

elevation to areas of lower elevation. Therefore, it has to be constantly replenished; removal occurs as withdrawal for use, or through seasonal discharge into streams, ponds, and wetlands.

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

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

The 1977 IEP study mapped aquifer areas in the town of Stow that are likely to meet these requirements. Prudent protection of these aquifers and their recharge areas is vital to not only Stow but to other communities as well.

The quality of groundwater in the aquifers will depend to a large extent on the quality of water which recharges the aquifer – which is affected by the land uses at the surface. Land uses which discharge polluted or toxic wastes, or result in pollutants leaching into the ground water, must be carefully regulated if Stow is to preserve and protect its groundwater supply. In general, the quality of water from the surficial aquifer is naturally of high quality. However, high concentrations of iron and manganese have been widely reported in Stow, especially where wells have been located near wetlands. The high iron and manganese levels are highly variable in terms of site locality. Thus, in the event that testing of a well is occurring it is necessary to analyze well samples at different depths and within short distances in order to determine where groundwater quality is best. Alternatively, filtration methods or other technological means can be used to treat the water.

### ***Water Resources Protection District***

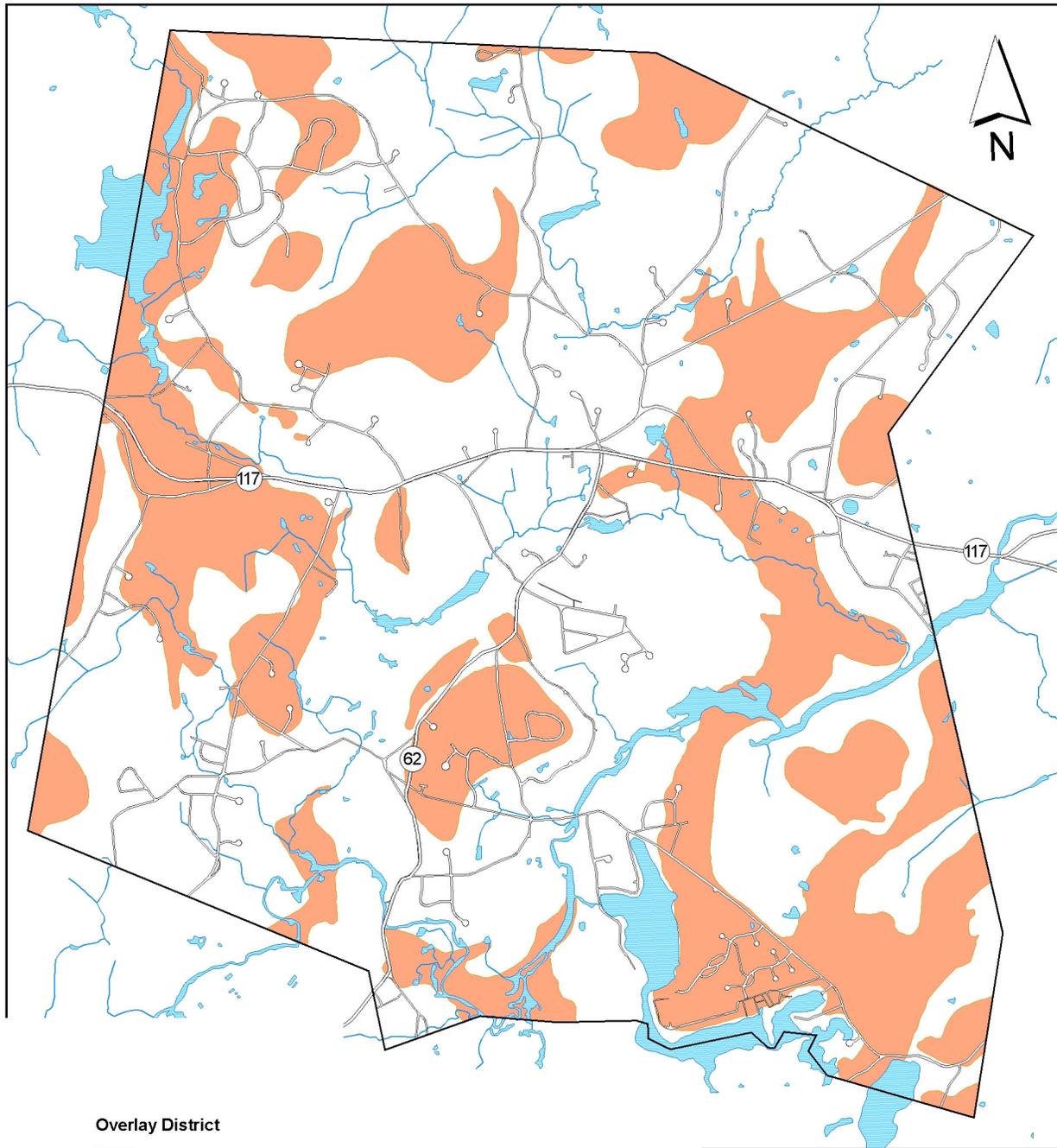
The surface hydrology or flow of surface waters is directly related to the groundwater systems in Stow and must be thought of as one complex hydrologic system. The streams, ponds and wetlands of Stow reflect the location of the water table that continues below the ground surface. Fluctuations in the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

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

### ***Flood hazard areas***

Flooding may be defined as the occurrence of flow in a stream or river that exceeds the capacity of the banks formed by normal flows. All waterways have floodplains, those areas that flood during significant storms. An increasingly important factor related to flooding in Stow is the creation of impervious surfaces that limit infiltration and increase surface flow. Flood hazard areas in Stow are shown on the "Floodway - Flood Boundary and Floodway Map", done for the Town of Stow by the Federal Emergency Management Agency, Community-Panel Number 250216-0005 B, Effective Date: August 1, 1979, as modified November 1989. Stow has, through its Zoning Bylaw

### Stow - Water Resources Protection District



- Overlay District**
-  Water Resources Protection District
  -  Water Bodies



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

(adopted October 23, 1968, recodified May, 1993) created a "Flood Plain/Wetland District" (Section 5.1), an overlay district to: "protect the public health and safety, persons, and property against the hazards of flood water inundation; to preserve and maintain the ground water table; to protect the community from the costs which may be incurred when unsuitable development occurs in swamps, marshes, along water courses, or in areas subject to flood; and to conserve natural conditions, wildlife and open spaces for the education, recreation and general welfare of the public."

The boundaries of the flood plain are given by Sect. 2.3.8 of the Zoning Bylaw:

"Boundary lines outlining the flood plain of the Assabet River shall be the limits of the standard Project Flood Modified delineated on the plan entitled "Flood Plains and Profiles", Sheets 2,3 and 4 of the Assabet River Technical Report, Dept. of the Army, Corps of Engineers, dated June 1966 and on file with the Town Clerk. Boundary lines outlining the flood plain of Heath Hen Meadow Brook, Stow, Mass. by BSC Engineering, Inc. dated Feb. 21, 1975 and revised May 2, 1975, and on file with the Town Clerk. The Flood Plain/Wetland District shall also include all lands designated as Zone A, AO, AH or Zone A1-30 and A99 on the Town of Stow Flood Insurance Rate Map (FIRM), panel 250216-0005B dated Aug. 1, 1979 as amended November 1989."

### ***Wetlands***

The wetlands in Stow have generally been mapped, inventoried and evaluated by IEP in a study completed in 1977 and available at the Conservation Commission. The map on the next page depicts wetlands in Stow as mapped by the Fish and Wildlife Service's National Wetlands Inventory and the Massachusetts Department of Environmental Protection at the time of the study. Because many small wetlands are not shown, this map should not be viewed as a substitute for actual on-the-ground wetland delineation.

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

## **4D. Vegetation**

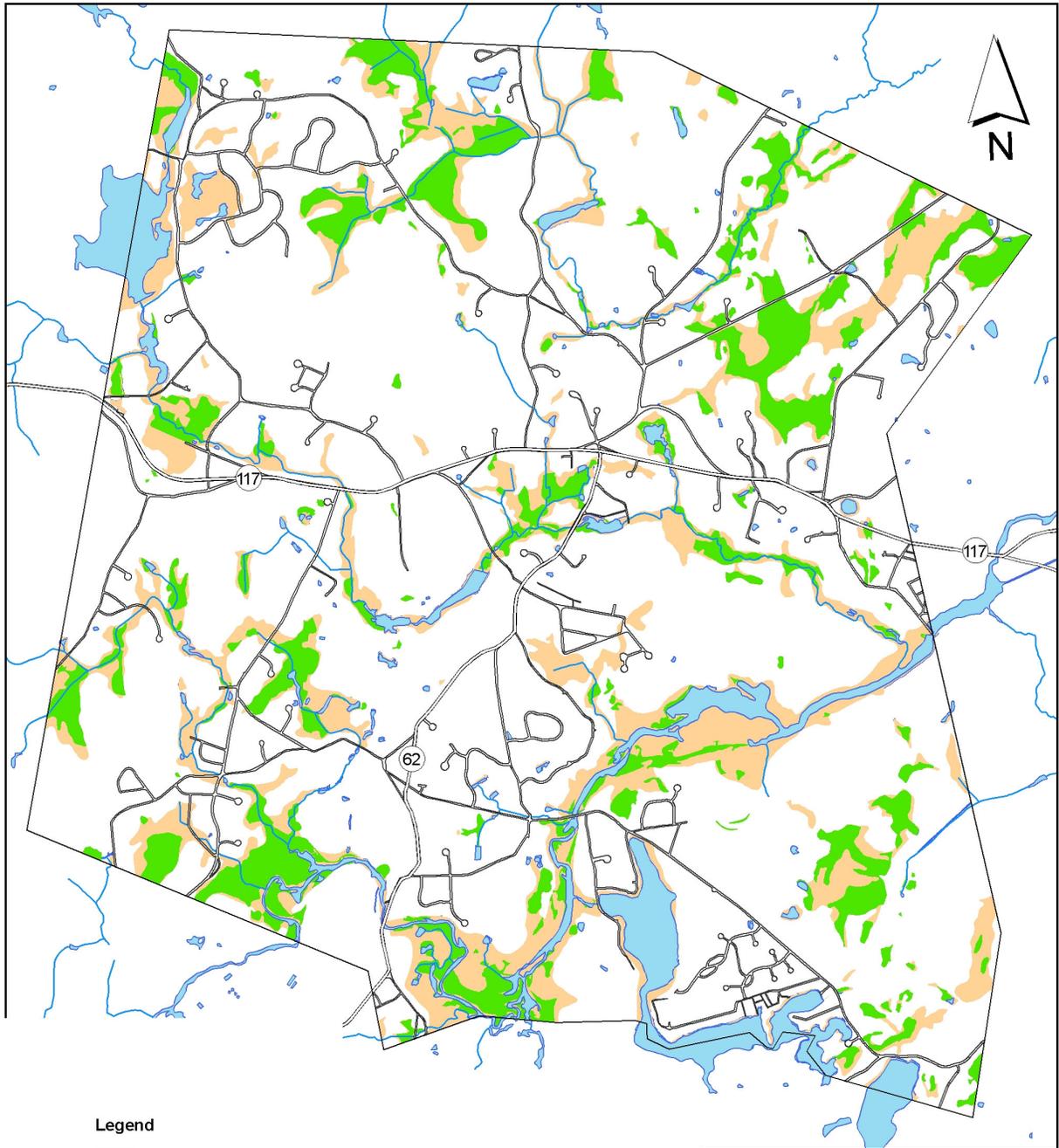
### ***General inventory***

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

### ***Forest Land***

The principal native forest trees in Stow are white pine, red oak, and mixed hardwoods in the upland areas along with hemlock groves and hickories; most wetlands are dominated by red maples. Birches are interspersed in the edge areas where more light is available and as an understory tree in some

### Stow - Wetlands and Floodplains



**Legend**

-  Floodplain
-  Wetlands
  
-  Water Bodies



Floodplain and Wetland data provided by MassGIS.  
Map produced June 2006.

younger forests. Understory vegetation consists of a variety of small trees and shrubs including, for example, evergreen shrubs, native dogwoods, viburnums, witch hazel and highbush blueberries.

A number of mature groves of white pines are found especially in the conservation lands: Marble Hill, Gardner Hill, Capt. Sargent Farm, and the Town Beach area. Especially conspicuous is the grove of pines atop Pilot Grove Hill. In 1930 Clifford Martin set out a large number of red pine and European larch (off of Sudbury Road) that are now mature.

Since 1900 a variety of causes have served to limit the diversity of our woodlands. Chestnut blight eliminated the American Chestnut; American Elms have succumbed to Dutch Elm Disease; White Ash trees are now dying of Ash Decline. This lack of diversity could prove disastrous if new diseases appear; a good example was the massive damage done to oaks during the Gypsy Moth infestation of the early 1980s and in 1990-1991. Indeed we now face loss of hemlocks by the woolly adelgid. To address this problem the Town started a tree planting program with the acquisition of 100 seedling elm trees developed from resistant stock, and soon hopes to also include resistant American chestnuts.

### ***Agricultural Land***

Stow has a large number of parcels that are in agricultural use – ranging from large and highly visible agricultural properties including Pilot Grove Farm, Carver Hill, Shelburne Farm, Honey Pot Hill Orchards, Applefield Farm, and Small Farm, to smaller and less visible properties. These farms are important elements of the town's community character and play a key contributing role as scenic vistas both from public roads as well as the Assabet River, parcels linking existing conservation lands, and important lands for wildlife habitat. Taking direct action to preserve Stow's agricultural base is a priority of the Stow Conservation Trust which recently developed a brochure highlighting the many and varied farms and farm products available in Stow in an effort to encourage residents to support local agriculture. Protection of agriculture and agricultural lands is also a high priority in this Plan. The Appendix to this Plan contains a copy of an Executive Order designed to minimize development on prime farmland and to require mitigation for state funded or permitted projects on prime farmland. A map of prime farmland in Stow appears below.





### ***Rare species and Unique Natural Resources***

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

STOW	*	Amphibian	Ambystoma laterale	Blue-Spotted Salamander	SC		1992
STOW	*	Reptile	Clemmys guttata	Spotted Turtle	SC		1999
STOW	*	Reptile	Terrapene carolina	Eastern Box Turtle	SC		1995
STOW		Bird	Accipiter striatus	Sharp-Shinned Hawk	SC	(PS)	1891
STOW	*	Bird	Ammodramus savannarum	Grasshopper Sparrow	T	(PS)	1994
STOW	*	Bird	Botaurus lentiginosus	American Bittern	E		1992
STOW	*	Bird	Gallinula chloropus	Common Moorhen	SC	(PS)	1992
STOW	*	Bird	Ixobrychus exilis	Least Bittern	E		1992
STOW	*	Vascular Plant	Carex oligosperma	Few-Fruited Sedge	E		1992
STOW	*	Vascular Plant	Liatris borealis	New England Blazing Star	SC		1992
STOW	*	Vascular Plant	Panicum philadelphicum	Philadelphia Panic-Grass	SC		1992
STOW	*	Vascular Plant	Spiranthes vernalis	Grass-Leaved Ladies'-Tresses	T		1991

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

In addition to tracking rare species occurrences, the Massachusetts Natural Heritage and Endangered Species Program recently completed studies of both terrestrial and aquatic systems designed to identify those areas most critical to the protection of biodiversity in Massachusetts – including rare species and priority habitats. These studies are called BioMap and Living Waters. While only small areas of Stow are identified in these reports, these are important areas to protect wherever possible.

There are three areas of BioMap Core Habitat, the more important terrestrial areas, in Stow. These are located 1) in the extreme northeast corner of town in a wetland system to the east of Red Acre Road at the confluence of the Acton, Maynard at Stow town lines; 2) in another wetland system just west of Harvard Rd along the Stow/Harvard line and 3) just south of Delaney Reservoir at the Stow/Harvard/Bolton line. These three areas include important marsh habitats that support one of the most diverse assemblages of freshwater wetland birds in Massachusetts including two different species of bittern, unprotected habitat for the Elderberry Longhorned Beetle, a species of special concern, and dry, sandy fields that are important for the threatened Grasshopper Sparrow. Areas of Supporting Natural Landscape – buffers and connections between these Core Habitat areas – have also been identified in Stow. These include 1) a large area in the vicinity of the Delaney Project connecting Core Areas #2 and #3 identified above, and extending across Harvard Road to include several large undeveloped parcels south of Harvard Acres and 2) a large area including portions of Maynard, Stow and Sudbury that incorporates portions of the Assabet Refuge, Sudbury State Forest and extends toward Lake Boon, including much of the area currently being developed as part of the Wildlife Woods subdivision.

While there are no Living Waters Core Habitat areas within the Town of Stow, there is a Core Habitat area located along the Assabet River in the town of Concord. The Supporting Watershed for this Core Habitat area extends upriver and includes a large area in Maynard and Stow. The Stow portion includes lands along the Assabet River within the Assabet Wildlife Refuge and extending to an area just south of Sudbury Road where it crosses the Assabet and also includes lands along Elizabeth Brook near the Town Forest.

In addition to these statewide mapping projects, the Sudbury Valley Trustees recently contracted with a botanist to analyze maps and conduct field work to identify areas of likely high wildlife habitat significance. These are shown on the Wildlife Habitat Map in this Plan.

#### **4E. Fisheries and wildlife**

##### **Inventory**

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

There are now 4 major properties in Stow that are managed specifically to encourage wildlife: the Delaney Project (SUASCO Watershed flood control), the Assabet Wildlife Refuge (US Fish and Wildlife Service), and the Town-controlled Gardner Hill land and Flagg Hill lands. Many other properties in Stow, although not managed specifically to encourage wildlife, serve as links between many of these 4 main areas.

Stow is within the range of about 50 mammal species, 220 bird species, 20 reptile species, and 20 amphibian species. A list of these species is contained in the 1987 Stow Open Space and Recreation Plan. According to one local trapper, mink and otter have been trapped along the Assabet River at the Stow Acres Country Club golf course. He has also noted large snapping turtles, black ducks and wood ducks. Foxes, pheasant, and grouse are not uncommon in undeveloped areas. Beavers have been active since the mid 1980s at Fletcher's Pond, in Elizabeth Brook, also more recently in Hiley Brook and Heath Hen Meadow Brook. The Eastern Coyote are now common, and Moose have made regular appearances in Stow in the past few years. A moose (cow) has been seen at Lake Boon and along the Assabet River and is believed to over-winter in Stow.