

Water Resources

Watersheds *contributed by Pat McLeod*

A watershed is the geographic area in which surface water flows to a common point such as a river, lake or bay. The Canoe River, Rumford River, Wading River and the Three-Mile River are the four major watershed areas in Norton as shown in the map on the next page. The Canoe River watershed consists of five towns as far north as Sharon and comprises the northeastern portion of town. The Rumford River originates in Mansfield and comprises the northern-central



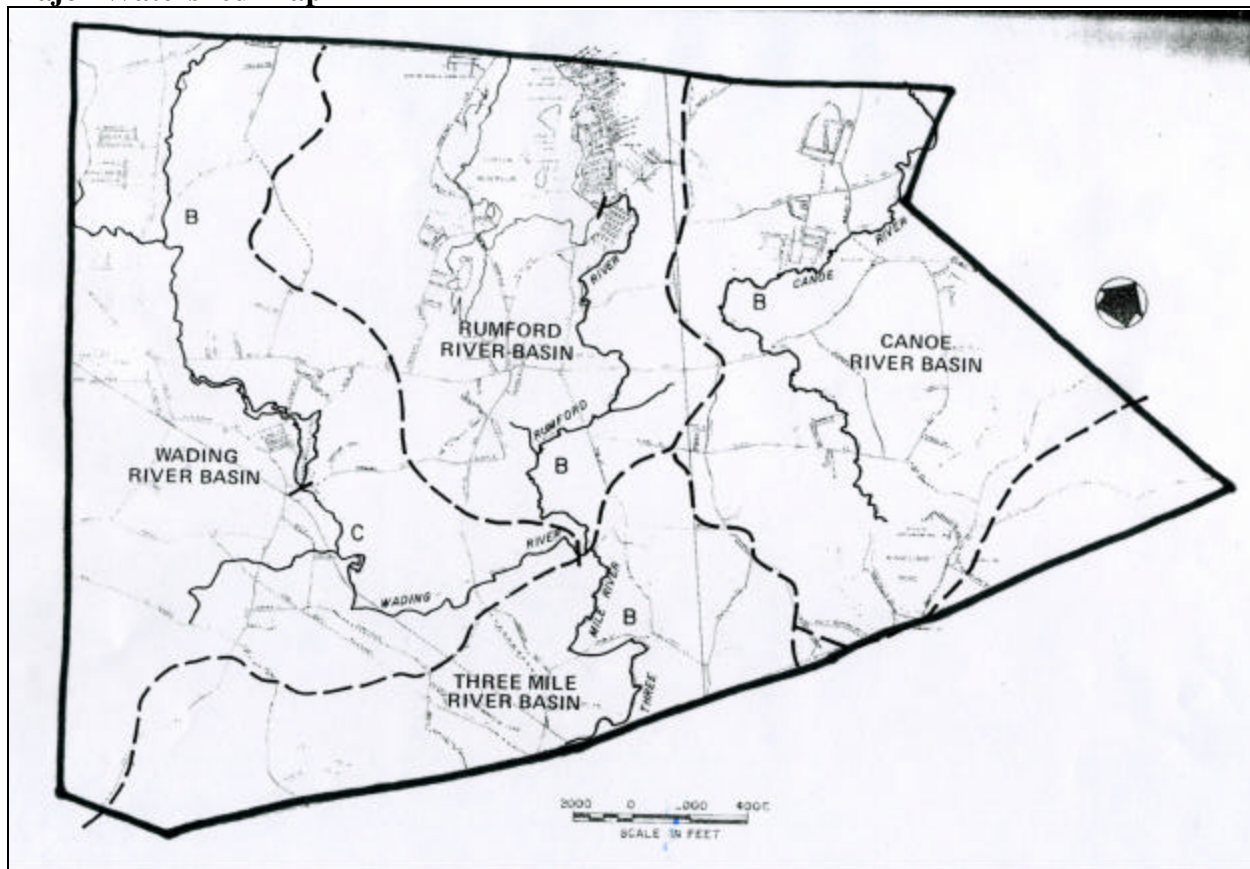
The Canoe River supplies most residents of the town with drinking water.

and the southern-central sections of Norton. The Wading River also originates in Mansfield and comprises the northwestern portion of town. The Three-Mile River comprises the southwestern, southern and southeastern portions of town beginning at the confluence of the Wading River and the Rumford River.

Watersheds are threatened by issues such as growing populations and increased residential development. Items of concern for these areas are overuse of our water supplies, pollution from widely dispersed sources like storm water runoff and failed septic systems. We, as a community need to work together to protect these precious areas. Support is needed to influence local decisions to guide future growth to less sensitive watershed areas and reduce the impact of non-point source pollution from existing development.

The public needs to be educated in ways to protect these watershed areas. Areas of education could include some of the following areas: Practicing water conservation, recycling waste, identifying and fixing polluted runoff due to construction, storm drains and septic systems and by being aware of oil, paint and solvent disposal.

Major Watershed Map



Major Surface Water (Creation, Size, Recreational Use) *Updated 2010*

Major Water Bodies (Creation, Size, Use)

Norton has abundant opportunities to enjoy the recreation of several lakes and ponds. The major water bodies are listed below. All water bodies are used recreationally for fishing, boating, skating, and canoeing. The islands on the Reservoir are used for camping as well. Meadowbrook Pond is privately owned and does not have access open to the public.

<u><i>Water Body</i></u>	<u><i>Creation/Origin</i></u>	<u><i>Acres under water</i></u>
Norton Reservoir and Islands	man-made dam-Rumford River	550+
Winnecunnet Pond	Natural Great Pond	143
Barrowsville Pond	man-made dam-Wading River	44
Chartley Pond	man-made dam-Chartley Brook	37
Meadowbrook Pond	man-made dam-Meadow Brook	13+/-

Norton Reservoir, located in Norton (525+ acres) and Mansfield (25 acres) is one of the largest dammed water bodies in southeastern Massachusetts. Despite its name, the Norton Reservoir is not a drinking water source. The damming of the Rumford River for private industrial waterpower and fire protection uses in the late 1860's created it. Sewage discharges from the old Mansfield sewage treatment plant (1938-1985), and septic discharges from shoreline cottages, degraded the water quality for recreational use. Some improvements have been made though; in 1991, 765 homes received town sewer. Known problems include shallow depth, excessive algal

presence, high-suspended solids and phosphorus concentrations, and non-point source nutrients from storm water runoff via Rt. 495.

For decades organized groups of residents and town officials tried to negotiate with the private owners, the Wading River Reservoir Corp., to sell the Reservoir to the Town of Norton so that the Reservoir could be restored for regional recreational use. In 1986, the residents of the Town of Norton approved the purchase of Norton Reservoir for \$2.1 million.



In 1989, the Conservation Commission was awarded a grant from the Mass. Department of Environmental Protection's Clean Lakes Program to conduct a Diagnostic and Feasibility (D & F) study of the dredging of the Reservoir. In 1990, the Commission received \$1 million

from the Mass. Division of Conservation Services' Self-Help Program for 50% reimbursement of the purchase price. Residents at the 1991 annual Town Meeting approved the use of \$92,210.00 of those funds to be expended on a D & F study of the water body. The report was completed in January 1994 and is available for public review in the Conservation Commission office at the Town Hall and the Norton Public Library. In 1994, a Department of Environmental Management (DEM) Small Lakes & Ponds Program matching grant was used to conduct a watershed management program in conjunction with the Towns of Sharon, Foxborough and Mansfield, within the Rumford River watershed.

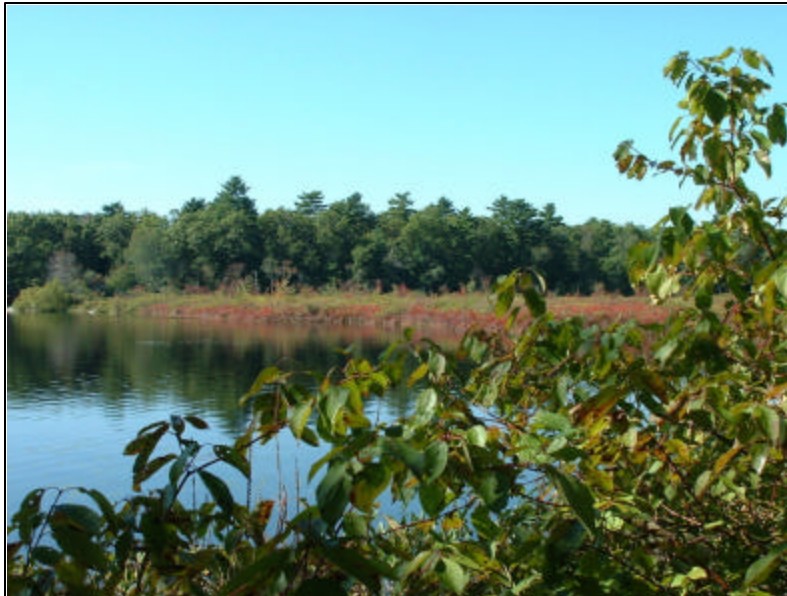
In 1996 the Conservation Commission contracted with a dredging consultant as part of the D & F Study recommendations, to design and permit a dredging project at the Norton Reservoir. In 1997 a Findings Report was issued. Due to the decreased potential for environmental damage, permitting requirements, and market factors (over a 13-15 year period) hydraulic dredging was the recommended dredging method. The draft *Environmental Impact Report* was completed in April of 1998, and later accepted as the Final Environmental Impact Report. This report is available for review at the Conservation office and Norton Public Library. The intent of these projects is to reduce the nutrients flowing into the Reservoir, and increase its depth by removing nutrient-laden muck and sand and gravel, thereby creating a clearer, more aesthetically appealing water resource for recreational activities and wildlife habitat.

In 2002, the wetland boundary was verified for the conservation property on Mansfield Avenue. This property was temporarily transferred to the Board of Selectmen for the duration of the dredging project to serve as the staging and processing area for the material dredged from the

Reservoir. The property will revert back to passive recreation and wildlife habitat uses under the management of the Conservation Commission at the completion of the project.

The Conservation Commission contracted the final design and permitting work to Baystate Environmental Services in 2006. We held a bidding conference in which ten interested companies attended. Unfortunately not one of them bid on the project. The Conservation Commission then requested assistance from Engineering & Management Services Inc. (EMS), an independent consultant. EMS evaluated the current proposal, sampling data, disposal/processing site and consulted with others on marketability of the sand and gravel to be removed. By May of 2007 it became apparent that the project was not economically feasible to conduct. EMS determined that the sand and gravel that was supposed to fund the hydraulic dredging activities was heavily composed of silt, so much silt that it is not economically feasible to sort the silt from the rest of the material. The difference in the cost to process the sand and gravel and the cost of hydraulic dredging is between \$23 million and \$30 million. Even factoring in a revised project scope, where the dredging would be confined to a smaller portion of the reservoir with higher quality sand and gravel the project costs would still have a deficit of \$19 million. In very simple terms the cost to dredge, as of 2007, would be \$10.00/yard and the value of the material, in 2007, was \$8.10/yard, at best. Therefore, the Norton Reservoir Dredging project is indefinitely on hold.

Winnecunnet Pond is a 148-acre natural Great Pond (Norton's only Great Pond), which suffers primarily from dense growth of *nuisance aquatic vegetation* in shoreline areas less than five feet



deep. The lake receives a relatively large loading of phosphorus, the critical nutrient of aquatic plants, from its largely wooded watershed (20,000 acres in extent). The soil types near the lake allow rapid leaching of phosphorus from septic system effluents from roughly 100 homes located on the shoreline.

A diagnostic study commissioned by the Norton Conservation Commission in 1988 recommended installing town sewer around the lake to control sources of nutrients and short-

term in-lake weed management to address the excessive density of weeds. The Town purchased an aquatic weed harvester in 1990, to be used where appropriate in Norton's lakes and ponds. Trained volunteers have selectively harvested aquatic vegetation from Lake Winnecunnet during the summer months since then.

The Lake Winnecunnet Association brought to the attention of the Conservation Commission that the weed harvester is not effective on the fanwort that is currently infesting the pond. As a result the Conservation Commission posted a Request for Qualifications to hire a consultant to

prepare a Diagnostic/Feasibility Plan for the lake. The consultant will conduct a biological survey of the lake and investigate the options for controlling the exotic, invasive plants. The master plan would also include maintenance of the lake once the invasive plants are removed and a management plan for recreational activities on the lake. This was completed in 2006 by Environmental Sciences Services (ESS). Funding for the final design and permitting for an invasive plant management plan was requested at the Fall Town Meeting of 2007. However, due to the economic climate, the town did not have the funds to pursue the project any further and the article was voted down.

Barrowsville Pond *contributed by Christopher Cox*

This pond is situated within the “Barrowsville” section of Norton and derives its name from the once prominent Barrows family that lived in the area. The pond, which comprises an area of 44



acres, was created to provide power to the several mills that were operated around that area during the industrial revolution in town. The pond is encompassed as part of the Wading River Watershed and though classified as “man made” some perennial water has always been present due to the flow of the Wading River. As part of the creation of Barrowsville Pond the water was dammed to control the outflow from the pond for power regulation and river floodplain management. Barrowsville Pond is situated 91 feet

above sea level within the Norton Quadrangle. The pond is owned by the Town of Norton Conservation Commission and is listed as a recreational water body. Though bounded on many sides by private property, there is some public access on Barrows Street and through Conservation Commission property on Power Street at the bridge. Barrowsville Pond is used recreationally for fishing, boating, skating, and canoeing. Water quality attainments and diagnostic studies for Barrowsville Pond were not available as of this writing pursuant to the U.S. Environmental Protection Agency 2002 Integrated Report Guidance information (2000 305(b) Lists/Assessments).

In 2008, the invasive plant called Water Chestnut was found covering Barrowsville Pond. The Open Space Committee performed a few work days to manually remove the plants before the spread as an emergency measure. Not long into the initial work day it was very obvious that the plant’s reach was extensive and would require a long-term plan.

In the Spring of 2008, Open Space Committee (OSC) members and Conservation Agent Jennifer Carlino observed Water Chestnut (*Trapa natans*) in the pond. Water chestnut is designated as an exotic, invasive plant by the IPANE (Invasive Plant Atlas of New England) project. Other invasive plants can also be found within Barrowsville Pond; however, they are perennial plants and would require extensive and costly plans to remove them from the pond. Variable water milfoil is one such plant that would require a drawdown of the pond, dredging, or a chemical treatment. The Town of Norton does not have the funds for permitting or implementation of such

a project. Water chestnut is an annual and while labor-intensive, it can be removed effectively without cost to the Town. At that time, water chestnut has not been located in any other waterbody in Norton. The OSC aims to prevent the spread of water chestnut to other waterbodies in Norton and to eradicate it from Barrowsville Pond.



Water chestnut plant



water chestnut seed

Due to the nature of the Water Chestnut plant, removal projects will require a timeframe of at least five years from the point of removing all plants from the pond and assumes that all plants can be removed from the pond annually within the five-year timeframe. Otherwise, the time commitment would be extended. The Open Space Committee then developed the Barrowsville Pond Water Chestnut Removal Plan and obtained an Order of Conditions from the Conservation Commission to legally remove the plant under the Wetland Protection Act. In 2008, the Open Space Committee conducted two work days and removed at least two small dumptruck loads of the plant. Plant material was composted at the Hill Street landfill. Four work days were completed in the summer of 2009 by open space committee members with the assistance from scouts, youth groups, local volunteers, B & B Landscaping and Dorrence Construction. This will remain an ongoing project.

Chartley Pond *contributed by Christopher Cox*

Located within the area known as “Chartley” this pond, like Barrowsville Pond, is classified as man-made. There has always been some water in the area because of Stony Brook which once traversed the area, where the pond is today. The name “Chartley” is attributed to the first iron forge, which was established in 1695 by the Leonard Family of Taunton. They called the forge “Chartley” after the area of Staffordshire England from which the Leonard family originated. The excavations for iron that were conducted created the pond itself, in the 17th & 18th centuries. The topography of the area including the



present pond is indicative of the large-scale excavations of the Leonard family. Chartley Pond constitutes approximately 37 acres and sits 103' above sea level within the Norton Quadrangle. Chartley Pond today makes up part of the Wading River Watershed and Narragansett Watershed. The Town of Norton Conservation Commission owns Chartley Pond and there is public access along West Main Street (Route 123 at the Conservation property) and South Worcester Street. Aside from the aesthetic value, the pond is used recreationally for fishing, boating, and skating. As of this writing, plans to clean up a 10-acre Superfund site proximal to the pond have been finalized. Refer to the section on Shpack for details. *Noxious aquatic plants* and *turbidity* make up the reported impairments for Chartley Pond (2002 U.S. EPA Listed Water Information). Water quality attainments and diagnostic data were not available as of this writing.

In 2010, reports of two water chestnut “patches” were submitted to the Conservation Commission. An immediate response plan will be created and hopefully the plants will be removed before they can establish a new site in town.

Meadowbrook Pond *contributed by Christopher Cox*

Comprising an area of approximately 13 acres, Meadowbrook Pond, like Chartley and Barrowsville, is classified as man-made. The pond is privately owned and there is no public



access. The pond is named for “Meadow Brook” which feeds the pond. Meadowbrook Pond was created by damming the brook to provide power for several mills, which operated in the middle 19th and early 20th centuries. One main “industry” established by the creation of the pond was ice harvesting. Ice was harvested and stored at Meadowbrook Pond from the 1880s to about 1941. Seven large ice houses were constructed and tracks from the nearby railroad line were constructed right to the pond and the ice houses. Water from Meadowbrook Pond was also used to irrigate nearby cranberry bogs. Meadow

Brook is fed by two smaller tributaries, one originating in the Cedar Swamp and another rising in the Seekonk Cedar Swamp. Noxious Aquatic Plants and Turbidity make up the reported impairments for Meadowbrook Pond (2000 U.S. EPA Listed Water Information).

Additional Resources on Major Waterbodies:

- History of the Town of Norton Bristol County, Massachusetts 1669-1859. George Faber Clark, Boston: Crosby, Nichols, and Company, George Clark. 1859.
- Massachusetts Department of Environmental Protection/ Environmental Analysis.
- U. S. Environmental Protection Agency. Watershed Assessment Tracking & Results.
- U. S. Environmental Protection Agency. Water Quality Attainments/ Impairments Lakes, Reservoirs, Ponds.
- Town of Norton Open Space and Recreation Plan. Norton Conservation Commission. July 2003, 2005-2010.
- Massachusetts Department of Environmental Protection. Priority Protection Areas. 1999.

Rivers

As described earlier in this Section, the Town of Norton owns the four major recreational water bodies in Town (excluding only Meadowbrook Pond). In addition, there are countless streams in Norton flowing either intermittently or perennially. The major waterways are described below.

<i>Waterways</i>	<i>Class</i>	<i>Origin</i>	<i>Public Access from the street</i>
Canoe River	n/a	Sharon	Red Mill Rd./Newland St./ Plain St.
Rumford River	n/a	Sharon	Reservoir St./East Main St.
Wading River	B	Mansfield	N. Worcester St./Barrows St.
Three-Mile River	B	Norton	Crane St.
Mulberry Meadow Brook	n/a	Easton	Plain St.
Tucker Brook		Easton	Johnson Acres (N. Washington St)
Crooked Meadow Brook		Norton	none
Birch Brook		Norton	none
Chartley Brook		Norton	none
Great Brook		Mansfield	Norton Historical Society land
Dora Brook	n/a	Norton	Water Department land, Pine St.

Aquifer Recharge Areas *contributed by Pat McLeod*

When a water-bearing rock readily transmits water to wells and springs, it is called an aquifer. Due to the glacial deposits within the Canoe River and Three-Mile River watershed, there are suitable soils that act as aquifers and their associated recharge areas. The stratified drift along both of these rivers provides the storage capacity for our municipal drinking water wells. Water is stored within the spaces between the sands and gravels and made available by pumping the water into our town wells. Major aquifer recharge areas are found along the Canoe River and its tributaries and along the Three-Mile River. Aquifer recharge areas are protected by our Water Resource Protection District bylaw. These areas are irreplaceable being that less than 1% of all the earth's water is available to humans for direct consumption.

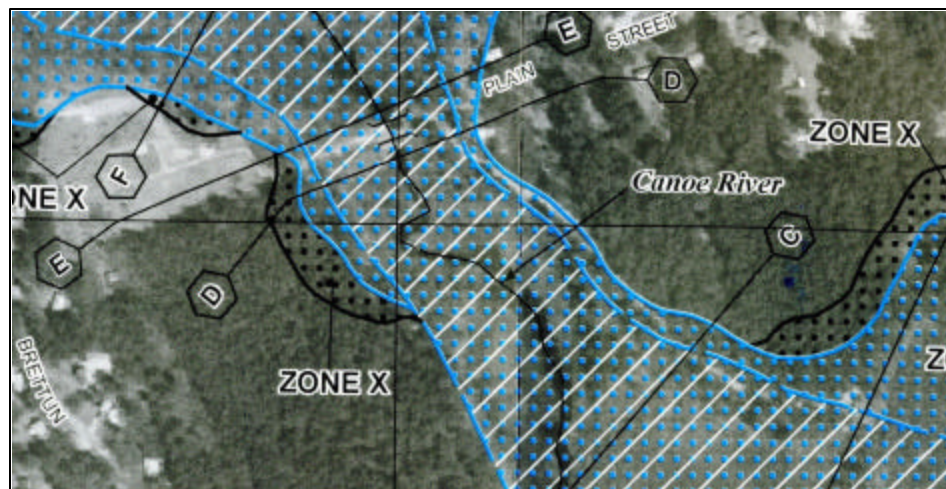
The Canoe River Aquifer Advisory Committee (CRAAC) successfully petitioned the U.S. EPA and in 1993 the Canoe River Aquifer was designated as a Sole Source Aquifer. The designation essentially means that the Towns using the water from the Aquifer cannot supplement their needs from any other aquifer source. Since its inception, the Committee has fostered both an appreciation for the Canoe River and raised the awareness of its relationship to ground water protection for the region. Aquifer recharge areas are shown on the Water Resources Map at the end of this section.

Flood Hazard Areas *updated 2010*

Floodplains are relatively flat areas adjacent to rivers, streams and large bodies of water in Norton. When rain causes a river to swell and overflow its banks, the floodwaters spill onto the floodplain. The high velocity of flood water, the long duration of the flood, and debris in the water (rocks, sediments, trees, lumber, etc.) can cause severe damage to life and property. The floodplain acts as a buffer to damage done by storms. A floodplain's natural function is to receive floodwater and disperse its energy. The 100-year floodplain is the adjacent land that would be covered by water when a river overtops its banks during a storm with 7" or more of rain in 24 hours. The 100-year floodplain designation is a percentage; it does not mean that a storm of that size only happens once every 100 years. The 100-year floodplain actually means

that there is a 1% or greater chance of being flooded in any given year. Flood damage is not usually covered by standard homeowner's insurance and anyone living within a flood hazard area should review his or her policy. Flood insurance is available to residents in most Massachusetts cities and towns. Before flood insurance policies can be sold to residents in a community, that town must adopt a protective floodplain bylaw that is consistent with requirements put forth by the Federal Emergency Management Agency (FEMA). The Town of Norton's *Floodplain Protection District* Zoning Bylaw meets these requirements. FEMA provides Flood Insurance Rate Maps (FIRM) that show the locations of the floodplain in each community. In Norton, Special Flood Hazard Areas (100-year floodplain) are located adjacent to the Wading, Rumford, Three-mile and Canoe Rivers around Lake Winnecunnet and in other areas. The National Flood Insurance Program (NFIP) is a federal program enabling property owners to purchase insurance protection against losses from flooding. A flood insurance policy may be purchased from any licensed property insurance agent or broker in good standing. Property owners can insure their buildings and contents, and renters can insure their possessions. The staff in the Conservation office at the Norton Town Hall provides map determinations for persons who would like to know whether their property is located in a Special Flood Hazard Area. The staff voluntarily participates in FEMA's Community Rating System program that enables Norton property owners to receive a 5% reduction on their flood insurance premiums.

At the June 2009 Town Meeting, residents were asked to adopt the revised Floodplain Protection District bylaw. The bylaw is essentially the same as the existing bylaw but incorporates FEMA's latest Flood Insurance Rate Maps (left). These maps are effective as of July 1,



2009. The most recent maps were revised on a county-wide survey rather than a town-wide review. This revision also changed the datum on which the maps were based, resulting in a one-foot lowering of the base flood elevation in some locations. Maps were updated to an aerial photo base map rather than a street map. Residents may be able to locate their actual homes with this new map.

A property owner must comply with the laws and regulations that are in effect, both statewide and locally, for Special Flood Hazard Areas. This applies to new structures, existing structures that are to be improved and certain alterations to the land surface. The Planning Board administers the local Floodplain Protection District Zoning Bylaw, the Conservation Commission administers the Massachusetts Wetlands Protection Act and Regulations (which has jurisdiction over activities proposed within the 100-year floodplain), and the local Building Inspector administers the state building codes. Anyone living within the floodplain area should check with the local Town Planner, Conservation Agent and Building Inspector to determine if

permits are needed prior to constructing any type of building, including sheds, or doing any landscaping requiring regrading.

Wetlands *contributed in 2010*

It is estimated that over 50% of the Town of Norton contain *wetlands*. Therefore, of the 29.4 sq. miles, or 18,816 acres, there are 14.7 sq. miles, or 9,408 acres of wetlands. Wetlands are identified by the plant community (hydrophytic plants), soil composition (hydric soils) and the water regime (hydrology). A botanist, soil scientist, or a wetland scientist identifies the plants, soil, and source of water in order to locate the wetland boundary. The Massachusetts Wetland Protection Act (Chapter 131, Section 40) and its implementing Regulations (310CMR10.00) specifically detail how a wetland is defined and delineated. Any project proposed within 100 feet of a wetland must obtain a wetland permit from the Conservation Commission before the project is started. The Conservation Commission is a volunteer board of concerned residents who administer the Wetland Protection Act and Regulations. The Conservation Commission also has the ability to propose wetland bylaws under a Home Rule Petition. The Commission may submit the wetland bylaw for approval at town meeting. The Conservation Commission reviews all applications, may conduct site inspections and approve or deny projects based upon whether the project meets the regulations. In addition to administering the wetlands laws, they manage protected property. So it is important to know where the wetlands are located and why they are important. Wetlands are protected within the Wetland Protection Act through the Regulations for a number of reasons, known as the eight statutory interests of the Act. These statutory interests describe the important functions that wetlands provide and include the following:

Ground Water Supply

While vegetated wetlands aid in maintaining the base flow levels in rivers and streams, they also filter and clean rainwater as it percolates into the groundwater.

Public and Private Water Supply

Similar to the protection wetlands provide to ground water supply, wetlands protect our public and private drinking water wells. It is the groundwater that is pumped from aquifers and used as water sources.



Wildlife Habitat

The hydrologic regime, plant communities, soils, topography and water chemistry of vegetated wetlands provide food, shelter, migration routes, overwintering areas and breeding areas for many birds, mammals, insects, amphibians and reptiles. Thirty-five percent of plants and animals that are listed as endangered or threatened in the United States live in wetlands or depend upon them for survival.

Fisheries

Vegetated wetlands provide habitat for insects, which are an important source of food for fish. Some types of wetlands are large enough and contain water long enough to support fish populations. Fish, in turn, are an important source of food for reptiles, amphibians, small mammals and birds.

Pollution Control

Vegetated wetlands filter the sediments, nutrients (such as nitrogen and phosphorus) and toxic substances (such as heavy metals) that are found in storm water. After being filtered through the wetlands, the water is considered clean.

Flood Control

Vegetated wetlands act like sponges and temporarily store floodwater. Water from streams, rivers and lakes flow over their banks and spill into the wetland and floodplain. Some of this water evaporates, some of this water percolates into the ground and recharges the aquifer, and some of the water is slowly released downstream.

Storm Damage Prevention

The reduction of the quantity and intensity of the flow of floodwater reduces damage to private and public property. Wetland vegetation also slows the flow of water and traps branches flowing through a stream that could damage property.

Another unregulated benefit of wetlands is passive recreation. Vegetated wetlands provide important areas for hunting, nature study, photography, wildlife tracking and bird watching.

Water Conservation *contributed by Pat McLeod*

Water is a limited resource. Water use does not have to come at the expenses of our water supplies and wildlife. Foresight and cooperation between the water department and homeowners can help prevent shortages. Care should be taken to minimize its use and conserve our supplies. As we continue to lose open space due to development we are going to be faced with the question of where to get water for human use and ecosystem sustainability. The public should be made aware of some of the following simple procedures that can be taken to help conserve water:

- During the summer people need to be particularly careful of their overuse of water when caring for their lawns or gardens, watering gently, allowing the water to soak in and watering before 9 am or after 9 pm to avoid evaporation.
- People with wells need to be reminded that although they would not be affected by a town water ban they are drawing their water from our river and stream water supplies. They should also cut back when using their wells during the dry seasons.
- Be aware of the loss of water through a leaking faucet.
- Purchase an inexpensive rain gauge to measure rain and water levels and water only when absolutely necessary.
- Plant low water plants

- Wash only full loads of dishes and laundry.

Planting a xeroscape garden is another way that residents can conserve water. The Canoe River Aquifer



Advisory Committee initiated a project in 2000 that included a water conservation and lawn care seminar and construction of a xeroscape garden. Mike Walsh of Horticultural Concepts spoke to attendees about the importance of using compost as a soil amendment, using drought resistant plants and ensuring proper connections for irrigation systems as part of a landscaping project. The Canoe River Aquifer Advisory Committee received a grant from the Riverways Program to host the seminar and to demonstrate concepts of the seminar in a xeroscape garden. The Trinitarian Congregational Church on the corner of East Main Street and Pine Street in Norton was chosen as the site for the demonstration garden. Cindy

Gouviea and members of the church teamed with local agricultural and landscaping companies like Bakers Landscaping, the Newland Street Farm and Karen Taylor to obtain materials for the project. The garden is open to residents and well worth the trip to see all of the flowers in bloom.

