

## Section 4: Environmental Analysis

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### A. Geology, Soils and Topography

Sturbridge, situated in the southwest corner of Worcester County, exhibits the geo-morphological results that are typically associated with glaciated landscapes in central New England. The terrain is hilly with generally north to south oriented ridgelines that are interspersed with extensive wetland systems in areas of lower relief. Large areas of the Town are overlain with thick deposits of glacial till. There is, however, an important swath of stratified deposits that can be found in the central part of Sturbridge from the northern boundary in the vicinity of South Pond going southerly all the way to the Connecticut border. Elevations range from just over 1,115 feet above sea level, down to approximately 510 feet above sea level in the lowest areas. The major stream is the Quinebaug River that bisects the Town flowing in a general west to east direction from Brimfield into Southbridge. There are numerous smaller streams and vegetated wetland areas distributed throughout the Town. The entire Town of Sturbridge is located within the Quinebaug River watershed.

Sturbridge is located on the central plateau of Worcester County. The plateau as a whole is so thoroughly dissected that large areas of smooth plateau surface do not exist within the county – and certainly not within Sturbridge. The surface of the plateau is interrupted in many places by hills rising higher than the general plateau elevation, which averages 800 to 900 feet in the southern portions of the county. These hills are predominately small in area and consist largely of elongated, rounded hills with the longer axes generally oriented north-to-south. Some of the hills are piles of unconsolidated clay, gravel and sand, called “drumlins” by geologists. These drumlins are the result of glacial activity in the past. The most recent glacier is estimated to have retreated some 12,000 to 15,000 years ago. As the glacier melted and retreated, it dumped along the receding face the load of boulders, stones and soils it gathered while moving southward. The material left by the glacier is called glacial “till” and, with drumlins, constitute most of the land surface area of Worcester County. Some of the hills within the central plateau consist of rock hills with a thin layer of unconsolidated material covering them. Hills in Sturbridge, particularly the southern section of town, are both types.

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Much of the most easily developed land has been developed; road frontage lots without development constraints such as wetland, ledge and unsuitable percolation tests for septic systems are increasingly hard to find. The result has been the creation of large interior tracts of land as yet inaccessible by road systems and still economically unattractive because of site development costs. At some point the cost of development will be exceeded by the return on the development. This will make these large tracts vulnerable to development pressures.

The soils in Sturbridge are generally unsuitable for agricultural purposes and many of the areas with more suitable soils for agriculture have been developed residentially. According to the USDA-Natural Resources Conservation Service report of 1998, Soil Survey of Worcester County, Massachusetts, Southern Part, Sturbridge can be divided into six soils categories. A graphic depiction of the Town's soils can be seen following the descriptions.

- Paxton-Woodbridge-Ridgebury Soils: Nearly level to steep, very deep, well drained to poorly drained soils on glaciated uplands. This soil type consists of soils on upland hills and ridges dissected by many small drainage ways. Stones cover more than 3% of the surface in most areas. The soils were formed in glacial till derived from schist, gneiss, and granite. This is the predominant soil type found in Sturbridge, covering much of its western half and the northeastern corner of Town.

The slope, the hazard of erosion, the stoniness, and the seasonal high water table are main limitations for agricultural operations. Non agricultural uses are limited by slope, wetness, slow permeability in the substratum and depth to bedrock. Constructing buildings so that the lower or basement level is above seasonal high water table helps to prevent damage caused by wetness and frost action. Landscaping treatments designed to drain surface water away from buildings helps to prevent the damage caused by wetness. Because of the slow or very slow permeability, the substratum does not readily absorb effluent in the septic tank absorption fields. Installing a drain field that is larger than average helps to overcome this limitation. Planting suitable grasses on road banks can reduce erosion hazards since large amounts of cuts and fill generally are needed in areas where roads are constructed.

Recreational uses can be limited by these soil types as well with camping areas, picnic areas, playgrounds and golf courses being hindered by wetness, slope and stones. Paths and trails may be better suited than other recreational uses on lands with these soil types, although they will still be at least moderately hindered by the presence of stones and by wet conditions.

- Brookfield-Brimfield Soils: Gently sloping to steep, very deep and shallow, well-drained and somewhat excessively drained soils on glaciated uplands. This soil type consists of soils on upland hills and ridges that have rock exposures throughout. Stones cover more than 3% of the surface. The soils were formed in glacial till derived from micaceous schist. This soil type covers a small section of the Town's southeast corner.

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Stoniness is the main limiting factor for agricultural uses within this soil type. Large stones and boulders on the surface of land may hinder and damage harvesting and planting equipment. Building can be limited by slopes, but designing buildings and lot layouts so that they conform to the natural slope of the land can help to overcome this limitation. Constructing driveways and roadways on the contour when possible and planting suitable grasses on road banks can help to reduce erosion hazards.

Recreational uses can be limited due to slopes and stones with campgrounds, picnic areas and playgrounds being most impacted. Paths and trails may be better suited than other recreational uses on lands with these soil types, although they will still be at least moderately hindered by the presence of stones and slopes.

- Freetown-Swansea-Saco Soils: Nearly level, very deep, very poorly drained soils on uplands, outwash plains and floodplains. This soil type consists of soils on broad flats that have small depressions. These soils are in old glacial lakes or small ponds adjacent to streams. The soils were formed in organic deposits and alluvium. In Sturbridge, this soil category is located along either side of Westville Lake and the Quinebaug River.

Much of the acreage within this map unit is poorly suited to farming, woodland and development. High water tables and the possibility of flooding are limiting factors. Lands within this unit may be idle, covered with trees or managed for wildlife habitat. Excessively wet soils, excess humus, and low strength soils limit development.

All recreational development including campgrounds, picnic areas, playgrounds, paths, trails and golf fairways are limited due to severe wetness, ponding and excess humus.

- Canton-Montauk-Scituate Soils: Nearly level to steep, very deep, well-drained soils on glaciated uplands. This soil type consists of soils located on upland hills and rolling glacial till flats. It is dissected by broad drainage-ways that flatten out on the lower slopes. Stones cover more than 3% of the surface in most areas. The soils were formed in friable glacial till. In Sturbridge, this soil category covers a large section in the south of Town.

Much of the acreage within this map unit is suitable for agricultural and farming uses, although wetness can be a concern. Constructing buildings so that the lower or basement level is above seasonal high water table can help prevent damage as can landscaping that is designed to drain surface water away from the buildings. Roadways should be constructed on coarse, textured base material with adequate side culverts for adequate drainage.

Limiting factors for recreational development include large and small stones, and slopes. These factors can pose challenges for the development of camping areas, picnic areas, playgrounds, paths and trails and golf fairways.

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- **Chatfield-Hollis Soils:** Gently sloping to steep, moderately deep and shallow, well-drained and somewhat excessively drained soils on glaciated uplands. This soil type consists of soils on hills and ridges that have bedrock exposures throughout. Stones cover more than 3% of the surface in most areas. The soils were formed in glacial till. In Sturbridge, this soil category is found in two locations: a small area west of Walker Pond and another small area located between Hamant Brook and Breakneck Brook.

This map unit is poorly suited to cultivated crops and pasture. Excavation for building sites is difficult with heavy equipment being needed for the removal of bedrock. The bedrock is a hindrance for road construction and is also the main limitation for septic tank absorption fields and the installation of distribution lines.

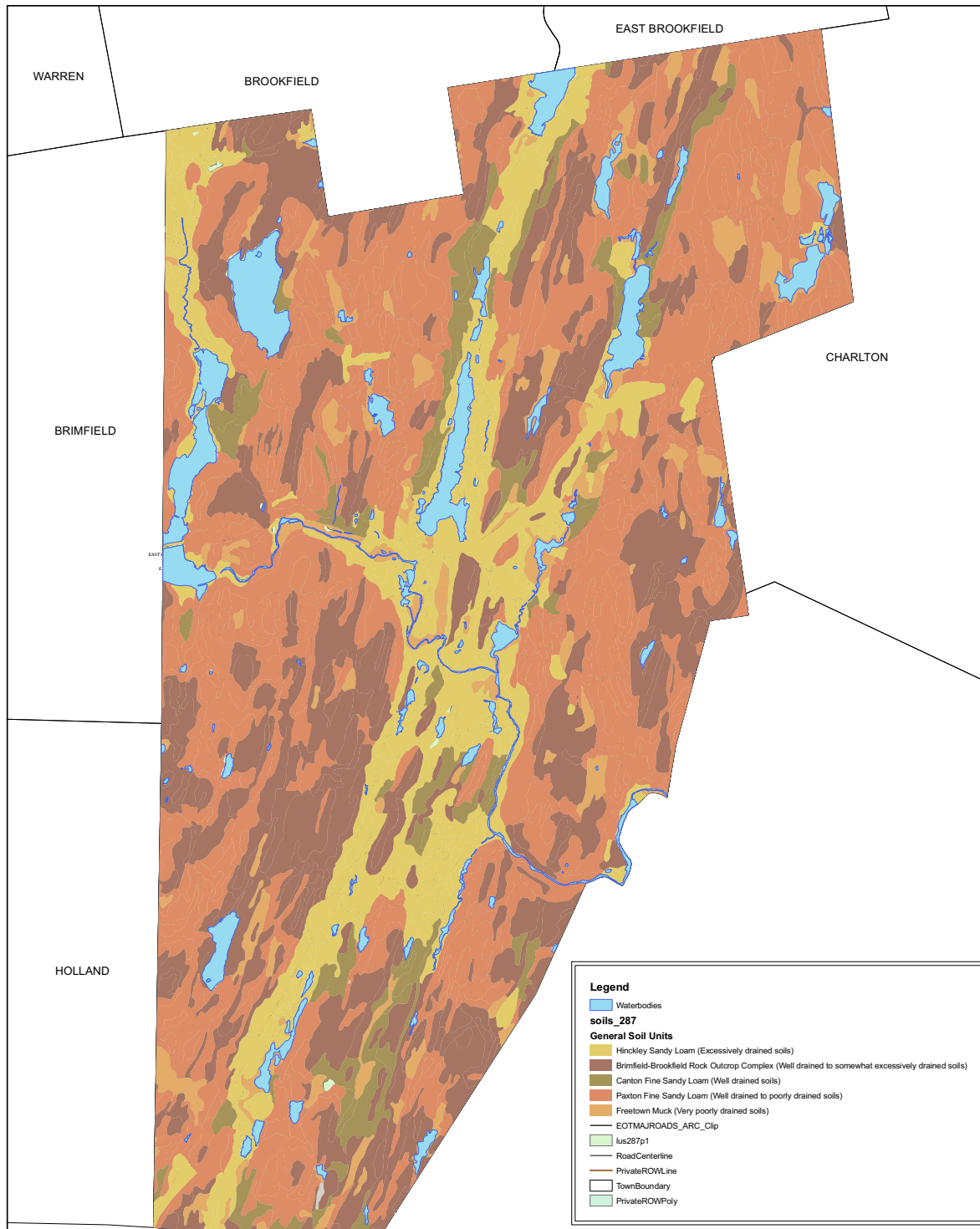
All recreational development including the development of camping areas, picnic areas, playgrounds, paths and trails and golf fairways is hindered by the presence of small and large stones, slopes and depth to rock.

- **Merrimac-Hinckley-Windsor Soils:** Nearly level to steep, very deep, excessively drained and somewhat excessively drained soils on outwash plains. This soil type consists of soils located on broad, flat plains and in rolling to steep areas throughout the southern portion of Central Massachusetts. The soils were formed in water-sorted deposits of glacial outwash. In Sturbridge, this soil category appears as a series of thin strips in the center of Town.

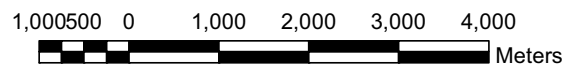
This map unit is suitable for agricultural uses and development. Drought conditions can be a management concern for agricultural uses but irrigation and the addition of organic matter to soils can help combat that condition. Extensive cutting and filling is normally required for roadway construction. Building the roads on the contours and planting suitable grasses on the road banks can help reduce erosion hazards. The slope and poor filtering capacity can be concerns for septic tank absorption fields.

Camping areas, picnic areas, playgrounds, paths and trails and golf fairway development may be somewhat impacted by slopes, excessively sandy conditions and drought conditions.

# Town of Sturbridge Soils



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## B. Landscape Character

Sturbridge is characterized by its abundance of natural features – the hills, woods, lakes, and streams. The strong influence of the hills and their pronounced northeasterly-southwesterly orientation, determines much of the land use and settlement patterns in the Town. The hilly and forested aspects of the Sturbridge landscape offer many pleasant vistas and view sheds. Most notable are those which include the Route 84/15 corridor as well as the Route 49 corridor and portions of Route 20, particularly on the west end of town at the intersection of Route 148 continuing west to Long Pond along the Quinebaug River. Much of this area is threatened due to limited protection and development pressures at the present time.

The Town of Sturbridge participated in the Massachusetts Heritage Landscape Inventory Program in 2007. This planning process helped identify “Heritage Landscapes” which are “special places created by human interaction with the natural environment that help define the character of a community and reflect its past.”<sup>4</sup> Participating in this program helped the community identify certain aspects of the landscape that give the town its own special unique character. The following Priority Heritage Landscapes were identified:

### **Quinebaug River**

Description: The Quinebaug River cuts from west to east across Sturbridge’s north-south oriented topography. A moderate-flow river, it enters Sturbridge at the Army Corps of Engineers (ACE) East Brimfield Reservoir/ Long Pond flood control project, and flows through the steep valley of Fiskdale where it once provided the waterpower that led to the area’s development in the 18<sup>th</sup> and 19<sup>th</sup> centuries. The river broadens and becomes marshy through the central plain that includes Old Sturbridge Village, then receives inflow from Cedar Pond and provides enough fall for another small mill site (David Wight – see Old Sturbridge Village) before it meanders through the southeastern section of town to the Westville Dam on the town’s border with Southbridge.

Today the river is appreciated for its scenic qualities, fly fishing and good kayaking. It still powers the saw and grist mills at Old Sturbridge Village, while both Long Pond and Westville Lake provide public access for boating and fishing under United States Army Corp of Engineers (USACE) auspices. The Grand Trunk rail bed shadows the course of the river, from inundated trestles in the East Brimfield Reservoir, along the south bank through Fiskdale and Snellville, cutting across wetlands in Old Sturbridge Village and level floodplain in the southeastern part of town.

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<sup>4</sup> Sturbridge Reconnaissance Report, June 2007. Introduction.

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## **Barrett Farm (Douty Road)**

Description: Barrett Farm encompasses 246 acres of primarily open, rolling land, on the north side of Stallion Hill, within sight of the Quinebaug River. The farm extends along both sides of Douty Road, one of Sturbridge's designated Scenic Roads and approximately 100 acres is under Chapter 61A. According to local sources, most of the Barrett land does not pass percolation testing for residential development and, although there is sewer at the bottom of Douty Road, the current treatment plant is at capacity.

The historic farmhouse on the east side of the road is a two-story, gable roofed building with 8-over-12 windows and two interior stove chimneys. Its center-entrance front door is surmounted by a semicircular fanlight. A two-story ell at the rear of the building attaches to a low, one-story shed. The house is aluminum sided. A small well-house stands in the front yard, which is shaded by two mature sugar maples flanking the front walk. Across Douty Road is a group of farm buildings in fair to poor condition, including two wooden barns, a silo and other sheds and outbuildings. Elsewhere on the property are a 1968 gambrel-roofed Cape house and a small 20<sup>th</sup> century electric sawmill.

Background: This farm appears to have been part of the Allen family's extensive colonial-era holdings that stretched down to what is now Fiskdale. The house, dated on town assessor's records as 1770, appears to have been updated in the 19<sup>th</sup> century, based on its two small interior chimneys that suggest conversion from fireplace to wood stove heat. In 1872 the owner was C. G. Allen. The property's present identification as Barrett Farm dates to its purchase by Everett Barrett in 1941. Barrett, succeeded by his son Walter, managed a dairy herd of 100 Holstein and Jersey cows until Walter's death in 1993. The present owner and her husband are the third generation of the family on the property.

## **Fiskdale**

Description: Fiskdale is a village landscape centered on an 1828 brick, three-story mill building. The neighborhood stretches along Main Street (Route 20) from Arnold Road on the east to Brookfield Road (Route 148) on the west. Land parcels south of Main Street abut the Quinebaug River, while those north of Main are restricted by the steep slope of Bates Hill, especially toward the western end of the area. Fiskdale is characterized by a mix of small commercial enterprises, many housed in free-standing Greek Revival wood frame buildings that evoke the neighborhood's prosperous history. The original Fiske mill, with assorted additions and alterations, is still standing between Main Street and the lower of two dams, and is currently in use as mixed commercial and office space. Across the street is Fiskdale's other anchor building, the [1880] brick Blackington Building, an imposing Gothic brick and slate commercial block with steep-roofed tower and dormers.

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## Theme Ponds

Description: The linear shape of the town of Sturbridge is reflected in the shapes of all its major ponds. Both are dictated by the north-south oriented, glacially formed uplands and valleys that characterize much of this area, across which the Quinebaug cuts and which it drains. Today, all of Sturbridge's ponds serve recreational purposes. Big Alum has the densest residential development surrounding it, and Long Pond the least, its shoreline being owned by the Army Corps of Engineers.

Background: Leadmine Pond, the north end of Long Pond, Big Alum Pond, Cedar Lake, Walker Pond, and the part of Brookfield's South Pond that extends into Sturbridge are all natural ponds, documented before industrial development on the 1795 map of the town. Long Pond was at least doubled in size as part of the 1964 East Brimfield Lake flood control project, and Westville Lake was created by a lower dam on the Quinebaug during the same period.

The shores of Big Alum Pond – or Lake Pookookapog as it was called – became a vacation cottage site as early as the 1890s. In 1889, a local history described Walker Pond (earlier Saltonstal's Pond) as *a pleasure resort*, probably due in part to its proximity to the trails and scenic vista available around Walker Mountain as well as a swimming area on the pond's west side. These features were incorporated into Wells State Park when the Wells family (see Old Sturbridge Village section) donated 678 acres to the state in 1962. At present the pond's remaining shoreline is developmentally fairly stable, privately owned in sizable parcels and, at the southern end, bordered by the Massachusetts Turnpike.

## Sturbridge Town Common Historic District

Description: The historic civic, religious and commercial center of Sturbridge encompasses 138.15 acres including the town's original six-acre common. It is further defined as the area along Main Street (Route 131) between Hall Road on the east and the I-84 overpass on the west, containing 47 public and privately owned properties. The area was designated a National Register Historic District in 1977.

Background: Sturbridge was incorporated as a town in 1738, and the present town common was immediately set off as the site for meetinghouse and burial ground. The common later developed into a center of commerce as well, due to the convergence of roads there. Sturbridge's original, irregularly shaped common remains intact, surrounded by buildings of compatible sizes and forms in a wide range of styles, with a preponderance of Federal and Greek Revival structures. Properties include public institutions such as the Old Sturbridge Burial Ground (1738), Erasmus Babbit Inn or Publick House (1772), Sturbridge Town Hall (1838), Sturbridge Center School (1855), Joshua Hyde Public Library (1896), and the Federated Church of Sturbridge and Fiskdale (1922), as well as numerous residences. Many of the buildings are of local or regional historical importance, as well as architectural significance.



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## **Hobbs Property (23 Hall Road)**

Description: This 23.43 acre property, bordered by Hall Road on the east and Hobbs Brook on the west, is notable for a long stretch of open field that parallels the road and is defined on the east by a tree-lined stone wall that marks the effective edge of beaver-dammed wetlands. The property includes a wood-frame house built by Samuel Hobbs about 1780, with an attached carriage shed and a barn. A tannery also stood near the intersection of Hall Road and East Main Street, although no sign of the business is immediately visible today. Approximately the southern half of the property is located within the Sturbridge Common National Register Historic District.

Background: Samuel Hobbs, a participant in the Boston Tea Party, operated a tannery adjacent to the brook until his death in 1823. Later generations of the family continued the business at least as late as 1870. Sturbridge selectman William Whittemore occupied the house from the late 19<sup>th</sup> into the 20<sup>th</sup> century. The property continues to be privately owned.

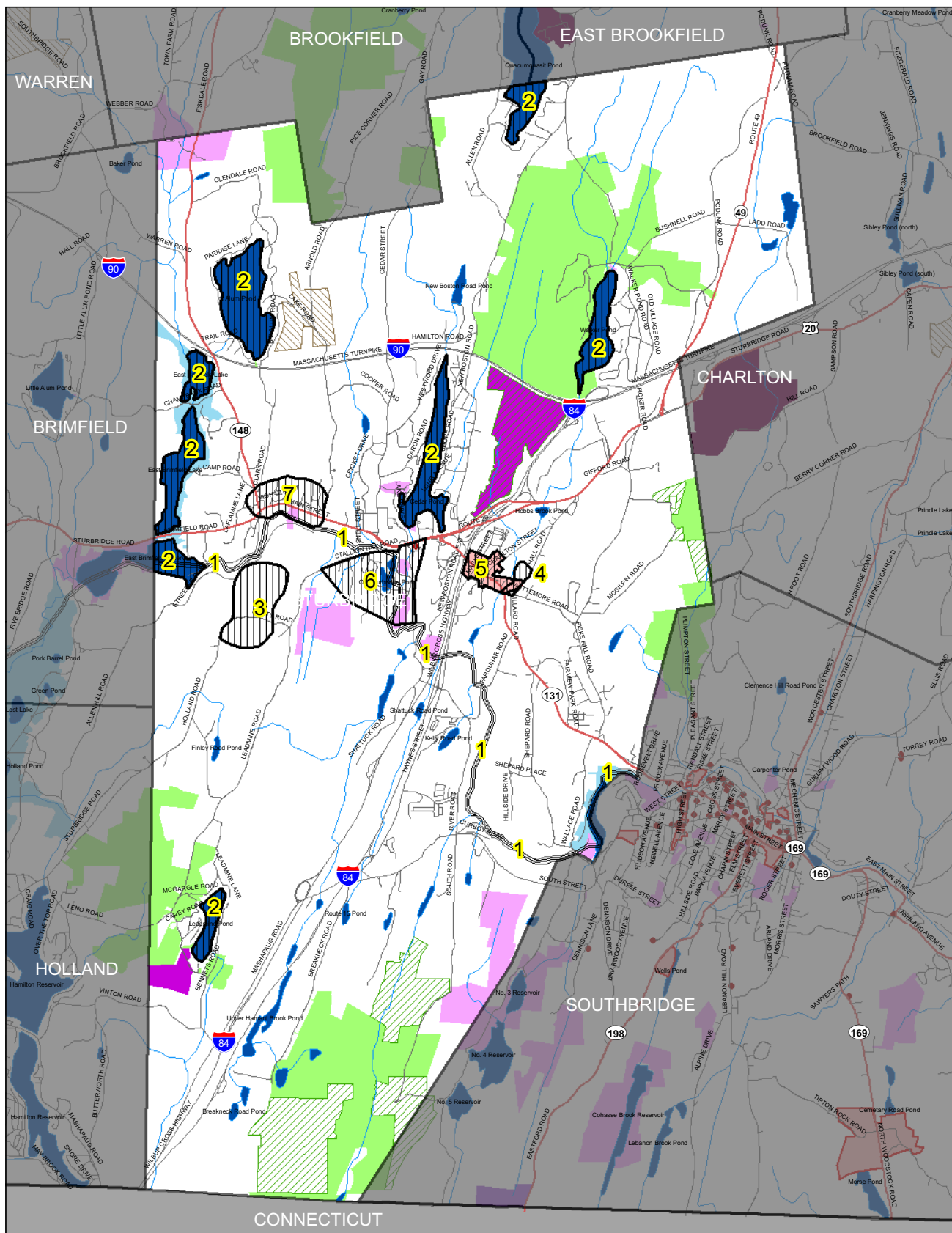
## **Old Sturbridge Village (1 Old Sturbridge Village Road)**

Description: A world-renowned open air history museum that combines historic architecture, material culture collections, costumed interpretation and educational programs to interpret New England village life of the early 19<sup>th</sup> century. As of 2006, OSV was the largest single private landowner in Sturbridge, owning 1,260 acres of land in the center of town plus 52 buildings (the town's largest state-owned holdings are Breakneck Brook W.M.A. and Wells State Park, each approximately 1400 acres). A substantial portion of the OSV real estate – 814 acres of the Village's "back land" – was sold to the Town of Sturbridge in 2006. The portion still owned by the Village, over 400 acres, includes the core museum landscape with its collection of historic buildings and reconstructed craft shops, as well as associated collections storage, educational, commercial, and administrative buildings fronting on Old Sturbridge Village Road. The landscape includes a stretch of the Quinebaug River and of the Grand Trunk Rail Road rail bed, discussed above (see Quinebaug River).

Background: Old Sturbridge Village was founded in the late 1930s by the Wells family of Southbridge, to house their collections of early 19<sup>th</sup> century Americana and interpret the life of early industrial rural New England (ca. 1790-1840) to the public. The living history museum opened to the public in 1946 on land that had constituted David Wight's farm in the early 19<sup>th</sup> century. Wight had dammed the Quinebaug River where it flowed through his land to provide power for a saw- and gristmill operation. Currently, OSV is streamlining its museum operations and repositioning itself to better respond to the needs of contemporary museum audiences<sup>5</sup>.

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<sup>5</sup> This section was taken in its entirety from the Sturbridge Reconnaissance Report: Blackstone Valley/Quinebaug-Shetucket Landscape Inventory. Massachusetts Heritage Landscape Inventory Program. June 2007.



# STURBRIDGE HERITAGE LANDSCAPE INVENTORY

## Priority Landscapes

1. Quinebaug River
2. Theme: ponds
3. Barrett Farm
4. Hobbs Property
5. Sturbridge Town Common District
6. Old Sturbridge Village
7. Fiskdale



NOTE RE BOUNDARIES: Priority Landscape outlines are not legal parcel boundaries; they indicate local focus of concern. All other GIS data were obtained from MassGIS and may not include 2007 updates.

- Priority Landscape
- Linear Priority Landscape
- State Register of Historic Places
- State Register of Historic Districts
- Major Road
- Road
- Conservation Restriction
- Agricultural Preservation Restriction
- Commonwealth of Massachusetts Lands
- Non-Profit
- Federal
- Municipal
- Land Trust
- Conservation Organization



0 0.5 1 Miles

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## C. Water Resources

Water resources include watersheds, surface waters, wetlands, stormwater groundwater and drinking water sources. The Town of Sturbridge has a wealth of water resources within its boundaries due to the many ponds, lakes and streams in addition to the Quinebaug River.

### Watersheds:

Sturbridge is primarily located within the Quinebaug River Watershed which is in the southern part of Central Massachusetts. Covering 850 square miles, the watershed extends south into Connecticut and Western Rhode Island. To the north/northwest is the Chicopee River Watershed. To the west is the Connecticut River Watershed and to the east is the French River Watershed.<sup>6</sup> The Quinebaug River stretches approximately 65 miles, 19 of which are in Massachusetts. Its watershed is heavily forested and contains 54 lakes and ponds. Together with the French River Watershed and the Quinebaug-Shetucket River Valley, it forms the Thames River Watershed.

### Surface Waters:

Located within the Town are seven major open water bodies: Cedar Lake, Walker Pond, Leadmine Pond, Big Alum Lake, East Brimfield Lake (Long Pond), and South Pond. These are either wholly or partially within the boundaries of Sturbridge. Public access to the major water bodies is available through either State or Town owned properties. More detailed descriptions follow:

**Cedar Lake:** Located in the north-central section of town, this lake is roughly 183 acres. The Town's recreational beach is located near the southwest end of the lake, and the Sturbridge Host Hotel on Route 20 is on the south end. Hotel guests or restaurant patrons can access a small beach on the lake. There is also a small area on the west side of the lake that is a popular fishing site.

**Walker Pond:** This 104 acre body of water is located in the northeast corner of town, east of Wells State Park. The park provides access to the pond with its admission fee for campers only. Boat access is available via boat ramp at the north end of the pond on town land.

**Leadmine Pond:** This 53 acre lake is located at the southwestern corner of town, about one mile west of Route 84 near the Holland Town line. Boat access is limited to car top boats or canoes which can be carried across public property off of Leadmine Road. Shore access is very limited.

**Big Alum Lake:** Covering roughly 195 acres, this is the largest lake in Sturbridge. The lake can primarily be accessed via residential routes, though there is a walking route around the lake, which is more than three miles long. There is also a public boat ramp at the end of Clarke Road. Fishing, boating, swimming and water skiing are all popular at this lake.

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<sup>6</sup> Massachusetts Office of Energy and Environmental Affairs, [http://www.mass.gov/Eoeca/doc/eca/water/watersheds\\_map.pdf](http://www.mass.gov/Eoeca/doc/eca/water/watersheds_map.pdf)

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East Brimfield Lake (Long Pond): This 360 acre lake straddles Sturbridge and Brimfield. Connecting to the lake to the north is Long Pond which can be accessed at fishing areas off of Champeaux Road. There are two public access ways to East Brimfield Lake, both off of Route 20. Several activities allowed in this area include motorized boating, fishing, canoeing, and picnicking.

Quacumquasit Lake (South Pond): This is a 218 acre lake located in Brookfield and Sturbridge about three miles north of Route 20. There is a small beach located off of Lake Road in Brookfield.

Breakneck Pond: Breakneck Pond serves as the source waters to Breakneck Brook, which flows from south to north.

Also located within the Town is a section of the Quinebaug River, which offers excellent potential for trail linkages throughout the region. There are several large forested and unforested wetlands, most notably Hobbs Brook, McKinstry Brook and Breakneck Brook. The Federal Emergency Management Agency (FEMA) Flood Map shows many small north /south flood plain striations. The Town has adopted bylaws that limit construction in floodplain areas. The Army Corps of Engineers owns land and easements within the floodplain of the Quinebaug River totaling nearly 600 acres.

## Wetlands:

Sturbridge has extensive wetlands and wetland resource areas. In addition to the noted great ponds, lakes, rivers and vernal pools there are extensive wetlands complexes, perched wetlands, and small ponds, perennial and intermittent streams.

## Northwest Region

There is an extensive perennial stream system in the northwest corner of town with Bordering Vegetated Wetland surrounding it until it outlets into East Brimfield Lake. There are also several intermittent streams flowing into Big Alum Pond, each with extensive Bordering Vegetated Wetlands surrounding it.

## Northern Central Region

In the Northern Central part of town there are several unnamed perennial streams with several "through flow" ponds that eventually discharge into the Quinebaug River. There are also a large variety of Bordering Vegetated Wetland complexes and an unnamed perennial stream that flows into Cedar Lake.

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## Northeast Region

In the Northeast corner of town there are extensive linear (north/south) wetlands surrounding the ridgelines of Hitchcock Mountain. The perennial streams fed by the wetlands in the ridges of Hitchcock Mountain feed/are headwaters for Walker Pond.

In the northeastern part of town there is a perennial stream and “through flow” wetlands that serve as the headwaters to McKinstry Brook.

## Central Region

The central part of town has several intermittent and perennial streams that feed the Quinebaug River. The perennial stream outletting from Cedar Lake begins a rather extensive wetland complex between Route 20 and the Quinebaug River.

Walker Pond is the headwaters for the perennial Hobbs Brook. Hobbs Brook is surrounded by extensive Bordering Vegetated Wetlands from its source to the Quinebaug River. Pistol Pond is a “through flow” pond within the Hobbs Brook stream system.

## Eastern Central

In the Eastern Central part of town there is a large beaver impoundment (south of Route 131 and west of Wallace Road). This wetland serves as the headwaters to a perennial stream that is a tributary of the Quinebaug River.

## Southwest Region

Finlay Pond, a small perched headwater pond, serves as the source waters for an unnamed perennial stream which flows into the Hamilton Reservoir in Holland. Further south Leadmine Brook, which is surrounded by a significant system of Bordering Vegetated Wetlands, flows into Leadmine Pond.

## South Central Region

A significant series of headwater “through flow” ponds which serve as the source waters to Hamant Brook exist just east of Route 84.

## Southeast Region

South of the Sturbridge town line, within the State of Connecticut and within the Nipmunk State Forest is the Breakneck Pond. Breakneck Pond serves as the source waters to Breakneck Brook which flows south to north. Breakneck Brook and the surrounding area have extensive

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wetlands interspersed between the ridgelines which run north/south. Breakneck Brook also serves as an important tributary to the Quinebaug River.

The Town has three municipal wells with a fourth currently under installation. There are 25 additional water systems registered with the State Department of Environmental Protection (DEP) that, because of the number of persons served, are regulated as public water supplies under the federal Drinking Water regulations. The Town owns most of the land falling within the Zone I contribution areas and what land it does not own is under the purview of the Army Corps of Engineers. Zone II contribution areas have been delineated for all four municipal wells and have received DEP approval.

Wetlands are protected under the Massachusetts Wetlands Protection Act (MGL c. 131 § 40), which was originally enacted into law as the Hatch Act in 1972 and amended by the 1996 Rivers Act. The law aims to protect public and private water supplies, prevent storm damage and pollution, protect wildlife habitat and fisheries, reduce the effects of potential flooding and protect groundwater supplies.<sup>7</sup>

The Town has adopted a local wetlands bylaw that is more stringent than state law. Enacted in 2002, it serves not only to protect wetlands and natural resources but also provide erosion and sedimentation control and protect water quality, rare species habitat, recreational values, and agriculture and aquatic activities.<sup>8</sup> Activities within 200' of wetlands require Conservation Commission review and approval to be sure there will be "no significant adverse impact" to the wetlands.<sup>9</sup> In addition, the local bylaw creates a 25-foot "No disturb" buffer and a 50-foot no permanent structure requirement. The Water Resources Map can be viewed on the next page.

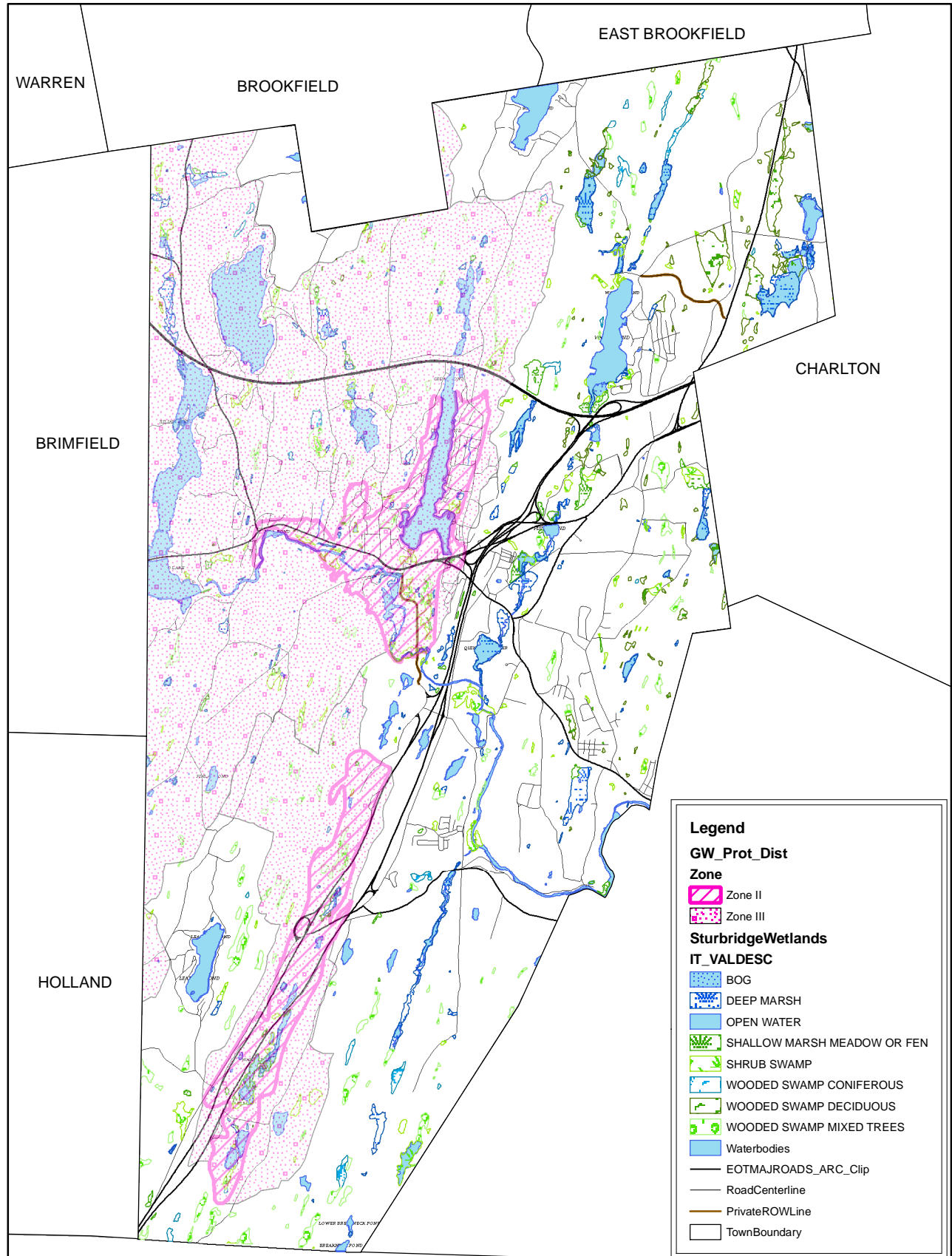
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<sup>7</sup> Wetlands Protection Act regulations, <http://www.mass.gov/dep/service/regulations/310cmr10a.pdf>

<sup>8</sup> Town of Sturbridge website, [http://www.town.sturbridge.ma.us/Public\\_Documents/SturbridgeMA\\_ConsInfor/conservation](http://www.town.sturbridge.ma.us/Public_Documents/SturbridgeMA_ConsInfor/conservation)

<sup>9</sup> Ibid.

# Town of Sturbridge Water Resources



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## Groundwater:

Groundwater resources can be found in the areas along the Quinebaug River and Hamant Brook. Aquifer areas in the central part of town – such as those in the Quinebaug River Valley – have higher yields, estimated at greater than 300 gallons per minute. Other areas have yields closer to 10 to 100 gallons per minute.

The Town also has a Groundwater Protection District which regulates construction, land uses and storage of liquid petroleum products. The map was most recently updated at the Annual Town Meeting held on April 27, 2009 to include an area along the Route 15 – I84 corridors. The amendment was necessary to allow for an expanded area of protection due to the installation of a new Well # 4 by the Town.

## Floodplains:

Floodplains are areas adjacent to waterways that are inundated with water during times of increased flow. In the Town of Sturbridge, the major flooding on the Quinebaug River occurs in the spring and can be the result of spring rains combined with snowmelt. The two most severe floods were the result of tropical storms. In August 1955, Tropical Storm Diane dropped record amounts of rain on ground that was already saturated due to Tropical Storm Connie.<sup>10</sup> Since the Town is rich in water resources, a great deal of land lies within the floodplain. The Floodplain Map can be viewed in the Environmental Challenges section of this plan on page 67.

The Town currently has a Floodplain District which does not allow the construction of new structures within the floodplain. Significant changes have been made to the Flood Insurance Rate Maps (FIRM) as part of an overhaul by the Federal Emergency Management Agency. These changes will become effective on July 4, 2011. The Town did amend its Zoning Bylaw at the Annual Town Meeting held on June 6, 2011 to reflect the newest Flood Insurance Study (FIS) and Flood Insurance Rate Map (FIRM) and to insure that the bylaw is consistent with the most current standards for construction recommended by FEMA.

## Vernal Pools:

The Division of Fish and Wildlife has certified 46 vernal pools in Sturbridge<sup>11</sup> (mostly located within Wells State Park) and local conservationists believe there are many more scattered throughout the community; in fact, there are 193 sites in Town that the State considers “potential” vernal pools. Vernal pools are unique wildlife habitats best known for the

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<sup>10</sup> Flood Insurance Study, Worcester County Massachusetts. Effective Date, July 4, 2011. Federal Emergency Management Agency.

<sup>11</sup> [http://www.mass.gov/dfwele/dfw/nhesp/vernal\\_pools/vernal\\_pool\\_data.htm](http://www.mass.gov/dfwele/dfw/nhesp/vernal_pools/vernal_pool_data.htm)

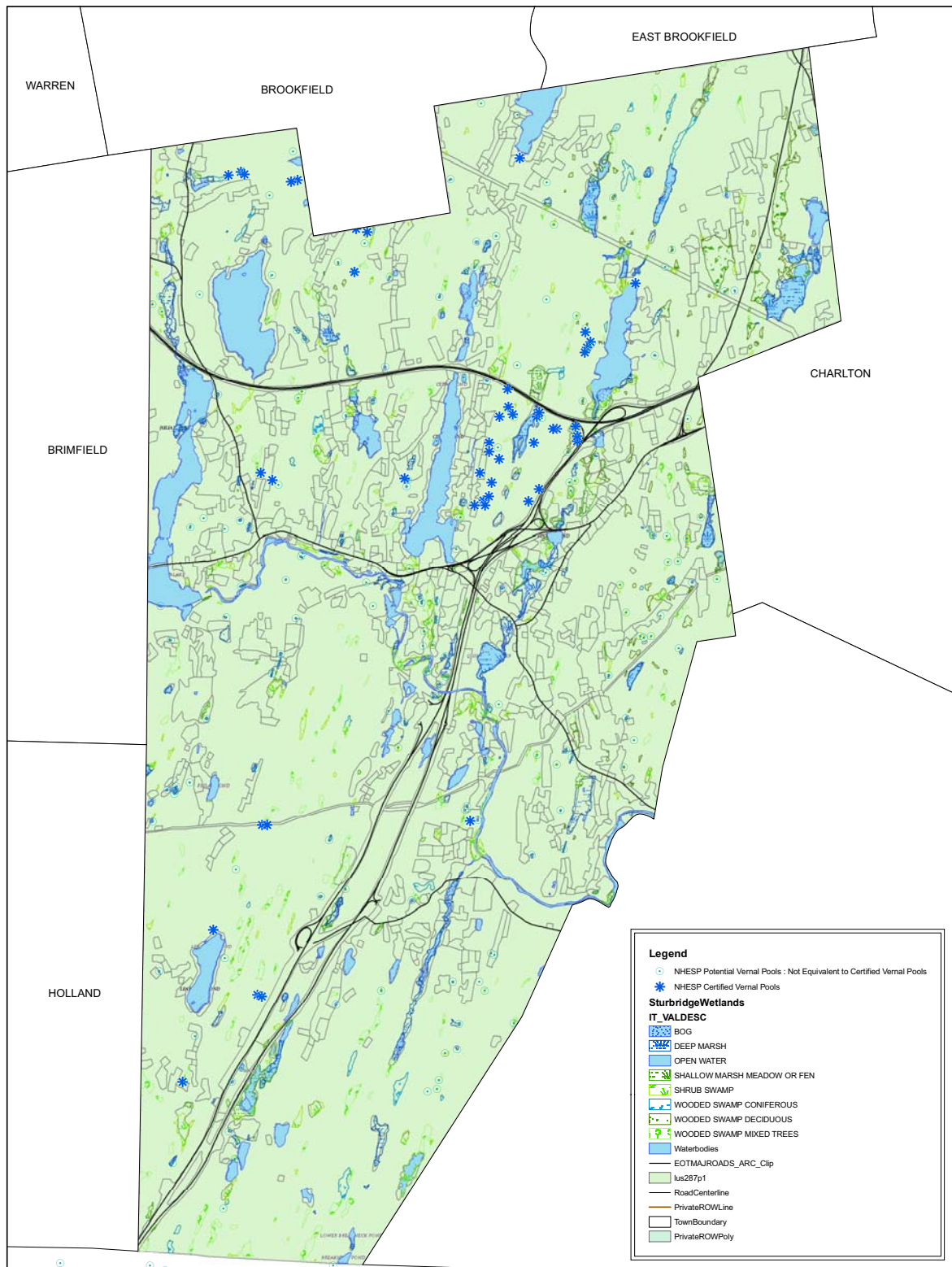


## TOWN OF STURBRIDGE OPEN SPACE & RECREATION PLAN - 2011

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amphibians and invertebrate animals that use them to breed. Vernal pools, also known as ephemeral pools, autumn pools and temporary woodland ponds, typically fill with water in the autumn or winter due to rising groundwater and rainfall and remain ponded through the spring and into summer. Vernal pools dry completely by the middle or end of summer each year, or at least every few years. Occasional drying prevents fish from establishing permanent populations. Many amphibian and invertebrate species rely on a breeding habitat that is free of fish predators. Some vernal pools are protected in Massachusetts under the Wetlands Protection Act regulations as well as several other federal and state regulations. The Natural Heritage Endangered Species Program (NHESP) serves the important role of officially “certifying” vernal pools that are documented locally. The locations of the State-certified vernal pools in Sturbridge can be seen on the following map:

# Town of Sturbridge Vernal Pools



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1,000 500 0 1,000 2,000 3,000 4,000 Meters



# TOWN OF STURBRIDGE OPEN SPACE & RECREATION PLAN - 2011

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In 2001, with funding from the EOE, the NHESP developed a BioMap for the entire Commonwealth in order to identify the areas most in need of protection to ensure native biodiversity. The BioMap identified Core Habitat areas based on verified data that corresponds to actual locations on the ground. The areas mapped were determined by biologists to be those most suitable to support viable plant and wildlife species. Similarly, the NHESP's Living Waters Project in 2003, attempted to identify and map the State's most critical sites for maintaining freshwater aquatic biodiversity. These Core Habitat sites represented where the State would focus its conservation priorities.

Both of these maps were replaced in 2010 with BioMap2, a map with supporting documentation. The original BioMap plan was based on data collected prior to 2001. More than 4,000 records have been added to the NHESP database since that time and better understanding of the geographic extent and types of suitable habitat needed to support many MESA species has been gained. This report and map discusses biodiversity in Massachusetts which is defined as the "totality of genes, species and ecosystems in a given place, as well as the ecosystem structure and function, the ecosystem processes that support and sustain life."<sup>12</sup> According to this report, biodiversity is an "invaluable natural resource" that when protected enhances water supply and watershed protection, as well as recreational opportunities and aesthetic benefits. Fragmentation or degradation of important natural communities and important habitat areas can in turn lead to loss of biodiversity and endangering of species.

The BioMap2 Project sought to produce a statewide map which could guide the protection of Massachusetts' biodiversity. In an effort to guide land protection the map shows areas that if protected would provide suitable habitat over the long terms for the maximum number of Massachusetts terrestrial and wetland plant and animal species and natural communities. While the GIS data for the map is not yet available to communities; readers of this report may access the map online at the following site: <http://maps.massgis.state.ma.us/dfg/biomap2.htm>.

The newest maps identify Core Habitat and Critical Natural Landscape. These two elements are defined as follows:

"Core Habitat – identifies key areas that are critical for the long-term persistence of rare species and other Species of Special 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 in biodiversity. Critical Natural Landscape – identifies large natural landscape blocks that are minimally impacted by development. If protected these areas will provide habitat for side ranging native species, support intact ecological resilience to natural and anthropogenic disturbances in a rapidly

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<sup>12</sup> BioMap 2 : Conserving Biodiversity of Massachusetts in a Changing World. Prepared by the MA Department of Fish & Game, Division of Fisheries and Wildlife, Natural Heritage & Endangered Species Program, and The Nature Conservancy. 2010. Page 6.

# TOWN OF STURBRIDGE OPEN SPACE & RECREATION PLAN - 2011

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changing world. Areas delineated as Critical Natural Landscape also include buffering upland around wetland, coastal and aquatic core habitats to help insure their long term integrity”<sup>13</sup>.

There are many threats to biodiversity. Climate change is one such threat, but beyond that habitat loss, habitat fragmentation, invasive species, air and water pollution and alteration of ecological processes all pose threats to biodiversity. The BioMap2 can help communities work to retain biodiversity by providing a priority blueprint for land preservation efforts. The Town of Sturbridge will need to focus future preservation efforts in the areas delineated on the newest map to help insure biodiversity in the future.

## D. Vegetation

Despite recent development trends, large portions of Sturbridge remain forested. Some important open agricultural land is still undeveloped. The forest type is northern mixed hardwood with the dominant tree species being red oak, white oak, red maple, white ash, white pine and eastern hemlock. Of the nearly 18,000 acres of forested land, over half is predominantly large hardwood stands. Nearly 1/3 is large mixed wood stands while less than 5% is mostly large conifer stands.

According to Massachusetts General Laws Chapter 87, “all trees within a public way or on the boundaries thereof including trees planted in accordance with the provisions shall be public shade trees; and when it appears in any proceeding in which the ownership of or rights in a tree are material to the issue, that, from length of time or otherwise, the boundaries of the highway cannot be made certain by records or monuments, and that for that reason it is doubtful whether the tree is within the highway, it shall be taken to be within the highway and to be public property until the contrary is shown”.<sup>14</sup>

The Town has a very active Tree Warden and Public Shade Tree Program. It is the responsibility of the Tree Warden to oversee the planting of trees, to maintain and care for the trees, and to remove injured or dangerous trees in the public area. The Tree Warden organizes and keeps track of every public shade tree that is to be planted and every tree that has already been planted in the town of Sturbridge. It is the Tree Warden’s goal not only to preserve the community forestry of Sturbridge, but to enhance it.

The Tree Warden determines where trees can be planted within public property (the common, streets, parks, etc). The Tree Warden also maintains all public shade trees by inspection, pruning, and trimming where needed. Pest control is also part of the Tree Warden’s duties in caring for the health of our trees.

Dead public shade trees in the town of Sturbridge are removed immediately.

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<sup>13</sup> Ibid. Page 9.

<sup>14</sup> Massachusetts General Laws Chapter 87.

## TOWN OF STURBRIDGE OPEN SPACE & RECREATION PLAN - 2011

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The Town of Sturbridge has been the recipient of numerous DCR Urban and Community Forestry Grants over the years which have helped to supplement the Public Shade Tree planting efforts undertaken by the town. This spring alone, 50 Public Shade trees were planted. The Town of Sturbridge has also proudly boasted the Designation of Tree City USA for more than 20 consecutive years now.

Sturbridge also contains a variety of wetland habitats, each with its own distinctive plant communities. Seasonally flooded basins occur primarily on stream flood plains and are populated by grasses and herbaceous species. The shrub swamps contain a variety of woody species including alder, buttonbush, dogwood and willow. The meadows contain numerous grasses and sedges. The shallow marshes are home to a distinctive vegetation complex, which includes cattails, bulrushes, burreed, pickerelweed and arrowhead. The deep marshes also have water lilies and a variety of pondweeds.

There has been substantial loss of open farmland over the last fifty years. Some farmlands have reverted to forest, but much has been developed residentially. A few large examples of typical agricultural land do remain. A floral inventory for State listed species has been done at Wells State Park with a few species identified within the park boundaries.

The Massachusetts Natural Heritage and Endangered Species program lists the following plant species for Sturbridge (note the two plant species listed as “endangered”):

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Taxonomic Group	Scientific Name	Common Name	MESA Status	Federal Status	Most Recent Observation
Vascular Plant	Adlumia fungosa	Climbing Fumitory	SC		2008
Vascular Plant	Asplenium montanum	Mountain Spleenwort	E		1946
Vascular Plant	Clematis occidentalis	Purple Clematis	SC		1998
Vascular Plant	Corallorhiza odontorhiza	Autumn Coralroot	SC		1984
Vascular Plant	Eriophorum gracile	Slender Cottongrass	T		1997
Vascular Plant	Liatris borealis	New England Blazing Star	SC		1934
Vascular Plant	Lipocarpa micrantha	Dwarf Bulrush	T		2007
Vascular Plant	Lygodium palmatum	Climbing Fern	SC		1937
Vascular Plant	Platanthera flava var herbiola	Pale Green Orchis	T		1933
Vascular Plant	Poa languida	Drooping Speargrass	E		2000
Vascular Plant	Ranunculus pensylvanicus	Bristly Buttercup	T		2008

State: E=Endangered, T=Threatened, SC=Special concern, WL=Unofficial watch list. Federal: LE= Federally Endangered, LT=Federally Threatened

## E. Fisheries and Wildlife

The large forested tracts and abundant wetland areas provide the necessary habitat requirements for the typical flora and fauna of southern New England. There are frequent sightings of coyotes, turkeys and white tailed deer. Fisher and bobcats are known to inhabit the town. Numerous beaver impoundments have been created on many suitable sites, which Great blue Herons now use as nesting sites. Moose and black bear sightings occur on an annual basis. State estimated habitat maps indicate a number of sites where State listed wetlands species exist. At Wells State Park, a population of State listed non-wetland endangered reptiles has been discovered. Field research is currently underway to gather more information on this population. Because of the large interior forested tracts, the potential for permanent wildlife corridors exists. Further research will be needed to document corridors, habitats, and other features related to wildlife in Town.

The State annually stocks Long Pond, Big Alum, Leadmine Pond and the Quinebaug River with trout. Indigenous fish exist in other ponds and streams within the Town.

The most recent listing of the Massachusetts Natural Heritage and Endangered Species program shows the following species existing in Sturbridge (note the two wildlife species listed by the State as “endangered”, as well as the entry for the Indiana Myotis, which is listed as a “federally endangered” species):

# TOWN OF STURBRIDGE OPEN SPACE & RECREATION PLAN - 2011

Taxonomic Group	Scientific Name	Common Name	State Rank	Federal Rank	Most Recent Observation
Fish	<i>Notropis bifrenatus</i>	Bridle Shiner	SC		1999
Amphibian	<i>Ambystoma opacum</i>	Marbled Salamander	T		2003
Amphibian	<i>Hemidactylum scutatum</i>	Four-Toed Salamander	SC		1999
Reptile	<i>Clemmys guttata</i>	Spotted Turtle	SC		2001
Reptile	<i>Clemmys insculpta</i>	Wood Turtle	SC		2005
Bird	<i>Haliaeetus leucocephalus</i>	Bald Eagle	E		1999
Mammal	<i>Myotis sodalis</i>	Indiana Myotis	E	E	1938
Mammal	<i>Sorex palustris</i>	Water Shrew	SC		1996
Mussel	<i>Alasmidonta undulata</i>	Triangle Floater	SC		2004
Mussel	<i>Strophitus undulatus</i>	Creeper	SC		2004
Crustacean	<i>Crangonyx aberrans</i>	Mystic Valley Amphipod	SC		1997
Butterfly/Moth	<i>Callophrys hesseli</i>	Hessel's Hairstreak	SC		1997

State: E=Endangered, T=Threatened, SC=Special concern, WL=Unofficial watch list. Federal: LE= Federally Endangered, LT=Federally Threatened

## F. Scenic Resources and Unique Environments

The rural character of the Town is an essential part of both residential quality of life as well as economic development. The long, straight stretch of Route 49 presents some serene travel through wooded landscape and hilly terrain and also prevents the interruption of intersecting roadways. Visitors and residents alike consider the entrance to Wells State Park particularly scenic. The Park borders Walker Pond and boasts a spectacular view off Carpenter's Rock as well as numerous recreational amenities from mountain biking to camping to swimming. The Westville Recreation Area, shared with the Town of Southbridge, provides good fishing and has several recreational fields and picnic areas. The Streeter Recreation Area provides a public beach, boating, fishing and picnicking areas. Another unique and scenic area is the 266-acre Opacum Woods. Located close to Sturbridge Center, this site is accessed via the trailhead at Old Brook Circle within the subdivision known as "The Preserve". The Woods contain a large beaver pond, historic and prehistoric sites, 3.5-miles of walking trails, and allows for a variety of passive recreation opportunities. The Woods also serves as habitat for a variety of wildlife species.

The Mass Turnpike corridor through Sturbridge is generally considered scenic, with rolling wooded hills and views of water. South of the Turnpike and along the Brimfield town line, Long Pond and the Quinebaug River provide both attractive vistas as well as recreation. While the land along much of

## TOWN OF STURBRIDGE OPEN SPACE & RECREATION PLAN - 2011

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the Quinebaug River is privately controlled, access is usually tolerated and several walking trails exist along its southern banks with views and great fishing. Scenic roads run through much of the Town and from Fiske Hill Road and McGilpin Road, there are vistas of the valley over Charlton.

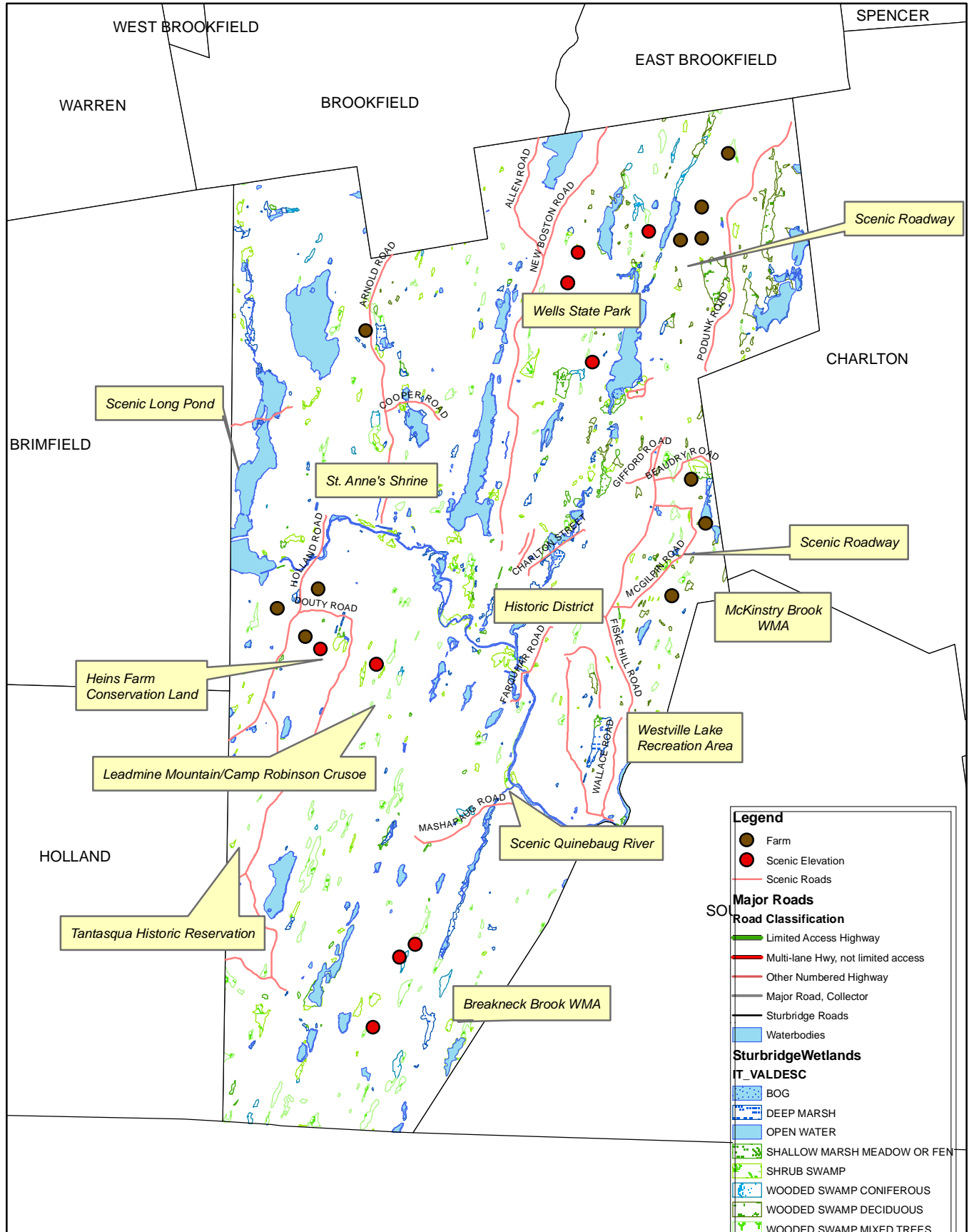
Sturbridge is well known for its historic appearance, with the National Historic District located around the Town Common. The district contains 42 historic buildings and structures. This area also includes the Hobbs Brook Conservation Area, a valuable wetland estuary, which is home to blue heron and many other species. On the south side of Town, the Trustees of Reservations maintain a 77-acre tract known as the Tantuisques Leadmine, the site of the discovery of graphite in 1633. This area features the mineshafts and tunnels where the graphite was extracted. Old Sturbridge Village is a major cultural attraction and complements other historic areas in Town. The expansiveness of the Breakneck area, which includes a large portion of the Southbridge aquifer and also abuts portions of Nipmuck State Forest in Connecticut, may have sufficient qualities to be considered an ACEC (Area of Critical Environmental Concern).

The Town's scenic features have been cited in survey after survey as one of the major reasons that residents have moved to Sturbridge. The Town's hills, water bodies, and woodlands have all been identified as scenic. The views along roads, the rural character, with stonewalls and stands of trees, have been mentioned as scenic features as well. A graphic depiction of the Town's unique features and scenic resources can be found on the Unique Features and Scenic Resources Map.



# Town of Sturbridge

## Unique Features and Scenic Resources Map



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0 0.4 0.8 1.6 2.4 3.2 Miles

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## G Environmental Challenges

### A. Surface water pollution

The Sturbridge Lakes Advisory Committee has found that the four top concerns for the Sturbridge Lakes are boating congestion, invasive aquatic plants, stormwater runoff and shoreline erosion. Lesser concerns identified were wildlife control (i.e. beaver and Canada Geese), bacterial counts, litter/waste, non-native bait fish, and dock issues. These water quality concerns are being addressed by the promotion of good environmental stewardship practices such as riparian vegetation buffer zones, use of low or no phosphorus fertilizers, low or no wake zones, etc.. The Sturbridge Conservation Commission also organizes a volunteer water quality monitoring program to track adverse trends or localized problems<sup>15</sup>.

Development around the lakes, especially the tear down and reconstruction of seasonal cottages into larger year round residences has become a common occurrence in recent years. While the Conservation Commission and Zoning Board of Appeals carefully review each project for compliance with the current applicable bylaws and regulations, it has become clear that existing regulations require review. The Master Plan Steering Committee and Focus Groups in its work on the Master Plan have raised this as an issue that needs to be addressed. Potential recommendations for goals of the plan include an analysis of the feasibility of the creation of specialized lakefront zoning regulations that take into consideration the sensitivity and desirability of these properties.

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<sup>15</sup> Report to the Sturbridge Board of Selectmen from the Sturbridge Lakes Advisory Committee: Report and Recommendations. October 2008. Section 4.0 Common Concerns and Issues for Sturbridge Lakes.

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## **b. Identified Polluted Sites in Town**

The Massachusetts Department of Environmental Protection currently lists one hundred forty-five 21E sites (also known as “brownfields”) in Sturbridge; however, this list is a bit deceptive as it contains multiple instances of contamination on a single property. The Town’s “brownfield” sites are as follows<sup>16</sup>:

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<sup>16</sup> The DEP Website <http://www.mass.gov/dep/cleanup/sites/statdef.htm> has information that can help the reader of this plan better understand the cleanup of sites and spills. Readers of this plan are encouraged to visit that website for detailed information on this program. The Appendix of this plan has a glossary of terms that can also help the reader better understand the abbreviations used in this table.

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RTN #	Release Address	Site Name Location Aid	Notification Date	Compliance Status	Date	Phase	RAO Class	Chemical Type
<a href="#">2-0000130</a>	392 MAIN ST	FORMER ARCO STATION		REMOPS				Oil
<a href="#">2-0000276</a>	RTE 15 MASHAPAUG RD	MOBIL GAS ATLAS OIL 01QRC		DEPNFA				
<a href="#">2-0000370</a>	40 MAIN ST	SUNOCO GAS STATION		RAO		PHASE V	A3	Oil
<a href="#">2-0000434</a>	149 CHARLTON RD	VILLAGE AUTOMOTIVE INC		RAO			A2	
<a href="#">2-0000797</a>	365 MAIN ST	MOBIL STATION		REMOPS		PHASE V		Oil
<a href="#">2-0010053</a>	MAIN ST	INTERSECTION		RAO			A2	Oil
<a href="#">2-0010121</a>	MAIN ST	MHD FACILITY 44		RAO			A1	Oil
<a href="#">2-0010133</a>	365 MAIN ST	MOBIL STATION 10 PUMP		RAO			A2	Oil
<a href="#">2-0010142</a>	MA TURNPIKE W	MI MARKER 79		RAO			A2	Oil
<a href="#">2-0010151</a>	400 MASHAPAUG RD	STURBRIDGE ISLE TRUCK STOP		RAO			A1	Oil
<a href="#">2-0010175</a>	RTE 84W	BEHIND STATE POLICE BARR		TIER1D				Oil
<a href="#">2-0010184</a>	358 MAIN ST	CARRIAGE HOUSE INN		RAO			A1	Oil
<a href="#">2-0010188</a>	MA TURNPIKE W	MI MARKER 79		RAO			A2	Oil
<a href="#">2-0010197</a>	MA TPKE	MI MARKER 68E BRIMFIELD-WARREN LIN		RAO			A2	Oil
<a href="#">2-0010204</a>	RTE 84	EASTBOUND NEAR REST AREA		RAO			A1	Oil

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RTN #	Release Address	Site Name Location Aid	Notification Date	Compliance Status	Date	Phase	RAO Class	Chemical Type
<a href="#">2-0010379</a>	MA TURNPIKE E	MI MARKER 74.5		RAO			A1	Oil
<a href="#">2-0010512</a>	MA TPKE	STURBRIDGE EXIT 9 PLAZA		RAO			A1	Oil
<a href="#">2-0010531</a>	MA TPKE	APA TRUCK LEASING		RAO			A2	Oil
<a href="#">2-0010566</a>	MA TURNPIKE E	MI MARKER 79.1		RAO			A2	Oil
<a href="#">2-0010716</a>	MA TPKE	EXIT 9		RAO			A2	Oil
<a href="#">2-0010759</a>	MA TPKE	REST STOP 5E		RAO			A1	Oil
<a href="#">2-0010776</a>	MA TURNPIKE W MI M	TRUCK ACCIDENT		RAO			A2	Oil
<a href="#">2-0010781</a>	441 MAIN ST	CPC ENGINEERING		RAO		PHASE III	B1	Oil and Hazardous Material
<a href="#">2-0010783</a>	MA TURNPIKE E	MI MARKER 77		RAO			A1	
<a href="#">2-0010905</a>	421 MAIN ST	ARLAND TOOL AND MANUFACTURING		REMOPS		PHASE V		Oil
<a href="#">2-0010907</a>	441 MAIN ST	WHEELABRATOR TECH INC		RAO			C2	Oil
<a href="#">2-0011047</a>	400 MASHAPAUG RD	STURBRIDGE ISLE TRUCK STOP		RAO			A1	Oil
<a href="#">2-0011099</a>	MASHAPAUG RD	STURBRIDGE MOBIL		RAO			A1	Oil
<a href="#">2-0011138</a>	236 MASHAPAUG RD	MOBIL STATION		RAO				Oil
<a href="#">2-0011148</a>	MAIN ST	MHD FACILITY 44		RAO			B1	Hazardous Material
<a href="#">2-0011157</a>	RTE 84W	RAMP ON EXIT 1		RAO			A1	Oil
<a href="#">2-0011255</a>	400 MASHAPAUG RD	ROUTE 84		RAO			A1	Oil
<a href="#">2-0011260</a>	MA TPKE	INTERCHANGE 9		RAO			A1	Oil
<a href="#">2-0011264</a>	11 MASHAPAUG RD	KRUCZEK RESIDENCE		TIER1D				Oil
<a href="#">2-0011355</a>	RTE 84	CENTIMARK CORP		RAO			A1	
<a href="#">2-0011424</a>	MA TURNPIKE S	MI MARKER 78		RAO			A2	Oil
<a href="#">2-0011425</a>	MA TURNPIKE W	500 FT OF EXIT 9		RAO			A2	Oil
<a href="#">2-0011534</a>	400 MASHAPAUG RD	STURBRIDGE ISLE TRUCK STOP	12/19/1996	RAO	3/20/2003		A2	Oil

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RTN #	Release Address	Site Name Location Aid	Notification Date	Compliance Status	Date	Phase	RAO Class	Chemical Type
<a href="#">2-0011761</a>	RTE 84E	BTWN EXIT 3A 3B		RAO			A1	Oil
<a href="#">2-0011805</a>	22 SECOND ST	RESIDENCE		RAO			A2	Oil
<a href="#">2-0011875</a>	126 FISKE HILL RD	RESIDENCE		RAO			A2	Oil
<a href="#">2-0011893</a>	RTE 84	AT INTERCHANGE 9		RAO			A1	Oil
<a href="#">2-0011905</a>	RTE 84	STURBRIDGE ISLE		RAO			A2	Oil
<a href="#">2-0012177</a>	361 MAIN ST	LOT 15		RAO			A2	Oil and Hazardous Material
<a href="#">2-0012226</a>	RT 84 AT RAMP TO MTP	NO LOCATION AID		RAO			A1	Hazardous Material
<a href="#">2-0012301</a>	CHARLTON RD RTE 20	HALL ROAD 1700 FT NORTH OF		RTN CLOSED				
<a href="#">2-0012387</a>	CHARLTON RD	NEW ENGLAND TRUCK STOP		RAO		PHASE III	A2	Oil
<a href="#">2-0012394</a>	RTE 84 W	REST AREA AT EXIT 2		RAO			A1	Oil
<a href="#">2-0012420</a>	CHARLTON RD RTE 20	149 CHARLTON RD		RTN CLOSED				Oil
<a href="#">2-0012456</a>	MAIN ST	STURBRIDGE DEPOT		RAO			A2	Oil
<a href="#">2-0012488</a>	319 BROOKFIELD RD	TANTASQUA REGIONAL HIGH		RAO		PHASE II	A2	Oil
<a href="#">2-0012570</a>	149 CHARLTON RD	VILLAGE AUTOMOTIVE		RTN CLOSED				Oil
<a href="#">2-0012615</a>	149 CHARLTON RD	GIFFORD RD		RAO			A2	Oil and Hazardous Material
<a href="#">2-0012878</a>	MA TPKE	MM79		RAO			A1	Oil
<a href="#">2-0013011</a>	MA TPKE	MA TPK MM 78E		RAO			A2	Oil
<a href="#">2-0013305</a>	40 MAIN ST	SUNOCO STA FMR		RTN CLOSED				Oil
<a href="#">2-0013314</a>	21 OLD HAMILTON ROAD EXT	POLE NO 39		RAO			A2	
<a href="#">2-0013348</a>	201 CHARLTON RD	NEW ENGLAND TRUCK STOP		RTN CLOSED				Oil
<a href="#">2-0013525</a>	660 MAIN ST	STURBRIDGE IND PARK FMR (NETOPTIX		RAO			A2	Hazardous Material
<a href="#">2-0013737</a>	358 MAIN ST	SUPER 8 MOTEL INC		RAO			A2	Oil
<a href="#">2-0013763</a>	400 RTE 15	STURBRIDGE ISLE XTRA MART		RAO		PHASE II	B1	Oil
<a href="#">2-0013981</a>	3 FALLS RD	RESIDENCE		RAO			A1	Oil

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RTN #	Release Address	Site Name Location Aid	Notification Date	Compliance Status	Date	Phase	RAO Class	Chemical Type
<a href="#">2-0013995</a>	41 MAIN ST	SUNOCO STN		RTN CLOSED				Oil
<a href="#">2-0014107</a>	MA TPKE AT EXIT 9	NEAR TOLL BOOTHS		RAO			A1	
<a href="#">2-0014118</a>	379 MAIN ST	SOVERIGN BANK		RAO			A2	Oil
<a href="#">2-0014156</a>	MA TPKE MILE MARKE	EXIT 9 EASTBOUND		RAO			A2	
<a href="#">2-0014206</a>	400 RTE 15	STURBRIDGE ISLE TRUCK STOP		RAO			A1	Oil
<a href="#">2-0014404</a>	514 MAIN ST	SOUTHBRIDGE CREDIT UNION		RAO			A2	Oil
<a href="#">2-0014431</a>	MA TPKE RT 84 AND RT 90	BEATON ROADWAY RELEASE		RAO			A1	Oil
<a href="#">2-0014436</a>	45 BURGESS SCHOOL RD	BURGESS ELEMENTARY SCHOOL		RAO			A1	Oil
<a href="#">2-0014524</a>	RTE 84 W	BETWEEN EXITS 2& 3		RAO			A2	Oil
<a href="#">2-0014563</a>	660 MAIN ST	CORNING INC		RTN CLOSED				Hazardous Material
<a href="#">2-0014643</a>	40 MAIN ST	IMPACTED RESIDENCE 27 MAIN ST		RTN CLOSED				Hazardous Material
<a href="#">2-0014659</a>	400 RTE 15	DRAKE PETROLEUM		RAO			A2	Oil
<a href="#">2-0014676</a>	236 RTE 15	EXXON STATION		RAO			A1	Oil
<a href="#">2-0014724</a>	51 HOLLAND RD	MUIRFIELD DEVELOPMENT		RAO			A1	Hazardous Material
<a href="#">2-0014753</a>	544 MAIN ST	MA ELECTRIC POLE 97		RAO			A1	
<a href="#">2-0014785</a>	LOTS 51 AND 55 HOLLA	FORMER US FILTER		RAO			B1	Hazardous Material
<a href="#">2-0014814</a>	71 MASHPAUG RD	MASHPAUG RD AT POLE 28		RAO			A1	
<a href="#">2-0014875</a>	175 CEDAR ST	CEDAR ST POLE 47		RAO			A2	
<a href="#">2-0014915</a>	27 BROOKFIELD RD	27 BROOKFIELD RD UST		RAO			A1	
<a href="#">2-0014922</a>	277 MAIN ST	RTE 131 PUBLIC HOUSE		RAO			A2	Oil
<a href="#">2-0015054</a>	400 HYNES RD	STURBRIDGE ISLE TRUCK STOP		RAO			A1	
<a href="#">2-0015114</a>	MA TPKE EASTBOUND	MA TURNPIKE ROADWAY RELEASE		RAO			A1	

# TOWN OF STURBRIDGE OPEN SPACE & RECREATION PLAN - 2011

RTN #	Release Address	Site Name Location Aid	Notification Date	Compliance Status	Date	Phase	RAO Class	Chemical Type
<a href="#">2-0015124</a>	365 MAIN ST	MOBIL STATION		RTN CLOSED				Oil and Hazardous Material
<a href="#">2-0015168</a>	315 CHARLTON RD	T & S TRUCK SERVICE		RAO			A2	Oil
<a href="#">2-0015244</a>	MA TPKE MM 78 5	CARDINAL FREIGHT CARRIERS		RAO			A2	Oil
<a href="#">2-0015366</a>	40 MAIN ST	JACKS GAS AND AUTO REPAIR INC		RAO		PHASE II	A2	Hazardous Material
<a href="#">2-0015483</a>	100 CHARLTON RD	CARRIER INDUSTRIES, INC.		RAO			A1	Oil
<a href="#">2-0015544</a>	201 CHARLTON RD	NEW ENGLAND TRUCK STOP		RAO		PHASE III	A2	Oil and Hazardous Material
<a href="#">2-0015899</a>	71 MASHAUG RD	CURBOYS AUTO PARTS INC		TIER 1C		PHASE II		Oil and Hazardous Material
<a href="#">2-0015914</a>	506 MAIN ST	CUMBERLAND FARMS		TIER 1C		PHASE IV		Oil
<a href="#">2-0015940</a>	MASSACHUSETTS TPK	COWAN SYSTEM LLC		RAO			A1	
<a href="#">2-0016021</a>	RT 84 WESTBOUND	MGM TRANSPORTATION ROADWAY REL		RAO			A1	Oil
<a href="#">2-0016088</a>	195 CHARLTON RD	TRAVEL NEST MOTEL		RAO			A1	Oil
<a href="#">2-0016104</a>	100 CHARLTON RD	STOP & SHOP		RAO			A1	Oil
<a href="#">2-0016238</a>	MA TPKE AT EXIT 9	MA TURNPIKE ROADWAY REL		RAO			A2	Oil
<a href="#">2-0016339</a>	60 FISKE HILL RD	SILVERBERG RESIDENCE		RAO			A2	Oil and Hazardous Material
<a href="#">2-0016355</a>	MASSACHUSETTS PIKE	MASS TPK AUTHORITY		RAO			A2	Oil
<a href="#">2-0016385</a>	400 HAYNES ST	PILOT TRUCK STOP		RAO			A1	Oil
<a href="#">2-0016413</a>	RTE 84 EASTBOUND	KEYSTONE FREIGHT ROADWAY REL		RAO			A2	Oil
<a href="#">2-0016417</a>	RTE 84 E AT EXIT 1	NATIONAL FREIGHT INC ROADWAY REL		RAO			A1	Oil
<a href="#">2-0016483</a>	71 MASHAUG RD	CURBOYS AUTO PART INC		RTN CLOSED				



# TOWN OF STURBRIDGE OPEN SPACE & RECREATION PLAN - 2011

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RTN #	Release Address	Site Name Location Aid	Notification Date	Compliance Status	Date	Phase	RAO Class	Chemical Type
<a href="#">2-0016511</a>	RST AREA 1 AT I 84 W	DART TRUCKING ROADWAY REL		TIER1D				Oil
<a href="#">2-0016547</a>	RTE 84 E	DELAWARE VALLEY TRANS ROADWAY REL		RAO			A1	
<a href="#">2-0016631</a>	400 RTE 15	PILOT TRUCK STOP		RAO			A1	Oil
<a href="#">2-0016662</a>	RTE 84 E	COVENANT TRANSPORT ROADWAY REL		RAO			A2	Oil
<a href="#">2-0016693</a>	400 RTE 15	PILOT TRUCK STOP		RAO			A1	Oil
<a href="#">2-0016765</a>	506 MAIN ST	CUMBERLAND FARMS		RTN CLOSED				Hazardous Material
<a href="#">2-0016899</a>	RTE 49	ROADWAY		RAO			A1	Oil
<a href="#">2-0016900</a>	559 MAIN ST	STURBRIDGE MARKETPLACE		RAO			B1	Hazardous Material
<a href="#">2-0016926</a>	INTERSTATE 84 W	BOSTON TRANSPORTATION		RAO			A2	
<a href="#">2-0016994</a>	400 HAYNES ST	PILOT TRAVEL CENTER		RAO			A2	Oil
<a href="#">2-0016996</a>	400 HAYNES ST	PILOT TRAVEL CENTER 222		TIER 1C		PHASE II		Oil
<a href="#">2-0017005</a>	236 RTE 15	MOBIL RS 13008		RAO			A1	Oil
<a href="#">2-0017006</a>	236 HAYNES ST	MOBIL FACILITY		RAO			B1	Hazardous Material
<a href="#">2-0017019</a>	400 HAYNES ST	PILOT TRAVEL CENTER SERVICE STATION		RTN CLOSED		PHASE II		Oil
<a href="#">2-0017038</a>	16 CHURCH ST	CHURCH		RAO			A2	Oil and Hazardous Material

# TOWN OF STURBRIDGE OPEN SPACE & RECREATION PLAN - 2011

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RTN #	Release Address	Site Name Location Aid	Notification Date	Compliance Status	Date	Phase	RAO Class	Chemical Type
<a href="#">2-0017041</a>	236 RTE 15	MOBIL RS 13008		RAO			B1	Hazardous Material
<a href="#">2-0017078</a>	400 HAYNES ST	PILOT TRAVEL CENTER 222		RAO			A1	Oil
<a href="#">2-0017082</a>	346 MAIN ST	FELLED UTILITY POLE		RAO			A1	
<a href="#">2-0017104</a>	MA TPKE AT EXIT 9	MASS TURNPIKE		RAO			A2	Oil
<a href="#">2-0017121</a>	MASSACHUSETTS TURNPIKE	DIESEL FUEL SPILL		RAO			A2	Oil
<a href="#">2-0017178</a>	236 OLD RTE 15	MOBIL STATION RS 13008		RAO				Hazardous Material
<a href="#">2-0017271</a>	HAYNES ST	ROADWAY		RAO			A1	Oil
<a href="#">2-0017367</a>	400 HAYNES ST	PILOT TRAVEL CENTER, 222		RAO			A2	Oil
<a href="#">2-0017386</a>	400 HAYNES ST	DIESEL FUEL RELEASE		RAO			A1	Oil
<a href="#">2-0017497</a>	362 MAIN ST	PICADILLY PUB		TIER 1C		PHASE II		Oil and Hazardous Material
<a href="#">2-0017520</a>	RTE 84 E RESTSTOP	ROUTE 84 EAST RESTSTOP		TIER1D				
<a href="#">2-0017531</a>	RTE 84 E	STURBRIDGE ISLE TRUCK STOP		RAO			A2	Oil
<a href="#">2-0017538</a>	400 HAYNES ST	PILOT TRAVEL CENTER		RAO			A1	Oil
<a href="#">2-0017541</a>	400 HAYNES RD	PILOT FUELS		RAO			A1	Oil
<a href="#">2-0017542</a>	400 HAYNES RD	PILOT FUEL STATION		RAO			A1	Oil
<a href="#">2-0017554</a>	400 HAYNES ST	PILOT TRUCK STOP		RAO			A1	Oil
<a href="#">2-0017573</a>	MASSPIKE WESTBOUND EX	ROADWAY		RAO			A1	Oil
<a href="#">2-0017601</a>	RTE 20 AT 201 CHARLTON	DIESEL FUEL RELEASE TO STORMDRAIN		RAO			A2	Oil
<a href="#">2-0017665</a>	MA TPKE W	VEHICLE ACCIDENT		RAO			A2	Oil
<a href="#">2-0017749</a>	400 HAYNES ST	PILOT TRAVEL CENTER 222		RAO			A1	Hazardous Material
<a href="#">2-0017787</a>	6 CHARLTON ST	RESIDENCE		UNCLASSIFIED				Oil
<a href="#">2-0017797</a>	MA TPKE AT EXIT 9	MA TPK EXIT 9		RAO			A2	Oil

# TOWN OF STURBRIDGE OPEN SPACE & RECREATION PLAN - 2011

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RTN #	Release Address	Site Name Location Aid	Notification Date	Compliance Status	Date	Phase	RAO Class	Chemical Type
<a href="#">2-0017816</a>	400 HAYNES ST	PILOT TRAVEL CENTER 222		RAO			A1	Oil
<a href="#">2-0017857</a>	362 MAIN ST	PICCADILLY PUB		RAO			A1	Oil
<a href="#">2-0017999</a>	RTE 84 EAST MM1	RTE 84 EAST REST AREA		UNCLASSIFIED				Oil
<a href="#">2-0018034</a>	215 CHARLTON RD	PAD MOUNTED TRANSFORMER		RAO			A2	Oil
<a href="#">2-0018063</a>	MASSPIKE EXIT 9 TOLL AREA	DIESEL FUEL RELEASE		UNCLASSIFIED				

## TOWN OF STURBRIDGE OPEN SPACE & RECREATION PLAN - 2011

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The old municipal landfill site off Cedar Street has been capped. The current Recycling Center and Landfill on Breakneck Road is expected to last another twenty years given the current rate of recycling. The Board of Health is promoting “Zero Waste” since an increase in recycling and a decrease in waste can help to extend the life of the landfill. After closure, this site might be suitable to be renovated as an open space area. The search has already begun for the location of the new landfill site.

## **c. Forestry Issues**

The Town of Sturbridge is unique in that it has a Forest Harvesting Bylaw. The intent of the Bylaw is to provide an additional level of regulation over and beyond Chapter 132 of the Massachusetts Forest Cutting Practices Act. The bylaw was implemented to allow additional Town oversight of Forest Cutting Plans by the Conservation Commission, Department of Public Works, and Board of Selectmen. The Sturbridge Forest Harvesting Bylaw requires the following: a copy of the State Certified Forest Cutting Plan signed by the State Forester and a copy of the site plan, proof of notification of the Conservation Commission, correspondence from the DPW Director regarding the driveway permit and bonding for road repairs and/or erosion controls, a certified list of abutters within 200-feet of the “cutting area”, proof of land ownership and/or a notarized letter from landowner to be provided to the town giving permission to harvest or gain site access from property other than that being harvested, a copy of the State Harvesters License, a reforestation plan for clear cutting projects and a filing fee of \$10.00.

The Town Administrator schedules a public hearing upon receipt of needed application materials (cost of legal ad is the responsibility of the applicant), and the applicant is responsible for sending the legal ad to abutters. At the hearing the applicant provides photographs showing the condition of all access and roadways in order to document the existing condition of access and roadways. The Board of Selectmen hears comments from all interested parties. The Board of Selectmen may place limits on the hours of operation, reasonably regulate noise levels, and require dust and debris protection on the site. The performance bond is held by the Town until the operation is complete and a final inspection has been conducted by the DPW Director.

In addition, the Conservation Commission Forestry Liaison and/or the Conservation Agent walk every Forest Harvesting Site with the Licensed Forester. The Commission inspects all proposed stream crossings, all buffer zone and/or resource area work, and make recommendations to the Board of Selectmen on any required plan adjustments. The Commission or its Agent always requires that comments/requirements of the Natural Heritage and Endangered Species Program, and Department of Conservation and Recreation are followed. In addition, the Commission always requires compliance with the MA Forestry Best Management Practices.

## **d. Sedimentation Issues**

### Private Roads

Private, unpaved roads present some of the most detrimental impacts to resource areas within the Town of Sturbridge. Many of these sedimentation issues result from insufficient/non-existent stormwater treatment, lack of maintenance by private road residents, steep slopes, and undersized water conveyances like culverts. Private road sedimentation issues are difficult to address and solve. Since typically the drainage problems result from multiple properties or the private roadway itself, it is impossible to correlate a sedimentation issue with just one property owner for repair or mitigation. The town highly encourages private road residents to form (informal) private road associations. The purpose of forming these associations is to build consensus amongs landowners for the need to monitor, maintain, repair, improve and address private road issues. In exchange for private road association cooperation the town provides assistance with materials and permit filings to facilitate repairs.

### Major Highways

The presence of major highways within the Town of Sturbridge and their proximity to wetlands and water bodies causes serious sedimentation issues as a result of stormwater discharges of road sand. Several water bodies in town including Cedar Lake, Long Pond, and Walker Pond experience increase sediment loads as a result of major highways. In addition, many wetlands and streams experience sediment problems from the highways.

### Stormwater

Generally speaking there is a need for Town wide improvements to stormwater infrastructure. In many areas where construction occurred prior to state stormwater regulations, drainage was not considered or installed, resulting in erosion and sedimentation into resource areas. In some cases lack of repair or maintenance and/or damage to failed structures cause sedimentation issues. There are several areas of town where improvements are being focused to improve stormwater problems that are causing sedimentation.

## **e. Flood Control**

The Army Corps of Engineers flood control system protects the area from severe flooding associated with the Quinebaug River. Dams exist at the east and west ends of Town along the Quinebaug River. Additionally the Town has a floodplain district bylaw that is very restrictive in terms of development in the floodplain. The FEMA Map that will become effective on July 4, 2011 follows this section.

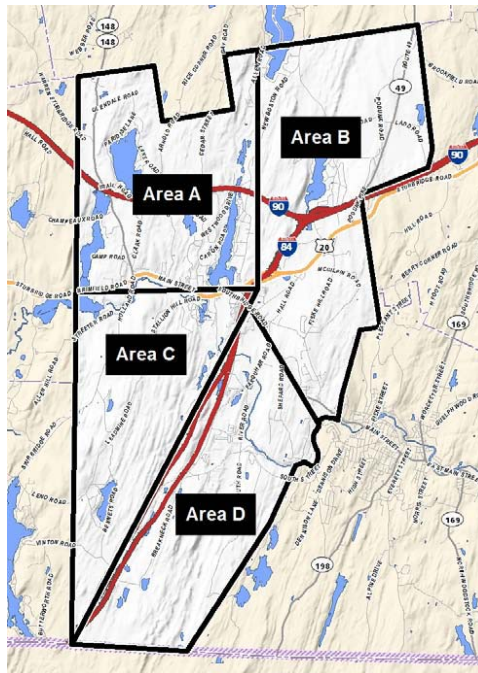
# TOWN OF STURBRIDGE OPEN SPACE & RECREATION PLAN - 2011

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## f. Environmental Equity

The open space areas are fairly well distributed throughout the community. The north side of Town contains the vast expanse that is Wells State Park. Opacum Woods and the Cedar Pond Recreation Area are also in this section of town. The southern side of town contains the Leadmine Mountain Conservation Area and other parcels owned by the Division of Fisheries and Wildlife. The town ball fields and future recreation area are also located on the southern side of town as is the Westville Dam recreation areas. As new developments occur, open space is being required within those neighborhoods. The Town has been asking developers to provide land that is suitable not only for open space protection, but those lands that could be suitable as a playground or ball field for the neighborhood. The concern is that as properties near the outskirts of town become developed, the young families and children will have a lack of recreational areas within walking or biking distance. It is hoped that through these planning efforts and development agreements, there will be an equitable distribution of open space and recreation areas throughout the town.

The Town also tries to gauge the desire for open space and/or recreation areas within various sections of the town. The Master Plan survey asked respondents to indicate if they would like more open space in their neighborhood. For the purposes of the survey, the town was divided into four segments as shown below:

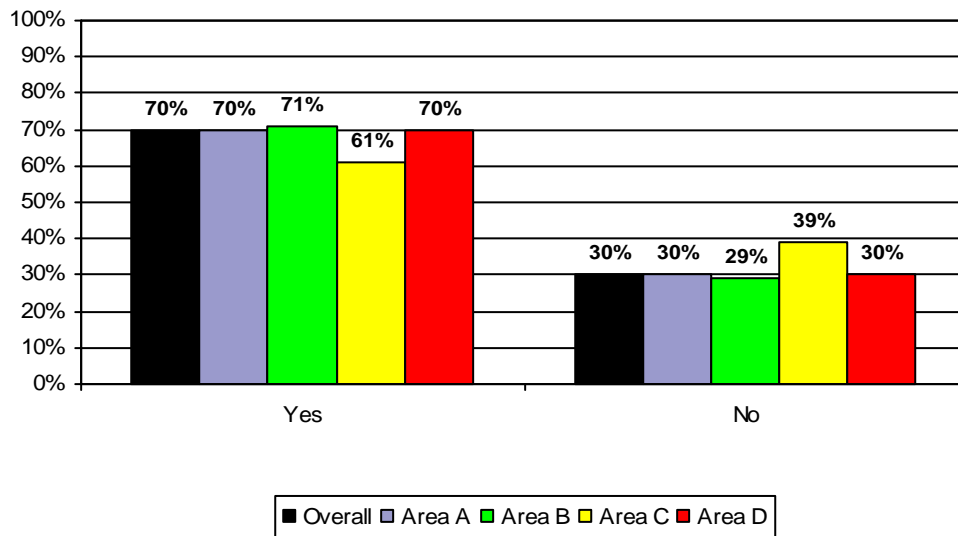


More than sixty-percent of respondents in all neighborhoods indicated that they would you like to see more open space and recreation areas their neighborhood (or area of town). Therefore as the

# TOWN OF STURBRIDGE OPEN SPACE & RECREATION PLAN - 2011

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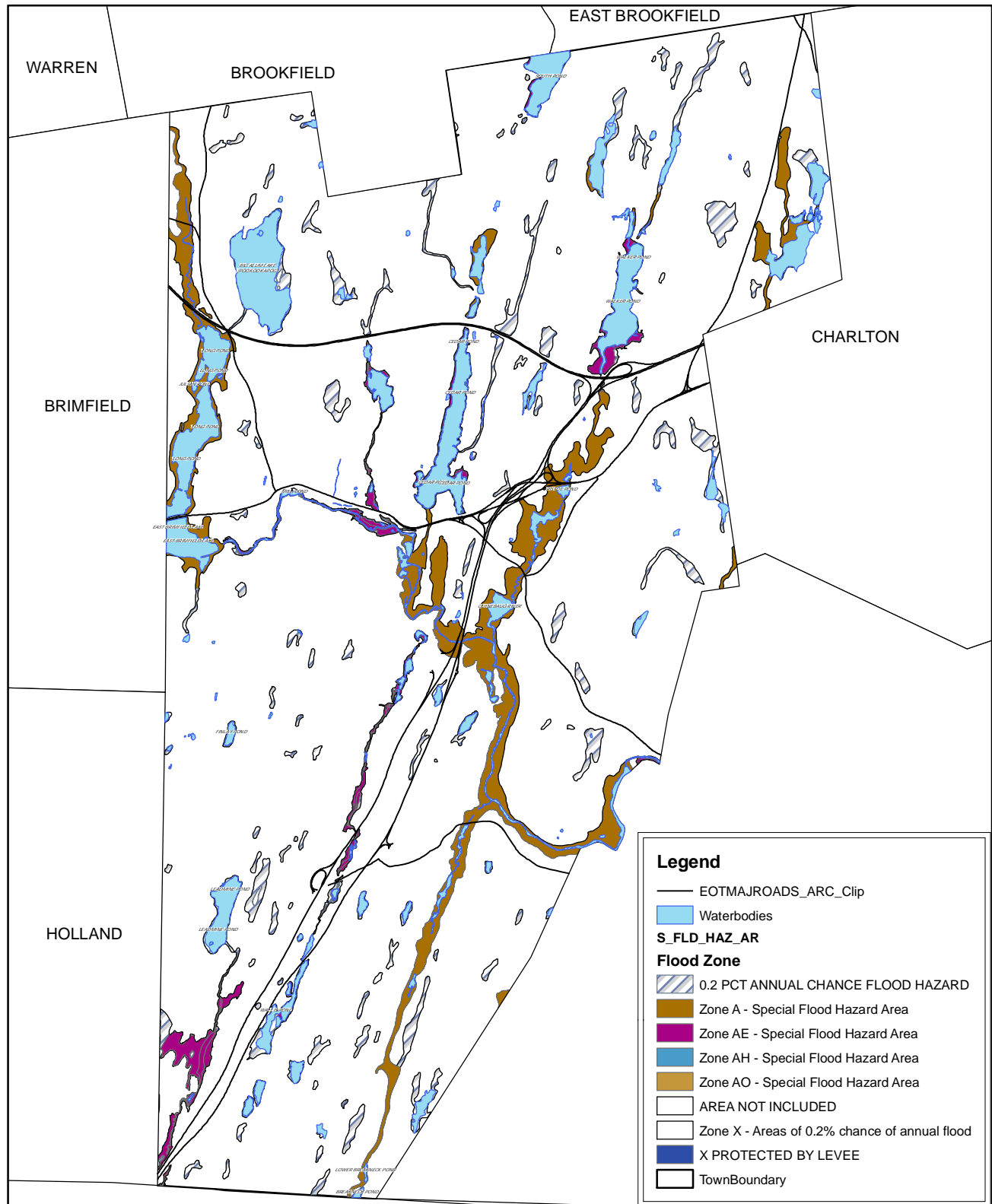
town develops more recreation areas and acquires more open space, it must be sure that these areas are equitably distributed.





# Flood Insurance Rate Map

## Effective Date 07/04/11



The information depicted by this date is for planning purposes only. It may not be adequate for legal boundary, definition, regulatory, interpretation, or property conveyance purposes. THE TOWN OF STURBRIDGE MAKES NO WARRANTIES, EXPRESSED OR IMPLIED, CONCERNING THE ACCURACY, COMPLETENESS, RELIABILITY, OR SUITABILITY OF THESE DATA.



0 0.35 0.7 1.4 2.1 2.8 Miles