



# **2002 Jacobs Pond Conservation Area Management Plan**

**Prepared by the  
Norwell Conservation Commission**

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# Introduction

The Jacobs Pond Conservation Area includes Jacobs Pond, a manmade pond about 60 acres in size, and approximately 200 acres of surrounding conservation land (Figure 1). The Town of Norwell acquired the parcels making up the area in several increments, beginning in the 1970s. Jacobs Pond is a publicly owned pond, held under the stewardship of the Town of Norwell Conservation Commission.

The Jacobs Farm house and hayfields, owned by the town and under the jurisdiction of the historical and conservation commissions, are subject to memoranda of understanding with the Society for the Preservation of New England Antiquities. Other parcels of the Jacobs Pond land and the pond are under the sole stewardship of the conservation commission. The most recent additions to the Jacobs Pond Conservation Area include a gift of land designated the Assinippi parcel, donated to the conservation commission upon completion of the Jacobs Pond Estates condominiums on Assinippi Avenue on the southwest shore of the pond, and the Betzold parcel, 15 acres at the end of Beer s Avenue.

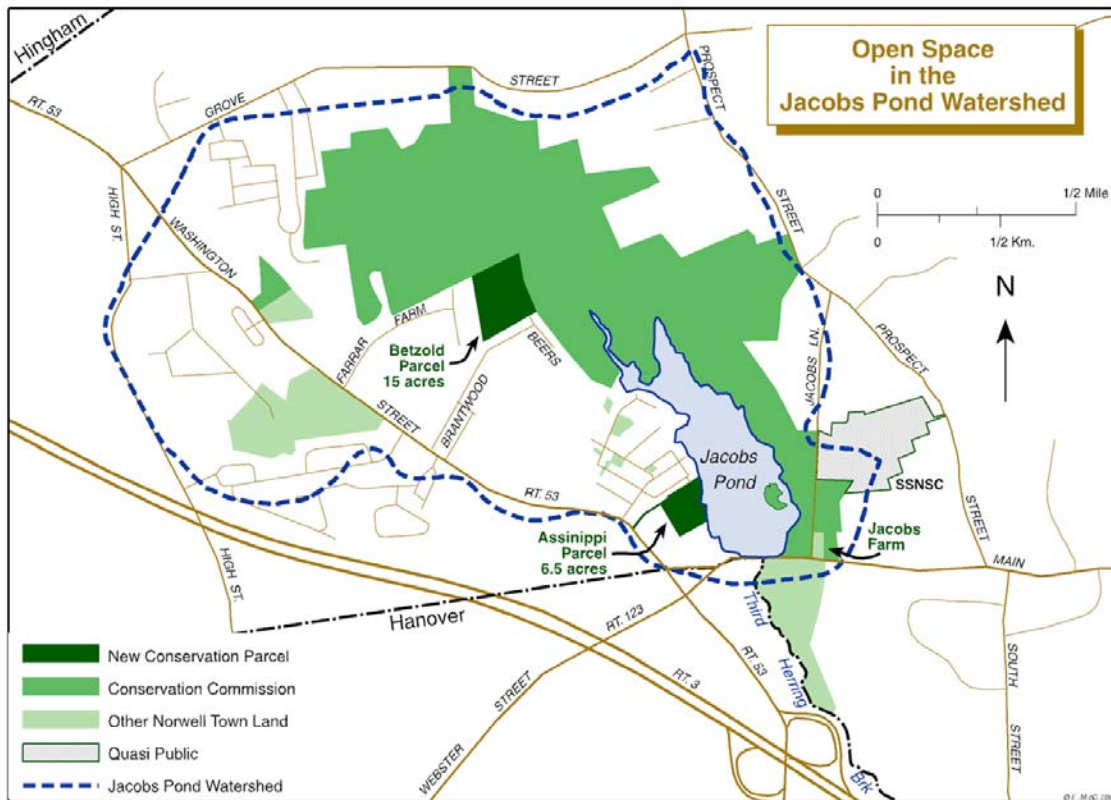


Figure 1. Open space in the Jacobs Pond watershed

The Betzold parcel was purchased following a fall 2000 special town meeting vote to purchase the property and to place it under the sole stewardship of the conservation commission. This property was then selected by the Massachusetts Executive Office of Environmental Affairs to receive state assistance from the Self-Help Conservation Program to cover 54% of its purchase cost (see Self-Help Program Project Agreement appended to this plan). A quitclaim deed was received and recorded at the Plymouth County Registry of Deeds, placing the administration, control, and maintenance of the property under the Town of Norwell Conservation Commission, following the provisions of the Massachusetts General Laws, Chapter 40, Section 8C. The land is legally and permanently protected as open space.

Our challenge in managing Jacobs Pond and the surrounding conservation land is to balance Norwell's need for recreational facilities with protection of the natural systems. Uses of Jacobs Ponds and the surrounding conservation land are many and varied, including fishing, boating, ice-skating, hiking, and nature study. The land provides protection to Norwell's public drinking water supply and habitat for plants and wildlife, including a rare species.

This plan updates a 1995 management plan and meets a requirement of the Self-Help Conservation Program for receipt of the assistance in purchasing the Betzold parcel. It describes the current condition of Jacobs Pond, develops management goals for the pond and the surrounding conservation land, and presents an action plan for implementing those goals.

# Existing Conditions

## Physical setting and watershed

Jacobs Pond and its conservation land are located within the North River watershed, located at the northern edge of the Massachusetts Bay south coastal watershed. The North River, protected under the Scenic Rivers Act, is slow moving, tidal, and was once the site of numerous shipbuilding businesses.

Within the larger North River system, the Jacobs Pond watershed subbasin is a part of the Third Herring Brook watershed. Third Herring Brook originates from the southern portion of Valley Swamp, a large red maple swamp located west of Prospect Street, both north and south of Grove Street, and north of the pond. Third Herring Brook flows from the pond at the dam located on Main Street (Route 123), passes under the Southeast Expressway (Route 3) near the Hanover Mall, and passes under Tiffany Road and River Street before it enters the North River. For much of its length, Third Herring Brook marks the boundary between Norwell and Hanover. Third Herring Brook is designated Class B by the Massachusetts Division of Water Pollution Control. (A Class B designation indicates streams that are protected for propagation of fish and aquatic life, wildlife, swimming, boating, and fishing.)

The limits of the Jacobs Pond watershed subbasin were described by Norwell's 1988 groundwater protection study:

- A northern boundary to the south of Grove Street.
- An eastern boundary that approximately follows Prospect Street and Jacobs Lane.
- A southwestern boundary to the west of Washington Street, Route 53.

Only a small fraction of the watershed is located outside Norwell, in Hanover. Portions of the watershed fall into Zones 1, 2, and 3 of Norwell's aquifer protection bylaw. Pumping stations within the watershed subbasin are located to the southwest of Washington Street, Route 53 (Figure 2).

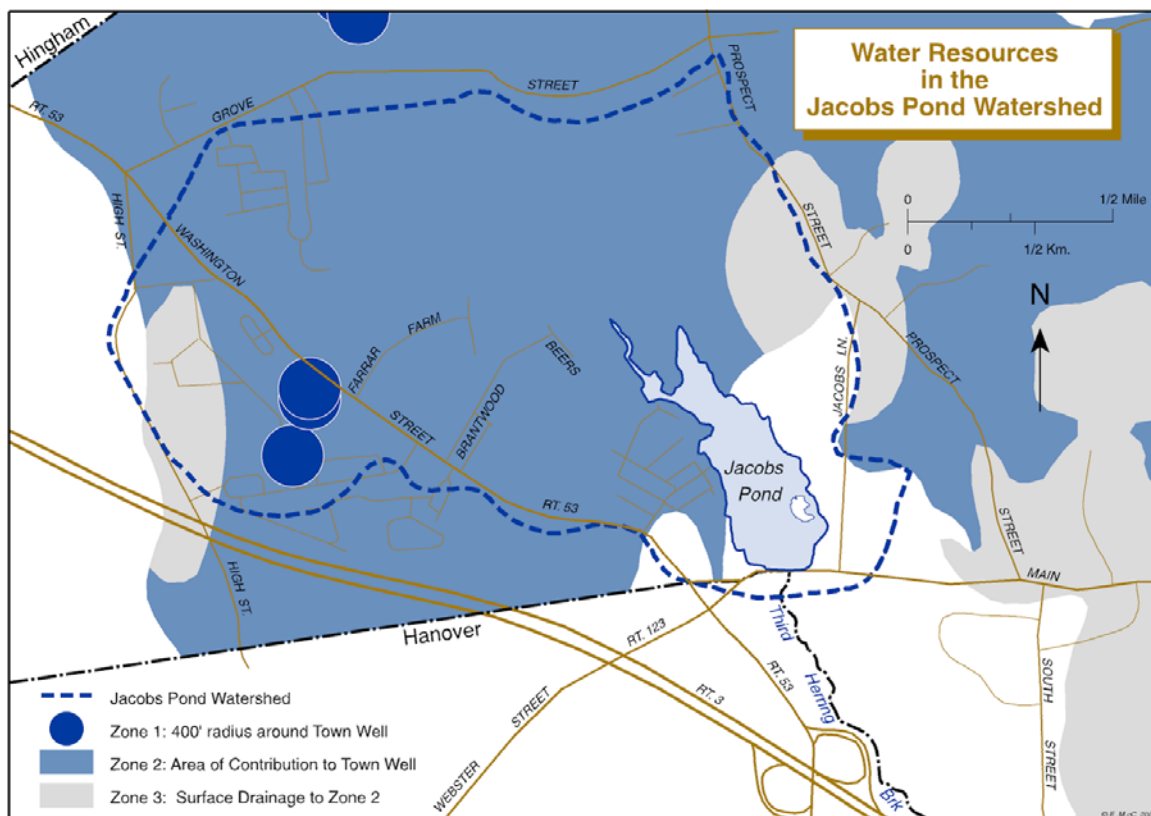


Figure 2. Water resources in the Jacobs Pond watershed

## Geology, topography, and soils

Bedrock in the Jacobs Pond area is composed of Dedham granite, a light grayish pink to greenish gray rock. A seismic refraction profile, completed along Jacobs Lane in the late 1980s, indicated a depth to bedrock of approximately 80 feet at the northern extent of the lane and 25-30 feet at the southern end.

The surficial geology around Jacobs Pond results from deposits left by the glaciers. These deposits range from fine to coarse gravel, with some areas of fine to coarse sand. On its northern shore, Jacobs Pond is bifurcated by an esker, a narrow, winding ridge formed from the deposits of a stream flowing through glacial ice. This esker and another one, on the recently purchased Betzold parcel, are included within the conservation land.

Loamy soils predominate on the western side of the pond, while sandy soils predominate to the east. At the southwest edge of the pond is one of Norwell's few remaining farms, Jacobs Farm, which was purchased by the town in 1986.

## **Creation of Jacobs Pond**

Jacobs Pond was formed in approximately 1730, when the Third Herring Brook was dammed at Main Street, Route 123. The pond is approximately 60 acres in size (Figure 3).

Originally the pond was called Snappet Pond, a colloquial abbreviation for the local Indian name Assinippi, which meant rocky water. Energy from the flume at the dam was used to run grist and sawmills. The gristmill was abandoned, and the sawmill was burned by 4<sup>th</sup> of July celebrants in 1920. A brick manufacturing facility was established on the recently acquired Assinippi parcel in 1680 and flourished until 1830.



*Figure 3. Jacobs Pond*

## **Bathymetry, sediments, and water quality**

Jacobs Pond is uniformly shallow. The bottom contour drops off immediately from the shoreline, and the pond is approximately 5 feet deep throughout its expanse. Some residents recount tales of walking across the northern portion of the pond.

Bottom sediments are unconsolidated, highly decomposed, organic “mucky/silty” material throughout the pond. The sediments range from less than 1 foot to more than 4 feet in thickness.

Water quality characteristics have been assessed sporadically in Jacobs Pond. The conservation commission has made single-day observations in 1993 and 1999, and volunteers for the Friends of Jacobs Pond coordinated with the North and South Rivers Watershed Association to sample monthly over six months in three locations in 1993. Norwell Public Schools students sometimes conduct science projects at the pond, and the South Shore Natural Science Center makes occasional water quality measurements.

Measurements have included a variety of water quality parameters:

- **pH**, a measure of the acidity of the pond and **alkalinity**, a measurement of the buffering capacity, that is, the ability of the pond to recover from inputs of acid. Acidity of Massachusetts ponds is a concern, because acid pollution has lowered the pH of ponds and can harm fish and amphibians.
- **Nutrients**, including phosphorus and nitrogen, which stimulate plant and algal growth. Excess nutrients, particularly phosphorus, contribute to excess plant and algal growth in ponds. Large algal or plant blooms can also lead to massive die-offs and subsequent effects on fish and other animals.
- **Pathogens**, primarily the sewage indicator, fecal coliform bacteria. High levels of pathogens preclude swimming in ponds. While Jacobs Pond has no facilities for swimming, students have considerable contact with the water during nature study and kayaking classes. The recreation commission has also expressed interest in expanding opportunities for swimming.

Toxic contaminants are not a major concern for Jacobs Pond. Within the watershed, only Washington Street houses businesses that could release contaminants. These businesses change with the years but have included hairdressers, automobile service facilities, printing facilities, furniture refinishers, and drycleaners.

Overall, water quality is good for a shallow, productive pond (Table 1). The pH values in 1993 and 1999 were nearly neutral, which is good. Alkalinity measurements have been somewhat low, below the 20 mg/l that would indicate a good capacity to handle additions of acid, but low levels are typical of the region.

Phosphorus concentrations were lower in 1999 than in 1993, a good sign. Concentrations as low as 0.03 mg/l can stimulate algal blooms, and the 1999 value of 0.02 mg/l is reasonable for a shallow pond.



Turbidity measurements for Jacobs Pond, including direct measurements, assessments of true and apparent color, and Secchi disk transparency, indicated that while turbidity was low, color was high, particularly in 1999. (“True” color represents water that has been filtered, leaving only dissolved pigments, while “apparent” color includes dissolved and particulate matter.) The 1999 results indicated high levels of tannic and humic acids, which leach out of decaying matter.

In 1999, total and fecal coliform bacteria concentrations were at or below the limits of detection and well below the state standards for Class B “swimmable” waters of <1,000 org/100 ml for total coliform bacteria and <200 org/100 ml for fecal coliform bacteria. During 1993, bacterial counts were elevated, not only in the samples taken in the single-day programs, but also in some samples taken over time. The geographic and temporal patterns of the high concentrations of indicator bacteria did not point to a single or recognizable source. In general, septic systems have been continually upgraded along the pond, and farming practices are designed to protect the pond from contamination.

Table 1. Water quality measurements made for the conservation commission

Parameter	1993 Results	1999 Results
pH (standard units)	6.12	7.04
Total alkalinity (mg/l CaCO <sub>3</sub> )	6	11.9
Total phosphorus (mg/l)	0.06	0.02
Turbidity (N.T.U.)	0.8	1.0
True color	12	350
Apparent color	12	350
Secchi disk transparency (feet)	Not measured	>4.5
Total coliform bacteria (organisms/100 ml)	Overgrown	<50
Fecal coliform bacteria (organisms/100 ml)	190	10

## Aquatic vegetation

Since 1993, the conservation commission has sponsored periodic surveys of the aquatic vegetation in Jacobs Pond by Aquatic Control Technology of Sutton, Massachusetts. The 1993 survey indicated that the pond had low densities of microscopic algae, presumably due to nutrients being taken up by dense weeds that were found throughout the pond. Most notable among these weeds was an infestation of fanwort, *Cabomba caroliniana*, an exotic and invasive plant that can outcompete other, more desirable plants. Predominant secondary species included floating leafed lilies, including the water shield *Brasenia* sp., yellow waterlily or

spatterdock *Nuphar* sp., and white waterlily *Nymphaea* sp. These plants were predominantly found around the perimeter of the pond, within approximately 100 feet of the shore. Greatest densities were in the northern part of the pond.

Several submerged species were found in low densities throughout the pond:

- Bladder wort, *Utricularia* sp., a native plant, which is not a problem in low densities.
- Large-leafed pondweed, *Potamogeton amplifolius*, a desirable native plant.
- Ribbon-leaf pondweed, *P. epihydrus*, a desirable native plant.
- Eurasian milfoil, *Myriophyllum spicatum*, an especially undesirable, exotic species.
- Water milfoil, *Myriophyllum* sp., a native species.

Only a few samples of Eurasian milfoil were found. However, to keep this undesirable species from spreading and to control the predominant and undesirable fanwort, chemical treatment was recommended and carried out during the early summer of 1997. The entire pond was treated with fluridone, marketed under the name Sonar®, a cost-effective and environmentally sound option for weed control. During 1998, fanwort was effectively controlled in the pond.

Scattered regrowth, noted in 1999, prompted a full survey of the pond, conducted in September. The survey found that fanwort again dominated the submersed plant community, although densities were greatly reduced from the pre-1997 conditions. Submersed plants and the microscopic species stonewort, *Nitella* spp., had the most widespread distribution. As in 1993, floating-leafed waterlilies were most abundant at the northern end of the pond, but were also established along all the shorelines. The pond was re-treated with Sonar® in 2001.

Approximately 3 acres at the northern end of Jacobs Pond has been overgrown by emergent wetland vegetation, predominantly the common reed *Phragmites* sp. and the cattail *Typha* sp. The 1999 survey also noted the presence of the invasive purple loosestrife, *Lythrum salicaria*, along the northern shore of the pond. Purple loosestrife is an exotic, emergent plant that originated in Eurasia and has spread throughout North America. Although the plant's purple flowers are beautiful, the spread of purple loosestrife has been an environmental disaster. It has displaced native vegetation and, because it is not a good food source, it has caused serious reductions in populations of waterfowl and aquatic mammals. Purple loosestrife can sometimes be pulled by hand or controlled by glyphosate (Rodeo®), a relatively environmentally friendly pesticide. Biological

controls, using root-mining weevils or leaf-eating beetles, also show promise.

## **Aquatic wildlife**

The pond supports a healthy variety of forage and sports fishes. At the annual fishing derbies, sponsored by the recreation commission, the species caught typically include chain pickerel, yellow perch, calico bass, and largemouth bass. Amphibians, including bullfrogs, green frogs, pickerel frogs, and toads, turtles, and other wildlife species are found in the pond, shallow marsh, scrub-shrub swamp, bog, and riparian habitat of the pond.

## **Other vegetation and wildlife**

The Jacobs Pond conservation area includes several habitat types besides the pond:

- **Shallow marsh**, present primarily at the northern edge and along the periphery of the pond.
- **Scrub-shrub swamp**, present primarily in the northern portions of the area and along portions of the periphery of the pond.
- **Bog**, present primarily in the northern portion of the area.
- **Riparian habitat**, including shoreline and island vegetation, present along the margins of the other aquatic and wetland habitat types, including the large wooded island located in the southeastern portion of the pond.
- **Upland woodland**, present throughout the area.

Surveys of vegetation and wildlife are conducted sporadically. Because of the interests of a local scientist, Fred St. Ours, Jr., classes at the South Shore Natural Science Center routinely inventory dragonfly species in the vicinity of the pond and the neighboring hayfields. Common species are listed in Table 2.

During 1995, the conservation commission sponsored a 1-day survey of the wildlife of the area, focusing primarily upon the wetland and riparian habitats. The survey noted that the herbivorous muskrat was likely to be common in the area. Fish-eating mammals, such as otter and mink, were also likely to be present.

Air-screening and hawking insectivorous birds and mammals, such as swallows and bats, are common, attracted by the large areas of foraging habitat and the high populations of insects supported by the pond and wetland habitats. Other birds are also attracted by the insect populations. Ground-gleaning birds, such as sparrows and grackle, and birds that feed in the lower canopy, such as the common yellowthroat, are also common.

Table 2. Common dragonfly species found in the vicinity of Jacobs Pond and the neighboring hayfields during 1998-2000.

Dragonfly Species	Latin Name
Common Green Darner	<i>Anax junius</i>
Lancet Clubtail	<i>Gomphus exilus</i>
Prince Baskettail	<i>Epithea principis</i>
Calico Pennant	<i>Celithmis elisa</i>
Eastern Pondhawk	<i>Erythemis simplicicollis</i>
Dot-tailed Whiteface	<i>Leucorrhinia intacta</i>
Golden-winged Skimmer	<i>Libellula axilena</i>
Spangled Skimmer	<i>Libellula cyanea</i>
Slaty Skimmer	<i>Libellula incesta</i>
Window Skimmer	<i>Libellula luctuosa</i>
Twelve-spotted Skimmer	<i>Libellula pulchella</i>
Painted Skimmer	<i>Libellula semifasciata</i>
Blue Dasher	<i>Pachydiplax longipennis</i>
Eastern Amberwing	<i>Perithemis tenera</i>
Ruby Meadowhawk	<i>Sympetrum rubicundulum</i>
Black Saddlebags	<i>Tramea lacerata</i>

The riparian area of the pond may provide suitable cavities within trees for wood ducks and medium-sized mammals such as raccoon and opossum. Large animals, including deer and coyote, have been seen.

Jacobs Pond is also home to a nuisance population of nonmigratory Canada geese. As in other areas around the country, many people find the geese a charming addition to the pond. Accumulations of droppings and feathers are not a problem, and the population densities are not enough to be the major contributor to the nutrient load to the pond. However, grazing by the geese has damaged and sometimes destroyed the hay crops at Jacobs farm.

On June 9-11, 2000, South Shore Natural Science Center naturalists participated in the state-sponsored "Biodiversity Days" by inventorying plant and animal species in the area. One naturalist focused on bird species in the immediate area around the pond and compiled a list included in Table 3.

## Environmentally significant species

The Massachusetts Natural Heritage and Endangered Species Program has reviewed the Jacobs Pond area and indicated that an area at the northwest corner of the pond and surrounding upland is habitat for a state-listed species of special concern.

Table 3. Bird species sited in the vicinity of Jacobs Pond, June 9-11, 2000.

<b>Bird Species</b>	<b>Latin Name</b>
Great Blue Heron	<i>Ardea herodias</i>
Green Heron	<i>Butorides virescens</i>
Black-crowned Night Heron	<i>Nycticorax nycticorax</i>
Wood Duck	<i>Aix sponsa</i>
Mallard	<i>Anas platyrhynchos</i>
Canada Goose	<i>Branta Canadensis</i>
Mute Swan	<i>Cygnus olor</i>
Red-tailed Hawk	<i>Buteo jamaicensis</i>
Red-shouldered Hawk	<i>Buteo lineatus</i>
Herring Gull	<i>Larus argentatus</i>
Ring-billed Gull	<i>Larus delawarensis</i>
Yellow-billed Cuckoo	<i>Coccyzus americanus</i>
Chimney Swift	<i>Chaetura pelagica</i>
Downy Woodpecker	<i>Picoides pubescens</i>
Eastern Wood Pewee	<i>Contopus virens</i>
Great Crested Flycatcher	<i>Myiarchus crinitus</i>
Eastern Phoebe	<i>Sayornis phoebe</i>
Eastern Kingbird	<i>Tyrannus tyrannus</i>
Red-eyed Vireo	<i>Vireo griseus</i>
American Crow	<i>Corvus brachyrhynchus</i>
Blue Jay	<i>Cyanocitta cristata</i>
Tree Swallow	<i>Tachycineta bicolor</i>
Tufted Titmouse	<i>Baeolophus bicolor</i>
Black-capped Chickadee	<i>Poecile atricapillus</i>
White-breasted Nuthatch	<i>Sitta carolinensis</i>
House Wren	<i>Troglodytes aedon</i>
American Robin	<i>Turdus migratorius</i>
Gray Catbird	<i>Dumetella carolinensis</i>
Northern Mockingbird	<i>Mimus polyglottos</i>
European Starling	<i>Sturnus vulgaris</i>
Common Yellowthroat	<i>Geothlypis trichas</i>
Ovenbird	<i>Seiurus noveboracensis</i>
Eastern Towhee	<i>Pipilo erythrophthalmus</i>
Chipping Sparrow	<i>Spizella passerina</i>
Northern Cardinal	<i>Cardinalis cardinalis</i>
Red-winged Blackbird	<i>Agelaius phoeniceus</i>
Orchard Oriole	<i>Icterus spurius</i>
Baltimore Oriole	<i>Icterus galbula</i>
Common Grackle	<i>Quiscalus quiscula</i>
American Goldfinch	<i>Carduelis tristis</i>
House Finch	<i>Carpodacus mexicanus</i>

# Land Use

The Jacobs Pond conservation land provides protection to the habitat of a rare species and protection of Norwell’s public water supply. A portion of the land preserves Norwell’s historic agricultural heritage. Other portions of the land are accessible for passive recreation and nature study. The Jacobs Pond conservation land also provides links to other public lands (Figure 4).

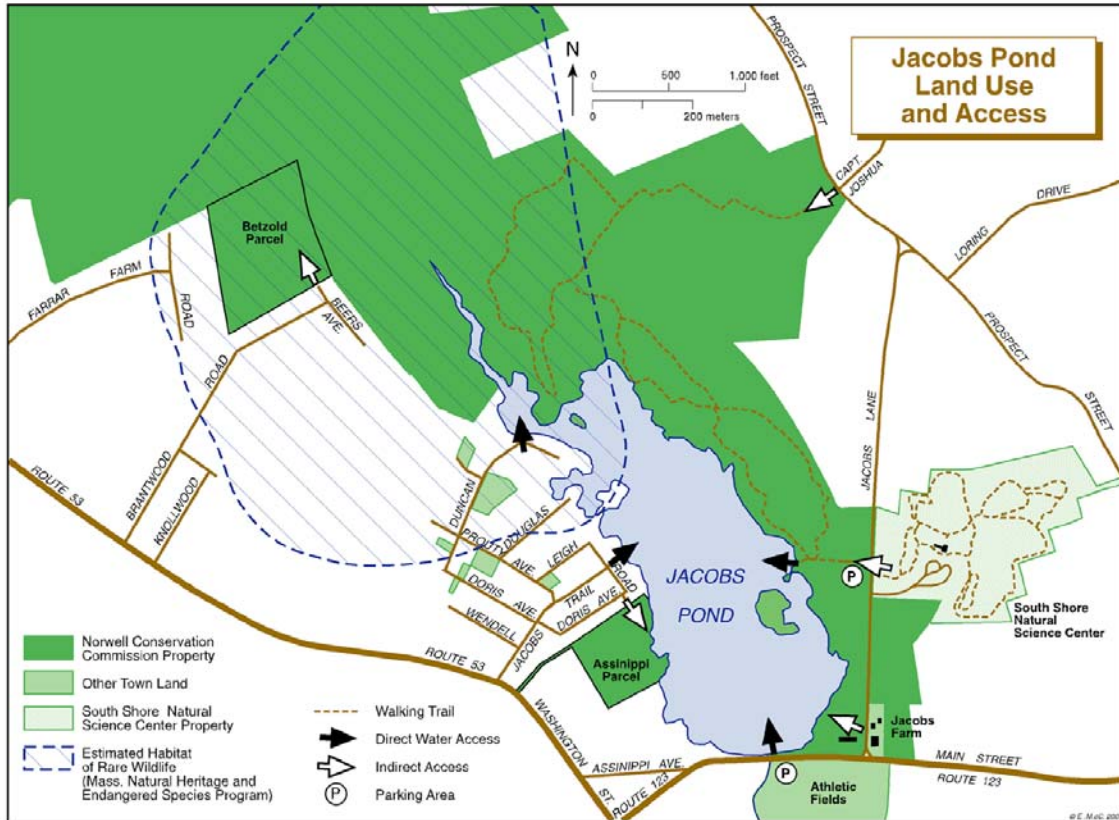


Figure 4. Jacobs Pond land use and access

## Habitat protection

Protection of Jacobs Pond and its surrounding conservation land in perpetuity provides protection to a state-listed rare species and to other plants and wildlife that occur there. The rare species is listed by the Natural Heritage and Endangered Species Program of the Massachusetts Division of Fish and Wildlife as NHESP File Number 95-705.

## **Water supply protection**

The portions of the Jacobs Pond conservation land that lies north and west of the pond are located within Zone 2 of Norwell's aquifer protection bylaw. These areas contribute to town wells located to the southwest of Washington Street, Route 53, which runs to the west of the pond.

## **Agriculture**

Jacobs Farm, located on both sides of Jacobs Lane at its intersection with Main Street, was purchased to preserve the agricultural heritage of the town. Under memoranda of understanding with the Society for the Preservation of New England Antiquities, the historical commission maintains the buildings, while the conservation commission is responsible for the fields and pastures. Those agreements specify that the fields continue to be used as agricultural land. Through a license agreement, the conservation commission allows a local farmer to use the fields and pasture for hay and sheep (Figure 5).



*Figure 5. Through a license agreement, a local farmer pastures sheep at Jacobs Farm.*



*Figure 6. Children from the Jacobs Pond neighborhood came together to support purchase of the Betzold parcel.*

## **Public access**

The general public and people from the immediate neighborhood use Jacobs Pond conservation land passive recreation and nature study (see, for example, Figure 6). Public access to the pond and conservation land is from several points:

- The pond abuts Main Street (Route 123) along its dam, an area that is easily accessible for fishing. Public parking is easily accessible, across the street at the entrance to the Norwell Little League Fields.
- Jacobs Farm regularly welcomes visitors, and off-street parking is available. Visitors are expected to respect the farming operations that take place there.
- North of Jacobs Farm, a public-access point on Jacobs Lane includes a public parking area, a boat launch and dock, a boardwalk, and access to walking/hiking trails. A crosswalk links this point of access to the South Shore Natural Science Center and its trail network.
- Further north, there is a trailhead on Prospect Street, across from Captain Joshua Lane. There is no off-street parking at this location.
- A public access point is maintained on Jacobs Trail on the western shore of the pond.
- A public access point is maintained off Duncan Drive, at an inlet on the western shore of the pond.



- Public access could be available at the end of Douglas Road, which extends to the pond. To date, no access has been maintained at that location.
- The Assinippi parcel is accessible at the end of Leigh Road, although no trail or water access has been developed. Limited on-street parking is available.
- The Assinippi parcel is also accessible from Washington Street, although no trail or parking has been established at that point.
- Access to the Betzold parcel, the newest addition to the conservation land, is at the end of Beers Avenue. Parking at this location is possible within the paved area that would have been an extension of Beers Avenue, had the land been developed.

### **Linkage to other public open space**

The Jacobs Pond conservation land provides links to other open space in Norwell. Norwell's Little League fields, managed by the recreation commission and maintained by the town, and the Norwell High School lands are located across Main Street from Jacobs Pond. The South Shore Natural Science Center, a private nonprofit environmental and educational facility, is located across Jacobs Lane and is connected to the land by a crosswalk. Additional conservation and water department lands are located north of Grove Street. The Hatch Lots and other town land, located between Grove, Prospect, and Bowker streets are assessable to Jacobs Pond land by walking trails.

## Management Goals

The 1997-2002 Norwell Open Space Plan, which has been approved by the Massachusetts Division of Conservation Services, presents two major goals for open space in the town:

- Acquisition and preservation of open space.
- Use of our existing open space.

The plan recognizes the Jacobs Pond area as one of Norwell's "special areas," areas for which we promote public use while preserving natural function and beauty. Balancing our two needs—preservation and use—remains our challenge for the Jacobs Pond conservation area.

In preparation of this plan, the conservation commission reviewed the goals of the 1995 Jacobs Pond Management Plan and the actions that have taken place in response to that plan. The commission also solicited input from citizens at a well-attended public hearing held on February 13, 2001. Additional information was sought from town boards, the farmer who uses our fields, and naturalists and students from the South Shore Natural Science Center. Our management goals for the coming years reflect the ongoing work and the needs articulated during the public hearing and information acquisition process:

- Maintain and enhance public access and facilities.
- Promote the use of Jacobs Pond and the surrounding area for recreation and nature study.
- Maintain the hayfields at Jacobs Farm in a manner that promotes public appreciation of the farm and the pond and that also respects the pond.
- Manage weed infestations in an environmentally sensitive manner, balancing recreation and conservation needs.
- Maintain and improve water quality by eliminating or controlling discharges into the pond.
- Integrate pond management with state and federal programs.

# Action Plan

Many specific actions are planned to address the management goals for Jacobs Pond and its surrounding conservation land (Figure 7). These actions will involve not only the conservation commission but all Norwell residents and state and local institutions.

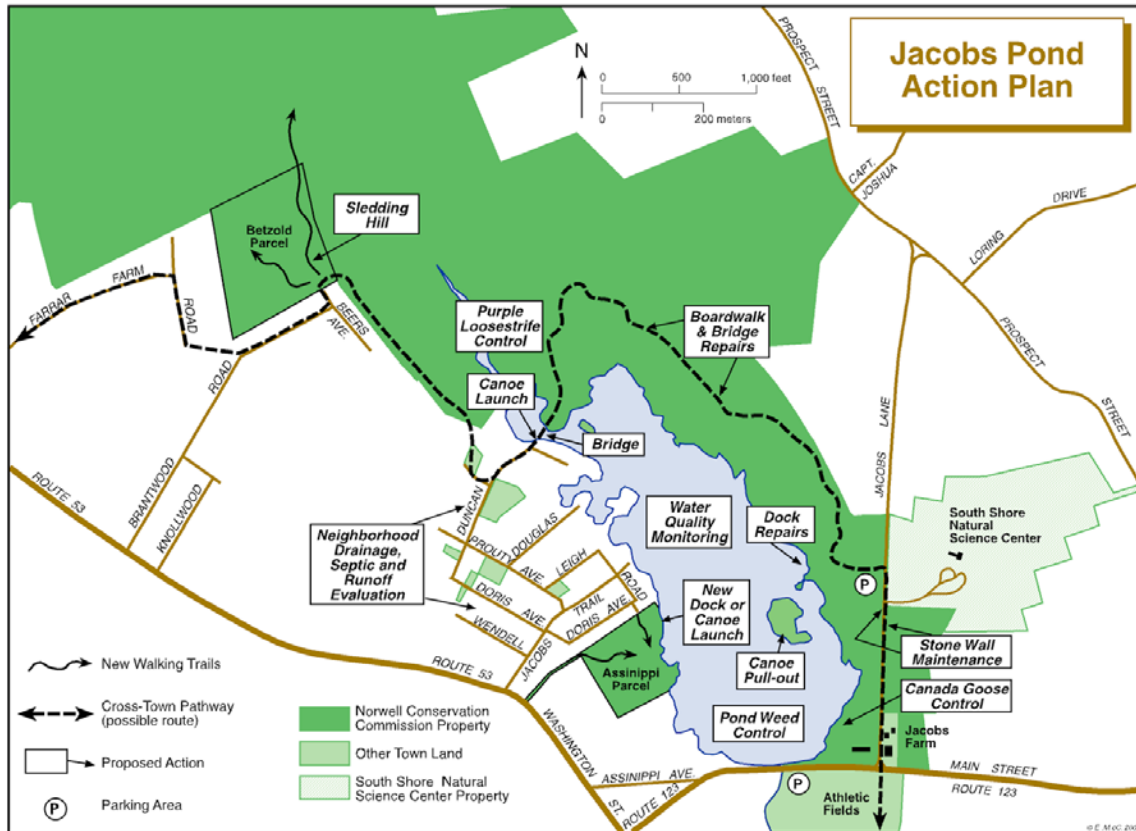


Figure 7. Jacobs Pond action plan

## Maintain and enhance public access and facilities

Considerable effort is being directed toward maintaining and enhancing public access to and facilities for the Jacobs Pond area. Many of these efforts will continue, and the conservation commission will take additional actions:

- Maintain and improve the existing parking area on Jacobs Lane.
- Improve signage at the Jacobs Lane area and other existing access points.

- Receive state assistance for establishing a canoe launch at Duncan Drive.
- Repair the dock at the Jacobs Lane access point.
- Establish a new dock on the Assinippi parcel and a new canoe pull-out area on the large island.
- Employ volunteer groups and staff to maintain existing trails.
- Establish new trails on the Betzold and Assinippi parcels.
- Receive state assistance for establishing a bridge from Duncan Drive to the western side of the pond.
- Maintain a sledding hill on the Betzold parcel.

The existing parking area at Jacobs Lane is currently the largest access point to the conservation land and the pond. Located in a relatively sparsely developed portion of the pond, it is subject to misuse. Late-night visitors create a nuisance for the neighbors and leave considerable trash behind. The conservation commission will work with neighbors to maintain this site and alleviate problems caused by misuse. The Norwell Police Department has agreed to schedule a regular patrol of the site.

The conservation commission will also improve signage throughout the property. A sign, indicating the receipt of state Self Help funds for the Betzold purchase, has been erected at a highly visible location along Main Street (Route 123). Other new signs will be erected at the Beers Avenue access and at the Assinippi parcel. Students from the South Shore Natural Science Center have suggested that a kiosk at the Jacobs Lane parking lot could provide information that educates the public about rules established to protect the pond. In February 2002, the conservation commission received a grant from the Department of Environmental Management Office of Urban Forestry that will provide for the additional signs and the kiosk. The grant is also paying for maps and a brochure.

In early January 2001, Norwell signed a land management agreement with the Public Access Board of the Massachusetts Department of Fisheries, Wildlife, and Environmental Law enforcement to develop a canoe launch and associated parking at the town-owned access point at Duncan Drive, on the western shore of the pond. Although designated as a public landing, this site has in the past not been suitable for use as a launch. The area will remain unpaved and will be suitable only for launching canoes, kayaks, and other small boats.

The existing dock at the Jacobs Lane access point is much used and in need of some repairs. The conservation commission is working with the faculty of the industrial arts program at Norwell High School to make those repairs.

Residents have suggested that the conservation commission construct an additional dock on the Assinippi parcel. The conservation commission will suggest construction of a dock as a possible Eagle Scout project. A younger scout has indicated that he would like to develop a canoe pull-out on the large island on the eastern side of the pond, and the commission will support this project.

Trails have been maintained on the Jacobs Lane side of the property, most recently by a group of citizens working under the Senior Tax Relief Work Program, a program that provides senior citizens with some relief from their property tax burden in exchange for public service. In the fall of 2000, the conservation commission recognized their work by naming a trail after Wes Osborne, a long-time town resident, employee, and supporter of conservation trails work. These trails will continue to be maintained.

The Betzold parcel already has a network of trails that have been made over the years. These trails extend into the remainder of the Jacobs Pond conservation land and once reached Grove Street. However, because the trails are not marked, a new visitor to the area can quickly become disoriented. The commission will mark and maintain a trail or trails on this property. Conversely, the Assinippi parcel is thickly overgrown, and there are no obvious trails. The commission will establish a trail or trail on this parcel as well.

As part of their industrial arts curriculum, Norwell High School students have developed plans to build boardwalks along portions of the trails that are wet. These boardwalks will make the area accessible to more people than those who currently feel comfortable on the rough trails.

The conservation commission, in collaboration with the planning board, is meeting a goal of the town's transportation enhancement committee to develop a bridge to span the 50 feet of pond between Duncan Drive and the eastern shore of the pond. During April 2001, the town was awarded \$10,000 from the state Department of Environmental Management Lake and Pond Grant Program towards the completion of the bridge. The bridge is being constructed during the preparation of this plan and will open the trail system on the Jacobs Lane side of the pond to the residents on the western shores (Figure 8). In its entirety, the proposed bikeway would link the public schools and other facilities throughout the town.

The entrance to the Betzold parcel at the end of Beers Avenue has for years been a popular sledding hill. The conservation commission will work with the neighbors to maintain this area for sledding.



*Figure 8. Top: members of the Senior Tax Relief Work Program. Bottom: the new bridge linking Duncan Drive with conservation lands.*

## **Promote the use of Jacobs Pond and the surrounding area for recreation and nature study**

While the conservation commission acts as stewards for conservation land and the pond, it is important to recognize that they are public spaces, owned by all the residents of the town and open to all. The commission will continue to promote use of the area:

- Support the fishing derby, kayaking classes and other activities conducted by the recreation commission.
- Support the recreation commission in determining whether opening the pond to swimming is feasible.
- Support the camp, science league, Quest course, preschool, and other programs sponsored by the South Shore Natural Science Center.
- Encourage local school and other educational groups to visit and study the pond.

The town's recreation commission has held an annual fishing derby at the pond since 1993, with as many as 270 children and adults registering (parents and grandparents participate without paying). Since 1998, the recreation department has held kayaking classes on the pond. Beginning with 24 participants, 90 participants kayaked during a 2-week period in 2001. The conservation commission will continue to support these popular activities. The recreation commission has also expressed interest in opening the pond to swimming. Opening the pond for swimming would require identifying a site within the pond, clearing the bottom of debris, and developing a plan to monitor water quality. If a beach were to be constructed, state and local permitting would be necessary. The conservation commission will support recreation commission efforts in determining whether swimming is appropriate and feasible.

The commission will also continue to encourage the South Shore Natural Science Center to use the facilities. Science center programs typically visit the pond at least once each day from March through November. For example, during 2000, 39 schools made field trips to the science center and the pond. Each day during the summer, the science center sends 40-50 children to the pond for nature study, canoeing, and exercise. The science center's Science League Pond Team is a science club made up of students in the 5<sup>th</sup> through 9<sup>th</sup> grades. The team studies the pond and has developed a "Quest" program on the conservation land. South Shore Quest was formed in 1998 to encourage exploration of the outdoors through clue-directed walks. Of the 19 Quests running in 2000, the Jacobs Pond route was the second most popular.

## **Maintain the hayfields at Jacobs Farm in a manner that promotes public appreciation of the farm and the pond and that also respects the pond**

Maintaining the historic farm at the corner of Jacobs Lane and Main Street links Norwell to its more rural past and provides for scenic views. The conservation commission is committed to maintaining our agreement with the Society for the Preservation of New England Antiquities and will continue several actions:

- Continue license agreements with a local farmer or farmers to maintain the agricultural fields.
- Keep the stone walls open and in repair.
- Continue efforts to control the nuisance Canada geese.
- Support farmers' efforts to obtain "living farm" and other farm museum grants.

Through license agreements, the conservation commission will continue to work with local farmers to maintain the agricultural fields at Jacobs Farm. The license agreements are short-term, renewable annually, and convey no interest in the conservation land to the farmer. In its annual reviews of the licenses, the commission will ensure that no practices are detrimental to the land or the pond.

To date the license agreements with farmers have included provisions for maintenance of the historic stone walls that line the street and divide the fields. The conservation commission has also received volunteer assistance in maintaining the stone walls. These activities will continue.

The conservation commission will also work with the farmer and local, state, and federal entities to control the nonmigratory Canada geese that can render hayfields bare. Past efforts have included feeding all farm animals indoors and using goose-resistant fencing. Increasing the depth of the vegetated border between the fields and the pond and other options will be evaluated and appropriate actions will be implemented.

Jon Haskins, Jr., the farmer who is currently working with the commission at Jacobs Farm, has expressed interest in obtaining living farm or other museum grants for projects at Jacobs Pond. The conservation commission will support his efforts to obtain additional funds for preservation of and education about historic farming practices.



## **Manage weed infestations in an environmentally sensitive manner, balancing recreation and conservation needs**

Invasive weeds can affect both the recreational and environmental quality of Jacobs Pond. In general, invasive weeds diminish habitat quality, reduce the diversity of native plants, and impair use of ponds for swimming, boating, fishing, and even ice-skating. The conservation commission will take several actions to continue to control weed infestations:

- Continue to monitor plant growth, and re-treat the pond as needed.
- Continue to evaluate new, more effective and environmentally sensitive methods of weed control.
- Install signs noting “No Motors on Pond.”
- Develop a plan for controlling purple loosestrife in the northern portions of the ponds.

In 1997 and 2001, the conservation commission successfully treated the fanwort infestation in the pond by applying Sonar®, a systemic herbicide that attacks plants and underlying root structures. When absorbed, Sonar® interferes with synthesis of carotenoid pigments and thereby blocks photosynthesis. Sonar® application was selected over physical methods as the most effective and safe choice for the pond.

Money obtained from 1997 and 2001 town meeting articles and the conservation commission budget paid for the treatments. Future treatments will be funded, at least in part, by a fund set up when the Jacobs Pond Estates condominiums were built on the southwest shore of the pond.

Because many nuisance weeds, including fanwort and Eurasian milfoil, spread by fragmentation, it is important that the conservation commission enforce a town meeting directive that no motors be allowed on Jacobs Pond. Surprisingly to some visitors, this directive applies to electric as well as gasoline motors. The conservation commission, with ongoing support from the recreation commission, will continue efforts to educate visitors about the need to exclude motors. The conservation commission will also install signs at the landings, the dam, and the parking lot on Jacobs Lane, noting that motors are not permitted.

While the conservation commission efforts to date have focused on submersed plants, the emergent vegetation, especially the invasive purple

loosestrife, is also a nuisance. The conservation commission will evaluate options to control the purple loosestrife infestation.

## **Maintain and improve water quality by eliminating or controlling discharges into the pond**

Nutrients, pathogens, and other pollutants enter Jacobs Pond from storm drains, road runoff, soil erosion, and poorly operating septic systems. The conservation commission will take several actions to inventory and eliminate or control pollutant inputs:

- Inventory storm drains and estimate pollutant inputs.
- Estimate inputs from septic systems.
- Estimate nonpoint source inputs from runoff and erosion.
- Work with the highway department to alleviate stormwater inputs.
- Work with the health department to alleviate sewage inputs.

## **Integrate pond management with state and federal programs**

Jacobs Pond is not alone in the problems and challenges it faces. Massachusetts has over 3000 lakes and ponds, and nation-wide there are approximately 4 million acres of lakes and reservoirs. Many of these water bodies suffer from invasive aquatic plants, excess nutrient loads, and the challenges of balancing recreation with preservation. Norwell can benefit from the experience, expertise, and funding opportunities of state and federal programs:

- Seek funding from the state Lakes and Ponds Watershed Action Strategy.
- Monitor other state and federal efforts for information or funding opportunities.

Norwell is already benefiting from the Self-Help Program, which provided funds to offset acquisition of the Betzold parcel. The conservation commission will continue to identify parcels for acquisition and, if appropriate parcels are purchased, apply for Self-Help Program funds. During the spring of 2002, Norwell passed the Community Preservation Act, and funds received through that program may also be used for conservation, recreation, or historic preservation in the area.

In 2001, the Massachusetts Secretary of Environmental Affairs announced a new multi-million dollar Lakes and Ponds Watershed Action Strategy, with a primary goal of strengthening local stewardship of lakes and ponds. The strategy includes funds for demonstration projects and

local grants. The conservation commission will take advantage of the actions identified in the strategy.

The federal Clean Lakes Program is ongoing, although it has not been funded for several years. The conservation commission monitor federal programs to take advantage of any new opportunities that arise.

## **A Final Note**

This plan was prepared by volunteer efforts and minimal funding from the Town of Norwell Conservation Fund, which is funded by town meeting and administered by the conservation commission. Christine Werme, a volunteer conservation commissioner, prepared the text. Eliza McClennen, a Norwell resident and cartographer, provided the maps at cost. Additional support was contributed by the Norwell Conservation Agent, Judith Salter, and by the many town residents who attended a public hearing on management goals and actions. Most of the photographs included in the plan were taken by Judith Salter.

Implementation of this plan will require additional volunteer efforts and the ongoing support of town meeting. For further information on the pond and conservation land and on the best ways to volunteer, please contact the Norwell Conservation Commission at Town Offices, 345 Main Street, (781) 659-8022.

# Signatures

## Norwell Conservation Commission

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# **Appendix**

## **Self Help Program Project Agreement**