

2016 Stow Open Space and Recreation Plan

Celebrating 50 Years of Conservation and Recreation in Stow



Stow Conservation Commission
Stow Open Space and Recreation Plan Subcommittee
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Section 1

Summary

Stow is a very special place. Despite increasing development pressures, Stow has managed to maintain a rural flavor that has been lost in most, if not all, surrounding communities along the Route 495 corridor. A wide range of agricultural products including fruits and vegetables, meat, Christmas trees, and greenhouse and cut flowers continue to be produced in Stow and are a major element of our community's heritage and economy. Economically viable farms preserve open space and contribute in many other ways to Stow's quality of life. Many roads are lined with historic stone walls and there are numerous highly valued scenic vistas such as Pilot Grove Farm, Carver Hill, Lake Boon, the Assabet River, and golf courses. With fewer than 7,000 residents, Stow still has a "small town" feel – where you know the people you meet in the Post Office and in the supermarket. And where annual events such as Springfest, the Stow Gobbler 5K, and the Lake Boon Water Carnival are important aspects of the community's character. Other less tangible aspects of small town character prevail – the skies are still dark at night, affording excellent stargazing opportunities, and on summer afternoons, the rustling of leaves and the songs of birds are more noticeable than sirens or traffic noise.

A Master Plan Survey in 2003 indicated that most people chose to move to Stow for what it still is, more than for what it could become. At that time, 62% percent of residents said that rural character (open space, farms and orchards, Lake Boon) was the main reason they decided to live in Stow. Almost half cited "small town community" as the main reason. The 2015 Open Space and Recreation Plan survey confirmed this finding, with "rural or small town character" being the #1 reason 63% of residents said they moved to Stow or remain here. Other top responses were: protected open space and trails, safe neighborhoods/low crime, good schools, farmland and orchards, and quiet.

At the same time, these aspects of Stow prized by residents also draw newcomers, making continued growth inevitable. Without careful planning and continued open space protection this growth could jeopardize the very qualities that make Stow a desirable community. One traffic light becomes two. The intersection of Rt. 62 and 117 becomes increasingly congested. It is harder to take a left turn out of your driveway. A patch of woods is subdivided for large new homes. Classroom sizes increase. Little by little, the sense of "elbow room" is diminished. Our demographics are also changing – with homeownership increasingly out of reach for many and those on fixed incomes struggling to keep up with rising property taxes. Growth will continue to affect our tax base, requiring costly services such as increased police and fire protection and additional classroom space. At the same time, there is a strong desire to maintain the existing small town character in Stow for its many benefits. Protection of our important remaining open lands can maintain or enhance our quality of life and be beneficial to the Town's budget in the long run.

We are used to looking at the landscape and assume that what we see and experience will always be there. Build out studies for Stow depict a future – where all of the existing unprotected open land has been developed – that seems unimaginable. Many Stow residents do not fully appreciate the magnitude of the changes that will occur with buildout or the speed with which it may occur. Many communities in eastern Massachusetts are looking at a "build out" time horizon of 5 to 15 years. The reality is that the decisions that are made within the next five to ten years will play a major role in shaping the Stow's future. To the extent that the

existing build out projections are undesirable, the Town must act now to change this blueprint and to create the “green infrastructure” that will sustain this community over the long term.

This Plan identifies specific needs in Stow that require actions today to address. These include:

- Protection of Priority Lands
- Protection of Stow’s Agricultural Base
- Continued Protection of Lands in the Southwest Quadrant of Stow
- Planning for the Protection of Key “At-Risk” Parcels
- Enhancing All-Persons Accessibility at Existing Conservation and Recreation Areas
- Creation of Additional Walking and Cycling Opportunities
- Improved Access to Water-Based Recreation
- Continued Support for Active Recreational Facilities
- Education Regarding the Community and Fiscal Importance of Open Space
- Expanded Land Stewardship Efforts

This Plan calls for specific actions to meet these needs – including active efforts to acquire or otherwise protect priority lands and provide recreational opportunities for Stow’s residents. It is clear that given the short amount of time remaining, the Town needs a strong, ongoing and well-prioritized land protection effort that makes use of all of the “tools” in the toolbox – encouraging donation of land and conservation restrictions, purchasing key properties, and making use of limited development, zoning incentives and creative land protection partnerships with private organizations that can assist with raising funds. We need to continue our efforts to meet the recreational needs of families and older residents, who are increasingly seeking opportunities for easy walking for exercise and health. In addition, more attention needs to be given to coordinated marketing and support of Stow’s assets – its farms, orchards, golf courses, bed and breakfasts, recreational lands, and small businesses. We should be able to purchase Stow apples in the supermarket and should encourage more visitors to consider Stow as a weekend getaway destination. In addition, the Town should ensure that land use and open space decisions are coordinated, infrastructure and capital facilities decisions support efforts to preserve important lands, and the various staff, boards and organizations involved in open space protection maximize their effectiveness. Finally, the Plan looks across Stow’s borders to identify key linkages with open space and greenway efforts in surrounding towns and within the region, and opportunities to collaborate with neighboring towns.

Section 2

Background and Introduction

Celebrating 50 Years of Open Space and Recreation Stow

On December 15, 1964, just as Route 495 was opening at Route 117, Town residents gathered at Stow Town Hall to listen to speakers and consider three key questions, setting events in motion that would fundamentally shape the growth and development of Stow for the next fifty years.

- Does Stow need conservation land now? Where, why and what kind?
- Do town forests, recreation sites and open space sites pay off?
- What are the facts on the Hatch Act, Delaney Project and the Assabet floodplain?

That meeting led to an innovative effort to prepare a Natural Resource Inventory for Stow, led by the Stow Conservation Commission and Stow Planning Board. This Inventory was completed in October 1965 with the assistance of the Middlesex Conservation District. The Inventory, called *“Reconnaissance and Preliminary Report of the Natural Resource Inventory and an Evaluation of Development Potentials for the Town of Stow, Massachusetts,”* was the first of its kind, and was widely hailed by conservationists across the region, winning both a statewide award and acclaim from the Massachusetts Audubon Society. The Inventory resulted in a series of maps identifying locations for town forests, trails, recreation sites, historic sites, and nature study areas in Stow. It also identified scenic vistas and areas that were unsuitable for building due to soils, streams and high groundwater. The final products of the study were a series of four maps as well as a narrative describing each site.

Shortly thereafter, the Town completed its first Master Plan in 1965 with the help of Thomas Associates, and also completed its first Open Space Plan in 1966. At the same time, the Conservation Commission, with the support of other boards, launched the effort to protect more than 300 acres owned by C.D. Fletcher along the Assabet River off Bradley Lane. This land would eventually become Stow Town Forest – Stow’s first conservation area – in 1968.

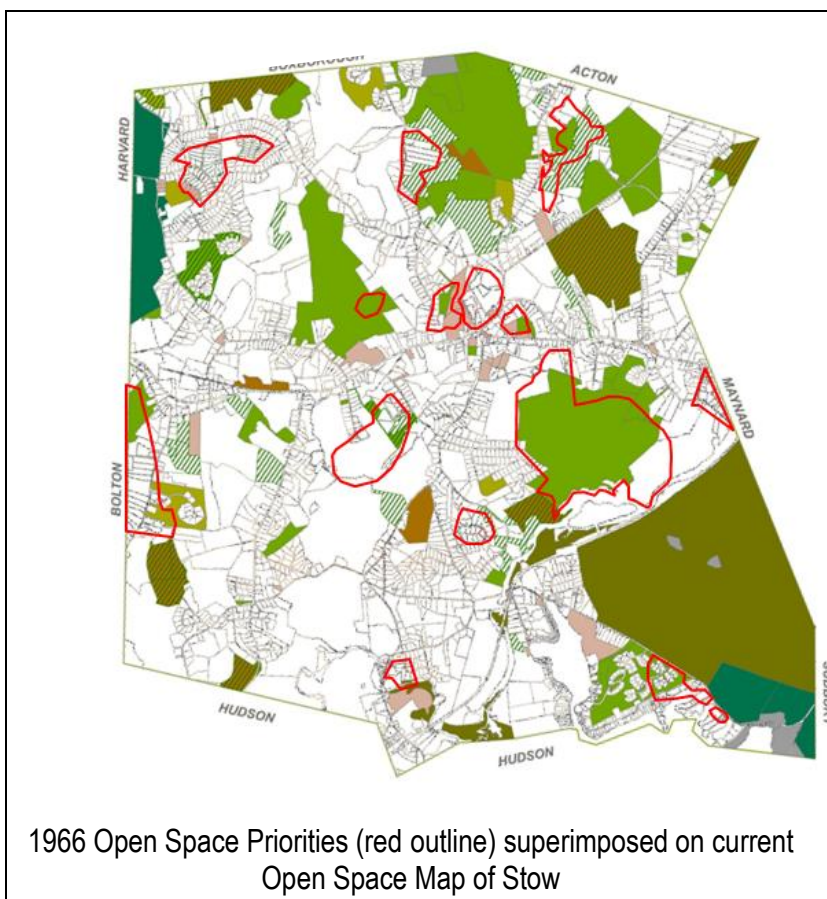
It is worth noting that many of the protected conservation and recreation lands that are community assets today were singled out for protection in these 1960s-era plans, including



1967 Site Visit to Consider Protection of Stow Town Forest (L to R) – Howard Gleason, Bud Peck, Alvin Fletcher, Bernard Fletcher, Douglas Trefry, John Paakki, Bill Shick, Ray Holland, Arthur Trefry (rear), Robert Connington, Arthur Whelden (rear) and Aubyn Freed

Town Forest/Gardner Hill, Marble Hill, Spindle Hill, Annie Moore, and Ministers Pond. Some areas like Harvard Acres, Birch Hill, and Pilot Grove Hill have largely been lost to development. And the fate of other areas remains to be determined. Appendix E contains copies of the maps from these early documents. And the map on the right shows areas outlined in red that were identified for protection in the 1966 Open Space Map, superimposed on today's map of protected land in Stow. Both Delaney and the Assabet Refuge were already identified as "protected" in 1966 and not highlighted for protection here.

Stow has regularly revisited the recommendations in its Open Space and Recreation Plans since that time, with updated plans completed in 1972, 1980, 1987, 1997, 2008 and now, in 2016. Each Plan reflects the concerns of the time to an extent, and each Plan has been able to take advantage of more sophisticated natural resource information and mapping technology. And yet each plan attempts to answer the questions from that initial meeting in 1964 – how much land should be protected? Which land is most important? What are the tax and community development implications of these decisions? And how should this land be managed.



2A. Statement of Purpose

This Plan is an update of the 2008 Open Space and Recreation Plan prepared by the Town of Stow. The Plan summarizes the progress that the Town has made in providing for its open space and recreation needs, and sets forth goals and specific action items for the next five years. The Plan is designed to provide a framework for the efforts of various Town boards and committees involved in the protection of Stow's open lands and the provision of outdoor recreational opportunities, and is intended to guide municipal partnership efforts with both state and federal agencies and nonprofit organizations. It will also help guide work by the Town's Community Preservation Committee. The Open Space and Recreation Plan must be updated regularly to maintain eligibility for the Commonwealth's open space and recreation grant programs. This is the seventh Open Space and Recreation Plan developed by the Town of Stow and marks the 50th anniversary of the community's efforts to plan for its open space and recreation needs, with the first planning efforts launched in 1965, as noted above.

2B. Planning Process and Public Participation

This Plan has been prepared by an Open Space and Recreation Plan Subcommittee, which was appointed by the Stow Conservation Commission in 2014 specifically for the purpose of updating this Plan. The Plan Committee consists of Bob Wilber (representing the Stow Open Space Committee), John Sangermano (representing the Stow Recreation Commission); Andy Snow and Sandra Grund (representing the Stow Conservation Commission) and Eve Donahue (representing the Stow Conservation Trust). Kathy Sferra, Conservation Coordinator, and Jill Kern, GIS Specialist, provided staff support to the Subcommittee.

The 2008 Open Space and Recreation Plan was used as the starting point for this Plan. The Committee reviewed it, updating relevant information and noting changes that have occurred in Stow since that time, as well as progress made in carrying out the recommendations of the 2008 Plan. New data from a variety of sources was also incorporated.

Stow is fortunate to have many organizations and agencies involved in open space protection. These include the Conservation Commission, Open Space Committee, Community Preservation Committee, Planning Board, Stow Conservation Trust, Sudbury Valley Trustees and state and federal agencies. At present, these entities are all working collaboratively to maximize efforts to protect open land – and make the most of the next ten to fifteen years – by which time most important land use decisions will have been made in Stow.

2C. Progress Made on 2008 Open Space and Recreation Plan

The Subcommittee noted significant accomplishments that have been undertaken or completed since the 2008 Plan. Highlights include:

- Acquisition of properties in the southwest quadrant of Stow including the Corzine property, new open space and trails as part of the Arbor Glen Active Adult Neighborhood development, and the pending acquisition of open space at the Hemenway Farm development and the Spring Hill development on Walcott Street
- Protection of other parcels including 323 Great Road and two parcels adjacent to Captain Sargent (one completed, one in progress)
- Acquisition of a recreational trail easement along “Track Road” with Community Preservation Funds
- Acquisition and creation of Stow Community Park on Old Bolton Road, including a seasonal ice skating rink
- Addition of recreation facilities as part of the Center School renovation/expansion
- Adoption by the Board of Selectmen of a formal process for the review of lands coming out of Chapter 61/61A/61B status



New Conservation Land at Minister's Pond off Great Rd.

- Upgrading and accessibility improvements at Pine Bluff Recreation Area (currently in progress); as well as the addition of canoe/kayak racks and floating docks
- Improvement to Assabet River canoe/kayak launch at Sudbury Road
- Annual tracking of the Town's progress toward the goal of protecting an acre for every acre that is developed in Stow
- Significantly improved communication and coordination among the various boards, committees and nonprofit organizations involved in protecting land in Stow

2D. 2015 Open Space and Recreation Survey

The Stow Open Space and Recreation Plan Subcommittee conducted a Stow Residents survey in conjunction with this Open Space and Recreation Plan update during February and March 2015. The survey was made available both electronically and in paper format and the availability was announced widely on the Town's website, Facebook pages, through email, at Town Meeting, in the weekly announcements section of the local newspaper, and through organizational networks including the Council on Aging, Scout groups and the Randall Library.

A total of 286 responses were received.

Question 1 asked residents to identify the four factors that were most important in their decision to live or remain in Stow. The top responses were (in order):

1. rural or small town character (62%)
2. protected open space and trails (45%)
3. safe neighborhoods/low crime (40%)
4. farmland and orchards (39%)
5. access to good schools (37%)
6. quiet (34%)

Questions 2-4 asked about frequency of visitation to various open space and recreation areas. 90% of respondents reported visiting Stow apple orchards and farms in the last year. Other areas with high visitation rates in the past year (more than 50% response) included: Stow Community Park, Assabet River National Wildlife Refuge, and Town conservation areas. In terms of frequency of visitation, thirty-one percent (31%) of respondents reported using conservation lands once a week or more (with 9% reporting daily use). By comparison, 24% report using recreation areas once a week or more, with just 2% reporting daily use. About 9% of respondents never use conservation areas and 13% never use recreation areas.

Question 5 asked what would help respondents increase their use of conservation areas. Approximately 42% of respondents were seeking more information about areas (trail maps, rules, etc.), 27% wanted more information about the location of these areas, and 19% noted a desire for more accessible trails. More than one-third (36%) of respondents were satisfied with the information and facilities provided, stating that they used these areas as frequently as they'd like to do so. This highlights the need for increased public outreach and advertising about the information that is already available.

Question 6 of the survey attempted to gauge residents' desire to continue protecting land in Stow. The survey noted that Stow is currently approximately 1/3 developed and 1/3 protected, with about 1/3 remaining open and available for development. When asked about the fate of that remaining 1/3 of available land, 44% of respondents said the town should seek to protect as much of that land as possible to limit additional development, 36% of respondents indicated a desire to maintain the current ratio of developed to protected land by protecting roughly half of

the remaining developable land. A total of 16% said that future acquisition should be concentrated on high priority parcels, and just 4% said that all remaining land should be allowed to be developed with no additional land protection.

Question 7 asked residents for their opinion on the impact of residential development on the tax base. Responses to this question indicate that approximately one-third (35%) of respondents are unsure about whether residential development is a net benefit or a net loss to the town in terms of tax base, with 43% feeling that it was a net loss, and 22% indicating that they believed additional residential development is a net benefit to the tax base.

Question 8 asked residents what additional recreational facilities they would like to see developed in Stow. Support was strongest for sidewalks (37%), bike trails (32%), bike lanes along roadways (28%), and accessible walking trails (26%), walking trails (23%) and canoe/kayak launch areas (20%). There was modest support for playgrounds (12%), dog parks (16%) and a teen center (16%). Less than 10% indicated a desire for additional formal playing fields, picnic areas, neighborhood parks, tennis courts, skateboard parks, and fishing areas. A number of respondents indicated that they did not support the creation of any new facilities.

The last two questions asked about demographics – specifically the age of respondents and how long they have lived in Stow. A good cross section of the community was represented.

The final survey question was open-ended, allowing residents to comment on anything that was important to them relative to open space and recreation for the Subcommittee's consideration. Comments included statements about the importance of open space and community character, concerns about the existing tax burden in Stow, and specific recreational needs. The full survey results can be found in Appendix A.

2E. Public Review of Revised Plan

All Open Space and Recreation Plan Subcommittee meetings were advertised public meetings open to interested citizens and members of other boards. In addition, copies of the draft document were circulated to all of the relevant Town boards and community groups for their comments and made available in the Stow Public Library. The specific distribution list included the following: Town Administrator, Selectmen, Conservation Commission, Board of Health,



Shelburne Farm and Heath Hen Meadow Brook in Spring

Planning Board, Board of Assessors, Recreation Commission, Lake Boon Commission, Historical Commission, Finance Committee, Randall Library, Master Plan Committee, Agricultural Commission, Tree Warden, and Community Preservation Committee as well as OARS, Stow Conservation Trust and Sudbury Valley Trustees.

The Open Space and Recreation Plan Subcommittee and Conservation Commission conducted a public forum on October 22, 2015 to present the final draft of the Plan and to accept additional public comments. The forum was advertised in local papers and via electronic means using the Town's website and via social media. Comments were received at the forum, and subsequently from the Planning Board, Open Space Committee, Board of Assessors, Board of Selectmen, OARS (a regional watershed organization), Metropolitan Area Planning Council, as well as from several residents. These comments were all considered and revisions were made to the Plan.

Section 3

Community Setting

3A. Regional context

Stow is only one of a handful of communities within Route 495 that has managed to retain a largely rural character with many prominent open lands, farms and orchards which contribute to the Town's character and economy. Stow's population, originally agrarian, has changed over recent decades to include workers in the high technology industries of electronics and biotechnology as well as many people who work from home in home-based businesses. Its socioeconomic level is generally middle to upper middle class.

Stow is within the Sudbury-Assabet-Concord (SuAsCo) Watershed (see Map 1). The Assabet River forms the main drainage area for the Town of Stow. The areas of highest elevation in Town are the bedrock and glacial till areas at Marble Hill. Other major topographical heights include drumlins such as Flagg Hill, Spindle Hill, Birch Hill, Pilot Grove Hill, Spring Hill, and Orchard Hill.

No major highways pass through Stow. However, Routes 117 and 62 are heavily used by commuter and commercial traffic. These two roads, in addition to West Acton Road, carve the Town roughly into four quadrants. These main roads, as well as back roads which connect to adjacent towns of Acton, Maynard, Boxborough, Harvard, Bolton and Hudson, form the primary local road network. There are no public transportation systems in Stow, although the MBTA commuter rail is just over the town line in South Acton. North on Boxborough Road is Minute Man Air Field, which has grown over the years but still accommodates only small aircraft.

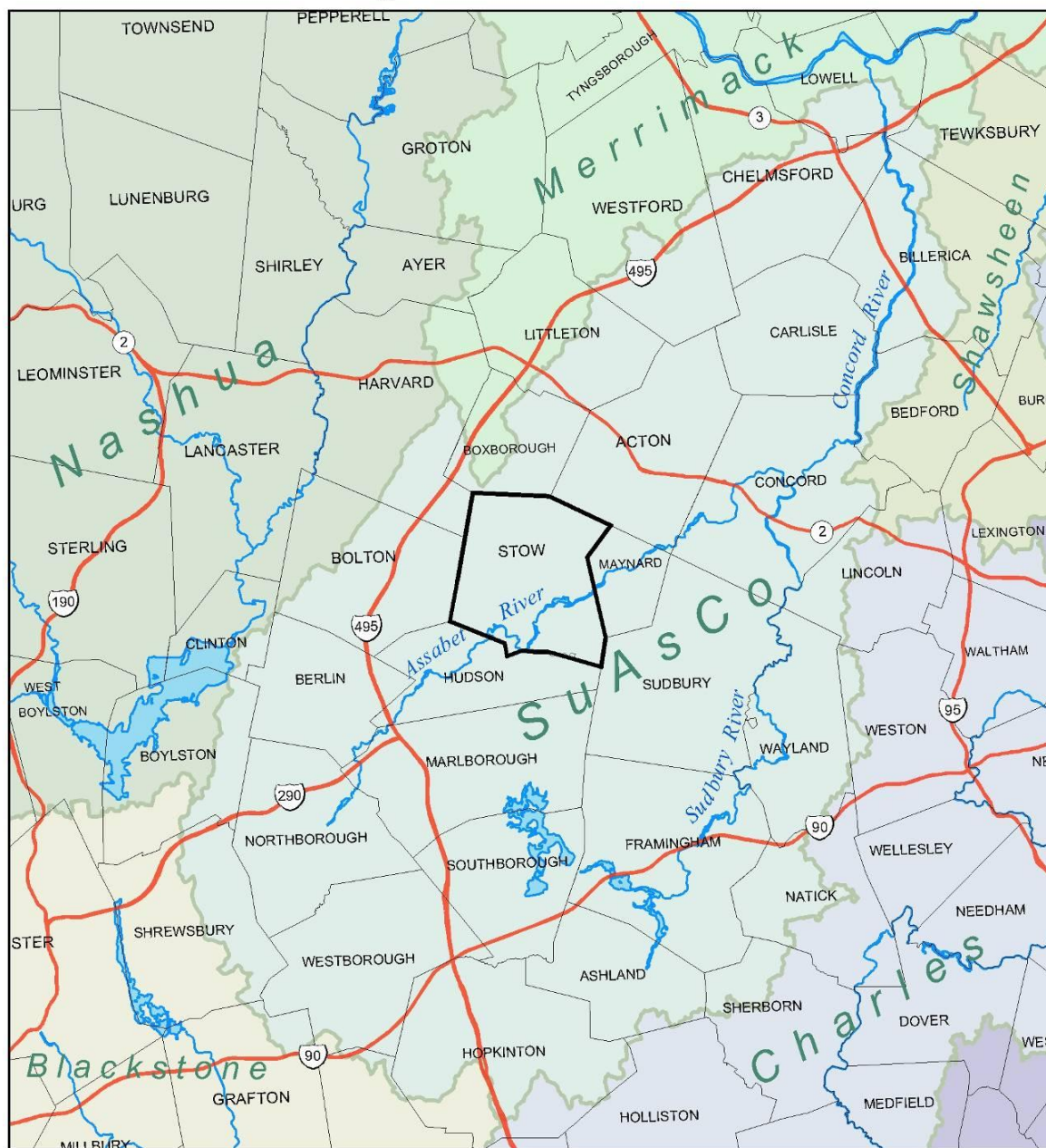
Stow has several light industries; the major ones include Bose, Radant, ET & L, and HydroTest. Small businesses are clustered around the Lower Village Common (the eastern end of Route 117), scattered along Route 117, at the north end of Hudson Road, and in Gleasondale Village in the old mill complex.

The southeastern corner of the Town contains the former US Army Fort Devens Sudbury Annex, consisting of approximately 1050 acres within Stow. This area was taken by the Army during World War II and contains considerable open space including Puffer Pond. With the



closing of Fort Devens, this land has been transferred to the U.S. Fish and Wildlife Service and now forms Assabet River National Wildlife Refuge, a significant open space and recreational resource. Just across the Assabet River which forms the northwestern boundary of the Assabet Refuge is the Gardner Hill Conservation Area (the Town Forest) which encompasses 326 acres. This area is traversed by Elizabeth Brook, which flows from Delaney Pond in the northwest corner of Stow, through Delaney Pond into Wheeler Pond, then through Fletcher Pond, and the Gardner Hill Conservation Area,

Stow - Regional Context and Watersheds



- SuAsCo - Sudbury / Assabet / Concord River Watershed
- Watershed Divides
- Highways

0 1 2 3 4 5 Mile



Hydrography, Town Boundaries, and Roads data provided by MassGIS.

Map produced June 2006.

Map 1: Regional Context and Watersheds

emptying into the Assabet River near White Pond Road. In the center of Town is Minister's Pond which is flanked by Route 117 and a portion of Crescent St.

In the southeastern section of Stow is Lake Boon (Boon's Pond). Although originally surrounded by summer cottages, it now has mostly year-round residents. The Town Beach (31 acres) is located on the northeastern side of the lake at Pine Bluffs. Due to the increase in population around the lake, some pollution has occurred from failing septic systems or cesspools. Over the last few years most of these systems have been upgraded and residents around the lake have worked diligently to decrease the pollutant load to the Lake and regularly pump septic systems. Nearby is White Pond, which is controlled by the Town of Maynard which prohibits recreational activity to protect water quality for the nearby municipal wells. Sudbury State Forest is nestled among the Wildlife Refuge, White Pond and the Lake Boon area.

In the southwestern corner of Stow is a former private landfill which contracted its services to Stow and Hudson. This landfill was closed in 1996 and has been capped. It is now under evaluation for development of a solar field. This part of Town also has a great deal of undeveloped land, only a small amount of which is permanently protected, and some industry, e.g. Radant Corp and the new Bose facility. There are two new large developments in this area, the Villages at Stow and the Arbor Glen Active Adult Neighborhood, but a large amount of undeveloped land still lies west of Hudson Road. The Hemenway Farm and Spring Hill subdivisions have been permitted but not yet constructed. Off more to the west is the Annie Moore land (27 acres) which spans the town boundary and is accessed via Bolton.

The northwestern section of Stow is dominated by two main features, the Delaney Flood Control project and the Harvard Acres residential development. The Delaney Project encompasses 170 acres consisting of open water and marsh, and a perimeter of wooded or open conservation land. The north central region of Stow contains the Marble Hill Conservation Area (249 acres) which is close to but not immediately adjacent to the Delaney land.

The northeastern sector of Stow is dominated by a major marsh system, Heath Hen Meadow, through which Heath Hen Meadow Brook meanders. Near this brook is the Captain Sargent Conservation Area, Heath Hen Meadow Brook Conservation Area, and the Flagg Hill Conservation Area, all of which were acquired with financial assistance from the Commonwealth's Self-Help Grant Program. Also in this area are the Red Acre Woodlands and a large complex of privately conserved land including Shelburne Farm.

Many of these conservation areas are close to being linked through a trail system called the "Emerald Necklace." One of the goals of this Plan is to create a green belt and trail system throughout Stow, perhaps linking with adjacent towns.

Stow is a member of the Minuteman Advisory Group on Interlocal Coordination (MAGIC), one of 8 subregions of the Metropolitan Area Planning Council (MAPC). MAGIC is a group of communities that meet regularly to discuss issues of common interest. The Sudbury Valley Trustees is a regional nonprofit organization that works on open space protection issues in Stow, as does the Stow Conservation Trust, a local nonprofit land trust founded in 1978. The Assabet River Rail Trail is a regional greenway project which stretches from Acton to Marlborough.

Regional Open Space Priorities

As part of Stow's Open Space and Recreation Plan update, the Open Space and Recreation Plans of the surrounding adjacent communities were reviewed. Many recommend periodic inter-town meetings for the purpose of coordination and collaboration.

The Town of **Acton** completed its Open Space and Recreation Plan in 2012. Stow has been working closely with Acton on acquisition of the Dunn Estate property, which spans the town line and provides a key trail connection between extensive conservation land in Acton and Stow's Captain Sargent Conservation Area. In addition, Acton Water Dept. land abuts the Flagg Hill Conservation Area.

Stow's common boundary with **Bolton** includes the Annie Moore Conservation area, which is accessed through Bolton but includes lands in Stow as well as the 580-acre Delaney Wildlife Management Area (WMA) which is formed by several dams located along Elizabeth Brook and managed by the Massachusetts Division of Fisheries and Wildlife. Delaney WMA spans four towns – Stow, Bolton, Boxborough and Harvard and is one of the more significant areas of Stow from an ecological standpoint. Delaney attracts large numbers of bird species to a variety of habitats – including open water and marshes used by waterfowl. Much of this area is mapped by the Massachusetts Natural Heritage and Endangered Species Program as rare species habitat. It also receives extensive public use from entrances in several towns for hunting, fishing, walking, dog walking, skiing and other recreational pursuits.

The **Harvard** Open Space and Recreation Plan was updated in 2008. Virtually the entire boundary that Stow shares with Harvard is the Delaney WMA.

The **Boxborough** Open Space and Recreation Plan was last updated in 2002. The Plan includes among its goals to protect upland adjacent to the Delaney WMA and Wolf Swamp. The Town of Boxborough's Conservation Commission jointly manages the Flagg Hill Conservation Area with the Town of Stow's Conservation Commission.

Recently several developments have been constructed on the Boxborough-Stow line adjacent to Flagg Hill as well as near the Delaney WMA. Stow's Heath Hen Meadow Brook, which is a priority for conservation, also has its headwaters in Boxborough. Much of this area is protected although there are some unprotected properties along the stream corridor.

Hudson's Open Space and Recreation Plan was completed in 2011. The Assabet River is a major scenic and recreational resource that flows from Hudson into Stow. The Assabet River Rail Trail was completed through portions of Marlboro and Hudson in 2005 and now terminates just south of the Stow/Hudson Town line in close proximity to the Gleasondale area. This leaves a gap between Hudson and Maynard in Stow, with various proposals for routing in between. Planning and design is also underway for the Central Mass Rail Trail which will pass through a corner of Stow along our southern boundary. Protection of lands surround the Chestnut Wellfield on the southern border of Stow is also a priority.

The **Maynard** Open Space and Recreation Plan was completed in 2004. Maynard shares several important resources with Stow including the Assabet River, Assabet River Rail Trail, and the Assabet River National Wildlife Refuge. A key recommendation in that plan is completing acquisition and development of the Assabet River Rail Trail connecting the Assabet River National Wildlife Refuge with downtown Maynard and beyond. In addition, a large area of orchard land farmed by Derby Orchards straddles the town line, and has been identified as important to protect in both the Stow and Maynard Open Space Plans. There is also a large area of open land in Maynard that borders protected land in Stow to the east of Red Acre Road, much of which is wetland – this area is part of the Great Swamp. The area is identified as important for protection as it borders Rockland Woods and includes priority habitat. Previous proposals for the Ben Smith Dam in Maynard would have had a significant impact on the Assabet River in Stow.

In addition, the **Metropolitan Area Planning Council** (MAPC) has prepared a regional policy plan for the Boston metropolitan area, which includes Stow. The plan is called *MetroFuture* and

it was adopted by MAPC in 2008. The plan contains 65 specific goals for the year 2030, as well as 13 detailed implementation strategies for accomplishing these goals. Two of these strategies are most relevant to this plan: protecting natural landscapes and conserving natural resources. In addition, the plan encourage communities to work together to plan for regional development and conservation initiatives such as parks, greenways, and trails, such as the Assabet River Rail Trail. This Plan's Vision, Goals and Actions are consistent with a number of the actions identified in the MetroFuture implementation strategies including:

- expanding the use of conservation restrictions and agricultural preservation restrictions
- maintaining or increasing participation in Chapter 61 programs
- encouraging agriculture and farming
- collaborating with surrounding communities on climate change mitigation and adaptation (through a regional MAPC/MAGIC initiative)
- increasing bicycle, pedestrian, and transit accessibility and safety
- maximizing local capacity for open space acquisition
- adopting environmentally friendly roadway standards and protecting scenic roadways including “complete street” best practices
- improving design of Open Space Residential Developments (known as Planned Conservation Developments in Stow)
- encouraging low impact development, energy conservation, and encourage installation of solar arrays on residences and at other appropriate sites.

3B. History of the Community

The history of Stow has been compiled by several authors over the years. The first history available in book form is the Crowell history, published in 1933 for the 250th anniversary of the Town. The most recent history of Stow was compiled by Ellie Childs and published by the Stow Historical Society Publishing Company as part of the Tercentenary in 1983. A brief summary of the histories is excerpted below.

An area of forest, wooded hills, streams and river, swamps and rock-strewn meadows (“meane land”) comprised Pompositticut Plantation in the 1600s. We know this area as Stow today. The Town, in the eastern part of the Massachusetts Bay Colony, 25 miles west of Boston, was centered in the cluster of communities of Concord, Sudbury, Marlborough, Lancaster, Groton (Groton) and Nashoby (Littleton).

Early Stow History

Matthew Boon of Charlestown explored Stow about 1660 and settled on Boon Hill which is adjacent to what is now known as Lake Boon. John Kettell settled in Stow about 1663. Both fled in the 1670s when hostile Indians were on the rampage.

The first action in establishing the settlement called Stow occurred in 1669 through the General Court of the Massachusetts Bay Colony. On May 16, 1683, twenty families were deemed the maximum the land could support and the Town of Stow was incorporated. In the latter part of the century the Town had two main concerns: achieving self-sufficiency and finding a minister. Stow originally included portions of what are now Boxborough and Maynard. In the early 1700s some of the first bridges were built in Stow primarily to cross the Assabet River. In the late 1600s the first mill was documented on “Assibath Brook” (now Elizabeth Brook). Many other mills followed: “wherever there was sufficient flow of water one could expect to find a mill” (Childs, 1983).

One of the more notable citizens of Stow in the 1700s was Henry Gardner who in 1768 was unanimously chosen to go to Faneuil Hall in Boston to take "the state of our public affairs" into consideration. He was later appointed Receiver-General by the Provincial Congress to collect and hold the colonists' taxes in lieu of payment to the Crown. In 1775 he was unanimously elected Treasurer by the 3rd Provincial Congress.

On April 19, 1775, John Gates Diary officially recorded that "a civil war [the Revolution] began in this Province" (Childs, 1983). Dr. Samuel Prescott came galloping into Stow to warn the people and the 81 militia men that the British were coming.

After the Revolution, the Town of Boxborough was formed in 1783 with lands annexed from Stow and Littleton. The population of Stow was about 935 at the time. In the early 19th Century, the Town of Maynard was formed from the area of Stow known as Assabet Village.

In 1786 there was a severe economic depression. Farmers were so desperate that in Western Massachusetts they started a revolt, Shay's Rebellion. Captain Nathaniel Sargent from Stow led a company to quell the revolt. Times were particularly hard after the Revolution so the Town built the Poor Farm still located on White Pond Road.

The 19th century was a time of growth and change. The appearance of the Town was documented on the 1830 map of Stow. A woolen mill was built on the Assabet River in 1813. In 1823, Lucy Smith bought the Gibson Farm on Pompositticut Hill and eventually deeded it to her son-in-law, Isaac Maynard. Eventually this land became a part of the Town of Maynard. "Half-mile trees" - elms - were probably planted before 1850 from Rock Bottom (now Gleasondale) to Stow Center. Dutch Elm disease has since destroyed all of them. The railroad came to Rock Bottom in June of 1850. It came from South Acton through Maynard eventually to Rock Bottom and ended in Marlborough. Near the Rock Bottom Mill was a shoe factory and cabinet makers

The Civil War drew a prompt response from the Stow militia. The townspeople had long supported abolishing the slave trade. Stow sent 112 men to fight. The Rock Bottom Mill prospered by supplying woolen goods.

At the beginning of the 20th century, many changes occurred. Stow's population was 1002. The electric trolley line of the Concord, Maynard and Hudson Street Railway was installed through Stow. In 1923, the trolley was replaced with buses. Hudson Light and Power brought power to Stow in 1906. A little later the Marlborough-Hudson Gas Company brought gas to the community. Indoor plumbing, a telephone in the Town Hall and running water were now in place. Wireless was available at every railway station. Shortly after 1912, radios were commonplace in households. The automobile appeared in Stow in the first part of the century.

The dam on Bailey Brook on Barton road enlarged Lake Boon and a few summer cottages were built around the Lake. A steamer ran around the shore to transport men to and from the train stop at Whitman's Crossing near what is now the corner of Sudbury Road and Barton Road. The Town took title to the Lake Boon dam in the late 1950s.

World War I had 77 Stow "boys" enlisted. After the war many immigrants arrived having fled Europe. In the Depression it was hard to make money but the citizens of Stow, good farmers, did not go hungry and inspired non-farming people to garden. The hurricane of 1938 did significant damage to the trees and buildings of the Town. Several sawmills were set up and worked for more than three years to convert the damaged trees into lumber. Then came World War II and many young men in Stow were drafted. Much of the stockpiled lumber cut from the trees felled during the 1938 hurricane was used to construct the barracks at Fort Devens in Ayer. After the war there was a great pressure to produce more food and Stow orchards constructed cold storage barns to handle the demand for increased quantities of fruit.

The Past 50 Years

In 1952 the Planning Board was established. In 1961 the Conservation Commission, concerned with land acquisition and preservation of open space, was established. Since that time the Town, largely through the efforts of the Conservation Commission, has purchased or acquired many significant parcels of land in Town for conservation and agricultural preservation and actively manages much of this land for public use. Furthermore, the Town has obtained a number of conservation restrictions on privately owned property through donations, purchases and negotiation with developers.

The Town's open space preservation efforts have been augmented by the Stow Conservation Trust, a private, nonprofit land trust that was founded in 1978. The Trust owns several large open space parcels in Town and has been encouraging many of the larger land holders to protect their land especially through agricultural and conservation restrictions (CRs). The Trust has also made efforts to educate and provide non-monetary assistance to private land holders. This effort was instrumental in a number of efforts to preserve properties including Shelburne Farm, a local apple orchard preserved through the Agricultural Preservation Restriction program of the Division of Food and Agriculture. As part of the preservation package the Town purchased an adjacent woodlot along Heath Hen Meadow Brook for conservation purposes. An abutter donated a parcel of land to the Town to grant access to the conservation land and in addition, placed a permanent conservation restriction on an adjacent parcel. Subsequently, the Town put together several other purchase/CR parcels linked to the Shelburne Farm area. Recent partnerships between the Town and the Stow Conservation Trust include the protection of the Red Acre Woodlands off Red Acre Rd. and South Acton Road and the Hale and Corzine Woodlands parcels in southwest Stow. The Trust has also secured protection of the 32 acre Leggett Property along Rt. 62 and the 24 acre Dunn Property along the Stow/Acton line.

The Town of Stow has active recreation facilities and assets managed by the Recreation Department and a paid Recreation Director. Actively used by residents and especially youth groups, the facilities have grown over time, with the most recent addition being the Stow Community Park on Old Bolton Road. The Stow Recreation Commission is an appointed body, created to oversee the Recreation Department and Director. The Recreation Department's mission is to provide recreation opportunities for residents of Stow as well as to maintain the Town's recreational assets. Under leadership of the Recreation Director, a mix of programs are run and overseen such as the youth basketball program and the management of the Town beach personnel and swimming programs. Some programs, such as the active school age soccer program and baseball program are run by independent groups, such as Stow Soccer Club and Assabet Valley Little League. Other programs are independently run, with groups and businesses paying for use of fields and facilities. There are diverse programs year round, promoted through seasonal mailings to residents.

In 2001 the Town voted acceptance of the Community Preservation Act (CPA) and as of FY 15 had collected nearly \$5 million in local funds and \$3.5 million in state matching funds. Funds have been spent on a number of important open space and recreation projects, including acquisition of an easement along Track Road (a popular walking and biking corridor), acquisition of Conservation Restrictions on the Hale, Corzine and Dunn properties, acquisition of the Snow Property and creation of Stow Community Park on Old Bolton Road, acquisition of land at Ministers Pond, and acquisition of the Tyler and Mosley Agricultural Preservation Restrictions. Currently, the Recreation Commission is leading an effort to upgrade facilities at Pine Bluff Recreational Complex using CPA funds. CPA funds have also been spent on a number of affordable housing and historic preservation projects.

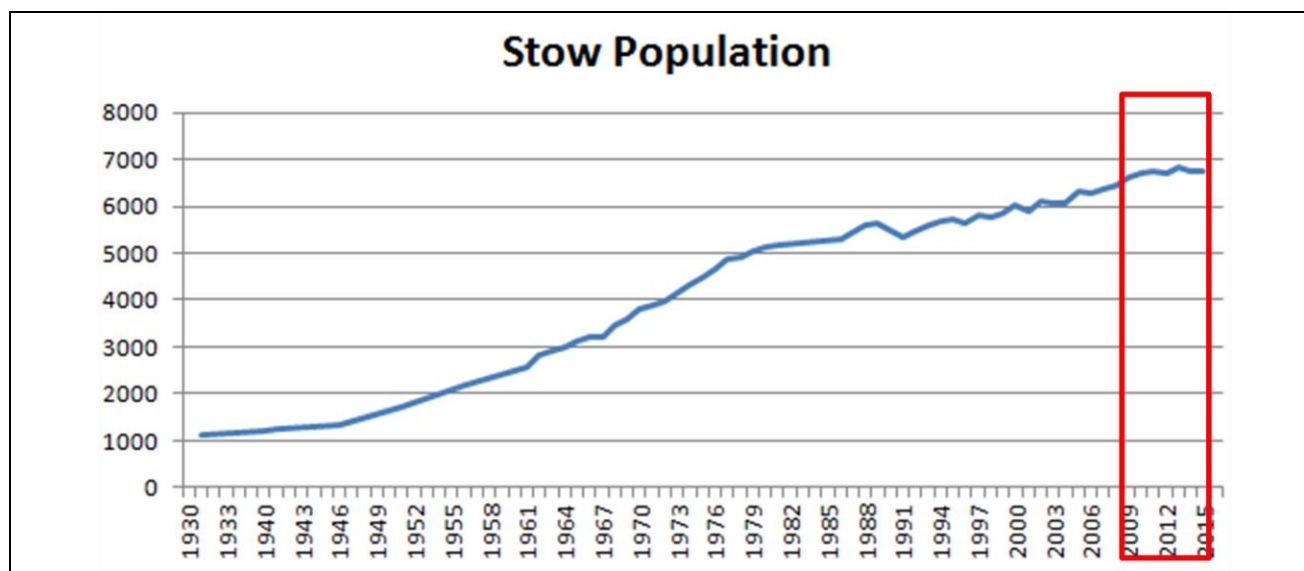
3C. Population Characteristics

The population of Stow has increased from 5,328 in 1990 to 5,902 in 2000 and to 6,590 at the 2010 Census, for a 11.7% increase in the past 10 years. According to the University of Massachusetts Donohue Institute's Population Estimates Program, which has analyzed growth in Massachusetts cities and towns since the last census, during a period from April 1, 2010 to July 1, 2013, Stow was 20th statewide in percentage of population growth with a total increase of 4.9%. See population growth numbers in Table 3-1 and the graph highlighting the growth since the last Open Space and Recreation Plan at the bottom of this page. Notably, the percent of individuals over 65 and over 85 has increased dramatically (Table 3-2), placing additional demands on senior services. Households with individuals 65 years and older have increased from 345 in 2000 to 604 in 2010, an increase of 75%. This is undoubtedly due to the development of several 55+ housing developments in Stow as well as the general aging of the population. It points to a need for facilities that will be accessible to and useable by older residents, as well as the need for additional senior services. According to the Metropolitan Area Planning Council data, this portion of the population is expected to continue to grow as the baby boomer population ages. In addition, two more over

Table 3-1. Population of Stow: 1930-2013

<u>Year</u>	<u>Population</u>
1930	1,142
1940	1,243
1950	1,700
1955	2,195
1960	2,573
1965	3,191
1970	3,907
1975	4,678
1980	5,190
1985	5,308
1990	5,328
1995	5,626
2000	5,902
2005	6,283
2010	6,759
2011	6,718
2012	6,846
2013	6,734
2014	6,747

Source: Town Reports and US Census



55 developments are permitted and awaiting construction – Ridgewood AAN and Plantation Phase 2.

The racial mix in Stow is primarily Caucasian, however, there is a small representation of diverse minorities (Table 3-3); the racial mix has not changed much in the last 10 years. The population is well educated with more than half of Stow's adults having a college education, significantly higher than the Massachusetts population as a whole (Table 3-4). This is also reflected in the distribution of occupations which indicates that more than half of the Town constitutes professionals and managers (Table 3-5).

Table 3-2. Population Distribution in Stow 2000-2010 (Census)

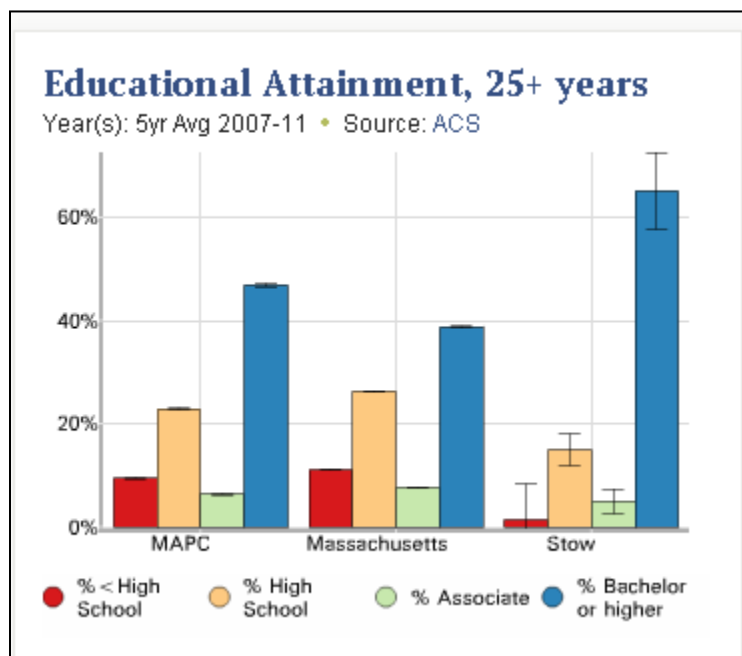
	2000	2010	% Change
Total Population	5902	6590	+ 11.66%
Under 5 years	510	412	- 19.22%
5-9 years	470	507	+ 7.87%
10-14 years	442	548	+23.98%
15-19 years	335	389	+16.12%
20-24 years	156	216	+38.46%
21 years and older	4109	4706	+14.53%
65 years and older	485	840	+73.20%
85 years and older	48	88	+83.33%
Median Age	38.8	43.5	+12.11%

Table 3-3. Racial Make-up of Stow ^a

White	6079
Black	44
American Indian	9
Asian/Pacific Islander	213
Hispanic	122
Other	10
Two or more races	113

^a 2000 & 2010 US Census data.

Table 3-4. Education Attainment – Stow vs. Statewide Average – Census/American Community Survey



There is very little industry in Stow, with more than 95% of the tax base being industrial. In addition to agriculture and construction, major employers include BOSE, Radant, small businesses within the Gleasondale Mill. Most of the commercial activity is in the retail and service sector and is located along the major routes through town, most notably Routes 117 (Great Rd.) and Route 62. There is little vacant land zoned for commercial and industrial use.

Table 3-5. Stow Employment by Sector – 2013

Natural Resources and Mining:	2.9%
Trade, Transportation and Utilities:	12.4%
Professional and Business Services:	5.1%
Manufacturing:	27.2%
Leisure and Hospitality:	14.7%
Information:	0.8%
Financial Activities:	1.8%
Education and Health Services:	10.6%
Construction:	7.9%
Other Services:	2.4%

2013, MA Executive Office of Labor and Workforce Development

3D. Growth and Development

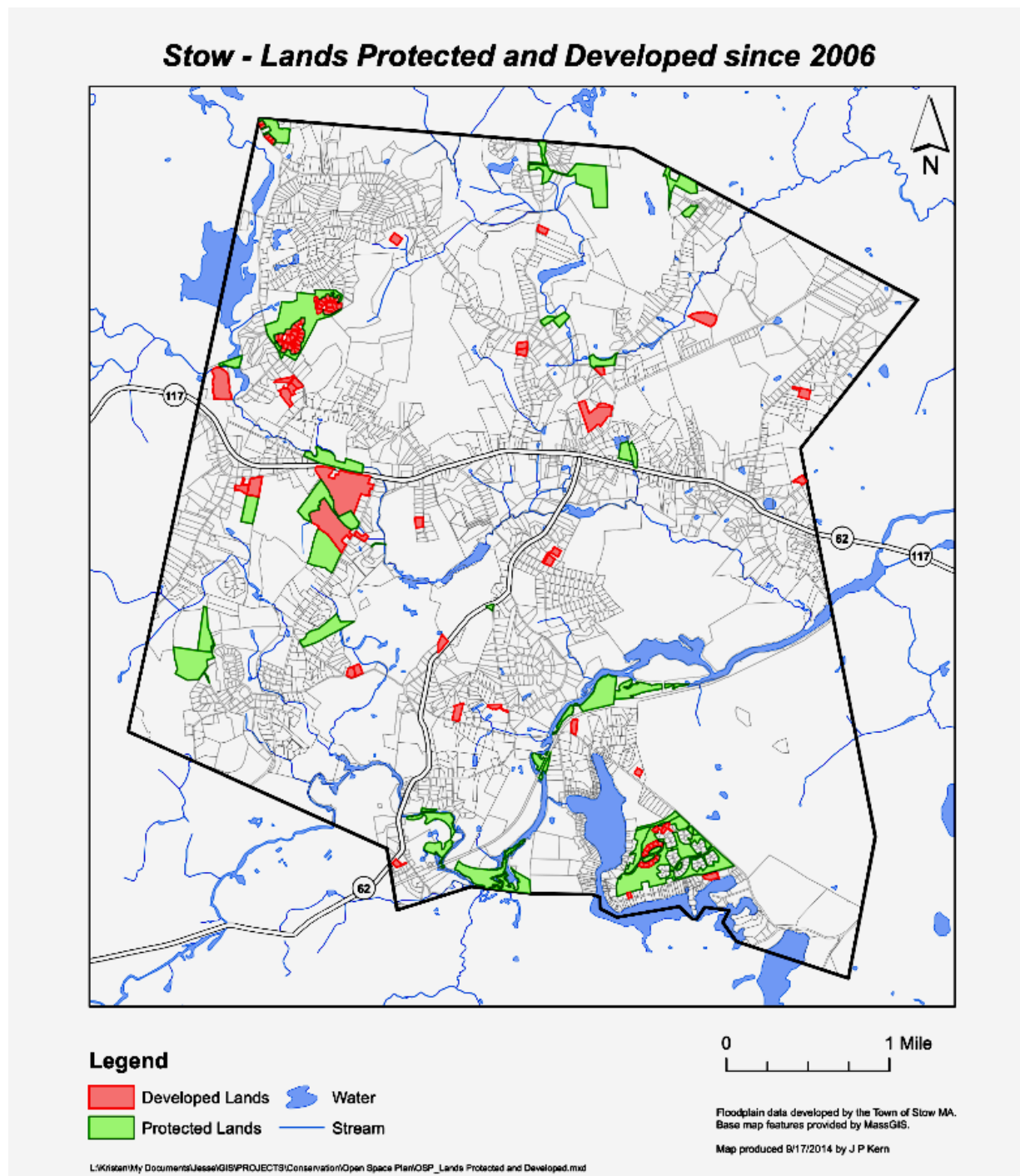
Patterns and trends

Between 2000 and 2010, the total number of households increased in Stow from 2,082 to 2,429, or 16.67%. The median single family house price in 2012 was \$479,285 versus \$323,800 for Massachusetts. Like most of the Commonwealth, growth and development in Stow has slowed considerably over the last decade. Table 3-6 shows the number of Building Permits for new single family dwellings that have been issued in Stow from 1996-2015. In the past few years, the number of single family dwelling permits declined sharply, but appears to be beginning to increase again.

**Table 3-6: Single Family New House Construction Building Permits in Stow
(Building Department/Annual Town Reports, Cost from www.citydata.com)**

<u>Year</u>	<u># of Permits</u>	<u>Average Construction Cost</u>
1996	19	\$118,200
1997	30	\$130,000
1998	34	\$141,900
1999	23	\$113,600
2000	41	\$173,000
2001	28	\$161,700
2002	36	\$167,500
2003	16	\$238,700
2004	37	\$228,100
2005	31	\$270,800
2006	37	\$216,900
2007	55	\$249,000
2008	45	\$302,400
2009	50	\$294,100
2010	27	\$308,900
2011	22	\$310,600
2012	10	\$377,200
2013	8	N/A
2014	5	N/A
2015	15	N/A

Stow's 2008 Open Space and Recreation Plan recommended that the Town track the number of acres developed and the number of acres protected annually. From this data, Map 2 was prepared showing the location of new development and new protected land over the past nine years (2006-2014). Most of the new development has been located within five larger developments: Wildlife Woods, Arbor Glen, Villages at Stow, Derby Woods and Pilot Grove 2.



Map 2: Stow Lands Protected and Developed since 2006

The Town of Stow contains 17.62 square miles and it is still a relatively rural town when compared with most neighboring communities. The population density of Stow is 377.9 persons per square mile as of 2011, compared with a density of 1948.9 in Maynard, 487.4 in Boxborough, 246.6 in Bolton, 248.0 in Harvard, 1675.1 in Hudson, and 1109.3 in Acton.

Income Characteristics

In 2000, the median income for a household in Stow was \$96,290, and the median income for a family was \$102,530. By 2012 the median household income was \$130,178 compared with \$65,339 statewide.

Infrastructure - Transportation Systems

The principal transportation network which serves Stow has not changed significantly in many years. Public transportation is provided only by the South Acton train station, part of the MBTA's Fitchburg to Boston line. There are still not many designated pedestrian, bicycle or horseback ways, although a portion of the Assabet River Rail Trail (ARRT) in Marlborough and Hudson has been completed, and a section in Maynard and Acton is in progress. In Stow, where a few private landowners have raised concerns about the Rail Trail, various alternative proposals have been examined that would provide for continuation of the trail. (ARRT Feasibility Study, 1997), the most promising of which is extension of the Rail Trail through the Assabet River National Wildlife Refuge.

Infrastructure - Water Supply Systems

The water supply system in Stow has also not changed significantly in recent years. It is still primarily based on individual on-site systems except for a number of privately owned "public" systems which either serve small developments, recreation areas or businesses and the town-owned system in Stow Center. The water supplier for Harvard Acres recently went bankrupt, forcing homeowners in that development to install individual wells. Current "public" systems include those of Juniper Hills, Plantation Apartments, Meetinghouse at Stow, Arbor Glen, Villages at Stow, Pilot Grove Apartments and the Town Common water system, which serves the Town buildings, one home and a church. Currently under consideration is a small-scale public or private water supply system to serve the "Lower Village" area, in order to alleviate regulatory constraints on businesses in this area. A portion of the Heritage Lane Open Space adjacent to Lower Village has been approved by Town Meeting and the Legislature for use as a water supply system in this area.

Protection of groundwater resources is a high priority according to Stow residents. It received a high priority ranking in the town-wide survey for the Master Plan in addition to being identified by participants in the Master Plan public forums. In the late 1980s Town Meeting approved a Water Resource Protection overlay zoning district in order to protect the groundwater resources of Stow. The overlay zones are based on an evaluation of the groundwater potential throughout the Town. The protected areas are those with the highest potential and generally coincide with the major aquifers in Stow. The Water Resource Protection district is shown in Map 4.

Infrastructure – Wastewater Disposal Systems

Sewage disposal systems in Stow, still mostly individual on-site septic systems, have not significantly changed in the last 20 years. New systems are all required to meet the local Board of Health regulations which are more stringent than the State's Title 5. Several new high density residential developments have constructed on-site private sewage treatment facilities including Meetinghouse at Stow on Rt. 117, the Villages at Stow 40B on Rt. 117, the Arbor Glen

Active Adult Neighborhood (AAN) development on Hudson Road, and the proposed Ridgewood AAN on Boxboro Road.

Long-Term Development Patterns

Stow has always prided itself on maintaining its rural character. Various town surveys over the years have consistently shown that the rural nature of the Town is crucial to the citizens. The most recent survey taken by the Master Plan Committee in 2003 reconfirms this desire. The perception of rural character is strongly dependent on the large amount of existing open land along the main roads of Stow. Thus preservation of these highly visible undeveloped parcels is necessary to maintaining the character of the Town.

The traditional development pattern in Town has encompassed 2 primary types of development: residential and business/light industry. During the 1980s, land values soared and some tracts of agricultural and forest land were sold for development. With the recession of the late 1980s and early 1990s and the drop in land values, growth slowed to its pre-boom pace. In the mid-1990s, however, housing growth increased and continued at a high rate through the early 2000s when large developments like Villages at Stow (96 units), Arbor Glen (66 units), and Derby Woods (33 units) were approved and constructed. The rate of development has slowed since 2006, but is likely to pick up again. Additional large developments are likely to continue to be submitted to the Town and will accelerate the pace of new home construction. Particularly vulnerable is the land in the southwest corner of Town where there are a large number of undeveloped parcels, three of the Town's five golf courses, and relatively little protected land. This area was identified for special attention in the 2008 Open Space and Recreation Plan. The 2000 Build Out Study completed by the Executive Office of Environmental Affairs (EOEA) for Stow identified the potential for the construction of more than 1300 additional homes *under current zoning*, which would increase the population from 5902 at the time of the study to 9582. Not taken into consideration are increases in population resulting from "density bonuses" in 40Bs or AAN developments, which could put this total higher. The study estimated that new development permitted by current zoning would add 699 new schoolchildren to Stow, generate a demand for 515,915 additional gallons of water/day, add 30 miles of new roads, and generate an additional 1888 tons of solid waste/year. The study also identified the potential for an additional 3.1 million square feet of commercial/industrial development on land currently zoned for this use.

This study provided helpful insight for the community and depicts a completely suburbanized landscape that will require significant investment in capital projects (such as new schools) to meet the demand generated by this development. While it is difficult to imagine a future Stow in which the only "open" land is that which is currently under permanent protection, this is the future reality depicted in the build out analysis. In addition to the impacts on the school population, such development would fragment habitat, threaten surface and groundwater quality, reduce recreational opportunities, add substantially to traffic issues on major arteries, and fundamentally change the character and quality of life of Stow. As a result, one of the recommendations of the 2008 Open Space and Recreation Plan was that town boards work actively to reduce the total buildout that is possible using a variety of tools including zoning, land acquisition, and other land protection techniques such as conservation restrictions, and seek to protect one additional acre of land for every acre that is developed. Today, residents continue to support strong land protection efforts, focused on those properties with the greatest potential to cause land use change.

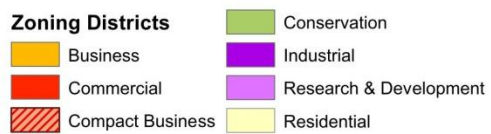
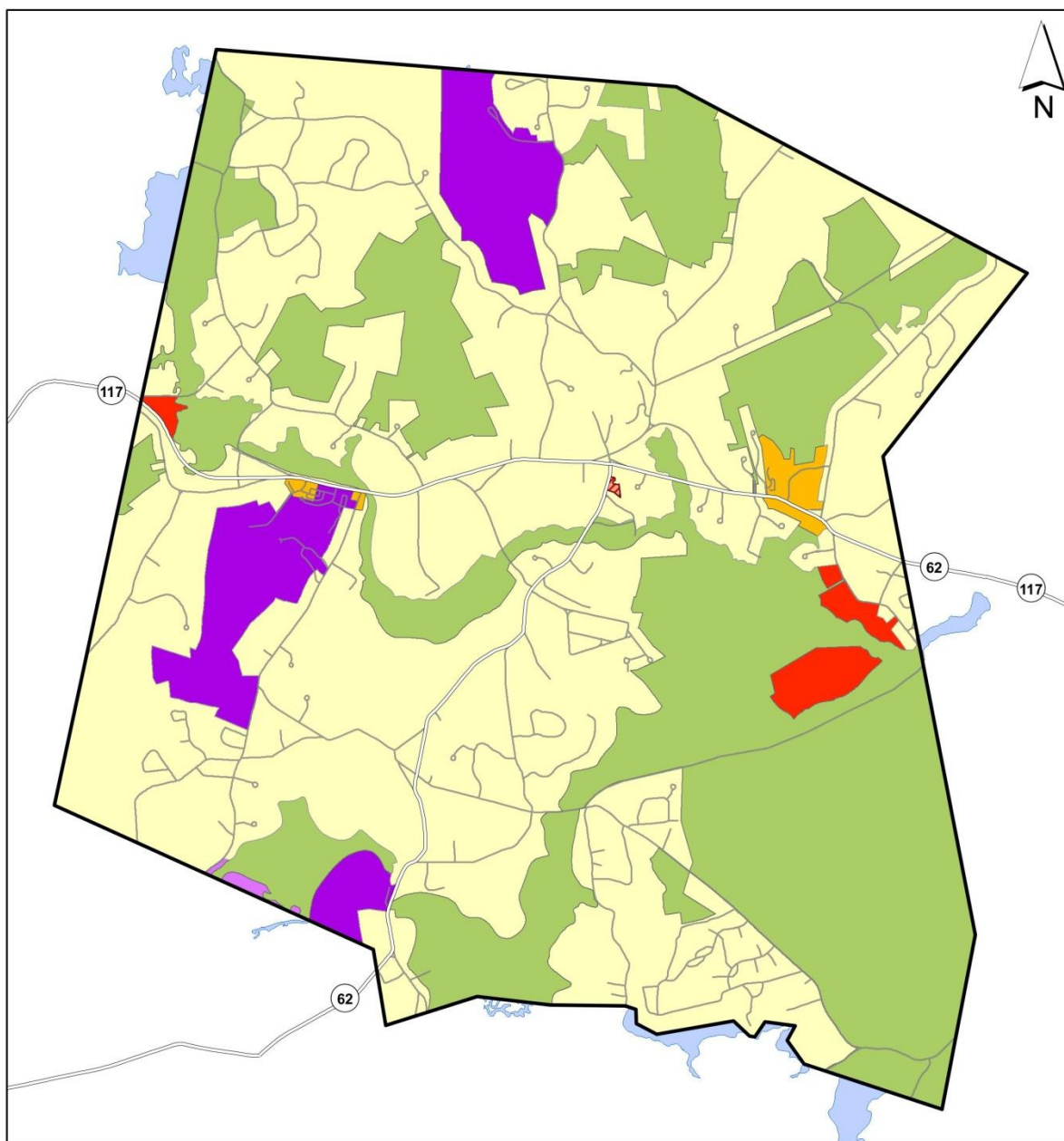
Another major regional study which included Stow was the 495/MetroWest Development Concept Plan addressing growth and development in 37 cities and towns along the I-495 corridor. The study identified Priority Development Areas (PDAs) and Priority Protection Areas (PPAs) within the study area. The study notes the progress that the Town of Stow is making

with regard to planned production of affordable housing. Relevant to this Open Space and Recreation Plan, the study notes the existence of several regionally significant land areas including Orchard Hill/Rockbottom Farm, Stow Acres (North and South Courses), Butternut Golf Course, Pilot Grove Farm, and several orchards including Honeypot, Carver Hill, One Stack Farm, Derby Orchards, and Shelburne Farm. Of these, Orchard Hill, Pilot Grove and the five orchards are listed as being of statewide significance. The “major” farms in Stow encompass more than 500 acres. Lastly the study notes a high priority protection and development area on White Pond Road near the Assabet River.



Flagg Hill Conservation Area Entrance off Trefry Lane.

Stow - Zoning



Water

0 1 Mile

Floodplain data developed by the Town of Stow MA.
Base map features provided by MassGIS.

Map produced 3/18/2015 by J P Kern

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Map 3: Current Stow Zoning

Section 4

Environmental Inventory and Analysis

4A. Geology, soils, and topography

The topography in Stow varies from low elevations along the Assabet River (180 feet above Mean Sea Level) to the highest elevation of 457 feet on Marble Hill. The Assabet River is the main drainage area for most of Stow. The areas of highest elevations in Stow are the bedrock and glacial till areas in the northwest quarter of the Town. Other major topographic highs include drumlins such as Spindle Hill, Birch Hill, Pilot Grove Hill, Spring Hill and Orchard Hill.

Stow's topography is a product of glacial activity. As the glaciers retreated, meltwater streams flowing out from under the glaciers dropped sands, gravels and silts either in large glacial lakes or along those drainage areas that existed in Stow. These meltwater deposits created the flat plains and irregularly shaped hills and ridges found throughout the Town.

From a land use perspective, the bedrock in Stow has not been a major impediment to agriculture or development. In most of Stow, bedrock is found only at considerable depths. Where bedrock occurs at the surface, the exposures are small and rather scattered. Most of the exposures are limited to either the northwest quarter of Stow or the southeast corner within the Assabet Refuge. In most places where bedrock is exposed, there are other constraints on land use such as high slope and/or perched water tables.

Stow's geology was studied extensively in 1977 by IEP, an environmental consulting firm. The report and accompanying maps are available in the office of the Stow Conservation Commission.

Soils (Map 4) and topography place constraints on development in Stow and affect land use patterns. In steep areas, access often requires significant cuts or fills, creating drainage problems, and erosion and sedimentation. Examples of this can be seen in the lots along the southwest side of Wheeler Road on the side of Spindle Hill, the access road to Pilot Grove Apartments on Pilot Grove Hill, and the new Common Driveway serving the Highgrove Estates development on West Acton Road. The Town has not adopted a steep slopes bylaw to address these issues but does have a common driveway bylaw which may serve to reduce the problem of multiple driveways serving individual single family houses. Similar changes could be made in the subdivision rules and regulations to

Orchard Hill – Rockbottom Farm Gleasondale

A unique drumlin/esker feature in Stow can be found at Rockbottom Farm in Gleasondale. This feature is so significant that it is highlighted in the popular book "Roadside Geology of Massachusetts" as well as in a 1956 regional geological study which contains this quote and photo:

"Most interesting of all the drumlins in the area is Orchard Hill near Gleasondale. Viewed from its base, Orchard Hill betrays nothing unusual in its form, but extending for about three-fifths of its length, parallel to and just west of its axis, is a remarkable scoured meltwater channel... 27 feet deep at its deepest point. Its gradient is toward the south... its sides remain steep and sharply outlined."



From: Geology and Mineral Resources of the Hudson and Maynard Quadrangles Massachusetts. Geologic Study Bulletin 1038, 1956 (photo from report)

require additional scrutiny for lots with severe topographic constraints. For example, some towns limit the amount of cut and fill or clearing permissible in these situations. Stow's Planning Board requires an Erosion Control Special Permit for many projects like these.

Drumlins are a notable feature of Stow, and many of the high hills scattered throughout the community singly and in groups have been the focus of land protection efforts, however some remain available for future development. Orchard Hill is one of the more interesting drumlins in Stow and additional detail about this feature can be found in the box on the right. Drumlins are glacial deposits that often have soils that make them poor choices for development. As part of this Open Space and Recreation Plan update we have mapped the drumlins of Stow and noted their protection status. (See Map 5). It is also worth noting the exemplary esker located within Red Acre Woodlands behind Pilot Grove Farm.

In addition to its high hills, Stow has many low-lying wet areas that place constraints on the development of septic systems. A good example is the 124-acre Kane property on Route 117, which was examined and rejected by the School Building Committee in 2005 as a potential site for a new school. Despite its large size and access to Route 117, extensive wetlands and streams, combined with steep slopes on a portion of the property, will make any development on this parcel challenging.

As Stow approaches buildout, the remaining parcels will be increasingly constrained by wetlands and steep slopes. This will necessitate additional scrutiny of proposed projects, including professional review of applications, particularly roadway designs and stormwater management plans.

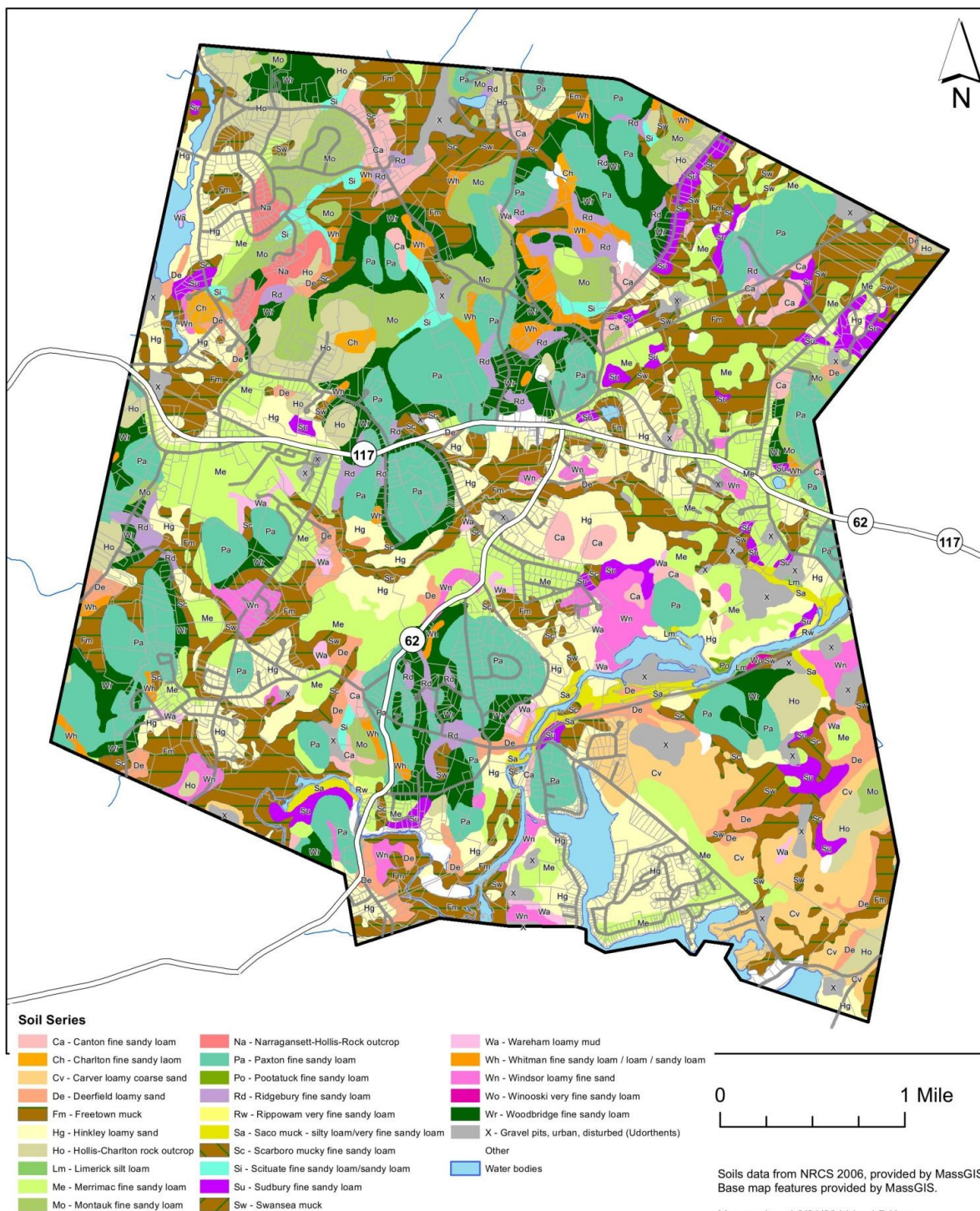
4B. Landscape Character

Stow is generally considered a rural community by its residents. This impression is reinforced by the areas of open space and scenic vistas visible along the Town's roadways. In particular, the many active orchards and farms lend a distinctively rural element to the Town that is not found in many nearby communities. In addition to the agricultural and conservation aspects of the community, Stow has five active golf courses: Stow Acres North and South, Butternut, Wedgewood Pines, and Stowaway. These open spaces contribute to the rural visual impression and sense of "elbow room" in Stow.

In addition, to the visible farms and golf courses, there is a large amount of undeveloped land "hidden" behind the many lots which front along public ways. One has only to look at the assessors' maps to discern the large parcels behind these lots; areas left in their natural state because of difficult access, wetlands, rocky soils, or poor drainage. Where the forested hills rise behind these homes, or one is able to see between the buildings, then one can sense the extensive undeveloped landscape of Stow.

Also contributing to the Town's open character are "odd" lots, which occur at forks in the road, on the outside of curves, or at wetland crossings. These bring a welcome relief to the developed roadside landscape, contributing a positive landscape attribution far beyond their size. Some of these lots are identified in this Plan, however, there has been no comprehensive inventory of Stow's scenic assets. The "Scenic Significance" map in Section 5 of this Plan identifies important unprotected scenic parcels in Stow (See Map 24 on Page 93).

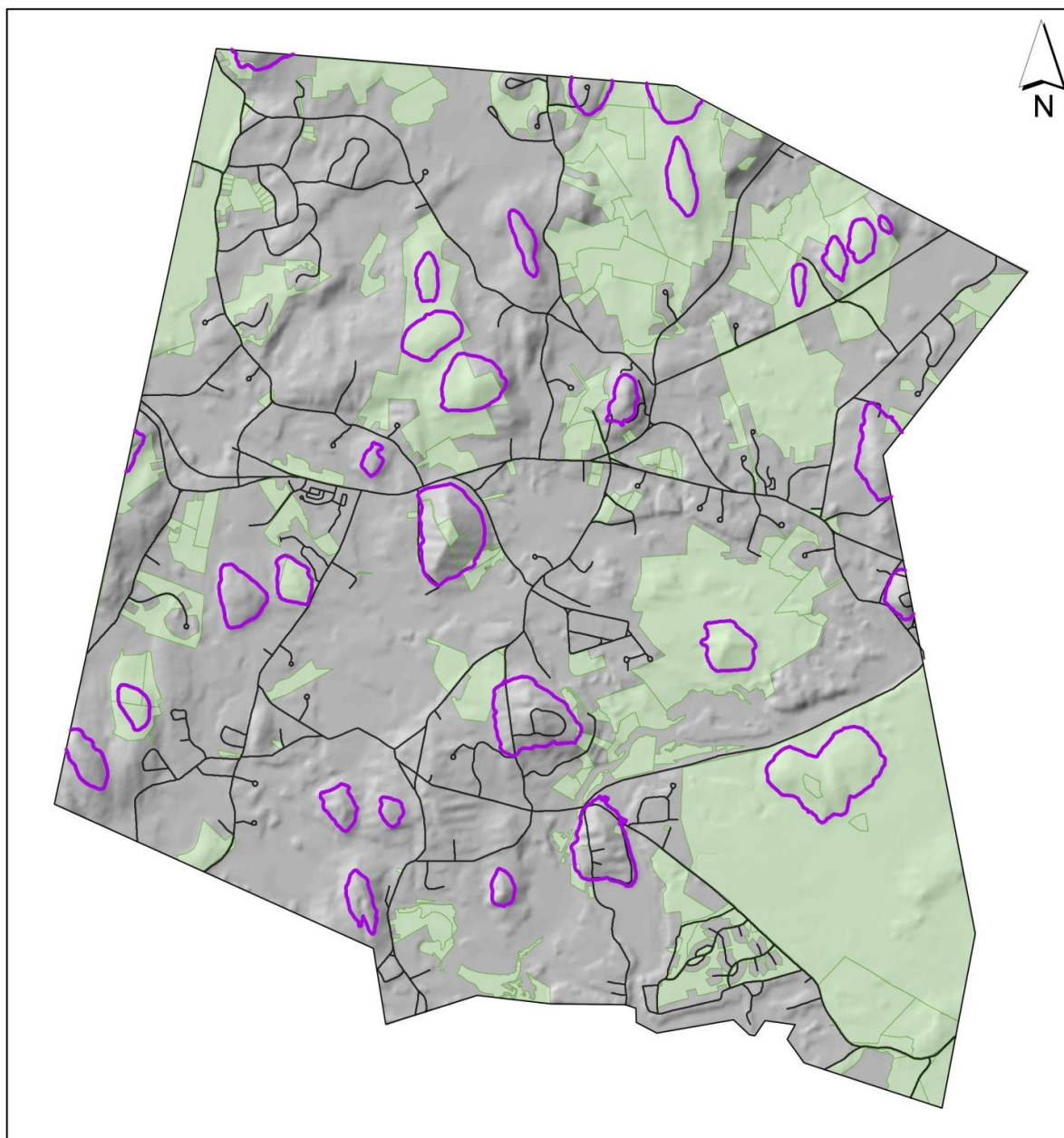
Stow - Soils



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Map 4: Stow - Soils

Stow - Drumlin Protection Status



Legend

- Drumlin
- Protected Open Space Lands

0 1 Mile

Floodplain data developed by the Town of Stow MA.
Base map features provided by MassGIS.

Map produced 3/11/2015 by J P Kern

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Map 5: Drumlin Protection Status

One of Stow's more noticeable landscape aspects is the health of the roadside trees. These trees are endangered by road salt, by extensive cut-backs for telephone, cable and electric wires, and by disease - Dutch Elm has killed most of the majestic Elm trees, and Ash Decline is quickly reducing the population of the White Ash, a common roadside tree. In an attempt to preserve the existing character of Stow, the Town has adopted a zoning bylaw that provides for "planned conservation development" of larger parcels. This bylaw encourages developers to build houses on reduced size lots, leaving large areas open for recreation and conservation purposes instead of using the traditional "cookie cutter" approach to subdivision. The landowner can realize the value of the property and the Town gains by retaining some of the open space. With the encouragement of the Planning Board, most recent subdivisions in Stow have taken advantage of this provision.

4C. Water Resources

Watersheds and Surface Waters

Stow is located within the Concord River basin and the Assabet River sub-basin of the Sudbury, Assabet and Concord (SuAsCo) watershed. Nearly all the surface runoff in Stow enters one of three drainage areas: Heath Hen Meadow Brook which flows northward into Acton and joins Fort Pond Brook; Elizabeth Brook which drains the middle of Stow and empties into the Assabet River near the Maynard town line; and the Assabet River, which with its smaller tributaries drains the lower third of Stow as it continues eastward to meet the Sudbury River and form the Concord River. Elizabeth Brook is the largest tributary of the Assabet River.

The Delaney Flood Control Project in the northwest corner of Stow also uses land in Bolton and Harvard; it is essentially the headwaters of Elizabeth Brook.

Lake Boon

Lake Boon is the largest surface water body in Stow (and Hudson). The Lake itself is made up of three major basins, which were expanded by the construction of a dam in 1847 in order to provide water storage for the Assabet Mills in Maynard. The Town of Stow purchased the water rights and subsurface land area (in Stow) from the heirs of Assabet Mills.

As Stow has grown and developed, summer cottages that surround Lake Boon have been converted to year-round homes. Many of the sewage disposal systems for these residences do not meet Board of Health regulations for wells and septic systems, and failures have to be treated as emergencies, resulting in limited upgrading to the extent practical. Many wells are also shallow point wells, which are gradually being upgraded over time.

A recognized problem associated with Lake Boon is increased growth of aquatic weeds (notably Milfoil and Fanwort) caused by runoff from lawn fertilizers and septic leachates from the densely developed shores. Despite regular pump outs and septic system improvements, installation of 25 leaching catch basins within the watershed, and broad community education on practices to minimize runoff, excessive growth of several species of invasive aquatic weeds is still adversely affecting recreational use of Lake Boon. The Lake is now regularly treated for weeds in a cooperative effort by both Stow and Hudson to maintain its ability to support swimming and boating.

The Assabet River

The Assabet River is a major regional surface water feature that flows from the southwestern to the east-central parts of Stow. Nearly all surface drainage in Stow flows either directly to the Assabet or to its tributaries - Heath Hen Meadow Brook in northern Stow and Elizabeth Brook in central Stow. A small area in the southeastern corner of Stow drains into the Sudbury River watershed.

Stream flow normally varies in an annual cycle, declining from peak flows in the early spring, reaching minimums in the later summer and early fall, and then rising and remaining at moderate heights during the winter. The US Geological Survey maintains a measuring station on the Assabet River (150 feet upstream from the bridge on Route 27 in Maynard).



Assabet River from Boon Road

The Assabet River has serious water quality problems caused by excessive nutrients. A local nonprofit watershed association, OARS, regularly monitors the water quality in the river and in Elizabeth Brook. OARS has been working with state and federal agencies to reduce the discharge of pollutants from the wastewater treatment plants upstream of Stow in Hudson, Marlborough, and Westboro that adversely impact the river. While these treatment plants have been significant sources of nutrients, additional nutrients come from septic systems and stormwater runoff. As land in Stow and the watershed as a whole is developed, runoff from impervious surfaces will increasingly contribute to the river's water quality problems unless stormwater is managed well.

Aquifer Recharge Areas

Abundant and clean groundwater supply is one of Stow's most valuable resources, for drinking, wildlife and recreation. The subsurface hydrology of Stow is directly related to its subsurface geology, the ability of the rainfall to infiltrate into the ground, thereby becoming groundwater. Once there, it is constantly moving from areas of higher elevation to areas of lower elevation. Therefore, it has to be constantly replenished, or "recharged." Removal occurs as withdrawal for use or through seasonal discharge into streams, ponds, and wetlands.

There are four general hydrogeologic requirements that must be met for an area to be a high yield aquifer:

- 1) surficial geologic deposits of proper size and sorting to produce high rates of water movement
- 2) sufficient saturated thickness of surficial deposits
- 3) sufficient area-wide recharge, and
- 4) acceptable water quality.

A 1977 IEP study for Stow mapped aquifer areas in Stow likely to meet these requirements (see Map 6). Prudent protection of these aquifers and their recharge areas is vital not only to Stow but to other communities as well, and to the base flow of local streams and rivers.

The quality of groundwater in the aquifers depends to a large extent on the quality of water that recharges the aquifer – which is affected by the land uses at the surface. Land uses which discharge polluted or toxic wastes, or result in pollutants leaching into the ground water, must be carefully regulated to protect groundwater. In general, the quality of water from the surficial aquifer is naturally of high quality. However, high concentrations of naturally-occurring iron and manganese in wells are common, especially near wetlands. Many wells have water softening systems to counteract the effects of these minerals.

Water Resources Protection District

The surface hydrology or flow of surface waters is directly related to the groundwater systems in Stow and must be thought of as one complex hydrologic system. The streams, ponds and wetlands of Stow reflect the location of the groundwater table. Fluctuations in the surface water levels coincide directly with fluctuations in the water table and vice versa. During most of the year surface waters are fed and maintained predominantly by groundwater flow.

To aid in the protection of its water resources, Stow has established a zoning overlay district, the Water Resource Protection District, and the Town has adopted protections within the Stow Zoning Bylaw that regulate the types and intensity of land uses within the overlay district. Map 7 on the next page shows the location of the Water Resource Protection District.

Flood Hazard Areas

Flooding may be defined as the occurrence of flow in a stream or river that exceeds the capacity of the banks formed by normal flows. All waterways have floodplains, those areas that flood during significant storms. An increasingly important factor related to flooding in Stow is the creation of impervious surfaces that limit infiltration and increase surface flow.

In January of 2013, the Federal Emergency Management Agency (FEMA) released Preliminary Flood Insurance Rate Maps (FIRMs) updated with more precise base flood elevation data and land contour mapping for Middlesex County. The Stow Planning Board held public information meetings, as well as a Public Hearing during the 90 day community comment period, prior to the Town's adoption of the updated FIRMs at the May 2014 Town Meeting. FEMA's updated FIRMs, together with floodplain designations delineated for the Assabet River, by the Army Corps of Engineers in 1966, and for Heath Hen Meadow Brook, by BSC Engineering in 1975, form the official boundaries of Stow's Floodplain Overlay District.

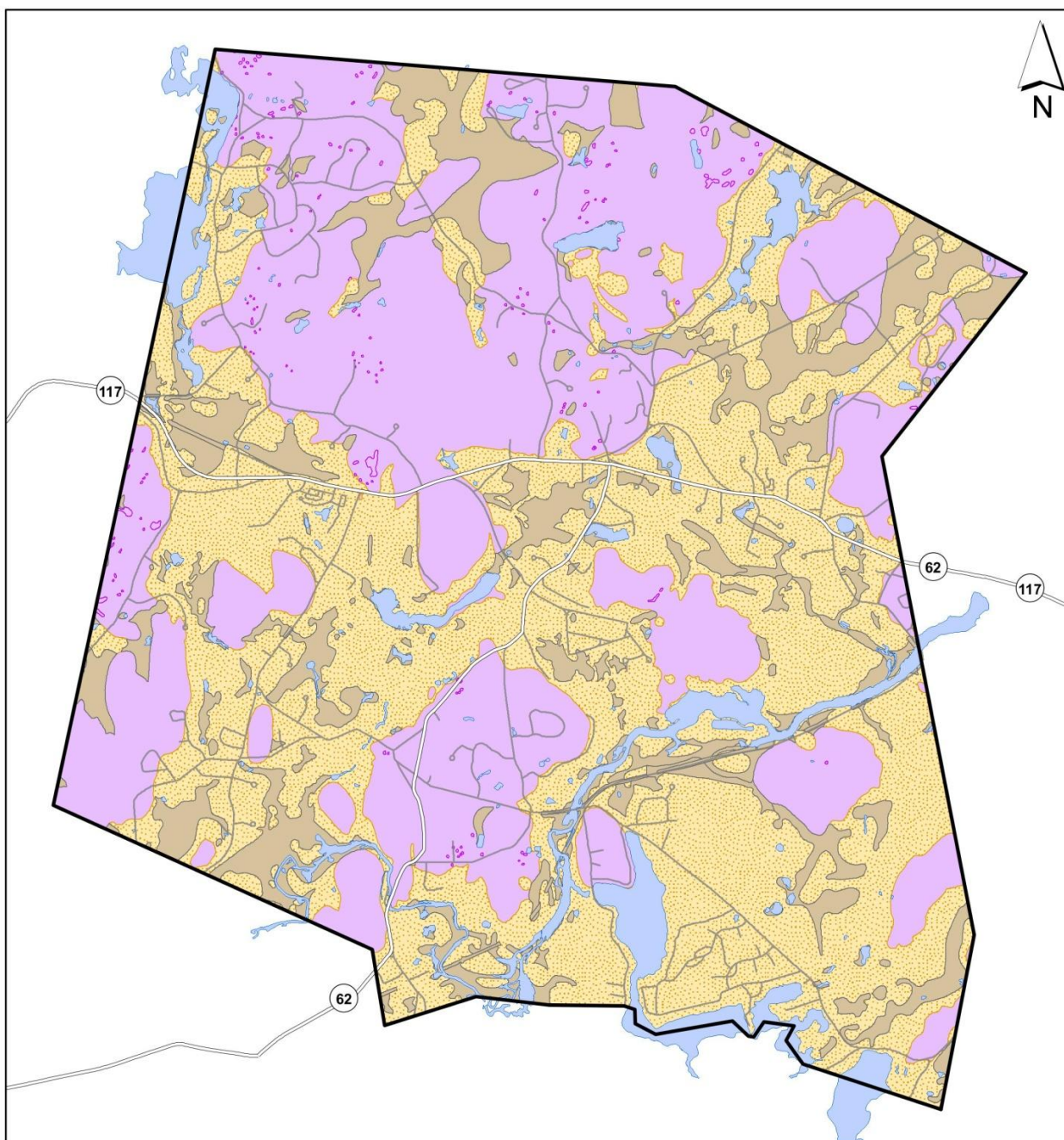
The combination of these three sources of floodplain data is shown on Map 8, depicting Stow's floodplain boundaries.

Wetlands

Stow contains many low-lying wetland areas. Map 9 depicts wetlands in Stow as mapped by the Fish and Wildlife Service's National Wetlands Inventory and the Massachusetts Department of Environmental Protection. Because many small wetlands are not shown, this map should not be viewed as a substitute for actual on-the-ground wetland delineation. Stow's GIS Department is just beginning a project to scan and add to the map available wetlands delineation information.

Stow has a local wetlands bylaw that is more stringent than the Massachusetts Wetlands Protection Act. The Conservation Commission administers the bylaw and is currently in the process of updating its regulations to assist in administration of the bylaw.

Stow - Surficial Geology



Legend

-  Sand and Gravel
-  Till or Bedrock
-  Floodplain Alluvium
-  Water

0 1 Mile

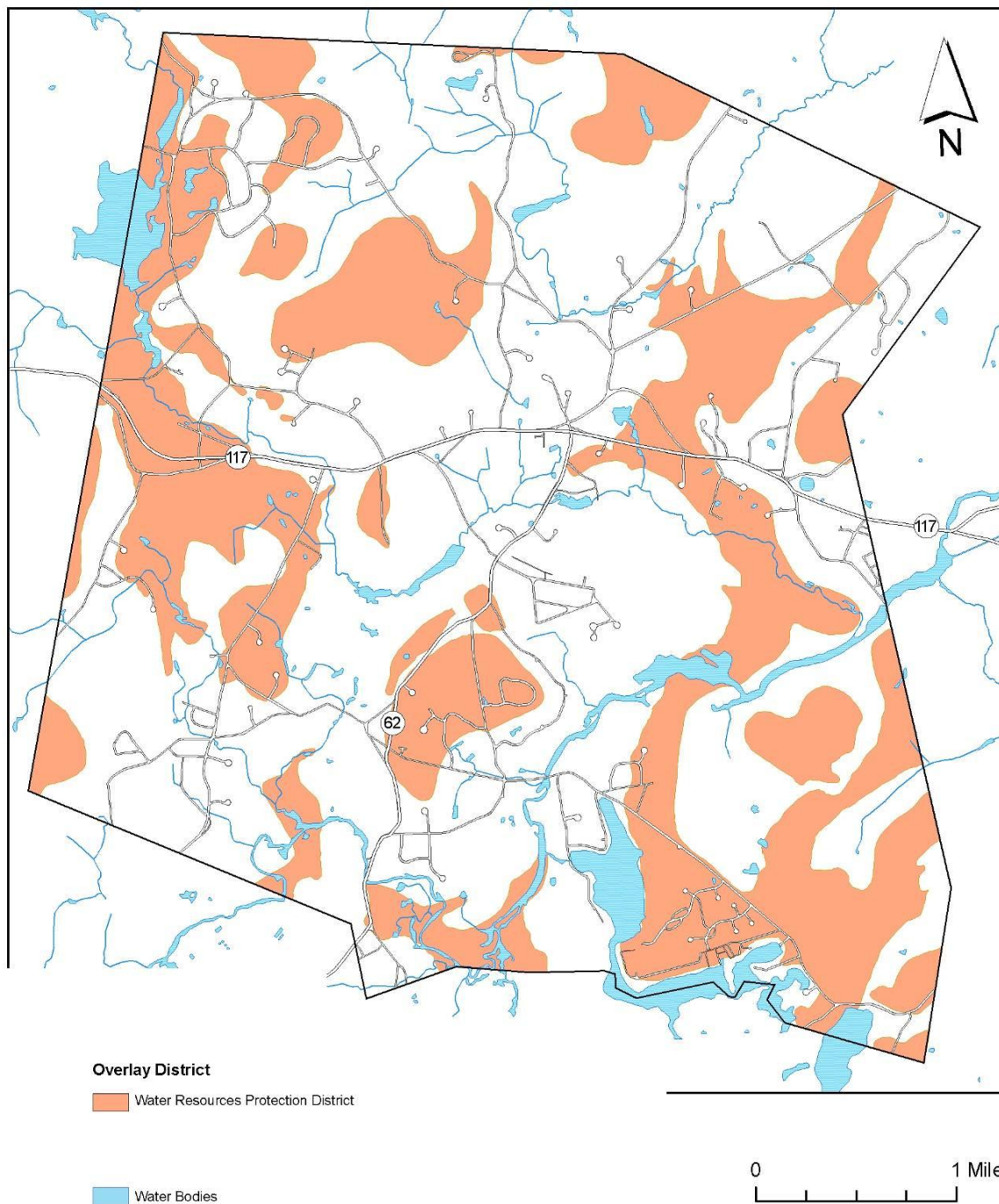
Floodplain data developed by the Town of Stow MA.
Base map features provided by MassGIS.

Map produced 3/18/2015 by J P Kern

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Map 6: Stow - Surficial Geology

Stow - Water Resources Protection District



Zoning data developed
by Town of Stow, MA.
Map produced June 2006.

Map 7: Stow – Water Resource Protection District

4D. Vegetation

General Inventory

There is a wide range of natural vegetative communities in Stow, including hardwood and pine forests, red maple swamps, cattail marshes, wet meadows and quaking (Sphagnum) bog-like wetlands known as fens. The Stow Acres Country Club golf course includes a cranberry bog in which pitcher plants and Jack-in-the-pulpits can be found. The Town Forest has two fens. In addition, topographic maps show cranberry bogs on the Assabet Refuge land in the southeast corner of Stow. Woodland wildflowers are common in some pine and oak forest areas. The Town contains several orchards, nurseries, greenhouses and farms. These areas provide a wide variety of habitat for wildlife species as well and add to the Town's aesthetic and economic resources.

Forest Land

The principal native forest trees in Stow are white pine, red oak, and mixed hardwoods in the upland areas along with hemlock groves and hickories; most wetlands are dominated by red maples. Birches are interspersed in the edge areas where more light is available and as an understory tree in some younger forests. Understory vegetation consists of a variety of small trees and shrubs including evergreen shrubs, native dogwoods, viburnums, witch hazel and highbush blueberries.

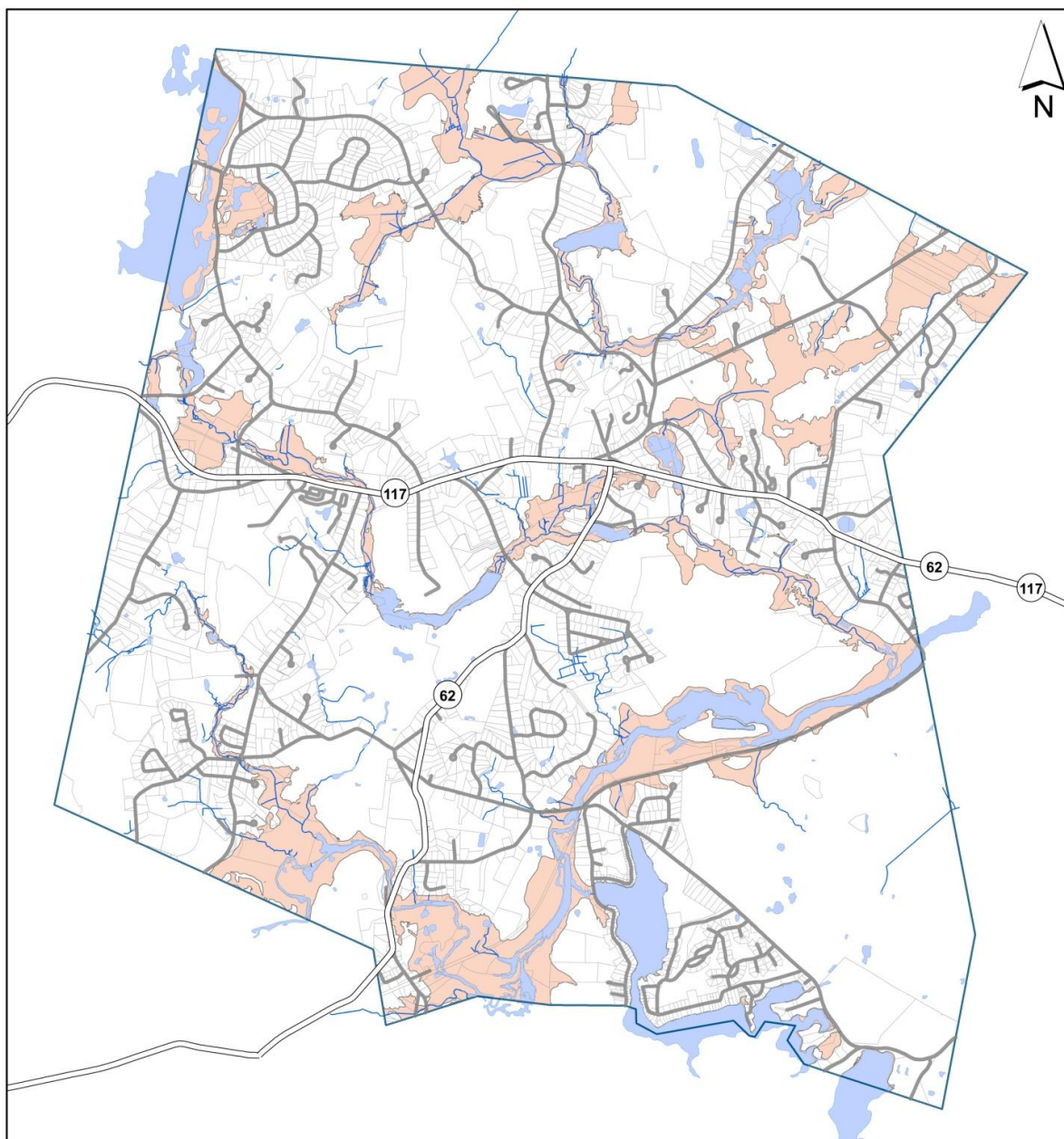
A number of mature groves of white pines are found in Stow's conservation lands, particularly at Town Forest, Marble Hill, and Capt. Sargent Farm. Other extensive groves of white pines are found at Lake Boon and on top of Pilot Grove Hill.

Since 1900 a variety of diseases and pests have limited the diversity of our woodlands. Chestnut blight eliminated the American Chestnut; American Elms succumbed to Dutch Elm Disease; White Ash trees are now dying of Ash Decline and many Hemlocks are infested with wooly adelgid. This lack of diversity could prove disastrous if new diseases appear; a good example was the massive damage done to oaks during the Gypsy Moth infestation of the early 1980s and in 1990-1991. To date there have been no occurrences of Emerald Ash Borer or Asian Long Horned Beetle, although these pests have been found in nearby communities. Stow is also seeing a large population of winter moth in recent years, which could affect apples, blueberries and various hardwood species.

Agricultural Land

Stow has a large number of parcels that are in agricultural use – ranging from large and highly visible properties such as Pilot Grove Farm, Carver Hill, Shelburne Farm, Honey Pot Hill Orchards, Applefield Farm, and Small Farm, to smaller and less visible properties. These farms are important elements of the Town's business base and community character and play a key role as scenic vistas both from public roads as well as the Assabet River. They also serve to link existing conservation lands and provide wildlife habitat. Protection of agriculture and agricultural lands is a high priority in this Plan. Map 10 depicts areas with prime agricultural soils in Stow. Massachusetts has a statewide Executive Order designed to minimize development on prime farmland and to require mitigation for state funded or permitted projects on prime farmland. A copy can be found in Appendix E of this Plan.

Stow - Floodplain Overlay District



Legend

- Floodplain Overlay District
- Water
- Stream

0 1 Mile

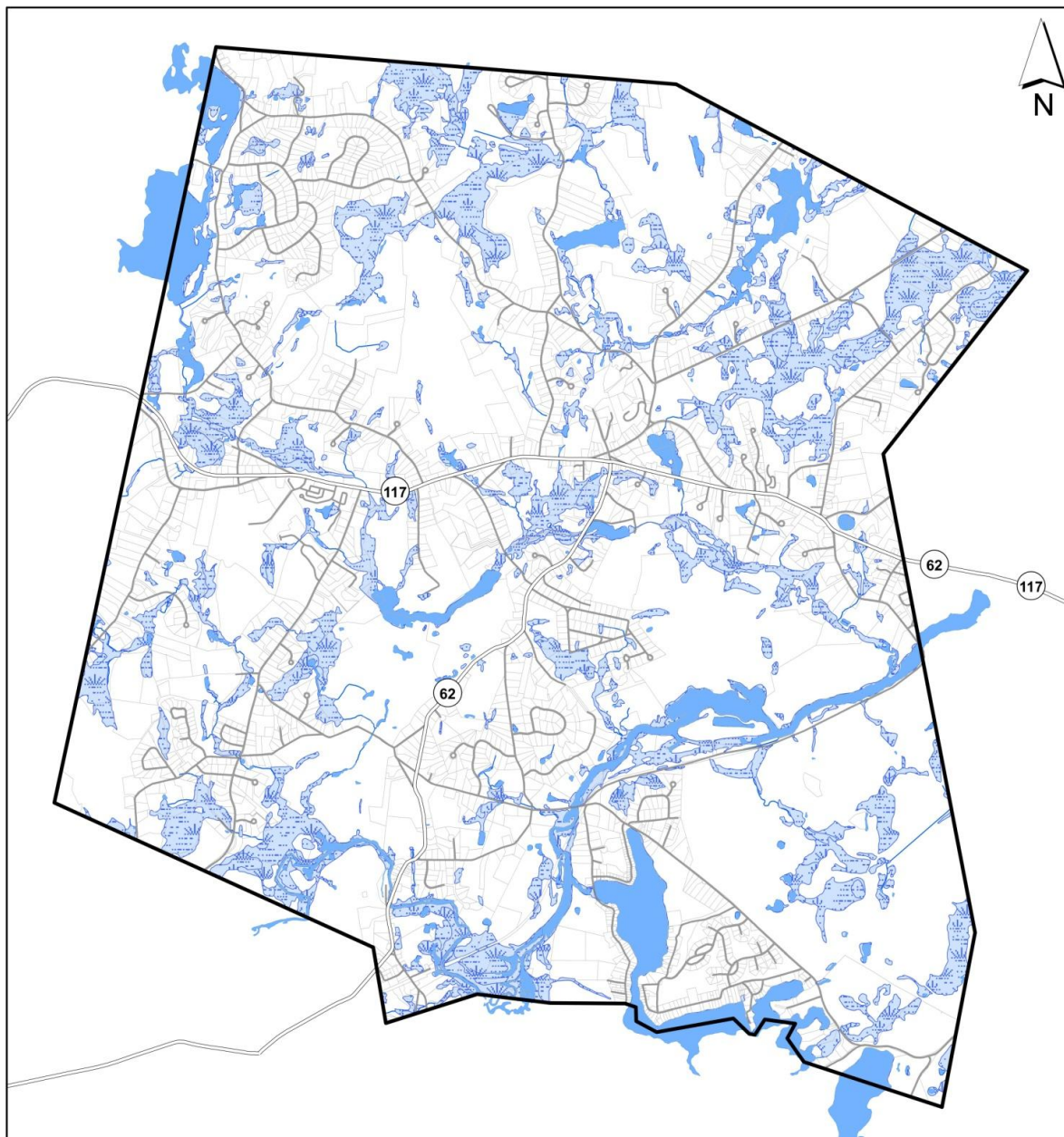
Floodplain data developed by the Town of Stow MA.
Base map features provided by MassGIS.

Map produced 7/27/2015 by J P Kern

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Map 8 – Stow Floodplain Overlay District

Stow - Wetlands



Legend

-  Water
-  Wetland
-  Stream

0 1 Mile



Floodplain data developed by the Town of Stow MA.
Base map features provided by MassGIS.

Map produced 8/12/2015 by J P Kern

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Map 9: Stow - Wetlands

In 2013, Stow played an active role in the Minuteman Advisory Group on Interlocal Coordination (MAGIC) Comprehensive Agricultural Planning Project, focused on farm viability, food system planning, farmland preservation in a thirteen town region. Several significant agricultural issues in the region emerged, such as limited options for land tenure and difficulty accessing affordable farmland, public education about farming processes and its community impact, as well as the affect local municipal regulations can have on farm viability strategies. Several key recommendations are noted in the report that support the continued viability of farming in Stow, including 1) undergoing a local assessment of the agricultural system (including potentially productive lands), regulatory support for diversified revenue streams for farms, and supporting potential agricultural productivity in the process of acquiring and protecting land.

Public Shade Trees

One of Stow's more noticeable landscape aspects are its roadside trees. Although protected from arbitrary cutting through the provisions of the state statute commonly known as the Public Shade Tree Law (G.L. Ch. 87), these trees are endangered by diseases, droughts, storm damage, motor vehicle damage, insect infestations, girdling roots, compacted soils, and other environmental stresses such as the application of road salt, and extensive cut-backs for utility wires, and poor planting practices. Fortunately, many miles of our roadsides have seen volunteer species rise to the occasion and infill areas where dead, diseased, and storm-damaged trees have been removed. Their numbers are regularly enhanced by the planting of other roadside trees through the efforts of the Tree Warden and other residents. Over the past two decades many so-called "Liberty Elms" have been planted around town. Liberty elms are American elm cultivars that are resistant to Dutch Elm Disease. Almost all the Liberty elms that have been planted as street trees around Stow are thriving. Other disease-resistant European varieties of native American trees have also been planted, such as a European Chestnut donated by a resident of Gleasondale and planted on the common area at Marlboro Road and Gleasondale Road, and which is also thriving.

Diseases, over the decades, have killed most of the majestic American elms, American chestnuts, ash varieties, and the American sycamore. Very few of the butternut and/or black walnut trees, once prevalent in some areas of town, remain on our roadsides, presumably due to their sensitivity to road salt.

Insects, such as the Asian Longhorned Beetle and Emerald Ash borer, have been found elsewhere in Massachusetts, but to date there are no known reports of either being found in Stow. But the number of different types of beetles, mites, aphids, adelgids, borers, caterpillars, moths, and other insects that can stress and kill trees is significant, and always of concern.

The Stow Tree Warden has created and maintains a list of acceptable and unacceptable species for street tree plantings in Town. Residents and developers are encouraged, and/or required, to refer to the list when choosing trees that are intended to be our future public shade trees. Many different species and varieties from this list have been planted around town.



The Tree Warden also maintains a current list of dead, dying, storm-damaged, or otherwise hazardous roadside trees for the Highway Department tree crews to prune or remove as time allows, in order to keep our public ways reasonably safe for travel. Highway Department personnel regularly prune roadside trees of low, dead, or otherwise troublesome limbs, as well as other small roadside growths. The cutting of roadside trees and growths is performed generally in accordance with the Tree Warden's *Policy on the Cutting of Public Shade Trees by Highway Department Personnel*.

The Tree Warden regularly deals with many requests from residents who wish to remove, or have removed, trees that they deem to be of concern to them. Determining whether a particular tree is in fact a public shade tree by definition, and therefore protected under the law, is often a difficult task, because most of the Town's public ways do not have recorded layouts that would show definitive property lines on each side.

For many reasons, the streets of Stow may never again be lined by huge numbers of towering shade trees, but our tree canopies are significantly greater now than at other periods of time in our past, and continue to expand. As one of the first settled areas in the country, our lands were almost entirely clear-cut, more than once over the centuries, prompting the need for Massachusetts to promulgate the nation's first public shade tree law.

4E. Fisheries and Wildlife

Inventory

Stow's diverse vegetative communities provide habitat for a wide variety of wildlife species. The transition zones between developed and undeveloped acreage or between wetland and upland provide particularly valuable 'edge' habitat suitable for many species because they combine the characteristics of both types of land.

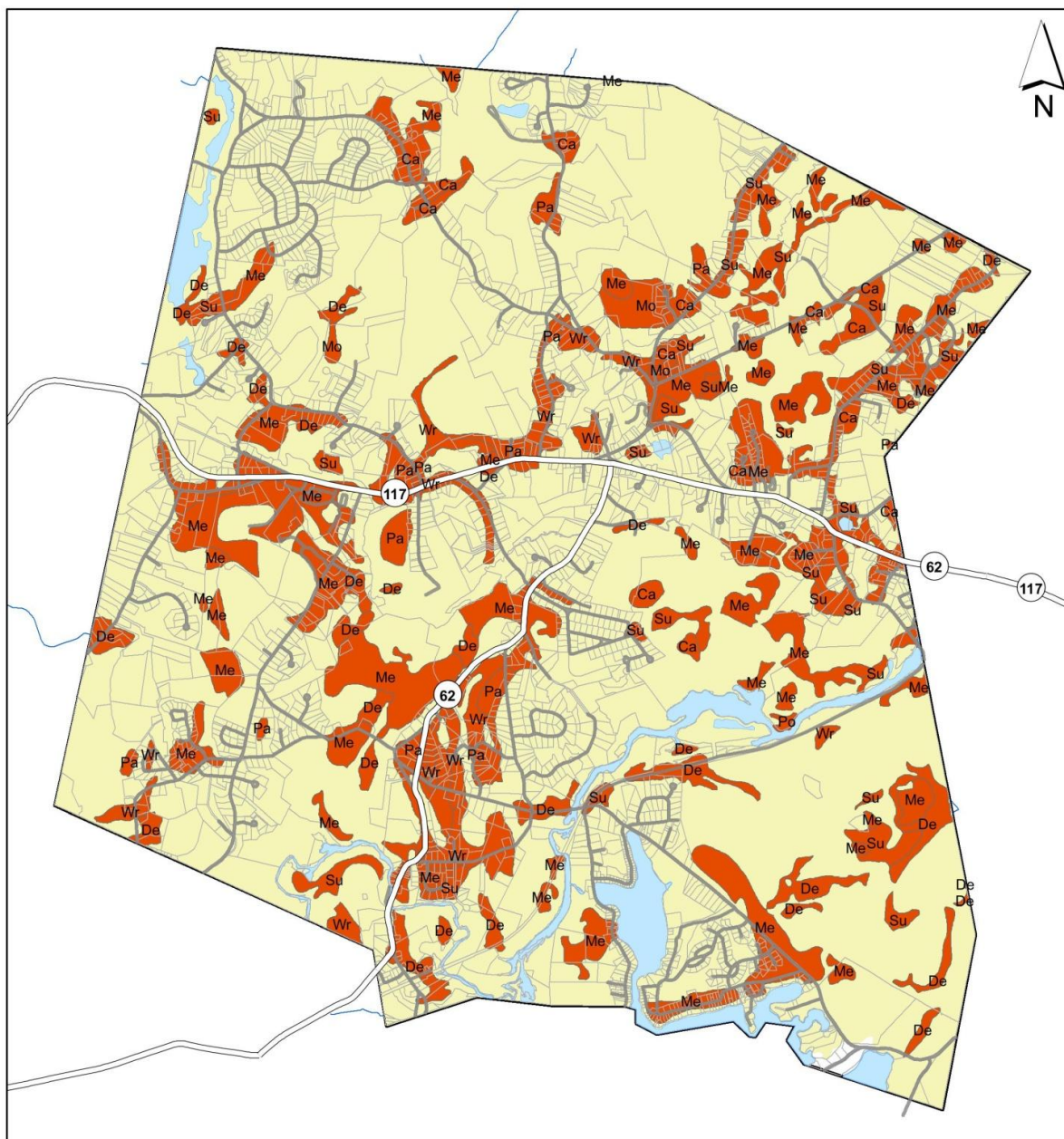
There are now four major properties in Stow that are managed specifically to encourage wildlife: the Delaney Project (MA DFW/DCR), the Assabet Wildlife Refuge (US Fish and Wildlife Service), and the Town-controlled Flagg Hill and Heath Hen Meadow lands. Many other properties in Stow, although not managed specifically to encourage wildlife, serve as links between many of these four main areas.

Stow is within the range of about 50 mammal species, 220 bird species, 20 reptile species, and 20 amphibian species. A list of these species is contained in the 1987 Stow Open Space and Recreation Plan. Increasingly common are mink, otter, fox, fisher, beaver and coyote. Moose have made regular appearances in Stow in the past few years and have even been seen at Lake Boon. Eastern Black bear is an occasional visitor.


Vernal Pools

Stow has 29 vernal pools – seasonally wet depressions that are important for their ability to amphibian breeding -- that have been certified by the State to date and which are scattered throughout Town, with a high concentration of these areas in the Assabet River National Wildlife Refuge. The Stow Wetlands Bylaw provides additional protection for vernal pools beyond what is contained in the Massachusetts Wetlands Protection Act. When development is proposed near a potential vernal pool, the Conservation Commission requires the applicant to research the area to determine whether it actually functions as a vernal pool. This process resulted in the certification of several vernal pools near proposed developments in recent years. Map 11 depicts certified and potential vernal pools (as identified by aerial photography). The Town should ensure that unprotected areas that function as vernal pools are certified to increase their

Stow - Prime Agricultural Soils



Prime Agricultural Soils

 Designated Prime Agricultural Soils from U.S. NRCS

0 1 Mile

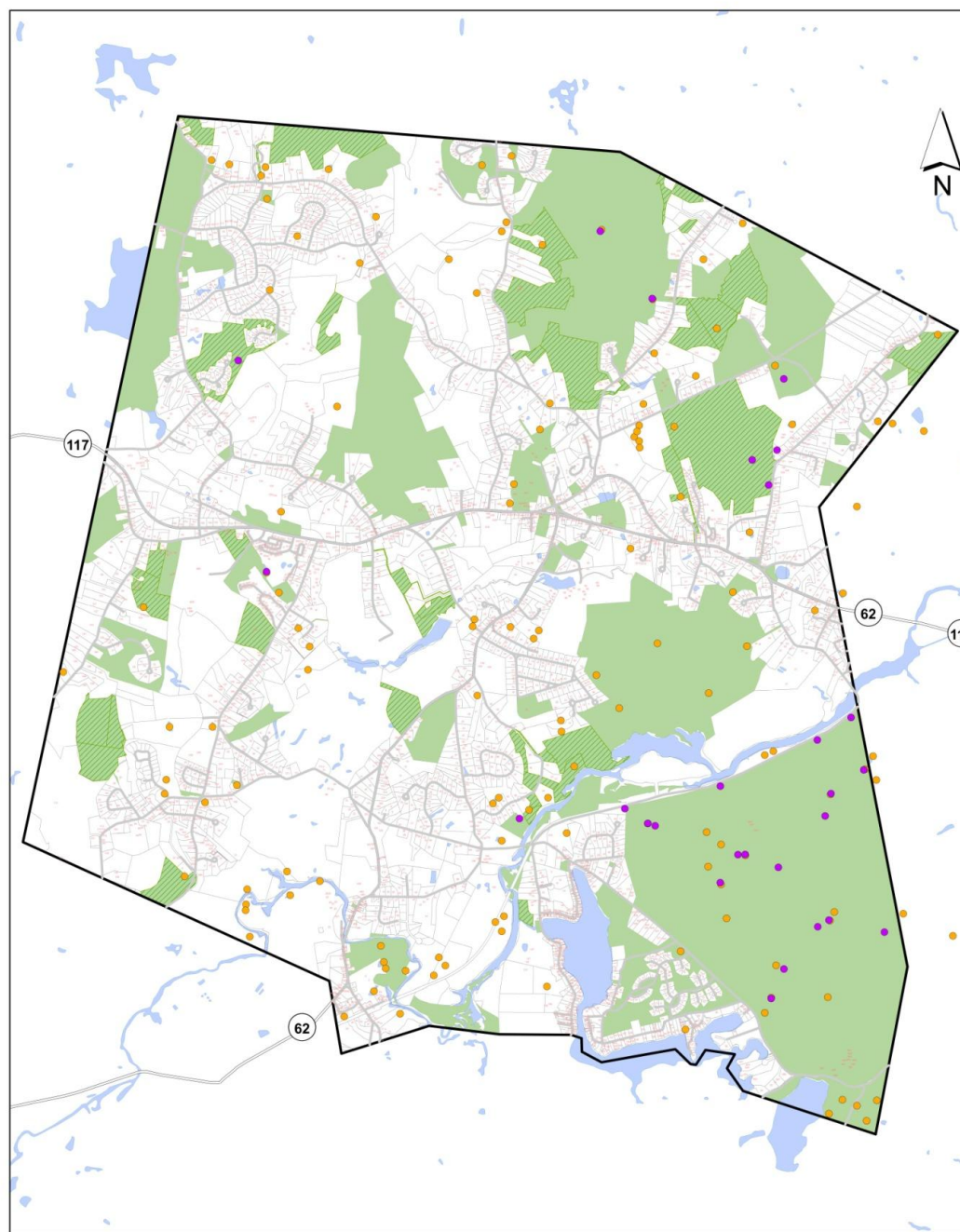
Soils data from NRCS 2006, provided by MassGIS
Base map features provided by MassGIS.

Map produced 10/28/2014 by J P Kern

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Map 10: Stow Prime Agricultural Soils

Stow - Certified and Potential Vernal Pools



Legend

- Certified Vernal Pool
- Potential Vernal Pool
- ▨ CR or APR
- Stow Open Space

0 1 Mile

Floodplain data developed by the Town of Stow MA.
Base map features provided by MassGIS.

Map produced 7/22/2015 by J P Kern

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Map 11: Stow – Certified and Potential Vernal Pools

protection. In particular, it is important to document, certify and protect clusters of vernal pools located within proximity to each other and large vernal pools as these provide the most viable habitat for species that depend on vernal pools for the breeding portion of their life cycle.

Stow's certified vernal pools to date are listed below:

Pool Number	Location	Year Certified
1545	Flagg Hill	1998
1546	Flagg Hill	1998
2839	Derby Woods	2002
3052	Off Red Acre Road (private)	2002
3188	Off Apple Blossom Lane (private)	2003
3750	Red Acre Woodlands	2006
4058	Villages at Stow	2006
4169 through 4178	Assabet River NWR (10 pools)	2006
4181	Assabet River NWR	2006
4183-4192	Assabet River NWR (10 pools)	2006
6524	Captain Sargent	2011

Rare Species

The following list of rare plant and animal species – endangered (E), threatened (T), and special concern (SC) – have been documented in Stow as reported by the Massachusetts Natural Heritage and Endangered Species Program (NHESP). The date in the last column represents the most recent observation of a particular species. An asterisk in the first column (*) indicates that the species was most recently observed within the past 25 years. However, many rare species are difficult to detect even though they are present, and Natural Heritage does not conduct methodical species surveys in each town on a consistent basis. Therefore, the fact that the most recent observation of a species may be several years old should not lead to the interpretation that the species no longer occurs in a town.

The locations of habitats of rare species are not publicized in order to protect the species.

In addition to tracking rare species occurrences, the Massachusetts NHESP has completed studies of both terrestrial and aquatic systems designed to identify those most critical to the protection of biodiversity in Massachusetts – including rare species and priority habitats. These studies are incorporated into the BioMap2 report published by the Massachusetts NHESP. While only small areas of Stow are identified in this report, these are important areas to protect wherever possible.

	Type	Latin Name	Common Name	Rank	Last
*	Amphibian	Ambystoma laterale	Blue-Spotted Salamander	SC	1992
*	Reptile	Terrapene carolina	Eastern Box Turtle	SC	1995
*	Bird	Accipiter striatus	Sharp-Shinned Hawk	SC	1891
	Bird	Ammodramus savannarum	Grasshopper Sparrow	T	1994
*	Bird	Botaurus lentiginosus	American Bittern	E	1992
*	Bird	Capimulgus vociferous	Eastern Whip-poor-will	SC	2013
*	Bird	Gallinula chloropus	Common Moorhen	SC	1992
*	Bird	Ixobrychus exilis	Least Bittern	E	2005
*	Bird	Rallus elegans	King Rail	T	2005
*	Vascular Plant	Carex oligosperma	Few-Seeded Sedge	E	2012
*	Vascular Plant	Liatris scarioa var. navae-angelie	New England Blazing Star	SC	1992
*	Vascular Plant	Lipocarpha micrantha	Dwarf Bulrush	T	1917
	Vascular Plant	Panicum philadelphicum	Philadelphia Panic-Grass	SC	1992
*	Vascular Plant	Spiranthes vernalis	Grass-Leaved Ladies'-Tresses	T	2011

BioMap2 identifies two complementary data layers, Core Habitat and Critical Natural Landscape. Core Habitats are key areas that are critical for the long-term persistence of rare species and other Species of Conservation Concern, as well as a wide diversity of natural communities and intact ecosystems across the Commonwealth. Protection of Core Habitats will contribute to the conservation of specific elements of biodiversity. Critical Natural Landscape identifies large natural Landscape Blocks that are minimally impacted by development. If protected, these areas will provide habitat for wide ranging native species, support intact ecological processes, maintain connectivity among habitats and enhance ecological resilience to natural and human-caused disturbances in a rapidly changing world. Areas delineated as

Critical Natural Landscape, also include buffering upland around wetland and aquatic Core Habitats to help ensure their long-term integrity.

In Stow, there are 876 acres of Core Habitat, 94.8% of which is already protected open space. In addition there are 1,318 acres of Critical Natural Landscape, of which 88.2% is already protected. These areas are located in the vicinity of the Assabet River National Wildlife Refuge, the Delaney Wildlife Management Area, Flagg Hill and the Heath Hen Meadow Brook Corridor near Captain Sargent.

The largest areas of Core Habitat and Critical Natural Landscape that are unprotected in Stow are Crow Island and the Stowaway Golf Course.

Wildlife Habitat and Connectivity

As part of the update of the Open Space and Recreation Plan, the Stow Open Space and Recreation Plan Subcommittee worked with Sudbury Valley Trustees (SVT), a regional land conservation organization focused on conserving land and wildlife habitat in the Concord, Assabet and Sudbury river basins, and the MassLIFT Americorps program, to analyze parcels in Stow using new statewide information developed by The Nature Conservancy, the University of Massachusetts and the Commonwealth of Massachusetts regarding priority lands for conservation for wildlife habitat and resilience to climate change. SVT and Americorps have developed a watershed-wide plan showing those parcels which emerge as most important for conservation when analyzed for climate resiliency, biodiversity, connectivity, and the creation of large blocks of habitat.

The following data was used in this analysis:

MassGIS/Natural Heritage Data:

- NHESP Priority Habitats of Rare Species
- BioMap2 Core Habitat and Critical Natural Landscape
- Areas of Critical Environmental Concern
- Priority Natural Vegetation Communities

Data from Other Organizations:

- UMass Conservation Assessment and Prioritization System (CAPS) Index of Ecological Integrity
- Audubon Important Bird Areas
- The Nature Conservancy Massachusetts and Northeast Resilience Data

Because this model does not capture lands that might otherwise be of conservation interest – farmland or land of scenic or historic value – SVT will be ground-truthing and revising the plan on a town-by-town basis in consultation with municipal partners and local land trusts. The Town of Stow has been the first partner in this consultation.

The resulting map of priority lands is shown as Map 12.

4F. Scenic Resources and Unique Environments

Scenic landscapes

Although there are many scenic spots in Stow, the most dramatic include: Pilot Grove Farm, the McCassey/Perkins (Orchard Hill) drumlin in Gleasondale, Honey Pot Hill Orchard, Shelburne

Farm Orchard, and the Delaney Flood Control Project. The Assabet River and the Elizabeth are among the most scenic rivers and streams in the area.

Pilot Grove Farm is centrally located in Town, and contributes significantly to the rural character of Stow. It is an active sheep farm with rolling hay fields and forested borders and fence rows, which are highly visible from major roadways. The farm is important in the history of the Town, and has been run by the same family since 1782.



Pilot Grove Farm from Pilot Grove Hill

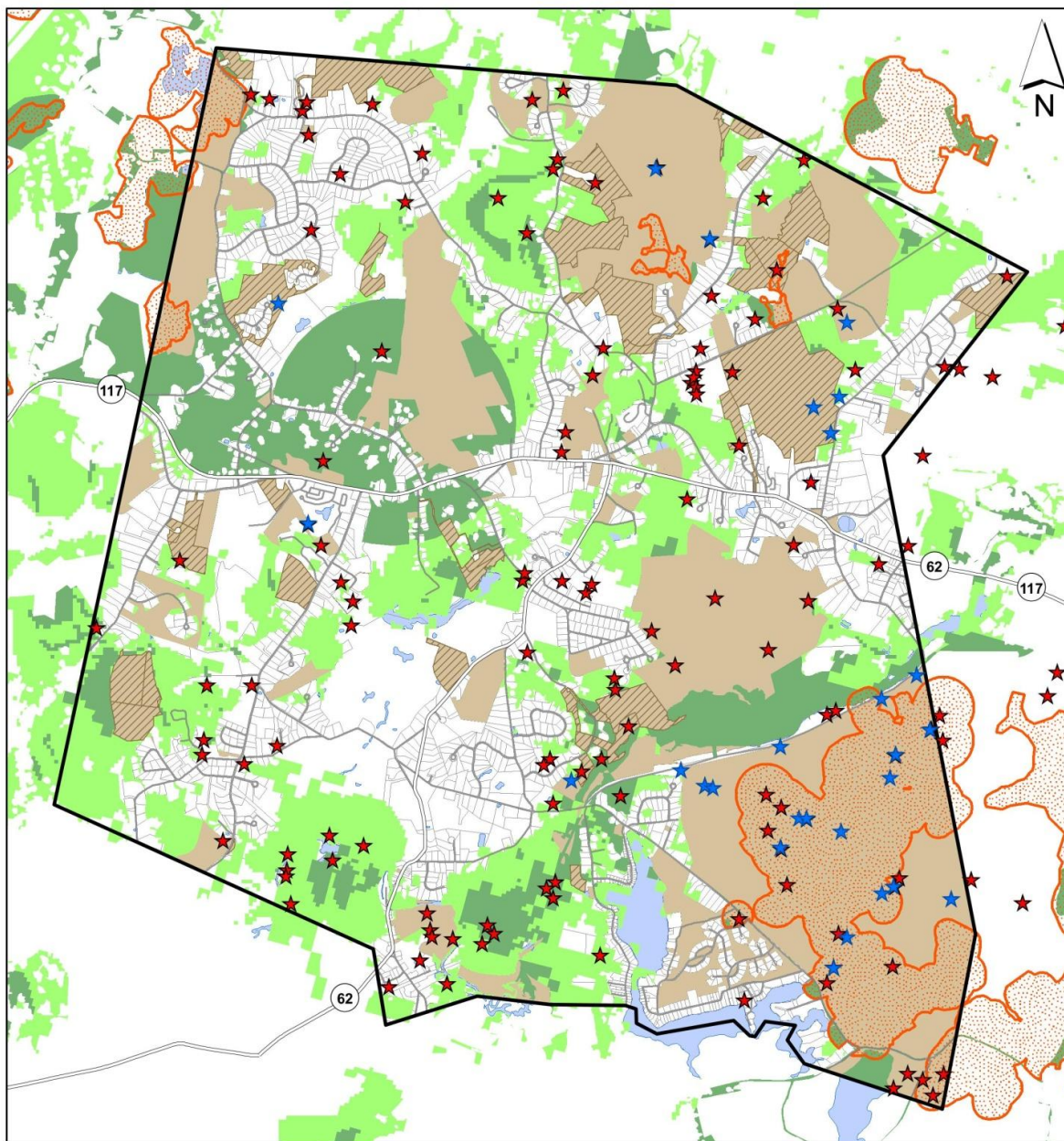
The McCassey/Perkins (Orchard Hill) drumlin offers a windswept open hill that juts out into the Assabet River forcing the river to bend sharply as it wends its way through Gleasondale. Although the view is partially obstructed by the homes along Route 62, it peeks out from behind the houses. If one stops to walk down to the river's edge or explores this area by canoe, the drumlin makes a distinctive impression with grazing livestock roaming its treeless but grassy slopes.

Honey Pot Hill Farm, an orchard located in the southern portion of Stow, is divided by Sudbury Road and Boon Road. Shelburne Farm is located near the Town center along West Acton Road and has been permanently protected. Both are thriving orchards with rolling hills covered with apple trees that are highly visible from public roadways. All of Stow's orchards attract large numbers of visitors from Boston and surrounding areas for apple picking, making them important for the community's economy.

Spindle Hill, a drumlin near the center of Stow, has been used for recreational purposes for many years. At one time there was a small ski tow on the hill. It presents an attractive view towards the north from Wheeler pond on the Elizabeth Brook.

The Delaney Project is a flood control area in the northwestern sector of Town. Because of its large area of water bordered by tall pines, some grassy ridges and fields, wildlife frequent the area. Its open expanse makes it an attractive site for hiking, horseback riding, fishing and mountain biking. It is also widely used for dog walking as well as dog training classes. Portions of this area are also located in the adjacent towns of Bolton and Harvard.

Stow - Unprotected Areas of Habitat Significance



Legend

- | | | |
|-------------------------|--|-----------------|
| ★ Certified Vernal Pool | Conservation Priority - SVT Study | CR or APR |
| ★ Potential Vernal Pool | Above-average ranking | Stow Open Space |
| 🦋 Biomap 2 Core Habitat | Average ranking | Water Body |

0 1 Mile

Floodplain data developed by the Town of Stow MA.
Base map features provided by MassGIS.

Map produced 7/6/2015 by J P Kern

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Map 12: Stow – Unprotected Areas of Habitat Significance

The Assabet River and Elizabeth Brook were working streams in the early history of our community, with mills located along both. Significant stretches of these rivers have almost no development visible from the banks and are extremely beautiful especially in fall. OARS, a regional watershed protection organization, is active in trying to clean up the river and enhance the natural beauty while also encouraging responsible recreational use.

The Stow Historical Commission and others have worked with the Massachusetts Heritage Landscape Inventory to develop the “Stow Reconnaissance Report” for the Freedom’s Way Landscape Inventory

which identifies many of these important scenic attributes. Map 13, the Unique Features Map, shows the larger unique features found in Stow, and a full list can be found in Appendix 4.



One of the town's many scenic golf course views

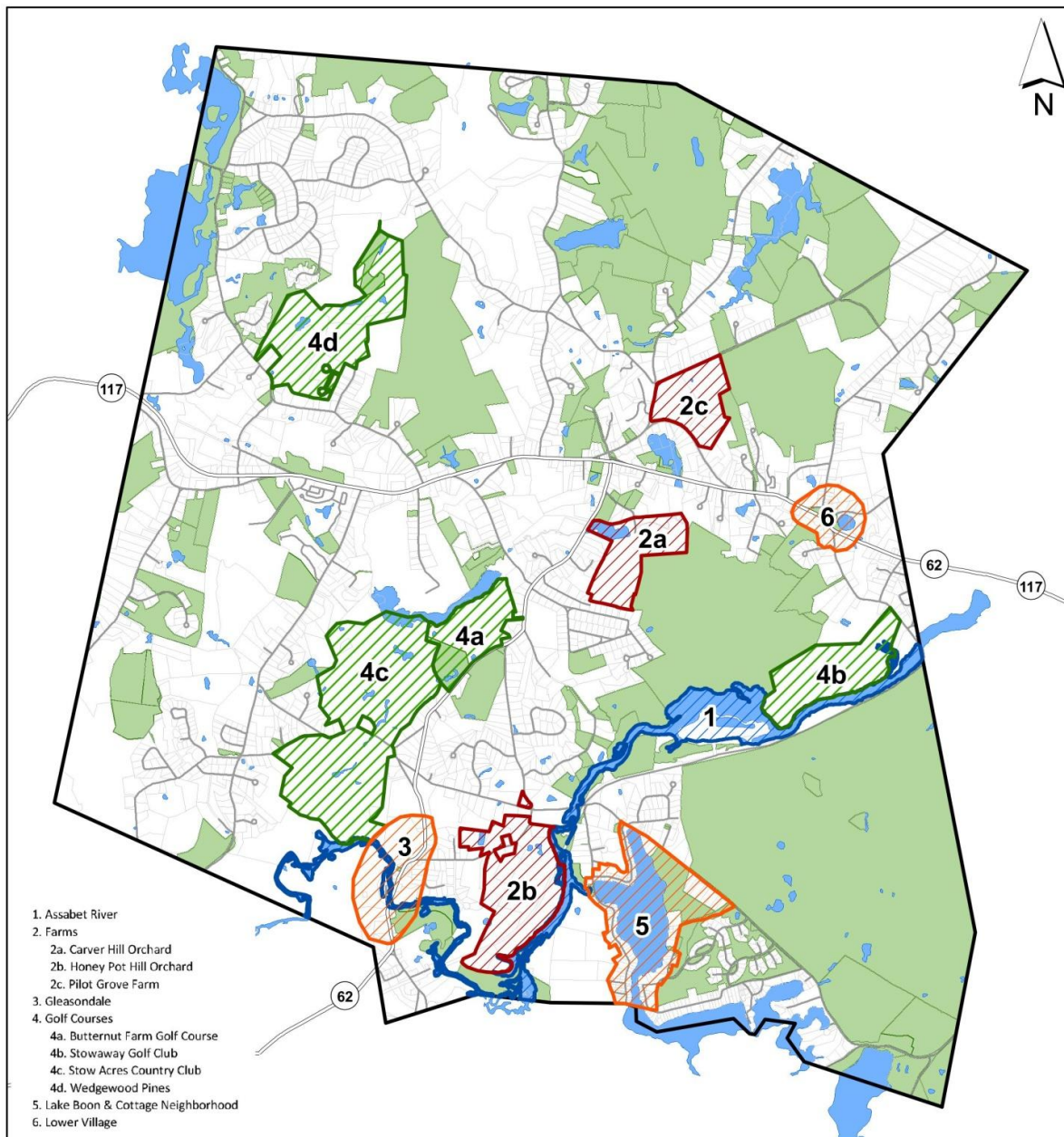
Cultural, Archeological and Historic Areas

Although there are a large number of historic sites and homes in Stow, only the most prominent are mentioned here. A more complete listing of historical sites and landscapes has been compiled by the Stow Historical Commission, and is currently in the process of being updated. Pilot Grove Farm and Hill are of central historic significance. The Stow West School is a restored one room school house on Harvard Road which is open to the public for special weekend events in the summer and fall. The Town created a small parking area and other access enhancements at the West School site using Community Preservation funds. The Gleasondale Mill area has a number of structures dating back to its operation as a woolen mill and the Planning Board is currently examining redevelopment of the mill and the creation of a stronger “sense of place” in the Gleasondale Village. The Town Center has a number of old homes and structures (e.g. old Town Hall, First Parish Church, etc.) that make the area both culturally and historically important for preservation.

Unique Environments

Stow currently has no designated Areas of Critical Environmental Concern (ACECs). Other areas with significant or unique resources include the Assabet River and Lake Boon, and the rare species and BioMap2 Core habitat areas described in Section 4E. At present, there are no plans to seek ACEC designation for any of these areas.

Stow – Unique Features Map



Legend

- Protected Open Space Lands
- Areas Identified in the DCR Heritage Landscape Inventory**
- Village
- Golf Course
- Farm
- Water

0 1 Mile

Floodplain data developed by the Town of Stow MA.
 Base map features provided by MassGIS.

Map produced 4/6/2015 by J P Kern

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Map 13: Stow – Unique Features Map

4G. Environmental Challenges

New Development

Development is gradually fragmenting Stow's forest lands and wildlife habitat, reducing opportunities to provide trail linkages between protected lands and affecting the Town's rural and historic character. Particularly noticeable is the fact that new residential developments tend to consist of large homes that can be intrusive on the landscape and out of character with much of the existing development in Stow, particularly when they require extensive grading and clearcutting or the construction of mounded septic systems due to high groundwater. The Planning Board has worked diligently to revise and modify zoning bylaws and regulations to encourage low impact development and retention of a roadside buffer, and has succeeded in convincing applicants to revise plans to reduce required clearing and grading.

Invasive Species

Like most communities, Stow is seeing increased growth of non-native, invasive plant species that often outcompete native species. Common invasive plant species include Oriental bittersweet, common and glossy buckthorn, Japanese barberry, multiflora rose, and Japanese knotweed and are affecting both upland and wetlands in Stow. The Conservation Commission is just beginning an initiative to map and control some of these infestations and a pilot mapping and control project was approved by Town Meeting in 2015 using Community Preservation Act funds. In addition, invasive plant species in Lake Boon are a nuisance for swimmers and boaters. A non-native invasive clam has also been documented in Lake Boon. OARS has been mapping and removing invasive water chestnut from the Assabet for several years. For the first time, the Open Space and Recreation Plan contains recommendations focused on the management and control of some of these invasive species.

Water Quality and Hazardous Waste Sites

A complete list of the reported hazardous release sites available from DEP as of 2015 follows. The list has been divided to show those open sites that are currently being cleaned up as well as older sites where remediation has concluded. Stow does not have any currently operating landfills. Former landfill sites on the Stow/Hudson and Stow/Acton lines have been closed and capped to DEP standards. Water quality issues in Lake Boon, the Assabet River and in groundwater are addressed as part of Section 4C above.

Open				
RTN	Release Address	Site Name/ Location Aid	Notif. Date	Chemical Type
2-0000280	124 GREAT RD	MOBIL SERVICE STATION 01 JEJ	4/15/1988	Oil
2-0000427	501 GLEASONDALE RD	FAHEY EXHIBITS BUILDING	1/15/1989	Oil and Haz. Material
2-0010279	77 WHITE POND RD	J MELONE & SONS INC	4/21/1994	Oil
2-0012504	626 GREAT RD	SERVICE STATION	11/18/1998	Oil
2-0019201	45 WALCOTT ST	BENTLEY BUILDING CORP LOT 25	5/9/2014	Haz. Material
2-0019330	174 HUDSON RD	RESIDENCE	10/9/2014	Oil
2-0019495	302 BOXBORO RD	MINUTEMAN AIRFIELD	5/4/2015	Oil
2-0019626	688 GREAT RD	BOSE CORPORATION	8/31/2015	Haz. Material

Closed				
RTN	Release Address	Site Name/ Location Aid	Notif. Date	Chemical Type
2-0000316	155 GREAT RD	DATAHECKER DTS	1/15/1988	
2-0000364	147 GREAT RD	STOW SHOPPING CTR	2/17/1988	Haz. Material
2-0000722	FT DEVENS	FORT DEVENS TRAINING ANNEX	1/15/1990	Oil
2-0010012	150 NORTH SHORE DR	RESIDENCE	10/6/1993	Oil
2-0010347	77 WHITE POND RD	J MELONE & SONS INC	6/21/1994	Oil
2-0010438	511 GREAT RD	POMPOSITTICUT ELEMENTARY	8/7/1994	Oil
2-0010789	GREAT RD	AT INTERSECTION OF HUDSON RD	5/23/1995	Oil
2-0012145	STATE RD	NEAR SUDBURY RD	3/16/1998	Oil
2-0012413	875 GREAT RD	ET AND L CONSTRUCTION	9/22/1998	
2-0012639	PNE STOW	SMITH PROPERTY	2/2/1999	Oil
2-0013499	47 MARLBOROUGH RD	RESIDENCE	9/27/2000	Oil
2-0013899	11 ASSABET ST	JANE MACCLELLAN	7/11/2001	Oil
2-0013979	58 RANDALL RD	STOW ACRES CC	9/6/2001	Oil
2-0013851	15 WOODMAN PL	WETLAND BEHIND PROPERTY	5/14/2001	Oil
2-0013854	45 WHITE POND RD	NEXTEL COMMUNICATIONS	5/17/2001	Oil
2-0014565	10 WHEELER RD	WASTE MANAGEMENT INC	11/25/2002	Oil
2-0014651	626 GREAT RD	COMMUNITY CONVENIENCE TRUST	1/31/2003	Haz. Material
2-0014665	26 HERITAGE LN	WASTE MGT INC ROADWAY RELEASE	2/10/2003	Oil
2-0014741	45 WHITE POND RD	ASTRO CRANE SERVICES INC	4/23/2003	Oil
2-0015271	45 WHITE POND RD	ASTRO CRANE SERVICES INC	5/19/2004	
2-0015629	45 WHITE POND RD	HUDSON LIGHT & POWER	3/8/2005	Oil
2-0015897	RANDAL RD-POLE 15-1	STOW ACRES COUNTRY CLUB	9/18/2005	
2-0016026	124 GREAT RD	MOBIL STATION	12/8/2005	Haz. Material
2-0016680	124 GREAT RD	MOBIL STATION	5/7/2007	
2-0017327	1 SUDBURY RD	MASS. FIREFIGHTING ACAD.	11/21/2008	Haz. Material
2-0018667	723 GREAT ROAD	VANDALIZED RESIDENCE	8/16/2012	Oil
2-0018877	FRONT OF 17 WEDGEWOOD RD	ROADWAY RELEASE	4/25/2013	Oil
2-0019241	1 STATE ROAD	STATE FIRE ACADEMY STOW	6/30/2014	Oil

Erosion, Sedimentation and Flooding

Lake Boon has several areas where steep banks are susceptible to erosion in heavy storms, from ice, and as a result of wash from power boats and inappropriate recreational use of the shoreline. Agricultural fields which are plowed regularly can be vulnerable to erosion, but there are few of these fields that are on significant slopes so this problem is minimal. The only other erosion which occurs in Stow is transient as a result of disturbance of the soils during development. Within 100 feet of wetlands, the Conservation Commission has been conscientious in requiring erosion mitigation and control measures as it reviews applications under the Wetlands Protection Act and Town of Stow Wetlands Bylaw.

Agricultural run-off from Stow's farms and orchards and from the golf courses in Stow is considered by some to be a possible source of ground and surface water pollution. However, a more likely source is the unregulated and uncontrolled application of fertilizer and pesticides to lawns and the incremental impact of nutrients from septic systems. Areas subject to chronic flooding include Heath Hen Meadow Brook, Elizabeth Brook (mostly due to the beaver dams), the Hiley Brook area, and portions of the Assabet River in Gleasondale just below the dam and at the Sudbury road crossing. Flooding also occurs regularly in a low wetlands area on Maple St. near the Hudson/Bolton Town line and at the lower "field" at the former Pompositticut School north of Great Road.

Environmental Equity

Environmental Equity refers to looking at the distribution of open space and recreational amenities in the town and identifying any areas that are lacking in them. The land of open space in the southwestern quadrant of town is a major issue that was identified in the 2008 Open Space and Recreation Plan and, while progress has been made, is identified as a continuing need in this plan. Additional information about this is contained in Section 7A(3) below.

Climate Change

With this 2016 Open Space and Recreation Plan, we are introducing a significant environmental

How will the changing climate affect Massachusetts?

Changes in the climate can have subtle as well as devastating effects on humans, infrastructure, and natural systems. An increase in temperature can cause increased virulence of viruses, insects, and pests; decimation of sensitive crops and plants; increased asthma and other human health effects; and impacts on the built environment.

Heat waves are predicted to be of particular concern and could have broad implications for public health, infrastructure, government capacities, native plants, and agricultural crops. It is likely that habitat boundaries of certain species may shift.

Change in precipitation will have significant effects on the amount of snow cover, winter recreation, spring snow melt, peak stream flows, water supply, aquifer recharge, and water quality. Large areas of the Northeast are projected to lose more than one-quarter and up to one-half of their snow-covered days toward the end of the century in the high-emissions scenario as a result of increased ambient temperature in February and March.

The predicted changes in the amount, frequency, and timing of precipitation, and the shift toward more rainy and icy winters would have significant implications for winter recreation such as skiing and snowmobiling, and could compromise water supplies and water availability for fish and various habitats. More winter rain is expected to drive more high-flow and flooding events during the winter, earlier peak flows in the spring, and extended low-flow periods in the summer months. These changes in hydrologic cycles would have profound impacts on water resources, including increased flooding and polluted overflows from stormwater and wastewater systems during high periods of flow, and increased stress on surface and ground drinking water sources during periods of drought and low flow. Increased intensity of precipitation can cause increased flooding, put humans and their property at risk, ruin crops, and create public health concerns from sewage overflows and hazardous waste leaks.

From MA Executive Office of Environmental Affairs, 2015

challenge that will affect future open space protection and management efforts in Stow.

Climate change is a shift in long-term weather patterns: temperature, precipitation, wind, and more. There is scientific consensus that our climate is changing as a result of warming caused by human activities that produce greenhouse gas emissions. The ongoing debate in the scientific community is not about whether climate change will occur, but the rate and extent to which it will occur and the adjustments needed to address its impacts. Communities in Massachusetts are expected to experience warmer temperatures, increased frequency and intensity of storms, public water supply shortages, and rising sea levels and increased erosion which will affect coastal areas. There is also likely to be a change in rainfall rates with less rain in the dry summer months, and increased precipitation, primarily in the form of rain, during winter months. This change in precipitation type will have impacts on the amount of snow cover, winter recreation, spring snow melt and peak stream flows.

According to the Massachusetts Executive Office of Environmental Affairs, which recently published the Massachusetts Climate Change Adaptation Report, weather station records of the United States Historical Climatology Network indicate that the Northeast has been warming at an average rate of nearly 0.5 degrees Fahrenheit per decade since 1970, and winter temperatures have been rising even faster at a rate of over 1.3 degrees Fahrenheit per decade. Other observations indicate that extreme heat days are on the rise - we now regularly experience about 5 to 20 days of temperature over 90°F each year, and 24 days were noted at the Small Farm weather station in 2015. These higher ambient temperatures have resulted in a 2.3 degrees Fahrenheit increase in annual mean sea surface temperature between 1970 and 2002.

Here in New England, we need to be mindful that climate change is likely to have an impact on important elements of the economy. Winter recreation, particularly skiing, will be affected by increased rain, and agricultural production may be affected by changes in temperature, rainfall, and pests. For example, maple sugar production is likely to decline nationwide, and apple production may be affected, resulting in changes in particular types of apples. The longer growing season may provide opportunities for new crops, however it may also encourage new pests and invasive species.

Climate change will also affect open space protection and management planning. In the past, land conservation planning was relatively simple. For example, land with scenic qualities and/or rare species present would be acquired to prevent it from being compromised via development. By acquiring such properties and possibly some buffer around them, and by making a reasonable commitment to long-term stewardship, one would generally be able to ensure that future generations of the rare species would continue to live on the site, and that future generations of human visitors would have a reasonable likelihood of viewing that species in that particular location.

With current and projected climate change impacts factored in, it is clear that the old “simple” approach to land conservation will be woefully insufficient. While not all plants and animals will be significantly impacted by climate change, the reality is that due to increasing temperatures and shifting climatic conditions globally, most may need to shift around a bit to find suitable habitat going forward.

Targeted land conservation and thoughtful ecological management are both projected to play important roles as climate change response strategies.

The concept of *Landscape Resilience* to the impacts of climate change provides a very clear and very solid path forward in a climate changing world. There are two relevant aspects of this concept. First, some properties are already highly resilient to the impacts of climate change.

They are pristine, intact landscapes, where the natural systems are functioning well. Nature is projected to fare far better in these locations as the impacts of climate change become more pronounced.

The second aspect of landscape resilience is perhaps even more important – virtually any existing tract of conserved land can be made more resilient by applying key strategies as follows:

- *Reduce Stressors*: This activity includes reducing the impact of very traditional stressors such as land use conversion via development, as well as reducing the negative impact (stress) from certain invasive plant species. Climate change itself is a significant additional stressor – hence the strategy of reducing other stressors where possible to offset its impacts.
- *Restore Form and Function of Natural Systems*: Examples of this strategy in action include removing a dam or replacing a culvert that may be compromising the free flow of an otherwise healthy river or stream; restoring a floodplain forest that may have been cut years ago before its natural flood storage qualities were adequately appreciated; or (in coastal areas) by accommodating migration of salt marsh system that would otherwise be “flooded out” by rising sea level, so it can continue to serve as important habitat and reduce some of the energy of approaching coastal storms.
- *Increase Landscape Connectivity*: With the need for many species to find suitable habitat going forward, size does matter. By connecting an existing block of conserved land to another one, both become more resilient. If that linkage includes wildlife corridors between the two the resilience boost will be even greater.
- *Increase Landscape Complexity*: Increasing landscape complexity of a block of conserved land essentially means increasing the habitat diversity of it. On the most granular level, this strategy is about increasing the micro-climates present in a given conserved landscape – again geared at increasing the opportunity for resident plants and animals to shift around and find appropriate habitat to sustain them in the years ahead.

While much of resilience building is about helping nature endure the current and projected future impacts of climate change, much of it has tremendous relevance to human beings as well. The trees that are conserved already serve important duty by absorbing up to 15% of greenhouse gas emissions, in addition to generating clean air and clean healthy drinking water. Lands acquired/protected for climate change response can also greatly reduce potential for public health risk associated with flooding as well.

Stow is currently actively participating in a regional effort to develop a Climate Resilience Plan. This effort is being led by the Minuteman Advisory Group on Interlocal Coordination (MAGIC), our regional planning committee. Members and staff from Planning Board, Conservation Commission and the Energy Working Group are involved in this effort. It is expected that this study will inform future needed actions by the Town of Stow in this area.