include Bobolink, Barn Swallow, sparrow species associated with certain types of grasslands, and warblers that use specialized forest habitat. The town recently included language in its hay license for the Mt. Jefferson Conservation Area specifying that a specific 10 acre hayfield will not be mowed until after July 1st to provide dedicated habitat for Bobolinks. The Open Space Committee recently reclaimed an overgrown meadow at the Malone Road Conservation Area and will mow it every two to three years to manage it for early successional growth.

4.6.2 Wildlife

Hubbardston is home to many common species of wildlife. White tailed Deer, Coyote, Beaver, Raccoon, Porcupine, and Red Fox are abundant mammals here. Black Bear, Fisher, and Moose are found in small numbers. Native brook trout, large and small mouth bass, perch, and a variety of other fishes live in Hubbardston's waters.

4.6.3 Core Habitat Animal Highlights

In addition to identifying significant plant species the BioMap/Core Habitat project has identified rare and endangered animals associated with the four natural communities cited above. The four locations are: (1) Bickford Pond off of Lombard Road; (2) the wetland area adjacent to Moosehorn Pond; (3) the wetland downstream from Brigham Pond on the west side of Route 68 and (4) the

wetland area surrounding Canesto Brook on both sides of Williamsville Road. These areas are delineated on Figure 10 (Wetlands, Wildlife, and Core Habitat Map 7). Core Habitat BM518 lists the status of four invertebrates, three moths and one beetle, which are found there as “Threatened” or of “Special Concern.” Also present in that area are American Bittern (*Botaurus lentiginosus*) (Endangered) and Eastern Box Turtle (*Terrapene carolina*), Four-toed Salamander (*Hemidactylium scutatum*), Jefferson Salamander (*Ambystoma jeffersonianum*) and Spring Salamander (*Gyrinophilus porphyriticus*) and Wood Turtle (*Clemmys insculpta*), all of “Special Concern” status. Core Habitat BM622 is important in supporting Common Loon nesting habitat. The loon is a species of Special Concern in Massachusetts. A rare dragonfly, Beaverpond Clubtail (*Gomphus borealis*), has been found in Core Habitat BM609, and it is likely that other rare vertebrates are also present at this location.

4.6.4 Wildlife Corridors

A healthy community ecosystem includes wildlife corridors and “greenways” that allow animals and birds to travel easily over many miles of terrain and therefore not create isolated “islands” of populations. Wildlife populations that are unable to move about can put too much pressure on a given tract of land, depleting the food resources and thereby starving themselves out of their own living spaces. Further, isolated wildlife populations suffer from lack of genetic diversity. Large migration-enabling tracts of land add to overall species biodiversity, too. Fortunately, Hubbardston’s present land use structure provides many opportunities for sheltering wildlife and allowing wildlife movement over large, unbroken tracts of undeveloped areas. Interconnected parcels of woodlands and wetlands can be seen on the town’s land use map, Figure 9. Hubbardston also shares much unfragmented open space with neighboring towns to the west/northwest and south/southeast. The only section of town which probably blocks movement of many, although not all, wildlife species, is the northeastern corner which abuts the outskirts of metropolitan Gardner.

4.7 Natural Resource-Based Recreation

Hubbardston offers thousands of acres of open space where people may enjoy many non-consumptive activities which are dependent upon open, undeveloped tracts of land and clean, unobstructed waterways. While many of these activities are allowed and encouraged, there are many tracts of land in town which are regulated and operate under various restrictions.

The 2014 questionnaire showed that residents regularly use trails, ponds and streams for recreational use. Additional kinds of recreational activities which are not reliant on the town’s natural resources are discussed in Section 5: .

4.7.1 Hunting and Fishing

Hunting and fishing are two popular activities which are dependent upon Hubbardston’s open space resources. (See Section 5: regarding properties that allow licensed hunting and fishing in season.)

4.7.1.1 Hunting

Under state regulation, there are specific hunting seasons and bag limits for numerous mammal species, trapping regulations and limits for various fur-bearing mammals, and management of hunting seasons on resident and migratory waterfowl and game birds. Game species populations in Hubbardston are monitored and managed by Mass Wildlife with regard to species’ health and the carrying capacity of the animals’ habitat.

In addition to native game birds, such as Ruffed Grouse and American Woodcock, The Division of Fisheries and Wildlife (Mass Wildlife) stocks pheasants at the Hubbardston Wildlife Management Area (WMA). The pheasants are stocked from two different sites, both of which are owned by the Department of Conservation & Recreation (DCR), but are part of the WMA per an agreement between Mass Wildlife and DCR. One site can be accessed from a parking area off of Old Westminster Road. The other is accessible from a parking area off of Gardner Road (RT 68), near High Bridge Rd. The areas are stocked once a week, the day and time varies and is not published.

Wood Duck nesting boxes are monitored and maintained at two locations within the town; Joslin Brook, off of New Westminster Road, and at Cunningham Pond.

4.7.1.2 Fishing

Hubbardston has several ponds and streams that offer excellent fishing and access throughout the year. Comet (Asnacomet) Pond, is a favorite site for ice fisherman as it freezes early, holds its ice late and is a premier spot for taking trout through the ice. Moosehorn Pond, Brigham Pond, and Williamsville Pond are other large ponds offering easy canoe or small boat access and excellent bass fishing. The Mare Meadow Reservoir, which only permits fishing from the shore, is another excellent bass fishing area.

Mass Wildlife stocks hatchery-raised rainbow, brook, brown, and tiger trout in Hubbardston. The waters currently stocked with all, or some, of the above mentioned are: Asnacomet (Comet) Pond, Burnshirt River, East Branch Ware River, West Branch Ware River, Canesto Brook, Joslin Brook, and Natty Pond Brook. All these waters are stocked at least once every spring and Asnacomet Pond is also stocked in the fall. Actual stocking times and locations vary and are not published. The website <http://www.mass.gov/eea/agencies/dfg/df> is updated every Friday morning during the spring with the water bodies stocked that week. Past fisheries surveys show that native brook trout were found in the following water bodies:

- Burnshirt River
- East Branch Ware River
- West Branch Ware River
- Canesto Brook
- Joslin Brook
- Natty Pond Brook

Unfortunately broodstock salmon is no longer stocked in Hubbardston. In 2012 the U.S. Fish and Wildlife Service withdrew its support and resources from the Connecticut River Atlantic Salmon restoration program, including its egg and fry production at the White River National Fish Hatchery and sea run broodstock operations at the Cronin National Salmon Station. These operations were critical components of the Atlantic Salmon restoration program and without them there was no viable chance of success moving forward. Therefore, after nearly four decades of effort, Mass Wildlife has ended its efforts to restore Atlantic Salmon to the Connecticut River. As a result, Mass Wildlife will no longer culture Atlantic Salmon at the Roger Reed fish hatchery or stock Atlantic Salmon fry or smelts into waters of the Commonwealth. This means there are no surplus broodstock salmon for anglers.

4.7.2 Other Natural Resource-Based Recreation

Other activities enjoyed by both Hubbardston residents and visitors alike include hiking, cross country skiing, snowshoeing, mountain biking, horseback riding, bird and wildlife watching, nature and wildlife photography, animal tracking, and swimming. Most aspects of these pastimes are dependent upon undeveloped open space for their enjoyment. See Section 5: Inventory of Conservation and Recreation Lands for further discussion of recreational opportunities.

4.8 Scenic Resources and Unique Features

Figure 11 Scenic Resources and Unique Features Figure 11 Scenic Resources and Unique Features at the end of this section depicts locations of the myriad scenic resources and unique environments in the town.

4.8.1 Introduction / Landscape

Like most towns in rural Massachusetts, Hubbardston is primarily forested with numerous fields and farms. Because of its location within the Ware River Watershed there are large tracts of contiguous forests that are permanently protected to preserve the quality of the water flowing into the Quabbin Reservoir. Large tracts of land in the eastern section of town are also conserved to protect the Fitchburg water supply. Indeed, it is probably true to say that Hubbardston's most important resource is its water. Protecting the drinking water supply for millions of people in the metro Boston area and the City of Fitchburg has been the driving force for the slow development or lack of development in the town.

Many of Hubbardston's roads are winding lanes that pass by preserved images of rural New England: woods, open fields, stone walls, ponds, and clapboard houses. In 1975, following the recommendations of the Conservation Commission and the Planning Board, under the provisions of M.G.L Chapter 40, Section 15c, the town approved the designation of the following as scenic roads: Barre Road, Bemis Road, Brigham Street, Flagg Road, Grimes Road, Hale Road, Halfrey Road, Healdville Road, High Street, High Bridge Road, Kruse Road, New Templeton Road, Old Princeton Road, Old Westminster Road, Lombard Road, Mile Road, Mount Jefferson Road, Morgan Road, Pitcherville Road, Ragged Hill Road, Thompson Road, Twin Hill Road, Underwood Road, Upper Intervale Road, Williamsville Road, and Williamsville-Templeton Road. The intention of this designation is to assist with planning along the roadways with regard to preserving aesthetic and natural resources. Repair, maintenance, reconstruction, or paving work on roads with this designation "shall not involve or include the cutting or removal of trees or the tearing down or destruction of stonewalls or portions thereof, except with prior written consent of the Planning Board" and after a public hearing.

4.8.2 Major Characteristics and Geological Features

Hubbardston contains within its borders several natural and managed features which are valuable from a scenic standpoint. The southernmost section of Mare Meadow Reservoir, Barre Falls Dam Reservation, and many of the town's ponds provide attractive

waterfront views. There are several points of high elevation that offer outstanding looks toward Mt. Wachusett, the region's most prominent landscape feature. The Mt. Jefferson Conservation Area, which maintains open fields and offers dramatic views of Mt. Wachusett, as well as attractive vistas of church steeples amongst the rolling hills, is a valuable scenic asset to the town. Not as well known, because of its seclusion on the Malone Road Conservation Area, is the view of Mt. Wachusett from the cliffs above Natty Pond. Many of the open vistas in town remain that way because of periodic grazing, mowing, clearing, and stewardship. While a number of our town's most treasured scenic aspects are available on public property, many of the most aesthetically-pleasing viewing points and scenic locations in town are in private ownership. Certain privately-held open-space properties here offer public benefits by contributing to all the positive aspects associated with open space; thus it is wise for the community to work with landowners to ensure the future of the town's character and scenic resources and with citizens with regard to respect of the rights and privacy of these landowners. Some of Hubbardston's more popular vistas are:

- ✧ Mt. Wachusett from upper Mt. Jefferson Road;
- ✧ Mt. Wachusett and open meadow from Curtsey Farm on Hale Road;
- ✧ Brigham Pond from upper Brigham Road to Evergreen Road;
- ✧ Mare Meadow Reservoir from New Westminster Road near Westminster line;
- ✧ Mt. Wachusett from George Howard Road;
- ✧ Comet Pond from Old Princeton Road.

New Templeton Road is the site of two notable geologic features that many residents are not aware of. The cliffs that rise above the swamps in New Templeton Road provide a wonderful overlook in the Malone Road Conservation Area but further north they are the site of the Indian Caves. There are several caves and one has a large chamber big enough for two people. A hole at the bottom of the cave is the site of a fire pit and three windows above it allow the smoke to escape.

Also on New Templeton Road is a massive boulder over 100 feet in diameter and a top that is large enough for people to stand on. In times past it used to be quite a tourist attraction. Now the "big rock" is on private property its existence is not well known.

4.8.3 3 Cultural, Archaeological, and Historic Areas

Old stone walls crisscross through the forests and tell the story of the town's agricultural past. Most of Hubbardston's agricultural lands have been eaten up by recent housing development but there are still a number of working farms and many small hobby farms. As one resident was noted to say, he moved to the nearest town where he knew he could keep his pigs and no one would complain! The open farmland provides most of the scenic vistas that residents have come to cherish.

4.8.4 Unique Features

The forests provide important corridors for wildlife, trails for multi-use recreation and a mecca for hunters. Scattered throughout these forests are remnants of the town's commercial past where the rivers and streams that now provide pure drinking water, used to power numerous mills. Numerous old dams mark the sites of former mills. These water bodies are favorite places of relaxation providing havens for fishing, kayaking and swimming.

The town has a number of unique features. The northwest section of town is an area of vast gravel reserves which have been heavily mined over the years. Ironically the same area contains one of the town's most important aquifers and is within the Zone 11 protection area for the City of Gardner's Snake Pond Well. There is also a large area of NHESP priority and core habitat located within the gravel reserves. The town has recently fended off several detrimental industrial proposals for some of these pits. Thoughtful reclamation of the played out gravel pits and careful planning for future development are vital for this important environmental area.

Hubbardston Scenic Resources and Unique Environments

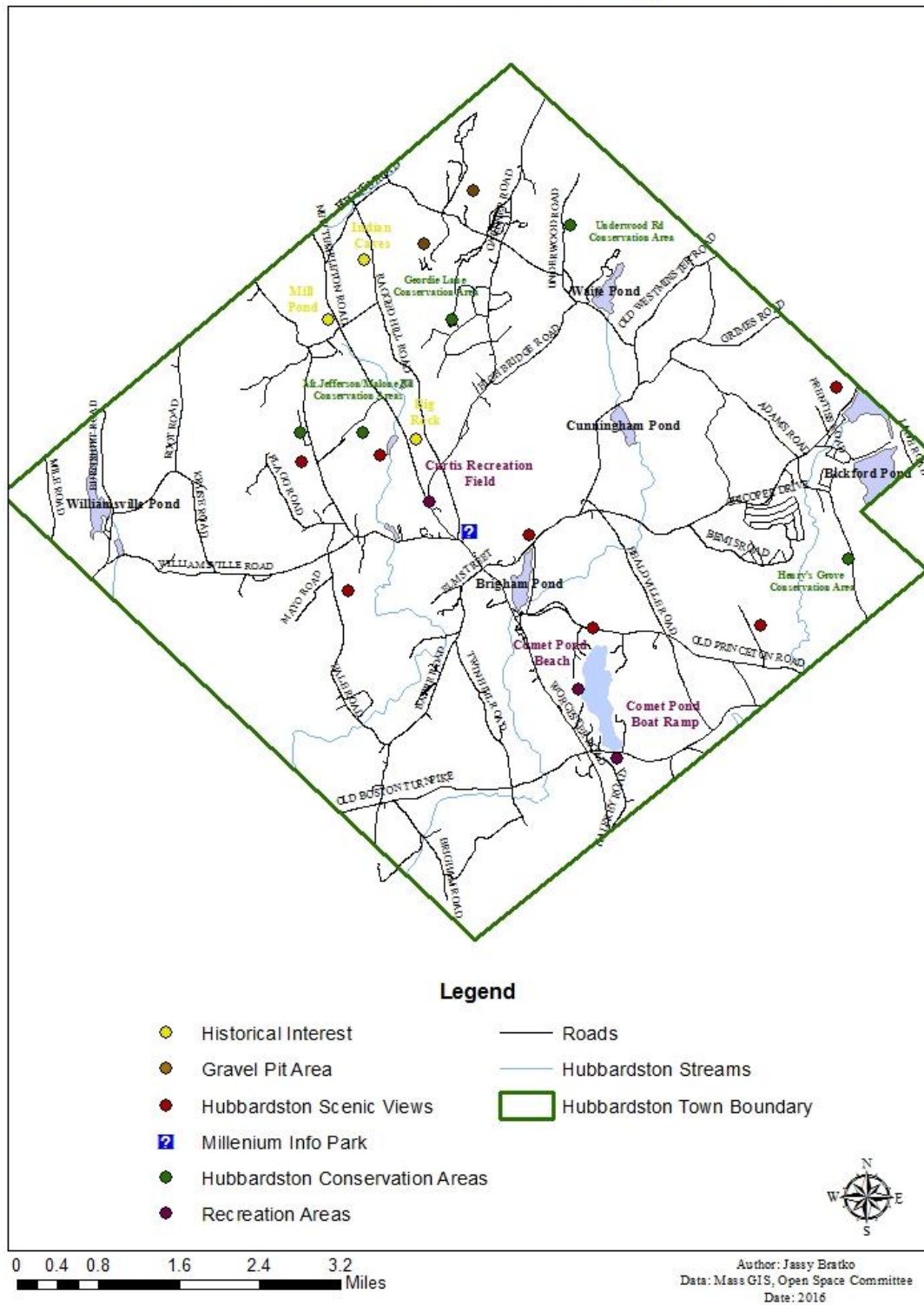


Figure 11 Scenic Resources and Unique Features

4.9 Environmental Challenges and Issues

4.9.1 Hazardous Waste Sites

Information obtained from the state DEP website (address at the bottom of the table) shows a list of hazardous wastes in Hubbardston as of 12/23/16. All but one of these situations is in the permanently addressed RAO (Response Action Outcome) category. The one situation is Mr. Mikes where the initial RTN (Release Tracking Number) was assigned in November of 2000. That contamination affected the well at the residence of 31 Main St. The contamination at Mr. Mikes is now in a Phase IV (remedial plan activated and ongoing). The residence at 31 Main St. is in a Tier 1 category (regular monitoring performed and overseen by DEP). The RTNs in the table are all hyperlinks to the associated detailed release reports associated with each release. If this Open Space Plan is being read via a computer with internet access, these detailed reports can be readily accessed. The definitions of the myriad acronyms used in the table are also available at the DEP website noted at the bottom of the table

Table 9 Hazardous Waste

RTN	Release Address	Site Name Location Aid	Reporting Category	Notification Date	Compliance Status	Date	Phase	RAO Class	Chemical Type
2-0019829	MORGAN ROAD	P&W RAIL GARDNER BRANCH MILE POST 24	TWO HR	2016-03-30	PSC	2016-05-27		PC	
2-0019178	129 WILLIAMSVILLE ROAD	HYDRAULIC OIL RELEASE	TWO HR	2014-04-24	PSNC	2014-06-06		PN	Oil
2-0018495	WORCESTER ST @ ELM ST	HYRAULIC OIL SPILL	TWO HR	2012-02-13	RAO	2012-03-06		A1	Oil
2-0016423	27 OLD COLONY RD	FORMER CURTIS LUMBER	72 HR	2006-10-13	RAO	2007-10-03		A2	Oil
2-0015527	35 MAIN ST	MR. MIKES MINI MART	72 HR	2005-02-11	RAO	2006-02-27		A2	Hazardous Material
2-0015133	35 MAIN ST	PETERBOROUGH OIL CO INC	72 HR	2004-02-26	RTN CLOSED	2004-11-23			Hazardous Material
2-0014309	33 MAIN ST	MR MIKES GAS STN	TWO HR	2000-11-09	RAO	2006-02-27	PHASE IV	A2	Oil
2-0014220	31 MAIN ST	RESIDENT	TWO HR	2002-03-06	TIERI	2004-11-23			Hazardous Material
2-0013786	54 GRIMES RD	UTILITY POLE NO 21	TWO HR	2001-04-22	RAO	2001-06-20		A2	
2-0013557	33 MAIN ST	MR MIKES	TWO HR	2000-11-09	RTN CLOSED	2004-11-23	PHASE II		Hazardous Material
2-0013463	10 MAIN ST	FLEMING PROPERTY	72 HR	2000-09-18	RAO	2002-06-13	PHASE II	A2	Oil
2-0012223	RITCHERVILLE RD	ROADWAY RELEASE	TWO HR	1998-05-20	RAO	1998-07-23		A2	Oil
2-0011908	245 GARDNER RD	RESIDENCE	TWO HR	1997-10-02	RAO	1997-10-30		A2	Oil
2-0011852	15 OLD BOSTON TPKE	WAIN ROY INC FRM WOODS EQUIPMENT CO	72 HR	1997-08-22	RAO	2005-12-13		A1	Hazardous Material
2-0011714	12 OLD WESTMINSTER RD	WACHUSETT LUMBER	TWO HR	1997-05-02	RAO	2009-06-26		B1	Oil
2-0011280	64 WORCESTER RD	HIGHWAY DEPT	72 HR	1996-06-18	RAO	1997-10-27	PHASE II	A2	Oil and Hazardous Material

RTN	Release Address	Site Name Location Aid	Reporting Category	Notification Date	Compliance Status	Date	Phase	RAO Class	Chemical Type
2-0011206	BRIGHAM ST	HAKALA BROTHERS CONSTRUCTION CO	TWO HR	1996-04-25	RAO	1996-06-24		A1	Oil
2-0010974	63 WORCESTER RD	DAVID ROY TRUCKING	TWO HR	1995-10-26	RAO	1995-12-27		A1	Oil
2-0010702	12 OLD WESTMINSTER RD	WACHUSETT LUMBER CO	72 HR	1995-03-14	RAO	1996-04-23		A2	Oil
2-0010285	MT JEFFERSON RD	ILLEGAL DUMPING	TWO HR	1994-04-25	RAO	1994-06-16		A1	Oil
2-0000373	15 OLD BOSTON TPKE	WAIN-ROY INC	NONE	1988-04-22	ROSTRM	2004-07-08	PHASE V		Oil
2-0000260	35 MAIN ST	KENS GROCERY FMR	NONE	1987-09-16	RAO	1999-02-26		A2	Oil and Hazardous Material

Source: http://public.dep.state.ma.us/SearchableSites2/Search_Results.aspx

4.9.2 Erosion, Chronic Flooding, Sedimentation

Hubbardston has no serious erosion, flooding or sedimentation problems.

4.9.3 Environmental Equity

The distribution of open space and recreational amenities, etc. in Hubbardston is relatively uniform, providing approximately equal access to all town members. The town has one main ball field / park area – Curtiss Field – which is centrally located. Open space land and access to ponds, trails, and public lands are readily accessible throughout the town as is shown in Figure 11 and Figure 18 Hubbardston Protected Open Space and Recreation Areas

4.9.4 Water Quality

4.9.4.1 Overview

A very important environmental concern for Hubbardston, and, indeed, most communities, is water quality protection. Hubbardston's situation is even more important, however, because, as mentioned earlier, much of the town lies within the DEP Class A Water Supply District, contributing to the public drinking water supplies of many Massachusetts residents. Most of Hubbardston, a major feed to the Ware River Watershed, has been designated as an Outstanding Resource Waters region because waters for both Quabbin and Wachusett Reservoirs originate here. These waters are considered exceptional for their socio-economic, recreational, ecological and/or aesthetic values. The waters are valued for their high drinking water quality and have more stringent protection requirements than other waters; no lowering of water quality is permissible.

In the 2004 Massachusetts Water Policy report, the Water Policy Task Force of the Executive Office of Environmental Affairs stated that one of the state's biggest challenges is maintaining sufficient quantities of stream flow so as to sustain ecological and anthropogenic demands. Massachusetts receives 44 inches of rainfall per year that fills our reservoirs and streams, and sustains our aquifers. In dry years, the amount of water remaining in our streams often becomes dangerously low. In the summer months, the thin, discontinuous aquifers of eastern and central Massachusetts and the limited aquifers (mainly fractures in bedrock) of western Massachusetts provide the only source of stream flow. The combination of high summer demand and low stream flows can adversely impact water availability and quality, vegetation and fish counts.

The Task Force Report advises that better use patterns will help minimize the need to develop new sources of water supply, and that we also need to rethink where the water that we use goes. Existing infrastructure often transports precipitation away from where it lands instead of letting it infiltrate. Transporting dirty water far from its source made sense historically, but today, with significant improvements in wastewater treatment techniques and standards, treatment levels often make the water available for reuse or recharge, thereby replenishing the natural stream flows and aquifers in the basin or sub-basin.

The report goes on to state that the Commonwealth also has impaired waters and debilitated aquatic habitat areas. Ensuring clean water requires that we do a better job of limiting point and non-point source pollution. Recent patterns of growth have introduced impacts due to runoff (e.g., changes in temperature and oxygen, suspended solids and bacteria), discontinuous critical habitat areas, and altered habitats. As a result, alarming changes in fish populations are evident in many of the Commonwealth's rivers.

The Task Force believes that the problems described above will only get worse if we continue to grow and manage water in the way we have over the last half-century. During the past 25 years, considerable land mass has been developed, rippling outward from Boston, even as total housing starts have not sufficed to meet the state's housing needs. Assuming growth continues on the basis of recent land use patterns, demand for water and the development of land critical to future drinking, recreational and habitat purposes will increase significantly. In addition, this will eventually undermine the state's ability to ensure sufficient drinking water supplies for new growth and will overextend state resources.

Water quality management is multi-faceted, and several state and federal agencies are responsible for and regulate various aspects of water quality, based upon the types and purposes of water bodies. A huge body of information made up of reports, surveys, sampling, observations, and more are available through the Massachusetts Department of Environmental Protection, the Department of Conservation Resources Division of Water Management, the US Environmental Protection Agency, and more. Key information relevant to Hubbardston is presented in this section.

4.9.4.2 Hubbardston Drinking Water--Private

Protection of groundwater, water found beneath the surface of the ground within drainage basins, is of vital importance here since all residents obtain their drinking water primarily from drilled wells. In addition to private wells, there are 9 non-community public water systems within the town that meet the definitions of the federal Safe Drinking Water Act and the Massachusetts drinking water regulations as "a system for provision to the public of piped water for human consumption if such a system regularly serves an average of at least twenty five (25) individuals daily for at least sixty (60) days per year." According to the Board of Health, the public water supply systems in Hubbardston are:

Hubbardston Center School
Peaceful Acres Campground
Hubbardston House Apartments
Silverleaf Hollow Condominiums
Briarwood Townhouses
Mr. Mike's
Breezy Hill Plaza
Stamatias Plaza
Ron Burton Training Village

Hubbardston's Board of Health assists DEP /DSW in the regulation of these non-community public water systems and, along with the State Department of Public Health, regulates private water systems.

The Department of Environmental Protection maintains several on-line sites, reports, and recommendations with regard to drinking water quality and private and public wells (www.mass.gov/dep/water). It also provides provide numerous tables identifying potential well water contaminants and suggested testing parameters and monitoring frequency schedules (www.mass.gov/dep/water/laws/priwells.doc).

4.9.4.3 Hubbardston Drinking Water--Public

Although the town doesn't have its own public drinking water supply, nearly all of Hubbardston's water resources are critical to the drinking water supplies for many of Massachusetts' residents. In addition to supplying water for the Quabbin and Wachusett reservoirs, Hubbardston supplies some water to the cities of Fitchburg and Gardner. All surface and groundwater drinking water supply areas in Hubbardston are identified in Figure 12.

According to the 2013 Annual Water Quality Report for The City of Fitchburg, the city can draw water from seven reservoirs located in Fitchburg, Ashby, Westminster, Hubbardston and Princeton. Figure 13 depicts the relative locations of the reservoirs and how they feed into the city.

In Hubbardston, Fitchburg gets drinking water from Mare Meadow Reservoir and has access to Bickford Pond as an emergency back-up supply. According to Fitchburg's 2002 DEP Source Water Protection Report, the city's population grew rapidly between 1907 and 1930 and, due to periodic drought conditions, Mare Meadow Reservoir and Bickford Pond were added to the system. Bickford Pond has never been used and Mare Meadow Reservoir is used approximately four to six weeks each year during periods of high demand.

The city of Worcester's Quinapoxet Reservoir receives water from the Quinapoxet River sub-basin, the headwaters of which originate in the eastern part of town. The 90% of Hubbardston that is located in the Chicopee River Basin is all part of the Ware River sub-basin, a major water supply for the City of Boston and surrounding communities. All contributing surface sources are classified by the Department of Environmental Protection as "Outstanding Resource Waters", their highest classification.

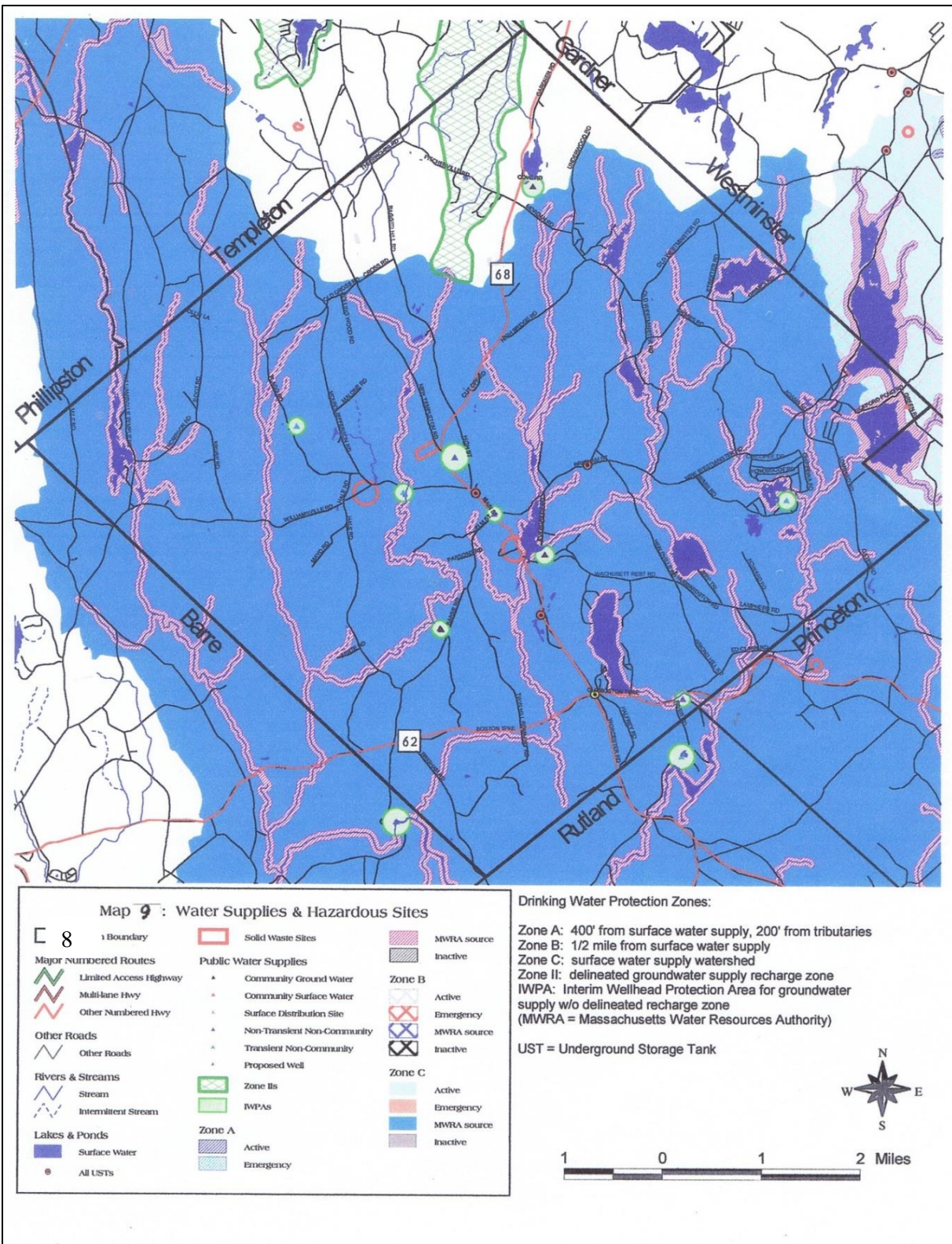


Figure 12 Hubbardston Surface and Groundwater Drinking Water Sources

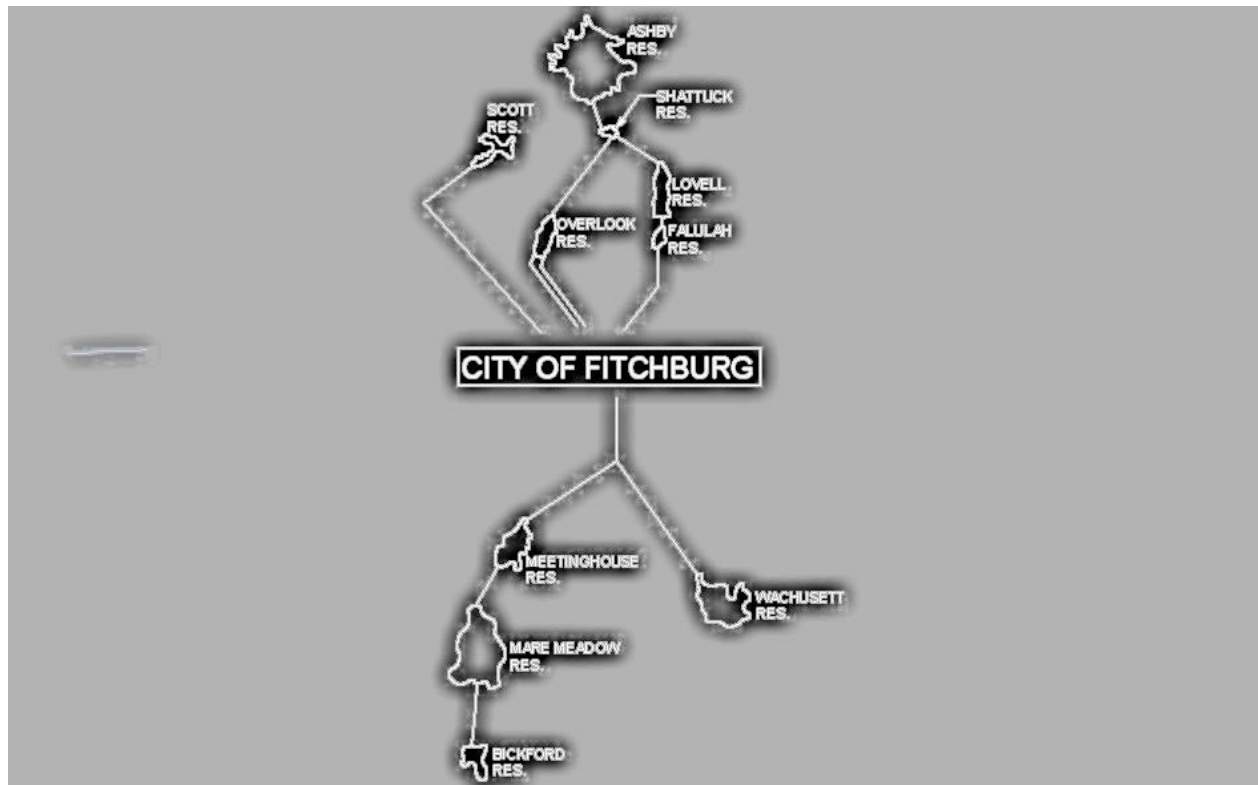


Figure 13 Location of Fitchburg's Reservoirs

The northern section of town, located in the Millers River Basin, is mostly within a delineated Zone II for the groundwater supply for the city of Gardner's Snake Pond Well. A Zone II is the area that contributes to the recharge of a public groundwater supply. According to Gardner's 2013 Annual Water Quality Report the Snake Pond Well facility is the city's lone ground water source. It is used as a secondary source to help with seasonal water demand issues. Much of this area is currently unprotected, which could have severe effects on Gardner's water supply in the future.

By far the largest portion of the town supplies water to the Quabbin and Wachusett Reservoirs. According to the 2012 Water Quality Report for the Quabbin Reservoir Watershed and Ware River Watershed, water from Ware River may supplement Quabbin Reservoir supplies by being diverted into the Quabbin Aqueduct at Shaft 8 in Barre and directed west towards Quabbin Reservoir via gravity flow. Under the authority granted by Chapter 375 of the Massachusetts Acts of 1926, the DCR is limited in the diversion of water from the Ware River to a period from October 15 to June 15, and at no time is diversion allowed when the flow of the river at the diversion works is less than 85 Million Gallons per Day (MGD). Water from the Ware River enters the reservoir at Shaft 11A, located east of the baffle dams in Hardwick. The report indicates Ware River Transfers as follows:

2012 168.6 MG (2 days: 84.3 MGD)

2011 2,452.5 MG (10 days: 245.3 MGD)

2010 46.1 MG (1 day: 46.1 MGD)

At the USGS stream gage near the Shaft 8 intake works, mean daily flows averaged 112 cfs in 2012, the eighth lowest since flow monitoring began in 1928. The monthly average flow in April (116 cfs) marked a new historical minimum for April, compared to the previous April minimum of 124.6 cfs. Because diversions contribute to compromised water quality, DWM has established numerous water quality sampling stations in the region. The only sampling station within Hubbardston is located on the East Branch of the Ware River on Brigham Road. Water is sampled on a regular basis for coliform bacteria, chemical properties and composition, nutrients, metals, algae, macroinvertebrates, and *Giardia* and *Cryptosporidium*.

4.9.5 Watershed Planning

(Note: The Commonwealth owns the larger lakes [Great Ponds] in the state, but neither owns nor controls their watersheds.)

In 2006, the Division of Watershed Management's Watershed Planning Program issued the *Proposed Massachusetts Year 2006 Integrated List of Waters*, a proposed listing of the condition of the state's waters pursuant to Sections 303(d) and 305(b) of the Clean Water Act. The report explains that Massachusetts has adopted a watershed approach to planning and implementing water resource protection activities, emphasizing that water quality is influenced not only by natural ecology, hydrology, and geomorphology, but also by the mosaic of land-use patterns resulting from human activity within respective drainage basins. The result is a comprehensive, integrated program that addresses all aspects of water resource management, such as drinking water protection and pollution abatement, and focuses more efficiently the programs of various governmental and non-governmental organizations that are charged with restoring and protecting the water resources of Massachusetts. Obviously, Hubbardston's water quality issues are the result of both local and regional factors.

The major watersheds that fall within Hubbardston's borders are monitored and assessed by the Department of Environmental Protection on a rotation basis. Surface water quality standards goals have been adopted; beneficial uses are assigned to specific defined water bodies, and the standards specify criteria which must be met in order to reach the goals. This method of establishing water quality standards is a policy decision which takes a number of factors into account and is a public process.

4.9.6 Water Quality Problems and Issues

4.9.6.1 Water Quality Standards and List of Waters

The Federal Water Pollution Control Act of 1972 (FWPCA) and subsequent Amendments in 1977, 1981 and 1987 are collectively known as the Clean Water Act (CWA). The objective of this statute is to restore and maintain the chemical, physical, and biological integrity of the Nation's waters. As one step toward meeting this goal each state must administer a program to monitor and assess the quality of its surface and groundwater and provide periodic status reports to the U.S. Environmental Protection Agency (EPA), the U.S. Congress, and the public.

Section 305(b) of the CWA codifies the process whereby waters are evaluated with respect to their capacity to support designated uses as defined in each of the states' surface water quality standards (SWQS). These uses include aquatic life support, fish and shellfish consumption, drinking water supply, and primary (e.g., swimming) and secondary (e.g., boating) contact-recreation. The 305(b) process entails assessing each of these uses for rivers, lakes and coastal waters. Wherever possible, causes and sources of impairment are also identified.

Section 303(d) of the CWA and the implementing regulations at 40 CFR 130.7 require states to identify those waterbodies that are not expected to meet surface water quality standards after the implementation of technology-based controls and to prioritize and schedule them for the development of total maximum daily loads (TMDLs). A TMDL establishes the maximum amount of a pollutant that may be introduced into a waterbody and still ensure attainment and maintenance of water quality standards. Furthermore, a TMDL must also allocate that acceptable pollutant load among all potential sources. The formulation of the 303(d) List includes a more rigorous public review and comment process than does reporting under Section 305(b), and the final version of the list must be formally approved by the EPA.

Prior to 2002 states prepared and submitted to the EPA both a biennial Summary of Water Quality Report in accordance with the requirements of Section 305(b) as well as a separate Section 303(d) List of Impaired Waters. On November 19, 2001 the EPA released guidance for the preparation of an optional Integrated List of Waters that would combine reporting elements of both sections 305(b) and 303(d) of the CWA. This Integrated Report (IR) format allows states to provide the status of all their assessed waters in a single, multi-part list. States choosing this option can list each Assessment Unit (AU) (i.e., waterbody or segment thereof) in one of the following five categories: 1) Unimpaired and not threatened for all designated uses; 2) Unimpaired for some uses and not assessed for others; 3) Insufficient information to make assessments for any uses; 4) Impaired or threatened for one or more uses, but not requiring the calculation of a Total Maximum Daily Load (TMDL); or 5) Impaired or threatened for one or more uses and requiring a TMDL. Thus, waters listed in Category 5 constitute the 303(d) List and, as such, are to be reviewed and approved by the EPA. The remaining four categories are submitted in fulfillment of the requirements under Section 305(b), essentially replacing the old 305(b) Report format. Massachusetts formulated integrated lists in accordance with EPA guidance every other year from 2002 through 2012. The EPA subsequently approved each of these. The Final approved version of the Massachusetts 2012 Integrated List of Waters (2012 List) and related information, such as the associated public comment document and EPA approval letter, can be found at

<http://www.mass.gov/eea/docs/dep/water/resources/07v5/12list2.pdf..>

List categories 1-3 include those waters that are either unimpaired or not assessed with respect to their attainment of designated uses. Often insufficient data and information exist to assess all designated uses of any particular waterbody or segment. No Massachusetts waters are listed in Category 1 because a statewide DPH advisory pertaining to the consumption of fish precludes any waters from being in full support of the fish consumption use (see Fish Consumption Advisories later in this section). Waters listed in Category 2 were found to support the uses for which they were assessed, but other designated uses were not assessed. The Category 2 list does not contain every waterbody or segment (i.e., AU) for which one or more uses are supported. Many waters appearing in categories 4 and 5, while impaired for some uses (see below), are supporting other uses. Due to space constraints, however, supported uses are not presented for those impaired waters. Rather, individual watershed assessments should be consulted for a complete report on the support status of each designated use for every AU. Category 3 contains those waters for which insufficient or no information was available to assess any uses. Waters for which assessments were determined to be insufficient for 303(d) listing were also included in Category 3. Waters exhibiting impairment for one or more uses are placed in either Category 4 (impaired, but not requiring TMDLs) or Category 5 (impaired, and requiring one or more TMDLs) according to the EPA guidance. Category 4 is further divided into three sub-categories – 4a, 4b and 4c – depending upon the reason that TMDLs are not needed. Category 4a includes waters for which the required TMDL(s) have already been completed and approved by the EPA. However, since Mass DEP chooses to list each segment in only one category, waters that have an approved TMDL for some pollutants, but not others, remain in Category 5 until TMDLs are approved for all of the pollutants impairing those waters. The EPA tracks the states' progress with completing TMDLs in its Assessment and Total Maximum Daily Load Tracking and Implementation System (ATTAINS) which can be accessed at <http://www.epa.gov/waters/ir>. This system assigns a unique identification number to each approved TMDL which is included for reference in categories 4a and 5 of the 2012 List.

In 2014 Moosehorn Pond was the only body of water listed as impaired in Hubbardston. This fell into Category 4C (Impairment not caused by pollutant) due to non-native aquatic plants.

4.9.6.2 Contamination

There are many sources of contamination of both surface and groundwater, both natural and man-made. Human waste disposal practices, such as those for sanitary, solid, and industrial waste, are the most serious sources of groundwater pollution. Contamination also results from hazardous material spills and leaks and from the application of fertilizers, pesticides, and road salt.

Contaminants often enter groundwater from the land surface where they are dumped or spilled and percolate down through the zone of aeration, until they reach groundwater. Some contaminants, such as fuel from leaking tanks and effluent from septic systems, occur underground. In either case, once pollutants enter groundwater, they flow according to the same hydrologic principle: from recharge areas toward discharge areas, thus contributing to surface water problems.

With regard to DCR lands located within Hubbardston, the Division of Watershed Management “controls and manages public access to reduce the risk of introducing waterborne diseases according to standard public health practices, applicable environmental regulations, and on-going scientific research.”

Following are discussions of potential contaminants which could affect Hubbardston's water resources.

4.9.6.2.1 Point Source Pollution

4.9.6.2.1.1 Sand and Gravel Extraction in the Pitcherville Area

The mining of sand and gravel can contribute to degradation of water quality. For many years, resource extraction of this type has been taking place in Hubbardston, and several large sand and gravel pits are located in the Pitcherville area of the community. Because this region is in a Zone II Aquifer Recharge Area, the status of this area should be an area of concern for future open space planning.

At the June, 2007 town meeting, Hubbardston residents voted to adopt an Earth Removal Bylaw for the purpose of preventing degradation of soil, surface and groundwater, and naturally occurring vegetation due to the improper or uncontrolled removal or redistribution of earth and vegetation. This bylaw will help to not only protect water quality but also help to protect the right of residents to enjoy the natural, scenic, and aesthetic qualities of the environment. As a result of this bylaw change, future earth removal enterprises in town will only be allowed in the Residential Agricultural zoning district and not permitted in the Aquifer Protection Favorability overlay district. Quarrying is now also prohibited to further try and protect water and environmental resources.

However, a concern of the Open Space Committee, is a lack of enforcement of the bylaw. According to Planning Board Chair, Vin

Ritchie, only one operator has complied with zoning licensing regulations, while in some small areas in town there have been violation. A goal of the Open Space Committee will be to work with other boards in to help mitigate the number of violations.

The new bylaw states that existing earth removal permits shall remain in effect until their expiration, so the status of further use and/or reclamation or abandonment of these sites will be a function of the expiration dates. Again the OSC will continue to work with appropriate town boards to help enforce the bylaw.

An interesting aspect of the extensive disturbance and change to the landscape in this region has been the creation of a biologically unique (for Hubbardston) landscape which supports plant and animal species that thrive in dry, sandy, successional habitats. This gravel mining region is also an Aquifer Recharge Area and the source of water for wells in Hubbardston and the neighboring town of Gardner. These two factors could make this an area of a focus of land protection efforts in the future.

4.9.6.2.1.2 Sand and Gravel Pit Filling Concern

While the mining of sand and gravel described above is a drinking water quality degradation concern, the filling of these pits with undesirable soil excavated from construction sites represents an even greater concern. A recent proposed soil importation operation in the town of Hubbardston represents both water quality and Environmental Justice concerns.

During 2016 a proposal was made to the Hubbardston Select Board to send restricted soils from Boston to Hubbardston to fill one of the unused pits that is located within the Zone 2 area of the Snake Pond Well.

The Snake Pond Well is one of four major water resources for the City of Gardner. Following is information from Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report for Gardner Water Department as it pertains to the Snake Pond Well.

“The Snake Pond Well is one of four major water resources for the city, and is the only ground water source. Through 2014 the Snake Pond Well has provided 131 million gallons of water for Gardner, and has a capacity of 1.3 million gallons a day. The well is located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeological barriers (i.e. clay) that can prevent contaminant migration.”

The Zone 2 (primary recharge area for an aquifer) protection area for the Snake Pond Well extends into in the northern section of Hubbardston where many of its gravel pits are located. Potential contamination of any aquifer is a concern, especially one that is known to feed municipal and residential wells. Although the proposal to fill a gravel pit in this area with restricted soils was not opposed by DEP, it never came to fruition because voters of Hubbardston adopted a bylaw at the 2016 Annual Town Meeting prohibiting the importation of such soils.

In several sections of this plan it is mentioned that DCR Division of Water Supply Protection owns approximately 40% of the town for the purpose of protecting the Quabbin Reservoir watershed that supplies drinking water for much of the Boston metro area. Officials from DCR stated that they would not allow the deposit of restricted soils on their property due to potential contamination. It is not clear, and seemingly inconsistent, why DEP did not consider it problematic to import these soils into an area that could harm the drinking water for the City of Gardner. What is clear from the state’s Environmental Justice map Figure 14 below is that are large low income and large minority justice areas that would be most affected by any contamination to Snake Pond Well. All too often these are the areas where there is the least concern for the quality of drinking water. Flint, Michigan is an important reminder of this.

Hubbardston provides the drinking water for millions of people in many cities and towns. Protection of drinking water quality for **all** people is a major concern whenever evaluating potential land uses in Hubbardston

Hubbardston Environmental Justice

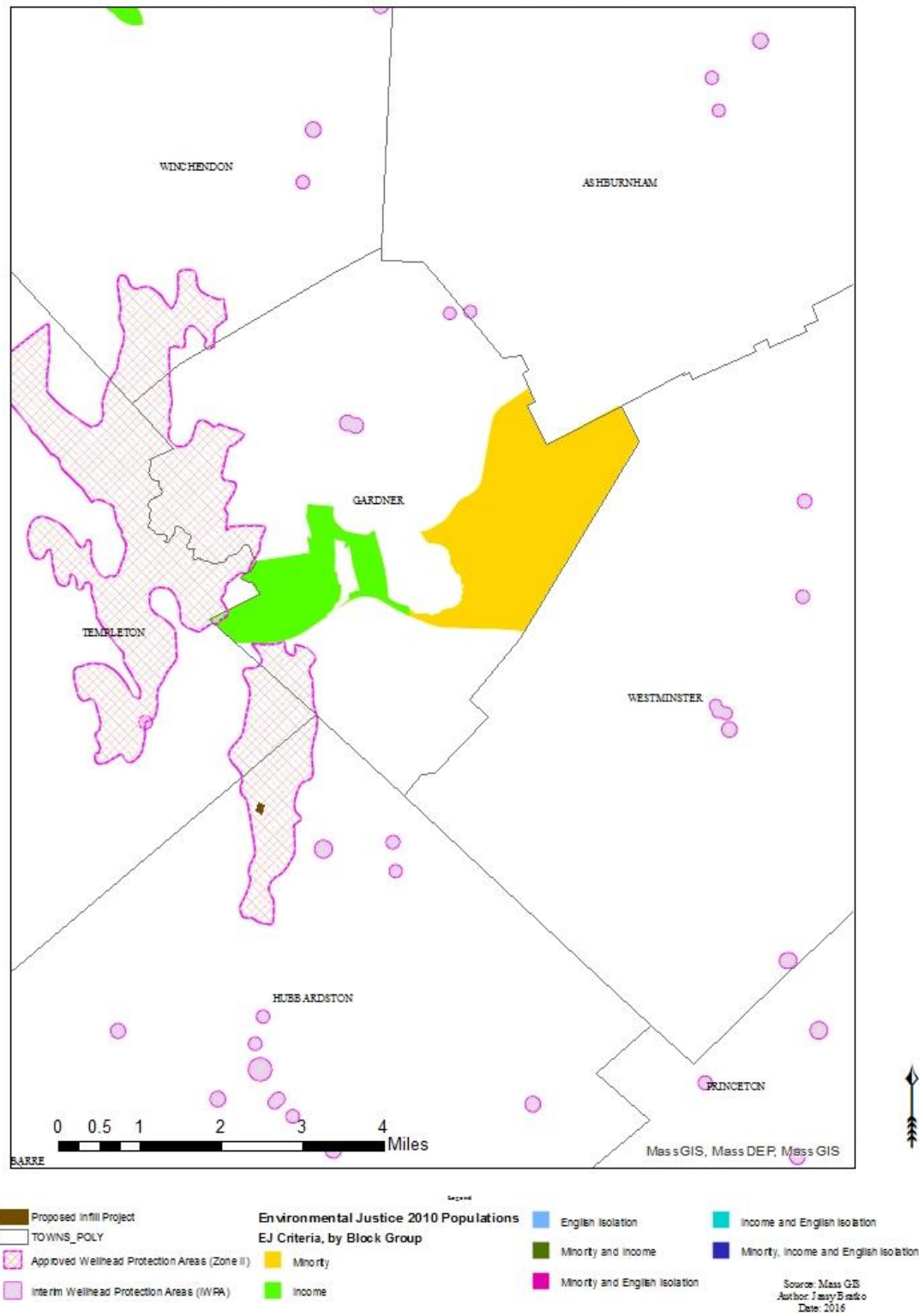


Figure 14 Environmental Justice Map

4.9.6.2.2 Non-Point Source Pollution

4.9.6.2.2.1 Roads

Topography, surface type, and distance to nearby water sources affect the impact that land clearing, construction, and new and existing roads can have on water quality. Rural roads in particular follow the courses of rivers and streams, and untreated storm water run-off discharges to the water bodies. The run-off from dirt roads and exposed areas of soil due to land clearing carries debris and sediment. Contaminants from vehicles, roadway maintenance activities, and heavy equipment wash into wetlands and waterways during rain-storms and periods of rapid snow melt. In more developed areas, storm water run-off from paved surfaces is often channeled to the nearby waterways at greater velocities, carrying silt, maintenance chemicals, and motor vehicle residue. Excessive debris sediment and storm water velocity can erode stream banks and hillsides, undermining infrastructure and destroying beneficial habitat and vegetation as well.

Most of Hubbardston's asphalt-paved roads have storm water drainage systems incorporated into their design to improve road safety. Many roads are drained according to old design standards which simply direct the untreated storm water away from the road and into nearby ditches, low areas, and waterways. Modern road drainage systems provide for storm water collection systems and, sometimes, treatment, before the water drains into waterways.

Hubbardston has some unpaved roads within its boundaries, not only old logging and farm roads or "temporary" roads, but more heavily used roads that serve residential areas, such as and portions of Mt. Jefferson Road. These graded earth roads are subject to constant erosion and breakdown, in spite of grading and ditching systems which have been attempted in order to alleviate these problems. In many areas alongside the unpaved roads, bank stabilization is non-existent or deteriorating.

In 2013 Hubbardston approved a two million dollar debt exclusion for major repairs to some of the town's worst roads. To date Ragged Hill and Hale Roads have been repaired and work is expected to be done on Healdville Road during 2015. Engineering is currently being done for Rt. 68 (Gardner and Worcester Rds) for future paving projects. According to DPW Director, Tim Kilhart, Hubbardston does not have a Municipal Separate Storm Sewer System (MS4).

4.9.6.2.3 Naturally-Occurring Contaminants

4.9.6.2.3.1 Iron and Manganese

Two of the most common types and sources of groundwater contamination in Hubbardston are iron and manganese. Iron, one of the earth's most abundant elements, occurs naturally throughout Massachusetts; manganese is less common but it is often found in association with iron in groundwater. Iron and manganese in drinking water do not pose a health hazard; in fact, iron is needed for oxygen transport in the blood, so it is essential to good health. However, both iron and manganese can impart an unpleasant taste to water and can stain plumbing fixtures and laundry. In the original Open Space Plan, it was noted that metal levels at some of the MDC sampling stations were high only for *secondary* drinking water standards (aesthetics of taste and odor) for iron and manganese. However, even with the presence of these metals, the applicable EPA Class A *primary* drinking water standards were satisfied.

4.9.6.2.3.2 Radionuclides

Certain minerals are radioactive and may emit forms of radiation known as alpha radiation, photons, beta radiation, and/or radium. These radionuclides are naturally occurring and are occasionally present in bedrock, similar to other minerals such as iron, arsenic, and quartz. Bedrock wells (often called artesian or drilled) can contain elevated concentrations of one or more radionuclides even if nearby bedrock wells have low concentrations. Wells that derive water from sand and gravel deposits, also known as dug or point wells (shallow wells), generally have substantially lower concentrations or no dissolved mineral activity.

Radionuclides exist throughout Massachusetts. In some areas the concentration of these minerals exceeds the public drinking water standards for radioactivity. EPA finalized new health standards for radionuclides in drinking water for public water systems in 2000. However, these standards only apply to community public water systems. There are currently no standards established for private wells or Hubbardston's other non-community public water systems.

Radon can be a problem in private wells drilled into bedrock, also known as artesian wells. Gas can dissolve and accumulate in underground water sources, such as wells, and in the air in your home. Breathing radon can cause lung cancer. Drinking water containing radon presents a risk of developing cancer. Radon in air is more dangerous than radon in water. Presently, there are no federal or state standards for radon in drinking water, only suggested action levels. Although present and with potential public health effects under certain conditions, radon must be evaluated on a structure-by-structure basis.

4.9.6.2.3.3 Microbes

The fecal coliform count is an indicator of the sanitary quality of water. Coliform bacteria are common in the environment and are generally not harmful, but high levels may indicate the presence of other pathogens that can cause waterborne diseases. Both fecal coliform and *E.coli* are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Microbes in these wastes can cause short-term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms.

Fundamental public health policy prohibits human or animal wastes in or adjacent to tributaries to water supplies because of the potential of feces to contain viruses, bacteria, protozoa (e.g. *Cryptosporidia*), and other organisms which could threaten human health, if transmitted to a water supply.

Cryptosporidium enters lakes and rivers through sewage and animal waste. It causes cryptosporidiosis, a mild gastrointestinal disease. However, the disease can be severe or fatal for people with severely weakened immune systems.

Giardia lamblia is a common parasite that enters lakes and rivers through sewage and animal waste and can cause an illness of the intestines known as Giardiasis. The disease can be found throughout the world and is widespread among mammalian, avian, and reptile species, including humans, companion animals, wildlife, sheep and cattle, and wading birds. *Giardia* goes through two stages: during the “active” stage, it is in the intestine of the host and cannot survive on its own. It becomes infectious when it enters the tough, protected cyst stage, and is shed in the feces of the host. In the cyst form, *Giardia* can be killed between 54-56°C (dies instantaneously at boiling point, 100°C), but it can last 2-3 months in cold water (<10°C). When humans become sick with *Giardia*, the *Giardia* parasite is predominantly spread via person-to-person contact due to poor hygiene practices. Contamination of food and water sources from human or animal infected fecal material is also a means of transmission.

There can be a connection between microbe contamination and turbidity. Turbidity in itself has no health effects. However, it can interfere with disinfection and provide a medium for microbial growth, and may indicate the presence of disease causing organisms. Elevated, unhealthy levels of these microbes can present both surface and groundwater contamination problems. Because Hubbardston has no public sewage/water treatment facility, and therefore no outfalls, contamination which occurs is likely to originate from non-point sources such as use of manure too close to surface waters, compromised human sanitation situations (swimming and camping), improper pet or livestock management, septic system failure, sewer overflow, and wildlife waste.

4.9.6.2.3.4 Inorganic Contaminants (Metals and Nutrients)

Arsenic may occur in drilled wells. It causes bladder, lung and skin cancer when it is consumed over a long period of time. According to a 2003 U.S. Geological Survey study, the arsenic belt in Massachusetts appears to run from New Hampshire to Connecticut. It's bounded on the west by Ashburnham, West Brookfield, and Douglas and on the east by Northbridge, Westborough, Stow, and Maynard up to the Merrimack River, and along it to the coast on the New Hampshire border. Taking effect in January, 2006, the Environmental Protection Agency (federal) limit on arsenic in public drinking water supplies is 10 parts per billion. Private groundwater sources, however, are not regulated and do not have to meet the federal or state standard. Although present and with potential public health effects under certain conditions, arsenic must be evaluated on a structure-by-structure basis.

Lead typically leaches into water from plumbing in older buildings. Lead pipes and plumbing fittings have been banned since August 1998. Children and pregnant women are most susceptible to lead health risks.

According to the USGS, concerns over contamination of groundwater and streams from **nutrients** continues to be among the most significant and widespread of the environmental issues faced by government agencies at all levels as well as the private sector. Elevated nutrients in the water supply is most commonly an issue in agricultural areas where run-off from fields adds nutrients from fertilizer application to streams and other surface water, and from there into shallow groundwater. Fortunately, deeper groundwater is usually protected from nutrient contamination. The greatest risks to human health from nitrate contamination exist in shallow household wells in these areas. These wells may not be monitored regularly since they are not regulated under the Safe Drinking Water Act and well owners may not be aware of potential risks posed by adjacent cropland. At high levels, nitrates can interfere with oxygen uptake by the blood.

Where cropland is being rapidly converted to residential developments serviced by household wells, drinking- water risks should also be considered. Case studies show improvements and degradation of ground water quality in response to changes in cropland management. Because nitrate leached to groundwater from cropland can be stored for decades, changes in water quality may lag far behind changes in land use. Agriculture is the largest source of nutrients to the environment. Even though Hubbardston's land use is in transition from forested and rural landscape to increasingly residential, this type of contamination may persist

Another frequently occurring nutrient contaminant is **phosphorous**. There are no direct health risks associated with elevated phosphorous; however, it can impart a bad taste to the water and contribute to water quality decline. While nitrate is readily soluble in water and thus can more easily wash off the land surface to streams, phosphate is less soluble and tends to move with the soil. Many of the current Best Management Practices are designed to reduce soil erosion and, thus also help limit phosphorus transport to streams. These same Best Management Practices would have less effect on the transport of nitrogen to streams.

In addition to the health issues, elevated nutrients can cause excessive algae growth that can choke out other aquatic life in the body of water and cause eutrophication.

Point source discharge of nutrients from wastewater-treatment facilities is not an issue in Hubbardston, where wastewater is treated by private/on-site in-ground septic systems. Systems that are carefully sited, constructed, and maintained can be effective and inexpensive wastewater treatment systems. Even the best septic systems, however, release some bacteria and nitrates into the ground. Septic systems that are poorly designed, sited, or constructed can be sources of severe pollution. Effluent from septic systems can contain bacteria and viruses, nitrates, heavy metals, detergents, and elevated levels of chloride, sulfate, calcium, magnesium, potassium, and phosphate. Pollution from this effluent poses a threat to groundwater quality. Nitrate-nitrogen is highly mobile and thus can be leached through the crop root zone to ground water, especially on sandy soils. Nitrate concentrations > 10 mg/l can cause human infant methemoglobinemia, which can be fatal. It can also result in cattle abortion and other livestock disorders.

A decrease in the concentration of bacteria and viruses in groundwater depends on soil type, amount of effluent, and distance that the effluent travels. In Massachusetts, a distance of 400 feet is considered adequate for the removal of most pathogens. However, when many septic systems are concentrated in a small area with highly permeable soil, it cannot be assumed that all bacteria and viruses are being removed from the effluent. In fact, some micro-organisms persist in groundwater and can be transported through an aquifer for hundreds of yards. When many septic systems are located within the area of influence of a public supply well, the water supply is likely to be degraded.

Nutrient sources from suburban lawns, gardens, pet waste, and vehicle emissions can also be important, but their relative contribution is difficult to define. Since World War II, the use of commercial fertilizers on crops, lawns, and golf courses has increased steadily. The major constituents of commercial fertilizers are nitrogen, phosphorous, and potassium, all nutrients required by plants. Potassium and phosphate do not move into groundwater as readily as nitrogen compounds do. Nitrogen in fertilizer is oxidized to form nitrates; nitrates percolate into the soil with rain and irrigation water and can contaminate groundwater. Where fertilizers are applied year after year, nitrate levels in groundwater may gradually increase and eventually exceed the 10 ppm limit allowed for drinking water by state and federal standards.

Because most of the above contaminants cannot be identified by taste or odor, it is difficult for homeowners to know if the water quality of their wells has changed. Hubbardston does require sampling of private wells after they are initially installed and 30 days subsequent to the first test and lenders usually require well-testing when a property is sold. However, it is the responsibility of all homeowners to periodically test their wells for contamination.

4.9.6.2.4 Other Chemical Contaminants

4.9.6.2.4.1 Road Salt

In winter, rock salt mixed with sand is spread on Hubbardston's public ways to melt ice. Salt is very soluble in water and moves easily into groundwater. Aquifers and recharge areas crossed by highways or located near uncovered salt storage piles are liable to be contaminated by sodium. Road salt storage, handling and application have the potential to increase levels of water pollution and impact residential wells, which may affect people who have health risks associated with elevated levels of sodium in their diets. Road run-off can drain directly into reservoirs. If the road salt reaches fast-flowing rivers and lakes, however, run-off will usually have little impact.

According to a 1988 report by Samuel J. Pollock, *Massachusetts Highway Department: Highway Deicing – Salt Contamination Problems and Solutions in Massachusetts*, the factors that determine whether the salt will actually enter nearby wells and other water supplies include the depth of the wells and their distance from the road, the permeability of the soils and the direction and rate of groundwater flow. Ground water flow in Massachusetts generally moves slowly, ranging from a few feet per year to a couple of hundred feet per year. Therefore, sodium contamination, which may have originated as highway run-off will vary greatly in the time it may take to be detected in nearby wells.

Since 1993, the EPA and Massachusetts DEP do not regulate sodium as a contaminant because of the minor contribution of drinking water to daily sodium consumption. However, as a general guidance level the EPA recommends that the sodium levels in drinking water not exceed 20 mg/l for the at-risk population, i.e. people on low-sodium diets. The EPA requires that all public wells be monitored for sodium and that concentrations in excess of 20 mg/l be reported to local health officials.

Although the effects of road salting as a source of non-point source pollution are most commonly associated with groundwater, there are other environmental impacts associated with road salt. Road salt has the potential to cause harm to aquatic life and vegetation such as roadside trees, shrubs and grasses, because elevated levels of sodium chloride in soils generate an osmotic imbalance in plants, which can inhibit a plant's water absorption and stunt root growth. The salt can also interfere with the uptake of plant nutrients and inhibit the plant's long-term growth. Sodium chloride can cause severe injury to flowering, seed germination, roots and stems, as well as damage vegetation up to 200 meters from roads that are treated with deicing salts (Keating, Janis. *"Environmental Impacts of Road Salt and Alternatives in the New York City Watershed."* Published in *Stormwater*, May/June 2001; p.9)

Damage to roadside vegetation can also intensify the impacts on drinking water quality by limiting the retention and processing of pollutants transported in run-off, and by diminishing the buffer zones to groundwater sources and reservoirs (Keating, p.10). Damage to vegetation can also have an impact on wildlife habitat by destroying food resources, shelter and breeding and nesting sites. Another impact common to wildlife is the ingestion of high levels of sodium. For example, many animals drink the salty snow-melt to relieve thirst, which may be toxic to salt-sensitive species. Birds also often mistake the road salt crystals for seeds. The impact of road salt on aquatic life varies. Salt tolerance of fish, depending on if they are fresh or salt-water species, range from 400-30,000 mg/l. Stream studies in upstate New York suggest that diversity of aquatic species decreases when salinity increases, and that salt tolerant species become dominant during periods of road salting activity (Keating, p.13).

Tim Kilhart, Hubbardston DPW Director, reports that the amount of salt used has increased in recent years. In the previous open space plan it was also noted that Highway Superintendent Lyn Gauthier acknowledged the town was using more salt than in previous years. This appears to be a continuing trend supported by Hubbardston residents' wishes to have better maintained roads in winter.

4.9.6.2.5 Synthetic Organic Contaminants

This would include contaminants such as pesticides, herbicides, and Volatile Organic Contaminants

Although a number of industrial, domestic, and public supply wells in Massachusetts have been contaminated by organic solvents, Hubbardston, due to its predominantly non-industrial land use patterns/usage, has had some immunity from a major contamination problem of this sort. (Industrial sources include waste chemical storage sites, areas with illegally stored and dumped barrels of hazardous wastes, industrial sites with complex occupancy histories, leaking sewer lines, and smaller generators of hazardous wastes such as machine shops and barrel-and-truck-washing facilities.) The Toxics Release Inventory (TRI) is a publicly available EPA database that contains information on toxic chemical releases and other waste management activities reported annually by certain covered industry groups as well as federal facilities. According to data extracted from the TRI in October 2014 there have been no reports of toxic release in Hubbardston.

However, the use of organic solvents is not limited to industry. These chemicals are present in various household products such as spot and stain removers, degreasers, paint and varnish removers, drain cleaners, etc. Groundwater contamination can also be caused by hazardous chemicals that homeowners pour down their drains or on the ground, by septic systems cleaners that contain strong acids or organic solvents, or by improper disposal by dumping along roadsides or directly into water bodies. Currently there is no regular provision for household hazardous waste disposal in Hubbardston, although residents can responsibly dispose of these materials at special hazardous waste collection events when they occur in nearby towns.

4.9.6.2.5.1 MTBE

Recent studies in New England have also identified contamination of some private wells from methyl-tertiary-butyl ether (MTBE). MTBE is a fuel additive commonly used in the United States to reduce carbon monoxide and ozone levels caused by auto emissions. Due to its widespread use, reports of MTBE detections in the nation's ground and surface water supplies are increasing. There has been no known well contamination from MTBE in Hubbardston.

4.9.6.2.5.2 Underground Fuel Storage Tanks

Underground tanks are a potential source of groundwater contamination. Diesel fuel and gasoline are stored in underground tanks in town, and there have been a small number of reportable (to DEP) underground storage tank (UST) leaks here in the past few years

which required remedial action. In 2006 Mass DEP executed a consent order for Waste Site Clean-up violations at Mr. Mike's gasoline station and convenience store on Main Street. A release of gasoline to the groundwater contaminated the drinking water well serving the business. The company did not immediately notify Mass DEP of the contamination, and inaccurately identified the drinking water well as a private well in its submittals to DEP. Because the well is used for service of coffee in the convenience store, the well should be designated as "public" and therefore requiring a suitable permit. As a result of operating as an unapproved public water supply, DEP entered into a Consent Order with parent company Peterborough Oil; bottled water began to be used at the site. The company now has a new compliant well.

According to the Mass DEP, only one other UST is still in use in Hubbardston, at the former Mac-Mae Bus Company site, 116 Worcester Road.

4.9.6.2.5.3 Dumps and Landfills

Leachate is the liquid that is created beneath dumps and landfills when precipitation percolates through decomposing solid waste, and it can contain large quantities of both organic and inorganic contaminants. The volume and characteristics of landfill leachate depend on the amount of water that passes through the refuse and the materials that are buried at the site. Unless landfills are covered with impermeable material (such as clay) to prevent precipitation from percolating through them, leachate continues to be produced for many years after dumps and landfills are abandoned. Leachate can seep out of dumps and landfills into surface water or it can percolate downward into groundwater and move in a contamination plume toward a discharge area.

In recent history, Hubbardston had two landfills—on 57 Williamsville Road and 26 Worcester Road (Inventory & Closed Landfills & Dumping Grounds published by Mass DEP Bureau of Waste Prevention) which became inactive as of 1968 and 1955, respectively. Neither of these two old landfills was lined or capped. In later years, the town had a solid waste landfill on the New Templeton Road from 1970-1990. It was unlined, but capped in 1991; closing was certified in December of 1993. Hubbardston's Board of Health monitors six groundwater wells and three gas vents at the New Templeton Road site. The groundwater monitoring program consists of the monitoring well network, sampling schedule, analytical list of parameters to be measured, and a quality assurance/quality control plan. Gas vents are a means of passive gas control and provide a conduit for the escape of landfill gas to the atmosphere. Testing is on a regular basis as required by DEP and will continue for 30 years following the site's closure. It may be extended if the DEP determines that a longer period of maintenance and monitoring is required to adequately protect human health and the environment.

According to DEP's *Landfill Technical Guidance Manual*, landfill gases are produced as a result of biological degradation of solid waste. The composition of landfill gas is roughly 50% methane, 50% carbon dioxide with trace amounts of nitrogen, oxygen, non-methane volatile organic compounds (NMOCs), hydrogen sulfide, and hydrogen. Trace compounds (NMOCs) that have been detected at municipal solid waste landfills are listed in an EPA table which is reproduced in the *Manual*.

DEP and the Board of Health monitor the landfills for public health risk. Toni Walker, Administrative Assistant for the Board of Health, reports that, as of 2014, the Hubbardston landfill continues to be tested regularly but there have been no problems.

Since the old landfill represents a small portion of the open space available for use by Hubbardston residents, it is important to keep in mind the unique problems associated with old landfill sites with regard to the generation of leachate and landfill gas and instability due the differential settling of the fill. Landfills will typically settle from 10% to 30% of their original thickness. In addition, the site has to be maintained and monitored for many more years to come. Currently the site is used for recreation such as walking or hunting, compatible uses which likely will continue.

4.9.6.2.6 Exotic and Nuisance Aquatic Plants

Many lakes are afflicted with rampant plant growth. Some of these aquatic plants are native species which are fed by an overabundance of nutrients and some are non-native (exotic) species which have gained access to a water body and proliferated in the absence of natural controls. The presence of nuisance aquatic vegetation is often related to nutrient overloads.

The 1998 Chicopee River Basin Water Quality Assessment report found three non-native aquatic species in our region's lakes: *Myriophyllum spicatum* - Eurasian water milfoil, *Myriophyllum heterophyllum* - Variable milfoil, and *Cabomba caroliniana* - Fanwort. These species have high potential for spreading and are likely to have established themselves in downstream lake and river segments in the Chicopee River Basin. Moosehorn Pond is the only body of water in Hubbardston that continues to be impaired. See also "Invasive/Exotic Plant and Animal Species" later in this section.

4.9.6.2.6.1 Eutrophication

Lakes are dynamic ecosystems that over time undergo a process of succession from one trophic state to another. Under natural conditions most lakes in this region move from a nutrient poor (oligotrophic) condition through an intermediate (mesotrophic) stage of nutrient availability and biological productivity to a nutrient-rich or highly productive (eutrophic) state. In the 1998 Chicopee River Basin report, DEP evaluated the trophic status of some of Hubbardston's water bodies, primarily using visual observations of macrophyte cover and phytoplankton populations. The report listed Moosehorn, Cunningham, and Williamsville Pond as eutrophic. Although it is natural for lakes to become eutrophic over time, various factors contribute to the acceleration of the process and result in compromised lake/pond water quality, primarily with regard to aesthetics, but also affecting the ability to support some species of fish. Over-development of the shoreline and a subsequent increase in phosphorus and nutrient loading is generally the cause of premature eutrophication. Title 5 controls, storm water controls, and informed land use are the major means of minimizing eutrophication beyond that which may occur naturally.

The effects of varying concentrations of nutrients and other factors on algal growth rates in streams is not well understood, but is essential for development of water body specific criteria and Total Maximum Daily Loads [TMDLs] for streams with impaired water quality. USGS and other agencies at the national level, along with various state and local agencies, monitor and study these effects.

4.9.7 Wildlife Issues and Problems

With an abundance of open space, Hubbardston is more subject to human-wildlife interactions than would be experienced in a more urban setting.

4.9.7.1 Beavers

Beaver populations are on the rise in every community in central Massachusetts. The two most common human-beaver conflicts are the flooding that results from dam-building and the damage to trees that are used for food or building materials. These activities can be a nuisance to landowners and public works employees, particularly when located near human infrastructure. Beaver activity can cause safety hazards such as flooding of roadways and precariously damaged trees, as well as septic problems and basement flooding due to raised water tables associated with their dams.

While problems sometimes arise when beavers come into contact with humans or human property, it's important to remember that beavers do not create problems in natural or wilderness areas. According to a 2003/2004 document entitled "*Solving Human-Beaver Conflicts: Practical Solutions for Local Health Officials and Conservation Commissioners*," prepared by Living With Wildlife, a program of the Massachusetts Society for the Prevention of Cruelty to Animals, wetland ecology is an important aspect to consider in the management of beaver populations. Beavers play an integral role in establishing and maintaining the wetlands that provide critical environmental functions. Beaver ponds, or impoundments, provide habitat for fish, amphibians, turtles, otters, and many other animals. Trees that are killed by beaver-induced flooding of wooded swamps provide nesting sites for great blue herons, wood ducks, and other birds. Beaver dams hold water within the landscape, maintaining local groundwater levels and providing flow to streams during even the driest portion of the summer season. The wetlands that beavers create support not only an abundance of animal and plant life, but they also serve many vital functions that benefit humans as well. Beaver habitat improves water quality by acting as a settling basin, controls flooding and reduces erosion by slowing water movement, processes organic wastes, removes toxins like pesticides and fertilizers, filters runoff, and protects against droughts. Beaver created wetlands are dynamic, rich environments that go through regular cycles with different ecological values at each stage. For example, after wetlands age and beavers abandon them, they are transformed into fertile meadows supporting a myriad of plant and animal life. Partially or completely breaching beaver dams can have negative impacts on all of the species inhabiting the impoundment.

The Living With Wildlife website offers practical, legal, and effective solutions to human-beaver conflicts and also makes the following suggestions:

- Conservation commissions should allow only the minimum amount of beaver dam removal necessary to abate an immediate public health, safety, or property damage threat. Usually, this means allowing the removal of a small section of the top of the dam, down to a specific elevation (typically no more than two feet below the top of the dam).
- Seasonal issues should be addressed in conservation commission's conditions. For example, in the fall turtles and amphibians enter a resting state for the winter season. Many of these animals will be present in shallow muddy areas around the edges of the beaver pond. If the water level is drawn down during the fall or winter, these animals can be killed due to exposure to freezing conditions. Similarly, if water levels drop below the entrances to the beaver's lodge, they too will be exposed to

freezing air. Beavers also may lose access to their food caches, either because the cache is exposed and freezes, or because the lodge entrances are now above frozen, lower water levels. This is an inhumane way to address the beaver problem, leaving them to a slow death from cold and starvation. Whenever possible, fall and winter drawdowns should be strictly conditioned and limited to prevent these kinds of impacts.

- Recent changes to state law have an impact on local public health officials. Under these changes, local health officials must respond to requests from the public to determine whether or not specific beaver activity poses a threat to public health and safety. The law makes suggestions about what may constitute such a threat, but it is up to each health official to decide whether the threat is real or not. The Massachusetts Department of Public Health (DPH) has written guidelines to assist local boards of health with determining whether or not beaver activity poses a real threat to human health and safety.
- *(Please note that the Department of Environmental Protection (DEP) shall make any determination of a threat to a public water supply. This is not the responsibility of local health officials.)*

The Living With Wildlife program and Beaver Solutions (a private company) has assisted Hubbardston with beaver control on almost a dozen roadways over the past several years. In the past, culvert damming by beavers repeatedly caused flooding of sections Route 62, Flagg Road, Pitcherville Road, and many other roadways. Beaver Solutions has installed large culvert protective fence systems. These devices have prevented beaver from damming of the culverts without needing to remove any of them. DPW Director Tim Kilhart reports that Hubbardston has had lots of beaver issues on many roads in town. They plug culverts and flood the roads. DPW hired a trapper that has removed 54 beavers since he was hired in November, 2013.

4.9.7.2 Black Bears

According to Mass Wildlife, the bear population in the state has grown from about 100 in the early 1970s to about 4000 in 2014, in response to increased legal protection, changes in forest structure and composition, and increased availability of supplemental fall foods. Bears are becoming more common in central Massachusetts.

Massachusetts bears are typically active in daytime during spring and fall, but are more active during dawn and dusk hours in summer. Males may be nocturnal during the breeding season. Typical spring habitats in Massachusetts include wetlands with lush emergent vegetation and hardwood areas with leftover nuts from the previous fall. In summer, wetlands and cutover areas with emerging berry crops are preferred. Corn fields and oak, beech, or hickory stands are favored in fall. Bears have good long-term memory and are capable of recalling the location of periodic food sources years after the first visit.

In Massachusetts, adult females use home ranges averaging 9 to 10 miles while adult males may have ranges exceeding 120 miles. Depending on food availability, Massachusetts bears enter the den between mid-November and early December and exit between early March and mid-April. Pregnant females often enter early and those with newborn cubs exit late. Bears commonly den in brush piles, under fallen trees or a jumble of rocks, or in a mountain laurel thicket.

Despite popular belief, black bears are not fierce. Their first response is usually to flee, and in woodland areas the bears may disappear long before they are seen. Black bears sometimes can become habituated to human presence and conditioned to human food sources. These circumstances may then lead to damage or depredations which have unfortunate consequences if people then destroy the bear out of fear or to alleviate the damage. Black bears rarely harm people, although minor defensive attacks can occur when people tease or closely approach bears in parks or campgrounds. Female black bears defend their cubs by putting them up a tree. The sows may huff and blow and make short rushes at people who get near the cubs, but will almost never press home an attack. Deliberate predatory attacks are very rare and typically occur in remote areas.

There are numerous reports of black bear sightings in Hubbardston. These often come as a result of a raid on beehives or the plundering of a bird feeder, especially in the spring when they emerge hungry from hibernation. In spring of 2006 one bear was legally destroyed when it made repeated visits to a large, beehive operation that was not protected by electric fence.

Mass Wildlife recommends preventing human-bear conflicts by taking various precautions, including removing all birdfeeders from April 1 to December 1, removing other potential sources of food from outdoor locations, use of bear-proof trash receptacles, and protection of beehives, livestock, orchards, and crops with electric fencing and other methods. Details are available on the Mass Wildlife website.

4.9.7.3 Ticks

The past several years have seen an increase in species of ticks, and an increase in incidence of Lyme-disease carrying ticks in Hubbardston. The deer tick (*Ixodes scapularis*) is a carrier of the corkscrew-shaped bacterium *Borrelia burgdorferi*, which causes Lyme disease. The bacterium normally lives in mice, squirrels, and other small mammals and is transmitted among these animals, and to humans, by the bite of infected ticks. Although adult ticks often feed on deer, these animals do not become infected. Deer are nevertheless important in transporting ticks and maintaining tick populations.

Lyme disease can cause serious long-term joint, heart and nervous system problems, if not recognized and treated early. According to the Center for Disease Control and Prevention, there were 3816 confirmed cases of Lyme disease in Massachusetts in 2013 which was the second highest rate in the country. Only Pennsylvania had more cases of the disease than Massachusetts. The incidence of Lyme disease in 2013 was 57 per 100,000. It is interesting to note that the 5 New England states have the highest incidence rate per 100,000 in the country. The ticks that transmit Lyme disease can occasionally transmit other tick-borne diseases as well. Ehrlichiosis is caused by bacteria (germs) that attack specific types of white blood cells. Human granulocytic ehrlichiosis (HGE) is caused when the bacteria attack the granulocytes, one type of white blood cell. The bacterium that causes HGE is transmitted by the deer tick. The bacterium that causes human monocytic ehrlichiosis (HME) is transmitted by the lone star tick, which is rarely found in Massachusetts. In the United States, HGE is most often reported in the northeastern and upper-midwestern states. In Massachusetts, the majority of cases are reported from the southeastern coast, Nantucket, and Martha's Vineyard.

Babesiosis is a rare and sometimes severe disease caused by a microscopic parasite (a type of germ similar to those that cause malaria) that infects red blood cells. The parasite is spread by deer ticks. The disease is found most commonly in coastal areas in the northeastern United States. In Massachusetts, the majority of cases are reported from Nantucket, Martha's Vineyard, and Cape Cod.

4.9.7.4 Mosquitoes

Viruses mosquitoes transmit are referred to as arthropod-borne viruses or arboviruses. Two different arboviruses found in Massachusetts are West Nile virus and eastern equine encephalitis virus. The Massachusetts Department of Public Health runs and arbovirus surveillance program throughout the state. Hubbardston residents can avail themselves of detailed information on these two rare but serious mosquito-borne diseases at the website maintained by the Department at www.mass.gov/dph.

4.9.7.4.1 Eastern Equine Encephalitis Virus

According to the CDC, eastern equine encephalitis virus (EEEV) occurs in the eastern half of the United States, as shown in Figure 15, where it causes disease in humans, horses, and some bird species. Due to the high mortality rate, EEE is regarded as one of the most serious mosquito-borne diseases in the United States. EEEV is transmitted to humans through the bite of an infected mosquito. The main EEEV transmission cycle is between birds and mosquitoes. Horses are susceptible to EEE and some cases are fatal. EEEV infections in horses, however, are not a significant risk factor for human infection because horses are considered to be “dead-end” hosts for the virus (i.e., the amount of EEEV in their bloodstreams is usually insufficient to infect mosquitoes). EEEV transmission is most common in and around freshwater hardwood swamps in the Atlantic and Gulf Coast states and the Great Lakes region. Human cases occur relatively infrequently, largely because the primary transmission cycle takes place in and around swampy areas where human populations tend to be limited. The Mass Dept of Public Health reported 7 cases of EEE in Massachusetts in humans. The Center for Disease Control reports that there have been 24 cases of EEE in Massachusetts from 2007-2013. It is interesting to note that, like tick borne diseases, Massachusetts has the highest rate of EEE in the country.



Figure 15 EEE Cases by State, 2004 - 2013

4.9.7.4.2 West Nile Virus

West Nile virus (WNV) can cause illness varying from a mild fever to more serious disease like encephalitis or meningitis. WNV grows in birds and is spread from bird to bird by infected mosquitoes. If mosquitoes infected with the virus bite horses or humans, the animal or person can become sick. In the United States, WNV was first identified in New York during the summer of 1999. Since then, it has spread throughout most of the continental United States.

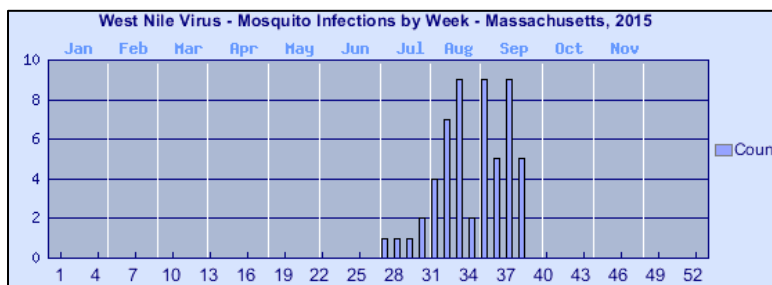


Figure 16 Massachusetts West Nile Virus Infections by Month

Serious illness caused by WNV is uncommon and has been identified in a small number of people in Massachusetts over the past several years. Figure 16 shows the number of confirmed Massachusetts cases in 2014. WNV has been found in horses, mosquitoes and many species of birds throughout the state. The mosquitoes that carry this virus are common throughout the state, and these mosquitoes are found in the city as well as in the woods and other less populated places.

4.9.8 Solid Waste/Illegal Trash Dumping / Litter

Another environmental issue in Hubbardston which has some bearing on open space and recreational planning is the large volume of illegal trash dumping and roadside littering on both public and private lands.

After Hubbardston's sanitary landfill was closed in 1990, town residents had to begin paying flat-rate user fees for private trash removal services with designated town-approved haulers. The town operates a recycling facility which is open 2nd Saturday of each month, April -November (weather permitting), for disposal of certain kinds of waste: automotive batteries, used motor oil and oil filters, used clothing, large appliances. There is a fee for some of these items. Although the recycling center accepts large appliances, these and other large items such as furniture and demolition debris make up a portion of dumped items. Unfortunately, open space, with its sheltered trails and wooded tracts invites illicit and anonymous dumping.

4.9.8.1 Household Hazardous Waste

The bordering communities of Gardner and Westminster host household hazardous waste collection events several times annually.

4.9.9 All-Terrain / Off-Road Vehicle Use

According to a 2000 document entitled *Environmental and Social Effects of ATVs and ORVs: An Annotated Bibliography and Research Assessment*, by Patricia A. Stokowski, Ph.D. and Christopher B. LaPointe of the University of Vermont, there are several environmental effects related to off-road motorized vehicles. Soil and vegetation impacts are widely discussed in the literature, and obvious to even casual observers. Soil compaction and the sheer forces of motorized vehicles create mud holes and gullies that alter hydrologic patterns and intensify erosion. Trail erosion and compaction caused by off-road and all-terrain vehicles reduce the quality of recreational trails and require enhanced management action to develop and maintain safe, usable trails. Also, ATV use has been found to widen and rut forest roads, and to increase the sediment load to streams which may threaten fisheries. ATVs and ORVs offer access to resource areas that are typically less accessible and more remote. ATV use often conflicts with non-motorized uses, such as hiking and cross-country skiing. Additionally, noise and intrusion of the modern world into nature often compromises the enjoyment of many users. Impacts and negative effects increase with more intensive or repetitive use. Also, the fragility of the environment affects the level of impact. Information about this subject is accessible on numerous Internet sites.

All-terrain vehicle use is prohibited on all DCR property in Hubbardston. ATV/ORV use is also prohibited at the Mt. Jefferson and Malone Road Conservation Areas. A major problem at the Mt. Jefferson Conservation Area has been the illegal use of registered trucks being used to drive through the fields in muddy conditions. There has been at least one instance where major damage has occurred in the fields. Luckily the violator was caught when his truck became stuck in the mud and he did finance repairs to the field. Other instances have occurred unseen. The Open Space Committee is currently exploring options to discourage these destructive activities.

In spite of prohibitions and designated trails, ATV users persist in using many of the other off-limits trails in town. The general public perception is that illegal motorized vehicle use is not enforceable in most cases.

This is an environmental issue which is relevant to the town's open space concerns and a challenge for property stewards.

4.9.10 Invasive /Exotic Plant and Insect Species

Identification, management, and control of non-native invasive plant and animal species are of environmental concern to open space managers.

4.9.10.1 Invasive Plants

The New England Wildflower Society defines exotic and invasive plants as follows:

- **Exotic species** – a non-native plant or animal introduced into a new location by human activity, either intentionally or by accident.
- **Invasive species** – a non-native (adventitious) species that is capable of moving aggressively into a habitat and monopolizing resources such as light, nutrients, water, and space to the detriment of other species.

According to the Society, the issue of invasive plants is critical because, second only to loss of habitat, it is the primary cause of the reduction of diversity in native plant populations worldwide. As of today, more than 28% of the world's native plant species are threatened or endangered, including over 200 species in Massachusetts alone. The organization has developed an expansive list which evaluates 85 plant species and includes an annotated list of Invasive, Likely Invasive, and Potentially Invasive species.

Hubbardston is host to many invasive plant species, including Japanese barberry (*Berberis thunbergii*), purple loosestrife (*Lythrum salicaria*), oriental bittersweet (*Celastrus orbiculatus*), and several types of honeysuckle (*Lonicera*).

Many lakes in Massachusetts are afflicted with rampant aquatic plant growth. Some of these plants are native species which are fed by an overabundance of nutrients and some are non-native (exotic) species which have gained access to a water body and proliferated in the absence of natural controls. In addition to affecting water quality with regard to health, invasive species spread rapidly and form dense mats that can make boating, fishing and swimming impossible. As the recreational and aesthetic value of the lake declines,

property values around the lake also decrease. The Lakes and Ponds program of DCR explains why nuisance aquatic plants are of concern:

- The spread of invasive species can cause native species to decline, and the animals that depend on them must either relocate or perish. This reduces the biological diversity of the area and disrupts the delicate balance of the environment.
- The aesthetic appeal, recreational value and surrounding property values of a lake or pond may quickly decline as the exotic invasive species takes over.
- Once exotic plants are established, they are almost impossible to eradicate. The United States has invested millions of dollars annually to manage the weeds and repair the damage.

Reduction of nutrients is the long-term control measure at least for the native species. But in some instances for native species and especially for non-native species, management of the water body is the only realistic option. Control measures include a wide range of tools that vary from physical, such as drawdown, to chemical herbicides so long as all controls meet state and federal requirements. Preventing the spread of non-native species is the single most effective control measure for exotic species.

The major effort on the state level here in Massachusetts is to prevent the spread of such plants. While there are regulations governing the importation of foreign plants, many of the plant species are already established in water bodies throughout the Commonwealth; the prevention strategy involves education and best management practices. Boaters in particular are urged to wash the hulls and clean the propellers of their boats before leaving a water body since most of these plants can be ferried from one water body to another. For those areas where nuisance and exotic plants are established, management techniques range from chemical controls to desiccation by lowering water levels during the winter. Massachusetts has issued a review of lake restoration practice—*Lakes Generic Environmental Impacts Report*—that serves as a guide for control measures. The final GEIR for *Eutrophication and Aquatic Plant Management in Massachusetts* and its companion document, *The Practical Guide to Lake Management in Massachusetts*, are now available on-line at www.mass.gov/dcr/waterSupply/lakepond.

4.9.10.2 Insects

Hubbardston's forests face serious threats from three invasive insects: the Hemlock Woolly Adelgid, the Emerald Ash Borer and the Asian Long Horned Beetle. According to Hubbardston Tree Warden Jeff Bourque, the Hemlock Woolly Adelgid has been in the area for a few years now, as it is widespread throughout Massachusetts. While it is not as well established in our town as it is around coastal regions, it may continue to spread if climate conditions allow. It was largely limited to eastern Massachusetts due to the slightly warmer winter temps, but recent mild winters have allowed it to spread statewide. In the residential landscape it is a treatable pest, but in the native forests it will likely weaken, and eventually deplete, the hemlocks if conditions permit. It causes a very slow decline and eventual death of hemlocks in a favorable climate. Although we live in an area that is very marginal for this pest to thrive, it can be found in Hubbardston.

Emerald Ash Borer has been found in the Berkshires, Andover, and Boston, but not yet in central MA. The state and fed governments are not proactively treating or removing trees like they are with Asian Long Horned Beetle. Infested ash trees need to be removed, and a landowner with ash trees should consider harvesting trees now while they have value, or perform preventative treatments. This pest is easily spread by moving firewood and timber harvesting. As yet there are no reports of Emerald Ash Borer in Hubbardston.

The Asian Long Horned Beetle is perhaps the most serious threat and it is still being actively managed by the Federal government. Although it is relatively contained in the greater Worcester area the nearest boundary of restricted areas for this pest is only 10 miles away in the town of Holden (See Figure 17). Bourque says that Hubbardston is routinely monitored for this pest and large black traps can be seen in various locations in the town. These are managed by either the USDA Animal Plant Health Inspection Service (APHIS) or the DCR. They have placed traps in several communities surrounding the regulation area.

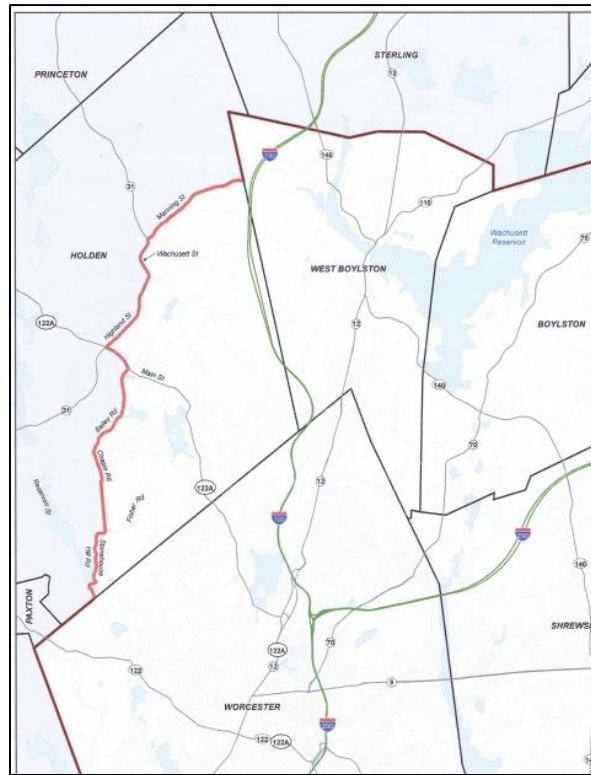


Figure 17 Asian Long Horn Beetle Restricted Area

Mr. Bourque has had several calls from residents thinking they have found this pest, but all instances have been look-alike pests like the pine sawyer beetle. The Hubbardston Center School has also been teaching the students about this insect. Bourque advises anyone with questions about these pests to contact him and he will inspect and give advice as needed. He believes that outreach and awareness efforts have been very effective.

4.9.11 Environmental Issues Summary

Of all the environmental issues facing our community, water quality protection is of great importance. Because of Hubbardston's geographical placement within the watersheds of two major drinking water reservoir systems, water quality protection is not only a local concern but is vital with regard to statewide water health and cleanliness. Wise land use and regular monitoring for potential hazards and contaminants are necessary.

Geology, soils, intensity of development, the type of land usage and other factors have a great impact on water quality protection, both now and in the future. Numerous regulatory mechanisms are in place to ensure the safety of public water supplies. However, Hubbardston residents must exercise personal responsibility with regard to waste disposal and private well testing. Solid waste disposal and illegal dumping are ongoing problems that impact the town's open spaces and water quality and present a huge challenge to the community. Reduced developmental pressure and protection of tracts of open space are known to contribute to water quality protection.

Protection of wildlife and increased abundance and diversity of wildlife species result from open space protection. The positive environmental effect of open space extends to the residents who enjoy increased opportunities for natural-resource based recreational activities. Open space provides many scenic and aesthetic community features.

Open fields, waterways, and forest tracts, especially along roadsides, attract illegal dumping and littering. Remote and undeveloped pieces of land invite illegal use of motorized recreational vehicles which can cause damage to soils and vegetation and disturb wildlife and/or other users who may be present.

Residents of Hubbardston express support of the town's many acres of protected open space and its rural character. Although numerous tracts of land and many streams and water bodies are part of the town's acreage, there are some particularly attractive and scenic parcels which are in private ownership and may not remain available as open space without outright ownership transfer.

Section 5: Inventory of Conservation and Recreation Lands

5.1 Introduction and Importance of Open Space

The town of Hubbardston has a wide array of conservation and recreation lands (See Figure 18). This section outlines the nature of current usage and attempts to characterize the features of the properties. When possible, attempts are made to comment upon the level of protection from destruction or degradation that is afforded to these various parcels.

Unprotected land is owned by a private individual, entity or the town. It could theoretically be developed at any time. Chapter 61 lands have a small measure of protection in that the town has the right of first refusal before the land can be developed and the owner must pay back taxes if development takes place. Permanently protected land is subject to Article 97. In 1972 Massachusetts voters approved Article 97, granting people the right to a clean environment and authorizing the Commonwealth to acquire conservation easements. Article 97 was intended to be a legislative 'check' to ensure that lands acquired for conservation purposes were not converted to other inconsistent uses.

The policy of EOEА (Executive Office of Energy and Environmental) and its agencies is to protect, preserve and enhance all open space areas covered by Article 97 of the Articles of Amendment to the Constitution of the Commonwealth of Massachusetts. The goal of this policy is to ensure no net loss of Article 97 lands under the ownership and control of the Commonwealth and its political subdivisions (i.e., municipalities and counties.) Exceptional circumstances must exist for EOEА and its agencies to support an Article 97 disposition. Determination of "exceptional circumstances" includes a finding that all options to avoid the Article 97 disposition have been explored and no feasible and substantially equivalent alternatives exist, including the evaluation of other sites for the proposed activity.

Hubbardston Protected Open Space and Recreation Areas

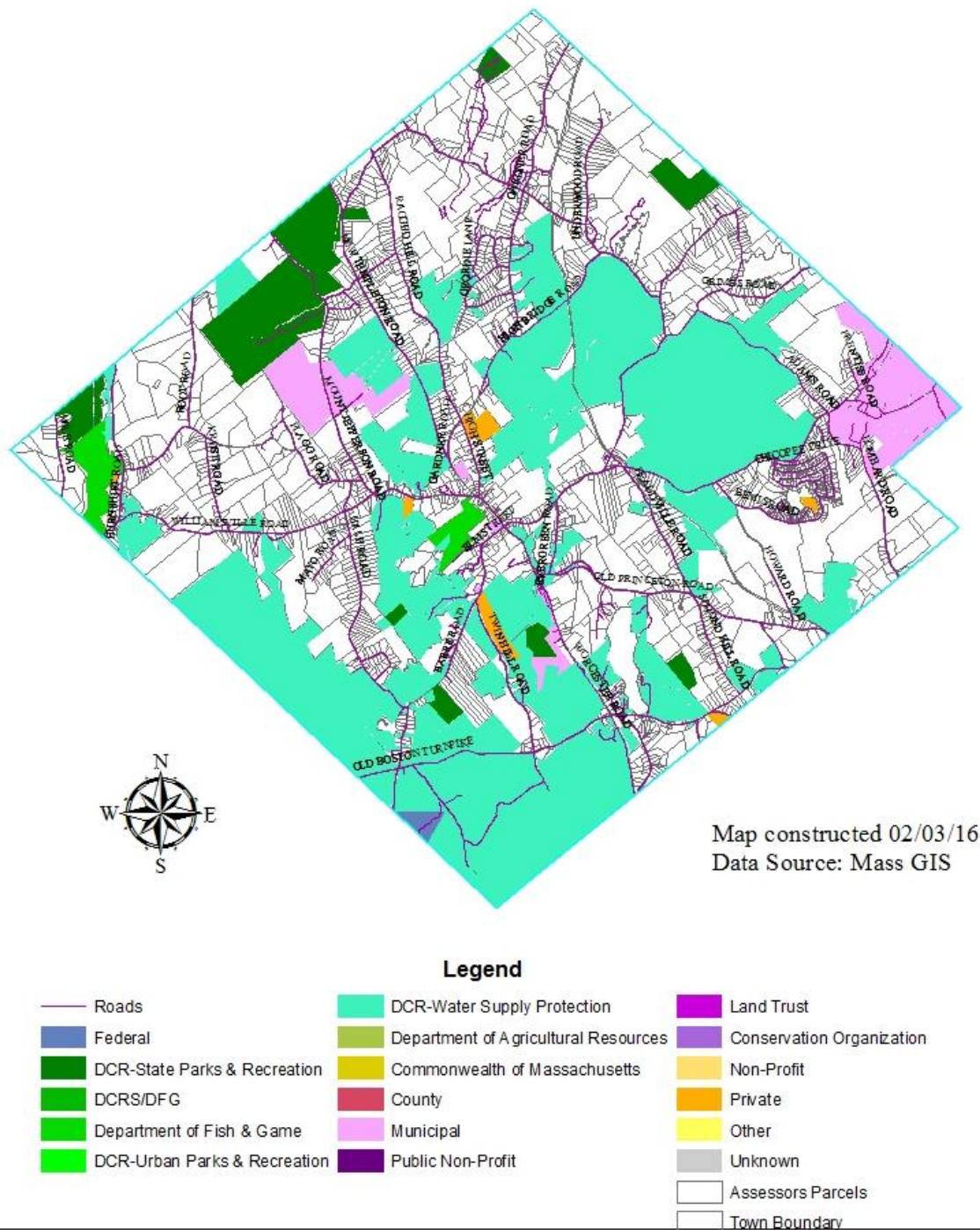


Figure 18 Hubbardston Protected Open Space and Recreation Areas

The protection of open land is important for many reasons. Uncontrolled growth or taking of land for things like pipelines can result in degradation of public drinking water sources as well as other very important environmental and aesthetic features. Hubbardston helps provide drinking water for millions of people in metropolitan Boston, Fitchburg and Gardner. Loss of open space results in the destruction of wildlife habitat, destruction of unique scenic and historic resources and the destruction of recreational resources.

There are also economic costs associated with growth. Numerous cost-of-community-service studies prepared by the American Farmland Trust have proven that residential development requires more in service costs than it pays in taxes. Hubbardston is a destination for recreational pursuits such as camping, hunting, skiing, hiking and horseback riding. Loss of recreational areas could help contribute to loss of potential associated income revenue for local campsites, stores and restaurants.

Preservation of open space has natural, social, and psychological benefits. Open land provides visual relief from the developed landscape. Vegetation helps filter out pollutants from air, rain water, and runoff. Vegetation also mitigates temperature extremes. Trees especially help reduce air pollution through the process of transpiration. In short, protection of open land is important for human / wildlife physical and mental well-being.

Following is a summary of Hubbardston land and it's allowed uses. Table 10 depicts Hubbardston acreage categorized by various levels of protection from development. Data was gathered from the Assessor's Office in March 2015.

5.2 Town Owned Lands

The town-owned acreage noted in Table 10 is primarily land with specific designated uses such as cemeteries and municipal services, fire ponds etc. These uses are unlikely to change within the near future and with little bearing on future open space decisions. A few parcels are currently undeveloped and contribute to open space values simply by virtue of being unused at this time. A few parcels of town owned land worthy of particular note are discussed below.

5.2.1 Open Space Land Swap with DCR

The town is hoping to build a new senior center/public safety complex on Gardner Road on a piece of land was owned by DCR. This land is in an excellent town center location for such a facility. In discussions with DCR, an agreement was reached to exchange a 17 acre parcel of town owned land on Mile Road for the DCR land on Gardner Rd. The net result is the parcel of land on Mile Road is now permanently protected DCR land and the town has buildable site with direct access to Gardner Rd (Rte. 68), the main road through the center of Hubbardston. There would be no net gain or loss of open space.

5.2.2 Ragged Hill Potential 40B Site

A 38 acre parcel of land on Ragged Hill Road is currently being considered for development of a "friendly" 40B. This would help the town to meet its affordable housing quota without being subjected to an "unfriendly" 40B.

5.2.3 Tax Title Properties

The town also has a number of tax title properties. The town treasurer and assessors are currently in the process of confirming which properties are actually in tax title. The Selectboard will then decide on the best course of action to take regarding dispensation of individual properties or encouraging payment of back taxes on the property.

5.2.4 Pitcherville Rd Potential

The town owns a 17.6 acre "back lot" situated close to the sand and gravel operations off Pitcherville Road. The Pitcherville lot may be of more interest in future years as it adjoins an expanse of exposed and non-reclaimed earthworks. The present ownership, intermittent sand and gravel extraction and the location of the parcel at present preclude any solid planning for its future use.

Table 10 Hubbardston Land Ownership and Protection*

Description	Acres
Total Town Acreage	26,259
Town Owned	842
Vacant, protected (Mt. Jeff and Malone Cons & Rec)	328
Vacant, unprotected	189
Other	325
Private Owned, Special Taxation	3677
Chapter 61	1,449
Chapter 61A	1,778
Chapter 61B	450
Permanent Protection Acreage	10,952
Private, spec. taxation CR/APR	75
Fitchburg Water Department	463
State Owned DCR, DFW &USACOE DEM	10,086
Town-owned (Mt. Jeff CA &Rec)	328
Remaining Private-owned, Unprotected Acreage	11,116
*Figures accurate to the best of our ability	

5.3 Private Parcels

5.3.1 Chapter 61 Lands

Since the previous Open Space Plan, the town has seen a slight overall increase in the total number of properties with Chapter 61, 61A, and 61B status. Table 10 presents a breakdown of the total town acreage broken into the various categories of town owned, private owned / chapter 61, permanently protected, and unprotected. Figure x and the table in Appendix E provide specific Chapter 61 details on lands which private owners have placed into special Chapter 61 programs as of 2016. Although these Chapter 61 properties afford some protection for the designated lands, the protection is essentially temporary in nature and not at all a guarantee that holdings are safe from destruction or degradation in the future. The main “potential protections” is guaranteeing the town the right of first refusal to purchase the land at the going rate. If the town opts not to purchase the land can be sold to any developer simply by paying back taxes.

5.3.2 Other Private Agricultural and Forested Land

Hubbardston has some large, uninterrupted parcels of undeveloped land, most of it in woodland and wetland, which are privately owned.

In 2002 the Open Space Committee generated a list of private parcels of priority interest with regard to future open space protection options and documented them on Figure 20 Land Protection and Priority Map. Some have been part of various temporary protection strategies (Chapter 61 status) while others have not. The parcels range in size from 24 acres to 350 acres, with most falling in the range of 60-100 acres. A few of the properties are used for agriculture. Many of the properties have been selected for priority open space interest because of their 1) relatively large size; 2) their proximity to existing protected tracts of land; 3) agricultural value; 4) scenic views.

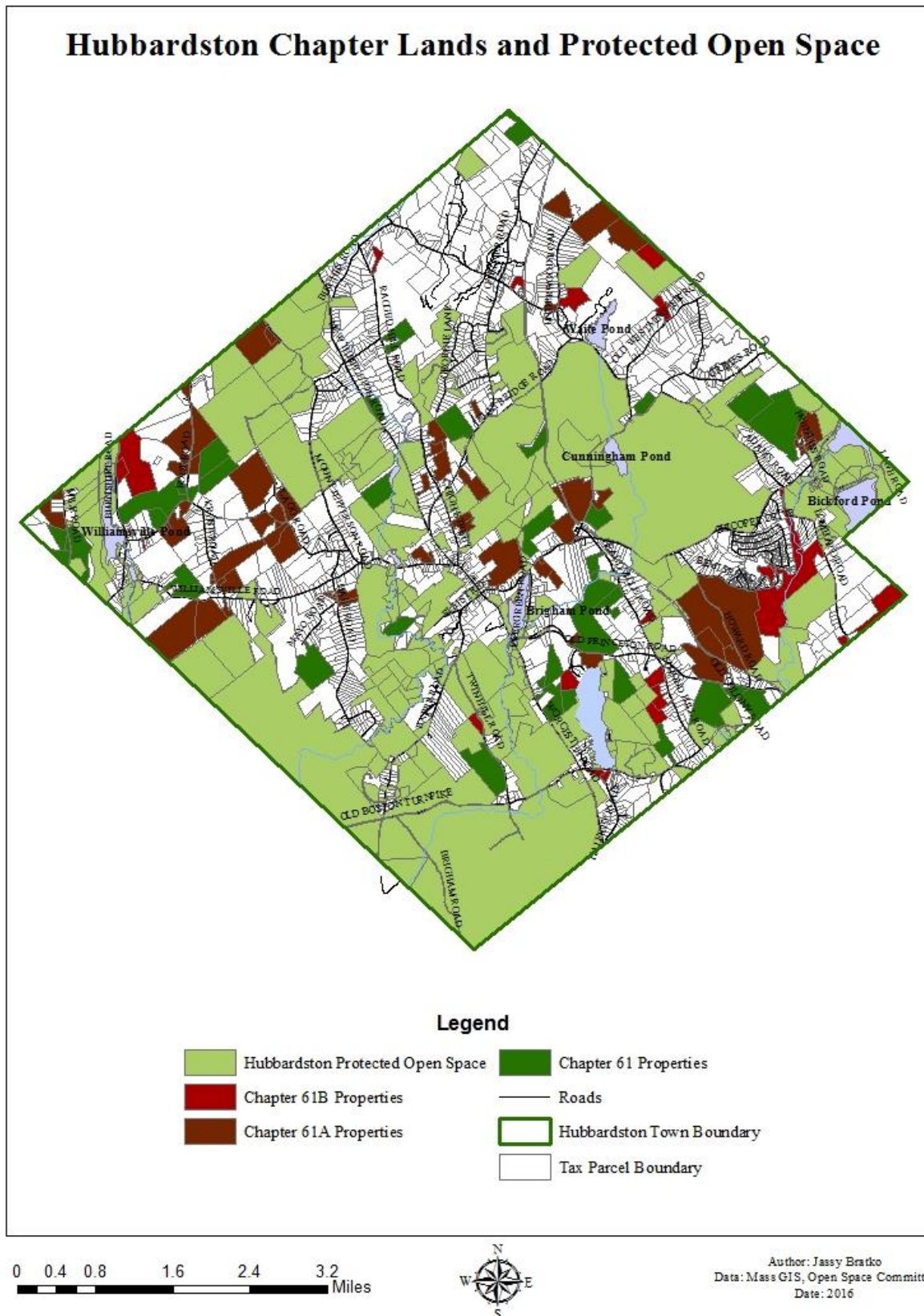


Figure 19 Chapter 61 and Protected Lands

The Open Space Committee is currently working with North County Land Trust, DCR and several other land trusts and agencies to conserve several of these parcels through the Quabbin to Wachusett Forest Legacy Grant. The Forest Legacy Program (FLP), a Federal program in partnership with States, supports State efforts to protect environmentally sensitive forest lands. Designed to encourage the protection of privately owned forest lands, FLP is an entirely voluntary program. To maximize the public benefits it achieves, the program focuses on the acquisition of partial interests in privately owned forest lands. FLP helps the States develop and carry out their forest conservation plans. It encourages and supports acquisition of conservation easements, legally binding agreements transferring a negotiated set of property rights from one party to another, without removing the property from private ownership. Most FLP conservation easements restrict development, require sustainable forestry practices, and protect other values.

At the time this document is being written, conservation restrictions or sale of property through this grant has either just taken place or is imminent. As this grant may greatly change the conserved landscape in Hubbardston, the Open Space Committee will wait until 2017 to update its current Land Protection and Priority Map. The Forest Legacy Grant also encourages public access on all its conserved land. This means that there may be limited public access on lands that have been previously posted as private. The Open Space Committee is currently working with North County Land Trust and DCR to ensure that the designated public access can enhance existing trail networks to the best extent possible.

After many years of decline Massachusetts has seen resurgence in agriculture in recent years and Hubbardston has experienced the same. While there is currently only one permanently protected farm in the town, another farm is in the process of being protected with an Agricultural Preservation Restriction. There are other farms within the town that sell their product through either direct retail or wholesale. The Country Hen is one of Hubbardston's largest businesses producing eggs for sale on a nationwide scale. It used to be owned by a Hubbardston resident but has recently been bought by a Californian company that wants to expand the operation within the town.

At least one farm is currently operating a CSA (Community Supported Agriculture) and offers certified organic fruit, vegetables, cut flowers and eggs. There are several livestock farms producing beef, pork and chicken, several others producing alpaca fiber and two commercial horse farms. In addition there are numerous hayfields that are maintained on private property, small horse farms and backyard flocks of chickens or other agricultural animals.

Michael Cahill, Director of the Division of Animal Health in the MA Dept. of Agricultural Resources reports that there are 66 properties in Hubbardston that keep some sort of livestock or poultry. The official count for Hubbardston is tabulated below:

- Bovine Beef 24
- Bovine Dairy 0
- Camelids 57
- Equine 208
- Feline 0
- Goat 45
- Gamebird 10
- Canine 0
- Chicken 69,010
- Rabbit 5
- Ratite 0
- Sheep 48
- Swine 31
- Turkey 0
- Deer/Elk 0
- Bison 0
- Waterfowl 13

Hubbardston does have an active Agricultural Commission that was established in 2006. The Commission has been involved in farm taxation issues and offers workshops and farm tours. It was instrumental in writing the town's Right to Farm By-law which was passed shortly after the Commission was established.

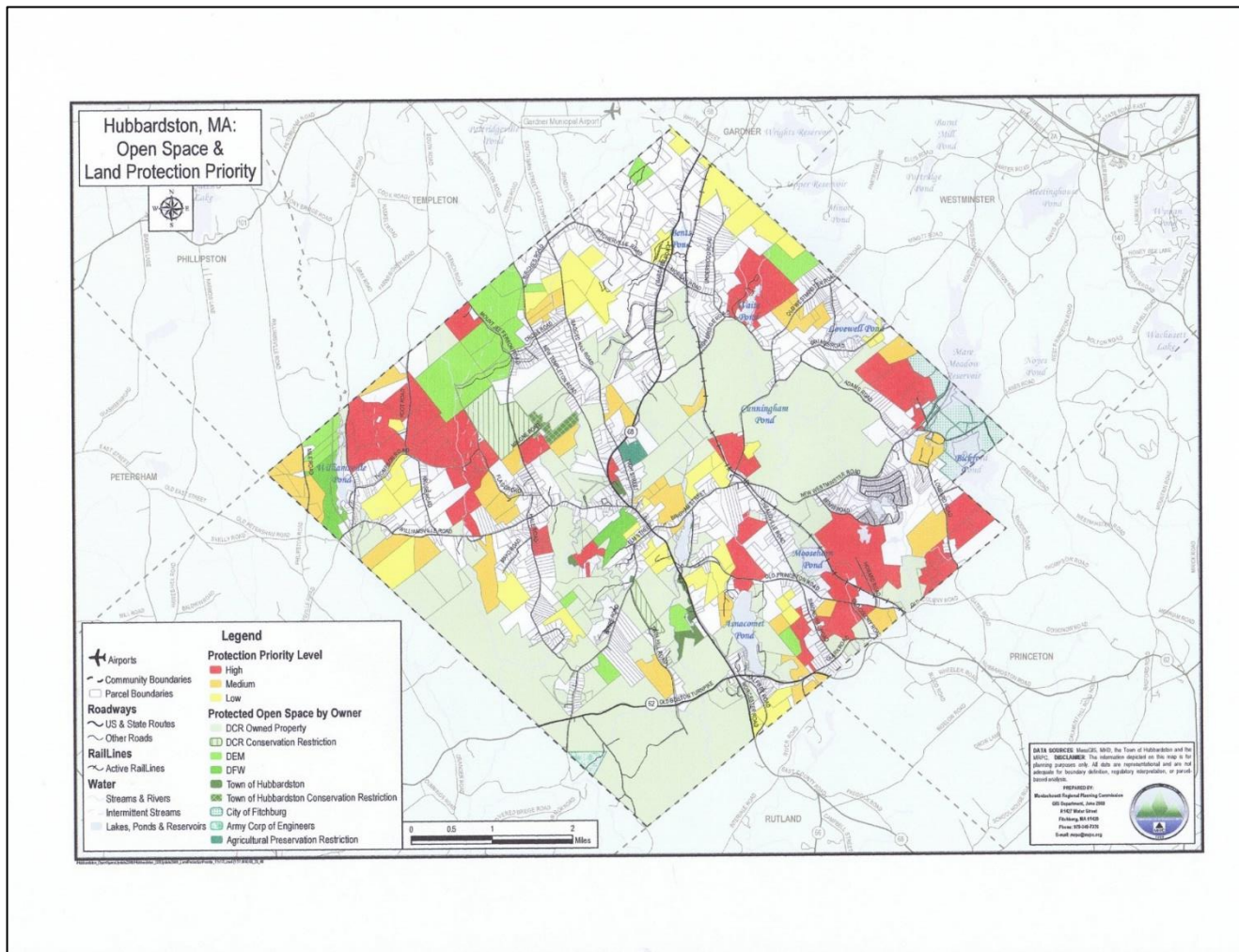


Figure 20 Land Protection and Priority Map

5.4 Private Recreation Lands

Hubbardston has some noticeable and important private holdings which are used for recreation by a limited number of “members” or landowners.

5.4.1 Hubbardston Rod & Gun Club

One private recreational holding of interest is the Hubbardston Rod & Gun Club located on Williamsville Road. Comprised of 16 acres abutting other state-owned (DFWELE /DCR) property and Natty Brook, the Club land includes one structure which is used for numerous non-profit and private functions and a section which has been developed as a baseball field. Much of the undeveloped acreage is wetland.

5.4.2 Pinecrest Property Owners Association

The Pinecrest Property Owners Association owns about 180 acres of open woodland and Cushman (Pinecrest) Pond, which are used for recreation and outdoor enjoyment by Pinecrest residents. There are trails through the wooded portion, as well as a beach and children’s play area on the shore of the pond. Although there is no general public access to the pond, the Association maintains a lodge there which may be used for special functions by both Pinecrest and other town residents. In addition, this property has the distinction of housing the largest old barn in town, which was built early in the 20th century and completed around 1918. The beautiful old cobblestone and shingle/wood structure, of historic interest, was used in years past as a site for large community functions after it ended its function as a farm structure. The Pinecrest woodland is also a Chapter 61B property.

5.4.3 Sawyer's (Bents) Pond

Sawyer's (Bents) Pond contributes to the open space landscape of Hubbardston and is one of the town's larger ponds. The pond is privately owned, however, and is open for use only by residents of Silverleaf Hollow and the newly-constructed Madison Greens senior housing condominiums. There are some limited uses of the pond for recreation, e.g. ice-fishing. Interestingly, Sawyer's Pond was used to store salvaged lumber following the 1938 hurricane and flood. Since the pond is shallow, one can catch glimpses of the logs, which were never used, when the water table is low during dry periods. The logs are now rising to the surface and drifting to the brook exiting the pond. They are being removed by Madison Greens to prevent the brook from being blocked.

5.4.4 Peaceful Acres Campground

Located at the end of Flagg Road is a moderately-sized private campground, Peaceful Acres Campground. Although the campground is not well-publicized, it has been here for many years and has steady patronage throughout the summer season. Of interest with regard to the town's open space is the fact that the campground, and other surrounding parcels, abuts the Mt. Jefferson Conservation Area.

5.4.5 Baseball Field

A private, fenced-in baseball field is located on the Barre Road.

5.4.6 Major Institutional Holdings

Hubbardston is home to the Ron Burton Training Village, founded by professional football player Ron Burton Sr. in 1985. The facility is a summer camp for Boston-area underprivileged and at-risk youth ages 11-17. The five-week program uses athletics to teach teamwork, sportsmanship, and moral conduct. Much of the 305-acre parcel is developed as playing fields/areas with pertinent administrative and program buildings, parking areas, etc.

5.4.7 Land Trust Owned Conservation Areas

There are two conservation areas that are owned by land trusts. North County Land Trust owns the Underwood Road Conservation Area and East Quabbin Land Trust owns Henry's Woods on Lombard Road.

5.5 Permanent Protection Acreage

5.5.1 Town Owned Conservation Land

Land that is considered "permanently protected" is protected under Article 97. The policy of the Executive Office of Environmental Affairs (EOEA) and its agencies is to protect, preserve and enhance all open space areas covered by Article 97 of the Articles of Amendment to the Constitution of the Commonwealth of Massachusetts. The goal of this policy is to ensure no net loss of Article 97 lands under the ownership and control of the Commonwealth and its political subdivisions (i.e., municipalities and counties.) Exceptional circumstances must exist for EOEA and its agencies to support an Article 97 disposition. Determination of "exceptional circumstances" includes a finding that all options to avoid the Article 97 disposition have been explored and no feasible and substantially equivalent alternatives exist, including the evaluation of other sites for the proposed activity.

The town currently owns four permanently protected recreation/conservation areas:

- **Mt. Jefferson Conservation Area (~250 acres)**
was created in 2001 through land purchase using funding from a state Self-Help Conservation Grant, Metropolitan District Commission Conservation Restriction monies and appropriated town funds.
- **Malone Road Conservation Area (~67 acres)**
was purchased by the town in 2007 with funding secured from a Self-Help Grant, Community Preservation funds, grants from several private foundations and private donations.

Both of the above properties are under the care and control of the Conservation Commission but managed by the Open Space Committee. They are multi-use areas and are managed for passive recreation, agriculture, wildlife management and water protection.

- **Curtis Recreation Field**
11.5 acres in size, was designed to provide for various organized and casual family recreational activities: baseball and

soccer, walking/running/rollerblading (paved pathway around the perimeter of the area), children's play (swing set, etc.), skateboarding (fenced, paved area with ramps). A basketball court is about to be built in the spring of 2016. This land is permanently protected under Article 97 due to receipt of an Urban Self-Help Grant for construction of the skate park, walking path and parking lot.

- **Sharron Conservation Area**

This is a new public land parcel of land recently gifted to the town in 2016, through the Conservation Land Tax Credit Program. The land is approximately 50 acres in area and located off Geordie Lane. . This land is be under the care and control of the Conservation Commission. The Open Space Committee has offered to develop a land management plan similar to the one that the committee did for the Mount Jefferson Land. The land is relatively flat, has wetlands and offers significant potential for walking, hiking and similar trails. The relatively flat nature offers potential to provide ADA accessibility.

Table 11 Town Owned Conservation and Recreation Properties

Property Name	Mngt. Agency	Current Use	Condition	Recreation Potential	Type of Grant	Public Access	Zoning	Degree of Protection
Curtis Recreation Field	Parks Comm.	Active Recreation	Excellent	Full suite of ballfields, basketball court; skatepark playground; bandstand; walking path	Urban Self Help Grant (PARC), CPA funds	Open to the public. Central location Excellent parking No dogs allowed	Commercial	Permanently protected under Article 97
Mt. Jefferson Cons. Area	Cons. Comm. and Open Space Committee	Passive Recreation; haying; wildlife Mngt.; timber Mngt.	Excellent	Full capacity for trails due to Cons. Restriction	Self Help Grant (LAND) w CR from former MDC; town funds	Open to public for multi-use passive recreation but no ATV's or motorized bikes	Res./Ag	Permanently protected under Article 97 also CR with DCR Div of Water Supply Protection
Malone Rd Cons. Area	Cons. Comm. / Open Space Committee	Passive Recreation, haying, wildlife Mngt.	Excellent	Potential for HC accessible trail to be added.	LAND grant, CPA funds, private donations and found.	Open to public for multi-use recreation passive but no ATV's or motorized bikes	Res./Ag	Permanently protected under Article 97.
Sharron Cons. Area	Cons. Comm.	Passive Recreation	Undev. for recreation	Excellent potential for trails and wildlife Mngt.	Donation through Cons. Land Tax Credit Program	Open to public for multi- use passive recreation but no ATV's or motorized bikes	Res./Ag	Permanently protected under Article 97.

5.5.2 Conservation Restrictions

According to the Assessor's office there is only one 30 acre parcel of land that has a permanent conservation restriction other than the APR property noted above. As also noted before, several parcels of land are presently being conserved through the Forest Legacy Program and the number of private conservation restrictions is likely to increase in the immediate future.

North County Land Trust (NCLT) owns the 67 Underwood Road Conservation Area. This land was donated to them and NCLT is in the process of acquiring a conservation restriction on the property through the Forest Legacy program.

5.6 Historic Preservation Interests

Hubbardston does not have any conservation or recreation property restrictions with regard to historic preservation. Some of the town's sites of historic interest enjoy *de facto* protection because they are located within the boundaries of areas which are already permanently protected. For example, locations of now-buried pits dating from the town's early mining industry (copperas, an iron-sulfur substance used in making dyes and inks, a wood preservative, and disinfectant for privies), are located on either DCR or state forest properties.

Similarly, much of Hubbardston's extensive network of early mill sites is now within the confines of DCR watershed protection property. Most of the mill site dams and structures were destroyed during severe storms and floods in the 1930s or were dismantled or deteriorated after DCR (formerly MDC) took ownership of land within the watershed, but a few remnant sites remain. Hubbardston's Historical Commission is currently embarking on an ambitious project of marking and documenting the old mill sites, and there has been some discussion about developing an interpretative trail encompassing at least one remaining mill pond that lies within the Mt. Jefferson Conservation Area/Hubbardston State Forest trail system.

Another historical landmark, The Big Rock, which is situated off New Templeton Road on private property, is of interest to town historians in terms of protection because of its long tradition as an object of interest. Because of its enormity and shape, with a circumference of about 100 feet, the rock has been a scenic attraction in Hubbardston since at least the 19th century. Funds for purchase of a small piece of land surrounding the rock, should the landowner wish to sell, have not been available. Gary Kangas, a local historian, reports that there has been some preliminary discussion with the landowner regarding donation of the land and construction of a narrow, boulder-gated footpath, but no firm plan.

Also mostly within the boundaries of public lands are a series of natural caves which may have been used by early indigenous peoples of the region. There are indications that at least one of these caves (just over the town line in Templeton, off New Templeton Road) was altered by people, possibly traders and prospectors in the 1600s who were searching for gold. It is also speculated that some caves were used as prospecting and camp sites by transient miners while the copperas mine pits were in operation. Also found amongst the rocky outcroppings in the area is one excavated underground trench/chamber covered with heavy, flat stones, a very old man-made construction of unknown origin and purpose, but possibly a type of cool storage chamber or root cellar.

The old barn in the Pinecrest area of Hubbardston is also of historic interest with regard to open space lands, although it is on privately-owned open space land.

5.7 Public Parcels

The great majority of protected open space lands in Hubbardston which are conservation and recreation assets are public lands. The majority of this acreage is Department of Conservation and Recreation (DCR), Division of Water Supply Protection, formerly MDC. These properties offer many recreational opportunities, but because the major purpose of land protection by DCR is for water quality protection, certain activities such as snowmobiling, mountain biking and horseback riding are regulated, restricted to designated tracts of land, or prohibited.

5.7.1 Hubbardston Wildlife Management Area

The Hubbardston Wildlife Management Area, leased from DCR, comprises 600 mixed acres of forest, field, and upland and encompasses Cunningham Pond, a portion of Joslin Brook, and adjoining marshland. The primary purpose of the property is game management and hunting, but other passive uses are allowed.

5.7.2 Hubbardston State Forest

Hubbardston State Forest, which comprises about 1,211 acres, is a section of public land is managed by DCR Mass Parks (formerly DEM). There are more allowable uses on this property and, as it abuts the Mt. Jefferson Conservation Area, the Open Space Committee has worked closely with Mass Parks to improve the trail system within the area.

5.7.3 Division of Fisheries and Wildlife 95 Acre Parcel

The Division of Fisheries and Wildlife owns a 95 acre parcel of land in the center of town that has road frontage on Williamsville Road and Parsons Road. At least one old historic trail runs through the property but it was flooded due to beaver activity in recent years.

5.7.4 Barre Falls Dam Area

The Barre Falls Dam and DCR Ware River Watershed contain approximately 23,000 acres located within the towns of Hubbardston, Barre, Oakham, and Rutland. The U.S. Army Corps of Engineers owns and manages the dam itself and some immediate surrounding acreage. The area owned by DCR offers many recreational opportunities: canoeing, bike riding, picnicking, hunting, fishing, hiking, sightseeing, horseback riding, cross-country skiing. The area around the dam owned by USACE has more managed recreational opportunities such as a large picnic area, horseshoes, an 18-hole disc golf course and restrooms. A carry-down canoe site is located near the dam and many other canoe access areas are located on the Ware River above and below the dam. The Barre Falls Dam area is crossed by the Mid-State Hiking trail and has a picnic and restroom area. The recreational benefits offered at this site are an "extra dividend" to the main purpose of this flood damage reduction project.

Maps of the Barre Falls Dam and Ware River Watershed are available, most easily accessed on the Internet. Maps of the Mt. Jefferson Conservation Area/Malone Road/Hubbardston State Forest interconnected system of trails are available at the area trail heads, on the town website, at Millennium Park, and at several other town facilities. A copy of this map can be seen in Appendix D.

5.7.5 Fitchburg Water Department Land

Another parcel of open space which is protected but which is somewhat limited in terms of recreational access is protected land around Mare Meadow Reservoir and Bickford Pond, both owned and managed by the Fitchburg Water Department as public water supplies. Recreational use allowed on these properties is similar to that of the Ware River Watershed.

5.8 Recreational Uses on Existing Open Space / Public Land

Following are descriptions of various allowed/ not allowed uses of Hubbardston's open space resources. It is important to note, and is reinforced throughout the list of activities, that the Department of Conservation and Recreation Division of Water Supply Protection regulates public access to all DCR water-control management property in town. The Ware River Public Access Plan was developed in 1988 and updated in 2000 and again in 2010 in order to protect public water supply lands.

5.8.1 Prohibited Uses

General public access is allowed in designated areas only. Any activity which injures or defaces State property is strictly prohibited. Prohibited uses include:

- Operating ATVs, dirt bikes, ORVs, etc.
- Fires and cooking, including with gas grills
- Operating personal watercraft/jet skis
- Trail marking/advertising
- Trail clearing
- Possessing alcoholic beverages
- Collecting/metal detecting
- Target shooting

5.8.2 Hunting and Fishing

Hunting and fishing are two popular activities which are dependent upon Hubbardston's open space resources. All DCR properties, the Mt. Jefferson and Malone Conservation Areas, the Hubbardston Wildlife Management Area (owned and managed by Massachusetts Department of Fish & Wildlife, or Mass Wildlife) and Hubbardston State Forest allow licensed hunting and fishing in season.

Barre Falls Dam and the Ware River Watershed allow shoreline fishing and hunting with certain restrictions.

Comet (Asnacomet) Pond, a 127-acre cold water pond with public access and a town beach, has long been one of the most popular trout ponds in central Massachusetts. The shoreline is more than 50% developed with year round homes and summer cottages, but the area remains generally scenic. The water is exceptionally clear with a transparency of approximately 25 feet. This pond is extremely infertile and there is very little aquatic vegetation.

Boat access is provided by a paved ramp just off Route 62. There is also good shoreline access here, extending for some distance up the southeastern shore. A paved parking lot adjacent to the ramp has space for 25 or more cars. In the spring and fall, shore access is also available at the town beach entrance off Route 68.

5.8.3 Horseback Riding

Different state agencies have different policies concerning horse trails on state lands. DCR Division of Water Supply Protection (i.e., 350 CMR 11.00) has had designated trails on lands in the Ware River Watershed since a public hearing in 1988. In 2000, these trails were revised and reduced in the Public Access Management Plan Update. The Access Plan was updated again in 2010 but with no change in horse access. A map of the designated trails is available at all libraries and town clerk's offices in the watershed, the State library, and the maps are available through the Ware River watershed map page on the Internet. Horseback riding access is allowed on DCR/MWSP Designated Horseback Riding Roads and Trails only in the Ware River Watershed and according to specific restrictions (e.g. no riding during mud season, permit required for group rides of 15 or more, no watering of horses in tributaries, etc.). The Designated Horseback Riding Roads and Trails Map is available from the Quabbin Visitor Center, Ware River Field Office and the DCR/DWM web site.

Horseback riding is prohibited at Barre Falls Dam. It is permitted at the Mt. Jefferson and Malone Road Conservation Areas, Hubbardston State Forest, and some trails within the Hubbardston Wildlife Management Area.

Although riding during mud season is restricted on DCR/ Ware River Watershed property, it is not specifically restricted at the Mt. Jefferson and Malone Conservation Areas or within the state forests.

5.8.4 Bicycling

On DCR and other public lands within the Ware River Watershed, bicycling—generally mountain-biking—is permitted on designated roads and trails. There are some areas at Barre Falls Dam which are gated and prohibit bicycle use during mud season. There are no designated bicycling trails on watershed land in Hubbardston. Bicycling is allowed at the Mt. Jefferson and Malone Road Conservation Areas and the State Forest. Individual judgment must be exercised with regard to riding trails during mud season.

It is worth noting here that bicycle enthusiasts have been using many trails in the Barre Falls Dam area of the Ware River Watershed for many years without realizing that they were not designated trails. Recently DCR has become aware of this and has made a point of closing these trails to cyclists. As noted above, Hubbardston has no official bike trails on watershed property.

5.8.5 Swimming

Hubbardston is fortunate to have a beach at Comet (Asnacomet) Pond. Since Comet Pond is one of the state's Great Ponds, use of the beach and pond is open to all state residents. More than half of the 2014 Open Space questionnaire respondents stated that they had visited Comet Pond at least once per year, and many indicated that they frequently swim there. In the survey for this updated plan, the Comet Pond beach was listed as one of the most frequently used recreation areas in the town in the survey for this updated plan. Swimming is prohibited at Barre Falls Dam and within the boundaries of the Ware River Watershed Reservation.

5.8.6 Snowmobiling

Snowmobiling is a popular winter-time activity which requires open space. Many residents make use of private properties at their

disposal, but within Hubbardston there are very few public trails open to snowmobile use. The Mt. Jefferson and Malone Road Conservation Areas and the Hubbardston/Templeton State Forest permit snowmobiling although there are no official snowmobile trails. Snowmobiling is allowed on designated trails within designated sections of the Ware River Watershed, but with one small exception, these areas are outside of Hubbardston town boundaries. A portion of the DCR Rail Trail passes through Hubbardston's northwest corner near Williamsville Pond. Stewarded to a great degree by the Cold Brook Snowmobile Club, the abandoned rail bed is a popular snowmobiling route.

5.8.7 All-Terrain Vehicle Riding

Within the boundaries of Hubbardston, there are no public trails allowing the use of all-terrain vehicles. They are not allowed on any MDC/DCR property or state forest land in Hubbardston or at the Mt. Jefferson and Malone Rd Conservation Areas. The use of off-road/all-terrain vehicles on public lands within the Ware River Watershed, including the Corps of Engineers acreage at Barre Falls Dam, is also prohibited.

Although ATV/ORV use is prohibited on the aforementioned DCR Rail Trail, it should be mentioned that the old rail bed is often used by ATV/ORV riders. Illegal ATV/ORV use is a persistent problem with many land owners and open space managers. In the last two years great damage has been caused to several fields and the parking area of the Mt. Jefferson Conservation Area by licensed trucks driven by people who enjoy making "donuts" in the mud. While at least one person was caught and did repair the damage, others have not been found. At the time of this report the Open Space Committee is discussing ways to prevent future truck damage.

5.8.8 Boating

Motorized boating is allowed on two of Hubbardston's water bodies. Motorboat access from DCR/MWSP lands in Hubbardston in the Ware River Off-Reservation is allowed with these restrictions.

- Motorboat access facilities (ramps) are provided only on DCR/MWSP lands at Brigham Pond and Comet Pond.
- Boat motor size off these ramps is limited to 20 hp (2 stroke) and 25 hp (4 stroke).

Non-motorized boating is allowed on waterways in the DCR/DWM region. Many residents enjoy using canoes or kayaks on Hubbardston's ponds and streams. There is an access point for non-motorized watercraft at Moosehorn Pond located off Healdville Road. An unimproved boat access point to Brigham Pond is located at the south end of the pond off of Route 68. Williamsville Pond has private access, and rustic access of the west side by means of portaging along the old railway bed is possible. Canoeing and kayaking are permitted through a designated section of the Barre Falls Dam area.

5.8.9 "Foot based" Recreational Uses

Miscellaneous recreational uses of public lands by Hubbardston residents include hiking, walking, snow-shoeing, cross-country skiing, dog-walking, bird watching, nature study and photography, etc. These activities, because they are by foot access, are permitted on all public lands. With regard to dog-walking or hunting with dogs, the DCR/DWM requests visitors to pick up and properly dispose of fecal waste within 100' of any brook, stream, pond, or other surface water.

Walking and/or running is also encouraged at the Curtis Recreation Field where a paved walking path encircles the central playing fields. This path is not plowed in winter and dogs are not permitted at all on the recreation field. The Informal Trail Inventory Map for the town (Figure 21 (Map 11)) which identifies current multi-use formal and informal trails, as well as potential trails, was developed and continues to be used as a planning tool by the Open Space Committee. The Formal Trail Inventory Map (Figure 22 (Map 12)) shows trails that are actually approved for public use as of 2014. The Open Space Committee, in partnership with local businesses, has printed a trail map of the Mt. Jefferson/Malone/Hubbardston/Templeton State Forest. Maps are available at the parking areas of the conservation areas and at various locations within the town.

It should again be noted as part of this plan that the vast majority of public, open land in Hubbardston is owned by the DCR Division of Water Supply Protection. While many residents are under the impression it is open to the public for all uses that is not the case. Uses such as snowmobiling, horseback riding and mountain biking are only allowed on designated trails. There are actually very few of these designated trails within the town. While hiking, hunting and dog walking is currently allowed on all DCR property it is not far from the realm of possibility that these activities could be banned on DCR land in Hubbardston. Consider that dogs are not allowed in the Quabbin or Wachusett watershed and there is absolutely no public access allowed in Worcester Reservoir lands.

At the time this plan is being written, mountain bike enthusiasts are meeting with DCR officials in an attempt to keep trails open in Rutland that they have used for many years. Given that such a high percentage of Hubbardston's open lands are owned by an entity that has the ability to close them to all types of public access, residents would be wise to pay attention to public access issues within the watershed and consider supporting acquisition of town owned passive recreation areas which they can control.

5.8.10 Organized Recreation

Hubbardston's many organized youth sports teams make regular use of the playing fields at the Curtis Recreational Field. There is space for soccer and a baseball diamond and batting cage. Private baseball fields are also found at the Rod & Gun Club and on Barre Road. An enclosed skateboard park and children's play area are also at the recreation area. A basketball court will be constructed at the field in the spring of 2015 using CPA funds. There is also a small basketball court located at Hubbardston Center School.

In 2014 the town tennis court was removed from Center School and replaced with a playground with funds acquired from donations, CPA funds and a state grant. The Parks Commission hoped to replace the school tennis court by constructing a court at Curtis Field next to the proposed basketball court. Sadly their application for a PARC grant was denied and the project had to be scaled back to just a basketball court. The Parks Commission hopes to be able to replace the tennis court in the near future.

5.9 Summary

While almost 11,000 acres within the town are permanently protected, there are numerous significant tracts of woodland or other open space which remain unprotected from degradation or destruction. Over 3,600 acres has been afforded some measure of protection through Chapter 61 tax programs, but those properties too are subject to sudden changes. Hubbardston is located on the very edge of the Boston metropolis and the next wave of building could have great impact on the town.

Due to Hubbardston's vital location within important water quality protection areas, residents are fortunate to have the recreational benefits that exist. The vast acreage owned by DCR and within the Ware River Watershed is permanently protected open space but it should be remembered that recreational uses are controlled by DCR and can be prohibited at any time.

Hubbardston residents may take advantage of a wide array of recreational activities, ranging from individual outdoor challenges and pursuits on both public and private property to team or group sports under the auspices of the Parks Commission. Many residents are fortunate to have undeveloped areas, woodlands, or fields inviting unrestricted foot access "right out their back doors." Allowed uses, even in the highly-regulated Ware River Watershed, are many.

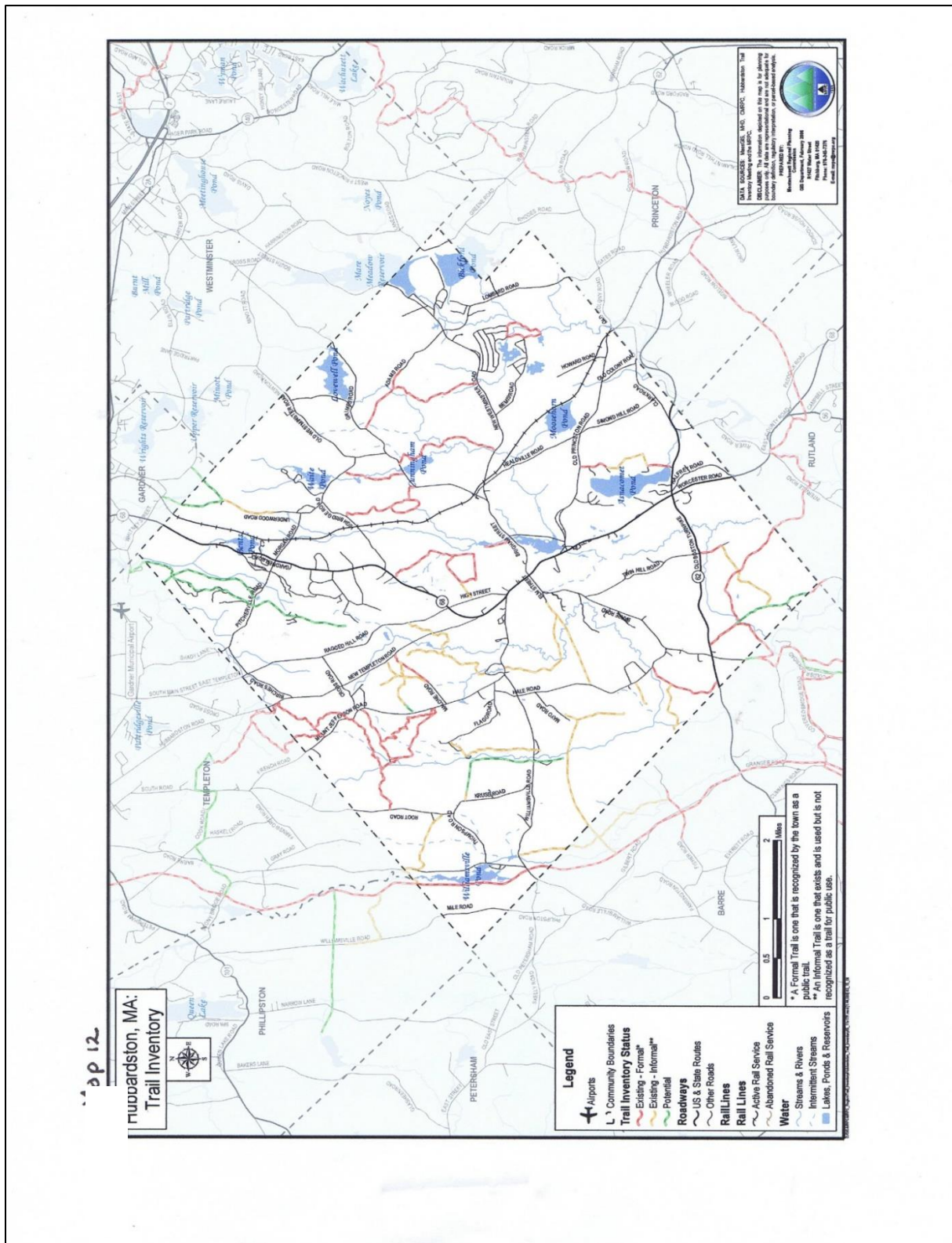


Figure 21 Informal Trail Inventory Map

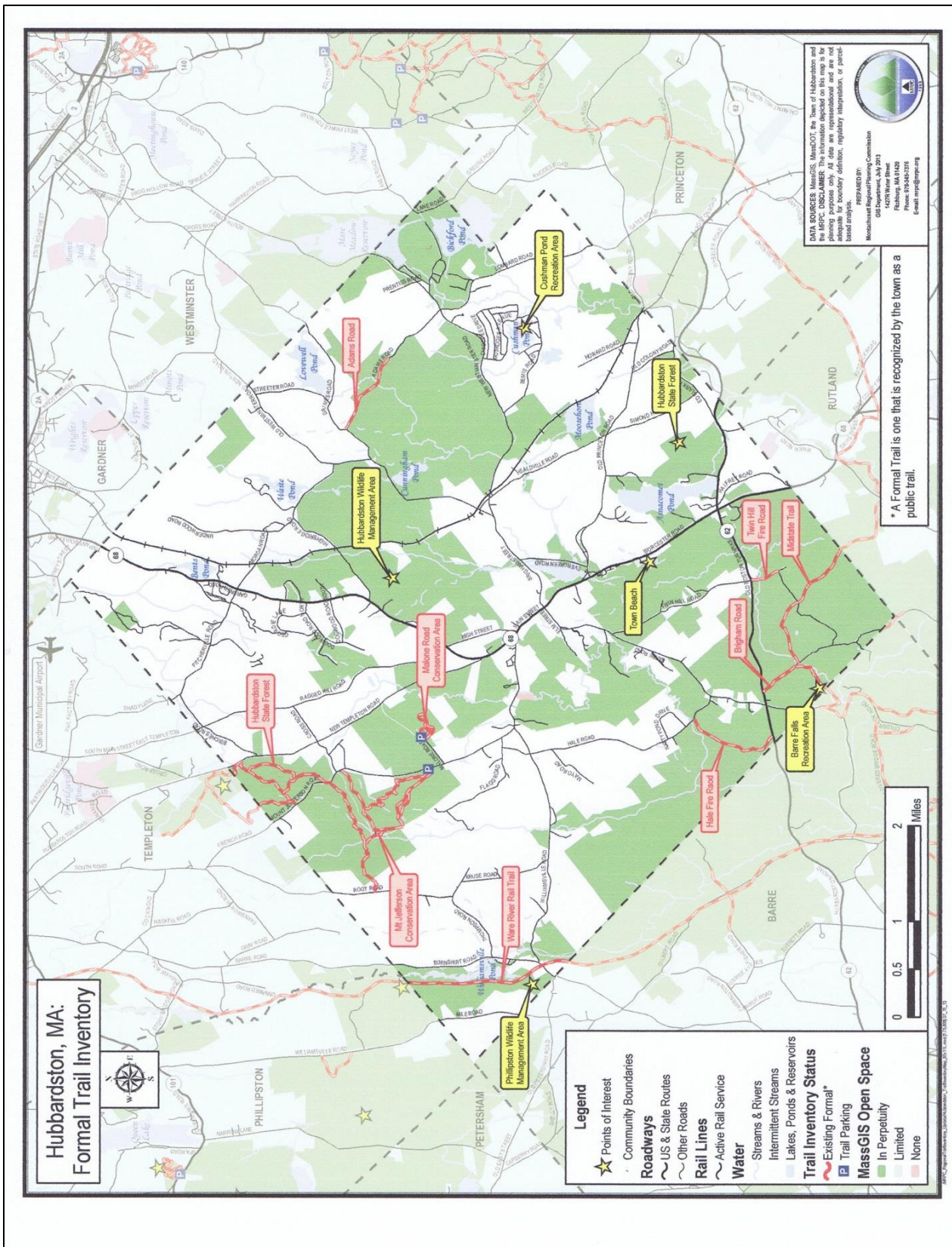


Figure 22 Formal Trail Inventory Map

Section 6: Community Vision

6.1 Open Space Plan Process Description

After the adoption of the 2001 Open Space and Recreation Plan, the town voted to form an Open Space Committee (OSC) whose mission would be to facilitate the implementation of that plan. Since its formation the OSC has used the goals and objectives set forth in both the 2001 and the 2006 plans as guidance for its work over the past fourteen years. As noted in Section 2: with the cooperation of other town boards and the overwhelming support of town residents and volunteers, many of those goals have been met, and others have at least been addressed to some degree. There is much work yet to be done, however, and this updated plan will be used as a guide for the next 5 years.

As a first step in updating the plan the Open Space Committee once again arranged to have a community survey made available to all town residents. The survey included questions generated by both Open Space Committee and the Agricultural Commission. The survey was put on Survey Monkey and residents were made aware of it through the Town News email, a notice on the town website and advertising in the Barre Gazette and the Gardner News. Paper copies were also made available at numerous locations throughout the town such as the library, town offices, post office and places of business. A copy of the survey file can be found in Appendix A. [Opening this embedded file will permit viewing the survey results.](#)

The survey generated 131 responses, 106 of which were from Survey Monkey and the remainder of which were paper copies returned to the town office. The results were tabulated and displayed graphically for ease of interpretation. All hand written comments were tracked and recorded. The information was then scrutinized carefully by the Open Space Committee and the Parks Commission and the results were integrated into the new goals, objectives and seven year action plan. In addition, the author of this plan visited the Parks Commission, Conservation Commission, Planning Board and Select Board for their comment and suggestions. Many other town departments were contacted for information including the Assessors, the DPW, and the Council on Aging, the Tree Warden, and the Board of Health.

6.2 Open Space Recreation Goals and Objectives

In the survey of the 2001 Open Space Plan respondents indicated that what they liked best about living in Hubbardston was the amount of “wild” open space and the rural atmosphere. The population of Hubbardston has increased considerably since 1999. In spite of that growth, 89% of the 2014 survey respondents responded that the thing they like best about living in Hubbardston is the “rural atmosphere. Written reasons indicate that people love the small town feeling, the peace and quiet and the access to trails and woods. It is clear that many residents would like to see that the town’s fields and forests remain the dominant landscape features and that the “small town” friendly, atmosphere prevails.

There is continued overwhelming support for zoning changes that will protect open space and for town support acquisition of land. It should be noted here that there is only support of town acquisition of land if it is paid for with grants and CPA funds. There is little support if these funds are not used. There is a continued positive outlook on permanently protecting more of our fields and forests for conservation, wildlife management and water protection. When asked what additional recreational activities people would like to see the highest demand was for bike trails closely followed by hiking trails. The 2006 survey also indicated there was enthusiastic support for more bike trails in the area. Once again it should be noted that DCR/DWSP is actively restricting the use of bikes within the Ware watershed.

The “big picture” for Hubbardston indicates that the town seems to be on the right track with regard to balancing the need for undeveloped open space with the desire for growth. Both have proceeded at a moderate and cautious pace in an effort to ensure that the character of the town will not be drastically changed. Citizens continue to enjoy and use existing open space and parks in town, supported passage of the CPA and say that they choose to live in the community because of the rural landscape. That survey respondents felt inclined to make specific suggestions about some recreational opportunities that are missing, as opposed to making sweeping generalizations about the need to prevent encroaching sprawl, for example, seems to indicate that many residents are comfortable with the current balance in land use.

When asked about zoning changes the majority of respondents who are aware of zoning continue to favor no change in the current zoning. However, when asked what kind of businesses they would like to see, two responses stood out – more restaurants and more agricultural businesses. A large number of respondents also wanted to see restaurants in the center of town but many people also specify not the fast food variety!

In light of the positive attitude toward agricultural businesses it is interesting to note that Hubbardston has seen a resurgence of agriculture in recent years. This resurgence is indicative of an increase in small farms and an awareness of local food production

statewide. There are now several farms producing meat, fruit and vegetables in addition to lambs' wool and alpaca fiber. Anecdotal information indicates that there may also be plans for blueberry and small fruit production on at least two properties. With droughts that have been called "catastrophic" occurring in California where so much of the nation's food is produced, all Massachusetts residents would be wise to protect the farmland that remains in the area.

An "ideal" five-year plan for Hubbardston should continue seek to strike a balance between inevitable residential growth and protection of the town's treasured open spaces, small farms and historical properties. With careful planning, it is possible to plan suitable location of new development while preserving critical parcels of land.

Section 7: Analysis of Needs

7.1 Survey Inputs

When asked which preservation issues concerned them the most survey respondents indicated that they were about equally concerned with the preservation of historic places, farmland, open space for conservation, open space for water protection, open space for wildlife habitat and open space for recreation. The preservation of farmland was considered slightly more important than anything else with 70% considering it the most important, while open space for recreation was considered the least important with 54% ranking it first. Overall the responses were relatively the same.

7.2 Resource Protection Needs

7.2.1 Water Resources

Nearly all of Hubbardston's water resources are critical to the drinking water supplies for many Massachusetts residents. Most of Hubbardston lies within the Ware Watershed which is part of the larger Quabbin Watershed. Mare Meadow Reservoir and Bickford provide drinking water for Fitchburg and the City of Gardner's Snake Pond Well is recharged from the ground water in the Millers River Watershed section of Hubbardston. Watershed protection will continue to be of critical importance but, historically, little attention has been paid to the Millers River Watershed. In prioritizing land for future protection the Open Space Committee has given those parcels that were important for water protection high priority. Partnerships with DCR and the City of Fitchburg have provided excellent opportunities for pooling resources for protection projects. DCR is currently funding land appraisals and holding CR's for the Q2W Forest Legacy project that is underway at present. The City of Fitchburg is involved in at least one CR acquisition as part of Q2W. Future partnerships with DCR, the City of Fitchburg in addition to the City of Gardner, may continue to provide excellent opportunities for pooling resources in future protection projects.

7.2.2 Agricultural Farmland and Forest

With the resurgence of local agriculture, the town should continue to focus on protecting its remaining farmland and even forest land that may contain prime agricultural soils. See Map of Prime Agricultural Soils Figure 23. Not only is there a growing demand for local food but water scarcity in the agricultural lands of California and Arizona may make locally grown food an absolute necessity in the future. Agriculture also supports the local economy with jobs on farms and related businesses such as farm supplies, grain, equipment and animal care. In the Open Space survey residents indicated that they would like to see more agricultural businesses within the town, surpassed only by the desire for more restaurants. The Land Protection Priority Map has always indicated farmland with a high priority for protection and the town should continue to support Agricultural Preservations Restrictions and other farmland protection whenever possible.

It is important for the town to maintain current levels of land use regulation and protection, much of it state-mandated, and cooperate with further land protection efforts. With regard to future land use protection, there are many gaps in the public trail system in Hubbardston. Many important greenways and recreational trail links cross private land. There is a need to work with landowners to connect existing trails through land acquisition/easements or appropriate zoning bylaws.

7.2.3 Public Green Space

The town is fortunate to have hundreds of acres of public green space as noted in Section 5: but many residents continue to be unsure of where they may access the trails. Detailed maps have been made of trails in and around the Mt. Jefferson/Malone Conservation Areas but a town-wide trail map would be helpful to residents and visitors alike. The Forest Legacy program encourages public access to parcels conserved with its funds so Hubbardston can expect many new public points of access to trails that are not yet mapped. The Massachusetts 2012 Statewide Comprehensive Outdoor Recreation Plan (SCORP) survey showed that Massachusetts residents in general would like to see more recreational facilities within walking or biking distance from their homes. Hubbardston should concentrate on making trailhead access points in a variety of locations throughout the town.

There is a need for continued stewardship, maintenance, and care of the Mt. Jefferson/Malone Road Conservation Areas. These properties are subject to erosion from legal and illegal use and there is always room for improvement on the existing trail system, parking and picnic areas. Illegal driving of trucks and resulting damage in the conservation area fields has been a major problem and cause for concern.

Illegal trash dumping and littering are ongoing concerns. Large items like furniture and appliances, demolition debris, and household hazardous waste end up on both public and private lands. This is a huge burden for Hubbardston and merits serious policy study and consideration.

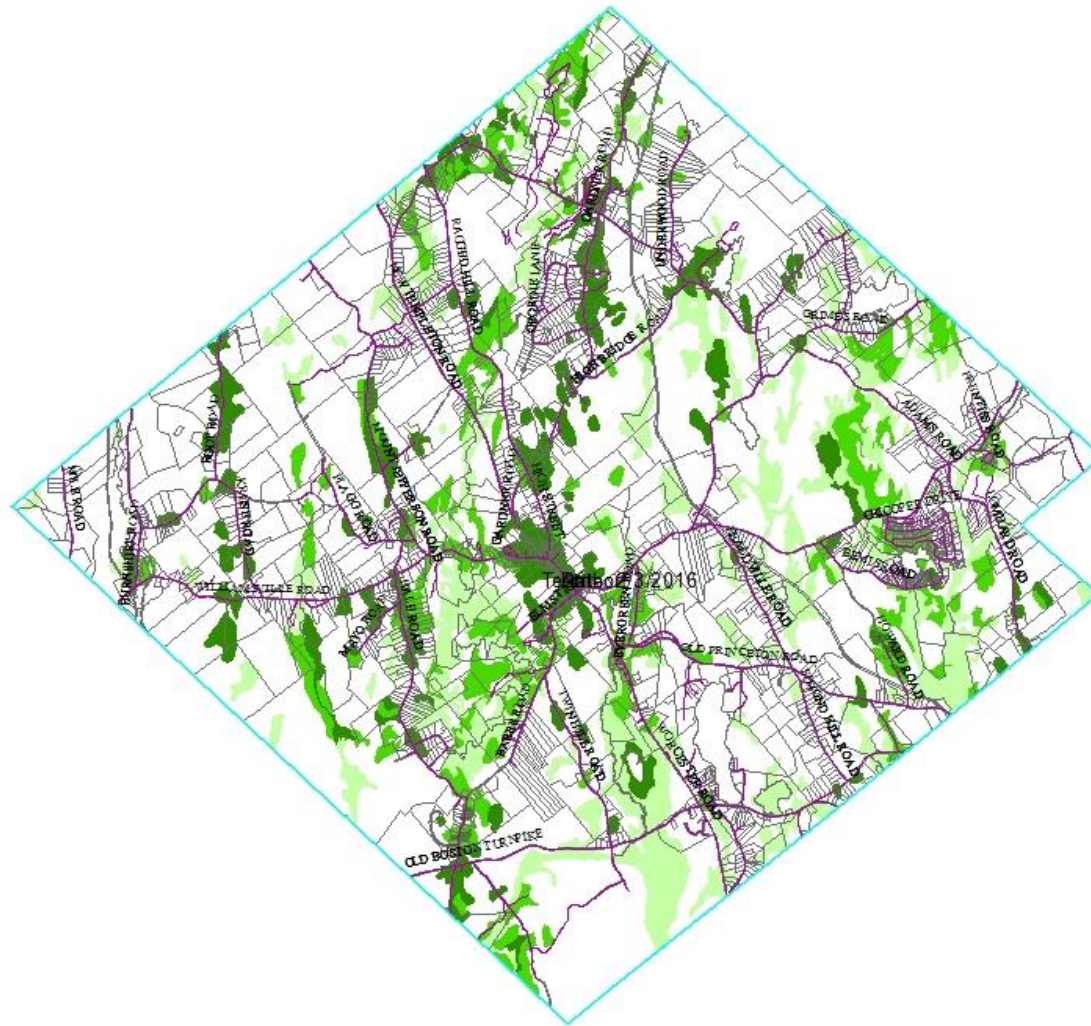
7.2.4 Invasive Plant Species and Insects

Hubbardston, like other communities, is home to a variety of non-native, invasive plant species. Removal or “knocking back” some of these species would improve the overall quality of existing open space. The town’s forests are in close proximity to the invasive Asian Long Horned Beetle. Residents should be alert for any sightings of these pests in the woodlands.

7.2.5 Historical Interests

At present, Hubbardston has no formal identification or protection system in place with regard to areas of historical interest lying within public lands’ boundaries. The town may wish to examine the possibility of enhancing and protecting these sites.

Hubbardston Prime Agricultural Soils



Legend

- | | |
|------------------------------|----------------------------------|
| Roads | Farmland of Statewide Importance |
| Assessors Parcels | Farmland of Unique Importance |
| All Areas are Prime Farmland | Town Boundary |



Figure 23 Hubbardston Prime Agricultural Soils

7.2.6 Zoning

Hubbardston has been proactive with many of its zoning by-laws in an effort to protect the rural atmosphere and environmental quality of the town. Zoning is only effective, however, when the zoning laws are followed by residents and business owners alike and when the town has the will and determination to ensure they are followed. Unfortunately it has become common knowledge within the town that zoning is not enforced and there have been, and continue to be, countless violations. The town has started to recognize the problem and limited funding has been allocated to address violations. This practice should be continued to protect the laws that the residents have voted in place to protect the town.

7.3 Community Needs

7.3.1 Statewide Comprehensive Outdoor Recreation Plan (SCORP) Highlights

7.3.1.1 Easy Access Simple Recreation Needs

Survey respondents indicated that they mostly desire to see more bike trails and hiking trails within the town. This is consistent with the 2012 SCORP which reads “The need for more trails, especially those closer to where people live, was most frequently mentioned as a real need across the state. There is a strong desire for more car-free recreation options, meaning options where a resident would not have to get in his or her car to access a recreational activity. Respondents want more town or city-wide trail systems, loop trails within long distance trail networks that can be completed in a shorter amount of time, and urban trails that connect to water bodies. Rail trails are popular, as is making roads more bike-friendly.”

The Statewide plan recommends increasing the availability of all types of trails for recreation. Examples include, but are not limited to: paved and unpaved trails that provide access and ability to participate in multiple different activities: running, jogging, and walking; hiking; biking; backpacking; and camping; increasing access to existing trails by making it easier for more residents to use them by creating shorter, intra-community loops and protecting land to lengthen existing trails; provide trails that provide corridors to wildlife and enable easier access to users for wildlife viewing. It is again important to note that DCR is actually reducing the number of trails for bicycles and prohibits making new trails in most areas within the Ware Watershed and so the importance of town owned land as a recreation source continues to be clear.

7.3.1.2 Aging Access Considerations

In considering recreation for future use it is also important to remember that the population of Hubbardston is aging. This too, is consistent with statewide numbers. According to the 2012 SCORP 46% of people over the age of 75 identify themselves as having disabilities. Trails that consider the aging population become important. According to SCORP, picnic areas and historic sites were the top two facilities favored for development among this group.

At the time this plan is being written the seniors in town are trying to raise funds to build a new senior center in the town. This is considered by many residents to be a high priority, especially with the aging population within the town. It is reasonable to consider that there may be a need for active recreation facilities associated with the new building. Claudia Provencal, Director of the Council on Aging, reports that it would be wonderful to have some walking trails for the physically challenged seniors, a horse shoe pit and a patio with a fire pit and BBQ area for outdoor evening activities.

7.3.2 People with Disabilities Access Considerations – ADA Assessment

The town Board of Selectmen has designated an ADA coordinator who will actively participate in continued efforts to improve accessibility for people with disabilities. That town employee is Laurie Reed, ADA coordinator.

At present, recreational offerings for persons who are physically challenged and/or wheelchair bound are limited, and efforts to improve this situation are being considered. The new playground at Center School does have an area for physically challenged children. The Open Space Committee has created a new trail at the Malone Road Conservation area that is accessible for the GRIT Freedom Chair, an all-terrain self-powered wheel chair that can be operated by mono- and para-plegics as well as certain others with limited functional use of their limbs.

Further investigation by this committee is planned on investigating the possibility of making this and other town trails more accessible for use by people with disabilities. Part of that investigation will involve sources of funding for these efforts.

The Open Space Committee is in the initial stages of a comprehensive ADA assessment. Our initial ADA inventory has been completed and is included in Appendix F. Using the sample provided in the Appendix G of the Open Space and Recreation Planners

workbook as a guide, a formal public grievance policy has been established by the Board of Selectmen and posted on the town website and town offices and buildings. This policy can also be found in Appendix F.

We are working with other boards and committees in town to address the requirements of Appendix G in the state's Open space and Recreation Planners Workbook. Most of the town owned lands do not lend themselves to physically challenged trails due to the significant elevation changes inherent in Hubbardston. However the, the Malone Road parcel does have significant potential , as noted in an earlier paragraph.

Malone Road is of prime interest for several reasons.

- Scenic beauty – it is located in a tranquil locations with several meadows, a hayfield, and overlooks. Note the trails to the overlooks are well beyond the scope of making ADA accessible, but other members of a group could take advantage of these.
- Newly installed bird houses
- Good parking
- Most important, the trails emanating from the parking area are wide and of relatively low gradients. Part of our continuing assessment will be to survey the trails to numerically assess the gradients to see if they comply with ADA requirements.
- Growth – the trail loop of prime interest lends itself to incremental development permitting the cost of implementing the trail to be spread over several years.
- An inherent aspect of the potential loop is it will permit the user to choose the length / time to complete.
- And now a Freedom chair accessible trail.

7.3.2.1 Equal Access Grievance Policy

The town officially adopted the following Equal Access Grievance Policy in July of 2019



EQUAL ACCESS TO FACILITIES AND ACTIVITIES

GRIEVANCE POLICY

Maximum opportunity will be made available to receive citizen comments, complaints, and/or to resolve grievances or inquiries.

STEP 1:

The Town Administrator or appointed ADA Coordinator will be available to meet with citizens and employees during business hours. When a complaint, grievance, request for program policy interpretation or clarification is received either in writing or through a meeting or telephone call, every effort will be made to create a record regarding the name, address, and telephone number of the person making the complaint, grievance, program policy interpretation or clarification. If the person desires to remain anonymous, they may.

A complaint, grievance, request for program policy interpretation or clarification will be responded to within ten working days (if the person making the complaint is identified) in a format that is sensitive to the needs of the recipient, (i.e. verbally, enlarged type face,

etc). Copies of the complaint, grievance, request for program policy interpretation or clarification and response will be forwarded to the appropriate town agency (i.e. park commission, conservation commission). If the grievance is not resolved at this level it will be progressed to the next level.

STEP 2:

A written grievance will be submitted to the Town Administrator. Assistance in writing the grievance will be available to all individuals. All written grievances will be responded to within ten working days by the Town Administrator in a format that is sensitive to the needs of the recipient, (i.e. verbally, enlarged type face, etc.). If the grievance is not resolved at this level it will be progressed to the next level.

STEP 3:

If the grievance is not satisfactorily resolved, citizens will be informed of the opportunity to meet and speak with the Board of Selectmen, with whom local authority for final grievance resolution lies.

EFFECTIVE DATE

This policy was adopted March 2019.

7.4 Restaurant Needs

While the majority of survey respondents don't want to see any change in town zoning it is very clear that there is a need for restaurants in town. Calico and Creme, a much loved Hubbardston restaurant and landmark, has closed its doors for the last time, meaning that need for a restaurant will be increased. There may be some town appetite (no pun intended) for amending zoning to accommodate such a business.

7.5 Protection of Agricultural Lands

Given that the overwhelming majority of survey respondents stated that they live in Hubbardston because of its rural atmosphere and large tracts of undeveloped land, it is not surprising that the majority also support protecting the town's natural resources and town acquisition of recreation land.

Development pressure on agricultural land continues to be high; in order to protect its remaining arable lands, Hubbardston must focus on reaching out to landowners, urging them to be proactive in preserving their land for future generations. Protection of agricultural land should also continue to be an important part of any zoning changes. Not only is an agricultural business the largest employer in Hubbardston but survey respondents rate agriculture as the second most desirable type of business to have in town after restaurants. Most of the scenic resources important to residents are associated with views only available due to agricultural land.

7.6 Open Space / Recreational Land Usage Statistics

Hubbardston residents make good use of their open space and recreational facilities. Consistent with the survey responses from 1999 and 2006, ponds, streams and bogs are the most frequently used facilities with 66% of the respondents saying they use Comet Pond Beach at least once per year. Other ponds and trails were used by 75% of the population at least once per year. Trails on DCR or town land were used by 70% of the respondents at least once per year. The recreation field walking path and ball fields are used by at least half of the population at least once per year. When asked what additional recreational facilities residents would like to, see the highest number of respondents mentioned bicycle trails, closely followed by hiking trails which is the same as the 2006 survey.

Noticeably fewer respondents wanted more developed facilities such as sports fields, a golf course, or children's play areas. It is also interesting to note that the highest percentage of respondents indicate a need for more recreational facilities for adults rather than children or teens which is different than in past surveys. This could be a result of the high use rate and popularity of the recreation ball fields and playground in addition to the new playground at Center School and the proposed basketball court at the Recreation Field. Building these new facilities seems to have filled the needs lacking five years ago.

The number of people using the Mt. Jefferson Conservation Area has increased from 49% in 2006 to 62% in 2014. This could be due to the trail maps that are distributed throughout the town, on the town website and at the picnic area. Many respondents stated that they would like to see additional hiking trails and town-wide trail maps might provide the necessary information. In addition, the promotion of various outdoor events, such as nature hikes, snowshoe walks, or bird watching field trips could help introduce residents to trails on public land.

7.7 Need for Nature Activities

It would be particularly advantageous to offer nature activities that would interest young children and teens. The 2012 SCORP says that many youngsters indicated their “preference to be on the internet over going outside.” The future of land conservation efforts depends on the youth of today to value conservation land in the future. Encouraging our youth to enjoy the outdoors for recreational pursuits not only encourages healthy exercise but also ensures land stewards for the future. The Open Space Committee plans to work with the Hubbardston Girl Scouts to tag monarch butterflies in 2016 but having an expanded nature program offered to our town’s youth is extremely important.

7.8 Improvement of Town Center

Many written comments on the questionnaire also alluded to improvement of the town common and town center and expansion of the library.

7.9 Management Needs

7.9.1 Funding Considerations

Many positive steps have been taken towards managing Hubbardston’s Open Space and Recreation facilities. Hubbardston has very limited funding, but the town’s commitment to preserving its character is evidenced by its establishment of the Fund for Hubbardston Preservation in 2003. Monies from fees charged to use town-owned facilities, hay leases, and timber harvest profits are deposited into the fund. The resulting monies can then be used for open space, recreation, or historic preservation efforts and projects. Further commitment to fundraising for open space and recreation was demonstrated with the town’s passage of the Community Preservation Act in March 2007.

CPA funds have been used in many open space and recreation projects since that time including open space acquisition and passive recreation improvements, the addition of a children’s playground and the proposed basketball court. The Open Space Committee opened a donation account which enables residents to donate money for trail improvements and businesses to donate money for trail maps.

7.9.2 Maintenance Considerations

The Parks Commission was formed in 2007 to consolidate the Parks and Recreation and Recreation Field Committees. The Department of Public Works was formed when the new town charter was adopted in January of 2013 and now oversees mowing of all public town recreation areas including the conservation areas. Previously the conservation areas were mowed by volunteers.

Maintaining all recreation facilities, whether they are passive, such as trails, or active, such as playgrounds and ball fields, requires many hours of volunteer work. The Open Space Committee and Parks Commission should continue to search for ways to tap into available volunteer resources and make better use of the town website volunteer opportunities page.

7.9.3 Growth Management

Many acres of land deemed “high priority” for protection from development by the Open Space Committee remain at risk of being lost if the settlement and housing boom of the 1980’s and 1990’s resumes. The town should continue to manage and guide growth through existing by-laws. Managed growth can then proceed at a pace which has more chance to be matched by open space and conservation protection efforts. Several properties noted on the priority protection map developed by the Open Space Committee, some of them abutting undeveloped public land, are at risk of being sold and developed into residential housing. At the time of this report (spring 2015), the Committee is actively pursuing acquisition of subdivided acreage abutting the Mt. Jefferson and Malone Conservation Areas. The previously mentioned Q2W project which is also ongoing will be enormously helpful in preserving key parcels using Federal funds.

The Open Space Committee is challenged to raise the funds needed to protect some key properties. It should continue to work with various landowners to protect priority lands through methods other than town acquisition by referring them to programs that allow

them to take advantage of state tax incentives for donations of land. Recent adoption of the Open Space and Senior Residential Bylaws allows for development while simultaneously providing protection of woodland, farm land, trails, and/or views. In addition, the implementation of conservation or agricultural preservation restrictions would allow continued private ownership along with protection of open space. It is likely that the Open Space Committee will continue to focus on facilitating these practical and realistic methods for land protection over the next five years.

Section 8: Goals and Objectives

The needs identified by this plan touch upon several different topics. Interest in preserving the town's rural character while accommodating its growth is ongoing. Goals and objectives for satisfying these needs overlap, but can be broken down into categories.

Preserving the rural character of the town is of uppermost importance. This goal involves continuing efforts to protect open space, encouraging town government toward sensitive land development and maintaining community support and involvement.

Three major environmental goals are water quality protection, wildlife habitat protection and farmland protection for numerous reasons explored in previous sections.

The need for continued and improved resource protection and ongoing stewardship of open space lands is present. The town's slow-but-sure residential growth likely will lead to increased use (and misuse) of the town's open space resources. It is hoped that the increased visibility of the Open Space Committee and the Parks Commission accomplishments will attract more community members to become involved with the management needs of the town's conservation areas and recreational facilities.

Another goal involves increasing and enhancing recreational opportunities on open space land, following ideas and suggestions from residents regarding needs. Some of the improvements and/or changes involve structured recreational facilities, while others focus on passive recreation.

In an effort to meet the overall goals and objectives, a seven-year action plan with specific tasks has been developed and follows in Section 9:

Section 9: Seven-Year Action Plan

Preserving Hubbardston's rural character and at the same time improving / enhancing the town's open space and recreation opportunities requires a grassroots, community-based approach. An ambitious action plan is required for attaining the goals and objectives noted in Section 8: and is summarized in Table 12 below.

Key parts of the plan include preserving and expanding permanently protected public open space. Figure 19 **Error! Reference source not found.** and Figure 20 Land Protection and Priority Map show current as well as high priority land that will be a focus of acquisition should funds and opportunity arise.

Figure 24 Action Plan Map, depicts the where actions identified in Table 12 Seven Year Action Plan are located.

Table 12 Seven Year Action Plan

Major Category			
Goals / Objectives	Action(s)	Schedule	Actionee (see Table 13 List of acronyms)
Land Protection			
<ul style="list-style-type: none"> • Protect water quality • Protect wildlife habitat • Protect agricultural resources • Enhance quality of life • Protect priority parcels 	1. Review and update the Land Protection Priority map as needed, based on upon changes in ownership, use protection status, character etc.	Yr 2	Open Space Committee (OSC)
	2. Continue to make connections and build relationships with landowners to encourage protection of priority acreage through: conservation restrictions (CR's); - landscape scale conservation projects such as Forest Legacy; - donations of land or CR's to take advantage of tax benefits or environmentally-sensitive development.	Yr 1 / Ongoing	OSC
	3. Continue building connections and relationships with land conservation organizations, land trusts, etc. Attend pertinent regional meetings	Yr 1 / Ongoing	OSC
	4. Encourage town to develop protective protocol for lands being removed from Chapter 61 status.	Year 1	OSC / Select Board (SB)
	5. Continue applications for relevant grants and funding as needed	Yr 1 / Ongoing	OSC
	6. Advocate for adoption of town bylaws that encourage environmentally friendly "green" development	Yr 1 / Ongoing	OSC / Planning Board (PB)
	7. Explore protection of Millers Watershed area in Hubbardston.	Yr 1 / Ongoing	OSC
Town-Wide Improvements			
<ul style="list-style-type: none"> • Increase and improve recreation opportunities • Protect water quality • Support balanced "green" development • Enhance open space protection 	1. Work with Parks Commissioner regarding specific developed recreation sites, such as possible ice-skating rink, opportunities for physically challenged and bicycle trails.	Year 3-7	OSC / Parks Committee (PC)
	2. Develop and map localized trail systems in different areas of the town. This may involve existing trails on state land, new trails on newly acquired land or trail easements to connect existing trails. Improve upon and add to the existing trail systems in the town, especially in the town owned conservation areas.	Ongoing	OSC
	3. Participate in Community Preservation Act fund allocation decisions. Town has approved CPA projects in each category	Ongoing	OSC / CPC
	4. Work with Planning Board to promote green and low-impact development as needed	Ongoing	OSC, PB
	5. Offer assistance in the event of town Master Plan update including incorporating suggestions from the Open Space survey.	As needed	OSC, SB
Community Involvement			
<ul style="list-style-type: none"> • Increase community involvement • Educate residents 	1. Sponsor and organize special events and field trips to expose residents to open space and recreational opportunities with particular emphasis given to youth.	Ongoing	OSC / PC
	2. Consider partnership with the afterschool program to encourage after school activities at the conservation areas.	Ongoing	OSC
	3. Hold public meetings and hearings regarding major land use goals and decisions on an as needed basis.	As needed	OSC

Major Category			
Goals / Objectives	Action(s)	Schedule	Actionee (see Table 13 List of acronyms)
	4. Post list of volunteer opportunities on website such as trail maintenance, leading educational events, etc.	Ongoing	OSC
	5. Post on website and publicize Open Space Donation account to encourage donations for general maintenance of open space areas.	Year 1	OSC
Trail and Open Space Land Improvement			
<ul style="list-style-type: none"> Enhance recreation opportunities on existing open space Increase community involvement Protect water quality Promote historically important sites 	1. Continue assessing, GPSing and mapping existing and historic cart paths and trails within the town; produce a town-wide trail map.	Year 1-7	OSC, HC
	2. Explore opportunities for new trailhead and trail systems around the town to encourage local use.	Year 1-2	OSC
	3. Create individual trail maps for new trailheads mentioned above	Year 3-5	OSC
	4. Explore opportunities for additional trails within the conservation area/state forest system e.g proposed Canesto Loop Trail.	Year 1-2	OSC
	5. Continue to repair, enhance, and maintain existing trails through volunteer and cooperative efforts.	Ongoing	OSC
	6. Explore possibility of including current and/or future trail and recreation maps with annual town report to increase awareness of existing opportunities.	Year 2	OSC, SB
	7. Continue partnership with Montachusett Regional Planning Commission and abutting towns with regard to region-wide trail system development.	As Needed	OSC
	8. Plan for and facilitate trail connections wherever practically possible. Explore opportunities to connect local trails into DEM Rail Trail.	Year 1-5	OSC
	9. Continue to explore appropriate funding opportunities for improvement of existing trails (culverts, bridges, etc.).	Ongoing	OSC
	10. Encourage and assist Historical Commission efforts to develop a mill pond/mill site interpretive trail within existing trail network; promote trail access to other significant historical sites	Year 2-5	OSC, HC, CPC
	11. Complete our ADA Assessment, develop an initial plan (including funding), if funding available, began an initial ADA trail.	Year 2-7	OSC, HC, CPC
Resource Protection and Enhancement			
<ul style="list-style-type: none"> Protect water quality Protect wildlife habitat Enhance existing open space 	1. Explore open space land plantings of Nonesuch apple trees and/or other fruit trees and plants beneficial to wildlife.	Year 2	OSC
	2. Encourage conservation and reclamation efforts at the Pitcherville gravel pits with regard to aquifer and wildlife habitat protection	Ongoing	OSC
Mt. Jefferson and Malone Road Conservation Areas Stewardship			
<ul style="list-style-type: none"> Enhance and improve existing open space 	1. Improve parking area with regard to location and drainage	Year 1	OSC, CC
	2. Address illegal ORV/ATV/truck use	Year 1	OSC, PD
	3. Address trash dumping and littering	Ongoing	OSC, HD, BH, SB
	4. Develop self-guided nature trail	Year 2-5	OSC

Major Category			
Goals / Objectives	Action(s)	Schedule	Actionee (see Table 13 List of acronyms)
	5. Involve and engage community in resource management (forests and fields) decisions and land use planning.	As needed	OSC
	6. Maintain and improve existing signs	Ongoing	OSC
	7. Develop H/C accessible trails	Year 2	OSC
Other Important Objectives			
<ul style="list-style-type: none"> Continue relationship with state forest Communicate with legislators 	1. Continue to foster relationship with local state forest administration and advocate for town open space needs relating to state forest funding and protection issues;	Ongoing	OSC, SFA
	2. Consider possible development of a “green” cemetery	Year 5-7	OSC, Cem, SB
Pursue Selected Educational Program Development			
Candidate Topics	1. Effect of pesticides on butterflies and bees	TBD	OSC
	2. Effect of pesticides on butterflies and bees	TBD	OSC
	3. Cave tours	TBD	OSC
	4. Firearm safety	TBD	OSC
	5. Wilderness survival skills	TBD	OSC
	6. Recycling	TBD	OSC
	7. Conservation land guided tours and trail walks	TBD	OSC
	8. Helping wildlife in your backyard	TBD	OSC
	9. Tracking	TBD	OSC

Table 13 List of acronyms

Acronym	Name / Organization
BH	Board of Health
CC	Conservation commission
Cem	Cemetery Commission
CPA	Community Preservation Act
CPC	Community Preservation Committee
CR	Conservation Restriction
DCR	Department of Conservation and Recreation
DPW	Department of Public Works
HC	Historical Commission
OSC	Open Space Committee
PB	Planning Board
PC	Park Commission
PD	Police Department
Q2W	Quabbin to Wachusett Forest Legacy Grant
SB	Board of Selectmen
SCORP	Statewide Comprehensive Outdoor Recreation Plan
SFA	State Forest Administration (Hubbardston group)

Action Plan Map

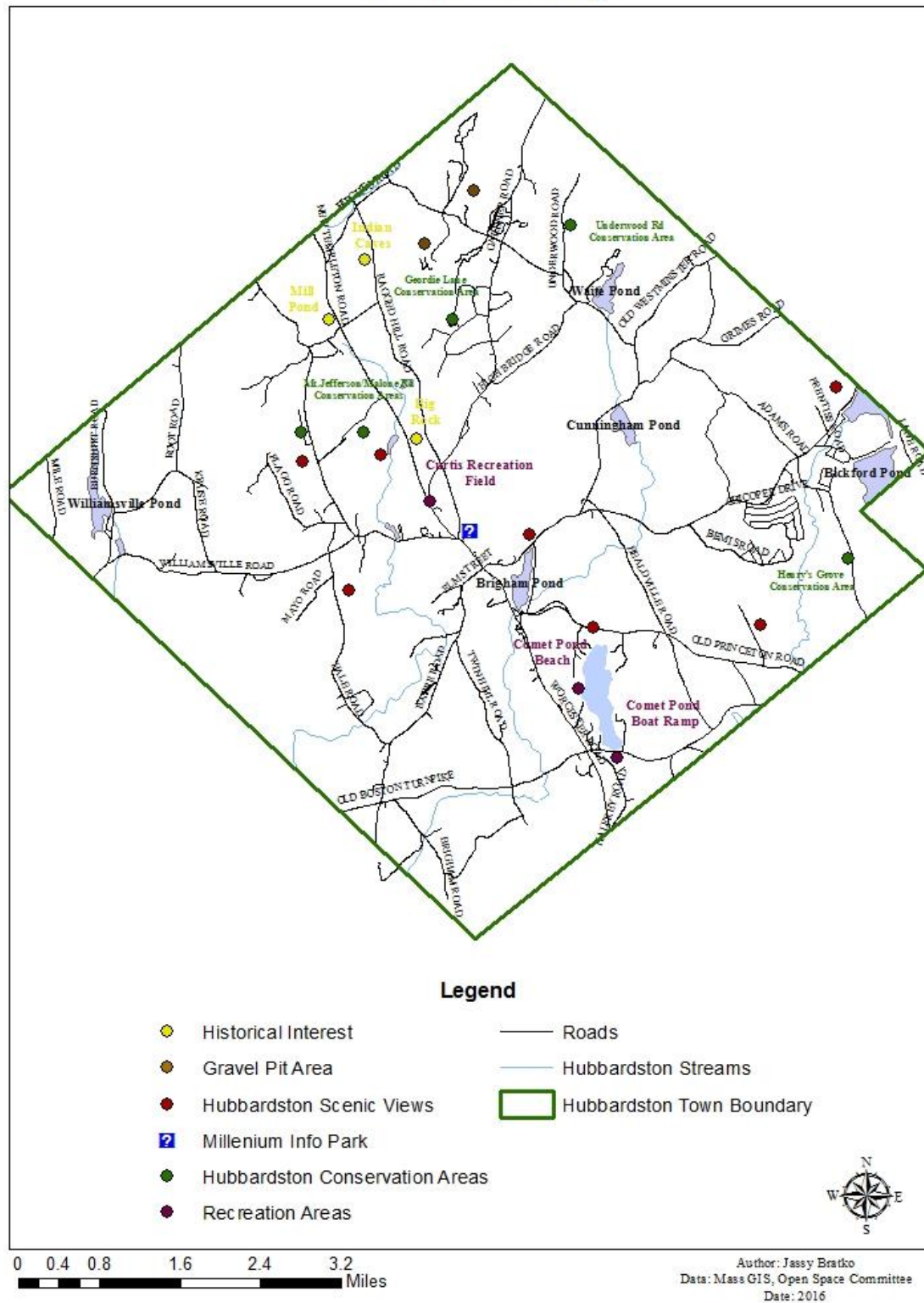


Figure 24 Action Plan Map

Appendices**Appendix A Town Survey Results**

Here-in is an attached PDF file which can be opened with any Adobe Reader. MS Word does not support incorporating PDF text directly into word. But the attached file can be easily opened and printed.



**Town Survey
Results.pdf**

Appendix B Buildout Projections and Methodology

Current Demographics and Buildout Projections			
	1990	2000	Buildout
Population	2,797	3,909	17,398
Students		871	3,874
Households	953	1,340	5,958
Water Use (mgd)*			1.246

*The Town of Hubbardston is on private wells

**Summary Buildout Statistics
(Additional Development and Impacts)**

Impact	Total
Additional Residents	13,489
Additional School Children	3,003
Additional Dwelling Units	4,618
Additional Residential Developable Land Area (sq. ft.)	491,704,077
Additional Residential Developable Land Area (acres)	11,288
Additional Commercial/Industrial Buildable Floor Area (sq. ft.)	3,118,914
Additional Water Demand (gallons/day)	1,245,612
<i>Residential Water Use (gallons/day)</i>	1,011,694
<i>Comm./Ind. Water Use (gallons/day)</i>	233,919
Additional Municipal Solid Waste (tons/year)	6,920
<i>Non-Recycled Solid Waste (tons/year)</i>	4,921
<i>Recyclable Solid Waste (tons/year)</i>	1,999
New Roads (miles)	105.02

Notes:

1. "Residents" at buildout is based on 2.92 persons/household (2000 Hubbardston average).
2. "School Children" at buildout is based on .65 students/household (2000 Hubbardston average).
3. "Developable Land Area" takes into account wetlands, certified vernal pools, 100-Year flood zones, river protection areas (0-100' buffer), watershed protection and aquifer recharge areas.
4. "Residential Water Use" is based on 75 gallons per person per day.
5. "Comm./Ind. Water Use" is based on 75 gallons per 1,000 square feet of floor space.
6. All solid waste estimates are for residential use only.
7. "Non-Recycled Solid Waste" is based on 730 lbs. per person per year.
8. "Recyclable Solid Waste" is based on 296 lbs. per person per year.
9. "New Roads" are based on the assumption that 60% of new residential lots will have required frontage on new roads and takes into account houselots on both sides of the road.

Methods

This buildout analysis is used to determine developable land area for residential, commercial and industrial zoning districts. Digital and hard copy data was collected. Digital zoning data was updated. Existing digital data was gathered from a variety of sources including MassGIS, the community, the Massachusetts Highway Department and federal sources. Zoning, open space, land use, hydrography, environmentally sensitive areas, wetlands, Rivers and Watershed Protection Act buffers, flood zones, slope, soil orthophotography, rail lines, road networks, and political boundaries were utilized to different degrees. Additional layers were created that include miscellaneous features determined to be undevelopable, an update of the most recent MacConnell Land Use, and subdivisions that were approved or built since 1988.

The developed land data is from the aggregated land use categories in the MacConnell Land Use layer provided by MassGIS. The aggregated developed land categories are spectator and water-based recreation, residential, commercial, industrial uses, transportation, and waste disposal. The GIS analysis consisted of subtracting layers from each zoning district. The remaining developable land area represented on MAP 2 is aggregated by zoning category.

To determine the number of future buildable residential lots by zoning district, a formula was developed to ascertain the land requirements of a typical lot in each district. The land requirements include minimum lot size, estimated road area (required frontage multiplied by half the right-of-way), and an additional 10% to cover miscellaneous variables such as odd lot shapes. Other environmental constraints were also taken into consideration including the 0-100' Rivers Protection Act buffer, the 100' 100-Year Floodplain buffer, the Aquifer Favorability Protection District, the 100' Wetlands Protection and Certified Vernal Pool buffers and the 0-200' Watershed Protection Act buffer.

Commercial and industrial buildable lots were determined using an "effective" floor area ratio. For each of the zoning districts, the major alternative land uses were examined in relation to height limitations, maximum allowable percent lot coverage and parking requirements. An effective floor area ratio (FAR) for all use categories (e.g. offices, warehouses) in a particular district was developed for analysis purposes. The effective FAR for the entire district was estimated by averaging the FARs for the various potential land use types. Limits placed on the total square footage of a building because of environmental constraints were also taken into account.

NOTES:

1. The Floodplain District and 50' buffer around all water bodies and water courses are absolute constraints.
2. The 0 - 100' Rivers Protection Act buffer and 0 - 200' Watershed Protection Act buffer are absolute constraints.
3. The land within the Aquifer Favorability Protection District yields 80% of the development potential of non-overlay areas.
4. Wetland areas and the 100' buffer around wetlands yield 80% of the development potential of non-wetland/wetland buffer areas.
5. The 100' buffer around the Floodplain District, all water bodies and water courses and Certified Vernal Pools yields 80% of the development potential of non-buffer areas.

Appendix C Traffic Count 2010

Following is Massachusetts traffic count statistics for many area towns, including Hubbardston.

Town	Road Name	Route Number	Location	Func. Class	Date	Raw Count	Factored Total
Ashburnham	Central Street	Rt 101	S. of Main St. N. (Rt 12)	R-5	7/7/2010	3,878	3,300
Ashburnham	East Ringe Road		At New Hampshire T.L.	R-6	7/7/2010	420	360
Ashburnham	Lake Road		S. of Sherbert Rd.	R-6	8/9/2010	1,998	1,700
Ashburnham	Main Street	Rt. 12	E. of Water St. (Rt. 101)	R-3	7/7/2010	5,097	4,500
Ashburnham	Main Street	Rt. 12	W. of Central St. (Rt 101)	R-3	7/7/2010	4,892	4,400
Ashburnham	Main Street	Rt. 12	W. of Water St. (Rt. 101)	R-3	7/7/2010	7,043	6,300
Ashburnham	Rindge State Road	Rt. 119	E. of Ashby Rd. (Rt. 101)	R-3	7/7/2010	4,434	4,000
Ashburnham	Rindge State Road	Rt. 119	W. of Ashby Rd. (Rt. 101)	R-3	7/7/2010	3,206	2,900
Ashburnham	Ringe Turnpike		At Ashby T.L.	R-6	7/7/2010	595	500
Ashburnham	Ringe Turnpike		S.E. of Ashby Rd (Rt. 101)	R-6	7/7/2010	570	490
Ashburnham	Water Street	Rt. 101	N. of Main St. (Rt 12)	R-5	7/7/2010	3,197	2,700
Ashburnham	Winchendon Road	Rt. 12	E. of Depot Rd	R-3	7/7/2010	3,301	2,900
Ashby	Damon Road		N. of Townsend Rd (Rt. 31/119)	R-0	7/6/2010	143	120
Ashby	Fitchburg State Road	Rt. 31	S. of Townsend Rd. (Rt. 119)	R-3	7/6/2010	5,991	5,500
Ashby	Main Street		N. of Greenville Rd. (Rt. 31/119)	R-3	7/6/2010	5,781	5,300
Ashby	Wares Road		E. of Fitchburg State Rd (Rt. 31)	R-0	7/6/2010	244	210
Ashby	West Road	R-6	N. of Main St. (Rt. 119)	R-6	7/6/2010	850	740
Athol	Daniel Shays Highway		N. of Partridgeville Rd	U-3	6/14/2010	6,890	6,000
Athol	Hapgood Street		W. of Chestnut St.	U-5	8/9/2010	3,572	3,200
Athol	South Street		W. of Exchange St.	U-5	7/19/2010	4,546	4,100
Ayer	Fitchburg Road	Rt. 2A	At Shirley T.L.	U-3	6/23/2010	7,657	6,700
Ayer	Groton School Road	Rt. 111	At Groton T.L.	U-3	6/23/2010	5,590	4,900
Ayer	Harvard Road	Rt. 110/111	S. of Carlton Circle	U-2	6/23/2010	14,339	12,500
Ayer	Littleton Road	Rt. 2A	At Littleton T.L.	U-3	6/24/2010	12,702	11,100

Town	Road Name	Route Number	Location	Func. Class	Date	Raw Count	Factored Total
Ayer	Old Groton Road		At Groton T.L.	U-6	8/4/2010	4,233	3,700
Ayer	Sandy Pond Road		E. of Central Ave	U-5	6/23/2010	6,360	5,600
Ayer	Sandy Pond Road		N. of Carlton Circle	U-5	6/23/2010	4,083	3,600
Ayer	Westford Road		S. of Nemco Way	U-5	6/24/2010	4,408	3,900
Clinton	Beacon Street		E. of Main St. (Rt. 110)	U-6	6/21/2010	956	860
Clinton	Berlin Street		S. of Chace St.	U-5	6/21/2010	8,529	8,529
Clinton	High Street	Rt 62 & 70	N. of Union Street	U-5	6/21/2010	5,869	5,200
Clinton	High Street	Rt 62 & 70	Btwn Prospect & Church	U-5	6/21/2010	7,385	6,500
Clinton	Oak Street		N.E. of Boylston St. (Rt 62&70)	U-5	7/26/2010	679	610
Clinton	Prospect Street		E. of High Street	U-0	6/21/2010	707	620
Clinton	Union Street		W. of High Street	U-3	6/21/2010	10,854	9,500
Clinton	Willow Road	Rt. 62	At Berlin T.L.	U-3	7/26/2010	3,615	3,200
Fitchburg	Beech Street		N. of Franklin Rd.	U-6	8/2/2010	1,839	1,700
Fitchburg	Causeway Street		N. of School Entrance	U-0	10/13/2010	821	760
Fitchburg	Crawford Street		S. of Airport Rod	U-5	8/2/2010	9,173	8,300
Fitchburg	Depot Street		N. of Fairmont St.	U-5	8/2/2010	4,484	4,000
Fitchburg	Franklin Road		E. of Depot St.	U-5	10/13/2010	5,627	5,200
Fitchburg	John Fitch Highway		Btwn The 2 Shopping Plazas	U-5	7/12/2010	18,887	16,800
Fitchburg	John Fitch Highway		N. of Bemis Rd	U-5	7/12/2010	18,798	16,700
Fitchburg	John Fitch Highway		N. of Lunenburg St. (Rt. 2A)	U-5	7/12/2010	12,337	11,000
Fitchburg	John Fitch Highway		N. of Pearl St.	U-5	7/12/2010	11,455	10,200
Fitchburg	John Fitch Highway		S. of Lunenburg St. (Rt. 2A)	U-5	7/12/2010	20,536	18,300
Fitchburg	Kimball Street	Rt. 12	E. of River St.	U-5	8/15/2010	9,370	8,300
Fitchburg	Kimball Street	Rt. 12	W. of Putnam St.	U-5	8/16/2010	8,367	7,400
Fitchburg	Laurel Street	Rt. 12	W. of Water Street	U-5	7/15/2010	13,810	12,300
Fitchburg	Lunenburg Street	Rt. 2A	E. of John Fitch Highway	U-5	7/12/2010	18,471	16,500
Fitchburg	Lunenburg Street	Rt. 2A	W. of John Fitch Highway	U-3	7/12/2010	14,123	12,600
Fitchburg	Lunenburg Street	Rt. 2A	N. of Main St.	U-3	7/15/2010	13,375	11,800
Fitchburg	Main Street	Rt. 2A	W. of Lunenburg St. (Rt. 2A)	U-3	7/15/2010	21,327	18,800

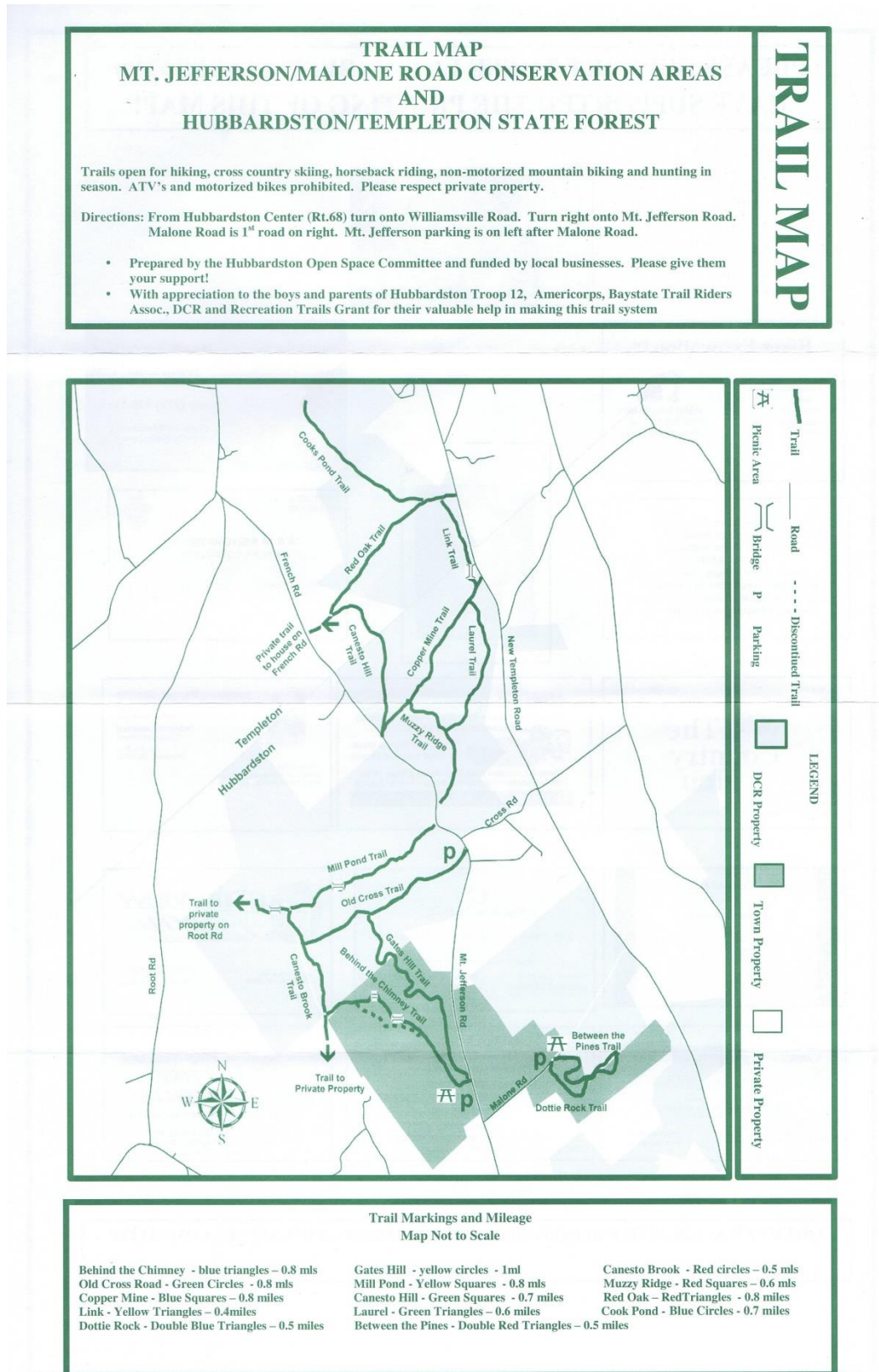
Town	Road Name	Route Number	Location	Func. Class	Date	Raw Count	Factored Total
Fitchburg	Main Street	Rt. 2A	E. of Pritchard St.	U-2	7/15/2010	13,511	11,900
Fitchburg	Main Street	Rt. 2A	Btwn Oliver and Pritchard St.	U-2	7/15/2010	10,947	9,700
Fitchburg	Main Street	Rt. 2A	W. of Academy St.	U-2	8/2/2010	11,150	9,700
Fitchburg	Mount Elam Road		N. of Damon Road	U-5	7/26/2010	1,159	1,100
Fitchburg	Mount Elam Road		S. of Rollstone Road	U-5	7/26/2010	1,421	1,300
Fitchburg	Oak Hill Road		W. of Pratt Road	U-6	8/24/2010	1,132	1,000
Fitchburg	Oak Hill Road		N. of Pratt	U-6	8/31/2010	1,506	1,400
Fitchburg	Pratt Road		E. of Oak Hill Road	U-6	8/16/2010	766	690
Fitchburg	Reingold Ave		N. of School Entrance	U-6	10/13/2010	907	840
Fitchburg	Reingold Ave		S. of School Entrance	U-6	10/21/2010	1,088	990
Fitchburg	River Street	Rt 2A,12&31	W. of Kimball St	U-2	8/2/2010	14,385	12,600
Fitchburg	Rollstone Road		S. of Franklin	U-5	7/26/2010	2,980	2,700
Fitchburg	Rollstone Road		N. of School Entrance	U-5	10/13/2010	4,938	4,600
Fitchburg	Rollstone Road		S. of School Entrance	U-5	10/21/2010	4,863	4,400
Fitchburg	South Street		N. of South Elementary	U-5	6/7/2010	10,671	9,600
Fitchburg	South Street		S. of South Elementary	U-5	6/7/2010	10,911	9,800
Fitchburg	South Street		N of Wanoosnoc	U-5	7/14/2010	18,838	17,100
Fitchburg	South Street		N. of Electric Ave	U-5	7/15/2010	10,806	9,600
Fitchburg	Summer Street		E. of Lunenburg Rd (Rt 2A)	U-5	7/15/2010	10,724	9,600
Fitchburg	Water Street	Rt. 12	N.W. of Benson St.	U-2	7/14/2010	17,439	15,400
Fitchburg	Water Street	Rt. 12	N. of Bemis Rd	U-2	7/15/2010	13,480	11,900
Gardner	Green Street	Rt. 140	N. of Pearl St. (Rt. 101)	U-2	9/21/2010	11,997	11,000
Gardner	Green Street	Rt. 140	N. of Matthews Street	U-5	9/21/2010	9,044	8,300
Gardner	Green Street	Rt. 140	N. of Green Street	U-2	9/21/2010	13,793	12,700
Gardner	Main Street		E. of Donlan St.	U-5	8/9/2010	13,104	11,600
Gardner	Pearson Boulevard		E. of Elm St	U-5	7/19/2010	17,327	15,500
Gardner	Rt. 140 (Bypass)	Rt. 140	S.E. of Pearl St. (Rt. 101)	U-2	9/21/2010	13,135	12,100
Gardner	Sand Street		N. of West St (Rt. 68)	U-6	7/19/2010	1,645	1,500
Gardner	Timpany Boulevard	Rt. 68	N. of American Legion Circle	U-5	7/19/2010	19,515	17,400

Town	Road Name	Route Number	Location	Func. Class	Date	Raw Count	Factored Total
Groton	Main Street	Rt. 111 & 119	N. of Pleasant St.	U-3	8/4/2010	15,143	13,200
Harvard	Ayer Road	Rt 110 & 111	S. of Rt 2 (Exit 38)	R-3	6/7/2010	7,989	7,000
Harvard	Ayer Road	Rt 110 & 111	At Ayer T.L.	R-2	6/23/2010	13,828	12,100
Harvard	Ayer Road	Rt 110 & 111	N. of Rt 2 (Exit 38)	R-2	6/23/2010	14,324	12,500
Harvard	Depot Road		Btwn Ayer Rd & Hill Rd	R-0	6/7/2010	442	390
Harvard	Fairbanks Street		Btwn Cross & Old Boston Tnpk	R-0	6/7/2010	331	290
Harvard	Littleton County Road		N. of Massachusetts Ave, (Rt 111)	R-0	6/7/2010	1,351	1,200
Harvard	Massachusetts Avenue	Rt 111	E. of Bolton Rd	R-5	6/7/2010	3,328	2,900
Harvard	Massachusetts Avenue	Rt 111	N. of Harvard Elementary School	R-5	6/7/2010	5,349	4,800
Harvard	Massachusetts Avenue	Rt 111	S. of Harvard Elementary School	R-5	6/7/2010	4,422	3,900
Harvard	Oak Hill Road		W. of Pinnacle Rd	R-0	6/7/2010	519	450
Harvard	Pinnacle Road		N. of Oak Hill Rd	R-0	6/7/2010	1,307	1,100
Harvard	Poor Farm Road		E. of Ayer Road (Rt 110/111)	R-0	6/7/2010	1,394	1,200
Hubbardston	Barre Road		S. of Main St. (Rt. 68)	R-5	7/19/2010	1,438	1,200
Hubbardston	Gardner Road	Rt. 68	N. of Morgan Rd.	R-3	7/19/2010	6,222	5,500
Hubbardston	Main Street	Rt. 68	N. of Brigham St.	R-3	7/19/2010	6,938	6,200
Hubbardston	Old Boston Turnpike	Rt. 62	E. of Worcester Rd. (Rt. 68)	R-5	7/19/2010	2,002	1,700
Hubbardston	Old Boston Turnpike	Rt. 62	W. of East Comet Pond Rd.	R-5	7/19/2010	1,344	1,100
Lancaster	Deershorn Road		N. of Chase Road	U-6	6/17/2010	1,502	1,300
Lancaster	Main Street	Rt. 117	NW of Brockelman Rd	R-3	6/15/2010	14,465	12,900
Lancaster	Mill Street		Btwn Main & Sterling Rd	U-6	7/26/2010	3,171	2,900
Lancaster	Old Common Road		E. of High Street	U-6	6/15/2010	3,675	3,300
Lancaster	Orchard Street		N. of Prescott	U-0	6/17/2010	158	140
Lancaster	Prescott Street		Btwn Maple & Orchard	U-0	7/26/2010	618	550
Lancaster	Sterling Road		W. of Sylvan Road	U-6	6/15/2010	5,757	5,200

Town	Road Name	Route Number	Location	Func. Class	Date	Raw Count	Factored Total
Leominster	Mechanic Street		E. of Visoloid Ave	U-5	7/26/2010	9,544	8,700
Leominster	Mechanic Street		W. of Lancaster T.L.	U-5	7/28/2010	5,329	4,800
Leominster	Merriam Avenue		N. of Madison St. (Over Rt. 2)	U-5	6/29/2010	25,808	22,800
Leominster	Nashua Street		N. of Leominster Connector	U-5	6/29/2010	10,307	9,100
Leominster	North Street		W. of Main Street (Rt. 13)	U-5	6/29/2010	8,349	7,500
Leominster	Pleasant Street		S. of Sylvan	U-6	7/28/2010	4,464	4,100
Leominster	Pleasant Street		N. of Union & Wachusett St.	U-6	8/31/2010	2,709	2,400
Leominster	Pleasant Street		Btwn. Manchester & Sylvan St	U-6	10/21/2010	4,686	4,400
Leominster	Pond Street		S. of Newton Street	U-6	7/20/2010	4,624	4,200
Leominster	Prospect Street		E. of Harvard Street	U-5	6/28/2010	5,166	4,600
Leominster	Prospect Street		W. of Harvard Street	U-5	6/28/2010	8,631	7,600
Leominster	River Street		N. of Main Street (Rt. 13)	U-5	8/2/2010	3,991	3,500
Leominster	Toleman Avenue		W. of Main Street (Rt. 13)	U-5	6/29/2010	2,519	2,300
Leominster	Union Street		Near House 537 S. of Litchfield	U-5	7/28/2010	3,342	3,000
Leominster	Union Street		W. of Decicco Drive	U-6	9/5/2010	3,156	2,900
Leominster	Viscoloid Avenue		N. of Lancaster St. (Rt 117)	U-5	7/26/2010	6,999	6,400
Leominster	Willard Street		E. of Central St. (Rt 12)	U-6	7/28/2010	5,505	4,900
Lunenburg	Chase Road	Rt. 13	N. of Northfield Road	U-3	6/28/2010	12,073	10,900
Lunenburg	Chase Road	Rt. 13	S. of Northfield Road	U-3	6/28/2010	,727 12	,500 11
Lunenburg	Electric Avenue	Rt. 13	N. of Whalom Road	U-3	6/28/2010	12,344	10,800
Lunenburg	Electric Avenue	Rt. 13	S. of Whalom Road	U-3	6/29/2010	12,873	11,200
Lunenburg	Leominster-Shirley Road		E. of Fort Pond Road	R-5	6/28/2010	6,608	5,800
Lunenburg	Leominster-Shirley Road		W. of Fort Pond Road	R-5	6/28/2010	7,399	6,500
Lunenburg	Massachusetts Avenue	Rt. 2A	S.W. of Electric Ave (Rt. 13)	U-3	6/28/2010	19,495	17,000
Lunenburg	Massachusetts Avenue	Rt. 2A	W. of Lancaster Ave.	U-3	6/29/2010	9,306	8,100

Town	Road Name	Route Number	Location	Func. Class	Date	Raw Count	Factored Total
Lunenburg	Northfield Road		E. of Chase Road	U-6	6/28/2010	1,734	1,500
Lunenburg	Northfield Road		W. of Chase Road	R-0	6/28/2010	1,492	1,300
Lunenburg	Prospect Street		S. of Pond Street	U-5	6/28/2010	1,970	1,700
Lunenburg	Whalom Road		W. of Electric Ave. (Rt. 13)	U-5	6/28/2010	3,675	3,200
Petersham	Barre Road	Rt. 32 & 122	E. of Main Street	R-3	6/14/2010	2,060	1,900
Petersham	East Street		W. of Oliver Street	R-6	7/19/2010	632	550
Petersham	North Main Street	Rt 32	At Athol T.L.	R-3	6/9/2010	1,838	1,600
Phillipston	Baldwinsville Road		N. of Petersham Road	R-6	6/9/2010	1,222	1,100
Phillipston	Main Road	Rt 68	Btwn Royalston T.L. & Templeton T.L.	R-5	6/9/2010	396	350
Phillipston	Petersham Road	Rt 101	At Petersham T.L.	R-5	6/9/2010	625	540
Phillipston	Queen Lake Road	Rt 101	At Templeton T.L.	R-5	6/9/2010	1,408	1,200
Phillipston	Royalston Road		At Royalston T.L.	R-6	6/9/2010	836	730
Phillipston	State Road	Rt 2A & 202	At Templeton T.L.	R-5	6/14/2010	4,445	3,900
Shirley	Great Road	Rt. 2A	At Ayer T.L.	U-3	6/23/2010	7,657	6,700
Shirley	Lancaster Road		S. of Main St.	U-5	8/5/2010	7,430	6,600
Sterling	Chocksett Road		E. of Pratt's Junction	U-3	7/1/2010	8,881	7,800
Sterling	Metropolitan Road		At West Boylston T.L.	R-5	7/1/2010	4,213	3,600
Sterling	Princeton Road	Rt. 62	W. of Redemption Rock Trail (Rt. 140)	R-5	7/1/2010	4,591	3,900
Sterling	Redemption Rock Trail	Rt. 140	S. of Princeton Road (Rt. 62)	U-3	7/1/2010	8,987	7,900
Sterling	Redemption Rock Trail	Rt. 140	At West Boylston T.L.	U-5	7/1/2010	5,425	4,800
Sterling	Redstone Hill Road	Rt. 62	At Lancaster T.L.	R-6	7/26/2010	1,157	990
Sterling	Worcester Road	Rt. 12	At West Boylston T.L.	U-5	7/1/2010	5,201	4,900
Templeton	Patriots Road	Rt. 2A & 202	At Phillipston T.L.	R-5	7/22/2010	4,445	3,900
Westminster	Nichols Street		SW. of Main Street (Rt. 2A/140)	U-0	7/21/2010	3,862	3,500
Westminster	State Road East	Rt. 2A	W. of South Ashburnham	U-2	8/17/2010	8,409	7,600
Westminster	West Main Street		W. of Simplex Drive	U-2	7/22/2010	15,563	14,200

Town	Road Name	Route Number	Location	Func. Class	Date	Raw Count	Factored Total
Westminster	West Main Street		E. of Simplex Drive	U-2	7/22/2010	17,349	15,800
Winchendon	Gardner Road	Rt. 140	S. of Spring Street	U-0	9/21/2010	11,802	10,900
Winchendon	Gardner Road	Rt. 140	N. of Teel Road	R-2	9/21/2010	12,839	11,600
Winchendon	Lincoln Avenue		N. of Front St. (Rt. 12/202)	U-0	6/14/2010	11,802	10,900
Winchendon	School Street	Rt. 12	At New Hampshire State Line	R-2	6/15/2010	4,888	4,300
Winchendon	School Street	Rt. 12	N. of Front St. (Rt. 12/202)	U-2	6/15/2010	7,009	6,100
Winchendon	Spring Street	Rt. 12	E. of Central Street	U-2	6/14/2010	12,411	10,800

Appendix D Mt Jefferson and Hubbardston State Forest Trail Map

Appendix E Table of Chapter 61, 61A, and 61B Lands

CHAPTER	PARCEL ID	ST #	LOCATION	TOTAL ACRES	NO. OF ACRES IN CHAPTER
61	2/39	6	RAGGED HILL RD	35.00	35.00
61	2/41	6	RAGGED HILL RD	12.05	12.05
61	12/70	65	LOMBARD RD	87.00	87.00
61	7/64	21	OFF PARSONS RD	17.90	17.90
61	11A/3		29 NORTH COMMET POND RD	17.70	15.70
61	6/14		OFF UNDERWOOD	61.60	61.60
61	11A/1	4	WORCESTER RD	44.52	44.52
61	8C/32	4	OFF WORCESTER RD	32.20	32.20
61	8C/34	4	WORCESTER RD	4.40	4.40
61	1/21		OFF ROOT RD	50.70	50.70
61	1/26		THOMPSON RD	91.38	91.38
61	1/35		ROOT RD	8.19	8.19
61	1/36		OFF KRUSE RD	41.50	41.50
61	1/155		KRUSE RD	8.62	8.62
61	1/140	45	166 WILLIAMSVILLE RD	29.83	27.83
61	8/36	25	OLD WESTMINSTER	31.38	31.38
61	4/82		MAYO RD	69.45	69.45
61	11/36	21	OLD PRINCETON RD	40.30	40.30
61	5/10	30	OFF NEW TEMPLETON ROAD	48.43	48.43
61	5/67	30	OFF HIGH BRIDGE ROAD	17.50	17.50
61	1/116		21 THOMPSON RD	20.60	20.60
61	8/77	20	20 HEALDVILLE RD	14.93	12.93
61	11/19	922	123 OLD PRINCETON RD	69.86	53.43
61	11/35	922	OLD PRINCETON RD	16.00	16.00
61	11/42	922	OLD PRINCETON RD	80.50	47.02
61	3/139	57	57 UNDERWOOD RD	28.67	19.17
61	6/32	11	11 GRIMES RD	18.50	16.50
61	2/61	50	NEW TEMPLETON RD	17.80	17.80
61	8/65	45	HEALDVILLE RD	49.10	49.10
61	8/70	45	45 OLD PRINCETON RD	81.70	73.55
61	1/98	152	152 WILLIAMSVILLE RD	19.00	10.00

61	1/46	42	MILE RD	46.10	46.10
61	1/6	42	MILE RD	21.00	21.00
61	1/7	42	MILE RD	10.00	10.00
61	1/8	42	MILE RD	5.60	5.60
61	3/15	42	OFF GARDNER RD	37.70	37.70
61	8/64	64	HEALDVILLE RD	40.25	38.25
61	9/26	11	OFF PRENTISS HILL RD	42.23	42.23
61	9/29	11	OFF PRENTISS HILL RD	152.77	152.77
61	11C/57	1	1 ED CLARK RD	27.08	24.00
61	10/3	428	58 TWIN HILL RD	84.13	82.29
61	11A/16	72	OFF OLD PRINCETON RD	50.00	50.00
61	5/52	85	85 GARDNER RD	57.30	55.40
61	8/30	99	OFF BRIGHAM ST	61.50	59.50
			Total Land in 61		1706.59
61A	8A/49		9 BRIGHAM ST	95.00	93.00
61A	2/144	143	143 MT JEFFERSON RD	7.00	5.00
61A	5/78	28	46 HIGH ST	38.70	36.70
61A	5/79	28	52 GARDNER RD	6.00	4.00
61A	5/152	28	GARDNER RD CUTOFF	32.00	32.00
61A	5/76	28	OFF HIGH ST	10.40	10.40
61A	5/77	28	30 HIGH ST	8.12	8.12
61A	5/79	28	46 HIGH ST	38.70	36.86
61A	5/78	28	52 GARDNER RD	6.00	4.16
61A	5/48	10	10 RAGGED HILL RD	28.40	23.00
61A	8/20		59 BRIGHAM RD	32.40	30.40
61A	6/14		OFF OLD WESTMINSTER RD	61.60	61.60
61A	5C/11		16 WILLIAMSVILLE RD	14.00	12.16
61A	5C/13		16 WILLIAMSVILLE RD	1.80	1.80
61A	4/5	6	6 KRUSE RD	27.16	23.16
61A	1/73		FLAGG RD	105.00	103.00
61A	1/75		FLAGG RD	16.50	16.50
61A	1/76		FLAGG RD	2.90	2.90
61A	1/77		FLAGG RD	21.40	21.40
61A	4/10		52 FLAGG RD	31.40	29.40
61A	4/9		FLAGG RD	16.60	16.60

61A	9/122	730	13 PRENTISS HILL	1.92	1.92
61A	8/32	25	25 OLD WESTMINSTER RD	62.90	60.90
61A	8/19	25	OFF BRIGHAM RD	12.20	12.20
61A	4/142	25	HALE RD	12.26	10.26
61A	4/143	25	HALE RD	2.12	2.12
61A	8/39	25	OLD WESTMINSTER RD	16.00	16.00
61A	4/1	143	143 WILLIAMSVILLE RD	55.85	53.85
61A	4/26	143	WILLIAMSVILLE RD	5.57	5.57
61A	3/115	408	UNDERWOOD RD	80.00	80.00
61A	11/42	922	OLD PRINCETON RD	17.50	31.48
61A	11/19	922	123 OLD PRINCETON	69.86	14.43
61A	2/2	376	147 MT JEFFERSON RD	83.00	81.00
61A	3/139	57	57 UNDERWOOD RD	28.67	7.5
61A	6/85	31	31 MORGAN RD	7.16	5.16
61A	4/12	24	29 FLAGG RD	40.82	10.00
61A	11/A/46	45	OLD PRINCETON RD	20.00	20.00
61A	8/C/30	45	OLD PRINCETON RD	6.00	6.00
61A	8/7	38	BRIGHAM ST	1.57	1.57
61A	8/125	38	38 BRIGHAM ST	14.61	12.77
61A	8/126	38	EVERGREEN	10.00	10.00
61A	1/39	36	THOMPSON RD	51.72	49.72
61A	1/132	36	THOMPSON RD	1.84	1.84
61A	1/133	36	THOMPSON RD	1.86	1.86
61A	1/17	15	OFF ROOT RD	14.50	14.50
61A	1/4	23	23 MILE RD	37.00	35.16
61A	9/119	14	14 PRENTISS HILL RD	3.38	1.38
61A	9/118	14	PRENTISS HILL RD	3.05	3.05
61A	9/117	16	16 PRENTISS HILL RD	5.04	5.04
61A	9/123	7	PRENTISS HILL RD	7.23	5.39
61A	9/120	11	OFF PRENTISS HILL RD	31.53	31.53
61A	9/121	11	PRENTISS HILL RD	3.06	3.06
61A	12/12	11	NEW WESTMINSTER RD	0.59	0.59
61A	11/23		28 GEORGE HOWARD RD	309.00	307.00
61A	11/24		OFF GEORGE HOWARD RD	33.50	33.50
61A	11/26		GEORGE HOWARD RD	21.00	21.00

61A	4/127	147	147 WILLIAMSVILLE RD	117.43	115.43
61A	5/23	5	5 RAGGED HILL RD	10.46	8.46
61A	1/18	38	ROOT RD	54.50	54.50
61A	1/20	38	38 ROOT RD	47.90	45.90
61A	1/22	38	ROOT RD	10.90	10.90
61A	1/23	38	ROOT RD	3.10	3.10
61A	5/156	24	24 RAGGED HILL RD	12.01	10.01
61A	5/33	24	OFF RAGGED HILL RD	20.53	20.53
61A	4/141		HALE RD	5.81	5.81
61A	4/170		HALE RD	2.71	2.71
61A	4/171		HALE RD	1.98	1.98
61A	1/100	14	KRUSE RD	1.40	1.40
61A	1/101	14	KRUSE RD	1.50	1.50
61A	1/102	14	14 KRUSE RD	50.40	48.40
61A	4/5B	14	KRUSE RD	2.36	2.36
61A	1/19	61	61 ROOT RD	10.00	8.00
			Total Land in 61A		1870.50
61B	11C/2	248	65 OLD BOSTON TURNPIKE	6.50	4.50
61B	11C/19	248	HALFREY RD	4.39	4.39
61B	6/15	5 B	OFF OLD WESTMINSTER RD	43.00	43.00
61B	6/88	6	6 UNDERWOOD RD	31.03	29.03
61B	12/125	97	LOMBARD RD	5.18	5.18
61B	12/114	97	LOMBARD RD	45.56	45.56
61B	7/48	34	34 TWIN HILL RD	11.30	7.30
61B	11/7	12	12 SIMOND HILL RD	19.80	13.50
61B	3/101	9	MORGAN RD	10.01	10.01
61B	11A/5	61	17 NORTH COMET POND ACCESS RD	21.30	19.30
61B	6/180	347	OLD WESTMINSTER RD	17.07	17.07
61B	1/14	671	BURNSHIRT RD	114.00	114.00
61B	1/15	671	BURNSHIRT RD	114.00	114.00
61B	12W/118		CHEYENNE DR	0.60	0.60
61B	12W/120		SEMINOLE AVE	0.68	0.68
61B	12W/121		61 SEMINOLE AVE	0.50	0.50
61B	12W/122		SEMINOLE AVE	0.75	0.75

61B	12/69		BEMIS RD	178.00	178.00
61B	11/72	488	SIMOND HILL RD	14.41	14.41
61B	11C/45	1	SIMOND HILL RD	18.19	18.19
61B	2/192	72	132 RAGGED HILL RD	10.86	10.86
61B	8/45		65 HEALDVILLE RD	9.10	7.10
61B	12/8	5	5 LOMBARD RD	24.40	22.40
			Total Land in 61B		680.33
			Total Acreage in Chapter 61		2505.92

Appendix F ADA Inventory

Activity	Equip- ment	Specification or Description	Locations					Notes & Comments
			Mt. Jeff.	Malone Cons. Area	Town Rec. Fields	Clark's Corner	Town Com mon	
Picnic Facilities	Tables & Benches	Located adjacent to accessible paths	Yes	Yes	Yes	No	Yes	
		Access to Open Spaces	Yes	Yes	Yes	N/A	Yes	
		Back and Arm Rests	No	No	No	No	No	None have arm rests
		Adequate number	2 table s 1 benc h	2 benche s	1 table 3 benche s	3 benche s	2 benc hes	
	Grills	Height of Cooking Surface	N/A	N/A	N/A	N/A	N/A	No Grills at any location
		Located adjacent to accessible paths	N/A	N/A	N/A	N/A	N/A	
	Trash Cans	Located adjacent to accessible paths	Yes	No	Yes	Yes	None	
	Picnic Shelters	Located adjacent to accessible paths	N/A	N/A	N/A	N/A	N/A	None at any location
	Trails	Located near accessible water fountains, trash can, restroom, parking, etc.	Parki ng, trash can	Parkin g	Parkin g, trash can	N/A	N/A	
		Surface material	Natur al	Natura l	Asphal t	N/A	N/A	
		Dimensions	Miles	Miles	.5 mi. x 8'	N/A	N/A	
		Rails	No	No	No	No	No	
		Signage (for visually impaired)	No	No	No	No	No	
Swimming Facilities	Pools	Entrance	N/A	N/A	N/A	N/A	N/A	
		Location from accessible parking	N/A	N/A	N/A	N/A	N/A	
		Safety features i.e. warning for visually impaired	N/A	N/A	N/A	N/A	N/A	

Activity	Equip- ment	Specification or Description	Locations					Notes & Comments
			Mt. Jeff.	Malone Cons. Area	Town Rec. Fields	Clark's Corner	Town Com mon	
	Beaches	Location from accessible path into water	N/A	N/A	N/A	N/A	N/A	
		Handrails	N/A	N/A	N/A	N/A	N/A	
		Location from accessible parking	N/A	N/A	N/A	N/A	N/A	
		Shade provided	N/A	N/A	N/A	N/A	N/A	
Play Areas (tot lots)	All Play Equip. i.e. swings, slides	Same experience provided to all	N/A	N/A	No	N/A	N/A	
	Access Routes	Located adjacent to accessible paths	N/A	N/A	Yes	N/A	N/A	
		Enough space between equipment for wheelchair	N/A	N/A	Yes	N/A	N/A	
Game Areas: *2 ballfields *1 basketball *1 Skateboard *2 Soccer Fields *1 multi- use	Access Routes	Located adjacent to accessible paths	N/A	N/A	Yes	N/A	N/A	
		Berm cuts onto courts	N/A	N/A	Yes	N/A	N/A	
	Equipment	Height	N/A	N/A	Stand- ard	N/A	N/A	
		Dimensions	N/A	N/A	Stand- ard	N/A	N/A	
		Spectator Seating	N/A	N/A	Yes, for soccer & baseball	N/A	N/A	Ballfields have covered, screened team dugouts
Boat Docks	Access Routes	Located adjacent to accessible paths	N/A	N/A	N/A	N/A	N/A	
		Handrails	N/A	N/A	N/A	N/A	N/A	
Fishing Facilities	Access Routes	Located adjacent to accessible paths	N/A	N/A	N/A	N/A	N/A	
		Handrails	N/A	N/A	N/A	N/A	N/A	
	Equipment	Arm Rests	N/A	N/A	N/A	N/A	N/A	
		Bait Shelves	N/A	N/A	N/A	N/A	N/A	

Activity	Equip- ment	Specification or Description	Locations					Notes & Comments
			Mt. Jeff.	Malone Cons. Area	Town Rec. Fields	Clark's Corner	Town Com mon	
		Handrails	N/A	N/A	N/A	N/A	N/A	
		Fish Cleaning Tables	N/A	N/A	N/A	N/A	N/A	
Program ming	Are special programs at your facilities accessible ?	Learn-to-Swim	No	No	No	No	No	
		Guided Hikes	No	No	No	No	No	
		Interpretive Programs	No	No	No	No	No	
Services and Technical Assistance	Information available in alternative formats, i.e. for visually impaired		No	No	No	No	No	
	Process to request interpretive services (i.e. sign language interpreter) for meetings		No	No	No	No	No	