

# Chapter 3

## Natural & Cultural Resources



# Chapter 3

## Natural & Cultural Resources

### 1.0 INTRODUCTION TO NATURAL RESOURCES

The environment created by Bridgewater's system of natural resources serves both residents and visitors. Bridgewater's natural resources support the community's economy, tax base, recreation, quality of life, and the water quality of Newfound Lake and the Pemigewasset River. The type and distribution of the town's natural resource base also influences the location and type of development that takes place within the community. Based on the natural resources that are present, some areas of the community are better suited for a particular use than others. The information provided in this chapter will allow Bridgewater to determine compatible future uses for certain land areas, and significant resource areas that are not currently protected.

Development activities have generally been concentrated in smaller areas of the community, and need to be sensitive to the resources that are present in these developing areas. Bridgewater does not exist in isolation. It is important to remember the importance of Bridgewater's natural resources as future land use decisions are made.

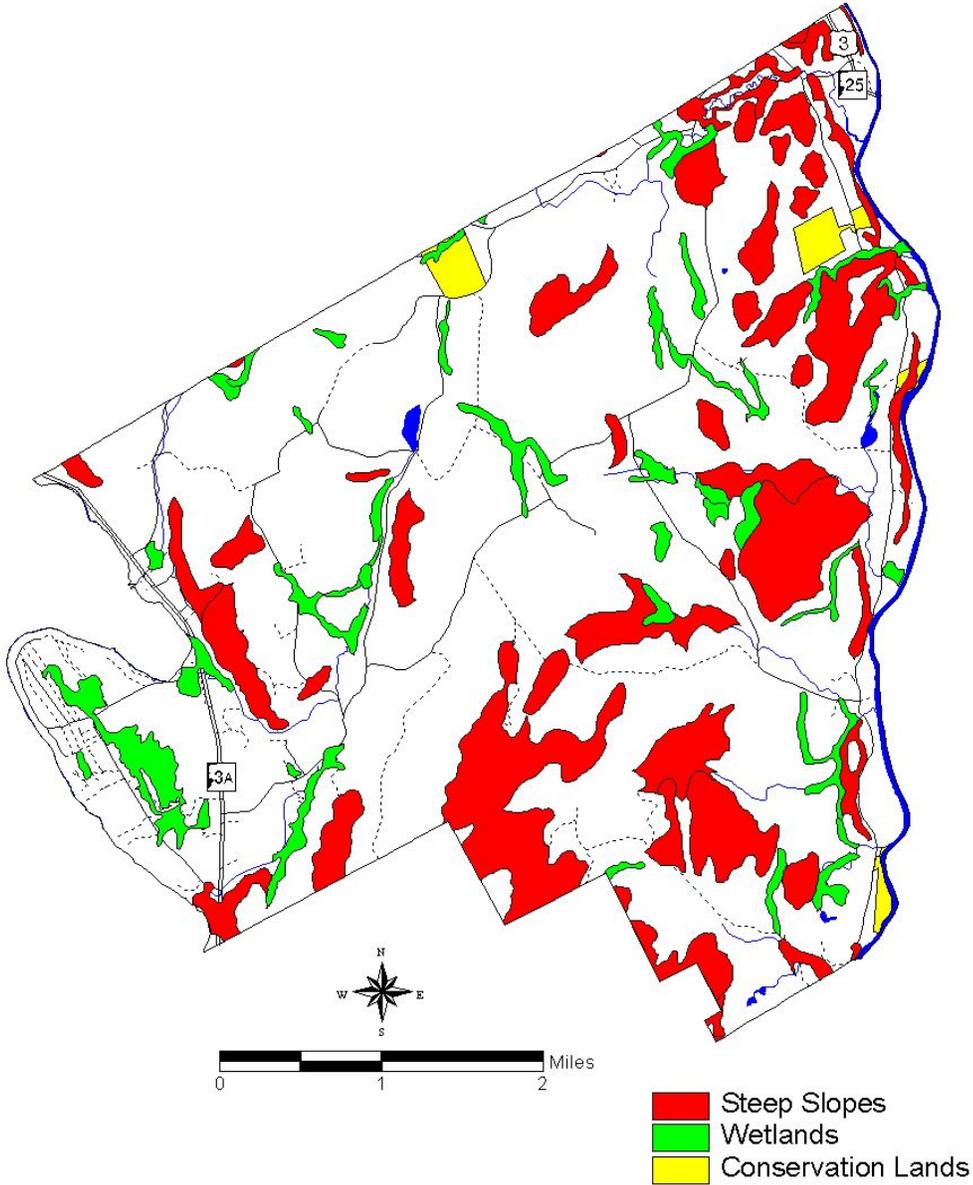
### 2.0 EXISTING CONDITIONS

Much of Bridgewater is heavily wooded and set on hillside slopes. Many slopes exceed 25 percent. Wetlands occur not only at lower elevations, but in pockets and saddles throughout the hills. Fewer acres each year are described as agricultural, in the sense of cleared land seeded for annual crops, but some niche, agricultural operations such as maple sugaring, bee keeping, berry operations, and small animal farms can still be found. Forested areas persist as sources of lumber, firewood, and chips for power and paper plants. The following two maps identify locations of forest, steep slopes, and wetlands.

The first map, Current Land Use, displays the extent of existing development in Bridgewater, and more importantly for this chapter, illustrates the extent of forest and agricultural lands. Significant unfragmented blocks of land exist throughout Bridgewater, the largest within the central portion of the community across the height of land.



# DEVELOPMENT CONSTRAINTS



*Mapping Note* – Additional information related to steep slopes in Bridgewater can be found on Page 3-5.

The interaction of each of the following natural resources creates opportunities for and limitations to various land uses:

A. Soils

Soil is that part of the surface of the earth that supports plants, animals, and humans. Soils information is an integral part of a natural resources analysis because it provides a wealth of data concerning the capability of land to support various land uses. Soils differ from one another in their physical, chemical, and biological properties. Soil properties which affect its capability include depth, permeability, wetness, slope, susceptibility to erosion, flood hazard, stoniness, etc.

Agricultural soils represent a unique and scarce resource since they are both highly productive and exist in such limited areas of the town that, once used for most other purposes, they cannot be replaced. Because of this, prime agricultural soils are often mapped as a critical resource. Major areas of prime agricultural soils are located in the central section of Whittemore Point along both sides of Whittemore Point Road, on Bridgewater Mountain along Cass and Bridgewater Hill Road, near River Road at Hammond Hill Road, and along Dick Brown road near Clement Road.

C. Wetlands

Wetlands are defined as those areas that are inundated or saturated by ground or surface waters at a frequency and duration sufficient to support a prevalence of vegetation adapted for life in saturated soil conditions. Wetlands soils include swamps, marshes, bogs, or very poorly drained soils. In their natural condition, wetlands perform a number of valuable functions. Among them are retention of nutrients, thus preventing the addition of nutrients to lakes and other water bodies; discharge of water to streams during periods of low water flow; flood water storage; and provision of prime habitat for many types of wildlife. They are unsuitable for development purposes because of their year-round high water table.

Bridgewater contains pockets of wetland soils scattered throughout the town. Some are wet year-round and others are seasonally wet soils. All of these soils may have development limitations due to high water table conditions during wet seasons. The *Bridgewater Wetland Evaluation Project* completed in November of 1997 is on file at the Town Office, and provides very detailed information on Bridgewater's wetland resources.

D. Floodplains

Floodplains are the periodically inundated flat lands adjacent to rivers and streams, serving as storage areas for water during times of high water flooding. Floodplains in Bridgewater are located generally along the Pemigewasset River, and along portions of Clay Brook and Dick Brown Brook. Due to their important ecological functions, development in floodplains present some special problems, including: (1) a high probability of property damage during flooding; (2) the restriction of periodic water storage resulting in potentially greater flooding down stream;

and (3) the increased likelihood of erosion and sedimentation. The latter factor can cause increased turbidity of water in rivers and streams.

#### E. Steep Slopes

The slope of the land is expressed in terms of percent. This is the number of feet, fall or rise, per 100 feet of horizontal distance. The slope of the land in Bridgewater varies from less than 3 percent in areas along the Pemigewasset River and adjacent to Newfound Lake to more than 25 percent in other areas. Areas with the steepest slopes occur in the southern section of town near the Bristol town line along the easterly side of Bridgewater Mountain, on the easterly slopes behind Webster and Drew Ponds, on the southeasterly slope west of Dick Brown Pond and along portions of the hillside east of Newfound Lake and Route 3A. Areas in which slope exceeds 25 percent have been designated as a critical resource on the Development Constraints Map. It is recommended that these areas not be utilized for development purposes.

#### F. Groundwater

Those areas which have a significant potential to yield groundwater are called aquifers. An aquifer is a soil deposit, or sometimes a porous rock formation, that contains a recoverable volume of groundwater. Ease of recoverability is one of the most important aspects of an aquifer as it relates to development potential. The major aquifer identified in Bridgewater, which has a high potential to yield groundwater, is located adjacent to the Pemigewasset River near River Road. Because the aquifer is located in stratified deposits of sand and gravel, which are porous and transmit water rapidly, it is quite susceptible to pollution from septic tank effluent, landfill refuse, and agricultural fertilizers.

#### G. Watersheds

The Town of Bridgewater contains all or portions of twelve separate watersheds. A watershed is an area of land that drains down slope to the lowest point. The water moves through a network of drainage pathways, both underground and on the surface. Generally, these waterways converge into streams and rivers, which become progressively larger as the water moves on downstream. Bridgewater is divided nearly in half by a high ridge of hills with six of these watersheds on the easterly side of the ridge entering the Pemigewasset River, and six on the westerly side entering Newfound Lake.

### **3.0 EMERGING ISSUES**

There are several emerging land use issues in Bridgewater that could potentially impact the communities resources, and should be addressed.

#### A. Windfarms

In a time when there is increasing demand for renewable energy, windfarm proposals are starting to be discussed in many New England communities and often generate numerous questions and concerns. This is similar in many ways to the telecommunications tower issue the community

addressed a few years ago prior to adopting an ordinance related to towers. Because windfarms generally require a north-south ridge similar to the one created by Bridgewater Mountain, it is in the best interest of the town to understand this complex issue and adopt guidelines for the siting of such facilities. In general windfarms tend to require large areas of land, but physically disturb only a limited portion of that acreage. Avian and bat mortality from collisions with the turbine blades, towers, or related facilities is the best documented impact on wildlife. The visual impact of wind facilities is an issue that must be discussed and understood. Best management practices for the siting of wind facilities may be helpful in reducing the visual impact of a proposed windfarm facility. Technology-specific guidelines are needed for the Town and developers to understand and minimize the potential adverse impacts on residents and important natural resources.

B. Protection of Groundwater Quality and Quantity

Concerns related to Bridgewater's groundwater resources involve both the quality and quantity of the resource. Because Bridgewater's largest groundwater resources are generally located in stratified deposits of sand and gravel, which are porous and transmit water rapidly, they are quite susceptible to pollution from septic tank effluent, landfill refuse, agricultural fertilizers, and other pollutants. This resource is also susceptible to large withdrawals for manufacturing or water bottling operations, and should be protected to the best of the Town's ability.

C. Conversion of Seasonal Units to Year-Round Units

The Town currently regulates the conversion of seasonal residential units to year-round units, and this should continue. One of the largest implications for the community's natural resources related to this issue is the quality of the septic system which serves the unit. Older septic systems and under sized systems may not be able to handle the septic load, and could result in the pollution of ground and surface water resources in Bridgewater.

## **Land Use Implications and Potential Actions**

### **Land Use Implications**

Bridgewater's natural resources have an effect on land use decisions and impact the character of the community. The community would like to ensure that the built environment does not adversely effect these natural features in Bridgewater. Here are a few items to consider related to natural resources in Bridgewater.

1) Identifying and protecting valuable natural resources within Bridgewater is a critical step toward the long term sustainability of the community.

2) The variety of topography within Bridgewater contributes to wildlife habitat and recreational opportunities. Encouraging connections between these distinct areas will ensure the continued health of the organisms using them. These resources also pay their own way in terms of Town services.

- 3) There is a direct correlation between activity within the watershed and the quality of lakes and ponds that are fed by those watersheds. All of the activities taking place on land will eventually impact both surface and ground water. This refers to both quality and quantity of groundwater. Mismanagement in the watershed will adversely affect the water bodies downstream.
- 4) The health of Bridgewater's wetlands is critical to the function of natural systems within the community. If they are destroyed or degraded, Bridgewater's water resources (quantity and quality) will suffer, and many animal and plant species will disappear.
- 5) Responsible harvesting of forest resources supports the local economy and provides access to local forest products. The working landscape contributes to the character of the region.
- 6) Preserving the possibility of farming in the future adds to the sustainability of the community. If agricultural resources are lost to development they will not be viable options for producing goods locally in the future. This could become a necessity if global food distribution systems change.
- 7) Development at higher elevations on the high ridges and lower hills in Bridgewater presents challenges and impacts. Access to these areas provides an opportunity for greatly increased environmental impacts (erosion, increased runoff rates, longer roadways, and fragmentation of habitat to name a few).

### **Potential Actions**

*There are an array of possible actions the Town may want to consider pursuing as it evaluates the natural resources in Bridgewater and the associated land use implications. This section will be used to identify the specific actions for Bridgewater to take upon completion of the master plan.*

- 1) Create a plan and increase efforts to secure conservation easements on land with significant ecological features. This would include properties with prime wetlands, aquifers, floodplains, rare and endangered species, and other critical resources. Land protection opportunities that create corridors of contiguous open space are especially important.
- 2) Evaluate future zoning districts based on the land capability of the area being included and the desired development pattern. The minimum lot size in zones with valuable and sensitive natural resources should be examined. Lower densities of development and innovative land use controls should be encouraged in these portions of the community.
- 3) Promote education and enforcement initiatives in Bridgewater related to the State Shoreland Protection Regulations so that landowners and developers are involved in protecting the community's surface water bodies.
- 4) Consider partnering with other organizations such as the Newfound Lake Region Association to routinely monitor the quality of existing water resources and prevent the infestation of

invasive species (such as Eurasian Milfoil). The NHDES can provide training and equipment for such a program.

5) Promote good forestry practices by requiring use of licensed foresters and registered loggers on timber harvests greater than five acres.

6) Conduct an inventory of scenic resources and viewsheds within the community to guide the protection of key parcels within the identified scenic viewsheds. Provide guidelines for new development in these areas.

7) Require professional evaluation of subdivision proposals of more than ten acres with special reference to the USDA Grafton County Soils Survey (1999) and the Aquifer (Groundwater) Survey of 1998.

8) Consider adopting technology specific guidelines for the siting of windfarms in Bridgewater.

## **4.0 INTRODUCTION TO CULTURAL RESOURCES**

The primary focus of this section of the Chapter is to identify the cultural and historic resources in Bridgewater, recognize the role they play in giving the town its character, and decide what strategies would best maintain that character. From the time of settlement, Bridgewater enjoyed a rural prosperity that declined after the Civil War in the 1860's. Since that time, the population has decreased, and many houses and farm buildings have turned into cellar holes. Stone fences meander through woods, defining farm properties whose limits are now obscured by either forests and underbrush. Many of these relics of earlier settlement remind us of our colonial heritage, and are well worth noting and protecting.

## **5.0 EXISTING CONDITIONS**

Visitors and residents can view the artifacts of Bridgewater's past by visiting the areas around the Town House, the cemeteries and watering troughs in the hills, and the old school on River Road. Currently, the ten or more acres surrounding the Town House are mostly grassy and allow a view of the building from three vantage points along the two intersecting roads. To the rear of the Town House beyond a screen of trees is a meadow where children play on Old Home Day. The Old School on River Road sits elevated beside a winding road and easily reminds us of its history as first a school and a library, and now a community office building. Cemeteries on Brock Hill Road (Emerson) and Bridgewater Hill Road still speak volumes from headstones, some set near the time of the Revolution.



The following cultural resources have been identified on the *Natural, Cultural, and Historic Resources Map* that follows:

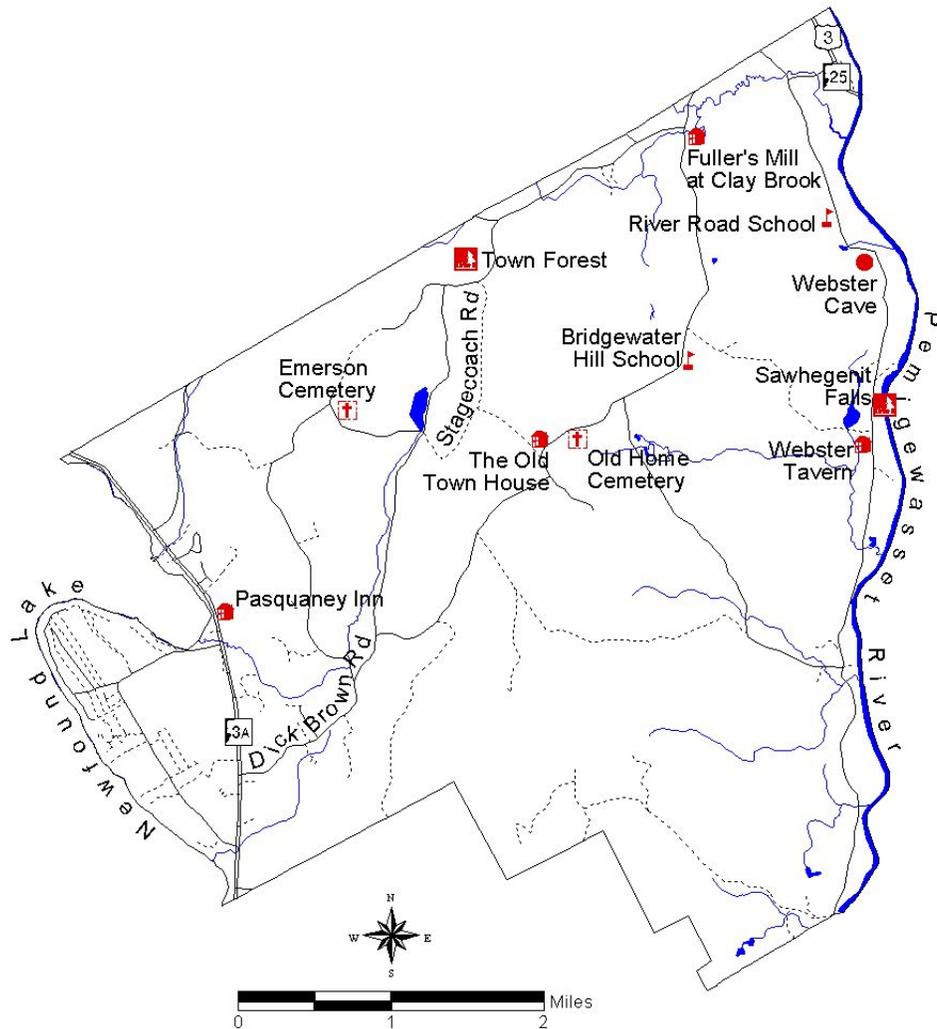
- Old Home Cemetery -- 1785 -- oldest cemetery in town
- Webster Cave -- Elizabeth Webster on her way to Plymouth to marry Colonel David hid here overnight to escape Indians who were camped above the cave.
- Webster Tavern -- 1806-1850 -- stop on old Boston to Montreal coach road
- Bridgewater Hill School - one of three standing old school houses, privately owned
- Emerson Cemetery -- 1825 -- one of the oldest
- Pasquaney Inn -- about 1880 -- now called Inn on Newfound Lake, early stop on stage coach road
- The Old Town House -- the original Town House located on Bridgewater Mountain
- Town Forest -- located on Dick Brown Road
- Sawhegenit Falls -- on the Pemigewasset River
- Fuller's Mill at Clay Brook -- site of clay kilns, sawmill, and cider mill
- River Road School -- early one room school house, currently owned by Town and used for offices and historical society museum

Some additional historic and cultural resources in Bridgewater include:

- Whittemore Point Cemetery - 1788 -- named for Peter Whittemore, its owner
- Webster Toll Bridge and House -- 1871-1896 -- currently a recreation area
- Dick Brown Mill -- early saw mill and source of power before electric lines
- Webster Cross Cemetery -- late 1700's -- Original town settlers such as Pingry (veteran of Revolution), Websters, and Ferrins are buried here.
- Old Dalton Place -- 1770 -- earliest frame house -- one of first founder's homes



## NATURAL, CULTURAL AND HISTORIC RESOURCES



---

### Land Use Implications and Potential Actions

#### Land Use Implications

Bridgewater's cultural resources have an effect on land use decisions and impact the character of the community. The community would like to ensure that the built environment does not

adversely effect the cultural features in Bridgewater. Here are a few items to consider related to cultural resources in Bridgewater.

- 1) Historic and cultural resources are critical to the town's character and contribute to the quality of life in Bridgewater.
- 2) These resources add a sense of place that could not be replaced by new construction.
- 3) By designating not only a building but also the land adjacent to a site as historically significant, the Town emphasizes maintenance of the historic appearance of the area.

### **Potential Actions**

*There are an array of possible actions the Town may want to consider pursuing as it evaluates the cultural resources in Bridgewater and the associated land use implications. This section will be used to identify the specific actions for Bridgewater to take upon completion of the master plan.*

- 1) Create a plan and increase efforts to protect properties with significant cultural and historic features so as to carry on the community's heritage and distinctive historic qualities.
- 2) Provide designation of historic sites, possibly in conjunction with the Old Home Day Association, or the Bridgewater Historical Society.
- 3) Work with abutting landowners to establish conservation easements on lands around the Town House on Bridgewater Hill to preserve the historical setting.