A STEWARDSHIP PLAN
for

The Three Mile River Watershed Area of Critical Environmental Concern

in the Towns of Norton and Dighton and the City of Taunton

Gertrude M. Boyden Wildlife Sanctuary

Prepared by the Three Mile River ACEC Stewardship Committee
September 2011

The Sacred Land

Donna Desrosiers (Spirit Fox) and
Roger Desrosiers (Gray Fox)

Native People consider the Land "sacred" for many reasons. First and foremost, Mother Earth and the Creator took care of them. Their ancestors lived on the land for 7,000 – 9,000 years in various locations throughout the Taunton River Watershed. Real people – families – mothers, fathers, and children, just like you and me, got up everyday and lived upon these shores. They too had hopes and dreams, happy and sad times. It is only time that separates us.

Although their campfires have gone out and their wetus (domed huts) have turned to dust, the evidence of their existence is still felt deep in the land. You cannot see the wind, but you can certainly feel it. Close your eyes and let your imagination work – what was it like for the Native Peoples? Only Nature! No fences, no concrete, no noise, no pollution, only a thriving civilization, living along the shores of the river.

Celebrations, feasts, weddings, and trading of goods, all took place here. The Native Peoples hunted, fished, and planted the fields with Corn, Beans, and Squash (The Three Sisters). Children were born here, grew up, and became adults, while learning, laughing, working, playing, loving, and crying. Family ties and traditions were strong and they had their own form of government. It was only their clothing, life-style, religious beliefs, and language that made them "different". They were merely people, just like us.

This Land still holds many of their secrets, and it should stay that way. The Sacred Land holds their stories to share with generations that follow. What if, thousands of years from now, our present civilization was only remembered for those things that "stood the test of time?" Wouldn't you still want your bones to rest in peace?

By preserving this river and its shoreline, we honor the Land, and its future will now be very different.

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About the Three Mile River Watershed

The Three Mile River flows approximately eight miles in a southwest direction from the confluence of the Rumford and Wading rivers in the Town of Norton, through the City of Taunton and the Town of Dighton, where it converges with the Taunton River. The Three Mile River watershed is rich in history, biology, scenery and recreation, fisheries and agriculture.

The native people, who have lived in the Three Mile River Watershed for the past twelve thousand years, are called "Wampanoag" which means "Eastern People" or "People of the First Light". They called the Three Mile River "Nistoquahannock", believed to mean "Little River". The abundant natural resources, fisheries, wildlife and waterways nurtured a people who depended upon "Mother Earth" for their well-being.

The discovery of "bog iron" and the abundance of rich, fertile farmland drew the attention of colonial leaders to the Three Mile River basin. The River provided a source of waterpower for generations of local industries, fueling the growth of economic opportunities and attracting waves of immigrants to the region in search of employment.

The natural communities associated with the Three Mile River Watershed also make it a special place. The banks of the Three Mile, by their geologic origin and design, make ideal homes for numerous plants and animals, some of which are rare species. The vast unaltered floodplain along the river, including a rare, intact Silver Maple Floodplain Forest, is the preferred breeding habitat for many of these animals. Due to the watershed's present condition (somewhat limited development), water that flows in the river is of generally good quality and supports a diversity of aquatic life and wildlife.

Perhaps the most important feature of the Three Mile River Watershed is its function. Draining from the Rumford and Wading River Watersheds to the Taunton River, the Three Mile River is a critical link between a state designated ACEC (the Three Mile River ACEC), a federally designated Wild & Scenic River (the Taunton River), and a federally recognized estuary and embayment (Narragansett Bay).

About the Three Mile River Stewardship Committee

In 2000, the "Three Mile River Area of Environmental Concern (ACEC) Study Committee" was appointed by the Taunton City Council in order to research human impact upon and resource protection needs within the Three Mile River Watershed. Over the years, the Committee gained delegates from the Towns of Norton and Dighton as well as an appointee from the Southeastern Regional Planning and Economic Development District (SRPEDD). The Committee has held fifty-five (55) open meetings between November of 2001 and April of 2011, including meetings with the Taunton City Council, the Dighton Board of Selectmen, the Norton Board of Selectmen (all of which were on local cable television), and three regional meetings at agreed upon central locations (two at the Freidman School near the Taunton/Norton municipal boundary, and one at the Dighton Inter-tribal Council building). The Committee also sponsored canoe trips on the Three Mile River, including one for the public and state ACEC staff in August of 2005.

In order to promote public awareness of the resources of the Three Mile River Watershed, The Committee developed an informational pamphlet (with a print run of 1,000), a website (threemileriver.org), and hosted three additional canoe floats and three nature walks (all open to the public). Committee members have participated in the Taunton River Wild & Scenic River Stewardship Council since 2001 and contributed to the Taunton River Stewardship Plan, which was published in July 2005 (and serves as the stewardship guidance document for the federally designated Taunton Wild & Scenic River).

Since the Committee began its work over a decade ago, there has been a more concerted effort within the Three Mile River Watershed to map and certify vernal pools, conduct rare species surveys, continue archaeological studies, help to restore the anadromous fishery, and acquire open space. Through these efforts, the Three Mile River Stewardship Committee has developed valued partnerships with the Nature Conservancy, the Taunton River Watershed Alliance, the state's Division of Ecological Restoration (DER), the DCR Preservation Planner/Heritage Landscape Inventory Program, National Park Service, and several other organizations and agencies.

The Three Mile River Stewardship Committee will continue its work on behalf of the Three Mile River and its watershed, in perpetuity, as is consistent with the recommendations of the Three Mile River Stewardship Plan.

Since 2001, the Three Mile River Stewardship Committee has included: Maryan Nowak, Cathal O'Brien, Jim Rusconi, Charles Crowley (Taunton); Jennifer Carlino, Deb Levesque, Jon Kitchen, Jim Hendrickson, Michelle Simoneaux (Norton); Lisa Caledonia (Dighton); Roger and Donna Desrosiers (Dighton Inter-Tribal Indian Council); Carolyn LeMarre (TRWA); Maisy McDarby, Karen Porter, Nancy Durfee, Bill Napolitano (SRPEDD), as well as many student and community volunteers.

Three Mile River ACEC Designation and Boundary Description

Announcement of Three Mile River Watershed ACEC Designation

On August 25, 2008 Secretary Ian A. Bowles designated the Three Mile River Watershed Area of Critical Environmental Concern (ACEC). The ACEC covers approximately 14,275 acres in Dighton, Norton, and Taunton in southeastern Massachusetts.

The effective date of the designation is August 27, 2008, the date of publication of this issue of *The Environmental Monitor*, in accordance with 301 C.M.R. 12.11.

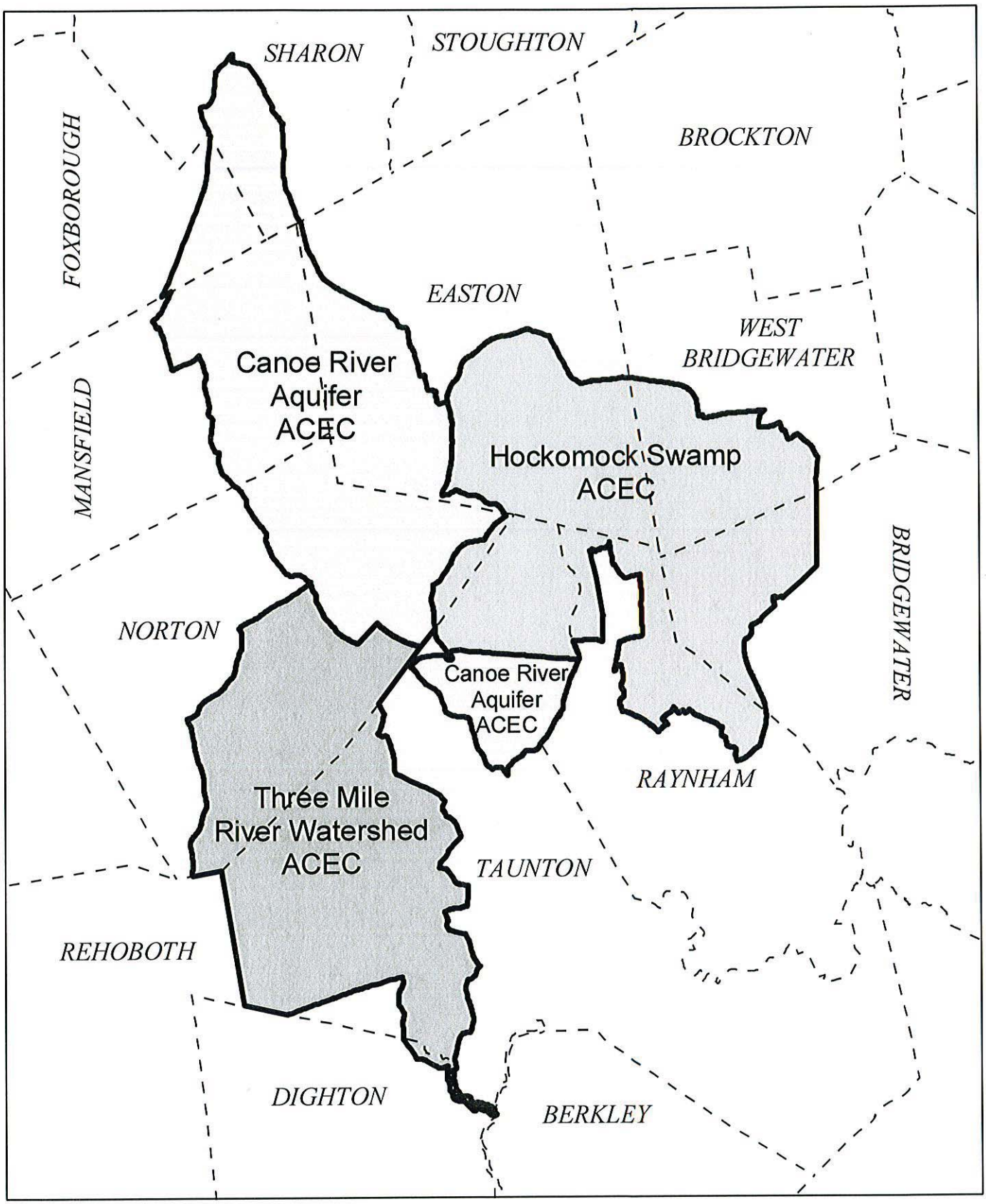
The newest ACEC increases the total number of Areas of Critical Environmental Concern throughout the Commonwealth to 29. The combined acreage statewide is now 255,275 acres in 74 communities.

This announcement includes the following documents:

- Three Mile River Watershed ACEC designation document,
- Three Mile River Watershed ACEC boundary map, and
- Regional ACEC map for Three Mile River Watershed ACEC, including adjacent Canoe River Aquifer ACEC and Hockomock Swamp ACEC, designated in 1991 and 1990 respectively.

The digital ACEC boundary will be available via the online mapping tools:
for ACECs at http://maps.massgis.state.ma.us/acecs/pages/main.jsp, and
for "Oliver," an interactive online data viewer, at
http://maps.massgis.state.ma.us/massgis_viewer/index.htm, and
in the ACEC data layer that can be downloaded from the MassGIS web site at
http://www.mass.gov/mgis/acecs.htm

For further information, please contact:
Elizabeth Sorenson at (617) 626-1394 or Elizabeth.Sorenson@state.ma.us
Please also visit the ACEC Program website for updates:
http://www.mass.gov/dcr/stewardship/acec/index.htm.



dcr
Massachusetts

Areas of Critical Environmental Concern Program

http://www.mass.gov/dcr/stewardship/acec/

Three Mile River Watershed ACEC

Designated: August 25, 2008

Acreage: 14275 acres
Dighton: 125 acres
Norton: 5400 acres
Taunton: 8750 acres

Massachusetts Department of Conservation and Recreation

Areas of Critical Environmental Concern (ACEC) Program

This map is intended to be used with the written boundary description contained in the ACEC designation document. The mapped boundary is not to be used by itself for definitive ACEC boundary delineation or regulatory interpretation. For review of site-specific projects within the ACEC boundary, determinations may need to be made in the field or in consultation with ACEC Program Staff.

For more information:
www.mass.gov/dcr/stewardship/acec

ACEC Boundaries by Type

- Road/Rail based
- River based
- Wetland based
- Floodplain based
- Tide based
- Contour based
- Political boundary
- Property line based
- Other
- Digital update required

Areas not within this ACEC are shaded with a gray mask.

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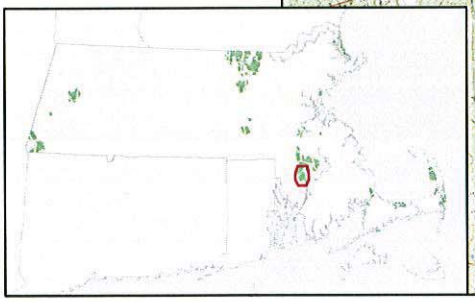
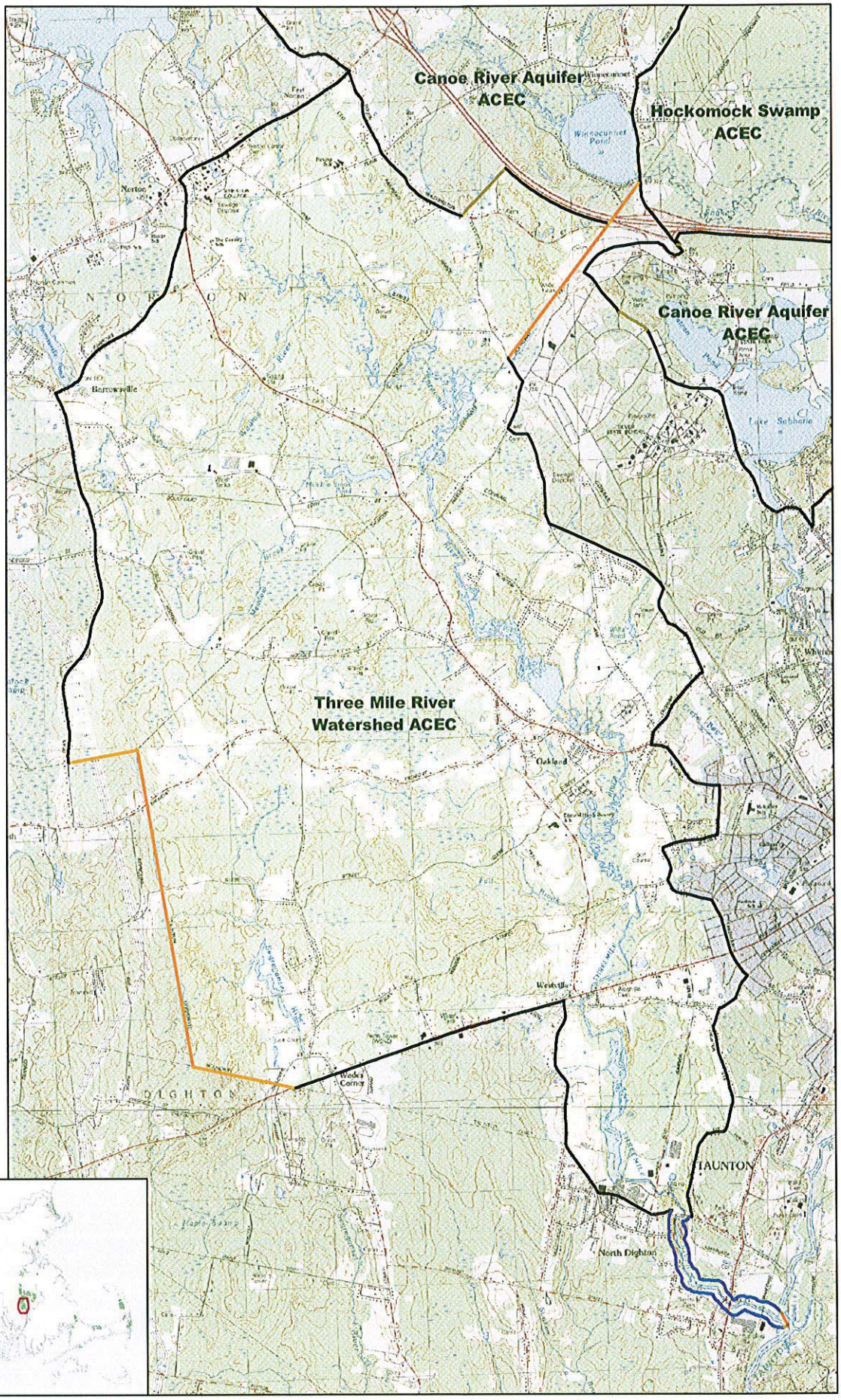




Final ACEC Boundary Description

The final boundary is shown on the attached map developed using MassGIS data layers derived from the following Massachusetts (single quadrangle) United States Geological Survey (USGS) 7.5 minute series, 1:25,000-scale metric topographic quadrangle maps: Assonet (1985), Dighton (1985), Norton (1987), and Taunton (1987). An official map and supplemental maps are on file at the ACEC Program office at the DCR Bureau of Planning and Resource Protection.

The USGS map is supplemented by the following maps:

> the Official Zoning Map of the Town of Norton, dated May 2, 1988 and the Town of Norton Assessors Map 24, dated July 7, 1989, showing the ACEC boundary as it runs along the boundary of the residential/agriculture and commercial zones delineated at that time between South Washington Street and Interstate 495 in Norton, and coincident with the Canoe River Aquifer ACEC boundary designated June 10, 1991.

Boundary Description of the Three Mile River Watershed ACEC

Specifically, the boundary of the ACEC is defined as follows (moving in a clockwise direction from the south):

Road	1. Commencing in the southern region of the ACEC, near the Dighton-Taunton corporate boundary at the intersection of Forest and Summer Streets in **Dighton** and following Forest Street northerly and along its continuation as South Walker Street in **Taunton** northerly to Winthrop Street (Route 44);
Road	2. Thence westerly along Winthrop Street (Route 44) to the Taunton-Dighton corporate boundary;
Municipal Line	3. Thence westerly along the Taunton-Dighton corporate boundary to the Rehoboth-Taunton corporate boundary;
Municipal Line	4. Thence northerly along the Rehoboth-Taunton corporate boundary to the Norton-Rehoboth corporate boundary;
Municipal Line	5. Thence westerly along the Norton-Rehoboth corporate boundary to its intersection with Dean Street in **Norton**;
Road	6. Thence northerly along Dean Street to its intersection with Barrows Street and South Worcester Street;
Road	7. Thence northeasterly along Barrows Street to Summer Street;
Road	8. Thence northeasterly along Summer Street to Taunton Avenue (Route 140);
Road	9. Thence northerly along Taunton Avenue (Route 140) to East Main Street (Route 123);
Road	10. Thence easterly along East Main Street (Route 123) to the intersection with South Washington Street;

Road	11. Thence following South Washington Street (where the boundary is coincident with the Canoe River Aquifer ACEC boundary) in a southeasterly direction to a point, west of the intersection of South Washington and Hill Streets, shown on the Official Zoning Map of the Town of Norton (1972, revised May 2, 1988), demarcating commercial and residential zones at the time of the Canoe River Aquifer ACEC designation in 1991;
Connecting Line	12. Thence following from that point along that zoning line beginning at South Washington Street, extending in a northeasterly direction approximately 62 feet coincident with the intersection of parcels 22 and 23, Norton Assessors Map 24, and extending in a direct line along the zoning line approximately 2,438 feet to Interstate Route 495 (I-495), again coincident with the Canoe River Aquifer ACEC;
Road	13. Thence southeasterly along I-495 to the Norton-Taunton corporate boundary (still coincident with the Canoe River Aquifer ACEC);
Municipal Line	14. Thence following the Norton-Taunton corporate boundary in a southwesterly direction to the intersection with Hill Street;
Road	15. Thence southeasterly along Hill Street in **Taunton** to Crane Avenue South;
Road	16. Thence along Crane Avenue South in a southerly and southeasterly direction to the northern Right-of-Way of the CSX railroad line;
Railroad	17. Thence southeasterly along the CSX railroad line to its intersection with Fremont Street;
Road	18. Thence south and southeasterly along Fremont Street to Dunbar Street;
Road	19. Thence southwesterly along Dunbar Street to Norton Avenue;
Road	20. Thence southerly along Norton Avenue to Tremont Street (Route 140);
Road	21. Thence southeasterly along Tremont Street (Route 140) to Anawan Street;
Road	22. Thence southerly along Anawan Street to Shores Street;
Road	23. Thence westerly and southerly along Shores Street to Highland Street;
Road	24. Thence southeasterly along Highland Street, crossing Winthrop Street (Route 44), continuing on Highland Street to Cohannet Street;
Road	25. Thence southwesterly along Cohannet Street to Dighton Road;
Road	26. Thence southwesterly along Dighton Road to Dighton Avenue;
Road	27. Thence southerly along Dighton Avenue to South Street/Railroad Avenue;
Road	28. Thence westerly along South Street to the intersection with the 200-foot jurisdictional Riverfront Area along the eastern bank of the Three Mile River;
200-ft Riverfront Area	29. Thence southeasterly along the Riverfront Area on the eastern and northern banks of the Three Mile River and continuing along the same line following 200 feet from the mean annual high-water line of the Three Mile River to a point on the western bank of the Taunton River at the confluence of the Three Mile River with the Taunton River;

Connecting Line	30. Thence continuing along the arc of the same line in an extension to its intersection with the Taunton-Berkley corporate boundary at the center of the Taunton River;
Municipal Line	31. Thence following the Taunton-Berkley corporate boundary in a southerly direction to the point of intersection of the Taunton/Dighton/Berkley corporate boundaries;
Connecting Line	32. Thence following a line from that point to the closest point on the western bank of the Taunton River and continuing along that line to its intersection with the Riverfront Area along the bank at the confluence of the Three Mile River with the Taunton River in **Dighton**;
200-ft Riverfront Area	33. Thence northwesterly along the Riverfront Area along the southern and western banks of the Three Mile River to Spring Street;
Road	34. Thence westerly along Spring Street to Summer Street;
Road	35. Thence northwesterly along Summer Street to its intersection with Forest Street and the point of beginning thus completing the boundary of the Three Mile River Watershed ACEC.

Unless otherwise specified, the boundary described above extends to and includes the entire width of the rights-of-way of public and private streets, roads and highways, and other rights-of-way such as railroads and utility easements.

I. STEWARDSHIP

STEWARDSHIP

The Need for Stewardship in the Three Mile River Watershed

The uniqueness of the Three Mile River Watershed was probably best summed up by The Nature Conservancy (TNC) in their 2004 Taunton River Conservation Area Plan. TNC looked at the North Atlantic Coast (NAC) ecoregion of the Continental United States, which encompasses the coastal areas of nine states from Delaware to Maine, during their NAC aquatic ecoregional planning process. The Taunton River and six of its significant tributary streams, including the Three Mile River, were chosen by TNC for their remarkable intact and functional condition and concentration of ecoregionally significant species and natural communities. TNC's ecoregional plans identify "portfolio sites" that need to be protected in order to conserve the native biodiversity of the region, for their regional, national, and global significance.

In the course of their analysis of the Taunton River Basin, the TNC has also cited the unique, high quality examples of brackish and freshwater marsh communities in the Lower Three Mile River. Both of these types of communities are globally rare and are associated with the presence of rare species. The Upper Three Mile River is home to another globally rare community, "a silver maple floodplain forest of outstanding size and quality."

Alison Bowden, Aquatic Ecologist with TNC in the Northeast Region, in discussing the Three Mile River Watershed and proposed ACEC area with the Taunton River Stewardship Council, stated that,

"...due to the ecological importance and sensitivity of this resource, this unique river deserves the highest level of protection."

This statement was also repeated in a letter of support from Alison, on behalf of TNC, for the Three Mile River ACEC, and was included in the ACEC nomination package.

Stewardship Efforts to Date

The application for federal designation of the Taunton River as Wild & Scenic, with the accompanying Stewardship Plan, was a first step in bringing together a regional grassroots coalition focused on stewardship of the Taunton River and its significant tributaries. The petition to the Commonwealth of Massachusetts to recognize the Three Mile River Watershed as an Area of Critical Environmental Concern is another step, with a more localized stewardship focus for the Three Mile River's host communities. Both of these efforts (carried out since 1999 and 2002, and realized in 2009 and 2008, respectively) speak to the persistence and commitment of these community volunteers to protect and preserve these outstanding cultural and natural resources.

Taunton, Norton, and Dighton, have all done what they could do within their respective means, to promote local awareness and stewardship within the Three Mile River Watershed. All three have completed updated Open Space and Recreation Plans. The City of Taunton has applied for and received state Division of Conservation Services (DCS) funding, to supplement municipal funding, in order to purchase additional land adjacent to the Boyden Wildlife Sanctuary and other municipally owned land within the Three Mile River Watershed (the City has secured over 1000 acres in total in the Three Mile River Watershed over the years). Taunton's most recent effort was a partnership with the Trustees of Reservations, The Nature Conservancy, and DCS, to preserve 54 acres of land on North Walker Street along the Three Mile River (the area is now known as the Westville Conservation Area).

The Town of Norton has also worked with DCS, and the Canoe River Aquifer Advisory Committee, to secure greenway land along the rivers throughout town, connecting municipally owned land, wherever and whenever possible, in the process. Jennifer Carlino, Conservation Agent for the Town of Norton, has led a concerted effort to document the natural resources, biodiversity, and unique habitats of the town. Jennifer has also led local efforts to document and state-certify vernal pools, and rid local waterbodies of aquatic invasives.

The Town of Dighton, under the direction of former Conservation Agent Lisa Caledonia, successfully petitioned the General Court in 2004 to allow "funds collected as rollback or conveyance or forest product taxes or penalties, pursuant to General Laws Chapter 61, 61A, and 61B, to be placed in a Conservation Fund to be disbursed under the direction of the Conservation Commission for the purpose of providing funds for the acquisition and management of properties for conservation purposes; or on anything relative thereto."

Though quite different in size, demographics and profile, the three municipalities have been in total agreement about the outstanding resource value of the Three Mile River Watershed. The chief elected officials in each municipality have given their enthusiastic support to the Three Mile ACEC, both at public presentations and in writing.

The ongoing work of the local Conservation Agents in each municipality, in conducting field investigations, leading nature walks and organizing canoe trips, also shows the support and commitment of local government to the Three Mile River ACEC.

Looking Ahead: Short-term, Long-term, and Priority Recommendations

The work of the Three Mile River ACEC Stewardship Committee has also involved partnerships with several local, regional and national conservation organizations, including: The Nature Conservancy, the Taunton River Watershed Alliance, The Trustees of Reservations, the Taunton River Stewardship Council, The Wildlands Trust, Mass Audubon, Save the Bay, MA Division of Ecological Restoration, MA Fish & Wildlife, MA Department of Conservation and Recreation, and Southeastern Regional Planning and Economic Development District (SRPEDD). Collectively, the work of these

conservation partners within the Taunton River Watershed and its sub-watersheds focuses on:

1. **Increasing public understanding of the cultural and natural resources of the watershed;**
2. **Creating a supportive climate for continued conservation projects, both in the public sector and with willing landowners, including ongoing efforts to improve fish passage, and;**
3. **Encouraging a higher degree of cooperation and coordination among decision makers in the watershed to improve stormwater management, public water supply management, and maintaining minimum stream flow for the overall health of the watershed.**

The investment of these partners and others, such as the USDA, has included active participation in Three Mile River Stewardship Committee meetings when requested. In an effort to learn more about the significant resources of the Three Mile River Watershed, the Three Mile River Stewardship Committee invited members of the above mentioned agencies and organizations to regularly scheduled meetings in order to discuss history, agriculture, fisheries, ecological restoration, natural resource protection and climate change. These topical meetings yielded the priority recommendations that appear at the end of each narrative section summarizing the outstanding resources of the Three Mile River ACEC (i.e.- Habitat, Agriculture, History, etc.).

In addition to the priority recommendations resulting from regular meetings of the Three Mile River Stewardship Committee, the Taunton River Stewardship Council (the group charged with the oversight of the Wild & Scenic Taunton River and implementation of the Taunton River Stewardship Plan), contributed stewardship recommendations for the short and long-term care of the Three Mile River. The Three Mile River is a featured tributary in the Taunton River Stewardship Plan.

TAUNTON RIVER STEWARDSHIP COUNCIL
RECOMMENDATIONS FOR ACTION
To Compliment the Taunton River Stewardship Plan
Based on ongoing Shoreline Surveys

Reporting: Share information about problems with town and city officials and support actions to solve these problems.
Short-Term Action: Suggestions for work that can be accomplished in a few months. Some of these proposals may be part of Long-Term Actions.
Long-Term Action: Suggestions for long-term activities. These activities can be seen as the glue that holds the Stream Team together. They are the major issues that the Stream Team chooses to work on to protect and restore the stream and its resources.

A. Access and Recreation

Short-Term Actions

1. Evaluate the adequacy of public access to the Three Mile River throughout the watershed, including alternatives for parking.
2. Evaluate cutting sections of downed trees, assess extent and difficulty of removal and prepare a request for determination of applicability for the Conservation Commission.
3. Investigate the rapids below Route 44 for improvement of recreational canoe passage at old dam site.
4. Place a floating barrier across the Mount Hope Dam and/or create signage to warn canoeists of the danger.
5. Follow-up on plans to create an access site at Warner Blvd near the Mount Hope dam. This could allow paddlers to paddle up river from the dam.

Long Term Actions

6. Evaluate canoe passage and access along the upper river.
7. Create signage at bridge crossings identifying the river.
8. Create signage identifying historic sites, including mills and other socially and culturally significant structures; also refer to the DCR Heritage Landscape Inventories conducted for Taunton, Norton and Dighton.

B. Education and Outreach

Short Term Actions

1. Provide landowner education about best management practices on residential property including maintenance of septic systems, fertilizer and pesticide use.
2. Educate business owners near Routes 44 and 140 about management of their property along the river.

3. Use public access cable to promote stewardship of the Three Mile Watershed and to disseminate educational information for residents.

Long Term Actions

1. Promote awareness of the rare and special resources of the Three Mile River within the Area of Critical Environmental Concern.
2. Provide ongoing public education about various watershed and land use issues.
3. Use local watershed issues in school curricula and create a traveling educational show about the Taunton River Watershed and its major sub-watersheds for school groups.
4. Make experts on Taunton River issues available to High Schools for special projects.
5. Place signage at road crossings identifying the Three Mile River.
6. Support college efforts to document biological resources of the Three Mile River Watershed.

C. River Protection, Habitat and Clean-ups

Short Term Actions

1. Create a clean-up team to take trash out to the river below Route 44.
2. Plan annual clean-ups as part of the City of Taunton clean-up day.
3. Consider placing an Osprey perch at Boyden Wildlife Refuge near the existing platform.

Long Term Actions

1. Form a subcommittee to evaluate the adequacy of local bylaws and zoning to protect the natural and cultural resources of the Three Mile River Watershed, and to research effective model bylaws from other communities.

D. Land Protection

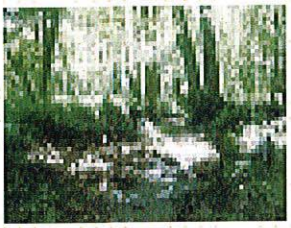
Short Term Actions

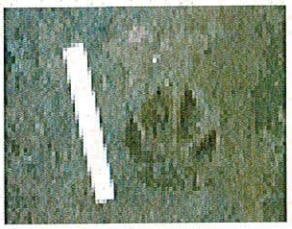
1. Compile list of abutters to the river, large parcel landowners and available open space in order to facilitate future land protection strategy and planning.

Long Term Actions

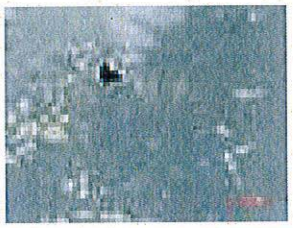
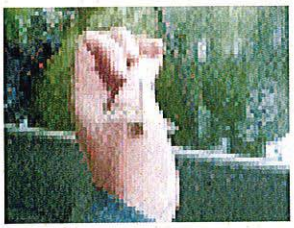
1. Work with the City of Taunton and Towns of Dighton and Norton to promote land protection along the Three Mile River Corridor.

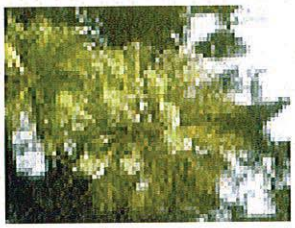
II. OUTSTANDING RESOURCES OF THE THREE MILE RIVER ACEC








A. HABITAT RESOURCES

Outstanding Natural Resources and Communities

The Three Mile Watershed is an outstanding natural resource that contains many important habitats. Of the 14,241 acres included in the ACEC area, 5,881 acres (or 41% of the ACEC) are identified as Core Habitat Area according to the Natural Heritage and Endangered Species Program's (NHESP) BioMap data. Core Habitat is large, undeveloped tracks of land that are essential to maintaining our biodiversity and populations of rare species. Core Habitat in the Three Mile River ACEC includes almost 2,000 acres (14% of the ACEC) of Priority Habitat for Rare Species and Estimated Habitat for Rare Wildlife. In total, Core Habitat and Supporting Habitat for both upland and aquatic species cover approximately 95% of the ACEC, according to MassGIS mapping data. There are also a high number of certified (44) and estimated (302) vernal pools within the ACEC that provide breeding habitat for wood frogs, spotted salamanders, and fairy shrimp.

The ACEC's inland wetlands provide food, cover, and shelter for waterfowl, muskrats, snakes, turtles, amphibians, and numerous insects. The floodplain provides essential breeding habitat for many reptile and amphibian species, including several NHESP listed species. The surface waters are the core of the corridor and were a former herring run. Currently, the river is home to one of the best warm water fisheries in the area, containing ample yellow perch, brown bullhead catfish, blue gill, largemouth bass, and the associated wading birds that feed on them. Another benefit to this fishery is the sustained freshwater mussel population, several of which are rare, who rely on these fish to host their larvae. Overall, it is the quality of the water in the river, due in part to the largely undeveloped river corridor and surrounding lands, which enables the Three Mile River Watershed to provide such a large quantity of outstanding habitat.

Fisheries Habitat

The Three Mile River is classified as a generally flat, warm water river, formed by the confluence of the Rumford and Wading Rivers in the Town of Norton, and flowing approximately 12 miles southeasterly to its confluence with the Taunton River in North Dighton. The river's fish population is comparable to other similar rivers in southeastern Massachusetts.

Before the earliest town settlement, herring were in great abundance in the rivers. In May, every stream and river that flowed into the Taunton River was alive with fish on their way to spawning pools. Many fishing grounds were established and the excess fish, not needed locally, were cured and shipped to other places. The fishing business was very profitable to the Dighton residents, giving rise to other lines of industry.

> "A great number of staves, hoops and barrel ends were needed for packing the fish that were transported. "Thousands of sticks were required for stringing the fish. Nearby boys were kept busy hunting for sticks of just the right thickness." (History of Dighton, 1962)

Native fish include:

Brook Trout (*Salvelinus fontinalis*)
Shiners (*Notropis* sp.)
Yellow Perch *(Perca flaverscens*)
Bullhead (*Ictalurus natalis*)
Redfin pickerel (Esox americanus americanus)
Eastern Chain Pickerel (*Esox niger*)
Sunfish (*Leponis* sp.)
Catfish (*Ictalurus punctatus*)
Herring
White sucker (Catastomus commersoni)

Introduced fish include:

Largemouth Bass (*Micropterus salmoides*)
Smallmouth Bass (*Micropteres dolomieui*)
Common Carp (*Cyprinus carpio*)
Crappie (*Pomoxis nigomaculatus*)
Bluegill (*Leponis marcochirus*)

Many freshwater fish are directly dependant on the wetlands. Several species require areas of shallow water for breeding and feeding, or some other part of their life cycle. They retreat to these areas to avoid predators, which are generally less common in shallow water. Deep water is an integral part of the food web. In fact, it has recently come to light that the nutrient-rich waters from the riverine ecosystems strongly influence the fish catch in the brackish estuarine waters at the mouths of the rivers.

The Three Mile is home to a very popular and productive warm water recreational fishery. It is primarily a Largemouth Bass area, with Bluegill and even some Pickerel caught there as well. The best section for public fishing is along the shore at what is called the Mount Hope Pond Area - at the Boyden Wildlife Refuge.

Since 2007, a strong effort to re-establish River Herring in the watershed has been underway, led by the Taunton River Coalition and the Massachusetts Division of Ecological Restoration. State funding has recently been earmarked for the construction of two fish ladders in the ACEC that would allow the herring to go from the Taunton River all the way to the above-mentioned Mount Hope Pond Area.

There is also a large population of freshwater mussels in the river. Most mussels depend on healthy stocks of Largemouth Bass for part of their reproductive cycle. Larval mussels (called glochida) lodge in the gill plates of passing bass (the host fish), which transport and disperse the young mussels along the river. These mussels provide an excellent food source for birds and mammals alike. Although freshwater bass have not been an important human food source for generations, people still enjoy fishing for them on leisurely evenings and afternoons.

Freshwater mussels include:

Eastern Elliptio (Elliptio complanata)
Eastern Pondmussel (Ligumia nasuta)
Eastern Lampmussel (Lampilis radiata)

Rare Species and Exemplary Natural Communities

A number of state-listed rare species and two sites for exemplary natural communities are located along the Three Mile River. Below is a list of all of the rare species occurring within the Three Mile River ACEC, for which the Natural Heritage and Endangered Species Program (NHESP) has documented records.

Plants:		
Long's Bitter-cress	(Cardamine longii)	E*
Eaton's Beggar-ticks	(Bidens eatonii)	T/E
Cat-tail Sedge	(Carex typhina)	T
Pale Green Orchis	(Platanthera flava)	T
Plymouth Gentian	(Sabatia kennedyana)	SC
Animals:		
Blanding's Turtle	(Emydoidea blandinii)	T
Wood Turtle	(Clemmys insculpta)	SC
Eastern Pondmussel	(Ligumia nasuta)	SC
Eastern Spadefoot	(Scaphiopus holbrooki)	T
Eastern Box Turtle	(Terrapene carolina)	SC
Atlantic Sturgeon	(Acipenser oxyrinchus)	E
Marbled Salamander	(Ambystoma opacum)	T

NHESP has stated that several of the above-listed species are particularly significant, specifically: Eaton's Beggar-ticks is considered a globally Imperiled rare species, meaning it is at high risk of extinction; both Long's Bitter-cress and Plymouth Gentian are considered globally Vulnerable species, meaning that the species are at moderate risk of extinction. Atlantic sturgeon is considered globally Vulnerable, with the extreme lower portion of the Three Mile River near its confluence with the Taunton River, being considered habitat for this fish.

The state follows the Federal Endangered Species Act definition for the following types of criteria.

* *Endangered* ~ (E) Any species that is in danger of extinction throughout all or a significant portion of its range.

Threatened ~ (T) Any species that is likely to become an endangered species, within the foreseeable future, throughout all or a significant portion of its range.

Special Concern ~ (SC) Are native species which have been documented by biological research or inventory to have suffered a decline that could threaten the species if allowed to continue unchecked, or which occur in such small numbers or with such restricted distribution or specialized habitat requirements, that they could easily become threatened within Massachusetts.

Inland Wetlands

The Three Mile River Watershed contains a variety of inland wetland resources. The state's Wetlands Conservancy Program has identified all forested deciduous wetland, forested evergreen wetland, shrub swamp, marsh, deep marsh, isolated wetland, cranberry bogs, and open water within the Three Mile River Watershed. In total, these various types of wetland cover account for approximately 2,700 acres (or 19%) of the ACEC.

The Three Mile River Watershed is made up of many interconnected freshwater wetlands, knit together by the river and its tributaries. In Taunton, Woodward Springs, a spring fed, red maple swamp, the red maple swamp at the Gibbs Cranberry site, and the Oakland Swamp, all characterize the Three Mile River corridor. The Oakland Swamp is a very large red maple swamp covering approximately one square kilometer, and draining northerly into the Three Mile through two stream systems. The Three Mile River corridor also contains a Silver Maple floodplain forest, one of the last and most intact landforms of its kind in the Commonwealth. Other major red maple swamps occur at the headwaters of Fall Brook, Westville Swamp, and the Boyden Swamp, which drains through the Boyden Wildlife Sanctuary.

Two exemplary natural communities have been documented along the Three Mile River, Alluvial Red Maple Swamp and Small-river Floodplain Forest. The ecological term "natural community" describes an assemblage of organisms found together often enough to give them a distinct collective identity. The edges of natural communities are often indistinct, since many organisms are not confined within the boundaries of a single community, and the boundaries between communities are often blurred. The concept is useful as an interpretive device because it allows us to define the natural world in terms of the landscape.

Alluvial Red Maple Swamps

The Alluvial Red Maple Swamps occur along small rivers in eastern Massachusetts. They are richer biologically than usual Red Maple Swamps because rich sediments from upstream are gradually deposited as flow slows in wider and less steep sections.

It is a colorful forest that undergoes striking seasonal changes. One of the first hints of spring in southern New England is the rosy red buds spread across the lowlands which only intensify as the pink flowers emerge, well before the first foliage appears in May. During the summer the swamp comes alive with the sweet sounds of songbirds, dragonflies and a variety of butterflies. All are attracted to the swamp flowers growing amongst the Red Maple such as swamp azalea, buttonbush, and sweet pepper bush. When autumn comes to New England and the Red Maple is stressed by the changes in light, temperature, and water levels, a vibrant crimson shines through. Even in winter, the smooth trunks and bare branches give off a lavender hue along the horizon.

These areas play an important hydrological role by absorbing excess precipitation, surface runoff, and providing flood abatement, while storing groundwater and recharging aquifers for our drinking water. Unfortunately, they have been considered wastelands in the past and filled at an alarming rate. Threats to this community are from damming of streams, agricultural conversion, highway construction, and development. Traditionally Red Maple Swamps in Massachusetts were considered abundant habitat and given little thought. But from a global perspective, it is clear we are fortunate to be a center of abundance for this spectacular and ecologically important community.

Alluvial red maple swamps occurring on small rivers have a Community State Rank of S-3 as listed in the Classification of the Natural Communities of Massachusetts. The Community State Rank is a designation that reflects a habitat type's regional rarity or threat by prioritizing areas from S-1 to S-5, with S-1 being the most rare. The S-3 rank of alluvial red maple swamps means that there are typically 21 – 100 occurrances of that habitat type within Massachusetts, and that there is a limited number of acres or miles of stream containing this type of habitat.

Small River Floodplain Forest

A floodplain is the area of flatland that is covered by water when a river reaches maximum height. The solids of the floodplain are composed largely of sediments that are picked up in the faster upper reaches of a river and then fall out of suspension as the river slows down over lower gradients. Quantities of organic material are also transported and deposited and, when mixed with clays, silts, and sands, create dark, moist, fertile, usually deep soils without distinct horizons. Within the Three Mile River ACEC, approximately 2,500 acres of land (or about 18% of the ACEC) are classified as either 100-year or 500-year floodplain cover.

The riverine system that grows out of these types of floodplain soils consists of straight, tall, well-spaced trees, which form a closed or partially closed canopy. The dominant tree species is usually Silver Maple, but Cottonwood, Sycamore and Black Willow are also characteristic of a floodplain forest. The floodplain is naturally a very dynamic zone because of the constantly changing course, height, and velocity of the water. Although the floodplain forests tend to be long and narrow, where the floodplain is broad, they can extend well inland.

Since the floodplain forest is not a recognized commercial forest, it is possible that no statewide survey has been attempted. In the state of Massachusetts, it is estimated that the total remainder of this type of natural community is less than 10,000 acres. Most of these floodplain forests occur along such large rivers as the Connecticut River. There are only four high-quality examples of floodplain forests on small rivers across the state, the best example of which is the Silver Maple floodplain forest on Three Mile River in Taunton, located adjacent to the Parker Memorial Golf Course.

Small river floodplain forests have a Community State Rank of S-2 as listed in the Classification of the Natural Communities of Massachusetts. The S-2 rank means that

the habitat type has only about 6 – 20 occurrances in Massachusetts, and that there are only are a few remaining acres or miles of stream or that the habitat type is in danger of expiration from the state.

> **"The Three Mile River (Silver Maple) floodplain forest is the only sizable example of true floodplain forest in Southeastern Massachusetts. <u>It is strongly recommended that this floodplain forest be protected from all disturbance.</u>"** Lynn Harper, Habitat Protection Specialist, Massachusetts Department of Fish and Game

Threats to both of these exemplary natural communities (alluvial red maple swamp and small river floodplain forest) include clearing, conversion to agriculture, development, and changes upstream, which would change the hydrological aspects of the whole area.

Vernal Pools

Vernal pools are magical worlds that have become a natural gateway from the aquatic to the terrestrial world for many organisms. Vernal pools are defined by the state as depressions in the ground that in most years contain water for a few weeks to a few months and can completely dry up. Another important characteristic is that they do not contain fish.

Pools begin filling with late autumn rain and freeze over during the winter cold. When spring finally arrives, the pools thaw and become a nursery. Vernal pool activity may start as early as the first spring rains, when many species that have lain dormant all winter, finally emerge. Several of these species have high natal pool fidelity, meaning that they return to the pools where they were bred; it is a type of genetic programming. Distinctive calls from croaking Wood Frogs announce the location of a pool.

The Vernal Pools species fall under two types of characteristics: Obligate species, which depend solely on vernal pools for their existence, and; Facultative species, which strongly favor vernal pools but also inhabit permanent ponds. Obligate species include the Fairy Shrimp, Wood Frog, Eastern Spadefoot Toad (State Threatened), Spotted Salamander, Blue-spotted Salamander, Four-toed Salamander (Special State Threatened), and Marbled Salamander. Facultative species include Spring peeper, Gray tree frog, American toad, and Fowler's toad.

There are currently 44 vernal pools that have been identified and certified within the Three Mile River ACEC boundaries. But, according to NHESP aerial data, there are an estimated 302 more potential vernal pools within the ACEC area. Since these particular areas are fairly easy to fill, many more vernal pools could disappear from existence under the pressure of development.

Topic: Natural Resources Protection
Guest Speaker: Alison Bowden, Freshwater Program Director, The Nature Conservancy (TNC)
Contact: abowden@tnc.org

Recommendations:

1. The Three Mile River ACEC has been recognized for its overall condition and ecoregionally significant species and natural communities. The ACEC is part of the larger Taunton River Watershed area that has been identified as a "portfolio" site by TNC; these portfolio sites need to be protected in order to conserve the native biodiversity of the region.

2. The brackish and freshwater tidal marshes and Silver Maple floodplain forest found within the Three Mile River ACEC are globally rare and deserve the highest level of protection.

3. Land use plans, local regulations, and stewardship efforts should all reflect an effort to retain the relative intact quality of much of the ACEC watershed area, which has been fortunate (lucky) to escape large-scale encroachment and fragmentation.

4. Encourage public education, awareness, stewardship (clean-ups, biodiversity walks, paddles) and other events, much like what the Norton Conservation Commission and Canoe River Aquifer Advisory Committee do, in order to gain public support and create a feeling of responsibility the care of the ACEC.

5. Work with the Taunton River Stewardship Council and its various members to enhance local stewardship efforts and seek the resources necessary to help implement stewardship activities.

Topic: Fisheries Resources
Guest Speaker: Steve Hurley, MA Division of Fisheries and Wildlife
Contact: steve.hurley@state.ma.us

Recommendations:

1. Improve public access to the river; engage people, get support.

2. Restore anadromous fisheries; add ladders, remove dams.

3. Protect scarce aquatic and aquatic support habitats (upland or upstream areas that have the greatest potential to influence the species living in prime fisheries habitats).

4. Address contaminant issues.

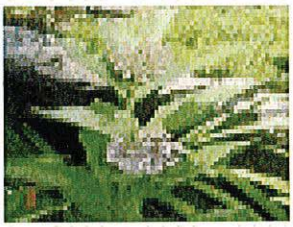
5. Properly maintain functional dams and impoundments.

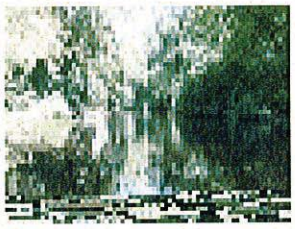
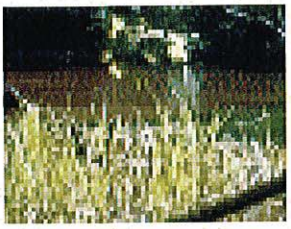
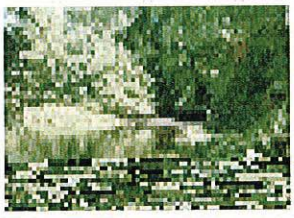
6. Control the spread of exotic species; this is a huge threat to aquatic integrity. Introduced non-native species (water chestnut, loosestrife, zebra mussels, etc.) are big problems.

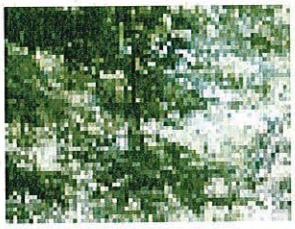
7. Coldwater fisheries require enhanced stormwater treatment; DEP certifies coldwater streams under its "Outstanding Resource Water" Programs.

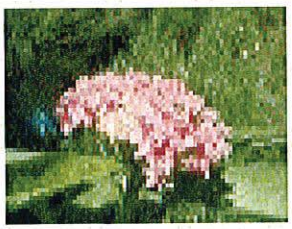
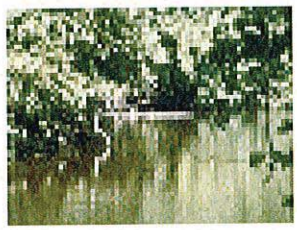
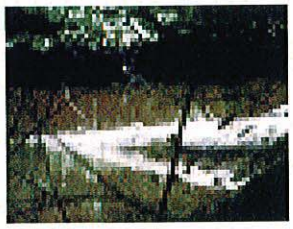
8. Put up signs at prominent streams in the ACEC.

9. Watch for certain fish species (bridal shiner, common shiner).





B. WATER RESOURCES

Inland Surface Waters

Several tributaries to the Three Mile River cut across both the Town of Norton and the City of Taunton. Beginning at the northernmost end of the Three Mile Watershed, the Rumford River and Wading River converge to form the Three Mile River. The Three Mile then meanders through a portion of Norton adding the Old Crane Pond and Dora Brook to its flow. The Three Mile continues its flow along the western bound of the watershed until it converges with Meadow Brook. Meadow Brook flows from the southeastern portion of Norton, where Birch Brook and Crooked Meadow Brook converge to form Meadow Brook. Meadow Brook then flows into Meadow Brook Pond, Crosses under Route 140, and then converges with the Three Mile River.

In Taunton, there are also many surface waters that play a vital role in the Three Mile River system. The North Oakland Brook is a stream that drains into the Three Mile at the first distinctive river bend crossing into Taunton. From this point, the Three Mile is joined by two unnamed brooks, which drain the Oakland Swamp, the largest wetland system in the Three Mile Watershed. The Three Mile then picks up flow from the Oakland Mill Pond, the largest pond in the watershed, and three more brooks that drain Willis Pond into the river. The Three Mile next picks up flow from Fall Brook, the longest stream in the watershed. Moving past the confluence with Fall Brook, the river passes the Parker Ponds, a series of small ponds that abut the Parker Municipal Golf Course. Passing the golf course, the river next picks up flow from the Westville Brook, a stream that flows through the Dexter Farms Conservation Restriction. As the Three Mile leaves Taunton, it picks up flows from the Hayden Pond system, a stream and pond on the Reed Farm APR (Agricultural Preservation Restriction, whereby the state purchases the property's development rights while allowing the farmer to maintain the working farm), and the Boyden Swamp. The Three Mile merges with the Taunton River at this point in the headwaters of the Narragansett Bay Estuary (within the proposed Taunton River Wild & Scenic River Corridor).

One of the most significant, yet least mentioned surface waters within the Taunton portion of the Three Mile River Watershed ACEC, is the Segregansett River. The "Seggie," as it is referred to locally, flows through the southwestern corner of the ACEC boundary, through the Zone II area of the Dighton wellfield, at the Taunton/Dighton border. The Seggie is part of the Somerset Public Water Supply System, and as such, is classified as an outstanding resource water (ORW). The Zone A (the river water), and Zone B (400'buffer on either side of the river), are part of the overall Somerset Surface Water Protection Plan. The Seggie flows south and slightly eastward through the southwestern corner of the ACEC, down into the center of Dighton. In Dighton, Somerset employs an intake facility on the Seggie that provides approximately 750 million gallons annually to the Somerset Reservoir. The Seggie flows through the center of Dighton, southeasterly, and drains into the Taunton River.

Water Supply Areas

Within the northern boundary of the Three Mile River ACEC, the Town of Norton has two public water supply wells located on Pine Street. Well #1 has a permitted withdrawal of 200 gallons per minute (gpm). Well #2 has the potential to withdraw up to 350 gpm (DEP 2005). The Zone II recharge areas for these wells also occur within the ACEC boundaries.

The Town of Dighton has three (3) public water supply wells located on Walker Street in North Dighton. The majority of the Zone II recharge areas for two of these wells are located within the southwestern boundaries of the Three Mile River ACEC. Well #1 has a Department of Environmental Protection (DEP) approved daily volume of 0.24 Million Gallons per Day (MGD). Well #2 has an approved daily volume of 0.26 MGD. Well #3 has an approved daily volume of 0.42 MGD (DEP 2005).

In the case of both the Norton and Dighton wells, the land use within the ACEC boundaries, surrounding the wells, is largely forested, with areas of non-forested wetland and wetland, and low density residential (sparsely populated). In total, the DEP delineated Zone II recharge areas for public water supply drinking wells within the ACEC is approximately 1,000 acres, or .07% of the ACEC.

As mentioned in the **Inland Surface Waters** overview, the Segregansett River is part of the Somerset Public Water Supply System. The Segregansett also flows through the Zone II of the Dighton wellfield within the southwest ACEC boundary, and in close proximity to the wellfield itself, in Dighton.

C. AGRICULTURE

There is evidence of agricultural practices having been plied in the Three Mile River Watershed for centuries. Local Native Peoples began to adopt subsistence strategies, most notably maize (corn) cultivation, which allowed for an increasingly stable and storable food supply. This change resulted in large horticultural villages, and distinct tribal groupings. This also changed them from a nomadic hunter/gatherer society to a more settled life style, though not a completely sedentary existence.

The first colonists also relied heavily on the sustainability of farming and hunting, and adopted several Native Peoples' farming practices. They used fish for fertilizer and irrigated their crops from the same rivers and streams we know and love today.

Technological advantages and development have threatened the farming and agricultural businesses. No longer do we buy locally grown produce, but instead, we increasingly rely heavily on the produce and value added products brought to us from other states and countries. Not only is there economic value to maintaining agriculture in our communities (a living, working landscape), but properties such as these help to maintain the intact quality of the river corridor that makes it unique and ecologically outstanding. These large areas of open space and edge habitat around farm fields provide important wildlife habitat for local, rare, and migratory species. These agricultural lands also provide connectivity for wildlife passage, in many instances.

The Massachusetts Department of Agricultural Resources (MDAR) regards the ACEC and land in the vicinity to be regionally significant to farming. MDAR also believes that these small-scale, locally owned, remaining farms are important to maintaining the local community character as well as providing local food and farm products, and retaining productive open land in the I-495 area.

Active agricultural land use within the ACEC area currently totals 487 acres (Dighton, 9 acres; Taunton, 253 acres; Norton, 225 acres) of the approximately 777 acres of land classified as agricultural open/pasture/forest/bog within the ACEC. This total acreage includes the Reed Farm, located along the banks of the Three Mile in Taunton and North Dighton, 138 acres of which is enrolled in the Commonwealth's Agricultural Preservation Restriction (APR) Program. MDAR also indicates that there have been, or currently are some 203 acres under Covenant with the Farm Viability Program (FVP), 86 acres of which have developed a farm business plan or received other technical assistance through the FVP.

Overall, agricultural activity within the Three Mile River Watershed has declined significantly within the past 50 years (a 51% loss of agricultural lands in Norton and Taunton during this time), consistent with the overall trend in southeastern Massachusetts. An inventory of currently active farms within the ACEC area of the three host communities includes: 3 forestry operations (64 acres); 4 cranberry bogs (136 acres);

vegetable farms (143 acres); haying operations (99 acres); tree farms, nurseries, and greenhouses (26 acres); and miscellaneous uses (19 acres).

The cranberry industry is one of the major economic engines in southeastern Massachusetts. According to the United States Department of Agriculture's (USDA) regional Natural Resource Conservation Service (NRCS) field office, three of the four cranberry bog operations have developed Farm Conservation Plans (FCP) with assistance from NRCS. A Farm Conservation Plan is designed to help the farmer manage the land profitably while protecting the natural resources of the area. The plan also enables the farmer to participate in other USDA technical assistance and cost-share programs.

It is important to note that the most significant active farms areas are direct abutters to the Three Mile River, and at the base of the watershed, provide a significant amount of control of the riverbank resource area that is habitat for numerous wildlife species. A case in point is The Crane Farm in Norton, which includes land on both sides of Crane Street near Pine Street. The farm is bisected by the Three Mile River, which was once dammed by the farmer to provide a livestock watering hole and ice-making pond. The Crane Farm is a former dairy farm, and contains remnant buildings where dairy operations and blacksmithing were carried out. The farm also contains hayfields and pastureland. Perhaps most impressively, the Crane family has owned the property for over two hundred years, providing one of the best long-term examples of the agricultural heritage of both Norton and the ACEC.

Forestry is also an important component of the ACEC, providing habitat, working landscape, and economic benefit. According to state mapped data, there are 8911 acres of forestland in the ACEC (63% of the ACEC), including 2012 acres of forested wetland/wooded swamp (15% of the ACEC). There are ten (10) private forest owners with a combined total of 422 acres enrolled in the DCR Forest Stewardship Program. These properties range in size from 14 acres to 102 acres, and all have DCR approved Forest Stewardship Plans. There are currently five (5) properties enrolled in Taunton, four (4) in Norton, and one (1) with acreage in both Taunton and Norton. Under the auspices of the Forest Stewardship Program, DCR works with woodland owners to protect the ecosystem values of their forests through ten (10) year plans for long-term management.

Topic: Agricultural Resources
Guest Speaker: Irene Winkler, United States Department of Agriculture (USDA)
Contact: irene.winkler@ma.usda.gov

Recommendations:

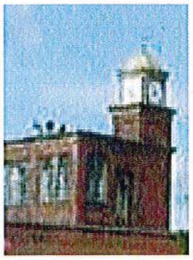
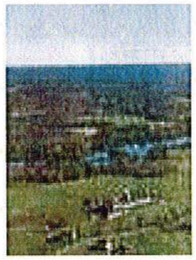
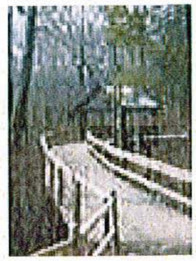
1. The Three Mile River ACEC is located in an area considered regionally significant to farming by both the Massachusetts Department of Agricultural Resources (MDAR) and USDA (programs such as the USDA's Conservation Security "Stewardship Program" have, as recently as 2005, targeted the area from Norton/Easton to Dighton/Berkley for participation).

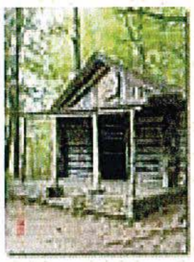
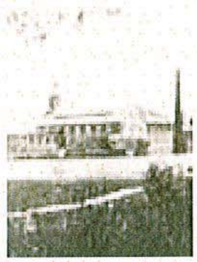
2. Promotion of agricultural preservation and assistance programs such as the MDAR Farm Viability Program, the USDA Farm Conservation Planning Program, and the MDAR/USDA Ag. Business Training courses, should be a priority agricultural preservation strategy.

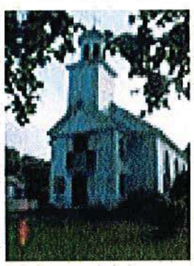
3. Plan for agriculture, not around it, and plan for agricultural retention as more than just a method of open space preservation. Poorly planned land use can have negative impacts on viable farm operations.

4. Explore the possibility of forming Ag. Commissions and developing Right-To-Farm Bylaws in the ACEC municipalities. This can help to increase community awareness of farms and their business needs. Your Regional Planning Agency (SRPEDD) can provide technical assistance with this task (MDAR has model materials on its website).

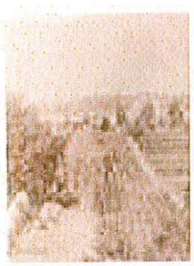
5. Hold local workshops on intergenerational transfer of property; Chapter 61 Programs; farm viability; conservation planning; stormwater management; environmental stewardship.

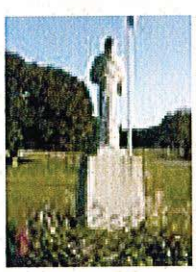
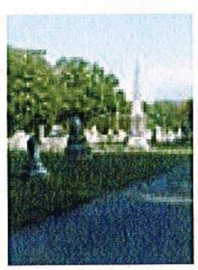




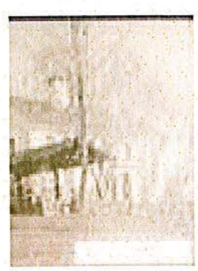








D. HISTORY

Historic and Archaeological Resources

The Three Mile River ACEC is rich in historic resources, including not only the historic villages of Westville and Oakland in the community of Taunton, but also sites in the neighboring communities of North Dighton and Norton. The abundant natural resources within the Three Mile River Watershed made it a perfect location for colonial settlements. The river also provided water for agriculture, shipbuilding, and later, generation of waterpower to produce goods for a growing region.

In North Dighton, the Three Mile River provided the platform for Peter Walker's Iron Mill, built circa 1700. The Walker's owned and operated the furnace for nearly 100 years before selling it to the Dighton Manufacturing Company. Dighton Manufacturing made castings well into the 1900's before abandoning the site.

Nicholas Stevens established a saw and gristmill on the Three Mile in about 1700. In the late 1700's, the Dighton Post Office was opened near a bridge that was constructed to crossover the Three Mile River. In the early 20th century, Mount Hope Finishing Company completed a reconstruction in the North Dighton area, near the river, and proved to be a catalyst for the development of residential communities in the area.

In Taunton, colonial industry also developed along the Three Mile River, particularly in the Oakland and Westville sections. During the Federal Period, from 1775 to 1830, Taunton was characterized by the dominance of iron manufacturing, exploiting the natural resource found in the bogs. This industrial growth brought skilled ironworkers from England and Scotland who helped to introduce the use of bituminous coal to the iron manufacturing process. In 1800, local manufacturers were shipping 800 tons of ironware and 700 tons of rails to various larger ports along the eastern seaboard.

The introduction of large stone cotton mills ushered in a new era for Taunton and Dighton. Both Taunton and Dighton constructed cotton mills along the Three Mile River in the early 1800's, in Taunton's Westville section and North Dighton, respectfully.

In Norton, the Crocker Family operated a successful copper rolling mill in the early 19th century, along the Wading River, near the confluence of the Three Mile. The Crocker Brothers Copper Works produced copper blanks for the United States Mint. The Copper Works was eventually moved to the Weir Village in Taunton, which at the time was a very busy port area. The area in Norton is currently a private residence, although the slag piles can still be seen along the bank of the Wading River on Taunton Avenue.

Also during this period, The Norton Furnace operated along a small tributary of the Three Mile River, near the town line.

The Three Mile River Watershed also includes several properties listed on the National Register of Historic Places, including National Register Historic Districts (NRDIS) and

one Local Historic District (LHD). Portions of the Norton Historic District (LHD, designated in 1975, 48 listed properties) and the Norton Center Historic District (NRDIS, designated in 1977, 66 listed properties) lie within the ACEC boundaries. These two districts overlap one another and include multiple listings in the Town Center and several more on the Wheaton College campus.

The City of Taunton has at least four National Register site within the ACEC, including the West Congregational Church, the Joseph Willis Home, and the Almshouse, and several other sites just outside of the ACEC boundaries.

Some of the other significant cultural, historic, and archaeological resources in the Three Mile River ACEC were noted in the Dighton, Norton, and Taunton Heritage Landscape Inventories conducted by historic preservation consultants on behalf of the Massachusetts Department of Conservation and Recreation (DCR) between 2000 and 2006. Below is a sampling of the list of cultural, historic, and archaeological assets contained within the Three Mile River ACEC:

Three Mile River
The Three Mile River begins at the junction of the Wading River and the Rumford River in the Town of Norton and empties into the Taunton River in the Town of Dighton. The river was known as the "Nistoquohammock," or, "Little River," to the native peoples.

Gertrude M. Boyden Wildlife
The Gertrude Boyden Wildlife Refuge was established 1968 when the City of Taunton's Conservation Commission purchased the Laura Thomas Estate. This beautiful site was often used by Arthur Cleveland Bent in his study of birds and their nesting habits. Bent was the world renown author of a series of books entitled "Life Histories of American Birds".
The Gertrude Boyden Wildlife Refuge is situated north and east of the Three Mile River, in the Westville neighborhood of Taunton. The refuge has grown from 14 acres to over 50 through subsequent donations and acquisitions. The refuge possesses a great diversity in vegetation type and maturity level and creates access to a beautiful waterway that make it a natural learning environment. The refuge serves as the headquarters for the Taunton River Watershed Alliance and Taunton River Campaign. The Boyden also contains large expanses of open field, several picnic areas, fishing stations and almost two miles of nature trails, highlighted by a covered bridge, and a new wetlands boardwalk, providing passive recreation, and bird watching opportunities.

West Congregational Church, Winthrop Street, Taunton
This beautiful church still retains its unique charm since its original construction in the 1830's. The church served the second Congregational Society to be formed in Taunton. This building was placed on the National Register of Historic Places in 1984.

The site of the Hodijah Baylies Iron Works, Cohannet & Winthrop Streets, Taunton
This 'bloomerie' was located on the banks of the Three Mile River and is most noted for forging one of the anchors for the U.S.S. Constitution, 'Old Ironsides'.

The site of the Westville Spinning Mill- Three Mile River at Cohannet Street
The Westville Mill was a popular textile mill that derived its power from the shallow Three Mile River.

The Site of the Nathaniel Burt Iron Forge, North Walker Street, Taunton
The site of the original Burt Iron Forge remains in pristine condition as the foundations for the 17th century iron forge still are visible and enjoy the protection as designated Conservation land, owned by the City of Taunton. The property and building, once owned by the Burt Family, was later used as a parsonage for the West Congregational church, a private school and, has come to be known as the Sharp Estates.

The Glebe, Tremont Street, Taunton
This grant of land from the Church of England was the home site of the first St Thomas Episcopal Church. The establishment of this church was a major factor in drawing residents from the center of town to the Western part of the community in the late 18th century. The church blew down in the Great September Gale of 1815 and the Congregation eventually relocated near the center of town.

Joseph Willis Home- 28 Worcester Street, Taunton
The Willis Home is a saltbox style house that was built in 1688 by Joseph Willis, who took advantage of a Land Grant process that was initiated by the original proprietors of Taunton in that same year. This home, the oldest structure in the City of Taunton, was placed on the National Register of Historic Places in 1984.

The Oakland Band Hall-6 Worcester Street
The popular band hall was used by local residents for their 'May Basket' parties and for entertainment by the Oakland Band, made up of a group of talented musicians. This hall was also used to conduct the original religious services for the St. Paul's Catholic Parish, which was established in 1904, as they awaited the completion of their new church (currently located on Tremont Street).

The Oakland School, North Walker Street, Taunton
This building once served as the village schoolhouse. It served many of the early immigrant children whose parents were drawn to the neighborhood for the economic opportunities offered by the Oakland Textile Mill. The property currently serves as an apartment house.

The Oakland Firehouse, North Walker, Taunton
This small building structure, built in 1849, served as the original village schoolhouse and later as the village fire station. The building also was used for a polling station, a grange meetinghouse and a meeting place for the local Lion's Club, Jaycees and the Taunton Garden Club.

The Zephaniah Hodges Home, North Walker Street, Taunton
This home was built about 1779 by Zephaniah Hodges, who was a local organ maker. He operated a small mill beside his home that was powered by a small stream that flowed into the Three Mile River.

The Almshouse, Norton Avenue, Taunton
The Almshouse was established over a century and a half ago as a working farm where the community's poor were supported. The main faculty was built in 1876 with a major addition completed in 1990. This building currently called the Taunton Nursing Home. This property was designated on the National Register of Historic Places in 1984.

The site of the Oakland Mill, Mill Lane, Taunton
This popular textile mill was built in 1809 and grew steadily and was a major source of employment for Irish, French and Scandinavian immigrants in Taunton. The mill utilized the Three Mile River as its source of power for the hundreds of looms found in this facility.

The Woodward Mills, Three Mile River, Taunton
The mill complex was operated by Josiah and Frederick Woodward and consisted of a sawmill and box mill that operated from the mid 18th century until the 1940's.

Woodward Springs Park, Harvey Street and Norton Avenue, Taunton
This popular passive recreational park has served the local residents since 1809. The park was privately owned until 1881 when the park was left to the City of Taunton by Stimpson Woodward "...as a public park and reserved as a place of public resort forever" This park is nestled alongside the Three Mile River and was used as a passive recreational activities. A series of walking trails became a popular attraction as the City of Taunton developed an ambitious tree planting program throughout the late 19th and early 20th centuries. The park was used by the Norton & Taunton Railway Company as their adopted 'trolley park' and the site was a popular stop on their inter-city system.

The Former District #11 Schoolhouse, Worcester Street, Taunton
This former schoolhouse, now a private residence, was the site for the high school class held in this community in 1838. The school was used by the community for the education of younger students until 1933.

The site of the former Stonecrusher, Fisher Street, Taunton
The 'stonecrusher' on Fisher Street alongside the Three Mile River created building materials for the local area for many years.

Reed Farm, South Walker Street, Taunton

John F. Parker Municipal Golf Course, Fisher Street, Taunton
This golf course was established in 1928 by Serles Reed, as a privately owned Golf Course, on land that was once the working farm of industrialist William Mason. The

City of Taunton acquired the property in 1985 in an effort to preserve the precious natural setting along the eastern bank of the Three Mile River.

Dighton Industries- North Dighton
A former mill and manufacturing site dating back to the late 17th century, including a mill complex and surrounding neighborhood which was laid out by the Olmstead firm in the 1920's.

North Dighton Furnace Company
This furnace Company was located along the banks of the Three Mile River in North Dighton, on the site of Richard Stephens' iron works, which was established about 1696.

Crocker Brothers Copper Works-Old Taunton Avenue, Norton
The Crocker Family operated a successful copper rolling mill in the early 19th century, along the Wading River in Norton, a short distance north of the Three Mile River. This company produced the copper blanks for the United States Mint. The Crocker Brothers moved their business to the Weir Village in Taunton to take advantage of the thriving river port there.

Norton Furnace- Old Taunton Avenue, Norton
This local furnace company operated along a small tributary that empties into the Three Mile River.

Robert White's Ice Houses at Norton Furnace
Robert White owned and operated the large ice business along the Attleboro-Taunton branch railroad line, which allowed him to transport large quantities of ice that they harvested from the furnace pond.

Lincoln Diary, North Walker Street, Taunton
Several generations of the Lincoln Family of Westville operated a successful Dairy Business on their large farm on North Walker Street.

The Site of the former Arthur Gagner's Milk Bottle, Winthrop Street, Taunton
Arthur Gagner built a large wooden Milk Bottle beside his Store on the banks of the Three Mile River in 1933 to sell home-made ice cream. This bottle was sold to the Sankey Family in 1943 and the ice cream was later purchased from the famous Hood Company. The Hood Company bought the abandoned Milk Bottle in the late 1970's and moved the structure to the Children's Museum in Boston.

Presence of the Native Peoples Within the Three Mile River ACEC

The Dighton Intertribal Indian Council (the Council) and the Pocasset Wampanoag Tribe have recently been very active in affirming the historical presence of the native peoples within the Taunton River and its sub-watersheds. Representatives of the Council have worked with the Three Mile River Committee through the Taunton River Stewardship Council. Members of the Massachusetts Archaeological Society (MAS) are also actively investigating and documenting sites within the Three Mile River Watershed. The Three Mile River ACEC Study Committee also sought technical assistance from Thomas Mahlstedt, Archaeologist with EOEEA's Division of Conservation and Recreation (DCR) in preparing a sensitive, yet informative text on the archaeological presence of the Native Peoples in the proposed Three Mile River Watershed ACEC area.

Currently, the Massachusetts Historical Commission (MHC) has site records for eleven (11) prehistoric archaeological sites within the boundaries of the proposed Three Mile River ACEC. Locally, individuals have identified at least an additional eleven (11) sites that have not yet been reported to the MHC. These sites tend to be on farms that flank the Three Mile River. Therefore, at least twenty-two (22) of the Native Peoples' sites are known within the proposed Three Mile River ACEC, and undoubtedly, many more have yet to be identified.

The cumulative evidence from these sites indicates that Native Peoples, as hunters and gatherers, were on the Three Mile River at least during Early Archaic times between 9,000 to 8,000 years ago. Although climatic warming continued and the composition of the forests changed, as did the flora and fauna that resided in them, the local Native Peoples adapted their tool kits, and probably their subsistence strategies, and continued to occupy the Three Mile River area through the succeeding Middle and Late Archaic periods between 8,000 to 3,000 years ago. Sometime between 3,000 and 1,700 years ago (Early Woodland Period), domesticated plants were introduced and maize, beans, and squash (the Three Sisters in native folklore), were planted along the fertile alluvial terraces adjacent to the Three Mile River. Native Peoples continued to adjust their lifeways and remained within the Three Mile River Watershed through the Middle and Late Woodland periods, from 1,700 to 400 years ago, when the first Europeans began to enter the area.

The archaeological record of the proposed Three Mile River ACEC clearly demonstrates that a viable resource base existed there through most of prehistoric times. While this resource has been changed through time, it is evident that local Native Peoples were capable of adjusting to these changes, and they may seized upon these changes as opportunities and thrived in the ecological richness that the Three Mile River Watershed offered them.

SPECIAL TOPICS PRESENTATIONS and RECOMMENDATIONS

Topic: Culture, History, and Archaeology
Guest Speaker: Jessica Rowcroft, Massachusetts Department of Conservation and Recreation (DCR) Preservation Planner
Contact: jessica.rowcroft@state.ma.us

Recommendations:

1. Complete the local historical inventory for the ACEC begun during the ACEC application process as well as any necessary survey forms for sites in the ACEC; forms are available from the Massachusetts Historical Commission (MHC). MHC is digitizing the state data layer; Josh Rosenthal is the MHC GIS specialist (call MHC directly at 617-727-8470).

2. Create a public awareness/advocacy piece with the Stewardship Plan and sponsor events to promote public awareness of the cultural, historical, and archaeological resources of the ACEC.

3. Highlight the potential for archaeological finds within the ACEC; work in conjunction with the Taunton River Stewardship Council to promote the regional significance of these special areas (similar carryover work may be completed on other significant tributaries following the lead of groups like the Three Mile River Stewardship Committee and the Berkley/Lakeville/Freetown/Fall River ROSA group).

4. Recommend archaeological surveys in the three ACEC municipalities; secure funding to hire a firm (such as Public Archaeology Lab) to complete these surveys.
   (perhaps secure a grant from the Taunton River Stewardship Council to facilitate this action)

5. Complete an architectural survey for the Dighton area (around Dighton Industries)

6. Meet with municipal officials and committees/commissions in each of the municipalities in order to educate them about the Stewardship Plan.

E. PUBLIC LANDS

Special Use Areas

The ACEC area not only contains outstanding wildlife, historic, and agricultural resources within its bounds, it also offers a wealth of recreational and scenic opportunities for the public to enjoy. These lands include nature preserves, schools, fields and golf courses, all of which support maximum public access to a valuable resource. This area also provides passive recreation that is close by and affordable for many within the community.

According to the most recent MassGIS land use data, over 1,700 acres (or12% of the land in the ACEC) of land within the ACEC are classified as open space and recreational, permanently protected under state, municipal, private non-profit, or conservation or agricultural restriction. Despite the ownership, classification, or level of protection, all of these facilities share a common quality … the need for stewardship. Many of these facilities require Land Use Management Plans as part of state purchase (under any number of state grants programs or direct state purchase), Conservation Restriction, or Agricultural Preservation Restriction requirements. The life and utility of these plans lies in the strength and commitment of the public/private/non-profit partnerships of which they are born. It's not just the planning, but also the practice of stewardship, that preserves the quality and experience of the land or facility.

Some of the major properties located within the ACEC, that provide outstanding passive, active, and visual experiences, are listed below:

Woodward Springs
Location: Harvey Street, Taunton
Ownership: City of Taunton, Conservation Commission
Management: Conservation Commission
Description: Currently forested
Uniqueness: Very steep hills run along the river, with a Spring fed BVW (Bordering Vegetative Wetland) on site. Allows for direct access to the river.

Private Sanctuary
Location: Evergreen Drive, Taunton
Ownership: Private, with deed restrictions
Management: Private owner
Use: Completely native for wildlife
Description: Forested
Uniqueness: High quality, build-able uplands protected by a private landowner

Oakland School
Location: Norton Avenue, Taunton
Ownership: Taunton School Department
Management: Taunton School Department
Use: Two schools with associated play facilities
Uniqueness: has active recreation and education within walking distance to the river, example of WPA in action

Taunton Western Little League Complex
Ownership: Taunton Western Little League
Management: TWL
Use: Baseball fields Description: Abutting Nursing home, with minimal buildings
Uniqueness: Popular family location that abuts a very large BVW along the river

Parker Municipal Golf Course
Location: 17 Fisher Street, Taunton
Ownership: City of Taunton
Use: 195 acres, 9-hole golf course, with plans for 9 more holes
Description: Currently, manicured grounds, with a large intact Silver Maple Forest between them and the river.
Uniqueness: Small River Floodplain Forest within walking distance of many residents, and future revenue for recreation

Gertrude Boyden Wildlife Refuge
Location: Cohannet Street, Taunton
Ownership: Taunton Conservation Commission
Management: Taunton Conservation Commission
Use: Wildlife Refuge and passive recreation
Description: 189 acres; Currently all forested, with permanent walking trails, and the Taunton River Center office
Uniqueness: Large forested area, municipal office, river access, and a supplemental non-profit facility (Taunton River Watershed Alliance)

Westville Cemetery
Location: Cohannet Street and Winthrop Streets, Taunton
Use: Permanent Cemetery
Uniqueness: Landscaped and treed grounds

Oakland Cemetery Complex
Location: Glebe and North Walker Street, Taunton
Use: Several permanent cemeteries
Description: Landscaped/treed grounds
Uniqueness: Abuts Idella Lewis property

Idella Lewis Property
Location: Glebe Street, Taunton
Ownership: Taunton Conservation Commission
Description: Has a silver maple floodplain forest, abandoned cranberry bog and a rail line
Uniqueness: **This parcel along with the Parker Golf Course, makes up the largest and best example of an intact Silver Maple Floodplain Forest in Southeastern Massachusetts.**

Sharpe Estate Property
Ownership: Taunton Conservation Commission
Description: 272 acres, entirely forested

Woodward Forest
Ownership: Land Preservation Society of Norton; Town of Norton
Description: Approximately 243 acres of woodland

Everett Leonard Park
Location: Parker Street, Norton
Ownership: Town of Norton
Description: 27 acres including: playground, ballfields, basketball court, pavilion, and town pool; parking lot is located on Parker Street.

Everett Leonard Conservation Area
Location: Parker Street, next to Everett Leonard Park, Norton
Ownership: Town of Norton
Description: 15 acres including open fields, Birch Brook, and forest; walking and habitat viewing; parking at the Everett Leonard Park.

Taunton Copperworks
Location: Taunton Avenue, Norton (along the Wading River)
Description: 150 acre site of 19th century copperworks constructed by the Crocker Brothers; the site contains man made canals to power the mills, remnant stonework and foundations for the Rolling Mill, Manager's House, Refinery Site, and Copperworks Bridge; the site was significant as an early supplier of ship hull sheathing and coin blanks for the U.S. Mint in Philadelphia; portions of the site have been preserved through the efforts of the Land Preservation Society of Norton and the Norton Conservation Commission.
Uniqueness: cultural and historic significance

L.A. Foster Wildlife Refuge
Location: South of Taunton Avenue/Route 140, Norton
Ownership: Town of Norton
Description: Gift of Marjorie and Barbara Foster, the refuge borders the Wading River across from the copperworks, and was once part of the copperworks.

Westville Conservation Area
Location: North Walker Street, Taunton
Ownership: Conservation Commission, City of Taunton
Description: 54 acres of forests and fields along the Three Mile River. The site is dominated by hayfields, floodplain forest, and over 3,300 feet of river frontage. Over the past century, the site use was largely agricultural (corn and hay). Trails on site provide an opportunity for hiking and observing nature, as well as access to the Three Mile River.

F. THREATS

NPDES Wastewater Discharges

The Mansfield Water Pollution Control Facility (WPCF) is located in Norton, in close proximity to the Taunton Industrial Park (Myles Standish Blvd., south of the Taunton/Norton line), near the northeastern corner of the Three Mile River ACEC boundary. The WPCF treats sewage and septage waste from Mansfield, Norton and Foxboro to remove solids and kill bacteria. The WPCF is permitted to discharge 3.14 MGD (average monthly) of treated effluent, via outfall, to the Three Mile River. According to reports submitted to state and federal agencies, the WPCF regularly achieves pollutant removals that exceed established regulatory standards (DEP 2005).

The WPCF treats over 800,000 million gallons of wastewater annually. Treated wastewater is disinfected with chlorine in order to kill pathogenic bacteria, then dechlorinated, in order to protect aquatic life, prior to discharge to the Three Mile River.

BIW Cable Systems is authorized to discharge 0.0017 MGD average monthly and 0.0027 MGD maximum daily of processed wastewater via one outfall, and a maximum of 0.006 MGD of wastewater from the electrical test tank, via a second outfall. Both outfalls have a maximum temperature allowance of 28.3 degrees C as both a monthly average and daily maximum (DEP 2005).

The Harodite Finishing is permitted to discharge noncontact cooling water from two outfalls, at 0.036 MGD with a maximum temperature of 83 degrees F (DEP 2005).

Natural Hazard Areas

Bordering Land Subject to Flooding, as described in the Wetlands Protection Act and regulations, has been identified within the Three Mile River Watershed by the Federal Emergency Management Agency (FEMA) and the Flood Insurance Rate Maps (FIRM). Special Flood Hazard areas extend along both banks of the Three Mile River. In Norton, the extent of flooding is expected to be greatest along the western bank downstream of the confluence of the Rumford and Wading Rivers. The extent of flooding then shifts to the eastern bank of the Three Mile River after the convergence of Old Crane Pond and Dora Brook.

The 100 year floodplain for the Three Mile River, as per 7 inches of rain in a 24 hour period for this region, makes up a significant portion of the watershed. The river has four bridges and two dams that cross this floodplain in Taunton. The bridges are located on Harvey Street, Tremont Street, Fisher Street and Winthrop Street. The two dams are the Oakland Mill dam and the Mount Hope dam. This floodplain currently has a considerable amount of storage capacity and provides a large protective corridor of breeding habitat to many reptile and amphibian species.

Threats to Public and Environmental Health Through Inappropriate Use

The Three Mile River flows through the communities of Norton, Taunton and Dighton towards the Taunton River. Taunton, in particular, as well as Norton and more recently, Dighton, have faced increased development pressure. In Taunton, several of the farms in the Three Mile River Watershed have succumbed to development and are remembered only by a subdivision or street name. Many of the land use practices associated with these developments may directly impact surface and groundwater quality downstream, including the Dighton wellfields and Segregansett River, both sources of public drinking water. Specific environmental impacts associated with development practices include: increased water use, adequate stream flows, stormwater run-off and all that is transported with it, and the spread of exotic, invasive species into our waterbodies, not to mention the potential loss of historical and archaeological artifacts with every truckload of gravel that is removed from these sites.

Non-point source pollution from stormwater run-off carries sediments, oils, heavy metals and salts to the river, streams, and wetlands. The stormwater running over areas cleared for development can also cause significant streambank erosion. While clean soil hardly seems like a pollutant, this soil erosion results in sedimentation. Silt and sand from sediment can result in choked streams, and thus threaten the overall health of the riverine ecosystem and some of the rare and unique species that inhabit the Three Mile and its minor tributaries.

The amount of impervious surface throughout the Three Mile River Watershed varies, but averages 13% overall. While this number is somewhat high, stormwater impacts to waterways may not be irreversible and streams can be restored. The Norton Conservation Agent has led coordinated efforts to clean-up streambanks and remove invasive species from waterbodies connected to the ACEC area (most recently, addressing the water chestnut issue in Barrowsville Pond). These activities have been part of the Conservation Department's long-range plan to evaluate and address the impervious cover and stormwater impacts to local aquatic systems. The implementation of this plan would involve: determining the headwater and 1st and 2nd order streams in the watershed; evaluating existing culverts to determine if they are adequately sized, structurally deficient, or restricting fish and wildlife passage, and; evaluate riparian buffer habitat and potential coldwater fisheries.

This program could be replicated throughout the ACEC with the aid of conservation partners (such as the Taunton River Coalition, the SRPEDD GRRIP Program, and the Taunton River Stewardship Council), and be brought to the public in a number of workshops or forums.

Another potential problem created by stormwater run-off is pesticide and fertilizer residues, carried over the farm fields into the river, where agricultural best management practices and adequate streamside buffering are not employed. While this problem does not appear to be widespread within the Three Mile Watershed, the Bristol County Conservation District, the Pilgrim Resource Conservation & Development Area Council

(RC&D), and the United States Department of Agriculture (USDA), are all working with planning and conservation groups to promote responsible, sustainable agricultural practices (two farm conservation plans have recently been completed within the ACEC area under the auspices of the USDA Farm Planning Program).

One of the greatest, and perhaps most irreversible impacts, to the Three Mile and the Taunton River Watershed in general, is the impact of development upon the cultural, historical, and archaeological resources of the region. The Massachusetts Historical Commission considers the whole of the Taunton River watershed as having one of the highest densities of recorded archaeological sites in the Commonwealth.

The Taunton River Stewardship Council and the Three Mile River ACEC Stewardship Committee have been working with representatives of the Wampanoag Nation through the Dighton Inter-Tribal Indian Council. The tribe is concerned with both the fragmentation of the habitat areas that supplied the needs of their ancestors, recorded with every river and streamside development that is completed, as well as the loss of the cultural, historical and archaeological information, largely unrecorded, that is plowed under or carted away by the truckload. This information is irretrievable, irreplaceable, and a loss not only to the native peoples, but to every citizen of the Commonwealth as well.

The Three Mile River Stewardship Committee has been working diligently with partners in the non-profit community as well as municipal partners to stem these potential cultural losses in known areas of cultural/historic/archaeological sensitivity. While there are many such properties throughout the ACEC, and in the Three Mile River corridor alone, we must be able to recognize and seize upon opportunity when and where it presents itself. One recent conservation effort paid dividends when on June 10, 2010, the City of Taunton, in conjunction with The Trustees of Reservations, The Nature Conservancy, the MA Division of Conservation Services, The Sheehan Family Foundation, The Open Space Institute, the Bafflin Foundation, and one anonymous donor, partnered to preserve a 54 acre parcel on the banks of the Three Mile River in the Westville Neighborhood of Taunton, within the ACEC. This parcel, referred to as the Westville Conservation Area (the former Mello property; see map on following page), contains three vernal pools, habitat for Blanding's and wood turtles, over 3,300 feet of river frontage, and was a site of activity for the Native Peoples.

Threat to the Resource

Despite some successes, like the Mello Property, and the recent additions to the greenway in Norton, the potential impacts from development, utility (sewer and water), and transportation projects that are slated for the ACEC area (residential development in North Dighton, in the Dighton Industries area; the City of Taunton's Comprehensive Wastewater Management Plan, and several others under consideration), may not be part of any discussion unless we actively work to incorporate the conservation and preservation needs of the ACEC into the planning agenda.

However, all of these potential problems pale in comparison to what may be the most imminent threat to the outstanding resources of the Three Mile River Watershed … our own lack of awareness of what we have. Perhaps, to this point, the lack of awareness of others to the development potential that exists within the Three Mile River Watershed is what has helped to maintain its ecological, cultural, historical, and archaeological integrity. We cannot, and should not, hope to hide this area from view, or hope that development avoids this little corner of southeastern Massachusetts. Despite the best efforts of the municipalities, we have seen important farmland, open space, and historical resources disappear in recent years. If we plan, but do not act, this process will only accelerate in the coming years.

Due to the large amount of open/rural land remaining within its bounds, the development potential of the Three Mile River Watershed is very high (the growth rate within the three municipalities averaged over 30% between 1990 and 2005). Increased development pressure could lead to the extension of the transportation, sewer, and water infrastructure systems to the ACEC area.

While growth in the Three Mile River Watershed area is anticipated in the Taunton Comprehensive Wastewater Management Plan, the potential for and impacts from secondary development cannot be accurately anticipated. The fiscal impacts to the city, coupled with the potential loss of natural, historical, and archaeological resources in the Three Mile River Watershed, could prove to be a long-term financial burden and an irretrievable cultural loss.

Topic: Dams and Ecological Restoration
Guest Speaker: Beth Lambert, MA Division of Ecological Restoration (DER)
Contact: beth.lambert@state.ma.us

Recommendations:

1. Help to meet the needs of rivers and aquatic organisms
    a. Promote clean water;
    b. Maintain appropriate amount of water (natural streamflow);
    c. Retain appropriate stream habitat (channel shape, cobbles, boulders, banks; the "natural messiness " found in healthy rivers and streams;

2. What we can do to maintain the ecological integrity of the watershed:
    a. Restore altered wetlands;
    b. Manage stormwater;
    c. Protect streamside lands;
    d. Collect streamflow data and ID problems/problem areas;
    e. Remove dams that negatively impact natural stream processes or create flood hazards;
    f. Replace non-functioning/undersized culverts that create fisheries and flow obstructions;

3. Threats posed by obsolete or structurally compromised dams:
    a. Interruption of natural stream processes;
    b. Dams can create ponds which in turn promote a uniformity of species and habitat, whereas natural streamflow and natural messiness found in streambeds promote a diversity of habitats and species;
    c. Dams can also have negative impacts on water quality behind them in the form of low dissolved oxygen levels, high temperatures, high nutrient levels, and create sinks for toxins in the sediments trapped behind them;
    d. Two types of dams that are beneficial to remove: large dams at the mouth of rivers and streams that impact natural flows and fish passage; small headwater dams that can have profound ecological impacts;
    e. Dam removal process includes feasibility study, data collection and analysis, a cost-effective design/plan, and development of follow-up protocol to evaluate the evolution and effectiveness of the restored area.

4. The DER can help with an overview and ecological assessment of dams in the Three Mile River ACEC as well as GIS maps of dams in the ACEC; the MA Division of Marine Fisheries (DMF) is looking to replace one fish ladder and add another on the Three Mile River (it is important to note that while ladders may improve the movement of fish in the watershed, fish ladders won't necessarily have an impact on pond or stream habitat.

G. CLIMATE CHANGE

With the changing levels of precipitation related to climate change, our communities will become more vulnerable to flood events, particularly in areas of floodplain encroachment and where stormwater conveyance and drainage facilities along our roadways are structurally deficient or functionally obsolete.

Precipitation data compiled over the past several decades has shown an increase in the intensity, magnitude, and distribution of storms. In fact, in the past fifty years, the incidence of very heavy precipitation has increased 67% in the Northeast, more than double the increase in any other area in the United States (*U.S. Global Change Research Project,* 2007). These storms are characterized by intense downpours, bringing large volumes of water in a short period of time, resulting in flash flooding events. Massachusetts has seen an increase in the frequency of these extreme/intense storm events (as has much of the northeast), particularly in the past twenty years. These types of storm events will present new challenges and possibilities for those agencies and individuals in charge of stormwater management in our communities.

While the worst case scenarios associated with climate change and sea level rise are not imminent, the evidence is beginning to be seen in our growing seasons, forests, and coastal waters. Similarly, while southeastern Massachusetts has yet to experience a Category 3 storm or the equivalent, the potential for such occurrences must be taken into account in future comprehensive planning. The National Oceanic and Atmospheric Administration (NOAA) Mean Sea Level Trend Data for its Woods Hole station shows a rise of 2.61 +/- 0.20 millimeters/year based on monthly mean sea level data from 1932 to 2006 (a rate of approximately 10.3 inches per hundred years, *NOAA Sea Levels Online*). In any of our on- the-ground planning, we must also be very aware that elevations on Flood Insurance Rate Maps (FIRMs) do not include this sea level rise, and that storm surges can (and do) also reach elevations higher than the FIRMs.

Adaptation and Mitigation Planning

Adaptation accounts for our actions taken individually, locally, or regionally, in order to avoid, withstand, or take advantage of current and projected climate changes and impacts (Pew Center for Global Climate Change, 2009). The potential effects of climate change – changing temperatures, floods, droughts, sea-level rise/tidal impacts to coastal rivers – are already presenting themselves in our local communities and region as a whole. While climate change impacts are discussed most often within an environmental context, the long-term impacts to the economy, habitat, biodiversity, and infrastructure of our region are all interrelated and at risk. Many of the adaptive strategies that can be employed to deal with the potential effects of climate change are the same as those proposed to deal with stresses to systems in watershed-based planning.

Mitigation, in reference to climate change, involves the actions prescribed or taken to reduce greenhouse gas emissions. Some of these actions, whether structural or policy related, intersect with adaptive capacity, in terms of the reparation or restorative action's ability to lessen the stresses to an affected system and increase its resiliency. This promotes a multidisciplinary

approach to adaptation planning. Some of the collaborative planning related adaptation and mitigation recommendations include:

- Increasing the size of culverts when they need to be replaced;
- Use the Cornell Data in stormwater calculations;
- State programs should apply ecosystem based management principles at the watershed level to address cumulative impacts of climate change and infrastructure and infrastructure related development (smart growth principles);
- Identifying and prioritizing sites for structural retrofit projects, including stormwater facilities, multi-modal transportation accommodations, and regional transit projects;
- Increasing federal and state funding available at MassDOT to support the construction of stormwater retrofits identified in DEP's revised Total Maximum Daily Load (TMDL) reports;
- Working at the local, state, and federal levels to retain roadside, river, and streamside buffers and intact open space (including forest, edge habitat, and floodways), as well as assessing the use of pervious pavement in the management of stormwater.

As we proceed with our regional tasks, a combination of adaptation (planning to cope with climate change) and mitigation (reduction of greenhouse emission) strategies will be necessary to create an efficient and effective response to impending climate change.

Topic: Climate Change
Workshop Host: Eric Wallberg, Manomet Center for Conservation Sciences
Contact: ewallberg@manomet.org

Summary of November 10, 2010 Workshop

Manomet Center for Conservation Sciences (Manomet) hosted a Taunton River Watershed Workshop on November 10, 2010 at Middleboro Town Hall. The overall workshop goal was to solicit input from a group of experts on the prioritization of ecosystem services provided by the Watershed, the threat posed by climate change, and the recommended adaptation response. The workshop was held as part of Manomet's new climate change adaptation project partially funded by the Kresge Foundation.

The majority of participants felt strongly that public education regarding climate change adaptation/issues is needed – from individual to municipality and state agencies. A visual tool and/or map is needed ASAP that is specific to the Taunton River watershed to facilitate education. The map should have explicit information for decision making on the issues of: water quality, quantity and flow as they are impacted by climate change. This will hopefully connect the urgency with financial resource need. (Note: Mapping has been started in Rhode Island).

Regulatory change and enforcement is critical:

- Pass stream flow regulations that protect sustainable flows.
- Recognition of climate change in current regulations and state enabling legislation, implement to full extent possible – wetlands regs, water management act, stream flow, etc.
- Regionally consistent zoning and regulations are needed to prevent "development hopping." These need to be incorporated into state planning lexicon.
- Wetland protection! Ways to protect migrating wetland areas are needed. Strengthen local and state regulations on wetlands and obtain new data on 100 year flood events. All must be communicated to planners.
- Enforcement of current regulations pertaining to stormwater and flooding issues is lacking. Need to put pressure for compliance on MADEP.
- Better and more flexible planning integrating adaptive future uses; legal constraints on permitting procedures.

More data is needed:

- Cornell University has produced rainfall curves that take climate change into account. But has to be DEP required or engineers will not use it, mapping in communities to show potential impact areas, encourage infiltration.
- Urbanization has resulted in a net decrease in groundwater recharge of -6.2%. However, this deficit is to some extent counterbalanced on a watershed-wide basis by surface discharge of treated wastewater. Unfortunately, on a sub-watershed basis, significant imbalances exist that threaten the ecological vitality of those areas.

Ecosystems in the watershed will be impaired due to climate change along with water quality, quantity and flow; especially need to prepare for wetland migration.

Planning and communication to planners critical:

- Infrastructure updates are necessary to remove "functionally obsolete, structurally deficient" structures (dams, update culverts, un-develop floodplains, especially wastewater plants, etc) for multiple benefits. TNC and others have identified priority dams.
- Get development out of flood plains; identify places where salt and freshwater wetlands will need to migrate.

- Acquire land to protect food and farms, support local agriculture and CSAs, species, riparian zones, wetlands/cranberries – carbon sink.
- Revisit the Taunton River Priority Opportunity Acquisition list and overlay climate change impacts. Priorities for acquisition may change as a result.

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Appendices

Appendix A: History and Architecture

The History and Architecture of Selected Sites

This section of the Stewardship Plan covers in part the history and architecture of specific areas of the ACEC. Its purpose is to identify those remaining structures of significant age that reflect the early character of a particular neighborhood. Most of these structures do not have exceptional architectural features but collectively continue to remind us of the past.

TAUNTON

Two Old Roads

Dighton, Norton and Taunton are replete with old roads representative of early means of travel from one community to another. Among the significant ones in the Taunton sector of the ACEC are the present Tremont Street (The Bristol Path) and Norton Avenue (The Norton Road).

William Hanna, in his book "A History of Taunton, Massachusetts" tells of how the town of Bristol was imprtant to the early residents of Taunton. He writes that in 1685, the General Court of Plymouth Colony divided the colony into three counties -- Plymouth, Barnstable and Bristol. Although Taunton was one of the largest and oldest towns in the newly designated county, the honor of being designated the shire town fell to Bristol, (now Bristol, R.I.). It was hoped at the time that Bristol, being a shire town, would encourage settlement in that area. But to get there from here was a circuitous route. The traveler on any county business would have to go west to get to south. Bristol would remain the county seat until 1746 when Bristol became a part of Rhode Island and Taunton would gain the well deserved title.

As with any significant road of the time, there sprang up homes, taverns, inns and villages along the route. Oakland became one of these villages and will be referenced in another segment of this stewardship section. Tremont Street was a thoroughfare well before the beginning of the 18th century.

Some one mile from the center of Taunton, off of Tremont Street, lies Norton Avenue. (The Norton Road). Here again are located early houses as this road became a means of getting to the North Purchase, later known as the North Precinct, and on March 17, 1710/11 the town of Norton.

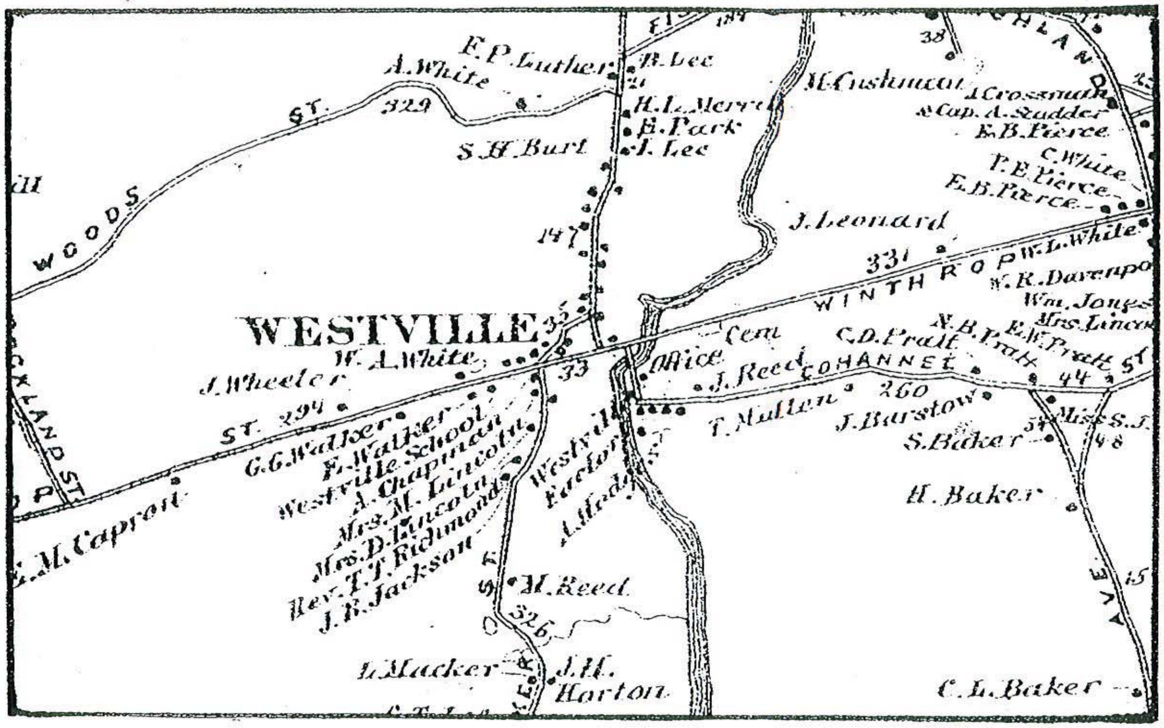
Near the end of Norton Avenue, where the old road meets the new road to Norton, was located Woodward Springs Park. Late in the 19th century, and under the sponsorship of the Norton-Taunton Street Railway Company, this area became "a park and recreational site to attract and entice trolley riders to travel on weekends to enjoy a peaceful afternoon picnicking or swimming"

Vestages of the park, now city property, remain; especially the spring that still flows into the Three Mile River.

WESTVILLE VILLAGE

As with most New England towns, they grew along principle roads or power sources. Homesteads were located in the Westville/Oakland area as early as 1640.

At the beginning of the 18th century (1702), the area along the Three Mile River, some 1 mile above the rapids in Dighton, a suitable section of the river was harnessed by Captain John Andres to grind the local farmer's corn. Shortly after, Andres erected a saw mill, both located a stone's throw from the center of the present village. This section for a century was known as Andrew's Mills. Later came a bloomery (c1739) and in 1809, John West erected a paper Mill. In 1823 came a cotton mill erected on the site of the bloomery. Soon the village name changed to Westville after John West. The manufacture of cotton goods continued well into the 20th century. As the area grew larger to some 500 souls, the villagers partitioned and were granted their own post office -- Walker Mass. (1884 - 1895)

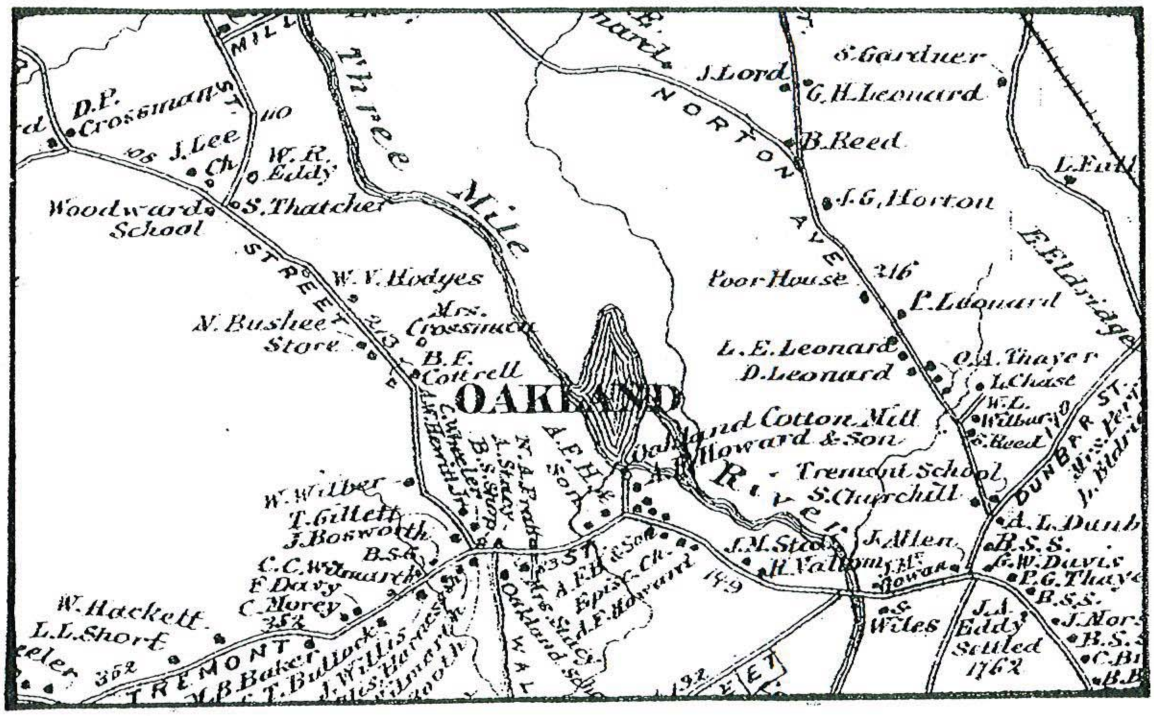

WESTVILLE
WOODS ST.
WINTHROP
COHANNET
ST.
E.P. Luther
A. White
B. Lee
H.L. Merrell
E. Park
I. Lee
S.H. Burt
M. Cushman
J. Leonard
E.B. Pierce
C. White
W.L. White
W.R. Davenport
Wm. Jones
W.A. White
J. Wheeler
G.G. Walker
F. Walker
Westville School
A. Chapman
Mrs. M. Lincoln
Mrs. D. Lincoln
Rev. T.T. Richmond
J.R. Jackson
E.M. Capron
Office
Cem
J. Reed
C.D. Pratt
N.B. Pratt
E.W. Pratt
T. Mullen
J. Barstow
S. Baker
H. Baker
M. Reed
J.H. Horton
C.L. Baker
AVE

OAKLAND VILLAGE

Just off the Bristol Path, between 1680 and 1730, a small community developed that the inhabitants called Newtown, shortened to "Nuten" to distinguish it from the rest of Taunton, which they called Oldtown.

The early settlers were not the Congragationalists of Taunton's earliest church, but communicants of the Church of England. By 1740, they petitioned the General Court to establish their church. Although the General Court denied their petition, they built a church anyway. The vestages of the church, which was blown down in the gale of 1815, still remain near the banks of the Three Mile River on Tremont Street. The congregation and the church experienced political pressures during the Revolutionary War up until about 1785, had a resurgance from about 1785 to 1798 and then languished until 1820 when there was a movement to revitalize the Episcopal church in Taunton. A new church was erected near the center of town in 1829.

In 1828, Captain John Shepard purchased water privileges on the river and erected a stone mill to produce cotton yarn. In 1831 he added looms for making cloth. The business expanded, more looms were added, it passed through several owners and produced a variety of textiles until about 1935. The textile business sustained the village for over 100 years. Oakland, like Westville, had its own post office in the villages general store. from 1891 - 1895.


OAKLAND
Three Mile River
NORTON AVE
MILL ST.
STREET
TREMONT
DUNBAR ST.
D.P. Crossman
J. Lee
Ch.
W.R. Eddy
Woodward School
S. Thatcher
W. V. Hodges
N. Bushee Store
Mrs. Crossman
B.F. Cottrell
J. Lord
S. Gardner
G.H. Leonard
B. Reed
J.G. Horton
Poor House
P. Leonard
L.E. Leonard
D. Leonard
O.A. Thayer
L. Chase
E. Eldridge
Oakland Cotton Mill
A.F. Howard & Son
Tremont School
S. Churchill
A.L. Dunb
B.S.S.
G.W. Davis
P.G. Thaye
J.M. Staples
J. Allen
H. Vallom
S. Wiles
J.A. Eddy Settled 1762
W. Wilber
T. Gillett
J. Bosworth
C.C. Wilmarth
F. Davy
C. Morey
W. Hackett
L.L. Short
M.B. Baker
C.T. Bullock
J. Willis
A.F. Howard
Epis. C. Ch.
Oakland Sch.
L. Full

DIGHTON

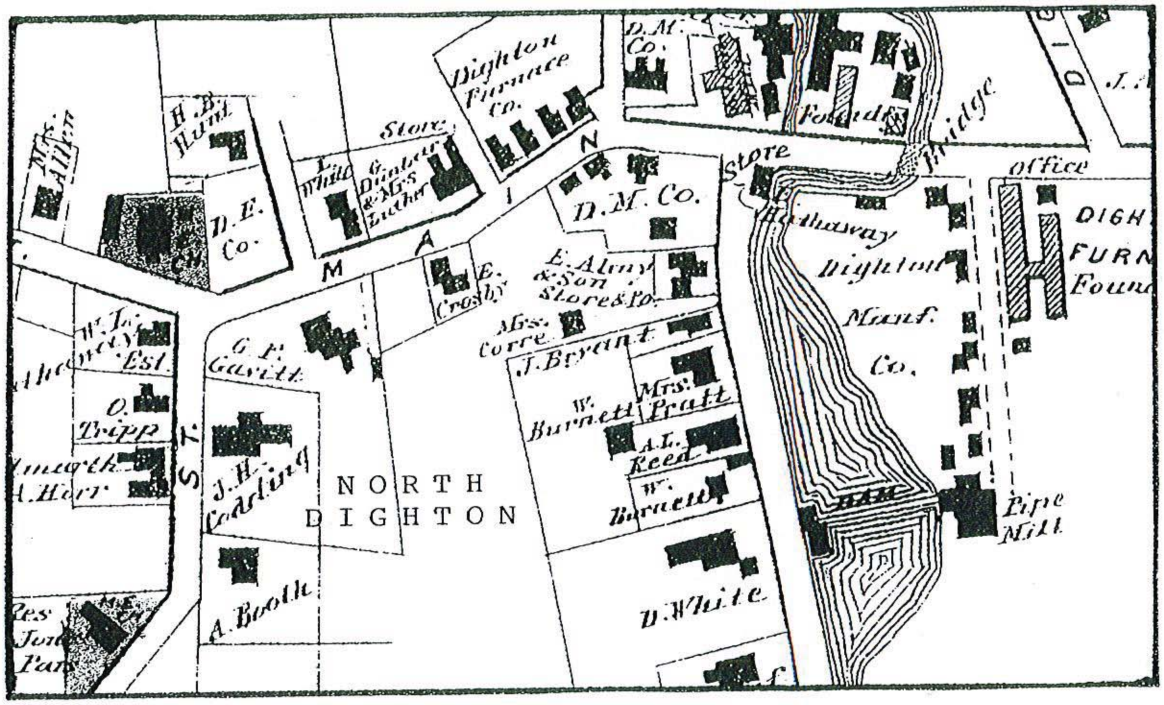
North Dighton Village

The most southern boundry of the ACEC, just before where the Three Mile River joins the Taunton River, has a small bit of historical and archaeological segment of land.

There is no doubt that the Native Americans used this portion of the river as a crossing, transportation and the trails on both sides which developed into established roads.

Peter Walker, as early as 1700, built a furnace and forge on the island formed by the division of the Three Mile River at the place where there was a significant drop in elevation (at the rapids). About the same time, NIcholas Stevens erected a sawmill and a grist mill on the same island.

By 1800, a dam was built upstream to provide a more controlled flow of water. This in turn, provided opportunities for the establishment of textile, paper and foundry operations through to the late 1800s and early 1900s. With the Mill Pond and the aquifer able to provide some 9 million gallons per day, Mount Hope Manufacturing Company, one of the largest textile finishing plants in the country,(1900-1954) was able to locate in the village along the river. The expansion of the Mount Hope Finishing Company resulted in many company owned houses being built about the village. There is no question that North Dighton was a company village.

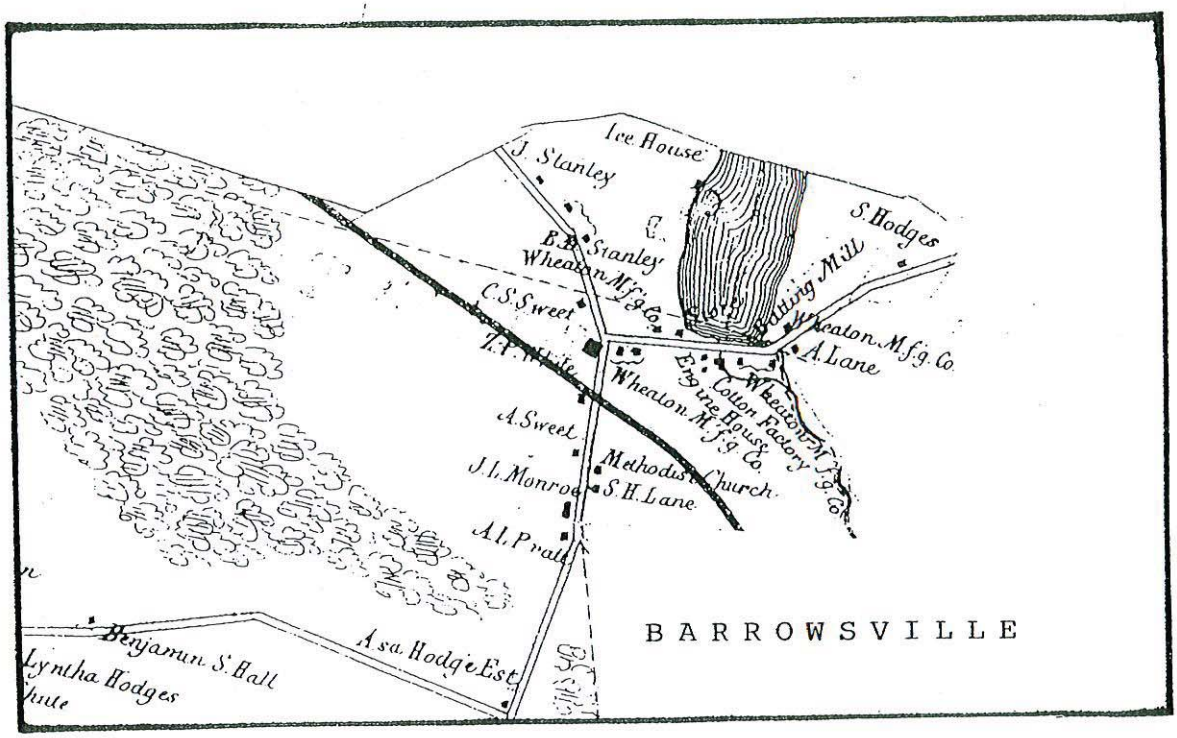

Dighton Furnace Co.
D.M. Co.
Store
Bridge
Office
Mrs. Allen
H. B. Hunt
D. E. Co.
Store
L. White
G. Dunbar & Mrs Luther
M A I N
D. M. Co.
Hathaway
Dighton Manf. Co.
E. Almy & Son Store & Po.
E. Crosby
Mrs. Corre
G. P. Gavitt
Est.
O. Tripp
S T
J. Bryant
W. Burnett
Mrs. Pratt
A. L. Reed
W. Burnett
J. H. Codding
NORTH DIGHTON
A. Booth
D. White
Pipe Mill

NORTON

Barrowsville Village

The early records of Taunton, of which Norton was the North Precinct until 1710/11, reflect that the Leonards, Thomas and James, established an iron forge at Stony Brook in 1695. Among their holdings and about one half mile from their forge, they erected a saw mill and a grist mill on the Wading River; just south of the present Barrows Pond and near the Worcester Road. The Leonard forge was in operation until about 1770. By 1790, the Wading River property was sold to Ephraim Raymond, who soon erected an iron forge and by 1810 a cotton mill. By 1833, after several changes in ownership, Albert Barrow became a principal owner and by 1844, the firm of Wheaton Manufacturing Company was incorporated by Albert Barrow, Samuel King and Leban M. Wheaton.

As was the custom of the time, the location assumed the name of the principal factory owner and by 1855 Barrowsville, with its cotton mill as the largest enterprise, was well established. The mill burned down in the late 1800s and was rebuilt about 1900 as the Defiance Manufacturing Company. As the population grew, a post office was established in 1873 and continued operations until 1972. The streets that reflect the character of those times and the village are Dean Street, Barrows Street and South Worcester Street.


Ice House
J. Stanley
S. Hodges
B.B. Stanley
Wheaton M.f.g Co.
C.S. Sweet
Cutting Mill
Wheaton M.f.g. Co.
A. Lane
T.T. White
Wheaton M.f.g. Co.
Engine House
Cotton Factory
Wheaton M.f.g. Co.
A. Sweet
Methodist Church
J.I. Monroe
S.H. Lane
A.I. Pratt
BARROWSVILLE
Benjamin S. Hall
Asa Hodge Est
Lyntha Hodges

Copper Works

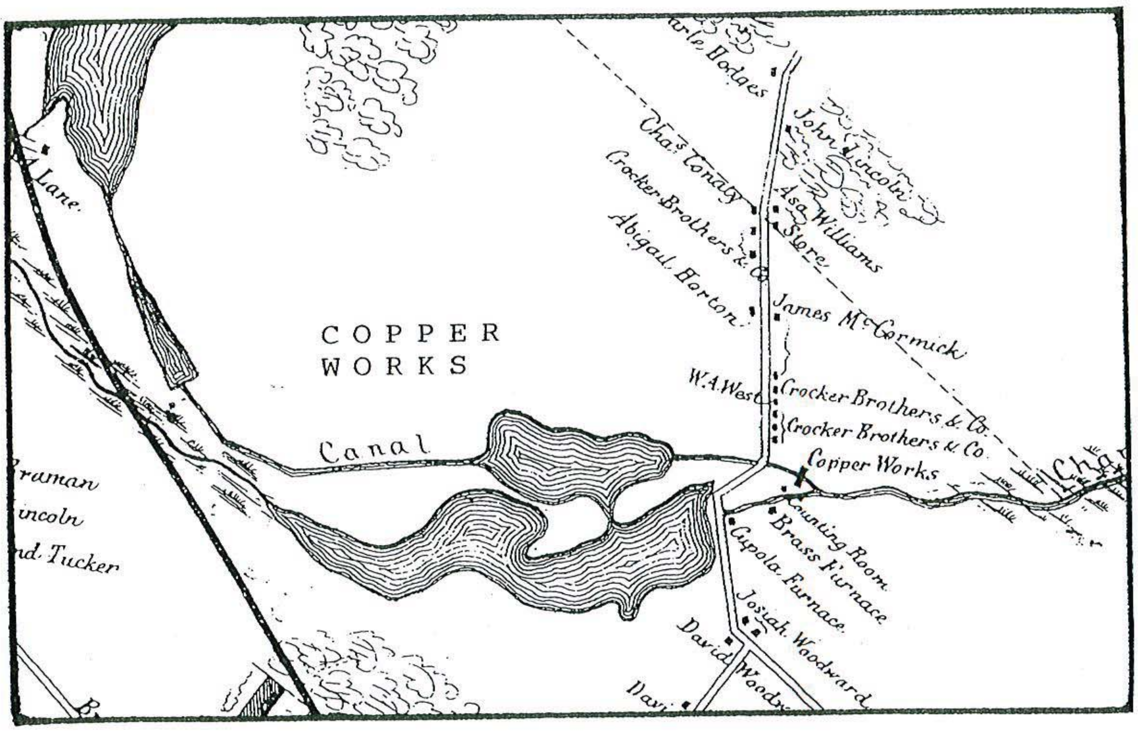
George F. Clark, in his 1859 history of Norton, lists the Copper Works as one of 4 villages in Norton with the copper works as its focus and some 25 houses and a store.

The area of the copper works, where the Wading River flows under Route 140, some ½ mile from the Taunton line; was occupied by manufacturing enterprises as early as 1796. The first was the slitting and cutting mills of Benjamin Horton in the manufacture of nails. By 1825, the entire Crocker family became involved in erecting a mill for the rolling of copper, as well as a copper refining furnace (a smelter). In 1835, the Crocker brothers dug a canal from the mill pond and built another mill and by 1838 a zinc mill. In 1857, they added an addition to the smelting furnace for the purpose of condensing the ozide of zinc escaping from the furnace. It was one of the earliest examples of dealing with a smelly nuisance as well as recovering some $50.00 per day of zinc oxide powder used in the paint industry.

The Crockers in about 1837, and under the direction of William A. West, started to provide the planchets (copper blanks) for coinage that amounted to $50,000.00 annually (5 million blanks).

In 1849, the Crockers expanded their operations to Taunton for the rolling of copper, yellow metal and zinc; removing a portion of the machinery from Norton. By 1855, most of these operations were removed to Taunton.

Route 140, Taunton Avenue, has a few remaining houses of the village era.

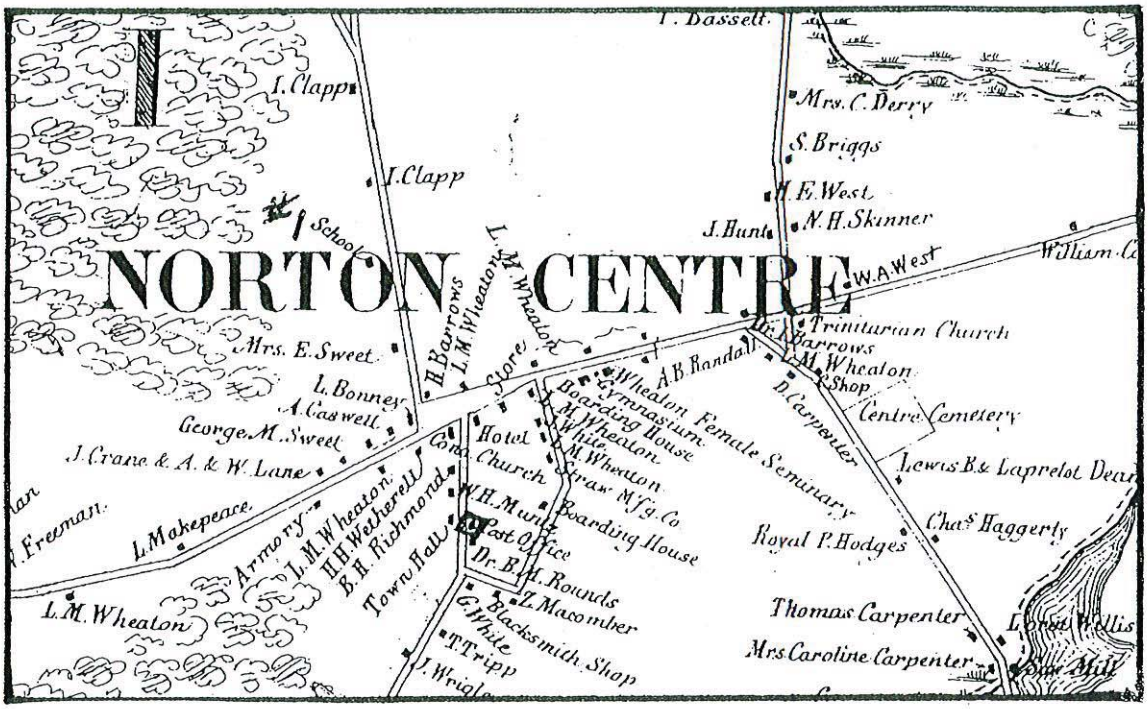

COPPER WORKS
Canal
A. Lane
Chas. Conaty
Crocker Brothers & Co.
Abigail Horton
John Lincoln
Asa Williams
Store
James McCormick
W.A. West
Crocker Brothers & Co.
Crocker Brothers & Co.
Copper Works
Brass Furnace
Cupola Furnace
Josiah Woodward

Center Village

The largest of the villages of Norton was Center Village, the heart of the town at the crossroads of what is now Route 123 and Route 140. Clark, in his 1859 history of the town, describes the village as having 60 homes, 2 churches, a public house, 2 stores and Wheaton Female Seminary.

Starting in 1707, the inhabitants petioned the General Court to separate themselves from Taunton first as a precinct and then as a town which status was achieved in 1710-11. They met the requirements that a church be gathered, a parsonage built and a minister engaged. Mr. Joseph Avery, after nearly 4 years being described as a "transient preacher", finally accepted the call in 1714. The parsonage they built in 1710, still stands on West Main Street.

The village located in the center of town, soon developed as a central location of religion, transportation, town business, education, commerce and residential expansion. The center of the village is designated as a Historic District.


NORTON CENTRE
T. Bassett
J. Clapp
J. Clapp
School
H. Barrows
L. M. Wheaton
Mrs. C. Derry
S. Briggs
H. E. West
N. H. Skinner
J. Hunt
W. A. West
Trinitarian Church
Dr. Barrows
M. Wheaton
Shop
Centre Cemetery
Mrs. E. Sweet
L. Bonney
A. Caswell
George M. Sweet
J. Crane & A. & W. Lane
L. Makepeace
Armory
L. M. Wheaton
H. H. Westherell
B. H. Richmond
Town Hall
L. M. Wheaton
Hotel
Cong. Church
W. H. Munn
Post Office
Dr. B. H. Rounds
C. White
Blacksmith Shop
T. Tripp
Wheaton Female Seminary
Gymnasium
Boarding House
A. M. Wheaton
White
Straw M'f'g Co
Boarding House
A. B. Randall
D. Carpenter
Royal P. Hodges
Lewis B. & Laprelot Dean
Chas Haggerty
Thomas Carpenter
Mrs Caroline Carpenter

Tremont Street (The Bristol Path)	Number 27	c1850
	30	1850
	42	1830
	62	1850
	101	1850
	103	1850
	155	1756
	167	1777
	174	1835
	211	1777
	221	1700
	273	1850
	313	1800
	347	1850
	376	1840
	383	1800
	386	1700
	396	1750
	408	1800
	433	1750
	490	1700
	492	1757
	567	1825
	1010	1827

(All dates as recorded in the Assessor's Office)

Norton Avenue (The Norton Road)	Number 78	c1770
	225	1780
	260	1725
	350	1876*
	461	1790
	920	1843
	995	1736
	1185	1700
	1255	1738

* Taunton Nursing Home established in 1827 as an almshouse.

Listed on the National Register of Historic Sites.

(All dates as recorded in the Assessor's Office0

Cohannet Street	Number1046	c 1850
	1310	1850
	1372	1800
	1380	1800
	1384	1800
	1390	1800
	1384	1800
Winthrop Street	419	1826
	427	1850
North Walker Street	96	1820
	102	1850
	104	1850
	106	1820
	111	1750
	121	1760
	126	1815
	155	1824*
South Walker Street	175	1800
	176	1775
	185	1820
	223	1825

* West Congregational Church established in 1792 and moved to its present location. Oldest standing church in Taunton and only example of Federal Church Architecture.

Listed on the National Register of Historic Sites.

(All dates as recorded in the Assessor's Office)

Tremont Street Number 211 thru 396

Mill Lane	Number 2	c1800
Alfred Lord Blvd.	86	1850
North Walker Street	15	1775
	27	1754
	36	1800
Worchester Street	1	1850
	2	1850
	3	1850
	4	1850
	25	1750
	27	1850
	28	1688*
	30	1770
	34	1850
	41	1850
	47	1845
	52	1840
	57	1850
	71	1850
	72	1850
	123	1850
	132	1767

* Oldest house in Taunton;

Only remaining early example of a salt box house,

Listed on the National Register of Historic Sites.

(All dates as recorded in the Assessor's Office)

Andrews Street	Number 238	c1775
Mt. Hope Street	270	1800
Spring Street	440	1850
Summer Street	12	1780
	42	1850
	136	1790
	159	1830
Lincoln Avenue	130	1800
	136	1800
	148	1765
	158	1820
	214	1850
	234	1800
	260	1800
	272	1850
	280	1850
	348	1840
	366	1800
	400	1850

(All dates as recorded in the Assessor's Office)

South Worcester Street	Number 185	c1800	
	235	1780	
	250	1800	
	284	1790	
Dean Street	1	1700	1765?
Barrows Court	38	1825	
Barrow Street	53	1760	

(All dates as recorded in the Assessor's Office)

Taunton Avenue	Number 145	c1785
	156	1780
	170	1840
	189	1780
	192	1812
	200	1800
	206	1850
	210	1800

(All dates as recorded in the Assessor's Office)

Mansfield Avenue	Number 2	c1835
	10	1835
	11	1850
	12	1850
	27	1750
	29	1800
	42	1797*
Howard Street	1-3	1835
	9	1840
Liberty Square	4-6	1840
	10	1832
East Main Street	34	1840
	44	1825
West Main Street	9-13	1850
	11	1710
Pine Street	0	1820
	22	1800
Elm Street	8	1830

* Listed on the National Register of Historic ~~Places~~ sites

The Wheaton College Campus has a number of early houses

(All dates as recorded in the Assessor's Office)

The Native American History Along the Three Mile River

The Three Mile River corridor of the ACEC is replete in Native American artifacts, going back some 10,000 years, for a distance of approximately two miles from its confluence with the Taunton River. Artifacts have been found along this two mile stretch on both public and private properties that indicate continual habitation over many millenia. The Baylies' Forge Site is registered with the Commonwealth.

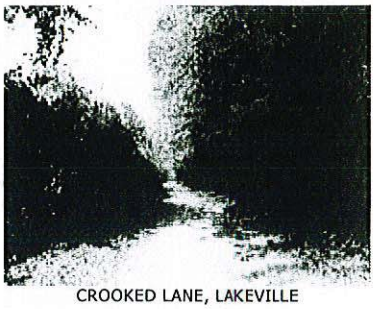
Appendix B: Heritage Landscapes

Historic Landscape Preservation Initiative

HISTORIC LANDSCAPE PRESERVATION PROGRAM

HERITAGE LANDSCAPE INVENTORY PROGRAM

The Heritage Landscape Inventory Program builds upon prior landscape survey efforts to identify, document and plan for the protection of the heritage landscapes that are vital to the history, character and quality of life of our communities.



CROOKED LANE, LAKEVILLE

What are Heritage Landscapes?

Heritage landscapes are those special places and spaces that help define the character of your community and reflect its past. They are the result of human interaction with the natural resources of an area, which influence the use and development of land. These geographic areas contain both natural and cultural resources. Heritage landscapes come in many forms – some you may already be aware of, and some you may not have considered as having the qualities that would make them a heritage landscape:

cemeteries	estates	shipyards
commons	farms	institutional campuses
mill sites	cranberry bogs	archaeological sites
formal gardens	river corridors	scenic roads
parks	camp meeting grounds	village centers

Because heritage landscapes contain both natural and cultural resources, they are subject to a wide variety of threats – but this means that they can also be protected through a wide variety of means. Through this program, DCR's Office of Cultural Resources is assisting communities and regional entities undertake reconnaissance surveys to help develop an integrated, proactive planning approach for heritage landscape preservation. DCR is currently able to provide targeted services to communities on a regional basis; however this does not mean that communities in other regions cannot independently undertake a reconnaissance survey.

The HLI program guidebook Reading the Land was developed to assist communities statewide with the identification, documentation, and preservation planning for their own heritage landscapes. DCR staff is also able to provide some limited technical assistance and guidance to communities who want to take some proactive planning measures for their heritage landscapes. DCR is also applying the Heritage Landscape Inventory program's methodology to the DCR parks system – we are currently wrapping up a pilot project in the Blackstone District parks.

The HLI program helps to foster relationships between local and regional advocates for natural and cultural resources, and serves as a critical link between DCR's Historic Landscape Preservation Initiative and the Commonwealth's Smart Growth programs. Check out our Current Projects to learn more about work that is currently underway within the Heritage Landscape Inventory Program.

For more information on the Heritage Landscape Inventory Program, contact:

Jessica Rowcroft, Preservation Planner
Department of Conservation and Recreation
251 Causeway St, Suite 600
Boston, MA 02114
(617) 626-1380
jessica.rowcroft@state.ma.us

Landscape surveys

Inventory Form

Order copies of "Reading the Land"

Current Projects

Community Reconaissance Reports

Panoramic views

PILOT PROJECT - PARTICIPATING COMMUNITIES

Historic Landscape Preservation Initiative

HERITAGE LANDSCAPE INVENTORY PROGRAM

HISTORIC LANDSCAPE PRESERVATION PROGRAM
HISTORIC CEMETERIES
HISTORIC LANDSCAPES IN MASSPARKS
PUBLICATIONS
HISTORIC LANDSCAPE BIBLIOGRAPHY
ANNOUNCEMENTS
CONTACT US
LINKS

Landscape surveys in Massachusetts can trace their roots back to 1929, when Charles W. Eliot, II working with the Governor's Committee on Needs and Uses of Open Space, identified key areas for open space acquisition throughout the state. Only two types of landscapes were identified – those areas that were proposed open spaces and areas within which state forests should be acquired. This identification helped guide the Commonwealth and municipalities with some initial land acquisition guidance.

Comprehensive efforts to identify significant landscapes in Massachusetts began in earnest in 1933, when The Trustees of Reservations, then known as the Trustees of Public Reservations, joined the American Society of Landscape Architects in sponsoring a statewide Landscape Survey. For the purposes of this survey, a set of categorical landscape types were chosen as "...kinds of Massachusetts scenery that are believed to have special character of outstanding value...". These categories were: ocean beaches and dunes; moor and seashore upland; scenic highway roadsides; mountains, valleys and gorges; woodland; flooded lands in the coastal plain; and smaller areas of scenic or historical interests, which was broken down into the historical, the curious and unusual, and the restful. A number of places were identified in each category throughout the state, and best use recommendations for preservation of these landscapes were made. Acting on the identifications and recommendations made through the 1933 Massachusetts Landscape Survey, The Trustees, DCR (then known as the Department of Conservation) and other entities subsequently acquired many of these places for their protection and public enjoyment.

In 1980, the challenge of again unifying the direction with which different interest groups should be approaching land conservation was raised, and this time DCR (then known as the Department of Environmental Management) took up the gauntlet, undertaking a statewide inventory of scenic landscapes. Adapting assessments utilized by the US Forest Service and the Countryside Commission of Scotland, the consulting team created a methodology that relied on three classifications of scenic quality: "distinctive", "noteworthy", and "common". Dividing the state into six physiographic regions and staying away from any densely settled areas, landscapes were evaluated based upon a set of scenic feature guidelines that were developed for each classification for each region. The assessment resulted in a well-received (and still heavily utilized) report in 1982 that was accompanied by a set of USGS maps used to record these scenic landscapes.

Only two large-scale, statewide cultural landscape survey efforts have since been undertaken, both of them thematically based. These are the 1982 survey of public landscapes designed by the Olmsted firm, sponsored by the Massachusetts Association for Olmsted Parks and the Massachusetts Historical Commission, and the 1995 survey of Civilian Conservation Corps resources sponsored by DCR (then known as DEM). Both of these initiatives started as pilot projects that were then implemented statewide and resulted in reports presenting the results. By the mid 1990s, it became clear that in order to be able to protect community character and promote an integrated planning approach, further identification of the overall cultural landscape of Massachusetts needed to be undertaken. Based upon a proposal prepared in 1997 by The Trustees of Reservations and PreservatiON MASS (then known as Historic Massachusetts, Inc.), DCR was able to secure funding through the legislature to develop the Heritage Landscape Inventory Program.

Heritage Inventory home page
Inventory Form
Order copies of "Reading the Land"
Current Projects
Panoramic views

PARTICIPATING COMMUNITIES

Appendix C: Agricultural Commissions

About AgComs: AgCom's Mission

A town agricultural commission (AgCom) is an appointed town standing committee whose members are primarily engaged in farming and are responsible for:

- Representing the farming community
- Encouraging the pursuit of agriculture
- Promoting agricultural-based economic opportunities
- Preserving, revitalizing, and sustaining the communities' agricultural businesses and lands

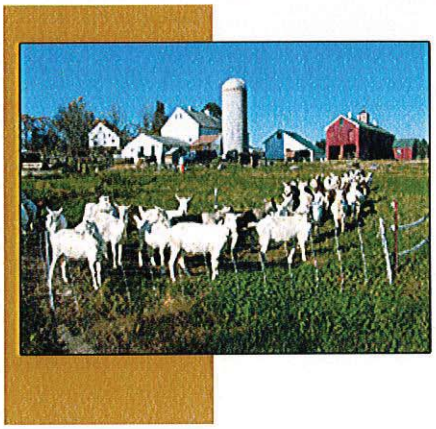
AgComs are:

- Mapping farms and farmlands
- Identifying farmers' and the community's needs, issues and concerns
- Serving as an information clearinghouse and forum for farm-town relations
- Facilitating the technical, educational, business and regulatory assistance needed to farm and to live near farms
- Developing trust and a working relationship among farmers, residents and institutions
- Advocating at state and federal levels for support of community-identified agricultural need
- Facilitating access to conflict resolution services for farmers and the community
- Hosting community agricultural events
- Recommending actions on land use programs that would help agriculture thrive, including Chapter 61, tax valuation, APR and other preservation programs and right-to-farm by-laws
- Seeking out informational and educational resources relevant to farms and farm communities
- Matching farmers with available land and helping the landowner and the farmer promote sustained use

"Our AgCom gives farmers an opportunity to network with each other and work with town boards on issues that make a difference in Rehoboth and its' farm businesses."
~Richard Pray, 7th generation farmer, AgCom member, Oakdale Farms, Rehoboth

"Sprawl and intense development are changing the landscape of our town and the economics of farming. In today's world the highest and best use of our land is houses. I want to work with my neighbors and family to keep our farm going for the next generation."
~Dawn Gates Allen, 4th generation cranberry grower, AgCom member, Gates Cranberry, Middleborough

"Our AgCom started in 1988 and was reorganized in 1997. Over the years we watched as support and assistance to farmers, from a variety of sources, was lost. Having an AgCom in Dartmouth allows our farmers and our town to take responsibility for ensuring that agriculture flourishes."
~ Susan Guiducci, Chair -Ag Preservation Trust Council, AgCom member, Apponagansett Vineyard, Dartmouth



Starting An AgCom: Getting Started

Is your town interested in starting an agricultural commission but has questions on where to begin? This page is designed to provide your town and you with the information and tools necessary to create a successful agricultural commission.

1. Identify leaders and organizers
2. Assess interest. Talk to farmers, residents, boards and committees, and community decision makers.
3. Gather the support of farmers and town leadership.
4. Organize a public informational meeting.
5. Invite farmers through written letters of invitation, residents and the public through press releases and newspapers articles.
6. Request that members of established agricultural commissions speak about why they organized, what they do, and the benefits to agriculture.
7. Answer the questions: Is an agricultural commission important for our town? Do you think we should organize an agricultural commission in town?
8. Gain commitment from participants to serve on an agricultural commission steering committee.
9. Publicize newly established steering committee meetings.
10. Draft an agricultural commission by-law and town meeting warrant article with input from town boards and town counsel.
11. Research advocates and opposition.
12. Present articles at Town Meeting for discussion and vote. Presentation is provided by well informed and prepared advocates.

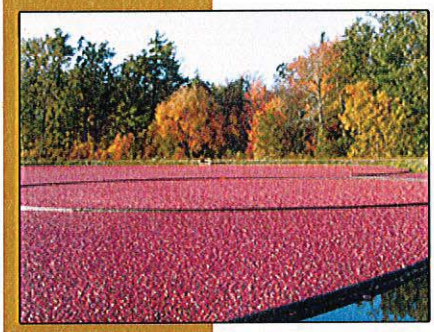
What happens after passage of the agricultural commission by-law?

1. Steering committee and town leadership work together to solicit applicants for agricultural commission members.
2. Steering committee reviews applications and makes recommendations to the Select Board.
3. Select Board appoints members, assigns terms of service, and establishes date for convening first meeting.
4. First meeting business:
    - Identify facilitator and recorder.
    - Review by-law, focus on mission, membership, terms of service, and vote in officers.
    - Chair convenes first meeting:
        - Note Roberts Rules of Order.
        - Identify Needs, Priorities.
        - Establish goals.
        - Begin development of work plan.
        - Implement Work Plan.
        - Guiding principle: Identify and work on achieving one or two measurable goals at a time…build success!
5. Seek Involvement from community through a Circle of Friends
   Circle of Friends or Friends of Farmers
   Agricultural Commission membership can leverage their resources by asking for help from others. Friends are people in the community (or connected to the community) that have skills and abilities that the Agricultural Commission needs to achieve their goals. A "friend" will be honored to assist if they are asked to volunteer time on a task that is focused, short term and achievable. Time volunteered by "friends" should be highly valued and respected.

Learn more by reading the Toolkit for Organizing an Agricultural Commission

If you are interested in starting an AgCom in your town, contact:

- Irene Winkler, USDA-NRCS, Pilgrim RC&D
  (Bristol, Plymouth, Barnstable, Dukes and Nantucket counties)
  508-295-1317 x130, irene.winkler@ma.usda.gov
- Peter Westover, Mass. Dept. of Agricultural Resources
  (Berkshire, Franklin, Hampden and Hampshire counties)
  413-665-4077, westover03@comcast.net
- Cheryl Lekstrom, Mass.Dept. of Agricultural Resources
  (Essex, Suffolk, Middlesex, Norfolk and Worcester counties)
  508-835-6936/2452, clekstrom@mac.com



About AgComs: Overview

What is an Agricultural Commission (AgCom)?
A town agricultural commission (AgCom) is a standing committee of town government, created through a vote of Town Meeting and appointed by the Board of Selectmen or governing body of the town. AgComs represent the farming community, encourage the pursuit of agriculture, promote agricultural economic development and protect farmlands and farm businesses, and preserve, revitalize and sustain agricultural businesses and land. In some communities they focus on farmland preservation efforts, while in others they review regulatory proposals developed by other town boards (planning board, board of health, conservation commission, etc), or provide marketing coordination to assist all farms in town. Others have played key roles in mediating farmer/neighbor disputes, or simply providing referrals for farmers needing better information. By working within town government through an AgCom, farmers enhance their credibility, and are viewed as part of the problem-solving team.

What does an AgCom do?

- Serves as a local voice advocating for farmers, farm businesses and farm interests
- Provides visibility for farming
- Works with other town boards about issues facing the town that affect agriculture
- Helps resolve farm related problems or conflicts
- Protects farmland and natural resources

Who can start an AgCom?
Any local resident or group concerned about their communities' farming, farm businesses, growth, rural character, open space, etc. can start organizing support for an AgCom.

Why are town AgComs formed?
Many towns trying to balance growth and quality of life issues are creating AgComs. The intent of an AgCom is simple: protect agricultural lands, preserve rural character, provide a voice for farmers, and encourage agricultural based businesses.

Who can serve on an AgCom?
Anyone who is a resident of the town is eligible to sit on a town board or commission. However, the by-law created and passed by the town determines the number of members and composition of the commission. In towns with existing AgComs there are several types of members-voting, alternate, and advisory. Usually, the voting members are farmers. Each town should decide what type of membership and qualifications are appropriate for their community.

Does an AgCom cost the town money?
Towns provide support for all committees-each town should decide what is an appropriate budget for the AgCom. Existing AgCom budgets range from $0 to $1,000 per year.

Are AgComs regulatory?
Unlike some other town committees, AgComs do not operate under any regulatory authority from the Commonwealth. While town conservation commissions implement the State Wetlands Protection Act and planning boards enforce the local zoning code, AgComs are created at Town Meeting to represent farming interests in the town-but they do not have any legal mandate or enforcement authority.

What are AgComs doing in Massachusetts?

- Adopting local right-to-farm by-laws
- Raising monies for farmland protection and economic development
- Starting local farmer's markets
- Providing mediation and conflict resolution on farm related disputes within town
- Collaborating with other town boards on development proposals
- Educating town residents about the value of agriculture in the community
- Holding educational workshops on intergenerational transfer of property, Chapter 61 lands, farm viability, and Agricultural Preservation Restrictions
- Obtaining technical assistance on nonpoint source pollution, conservation farm planning, manure management, environmental stewardship

MODEL RIGHT TO FARM BY-LAW

Section 1 Legislative Purpose and Intent

The purpose and intent of this By-law is to state with emphasis the Right to Farm accorded to all citizens of the Commonwealth under Article 97, of the Constitution, and all state statutes and regulations thereunder including but not limited to Massachusetts General Laws Chapter 40A, Section 3, Paragraph 1; Chapter 90, Section 9, Chapter 111, Section 125A and Chapter 128, Section IA. We the citizens of _____ restate and republish these rights pursuant to the Town's authority conferred by Article 89 of the Articles of Amendment of the Massachusetts Constitution, ("Home Rule Amendment").

This General By-law encourages the pursuit of agriculture, promotes agriculture-based economic opportunities, and protects farmland within the Town of _____ by allowing agricultural uses and related activities to function with minimal conflict with abutters and Town agencies. This By-law shall apply to all jurisdictional areas within Town.

Section 2 Definitions

The word "farm" shall include any parcel or contiguous parcels of land, or water bodies used for the primary purpose of commercial agricultural, or accessory thereto.

The words "farming" or "agriculture" or their derivatives shall include, but not be limited to the following:

- farming in all its branches and the cultivation and tillage of the soil;
- dairying;
- production, cultivation, growing, and harvesting of any agricultural, aquacultural, floricultural, viticultural, or horticultural commodities;
- growing and harvesting of forest products upon forest land, and any other forest or lumbering operations;
- raising of livestock including horses;
- keeping of horses as a commercial enterprise; and keeping and raising of poultry, swine, cattle, ratties (such as emus, ostriches and rheas) and camelids (such as llamas and camels), and other domesticated animals for food and other agricultural purposes, including bees and fur-bearing animals.

"Farming" shall encompass activities including, but not limited to, the following:

- operation and transportation of slow-moving farm equipment over roads within the Town;
- control of pests, including, but not limited to, insects, weeds, predators and disease organisms of plant and animals;
- application of manure, fertilizers and pesticides;
- conducting agriculture-related educational and farm-based recreational activities, including agri-tourism provided that the activities are related to marketing the agricultural output or services of the farm;
- processing and packaging of the agricultural output of the farm and the operation of a farmer's market or farm stand including signage thereto;
- maintenance, repair, or storage of seasonal equipment, or apparatus owned or leased by the farm owner or manager used expressly for the purpose of propagation, processing, management, or sale of the agricultural products; and
- on-farm relocation of earth and the clearing of ground for farming operations.

Section 3 Right To Farm Declaration

The Right to Farm is hereby recognized to exist within the Town of _____. The above- described agricultural activities may occur on holidays, weekdays, and weekends by night or day and shall include the attendant incidental noise, odors, dust, and fumes associated with normally accepted agricultural practices. It is hereby determined that whatever impact may be caused to others through the normal practice of agriculture is more than offset by the benefits of farming to the neighborhood, community, and society in general. The benefits and protections of this By- law are intended to apply exclusively to those commercial agricultural and farming operations and activities conducted in accordance with generally accepted agricultural practices. Moreover, nothing in this Right To Farm By-law shall be deemed as acquiring any interest in land, or as imposing any land use regulation, which is properly the subject of state statute, regulation, or local zoning law.

Section 4 Disclosure Notification

Within 30 days after this By-law becomes effective, the Select Board shall prominently post in the Town Hall and make available for distribution the following disclosure:

> "It is the policy of this community to conserve, protect and encourage the maintenance and improvement of agricultural land for the production of food, and other agricultural products, and also for its natural and ecological value. This disclosure notification is to inform buyers and occupants that the property they are about to acquire or occupy lies within a town where farming activities occur. Such farming activities may include, but are not limited to, activities that cause noise, dust and odors. Buyers and occupants are also informed that the location of property within the Town may be impacted by commercial agricultural operations including the ability to access water services for such property under certain circumstances."

In addition to the above, copies of this disclosure notification shall be available in a public area at the Town Hall.

Section 5 Resolution of Disputes

Any person who seeks to complain about the operation of a farm may, notwithstanding pursuing any other available remedy, file a grievance with the Select Board, the Zoning Enforcement Officer, or the Board of Health, depending upon the nature of the grievance. The filing of the grievance does not suspend the time within which to pursue any other available remedies that the aggrieved may have. The Zoning Enforcement Officer or Select Board shall forward a copy of the grievance to the Agricultural Commission or its agent, which shall review and facilitate the resolution of the grievance, and report its recommendations to the referring Town authority within an agreed upon time frame.

The Board of Health, except in cases of imminent danger or public health risk, shall forward a copy of the grievance to the Agricultural Commission or its agent, which shall review and facilitate the resolution of the grievance, and report its recommendations to the Board of Health within an agreed upon time frame.

Section 6 Severability Clause

If any part of this By-law is for any reason held to be unconstitutional or invalid, such decision shall not affect the remainder of this By-law. The Town of _____ hereby declares the provisions of this By-law to be severable.

MDAR
MASSACHUSETTS DEPARTMENT OF AGRICULTURAL RESOURCES

Agricultural Law Memo

ALM 10-04
August 9, 2010

TOPIC: Small Plot Farming: Amendments to Chapter 40A, Section 3

ISSUE: On Thursday, August 5, 2010, Governor Patrick signed into law Chapter 240 of the Acts of 2010. Section 79 of Chapter 240 amends General Laws Chapter 40A, Section 3, by adding as an additional category of agricultural uses protected by that statute any parcel of 2 acres or more that generates annual revenues from the sale of products of $1,000 or more per acre. The purpose of this ALM is to explain the meaning of this addition.

Chapter 40A, Section 3, provides a conditional exemption for the use of land and the construction and use of structures on land for the primary purpose of commercial agriculture. It provides that no zoning ordinance or by-law may prohibit, unreasonably regulate, or require a special permit for the use of land and the construction and use of structures that have a primary purpose of commercial agriculture. Prior to amendment, Section 3 applied to (1) parcels of land of any size devoted primarily to commercial agriculture within districts zoned for agriculture, and (2) parcels of land of five acres or more devoted primarily to commercial agriculture within any zoning district. Neither of these has a minimum revenue requirement.

As amended, Section 3 provides an additional third category of protection: (3) parcels of land of 2 acres or more if the sale of products from the agricultural use generates $1,000 per acre or more of gross sales. Therefore, if a parcel falls into any **one** of these three categories, the parcel will enjoy the protections of Section 3. The full text of Section 3, as amended, is attached to this ALM.

Readers should note three points: (1) the amendments to Section 3 became effective immediately upon the Governor's signing on August 5, 2010; (2) agriculture is broadly defined by reference to General Laws Chapter 128, Section 1A; and (3) the amendments do not alter the acreage requirements of other laws, such as use taxation under Chapters 61, 61A and 61B.

Chapter 240 of the Acts of 2010

SECTION 79. Section 3 of chapter 40A of the General Laws is hereby amended by inserting after the word "more", in line 25, as so appearing, the following words:or to parcels 2 acres or more if the sale of products produced from the agriculture, aquaculture, silviculture, horticulture, floriculture or viticulture use on the parcel annually generates at least $1,000 per acre based on gross sales dollars.

Amended Section 3 of Chapter 40A (inserting text in bold):

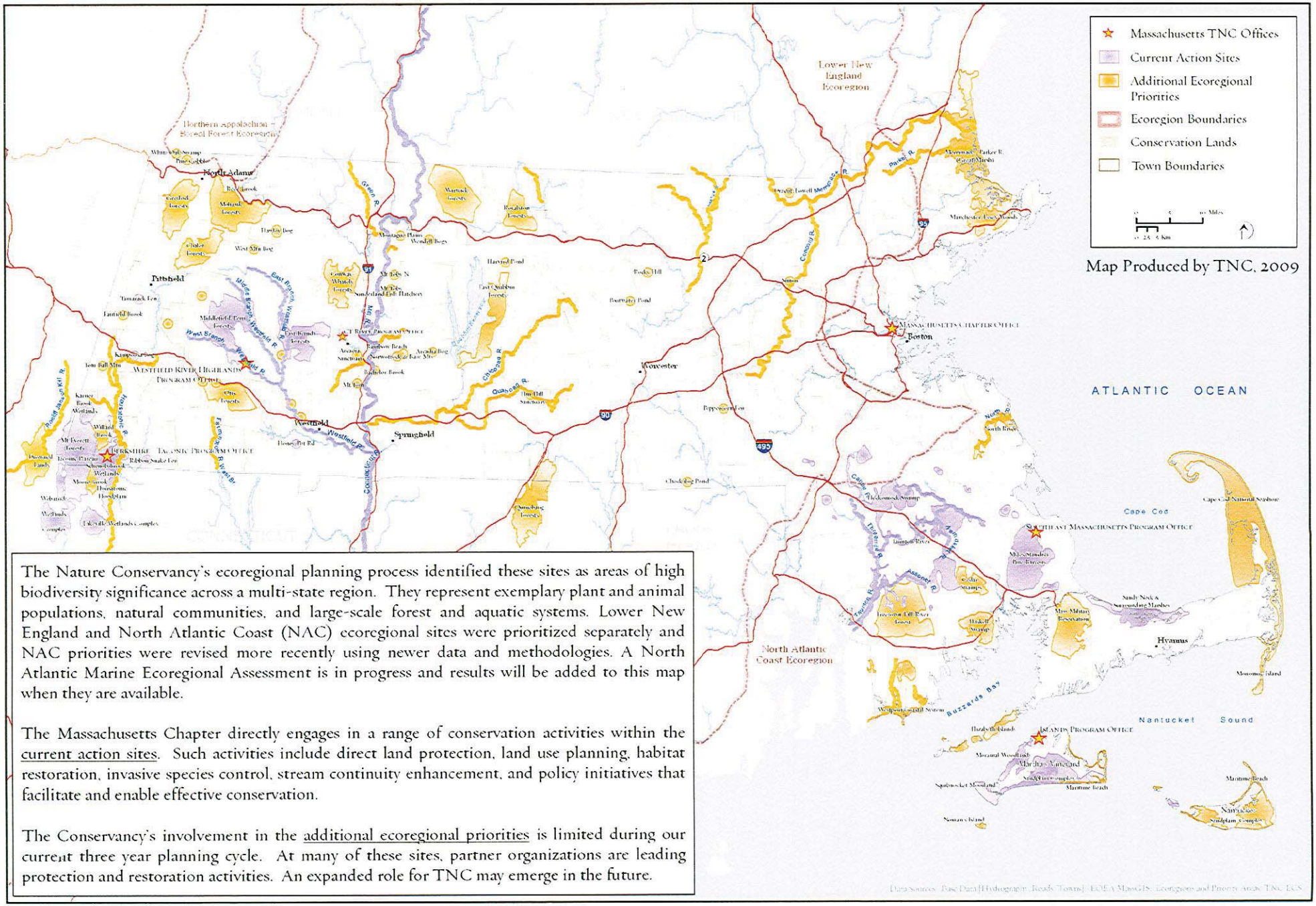
No zoning ordinance or by-law shall regulate or restrict the use of materials, or methods of construction of structures regulated by the state building code, nor shall any such ordinance or by-law prohibit, unreasonably regulate, or require a special permit for the use of land for the primary purpose of commercial agriculture, aquaculture, silviculture, horticulture, floriculture or viticulture, nor prohibit, unreasonably regulate or require a special permit for the use, expansion, reconstruction or construction of structures thereon for the primary purpose of commercial agriculture, aquaculture, silviculture, horticulture, floriculture or viticulture, including those facilities for the sale of produce, wine and dairy products, provided that either during the months of June, July, August and September of each year or during the harvest season of the primary crop raised on land of the owner or lessee, 25 per cent of such products for sale, based on either gross sales dollars or volume, have been produced by the owner or lessee of the land on which the facility is located, or at least 25 per cent of such products for sale, based on either gross annual sales or annual volume, have been produced by the owner or lessee of the land on which the facility is located and at least an additional 50 per cent of such products for sale, based upon either gross annual sales or annual volume, have been produced in Massachusetts on land other than that on which the facility is located, used for the primary purpose of commercial agriculture, aquaculture, silviculture, horticulture, floriculture or viticulture, whether by the owner or lessee of the land on which the facility is located or by another, except that all such activities may be limited to parcels of 5 acres or more **or to parcels 2 acres or more if the sale of products produced from the agriculture, aquaculture, silviculture, horticulture, floriculture or viticulture use on the parcel annually generates at least $1,000 per acre based on gross sales dollars** in area not zoned for agriculture, aquaculture, silviculture, horticulture, floriculture or viticulture. For such purposes, land divided by a public or private way or a waterway shall be construed as 1 parcel. No zoning ordinance or by-law shall exempt land or structures from flood plain or wetlands regulations established pursuant to the General Laws. For the purposes of this section, the term "agriculture" shall be as defined in section 1A of chapter 128, and the term horticulture shall include the growing and keeping of nursery stock and the sale thereof. Said nursery stock shall be considered to be produced by the owner or lessee of the land if it is nourished, maintained and managed while on the premises.

Appendix D: The Nature Conservancy's Ecoregional Priorities

The Nature Conservancy
Protecting nature. Preserving life.

MASSACHUSETTS CHAPTER OF THE NATURE CONSERVANCY

ECOREGIONAL PRIORITIES FOR BIODIVERSITY CONSERVATION



The Nature Conservancy's ecoregional planning process identified these sites as areas of high biodiversity significance across a multi-state region. They represent exemplary plant and animal populations, natural communities, and large-scale forest and aquatic systems. Lower New England and North Atlantic Coast (NAC) ecoregional sites were prioritized separately and NAC priorities were revised more recently using newer data and methodologies. A North Atlantic Marine Ecoregional Assessment is in progress and results will be added to this map when they are available.

The Massachusetts Chapter directly engages in a range of conservation activities within the current action sites. Such activities include direct land protection, land use planning, habitat restoration, invasive species control, stream continuity enhancement, and policy initiatives that facilitate and enable effective conservation.

The Conservancy's involvement in the additional ecoregional priorities is limited during our current three year planning cycle. At many of these sites, partner organizations are leading protection and restoration activities. An expanded role for TNC may emerge in the future.

Assonet Bay

Rachel Calabro

Bald eagle

Wemantic River

Alison Bowden

Bluet

Guide to the Habitat Protection Priorities Map

Highest Priority Areas for Habitat Protection (shown in orange) are a combination of the following areas:

- The *riparian zone* of the Taunton River, its largest tributaries, and smaller *coldwater streams*. Here, *riparian zone* includes the floodplains and wetlands that most directly influence – and in turn are influenced by – the branches of the Taunton. *Coldwater streams* are spring-fed streams that maintain temperatures low enough to support native brook trout and other sensitive species. These are extremely rare on the coastal plain.

- Habitat areas that support species identified by The Nature Conservancy as the most imperiled across the North Atlantic Coast region. The sites were mapped by the Massachusetts Natural Heritage and Endangered Species Program (NHESP) in 2006.

- *Natural Communities* designated by the Massachusetts NHESP as rare, endangered, or of special conservation concern. A *natural community* is a set of species occurring together under similar ecological conditions. Atlantic white cedar swamps and coastal plain ponds are examples of communities that define our region. Each contains species – such as Hessel's hairstreak moth and barrens bluet damselfly – which are unique to and dependent upon these specialized habitats.

Additional Priority Areas for Habitat Protection (shown in yellow) are a combination of the following areas:

- Areas mapped by NHESP that support other State-listed species. TNC has identified these as needing conservation attention at the ecoregional level, but not critically imperiled.

- Lands located within the region's least fragmented areas, such as Freetown-Fall River State Forest and Hockomock Swamp. Large blocks of natural vegetated land are critical to species that require an extensive habitat range, and also provide maximum opportunity for wildlife to survive and adapt to large-scale disturbances such as major storms and climate change.

Effectively conserving the areas shown on this map is critical to maintaining the vitality and viability of wildlife habitat in the Taunton River watershed. A variety of tools are available to achieve conservation, including voluntary action by landowners, regulatory approaches, or acquisition by state, local, or non-profit organizations. These efforts will provide benefits not only for wildlife, but also for other critical resources of the region – including farmland, drinking water supplies, historic scenic vistas, and recreational assets.

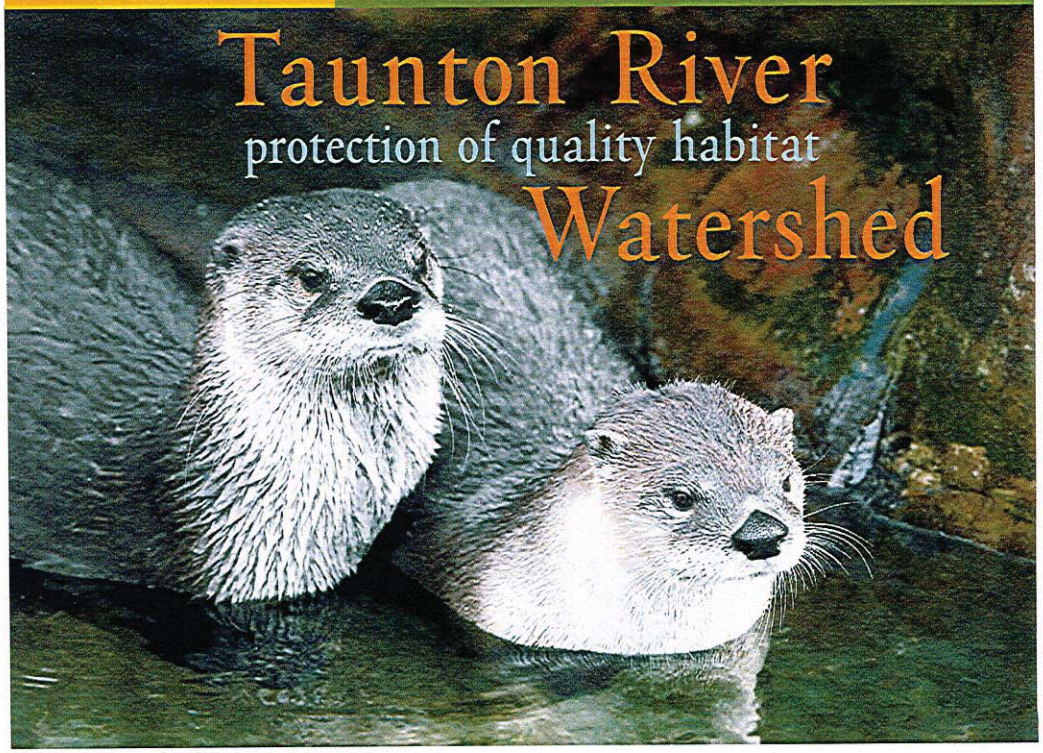
The Nature Conservancy
Protecting nature. Preserving life.™

The Nature Conservancy is an international non-profit organization striving to preserve the plants, animals, and natural communities that represent the diversity of life on earth by protecting the lands and waters they need to survive.

The Nature Conservancy
204 Long Pond Road • Plymouth, MA 02360 • 508-732-0300

The Nature Conservancy
Protecting nature. Preserving life.™

Taunton River
protection of quality habitat
Watershed



A Haven for Wildlife

The North Atlantic Coast Ecoregion hugs the seashore from the rocky ledges of Mount Desert Island in Maine to the beaches of Delaware Bay. The Nature Conservancy has found that one of the ecological jewels of this region is the 562-square mile Taunton River watershed.

This healthy and diverse watershed is home to 170 miles of river, more than 200 lakes and ponds and 27 different natural communities. In turn, these habitats – from the expansive wetlands of Hockomock Swamp to the tidal marshes of Assonet Bay – support hundreds of species such as bald eagles, river otters and New England's largest population of river herring.

Conservation Priorities for a Rapidly Growing Region

The Taunton River watershed lies within Massachusetts' fastest growing region. As communities continue to pursue economic development and housing needs, it is important to identify and protect the region's wealth of natural resources for future generations. The map on the reverse of this page depicts the land in the Taunton River Watershed that is, according to The Nature Conservancy's analysis, most important to the protection of quality habitat for regionally significant fish and wildlife populations.

Habitat Protection Priorities in the Taunton River Watershed

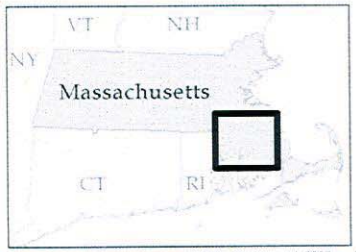
- Highest Priority Areas for Habitat Protection: these include the riparian zone of the Taunton River and its healthiest tributaries, plus important habitat for globally rare species and natural communities
- Additional Priority Areas for Habitat Protection: these include important habitat for other ecoregionally important state-listed species, identified by TNC, plus large areas (>1,000 acres) of unfragmented habitat
- Recreational and/or Protected Open Space
- Taunton Watershed Boundary

The Nature Conservancy
Protecting nature. Preserving life.

5 2.5 0 5 Miles

Data sources: Natural Heritage and Endangered Species Program; Office of Geographic and Environmental Information (MassGIS), Commonwealth of Massachusetts, Executive Office of Energy and Environmental Affairs; and The Nature Conservancy (TNC)

Map produced by TNC, July 2007



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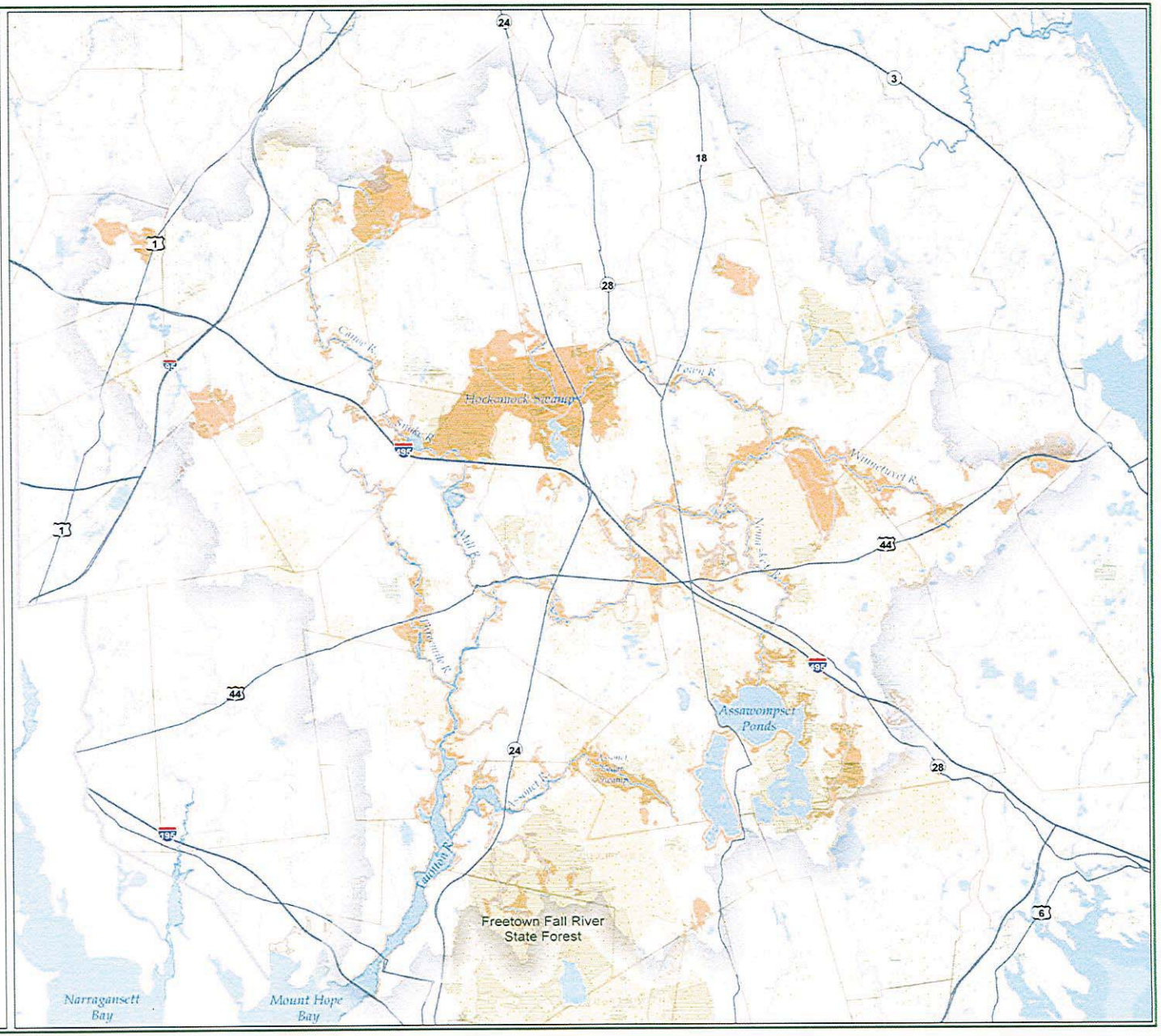


Appendix E: Protecting Coldwater Streams

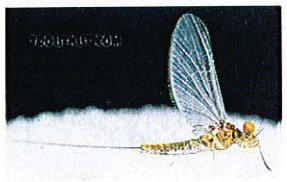
Ten Ways Conservation Commissions Can Help Protect Coldwater Streams and Their Inhabitants

[*Prepared by Russ Cohen, Rivers Advocate, Mass. Dept. of Fish & Game, (617) 626-1543, Russ.Cohen@state.ma.us.*
First Presented at the MACC Environmental Conference, Worcester MA, 3/1/08 - this version revised 3/5/10.
NOTE: *This document is intended for educational purposes only and does not necessarily represent the viewpoint of agencies and commissions having regulatory authority over coldwater streams.]*

(1) ► **Find out where the wild trout/coldwater stream reaches are in your community** (e.g., consult list on MA Div. of Fisheries & Wildlife (DFW)'s **Coldwater Fish Resources (CFR) web page:** http://www.mass.gov/dfwele/dfw/fisheries/conservation/cfr/cfr_home.htm

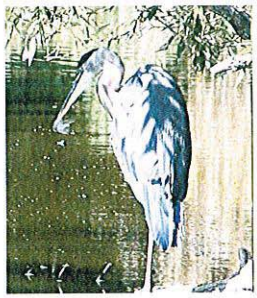
NOTE: the failure of a stream to appear on the list does **not** mean there are no CFR species there; it may be that DFW staff has yet to conduct fish species sampling in that waterway. Conservation Commissioners, anglers and others may know of wild trout streams not (yet) on DFW's list and can **bring them to DFW's attention** (see page 5).

(2) ► Use the state Rivers/Wetlands Act law and regulations and the permitting process to **retain/restore streamside vegetation along "CFR" and similar streams** to enhance the Riverfront Area Resource Area's functions and values (help keep water shaded, cool and clean + fuel the aquatic food chain, e.g.) for the eight Interests of the Act (for more information, see the nine Riparian Area fact sheets at http://www.mass.gov/dfwele/der/riverways/resources/riverfactsheets.htm).



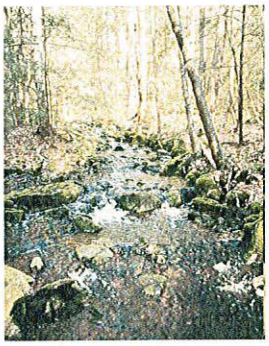
(3) ► Use new provisions in the Rivers/Wetlands regulations to **minimize adverse thermal, sediment or other impacts to coldwater streams.** New language relating to stormwater (http://www.mass.gov/dep/water/laws/regulati.htm#wl) and effective as of January 2, 2008 amended 310 CMR 10.04 and the Water Quality Certification (401) regs at 314 CMR 9.02 by adding the following definitions:

"**Cold-water fishery** - the mean of the maximum daily temperature over a seven day period generally does not exceed 68° F (20°C) **and**, when factors such as habitat can support a year-round population of aquatic life such as trout. Waters designated as cold-water fisheries by [DEP] in 314 CMR 4.00 **and** waters designated as cold-water fishery resources by DFW are cold-water fisheries. **Waters where there is evidence based on a fish survey that a cold-water fish population and habitat exist are also cold-water fisheries.** Cold-water fish include but are not limited to brook trout (*Salvelinus fontinalis*), rainbow trout (*Oncorhynchus mykiss*), brown trout (*Salmo trutta*), creek chubsucker (*Erimyzon oblongus*) and fallfish (*Semotilus corporalis*)." [N.B.: DFW's "CFR" species list does not include creek chubsucker or fallfish, but it does include the slimy sculpin (*Cottus cognatus*) and longnose sucker (*Catostomus catostomus*). DFW has requested that DEP modify its list accordingly.]



"**Critical areas** mean "Outstanding Resource Waters" and "Special Resource Waters" as designated in 314 CMR 4.00; Recharge Areas for public water supplies as defined in 310 CMR 22.02 (Zone Is, Zone IIs, and Interim Wellhead Protection Areas for ground water sources and Zone As for surface water sources); Bathing Beaches as defined in 105 CMR 445.000, **cold-water fisheries**, and shellfish growing areas."

310 CMR 10.05(6)(k) Standard 4 *(excerpt)*: "Stormwater management systems shall be designed to remove 80% of the average annual post-construction load of Total Suspended Solids (TSS)... The required water quality volume, the runoff volume requiring TSS treatment ... equals 1.0 inch of runoff times the total impervious area of the post-development project site for a discharge ... near or to the following critical areas ... [which includes] **cold-water fisheries** ... A discharge is near a critical area if there is a strong likelihood of a significant impact occurring to said area, taking into account site-specific factors". This language can be properly interpreted to mean that Standard 4, as well as Standard 6 below, **also apply** to any **tributaries to** cold-water fisheries, perennial **or intermittent**, if sediment-laden, heated or other degraded stormwater runoff entering the tributaries would have a strong likelihood of degrading the cold-water fishery they flow into."



310 CMR 10.05(6)(k) Standard 6 *(excerpt)*: "Stormwater discharges ... near or to any ... critical area require the use of ... best management practices determined by [DEP] to be suitable for managing discharges to such area as provided in the **Massachusetts Stormwater Handbook** ...
A discharge is near a critical area, if there is a strong likelihood of a significant impact occurring to said area, taking into account site-specific factors."

DEP Stormwater Standards apply to new development or redevelopment activities proposed in Wetland Resource Areas or Buffer zones that trigger the filing of a Wetlands Notice of Intent or §401 water quality application. If there is a cold water fishery, specific stormwater BMPs are required. In such circumstances, decentralized Low Impact Development (LID) measures to reduce the amount of impervious surfaces must be considered; source control and pollution prevention measures are selected first and then structural treatment practices are selected. Pretreatment must be provided, prior to discharge of stormwater runoff to a terminal treatment practice, for stormwater discharges to cold water fisheries.

► See the Best Management Practices (BMPs) in the **Massachusetts Stormwater Handbook** (http://www.mass.gov/dep/water/laws/v2c2.pdf) to find out which specific BMPs are and are not recommended where cold water fisheries are present.

Stormwater BMPs that **are** recommended for cold water fisheries include:

- Vegetated filter strips - p.17
- Bioretention areas and rain gardens - p.23
- Dry and wet swales (swales must be lined if used for pretreatment) - p.77
- Infiltration basins - p.86
- Leaching catch basins (if pretreatment is provided and pretreatment standards are met) - p.100
- Drainage channels - p.69

Bioretention - Rain Garden

Stormwater BMPs that **are not** recommended for cold water fisheries include:

- Constructed stormwater wetlands - p.36
- Dry detention basins - p.108
- Wet basins (a.k.a. wet retention ponds) - p.63

(4) ► Draft/**adopt a local wetlands bylaw** that goes beyond the requirements of the state Rivers/Wetlands Act + regulations. Examples:

- extend the Riverfront Area's coverage to all streams regardless of whether they "flow throughout the year" [see Note 3 of MACC model local wetlands bylaw - http://www.maccweb.org/documents/MACC_Model_Bylaw.doc]
- require a greater width of vegetated area along a coldwater stream than state law/regs require - DFW is developing BMPs to incorporate into local bylaws

► Draft/adopt a **local wetlands or other bylaw** that subject stormwater discharges into coldwater streams to a higher level of scrutiny or mitigation. Examples:

- Require greater than 80% TSS removal and/or treatment of more than 1" of runoff
- Incorporate DFW BMPs for CFR streams (once drafted) into local bylaws

(5) ► Work with planning and/or other municipal boards to adopt **zoning and subdivision bylaws** enabling low impact development (LID) techniques that keep potentially harmful land use practices away from coldwater stream habitats. Examples:

- zoning overlay districts along coldwater stream corridors
- open space residential development bylaws
- subdivision regulations limiting lot-clearing/lawn creation

[See Smart Growth Toolkit http://www.eot.state.ma.us/smartgrowth/07toolkit/index.html]

(6) ► **Assert jurisdiction over any activities that may "alter" coldwater stream habitat** and/or harm CFR and/or other sensitive aquatic species, such as:

- condition the operation of flow control points at the outlet of lakes and ponds, water supply reservoirs, etc. where CFR species and habitat in the stream reach below the flow control point may be harmed (by lake drawdown/refill, e.g.)
- condition the operation of irrigation withdrawals that deplete flow in CFR streams

See 310 CMR 10.04 - **definition of "alter"**: "Alter means to change the condition of any Area Subject to Protection Under M.G.L. c. 131, § 40. Examples of alterations include, but are not limited to, the following:
(a) the changing of pre-existing drainage characteristics, flushing characteristics, salinity distribution, sedimentation patterns, **flow patterns** and flood retention areas;
(b) the **lowering of the water level** or water table;
(c) the destruction of vegetation;
(d) the **changing of water temperature**, biochemical oxygen demand (BOD), and other physical, biological or chemical characteristics of the receiving water."

(7) ►Use the **MEPA comment process** to reduce adverse impacts of proposed development projects on coldwater streams and other sensitive aquatic species. Subscribe to the MEPA Environmental Monitor to keep track of Environmental Notification Form (ENF) or other MEPA filings in your community or watershed -http://www.env.state.ma.us/mepa/emonitor.aspx

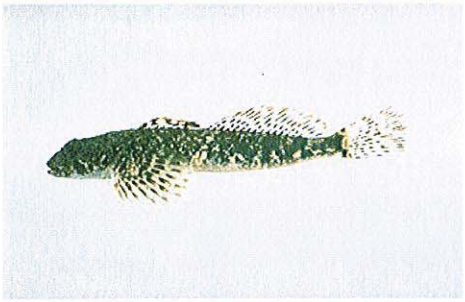
(8) ► **Be receptive** to proposals by state and federal fish and wildlife agencies, Trout Unlimited, land trusts and others seeking to **restore and enhance coldwater stream habitat and/or continuity** by, e.g., removing dams, fixing dropped and/or undersized culverts, adding or retaining large woody debris, etc.

(9) ► Acquire or assist others to **acquire undeveloped land** along coldwater streams and manage the lands to safeguard coldwater species habitat. Examples:

- Westport Land Conservation Trust's acquisition (with DFW's help) of the 50-acre Herb Hadfield Conservation Area, protecting Angeline Brook and its sea-run brook trout population: http://www.westportlandtrust.org/places.html
- Wildlands Trust of Southeastern Mass.'s acquisition of a conservation restriction (CR) preserving nearly 1,000 feet of frontage along Poquoy Brook in Lakeville, one of the few cold water streams draining into the Taunton River and supporting a native trout population: http://www.wildlandstrust.org/documents/pdf/WLT07AnnRep.pdf

(10) ► **Educational outreach to riparian property owners and managers** to raise awareness of the functions, values and sensitivities of coldwater streams and how to reduce impacts to coldwater stream organisms and habitats. See Selected Internet Resources on Riparian Areas and Vegetated Buffers for examples of science-based, on-line outreach materials: www.mass.gov/dfwele/der/riverways/pdf/internet_resources_riparian_veg_buffers.pdf as well as the nine fact sheets at http://www.mass.gov/dfwele/der/riverways/resources/riverfactsheets.htm.

Longnose Sucker



Slimy Sculpin

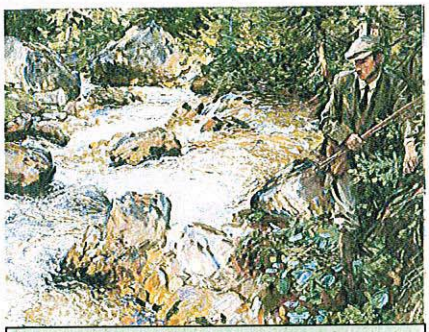
The following prepared with Glenn Krevosky, EBT Environmental Consultants (508) 987-0979

Development projects adjacent to streams supporting naturally-reproducing wild trout can harm coldwater species by discharging sediment, warm water and other pollution. While the use of best management practices can reduce (or eliminate) adverse impacts, **this is often not done** because the developer's consultant(s) and local or state reviewers are not aware that a stream affected by the project supports a wild trout population that can be imperiled by stormwater runoff.

One way to increase awareness of local coldwater streams by landowners, environmental consultants and reviewers is to propose they be added to the **Mass. Division of Fisheries and Wildlife's "CFR" list**, maintained by Todd Richards [todd.richards@state.ma.us, (508) 389-6336]. This list includes all the waterways for which DFW has documented the presence of naturally-reproducing populations of trout or other "coldwater" fish species. There are other streams deserving CFR status that are not on this list because DFW has

yet to evaluate them. Here's the link to the on-line version of the CFR list: http://www.mass.gov/dfwele/dfw/fisheries/conservation/cfr/cfr_home.htm

During field work, wetland scientists may visit cold water streams that are not on DFW's CFR list. Conservation Commissioners and Agents, volunteer water monitors, shoreline survey participants, anglers and others may also be aware of the presence of wild trout or other coldwater species that can be documented by the state. DFW staff is interested in hearing about these streams and evaluating them for possible inclusion on the CFR list.



"Trout Stream in the Tyrol"
Painting by John Singer Sargent

The confirmation of a stream as a "cold water fishery" affords the stream "**Critical Area**" status under state wetlands and water quality regulations and requires a more rigorous standard of stormwater BMPs to ensure development projects don't harm sensitive trout populations and habitats.

EBT Environmental has been involved in cold water fisheries projects since 1979, and asks that you contact Rich Hartley [(508) 389-6330, Richard.hartley@state.ma.us] or Todd Richards (see above) at the Mass. Division Fisheries & Wildlife, Route 135, Westborough, MA 01581, when you encounter unlisted trout streams. A USGS locus map should be sufficient to initiate the process for stream assessment.

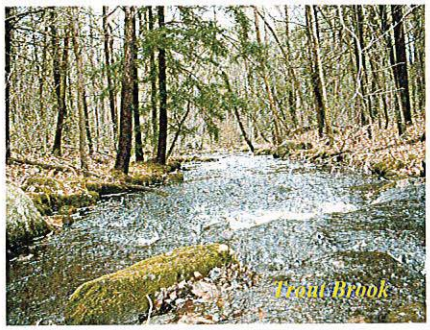
Even if a stream is on the DFW's "CFR" list, it may not get full protection if the stream segment is not listed as a cold water fishery in Mass. Surface Water Quality Standards Regulations (http://www.mass.gov/dep/service/regulations/314cmr04.pdf) The DEP's list of stream segments classified as "cold water fisheries" is much less extensive than DFW's CFR list.

Some developers and/or their consultants erroneously believe that the failure of a stream to be officially classified as a cold water fishery by DEP means that there is no obligation on their part to implement rigorous BMPs as required for "critical areas" under the DEP Stormwater Policy. In fact, **either** the inclusion of a stream on **DFW's CFR list, or** where a **fish survey confirms** that a cold-water fish population and habitat exists, is enough to qualify a stream for "critical area" status and trigger the increased level of protection called for in the stormwater regulations.

Also - the 2008 revision of the Mass. Surface Water Quality Standards **increased the recognition and protection of coldwater streams and their inhabitants.** The language of the most relevant excerpt (at 314 CMR 4.06(1)(d)7):

> 7. Cold Water - in these waters dissolved oxygen and temperature criteria for cold water fisheries apply. Certain waters not designated as cold water in 314 CMR 4.00 may contain habitat that supports a cold water fish population and, in such cases, **the cold water fish population and habitat shall be protected and maintained as existing uses**. The Massachusetts Division of Fisheries and Wildlife is responsible for identifying cold water fish populations that meet their protocol regardless of whether or not the water meets the cold water criteria in 314 CMR 4.00. Where a

cold water fish population has been identified by the Division of Fisheries and Wildlife as meeting their protocol, but the water has not been documented to meet the cold water criteria in 314 CMR 4.00, the Department **will** protect the existing cold water fish population and its habitat as an existing use



In other words, if a stream is classified as a "cold water" or "CFR" stream by DEP **or** DFW, **the coldwater fishery is deemed an "existing use"**, and stormwater discharges and other DEP-regulated activities that impair that use (cause excessive thermal or sediment loading to the waterway, e.g.) are in violation of the state water quality standards.

Appendix F: Division of Ecological Restoration

Commonwealth of Massachusetts

DIVISION OF ECOLOGICAL RESTORATION

About the Division

- Staff
- Contact Us
- Annual Reports
- Newsletters
- Strategic Plan

The Division of Ecological Restoration (DER) was created in July of 2009 with the merger of the Riverways and Wetlands Restoration Programs. DER coordinates ecological restoration to improve habitat for fish and wildlife and to restore important ecosystem services that benefit the quality of life for all Massachusetts citizens.

Native Species F

The Riverways Program has been maintained within the DER and continues to coordinate outreach and technical assistance to support river conservation and protection.

The Division and partners facilitate capital-based projects including (but not limited to) dam removal and culvert replacement with the goal of restoring aquatic habitats and ecosystems across the state. These projects support commercial and recreational fisheries and provide many other benefits such as reduced flooding, improved water quality, and the replacement of aging infrastructure.

Ecological restoration is also an important component of the Commonwealth's efforts to enhance habitat resiliency to better allow fish and wildlife to adapt to climate change – including sea level rise, elevated water temperatures, and increased floods and periods of drought.

The Division maintains its main office in Boston and has a western office in Williamsburg, Massachusetts.

Division of Ecological Restoration, Department of Fish & Game, 251 Causeway St., Suite 400, Boston, MA 02114
(617) 626-1540 (main line), (617) 626-1505 (fax)
Visit the Executive Office of Energy and Environmental Affairs
Visit the Department of Fish & Game

About DER's Riverways Program

- Adopt-A-Stream *Stream Teams*
- RIFLS/Instream Flow
- Technical Assistance
- Urban Rivers
- Wild & Scenic Rivers
- Newsletters

Mission

Riverways Program, within the Division of Ecological Restoration works with local, state, and federal partners to promote and establish policies that protect and restore valuable riverine and watershed resources.

Spring Flood, Connecticut River, Sunderland, photo by Tom Warhol

History

The Riverways Program was established within DFWELE in 1987 in recognition that river and stream corridors are a crucial component of the state's ecological infrastructure and that protection of these watershed resources could not be accomplished through land acquisition alone. The Riverways Program was created to encourage and support local river protection initiatives as a vital complement to state action. (M.G.L. Ch21A Sec.8)

In 2009 the Riverways Program and Coastal Zone Management's Wetland Restoration Program were merged to create a Division of Ecological Restoration. The Riverways Program remains a vital component and separate but integrated program with the Division of Ecological Restoration.

Our philosophy

Riverways is based on the belief that local action is the key to river protection. Riverways staff work side-by-side with local citizens, town officials, watershed-based groups and other partners to restore and protect the state's rivers and their ecosystems. In addition, Riverways believes in working with partners from state agencies, federal agencies, municipalities and nonprofit organizations to ensure that policies, actions and regulations protect river and riverine systems.

Riverways recognizes that by protecting rivers, streams and adjacent lands, we are also protecting the unique character and livability of our communities. Protected and restored rivers and stream will bring tourists, anglers, hunters, birders and hikers to Massachusetts destinations. In addition, healthy rivers will provide exceptional outdoor recreational opportunities close to home for Massachusetts residents and visitors, contributing to the high quality of life so essential for attracting and retaining top-notch employers and workers and for providing clean water for human health.

Appendix G: Flood Hazard Management

INTRODUCTION: FLOOD HAZARD MANAGEMENT PROGRAM MODEL BYLAWS FOR FLOODPLAIN DISTRICTS

Why adopt a floodplain zoning bylaw?

The National Flood Insurance Program (NFIP) was created in 1968 to help cut the costs to taxpayers of federal disaster relief for flooding. In order for residents of a community to be eligible to receive flood insurance, the community must agree to abide by the NFIP's minimum requirements for floodplain management. These requirements include the adoption of a floodplain zoning ordinance or bylaw by communities interested in participating. When a community seeks to enter the regular phase of NFIP participation, the Federal Emergency Management Agency (FEMA) Regional office will contact community officials to inform them of the minimum standards that must be adopted in the municipal ordinance or bylaw to ensure compliance with the requirements of the NFIP.

Why is the Flood Hazard Management Program involved?

The Flood Hazard Management Program within the Department of Conservation and Recreation is the State Coordinating Office for the administration of the National Flood Insurance Program throughout Massachusetts. The program serves as a liaison between municipal officials and FEMA, and as a guide for officials to the Massachusetts state regulations pertaining to floodplain management. Participating Massachusetts communities must abide not only by federal guidelines, but to state regulations that can be more restrictive than the federal regulations. All communities need to adhere to the State Building Code (780 CMR 120.G, Flood Resistant Construction and Construction in Coastal Dunes), the Wetlands Protection Act regulations (310 CMR 10.00), and the State Sanitary Code (Title 5). It is important that community officials understand where state and local regulations are more restrictive than federal requirements. In the following pages, recommended floodplain bylaw language will be supplemented with explanations in italics concerning the purpose of the suggested language.

For communities participating in the National Flood Insurance Program, designations are made depending on the level of mapping. The different types of communities will require differences in the language of the model bylaw. Each item in this model bylaw will show in boldface which type or types of community needs to adopt what language.

> **"b" communities** are those for which special flood hazard areas (A Zones) have been designated on the community's Flood Hazard Boundary Map or Flood Insurance Rate Map, but for which water surface elevation data has not been produced, and no Flood Insurance Study has been published.

"c" communities are those for which a notice of final base flood elevations have been designated within Zones A1-30 or AE on the community's Flood Insurance Rate Map (FIRM). AO, AH, A99, and A Zones may have also been designated on the community's FIRM. There has not been data prepared from which the community shall designate its regulatory floodway.

"d" communities are those for which a notice of final base flood elevations have been designated within Zones A1-30 or AE on the community's Flood Insurance Rate Map (FIRM). AO, AH, A99, and A Zones may have also been designated on the community's FIRM. In addition, data has been prepared by FEMA from which the community shall designate its regulatory floodway.

"e" communities are those for which a notice of final base flood elevations have been designated within Zones A1-30 or AE on the community's Flood Insurance Rate Map (FIRM), and if appropriate, has designated AO, AH, A99, and A zones on the community's FIRM and has identified on the FIRM coastal high hazard areas as Zones V1-30, VE, or V. In addition, data may have been prepared by FEMA from which the community shall designate its regulatory floodway.

Beginning in 2008 in Massachusetts, FEMA began producing Flood Insurance Rate Maps (FIRMs) and Flood Insurance Study (FIS) reports on a countywide basis. Prior to 2008, each community was represented individually on a set of FIRMs and FIS report. Under the new countywide format, a single set of FIRMs and FIS report is prepared for all communities in a particular county. There will be differences in the language used to define the floodplain district depending on whether the effective FIRMs are in a community-based or countywide format.

The items listed below are discussed in detail on the following pages. Each item is necessary to the adoption of a complete floodplain district bylaw.

Article I. Statement of Purpose

Article II. Floodplain District Boundaries and Base Flood Elevation Data, Floodway Data

Article III. Use Regulations

Article IV. Notification of Watercourse Alteration

Article V. Definitions

MODEL COMMUNITY BYLAW FOR FLOODPLAIN DISTRICTS

ARTICLE I. STATEMENT OF PURPOSE (b, c, d, e communities)

The model bylaw is not meant to add unnecessary layers of review to the permit-issuing process, but to ensure that participating communities fully adopt and enforce at least the minimum NFIP requirements. The following Statement of Purpose tells project proponents and permit reviewers why consideration of the siting of a project in the floodplain is important. Reasons why a floodplain district is required include providing public safety, reducing potential of emergency situations, eliminating costs, and reducing damage to property and community infrastructures.

The purposes of the Floodplain District are to:

1) Ensure public safety through reducing the threats to life and personal injury;
2) Eliminate new hazards to emergency response officials;
3) Prevent the occurrence of public emergencies resulting from water quality, contamination, and pollution due to flooding;
4) Avoid the loss of utility services which if damaged by flooding would disrupt or shut down the utility network and impact regions of the community beyond the site of flooding;
5) Eliminate costs associated with the response and cleanup of flooding conditions;
6) Reduce damage to public and private property resulting from flooding waters.

ARTICLE II. FLOODPLAIN DISTRICT BOUNDARIES AND BASE FLOOD ELEVATION AND FLOODWAY DATA

The Federal Emergency Management Agency creates maps that define a community's floodplain district boundaries. These maps include base flood elevations and floodway data. The maps form the basis of a community's floodplain management program. To ensure compliance with the requirements of the NFIP, communities must refer to the current effective Flood Insurance Study, Flood Insurance Rate Maps, and, if applicable, Flood Boundary and Floodway Maps in their bylaw. The following sections require close review by officials considering adopting the model bylaw. Officials must ensure that the proper dates are included, and should tailor the references to flood zones to what actually appears on the maps (e.g., do not include designations for AO or A99 zones if the FIRM does not include these zones). Dates are subject to change as maps are revised; FEMA notifies the chief elected official of any revisions well before the maps change.

SECTION A. FLOODPLAIN DISTRICT BOUNDARIES AND BASE FLOOD ELEVATION DATA (b, c, d, e communities with modifications)

The section below contains language to define the floodplain district, depending on whether the community has "community-based" or "countywide" Flood Insurance Rate Maps (FIRMs) and Flood Insurance Study (FIS). Communities should choose the appropriate section below based on the format of their map products.

For communities with "Community-Based" FIRMs and FIS:

The Floodplain District is herein established as an overlay district. The District includes all special flood hazard areas designated on the **(Community Name)** Flood Insurance Rate Map (FIRM) issued by the Federal Emergency Management Agency (FEMA) for the administration of the NFIP dated **(FIRM date)** as Zone A, AE, AH, AO, A1-30, A99, V, V1-30, VE, and the FEMA Flood Boundary & Floodway Map dated **(Flood Boundary & Floodway Map date)**, both maps which indicate the 100-year regulatory floodplain. The exact boundaries of the District may be defined by the 100-year base flood elevations shown on the FIRM and further defined by the Flood Insurance Study (FIS) report dated **(FIS date)**. The FIRM, Flood Boundary & Floodway Map, and FIS report are incorporated herein by reference and are on file with the Town Clerk, Planning Board, Building Official, Conservation Commission and **(Other)**.

For communities with "Countywide" FIRMs and FIS:

The Floodplain District is herein established as an overlay district. The District includes all special flood hazard areas within the **(Community Name)** designated as Zone A, AE, AH, AO, A99, V, or VE on the **(County Name)** Flood Insurance Rate Map (FIRM) issued by the Federal Emergency Management Agency (FEMA) for the administration of the National Flood Insurance Program. The map panels of the **(County Name)** FIRM that are wholly or partially within the **(Community Name)** are panel numbers **(panel numbers)** dated **(panel date)**. The exact boundaries of the District may be defined by the 100-year base flood elevations shown on the FIRM and further defined by the **(County Name)** Flood Insurance Study (FIS) report dated **(FIS date)**. The FIRM and FIS report are incorporated herein by reference and are on file with the Town Clerk, Planning Board, Building Official, Conservation Commission and **(Other)**.

SECTION B. BASE FLOOD ELEVATION AND FLOODWAY DATA

1. **Floodway Data**. In Zones A, A1-30, and AE, along watercourses that have not had a regulatory floodway designated, the best available Federal, State, local, or other floodway data shall be used to prohibit encroachments in floodways which would result in any increase in flood levels within the community during the occurrence of the base flood discharge.

2. **Base Flood Elevation Data**. Base flood elevation data is required for subdivision proposals or other developments greater than 50 lots or 5 acres, whichever is the lesser, within unnumbered A zones.

ARTICLE III. NOTIFICATION OF WATERCOURSE ALTERATION
(b, c, d, e communities)

In a riverine situation, **(appropriate official in community)** shall notify the following of any alteration or relocation of a watercourse:

- Adjacent Communities
- Bordering States (optional)
- NFIP State Coordinator
  Massachusetts Department of Conservation and Recreation
  251 Causeway Street, Suite 600-700
  Boston, MA 02114-2104
- NFIP Program Specialist
  Federal Emergency Management Agency, Region I
  99 High Street, 6th Floor
  Boston, MA 02110

ARTICLE IV. USE REGULATIONS

SECTION A. REFERENCE TO EXISTING REGULATIONS (b, c, d, e communities)

The floodplain district bylaw is part of a federal requirement for communities that choose to participate in the NFIP. However, the state already administers regulations that take care of many floodplain management concerns. Referencing existing regulations is important to ensure that projects have been reviewed under the appropriate state regulations and that variances to the conditions of the bylaw do not erroneously allow variances to state requirements.

The Floodplain District is established as an overlay district to all other districts. All development in the district, including structural and non-structural activities, whether permitted by right or by special permit must be in compliance with Chapter 131, Section 40 of the Massachusetts General Laws and with the following:

- Section of the Massachusetts State Building Code which addresses floodplain and coastal high hazard areas (currently 780 CMR 120.G, "Flood Resistant Construction and Construction in Coastal Dunes");
- Wetlands Protection Regulations, Department of Environmental Protection (DEP) (currently 310 CMR 10.00);
- Inland Wetlands Restriction, DEP (currently 310 CMR 13.00);

- Coastal Wetlands Restriction, DEP (currently 310 CMR 12.00); **(e communities only)**

- Minimum Requirements for the Subsurface Disposal of Sanitary Sewage, DEP (currently 310 CMR 15, Title 5);

Any variances from the provisions and requirements of the above referenced state regulations may only be granted in accordance with the required variance procedures of these state regulations.

SECTION B. OTHER USE REGULATIONS

1) Within Zones AH and AO on the FIRM, adequate drainage paths must be provided around structures on slopes, to guide floodwaters around and away from proposed structures. **(c, d, e communities, if AH or AO appear)**

2) In Zones A1-30 and AE, along watercourses that have a regulatory floodway designated on the **(Community or County Name)** FIRM or Flood Boundary & Floodway Map **(choose map which delineates floodways for your community)** encroachments are prohibited in the regulatory floodway which would result in any increase in flood levels within the community during the occurrence of the base flood discharge. **(d, e communities)**

3) Man-made alteration of sand dunes within Zones V1-30, VE, and V which would increase potential flood damage are prohibited. **(e communities only)**

4) All new construction within Zones V1-30, VE, and V must be located landward of the reach of mean high tide. **(e communities only)**

5) All subdivision proposals must be designed to assure that:
   a) such proposals minimize flood damage;
   b) all public utilities and facilities are located and constructed to minimize or eliminate flood damage; and
   c) adequate drainage is provided to reduce exposure to flood hazards.
   (b, c, d, e communities)

6) Existing contour intervals of site and elevations of existing structures must be included on plan proposal. **(optional for b, c, d, e communities)**

7) There shall be established a "routing procedure" which will circulate or transmit one copy of the development plan to the Conservation Commission, Planning Board, Board of Health, Town Engineer, Building Commissioner and **(other)** for comments which will be considered by the appropriate permitting board prior to issuing applicable permits. **(optional for b, c, d, e communities)**

ARTICLE V. PERMITTED USES (b, c, d, e communities)

The section below on permitted uses is taken from recommendations within the Massachusetts Wetlands Protection Act Regulations. The intent of encouraging such uses is to protect natural resources. These uses would be included as additional information for residents about what uses other than structural activity are allowed in floodplain areas.

The following uses of low flood damage potential and causing no obstructions to flood flows are encouraged provided they are permitted in the underlying district and they do not require structures, fill, or storage of materials or equipment:

1) Agricultural uses such as farming, grazing, truck farming, horticulture, etc.
2) Forestry and nursery uses.
3) Outdoor recreational uses, including fishing, boating, play areas, etc.
4) Conservation of water, plants, wildlife.
5) Wildlife management areas, foot, bicycle, and/or horse paths.
6) Temporary non-residential structures used in connection with fishing, growing, harvesting, storage, or sale of crops raised on the premises.
7) Buildings lawfully existing prior to the adoption of these provisions.

ARTICLE VI. DEFINITIONS

It is helpful to include certain definitions to aid in understanding and enforcing the floodplain district bylaw. Inclusion of the following definitions should be tailored to a community's needs. For example, there is no need to include a definition of a Zone A99 if the community has no such zone on its map. The definitions in the model are taken from the NFIP regulations and the Massachusetts State Building Code.

AREA OF SPECIAL FLOOD HAZARD is the land in the floodplain within a community subject to a one percent or greater chance of flooding in any given year. The area may be designated as Zone A, AO, AH, A1-30, AE, A99, V1-30, VE, or V.

BASE FLOOD means the flood having a one percent chance of being equaled or exceeded in any given year.

COASTAL HIGH HAZARD AREA means an area of special flood hazard extending from offshore to the inland limit of a primary frontal dune along an open coast and any other area subject to high velocity wave action from storms or seismic sources. The area is designated on a FIRM as Zone V, V1-30, VE.

DEVELOPMENT means any manmade change to improved or unimproved real estate, including but not limited to building or other structures, mining, dredging, filling, grading, paving, excavation or drilling operations.

DISTRICT means floodplain district.

FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA) administers the National Flood Insurance Program. FEMA provides a nationwide flood hazard area mapping study program for communities as well as regulatory standards for development in the flood hazard areas.

FLOOD BOUNDARY AND FLOODWAY MAP means an official map of a community issued by FEMA that depicts, based on detailed analyses, the boundaries of the 100-year and 500 year floods and the 100-year floodway. (For maps done in 1987 and later, the floodway designation is included on the FIRM.)

FLOOD HAZARD BOUNDARY MAP (FHBM) means an official map of a community issued by FEMA where the boundaries of the flood and related erosion areas having special hazards have been designated as Zone A or E.

FLOOD INSURANCE RATE MAP (FIRM) means an official map of a community on which FEMA has delineated both the areas of special flood hazard and the risk premium zones applicable to the community.

FLOOD INSURANCE STUDY means an examination, evaluation, and determination of flood hazards, and, if appropriate, corresponding water surface elevations, or an examination, evaluation and determination of flood-related erosion hazards.

FLOODWAY means the channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation.

LOWEST FLOOR means the lowest floor of the lowest enclosed area (including basement or cellar). An unfinished or flood resistant enclosure, usable solely for parking of vehicles, building access or storage in an area other than a basement area is not considered a building's lowest floor, PROVIDED that such enclosure is not built so as to render the structure in violation of the applicable non-elevation design requirements of NFIP Regulations 60.3.

MANUFACTURED HOME means a structure, transportable in one or more sections, which is built on a permanent chassis and is designed for use with or without a permanent foundation when connected to the required utilities. For floodplain management purposes the term "manufactured home" also includes park trailers, travel trailers, and other similar vehicles placed on a site for greater than 180 consecutive days. For insurance purposes, the term "manufactured home" does not include park trailers, travel trailers, and other similar vehicles.

MANUFACTURED HOME PARK OR SUBDIVISION means a parcel (or contiguous parcels) of land divided into two or more manufactured home lots for rent or sale.

NEW CONSTRUCTION means, for floodplain management purposes, structures for which the "start of construction" commenced on or after the effective date of a floodplain management regulation adopted by a community. For the purpose of determining insurance rates, NEW CONSTRUCTION means structures for which the "start of construction" commenced on or after the effective date of an initial FIRM or after December 31, 1974, whichever is later.

ONE-HUNDRED-YEAR FLOOD - see BASE FLOOD.

REGULATORY FLOODWAY - see FLOODWAY

SPECIAL FLOOD HAZARD AREA means an area having special flood and/or flood-related erosion hazards, and shown on an FHBM or FIRM as Zone A, AO, A1-30, AE, A99, AH, V, V1-30, VE.

STRUCTURE means, for floodplain management purposes, a walled and roofed building, including a gas or liquid storage tank, that is principally above ground, as well as a manufactured home. STRUCTURE, for insurance coverage purposes, means a walled and roofed building, other than a gas or liquid storage tank, that is principally above ground and affixed to a permanent site, as well as a manufactured home on foundation. For the latter purpose, the term includes a building while in the course of construction, alteration, or repair, but does not include building materials or supplies intended for use in such construction, alteration, or repair, unless such materials or supplies are within an enclosed building on the premises.

SUBSTANTIAL DAMAGE means damage of any origin sustained by a structure whereby the cost of restoring the structure to its before-damaged condition would equal or exceed 50 percent of the market value of the structure before the damage occurred.

SUBSTANTIAL IMPROVEMENT means any repair, reconstruction, or improvement of a structure, the cost of which equals or exceeds 50 percent of the market value of the structure either (a) before the improvement or repair is started, or (b) if the structure has been damaged and is being restored, before the damage occurred. For the purposes of this definition, "substantial improvement" is considered to occur when the first alteration of any wall, ceiling, floor, or other structural part of the building commences, whether or not that alteration affects the external dimensions of the structure.

ZONE A means the 100-year floodplain area where the base flood elevation (BFE) has not been determined. To determine the BFE, use the best available federal, state, local, or other data.

ZONE A1-30 and **ZONE AE** (for new and revised maps) means the 100-year floodplain where the base flood elevation has been determined.

ZONE AH and **ZONE AO** means the 100-year floodplain with flood depths of 1 to 3 feet, where a clearly defined channel does not exist, where the path of flooding is unpredictable, and where velocity flow may be evident. Such flooding is characterized by ponding or sheet flow.

ZONE A99 means areas to be protected from the 100-year flood by federal flood protection system under construction. Base flood elevations have not been determined.

ZONES B, C, AND X are areas identified in the community Flood Insurance Study as areas of moderate or minimal flood hazard. Zone X replaces Zones B and C on new and revised maps.

ZONE V means a special flood hazard area along a coast subject to inundation by the 100-year flood with the additional hazards associated with storm waves. Base flood elevations have not been determined.

ZONE V1-30 and **ZONE VE** (for new and revised maps) means a special flood hazard area along a coast subject to inundation by the 100-year flood with additional hazards due to velocity (wave action). Base flood elevations have been determined.

SAMPLE HEALTH AMENDMENT

The following regulation is suggested for adoption by the local Board of Health or Water and Sewer Commissions or Department of Public Works, as appropriate, in order to meet the minimum requirements of the National Flood Insurance Program.

HEALTH REGULATION PERTAINING TO THE FLOODPLAIN DISTRICT

The Board of Health, in reviewing all proposed water and sewer facilities to be located in the Floodplain District established under the Zoning Bylaw, shall require that:

1. new and replacement water supply systems be designed to minimize or eliminate infiltration of flood waters into the systems, and

2. new and replacement sanitary sewage systems be designed to minimize or eliminate infiltration of flood waters into the systems and discharges from the systems into flood waters and onsite waste disposal systems to be located to avoid impairment to them or contamination from them during flooding.