

# ENVIRONMENTAL INVENTORY AND ANALYSIS<sup>1</sup>

## **Introduction**

Walpole is located in Norfolk County in eastern Massachusetts. It is bordered by Dover on the north, Norwood and Sharon on the east, Medfield and Norfolk on the west, Foxboro on the south, and Westwood on the northeast. It shares many characteristics of other New England towns, including varying soils, much forest land and wetlands, and a system of rivers and streams. These characteristics will be discussed in more detail below.

## **Geology**

Walpole lies within the Eastern Plateau (also known as the Coastal Hills) subregion of the Lower New England Physiographic Province. This subregion is characterized by gently rolling hills with low relief and subtle breaks between major landforms (U.S. Department of Agriculture, 1989).

Figure 3 illustrates the generalized bedrock geology of Walpole along with Norfolk and Suffolk Counties. Most of central Walpole consists of Wamsutta Formation, while the north and south portions of town are underlain by Dedham Granite. Figure 4 presents surficial geology which indicates that most of the Town consists of sand and gravel while the northern part of town is primarily glacial till.

## **Topography**

The topography of Walpole is characterized mainly by the Neponset River, which flows northerly through the town, and by several of the wetland areas adjacent to the river. For the most part, the land in south Walpole is fairly flat. The elevation of the river varies from a high of 198 feet above mean sea level at Ruckaduck Pond in South Walpole to an elevation of approximately 180 feet in the town forest. Rapidly, the topography changes as the river meanders through the center of the town to an approximate elevation of 150 feet at Stetson Pond. Farther south, the elevation drops to 101 feet at Bird Pond and 86 feet at Hollingsworth and Vose Pond. In the northerly section from the town center, the river has steep banks and a more rapid gradient. The largest retention basin of the town is Cedar Swamp which encompasses a large area of South Walpole. Water from Cedar Swamp enters the Neponset River just north of the Bird Machine complex. Most of the westerly sections of the town depend on Mine Brook, Cobb Pond, and Willett Pond for their drainage.

<sup>1</sup>*This section adapted from Town of Walpole, 1987, with updates and changes as necessary.*

## **Soils**

As Figure 5 illustrates, most of Walpole's soil is of the Hinckley-Merrimac-Urban variety. These soils are very deep, and range from nearly level to steep. They are excessively drained and somewhat excessively drained soils formed in sandy and loamy glacial outwash overlying stratified sand and gravel, and areas of urban land. They are generally found in major stream valleys and on coastal plains. These soils are generally well suited for buildings as well as roads and streets. However, because they are well drained they can pose a water pollution hazard when used for septic systems since they readily absorb, but do not adequately filter, the effluent (U.S. Department of Agriculture, 1989).

North Walpole consists almost entirely of Woodbridge-Paxton-Montauk soils. These are also very deep and range from nearly level to steep. They are moderately well drained and well drained soils formed in friable, loamy glacial till overlying a firm substratum. These soils are well suited for cultivating crops, as pasture, and as woodlands because of smooth slopes and high productivity. They are poorly suited for septic systems because the firm substratum does not readily absorb the effluent (U.S. Department of Agriculture, 1989).

## **Water Resources**

**Surface Water** -- Water resources in Walpole range from small man-made ponds to the Neponset River which meanders through the town center. Figures 6, 7 and 8 illustrate the surface waters, Federal Emergency Management Agency (FEMA) Flood Plain zones and wetlands in Walpole respectively. Among the local ponds are: Brant's Pond, Clark's Pond, Cobb's Pond, Bird Pond; Diamond Pond, Ganawatte Farm Pond, Plimpton Pond, Rainbow Pond, Stetson Pond, Hollingsworth and Vose Pond, Ruckaduck Pond, Turner Pond and Willett Pond. The Walpole brooks include: Cedar Swamp Brook, School Meadow Brook, Mine Brook, Cobb Brook, Spring Brook, Bubbling Brook, and Traphole Brook. Willett Pond and Turner Pond contain water clean enough for swimming. Both ponds however are open for swimming only to abutting residents. The Town owns Turner Pond, while Willett Pond is owned by the Neponset River Corporation (NRWA).

Turner Pond, Clark and Cobb's Pond are available for ice fishing and skating. The Allen Dam reservoir can be used for fishing and boating.

There are two rivers in Walpole, the Stop River which marks the boundary of Walpole and Norfolk, and the Neponset River which punctuates the town's topography. Water quality of the Neponset River, which has been poor, has improved dramatically over the past several years. A 1990 study done by the Metropolitan Area Planning Council (Neponset Basin Water Supply Protection Study) formed the basis for ongoing water supply protection efforts in the Three Rivers Interlocal Council subregion. A sewer main interceptor installed near the river has contributed significantly to pollution reduction. An additional sewer project in South Walpole serving 159 homes will reduce pollution further.

A network of ponds and streams feeding into the Neponset River and the 6 dams on the Neponset in Walpole have been owned and controlled since the late 1800's by the Neponset River Corporation, a consortium of Walpole businesses and trusts.

The FEMA flood zones correspond closely with the wetlands areas in town, although the wetlands are more extensive. The most significant wetlands area are those that comprise the Cedar Swamp area and those associated with the major rivers and streams in Walpole. A significant amount of these wetlands and flood hazard areas are protected via Town ownership and the Wetlands Protection Act.

**Ground Water** -- The Town of Walpole obtains its drinking water supply solely from ground water. Three major ground water aquifers - the School Meadow Brook Aquifer, Mine Brook Aquifer and the Neponset River Aquifer- are the sources of Walpole's drinking water supply. Figure 9 presents the major aquifer areas and their recharge areas. The Town has a Water Protection Overlay District to protect its water resources. The district boundaries and regulations are currently being reviewed for possible revisions.

The School Meadow Brook Aquifer was the location of the Town's original tubular well field located off Washington Street directly north of School Meadow Brook. Due to elevated levels of iron and manganese and decreased yield over time, this well field has long since been abandoned. The Town presently has five active gravel-packed wells operating in this aquifer, and it is considered to be completely developed. School Meadow Brook and its associated aquifer are highly susceptible to contamination from the existing industrial and commercial land uses which are located along Route 1. Route 1 traverses the aquifer upgradient of the pumping stations. Recognizing the importance of this aquifer, the Town has purchased several parcels within this aquifer recharge area.

The Mine Brook Aquifer has three active and one inactive (due to poor quality) wells. This aquifer is shared with Medfield, and is the only one with the potential for additional development of water supply. Walpole is currently only drawing half of its allocation of 3.0 million gallons per day from this aquifer. Therefore, additional capacity, including two new wells and the reactivation of the inactive well, is currently being planned.

The Neponset River Aquifer had been identified in the mid-1980's as having potential for well development. Two wells came on line in 1991, and this aquifer is also fully developed.

## **Vegetation**

According to a study undertaken by Norfolk County of the Diamond Brook Watershed 3, there are five major plant communities which can be found within Walpole, particularly in the watershed area of the town. These communities include: upland -oak- hickory, upland northern hardwood - softwood, coniferous, and the bottom or wetland hardwoods.

Among the upland - oak - hickory community are: white, red, and scarlet oak and hickory. Often scattered within the community is pitch pine while the understory vegetation includes flowering dogwood, sassafras, and greenbrier.

The upland northern hardwood family includes sugar maple, northern red oak, black cherry, American beech, white ash, white birch, quaking aspen, basswood and red maple. The understory vegetation consists of arrowwood, wild raisin, sarsaparilla, sprouts of American chestnut, spicebush, witch hazel, and greenbrier.

The mixed - hardwood - softwood community consists of mixed stands of deciduous and coniferous trees. White pine, American beech, red maple, red oak, pitch pine, sugar maple, eastern hemlock, white ash, American elm, and basswood compose this mixture. The understory plants common in this community are: arrowwood, honeysuckle, wild raisin, spicebush, greenbrier, wild grape, shining clubmoss, partridge berry, sassafras, sarsaparilla, wintergreen, and witch hazel.

Within the coniferous community are: white pine, eastern hemlock, scotch pine, pitch pine, Norway spruce, red pine, and white spruce. This community has very few understory plants which occasionally consist of greenbrier and honeysuckle.

American elm, red maple, and an occasional black willow comprise the bottom land hardwood community. Scattered understory plants consist of highbush blueberry, greenbrier, witch hazel, silky dogwood, arrowwood, spicebush, honeysuckle, and speckled alder.

### **Wildlife and Wildlife Corridors**

The Walpole water bodies provide habitat for twelve species of fish even though only one of the ponds -- Clark's Pond--is stocked seasonally. Among the fish species found in Walpole are: trout, bass, pickerel, pike, catfish, crawfish, perch, brook trout, brook pickerel, carp, hornpout, sunfish, shiner, and fresh water clams.

The Massachusetts Division of Fisheries & Wildlife stocks Traphole Brook and Mine Brook with trout.

The water bodies also provide corridors for wildlife to migrate from one reserve to another.

Conserving undeveloped land along a waterway or other linear open space between established conservation lands increases the habitat value of each refuge by expanding the protected territory.

Birds known to habitats available in Walpole include the black-capped chickadee, white and red breasted nuthatch, blue jay, hairy and downy woodpecker, screech owl, red-tailed hawk, ruffed grouse, yellow-bellied sapsucker, common crow, myrtle warbler, scarlet tanager, cardinal, white-throated sparrow, rufous-sided towhee, common redpoll, Canada goose, Kingfisher, American bittern, green-winged teal, Wilson's snipe, swamp sparrow, ruby-crowned kinglet, parula warbler, black-poll warbler, slate colored junco, long-eared own, pileated woodpecker, Baltimore oriole, evening grosbeak, woodcock, tufted titmouse, catbird, wood thrush, veery, ruby-crowned kinglet, cedar waxwing, brown thrasher, yellow warbler, northern waterthrush, common grackle, American redstart, common redpoll, red crossbill, eastern green heron, tree swallow, black, wood and mallard duck, yellow-shafted flicker, robin, sparrow hawk, eastern phoebe, red-winged blackbird, cowbird, English sparrow, mourning dove, song sparrow, common goldfinch, starling, eastern kingbird, field sparrow, and ringneck pheasant. Also, house finch, mockingbird, purple finch, gold finch, great horned owl, turkey, blue heron, downey woodpecker, and swallow.

Species of mammals found in Walpole are: white-tail deer, striped skunk, meadow vole, eastern chipmunk, woodchuck, red fox, star-nosed mole, short-tailed weasel, meadow-jumping mouse, eastern cottontail rabbit, river otter, red-backed vole, eastern pipistrelle, hoary bat, short-tailed shrew, raccoon, opossum, northern flying squirrel, red squirrel, porcupine, gray fox, hairy-tailed mole, white footed mouse, woodland jumping mousegrey squirrel and coyote.

Reptiles and amphibians using different plant communities in Walpole as their habitat include: ribbon snake, northern water snake, eastern milk snake, common garter snake, brown garden snake, northern black racer, spotted salamander, eastern smooth green snake, eastern ribbon snake, spring peeper, Jefferson salamander, American toad, green frog, gray treefrog, wood frog, leopard frog, bullfrog, pickerel frog, common newt, snapping turtle, spotted turtle, and painted turtle.

In addition to the water bodies, wildlife use other natural and man-made features as corridors along which to migrate. These can include railroad beds, pipeline or transmission line rights-of-way, as well as undeveloped areas of woodlands, meadows, wetlands, or other lands. Some of these features can be important links between habitats within and between towns.

The ability to range over wider areas benefits both animal and plant life by providing more access to food sources, maintain a healthy gene pool within species, and spread seeds of native plants around a greater area (Fretz, 1996) -- all of which help promote biodiversity. While some species will travel through developed areas, others (such as fox, fisher, and bobcats) need the undeveloped areas in order to travel.

Walpole has several important wildlife corridors. For example, the School Meadow Brook

area (which is designated by the Massachusetts Natural Heritage and Endangered Species program as an Estimated Habitat of Rare Wetlands Wildlife) is linked to Wolomolopoag Pond in Sharon via a transmission line corridor (although a crossing of Route 1 and I-95 is necessary). Wolomolopoag Pond and the area to its southeast is another Estimated Habitat of Rare Wetlands Wildlife. A pipeline (also crossing Route 1 and I-95) also connects School Meadow Brook with Moose Hill.

In addition to its own direct link to the Neponset River, pipeline and transmission line corridors also connect School Meadow Brook with the Neponset River and beyond to an old railroad bed. This railroad bed then passes through Cedar Swamp, which is both an Estimated Habitat and a High Priority Site of Rare Species Habitats and Exemplary Natural Communities, and then on to Wrentham creating links to both Crocker Pond and Lake Pearl, which are each associated with Estimated Habitats.

Another pipeline corridor links both Cedar Swamp and the Cedar Hill area with a High Priority Site in Medfield north of Noon Hill. This High Priority Site is in turn linked to an Estimated Habitat via the Charles River. Willett Pond is linked to both a High Priority Site and an Estimated Habitat that straddle the Dover-Westwood line south of Noanment Pond. The preceding are just a few examples of existing wildlife corridors. Maintaining such corridors should be a consideration in planning and evaluating development projects and open space acquisitions.

### **Rare and Endangered Species**

The Natural Heritage and Endangered Species Program of the Massachusetts Division of Fisheries and Wildlife has identified a number of current and historic rare species and habitats that have been observed in Walpole. These are listed in Table 12.

The important habitats in Walpole include the Cedar Hill area (High Priority Site), Cedar Swamp (both a High Priority Site and Estimated Habitat), and School Meadow Brook (Estimated Habitat). There are also two certified vernal pools. The Natural Heritage Program provides guidelines on methods to protect the rare and endangered species as well as the habitats. These guidelines should be referenced when evaluating development projects or other activities that may occur in the vicinity of the habitat areas.

### **Agricultural Lands**

Most of the non-wetland soils in Walpole can be considered suitable for agriculture. Two categories of farmland for the Town of Walpole are Prime Farmland and Farmland of State or Local Importance as described by the USDA Soil Conservation Service. Most of the agricultural land in Walpole today is used for forestry products, haying or pasture (See Figure 12 for a list of Chapter 61A parcels) These lands represent some of most desirable lands for development.

**Prime Farmland** -- In general, prime farmland soils "have adequate and dependable precipitation, a favorable temperature and growing season, acceptable acidity or alkalinity, and few or no surface stones. They are permeable to water and air. They are not excessively erodible or saturated with water for a long period of time, and they either do not flood frequently or are protected from flooding" (Town of Walpole, 1987). Prime farmland soils must also be available for use as cropland, pasture land, or forest land, and therefore potential prime farmland according to the soil survey maps produced by the USDA Soil Conservation Service. These soil map units were not field checked to assure their availability for use as prime farmland. Soil series comprising the prime farmland of Walpole include the non-stony and 0-8% slope phases of Canton, Montauk, Paxton, Scituate, Sutton, Woodbridge, Merrimac, Pootatuck, Scio, Sudbury, and Unadilla soils.

**State or Local Important Farmland** -- State or local important farmland soils are those that "fail to meet one or more of the requirements of prime farmland, but are important for the production of food, feed, fiber, or forage crops. They include those soils that are nearly prime farmland and that economically produce high yields of crops when treated and managed according to acceptable farming methods: (Town of Walpole, 1987). Important farmland soils in Walpole are non-stony soils on 8-20% slopes, stony soil on 0-20% slopes, and very stony soils on 0-15% slopes. Soil series having these stoniness and slope phases and considered to be important farmland in Walpole include Canton, Montauk, Paxton, Scituate, Sutton, Woodbridge, Hinckley, Merrimac, and Windsor soils.

### **Scenic and Cultural Resources**

According to an unpublished research project (McGowan, 1996), there is evidence of extensive Native American activity in Walpole. McGowan cites Dr. Curtiss Hoffman (professor of archeology at Bridgewater State College) in stating that tribes such as the Ponkapoags and Neponsets gathered and traded at the elbow of the Neponset River near Plimptonville. In this location they collected fish at the falls, made stone tools and ground corn in stone mortars. There is also evidence that the area may have been a Native American burial ground.

The 1987 Open Space and Recreation Plan (Town of Walpole, 1987) identifies four historic areas that should be recognized and protected. These are:

- Common Street and Walpole Town Center -- Buildings such as the United Meeting House (1830), the Deacon Willard Lewis House (built in 1826, and currently the home of the Walpole Historical Society), and the old Town Hall (1881) are significant buildings from the past that are intact. The latter two represent Walpole's only buildings listed on both the State and National Registers of Historic Places (Massachusetts Historical Commission, 1996).

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**TABLE 12**

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**RARE AND ENDANGERED SPECIES IN WALPOLE**

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<u>Common Name</u>	<u>Status</u>	<u>First Observation</u>	<u>Last Observation</u>
<b>Vertebrates</b>			
Cooper's Hawk	SC	1918	1918
Blue-Spotted Salamander	SC	1992	1992
Spotted Turtle	SC	1991	1992
<b>Invertebrates</b>			
Persius Duskywing	T	1930	1930
Hessel's Hairstreak	SC	1965	1987
<b>Vascular Plants</b>			
Arethusa	T	0000	0000
Adder's-Tongue Fern	T	1908	1908
Great Laurel	T	1899	1908
<b>Natural Communities</b>			
SNE Acidic Seepage Swamp	-	1989	1989
Inland Atlantic White Cedar Swamp			
<b>Other Types</b>			
Certified Vernal Pool	-	1989	1989
Certified Vernal Pool	-	1990	1993

**Key:** E= Endangered      T= Threatened      SC= Special Concern

Source: Division of Fisheries and Wildlife, 1996

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- South Walpole -- This area features several well-preserved federal houses as well as the Fuller Tavern and a toll house from the early 1800's.
- Plimptonville -- Many of the large, distinctive houses built in this village in the early 1800's by members of the Plimpton family (one of the first families in town who became wealthy through industry) still remain.
- East Walpole Square -- This is the site of early industrial development in Walpole, although little of the original mill village remains.

There are several scenic areas and views within Walpole. Some examples include the well-maintained fields and pastures of the Norfolk County Agricultural School. These can be seen along North Street and High Street in North Walpole. The view of Gannewatte Farm Pond in its forest setting in southeast Walpole is outstanding (and a residential subdivision is planned for this area). The quiet Plimpton Pond with its falls over the dam also provides a pleasurable experience as well as view.

In addition "The Pinnacle" and the Bird Estate offer long, fabulous views that extend to Boston. The Pinnacle is a Town-owned hill that rises steeply from the Neponset River (A parcel near the Town-owned land has been sold by the Federal Deposit Insurance Corporation (FDIC) to a developer). Access to this site is provided through an abandoned railroad bed from Plimpton Street that was purchased by the Town's Conservation Commission. The Bird Estate includes a mansion that was once rehabilitated by the Junior League for use a "showhouse" to host fund raising events. It is now again in dilapidated condition. This 360-acre site on Bird Pond also includes a racetrack and an arboretum (Town of Walpole, 1987). This property is currently in the process of being subdivided for development.

Walpole has also designated a number of Scenic Roads, under the Massachusetts Scenic Road Act. These include North Street, High Street, Lincoln Road, Pine Street, Peach Street, Baker Street, and Lewis Avenue. The 1987 Open Space and Recreation Plan also identified Fisher Street, Brook Street, Bullard Street, Plimpton Street, Moose Hill Road, South Street, Summer Street, Kittredge Street, and Granite Streets as having significant scenic qualities, and recommended that they be considered for Scenic Road designation. It should be noted that scenic road designation does not guarantee protection of the scenic views. It simply requires that a public hearing be held prior to any changes in the stone walls and large trees that are located within the road right-of-way.

Figure 10 illustrates the Scenic and Cultural Resources of Walpole.

### **Environmental Problems**

Walpole is faced with several environmental problems, and has encountered varying degrees of success in addressing these problems. Its rapid growth, which reduces habitat area and has a

number of impacts on the Town's natural resources has already been mentioned.

In addition to the growth issues, the Town is the site of two contaminated industrial properties -- the former Bird site in East Walpole and the Shaffer site on South Street. These "brownfield" sites need to be cleaned up and returned to productive uses.

The Town also has underground fuel storage tanks at Walpole High School, Bird Middle School and Fisher Elementary School. These need to be replaced.

There is asbestos in Town buildings, including recreation buildings. It needs to be removed or encapsulated.

The Town's DPW garage, including its salt storage yard, is located in Zones I and II of the School Meadow Brook wells. Efforts to locate a replacement site have not been successful. At a minimum, mitigating measures to prevent contamination of the wells from this facility need to be taken.

The Neponset River is dammed at several points in Walpole creating ponds. Some of these dams are in need of renovation.