



2006

Five-Year Watershed Action Plan for the Taunton River Watershed

GeoSyntec Consultants

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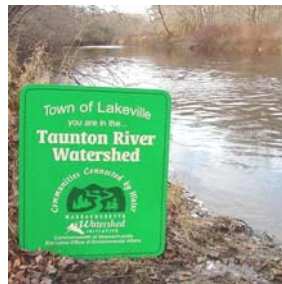
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Five-Year Watershed Action Plan for the Taunton River Watershed

SEPTEMBER 2006



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TABLE OF CONTENTS

EXECUTIVE SUMMARY.....	1
SECTION 1: INTRODUCTION.....	3
1.1 PROJECT PURPOSE.....	3
1.2 THE WATERSHED ACTION PLANNING PROCESS.....	4
SECTION 2: OVERVIEW OF WATERSHED BACKGROUND INFORMATION	5
2.1 WATERSHED BACKGROUND INFORMATION.....	5
2.1.1 Physical Features of the Taunton River Watershed	5
2.1.2 History of the Taunton River	11
2.1.3 Wildlife Habitat/ Rare and Endangered Species.....	11
2.1.4 Water Use and Supply Issues.....	12
2.1.5 Population Growth/Growth Planning.....	12
2.1.6 Watershed Organizations.....	13
2.2 SUMMARY OF MAJOR WATERSHED INFORMATION SOURCES.....	14
SECTION 3: THE FIVE-YEAR WATERSHED ACTION PLAN	31
3.1 WATERSHED ACTION PLANNING CATEGORIES	31
3.2 WATERSHED ACTION PLAN.....	31
3.3 WATERSHED ACTION PLAN SUMMARY MATRIX	50
MAPS:	
MAP 1: TAUNTON RIVER WATERSHED LAND USE MAP.....	54
MAP 2: TAUNTON RIVER WATERSHED WATER RESOURCES MAP.....	56
MAP 3: TAUNTON RIVER WATERSHED WILDLIFE HABITAT MAP	58
APPENDICES:	
APPENDIX 1: SUMMARY OF MAJOR WATERSHED INFORMATION SOURCES.....	60
APPENDIX 2: TAUNTON RIVER WATERSHED CONTACT LIST.....	67

EXECUTIVE SUMMARY

The 562-square mile Taunton River watershed includes all or portions of 40 cities and towns in southeastern Massachusetts and is the second largest watershed contained entirely within Massachusetts. With funding from the Massachusetts Executive Office of Environmental Affairs (MA-EOEA), GeoSyntec Consultants was retained to coordinate local watershed organizations and municipalities in development of a prioritized five-year action plan for the watershed. This project provided a unique opportunity for watershed communities to cooperatively prioritize goals and set a course for the future of the watershed. The recommendations of this locally developed Five Year Watershed Action Plan will receive prioritization for funding from MA-EOEA via state agency grant programs and other funding sources under MA-EOEA purview.

The three primary goals of this project were as follows:

1. Promote watershed-wide planning, cooperation and consistency by emphasizing local involvement a regional perspective in the planning goals of the watershed communities.
2. Synthesize and prioritize existing information from a variety of existing sources.
3. Develop a Five Year Watershed Action Plan that is relevant to the watershed communities and achievable within a five-year timeframe given existing and realistically anticipated resources.

GeoSyntec facilitated a series of planning sessions with a Watershed Advisory Committee (WAC) comprised of municipal officials, watershed organizations, regional planning agencies, state environmental agencies and other stakeholders. These meetings were used to develop the complete list of watershed action items described in Section 3 of this Five-Year Watershed Action Plan. The WAC then voted to establish the following "High Priority" action items in five watershed planning categories listed below:

High Priority Action Items for the Taunton River Watershed:

A. *Water Quality Improvement & Protection*

- Identify sites for Low Impact Development (LID) storm water retrofits. Apply LID retrofits at "example" sites for showcasing LID function, which can be used for public outreach and awareness in promoting LID technologies in the watershed.
- Increase monitoring at all six wastewater treatment plants (WWTPs) in the watershed. Monitor at 20 new points at the Brockton WWTP and expand monitoring from 10 to 20 points at the Taunton WWTP.
- Investigate new wastewater treatment technologies. Identify sources of funding to research innovative wastewater treatment technologies for application in WWTPs.
- Increase water quality monitoring of fisheries (including anadromous fisheries). This includes (1) develop a QAPP for volunteers to ensure data integrity and (2) identify and register rare cold water fisheries in the watershed.

B. *Wildlife Habitat and Ecology Protection (including Water Quantity Protection)*

- Protect established NHESP Priority Habitat areas, including: (1) update municipal by-laws and regional plans to protect Priority Habitat areas, using available tools like Bio-Map and Living Waters Map, (2) obtain more support from NHESP to municipalities through hiring of Outreach Coordinator, (3) at a regional level, purchase/acquire lands in Priority

Habitat areas, (4) focus protect efforts on habitat of globally rare species (e.g. Segregansett River, Nemasket River, Three Mile River and Hockomock Swamp).

- Restore rare Atlantic white cedar swamp habitat.
- Support completion of ongoing watershed-wide assessment and prioritization of culverts and other barriers to fish passage.

C. *Recreation and Access*

- Remove remnants of the Plymouth Street Dam in Bridgewater, allowing for a "source to the sea" continuous canoeable passage from the Matfield River to Fall River.
- Develop a walking/equestrian trail system at the Assawompset Pond complex, including signage, public awareness programs, trail maps, parking areas and ADA-access.
- Develop a basin-wide trail system map to identify existing trail systems. This map would also be planning tool to identify potential connection points between trail systems. Assess the previously completed "Taunton River Trail Plan" as a starting point for this effort.

D. *Open Space, Land Use and Sustainable Development*

- Identify and prioritize cold water tributaries of Taunton River for mapping and official designation with the state.
- Purchase/acquire land around the Oxbow in Raynham; this landform is unique for Taunton watershed and includes globally rare species.
- Preserve and protect working and historic farms.

E. *Public Outreach and Education*

- Develop basin-wide recreational maps that identify canoe access points and historical sites. Printed copies of maps may be provided at kiosks within the watershed. Develop a digital, interactive watershed map of that incorporates information from existing digital Public Access Board maps.
- Develop and install signage to promote awareness of important watershed features. Examples of signage may include "Entering the Taunton River Watershed" and tributary stream signage at major stream crossings, Water Supply Protection Areas, and Source Water Protection Areas.
- Develop laminated canoe trail maps for canoeable rivers in the watershed (e.g. Three Mile River, Mill River and Town River) and distribute in kiosks at canoe access points. The maps may identify historical and archeological sites.

Section 3 of this report includes a more detailed description of the high priority action items listed above, as well as complete listing other actions recommended for implementation in the Taunton River Watershed over the next five years.

SECTION 1: INTRODUCTION

1.1 PROJECT PURPOSE

GeoSyntec Consultants, Inc. (GeoSyntec) was contracted by the Massachusetts Executive Office of Environmental Affairs (MA-EOEA) to work with local communities to develop a Five-Year Watershed Action Plan for the Taunton River watershed.

The Taunton River watershed encompasses all or portions of 40 cities and towns contained entirely within southeastern Massachusetts. This project provided a unique opportunity for watershed communities to cooperatively prioritize goals and set a course for the future of the watershed. The recommendations of this locally developed Five Year Action Plan will receive prioritization for funding from state grant programs and other funding sources.



The Taunton River

As described below in Section 1.2, GeoSyntec served as technical consultant and facilitator for a watershed planning process that was structured around local participation and input from a Watershed Advisory Committee (WAC) and other public participants. The three primary goals of this watershed planning project are described below:

FIVE-YEAR WATERSHED ACTION PLAN GOALS:

- **Promote Watershed-wide Planning, Cooperation, and Consistency:** By emphasizing local involvement and inter-municipal collaboration in development of the Five-Year Action Plan, a strong focus of this project was to foster consistency and a regional perspective in the planning goals of the watershed communities.
- **Synthesize and Prioritize Existing Information From a Variety of Sources:** The Five Year Action Plan reflects the review, synthesis, and prioritization of a variety of previous assessments of the Taunton River watershed, including the *2005 Taunton River Stewardship Plan* developed by Taunton River Wild and Scenic River Study Committee.
- **Develop a Five Year Action Plan That is Relevant, Focused and Achievable:** The recommendations of this Action Plan are intended to be (1) relevant to the communities of the Taunton River watershed, (2) focused on the issues of greatest concern and/or greatest potential benefit to the watershed, and (3) achievable within a five-year timeframe given existing and realistically anticipated resources.

1.2 THE WATERSHED ACTION PLANNING PROCESS

In cooperation with EOE staff, GeoSyntec conducted outreach to municipalities and other stakeholders in the Taunton River watershed, inviting representatives from the watershed to participate on a Watershed Advisory Committee (WAC).

To begin the process of forming the WAC, a letter was sent to municipal leaders, which described the project and solicited municipal participation in this watershed planning process. Committee participation was also directly requested of local environmental groups and other key watershed stakeholder organizations, including the Taunton River Watershed Alliance, the Southeastern Regional Planning and Economic Development District (SRPEDD), the Old Colony Planning Commission, state environmental agencies and other groups.

A project website (<http://projects.geosyntec.com/bw0078/>) was established by GeoSyntec to provide a convenient means of posting draft project reports, WAC contact information and other documents related to the project.

After the community representatives to the WAC were appointed, a kickoff meeting and a series of three public planning forums were held at the Massachusetts DEP (MA-DEP) Southeast Region Office in Lakeville between February and April of 2006. GeoSyntec facilitated these meetings, during which the Watershed Advisory Committee and other public participants developed the priorities and watershed action items described in Section 3 of this Five-Year Watershed Action Plan. A contact list of Watershed Advisory Committee members and other key watershed planning contacts is provided as an Appendix to this report.

Taunton River Watershed 5-Year Action Plan Public Forums

February 24, 2006 (kickoff meeting)
March 10, 2006
March 24, 2006
April 7, 2006

SECTION 2: OVERVIEW OF WATERSHED BACKGROUND INFORMATION

2.1 WATERSHED BACKGROUND INFORMATION

A variety of previous studies, planning documents and other information sources related to the Taunton River watershed were reviewed by GeoSyntec in developing this Watershed Action Plan. These information sources are listed in Section 2.2 on page 13. A brief overview of the Taunton River watershed and related planning issues is provided below, as excerpted from several of these information sources.

2.1.1 Physical Features of the Taunton River Watershed

Adapted from the Taunton River Watershed 2001 Water Quality Assessment Report (MA-DEP) and excerpted from the Taunton River Stewardship Plan (July 2001, Taunton Wild & Scenic River Study Committee)

The Taunton River watershed is the second largest watershed contained entirely in Massachusetts and is approximately 562 square miles in area. As shown in Figure 1 on the following page, the watershed encompasses all or portions of 40 cities and towns in southeastern Massachusetts. The topography of the watershed ranges from flat lowlands to low rolling hills, typically of the glaciated landscape of southern New England. The Taunton River is approximately 40 miles long and drops only 21 feet in elevation from start to end. Saltwater intrusion extends about 12 miles from the mouth of the river at the bay and it is tidal for 18 miles from the bay.

The Taunton River is the longest undammed coastal river in New England, winding from headwaters in Bridgewater, West Bridgewater and Brockton to Mount Hope Bay near Fall River.

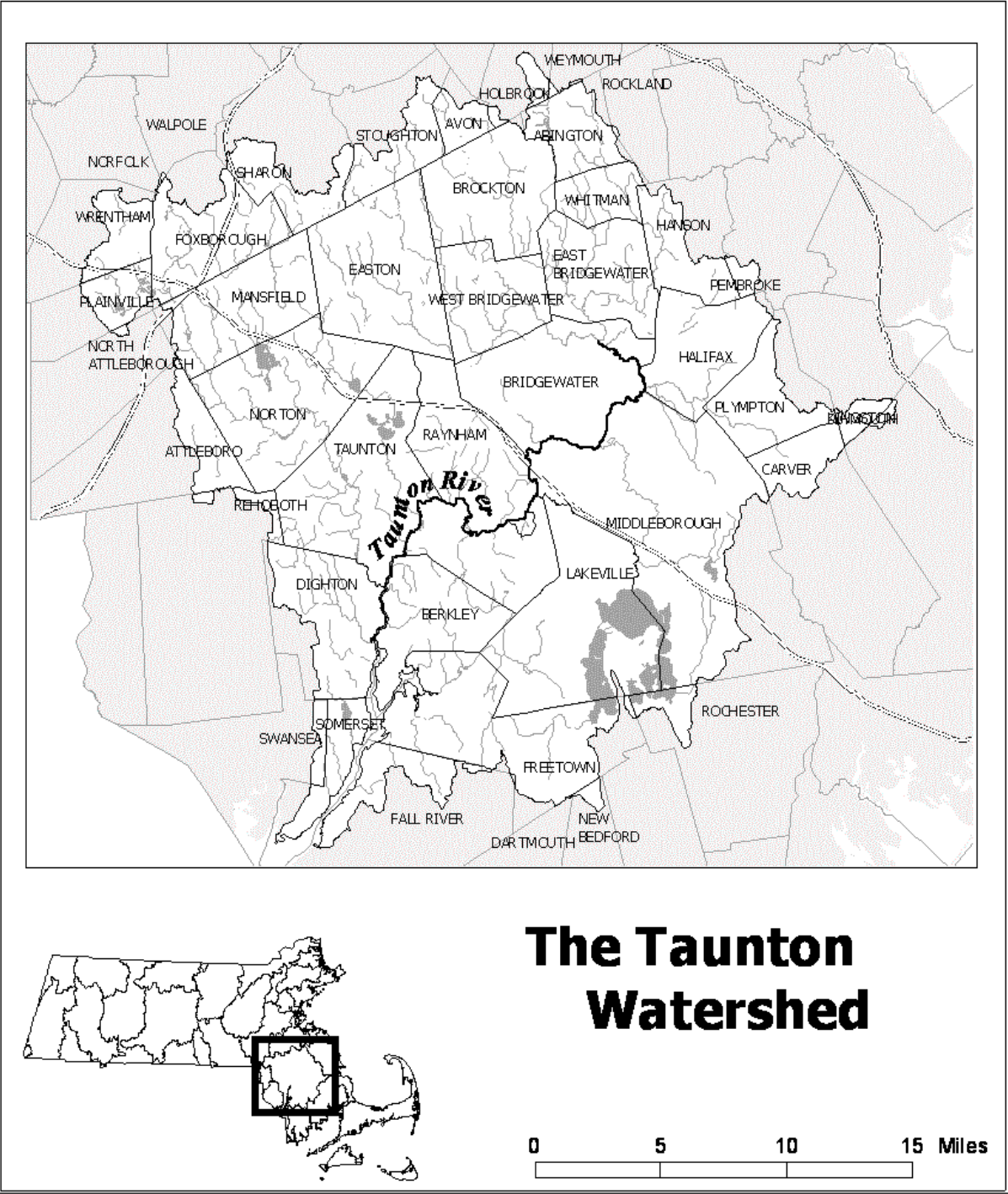
The Taunton River watershed contains over 94 square miles of wetlands, 12,883 acres of lakes and also some of the country's most productive cranberry bogs. Two Areas of Environmental Concern (ACECs) are located in the watershed, the Hockomock Swamp and the Canoe River Aquifer (including the Snake River, Watson Pond and Lake Sabbatia). The wetlands within the Hockomock Swamp are home to at least 13 rare and endangered species. Because there are no dams in this wetland system, it serves an important anadromous fish run.

The Taunton River Watershed includes:

- 7 species of freshwater mussels
- 27 habitat types
- 29 species of native fish
- 114 species of birds
- 173 canoeable river miles
- 221 lakes and ponds
- 16,800-acre Hockomock Swamp

http://en.wikipedia.org/wiki/Taunton_River_Watershed

Figure 1: Taunton River Watershed Communities

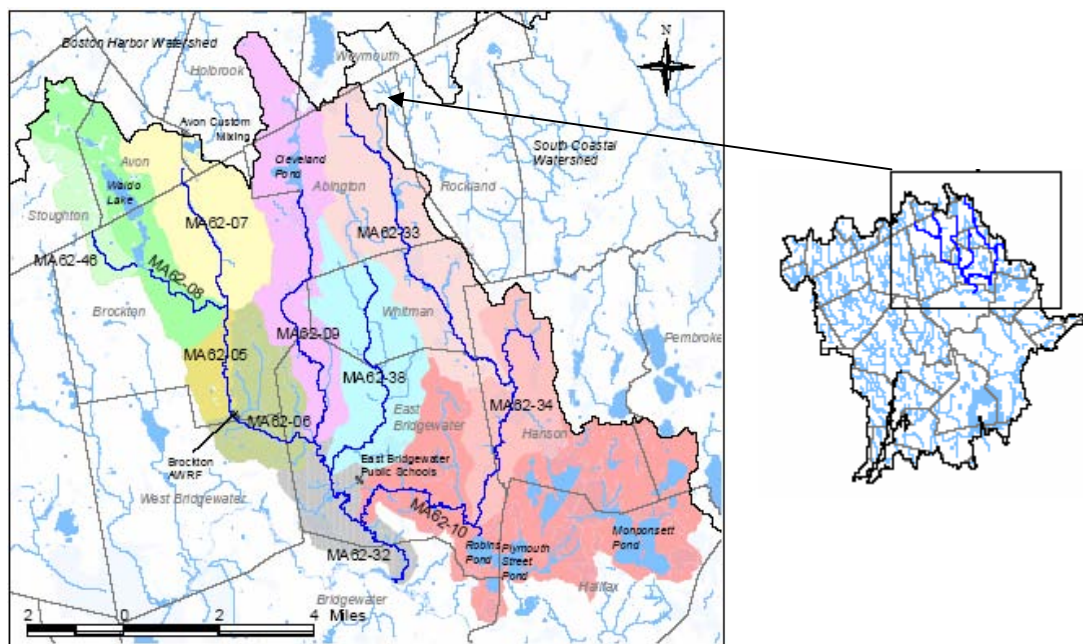


Summaries and locus maps of the major tributaries of the Taunton River are provided below, as adapted from the MA-DEP 2001 Taunton River Watershed Water Quality Assessment Report.

- **Matfield River:** The Matfield River subwatershed includes 77 square miles in the northeast portion of the Taunton River Watershed. This subwatershed contains some of the most densely developed areas in all of Massachusetts, including a majority of the City of Brockton. The Matfield River flows south from East Bridgewater into the confluence of the Town River and Taunton River.

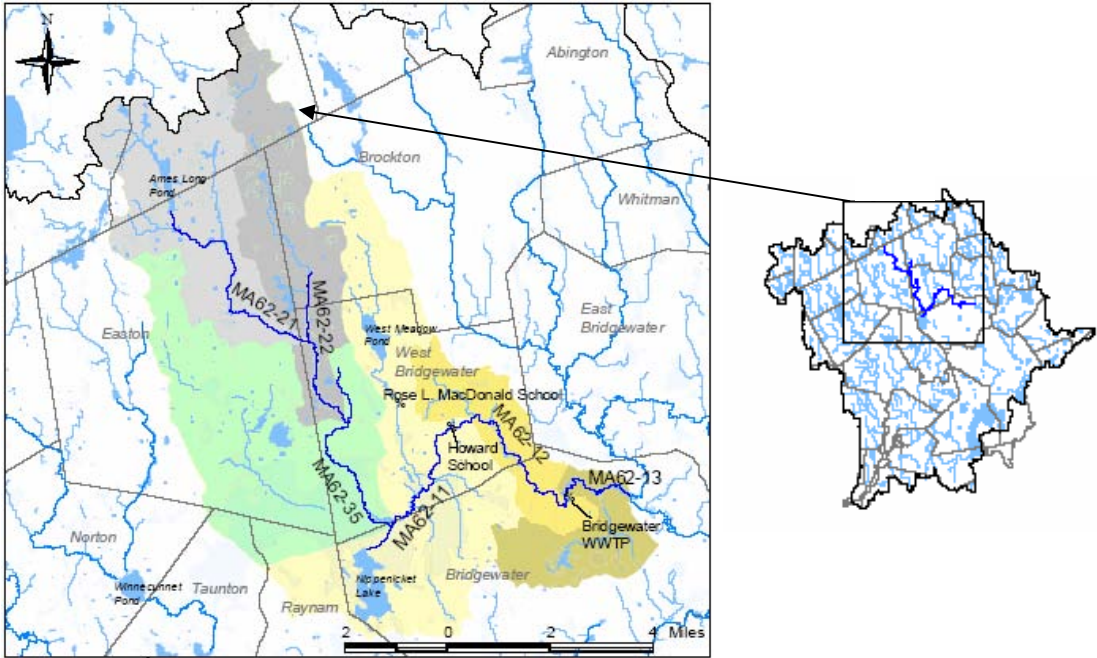
Land use in the western portion of this subwatershed is primarily residential, followed by forest and some commercial and open space areas. This portion of the Matfield River contains some of the highest concentration of impervious area in the Taunton River watershed with impervious cover values greater than 25%. Land use in the central and eastern portions of the subwatershed is predominantly forest, followed by residential and some open space area. The impervious surface cover in these areas are less than 12.8%, indicating a low to moderate potential for adverse water quality impacts from impervious surface water runoff.

The Matfield River Subwatershed



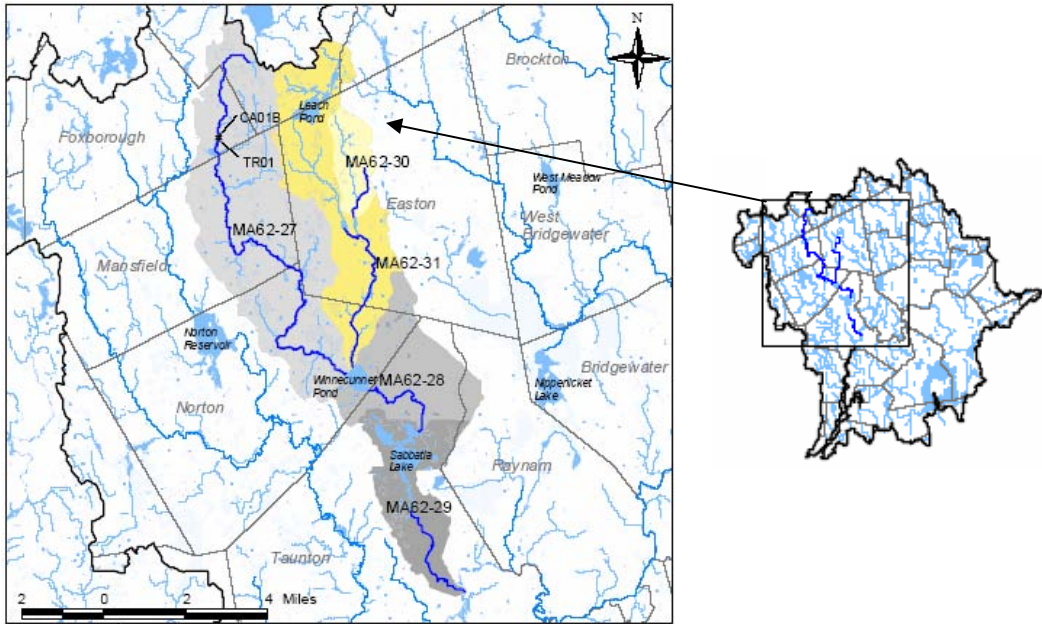
- **Town River:** The Town River subwatershed contains most of the Hockomock Swamp Area of Critical Environmental Concern (ACEC), which along with its neighboring wetlands and water bodies, makes up Massachusetts' largest vegetated freshwater wetland system. The primary land use in the Town River subwatershed is forest, followed by residential, open space and agricultural areas (including approximately 59 acres of cranberry bogs located in the Hockomock River watershed and its tributaries). Impervious surfaces are estimated to cover less than 10% of this watershed, indicating there is a low potential for adverse water quality impacts from impervious surface water runoff. The exceptions to this are the lower portion of the Town River and the Coweaset River with 11% and 12.9% impervious cover, respectively.

The Town River Subwatershed



- **Mill River:** The Canoe River Aquifer ACEC and a portion of the Hockomock Swamp are located in this subwatershed. The Canoe River Aquifer ACEC is characterized by an extensive system of surface waters, wetlands, floodplains and high-yield aquifers. The aquifers provide drinking water to four communities within the ACEC. This ACEC is located adjacent to the Hockomock Swamp ACEC. The land use in the Mill River subwatershed is primarily forest followed by residential and some open space areas. This includes approximately 388 acres of cranberry bogs in the eastern portion of this subwatershed. Impervious Surfaces comprise less than 10% of this area, indicating a low potential for adverse water quality impacts from impervious surface water runoff.

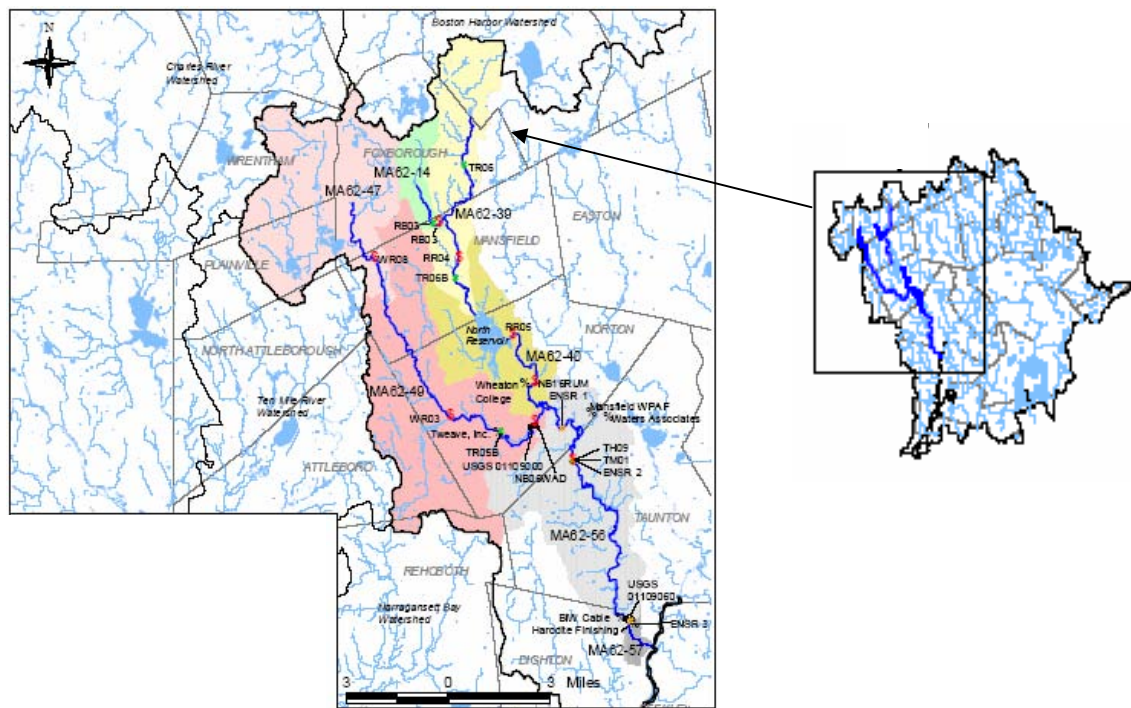
The Mill River Subwatershed



- **Threemile River:** The Threemile River is formed at the confluence of the Wading and Rumford Rivers in the northwest section of the Taunton River Basin. The Three Mile River boasts an excellent warm water fishery and over 6 species of rare and endangered plant and animal species.

The land use in this 85-square mile subwatershed is primarily forested. Residential is the next largest land use category followed by a much lower percentage of open space. Impervious surfaces cover from 13.6 to 23.7% of the eastern portion of the Threemile River subwatershed (Robinson Brook and Rumford River). These areas have some of the highest percentages of impervious area in the Taunton watershed, indicates the potential for water quality to be impacted by impervious surface water runoff.

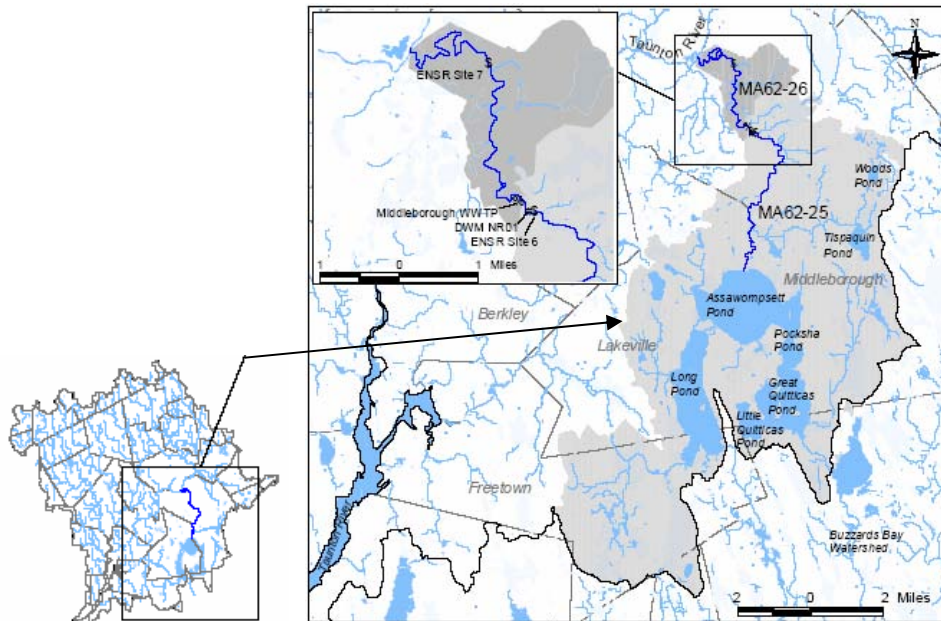
The Threemile River Subwatershed



- **Nemasket River:** The Nemasket River starts at the outlet of Assawompset Pond, which is Massachusetts' largest natural fresh water body and also contains the state's largest alewife spawning habitat. Assawompset Pond and Long Pond serve as emergency water supply for the New Bedford area. Flow is regulated at the dam located between Assawompset Pond and Great Quittacas Pond.

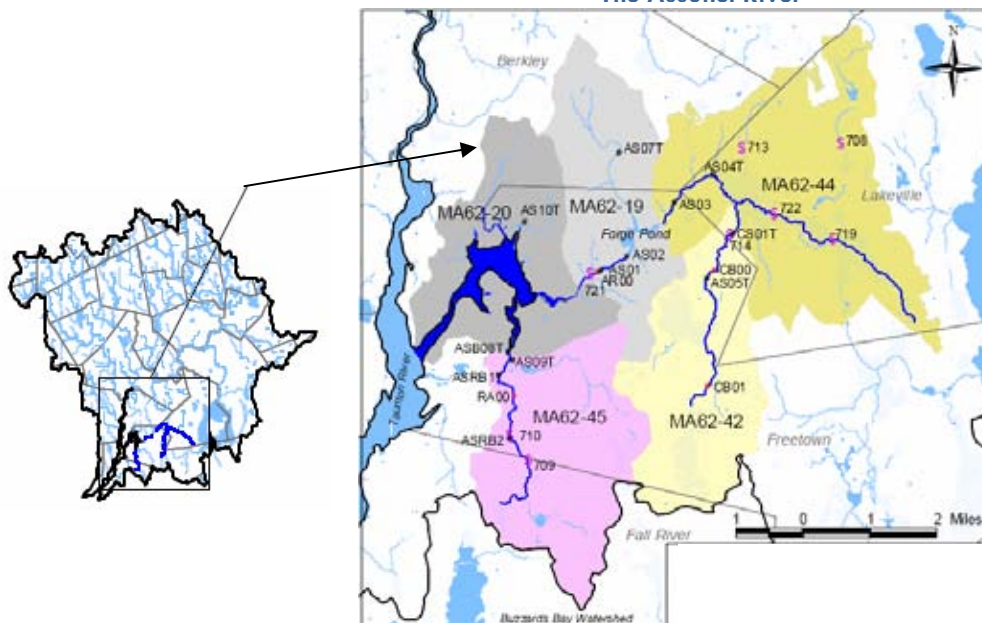
The Nemasket flows northward from its source before joining the Taunton River near the Bridgewater/Middleborough border. In addition to urbanized portions of Middleborough, the Nemasket River subwatershed drains vast areas of forest, wetland, and cranberry bogs.

The Nemasket River



- **Assonet River:** The Cedar Swamp River originates in Cedar Swamp (Lakeville) and flows through an extensive wetland area. Cedar Swamp River flows to the west, becoming the inlet to Forge Pond where it becomes the Assonet River. The lower Assonet forms a broad estuarine finger of the Taunton River, which includes the largest contiguous salt marsh in the Narragansett Bay estuary. Land use in this subwatershed is dominated by over 70% forest. Residential land use is less than 15%, followed by open space. Impervious area is less than 10%, indicating a low potential for adverse water quality impacts from impervious surface runoff. The lower portion of the Assonet River has been placed on the Massachusetts Year 2002 Integrated List of Waters – Category 5 as not meeting Water Quality Standards for pathogens. The 2003 MA-DMF Shellfish Status Report indicates that shellfish harvesting is prohibited in all growing areas of the lower Assonet River.

The Assonet River



2.1.2 History of the Taunton River

Excerpted from the Taunton River Stewardship Plan (July 2001, Taunton Wild & Scenic River Study Committee)

The Taunton River historically served as a vital waterway for Colonial settlements and earlier for Native American settlements dating back as far as 12,000 years. The “Great River” as referred to by Native Americans, provided a wide range of natural resources to support sizeable prehistoric populations. Historical evidence of these uses includes stone and wooden fish weirs.



Depiction of a Native American fish weir.

Colonial and early industrial development was focused around streams and tributaries of the Taunton River. These waterways provided power sources for mills, forges, and other industrial pursuits, while the Taunton River provided an ideal conduit to transport goods to and from markets.

The towns and cities in the Taunton River corridor formed village clusters centered on upland areas surrounded by rich wetlands. These villages were connected by a network of roads and became centers of farming and commercial activities. Between 1700 and 1900, money was invested in shipping goods via vessels on the Taunton River. At the turn of the 19th Century, the banks of the Taunton River became home to major resorts including amusement parks, picnic areas and dance pavilions.



The Taunton River, Fall River, Massachusetts.

2.1.3 Wildlife Habitat/ Rare and Endangered Species

Adapted from the Taunton River Watershed 2001 Water Quality Assessment Report (MA-DEP) and excerpted from the Taunton River Stewardship Plan (July 2001, Taunton Wild & Scenic River Study Committee)

There are 31 distinct wildlife habitat types within the Taunton River corridor. There are a number of endemic species in the Taunton River watershed that are not found anywhere else in Massachusetts. This watershed also is home to the Water willow stem-borer moth, which is an endemic species to Southeastern Massachusetts’ wetlands and found nowhere else on earth. The Taunton River corridor provides habitat to over 154 species of birds and 45 species of fish, including the Bald eagle and the globally rare endangered Atlantic sturgeon. There are also over 360 plant species identified here, including 3 globally rare species: Long’s bittercress, Long’s bulrush and Eaton’s beggar ticks. There are also seven rare reptiles and amphibians found within the watershed. The upper part of the Taunton River holds one of the largest clusters of Spotted turtles in the state. There are 12 rare bird species in the Taunton River corridor. Two endangered bird species that depend on this habitat include the Upland sandpiper and the Northern harrier.



Upland Sandpiper

2.1.4 Water Use and Supply Issues

Adapted from the Taunton River Watershed 2001 Water Quality Assessment Report (MA-DEP) and Excerpted from the Taunton River Stewardship Plan (July 2001) and the Southeast Regional Planning and Economic Development District's Comprehensive Economic Development Strategy 2004 (www.srpedd.org).

The waters of the Taunton River watershed are most commonly used for swimming, boating, fishing, wildlife viewing, aquatic habitat, industrial cooling, shellfish harvesting, irrigation, agricultural uses, beachfront, and potable water.

Over the past thirty years, the Taunton River's overall health has improved greatly. In the past, the river has been considered toxic because of the industrial and commercial uses and abuses of this water source. Much of the River's improvement in water quality improvement can be attributed to the passage and enforcement of environmental regulations pursuant to the federal Clean Water Act and Wetlands Protection Act. The quantity of pollutants entering the river has also decreased due to the closing of riverside mills.

The city of Taunton gets its principal water supply from the Assawompsett Pond Complex, which is the largest natural freshwater reservoir in the Commonwealth. There are only two cities within the Taunton River Watershed, Brockton and Taunton, that rely on surface water for their drinking water needs. The other communities in the watershed rely almost entirely on groundwater resources.

The Taunton River watershed has experienced significant population growth over the past few decades, including a 24% increase in population in the City of Taunton between 1980 and 2000. Water supply demand in the watershed has increased in parallel with the increasing population and related development in this area. The increased water demand has resulted in fluctuations in water quantity of the Taunton River and its tributaries, thereby altering habitat.

2.1.5 Population Growth/Growth Planning

Adapted from the Taunton River Watershed 2001 Water Quality Assessment Report (MA-DEP) and the Southeast Regional Planning and Economic Development District's Comprehensive Economic Development Strategy 2004 (www.srpedd.org)

A major issue facing the Taunton River Watershed is how to deal with the future population growth that is predicted as a result of proposed transportation links. Presently, more than half of the watershed is categorized as forested, recreational, or open land, with approximately 20-percent of the watershed being characterized as residential.

Currently in the Taunton River Corridor, there are approximately 2,537 acres of agricultural land. Since 1971, the amount of agricultural land has been reduced by more than 1,200 acres (28%). Subdivision of farmland for residential development is the primary cause for this reduction. Current agricultural production in the watershed includes cropland, pastureland, cranberry bogs, tree farms, orchards, and open land.

The Myles Standish Industrial Park in Taunton has been an important contributor to economic growth in this region of Massachusetts. The park is currently undergoing a Phase 3 expansion and is planning a Phase 4 expansion with an intended completion date of 2010. The park is expected to hold more than 100 companies which will provide 10,000 jobs to the area.

2.1.6 Watershed Organizations

The Taunton River Watershed Alliance:



The Taunton River Watershed Alliance (TRWA) is a non-profit alliance of individuals, businesses and organizations united to restore and properly manage water and related natural resources within the Taunton River watershed. The TRWA is focused on protecting and restoring the Taunton River watershed, its tributaries, wetlands, floodplains, river corridors and wildlife. More information on the TRWA can be found on their website at: <http://savethetaunton.org>.

Taunton River Watershed Campaign:



The Taunton River Watershed Campaign (TRWC) is a partnership of ten organizations working to protect natural communities, the landscape, and the quality of life in the Taunton River watershed. The TRWC's goals include: protecting critical land and water resources; linking environmental groups and municipalities working to protect natural resources; and identifying environmental priorities to help ensure growth happens in a manner that supports biodiversity and water quality while preserving community character. More information on the TRWC can be found at:

<http://savethetaunton.org/index.cfm?fuseaction=Page.viewPage&pageId=509>

Taunton River Stewardship Council:



The Taunton River Stewardship Council (TRSC) serves as the coordinating/facilitating body for the implementation of the Taunton River Stewardship Plan, developed as part of the Taunton Wild & Scenic River Study. The purpose of the TRSC is to promote long term protection of the river by bringing together and coordinating between various groups working on river management and by discussing and making recommendations regarding issues of concern and implementing the Stewardship Plan. The council is currently seeking official designation of the Taunton River as a Wild & Scenic River. More information can be found at www.tauntonriver.org.

Members of the Taunton River Watershed Campaign

The Environmental League of Massachusetts

Manomet Center for Conservation Sciences

Mass Audubon

The Nature Conservancy

Save the Bay-Narragansett Bay

Southeastern Regional Planning & Economic Development District

Taunton River Watershed Alliance

The Trust for Public Land

The Trustees of Reservations

Wildlands Trust of Southeastern MA

2.2 SUMMARY OF MAJOR WATERSHED INFORMATION SOURCES

To provide an overview of current water quality and watershed planning issues facing the Taunton River Watershed, this section provides summaries of watershed issues and proposed action items as presented in the reports that are listed below. The key watershed issues identified in these documents are listed below, organized according to the five major watershed planning categories selected by the watershed advisory committee (as discussed in Section 3).

★ Please note that the issues and action items listed in this section do not represent the 2006 Taunton River Watershed Five-Year Action Plan developed through this project. Rather, this listing represents a compilation of existing information which was presented to the Taunton Watershed Advisory Committee to facilitate thinking and discussion at the watershed planning sessions.

The Five -Year Action Plan is presented in Section 3 of this report (see page 30).

Taunton River Watershed Information Sources

- 2001 Taunton River Basin Water Quality Assessment Report (MA-DEP)
- Technical Memorandum – Taunton River Assessment, December 2004 (MA Riverways)
- Draft Pathogen TMDL for the Taunton River Watershed (MA-DEP, USEPA)
- Taunton River Stewardship Plan - Taunton River Wild & Scenic River Study, July 2005 (Taunton Wild & Scenic River Study Committee)
- Priorities for the Taunton River Watershed (MA-EOEA)
- Natural Resource Inventory and Conservation Plan for the Taunton River Corridor, Feb 1998 (Wildlands Trust of Southeast MA)
- An Action Plan for the Taunton River Watershed, 1992 (University of MA, Boston)

Website Links

- Taunton River Watershed Alliance www.trwaonline.org/
- Southeast Regional Planning and Economic Development District www.srpedd.org/
- Save the Bay www.savebay.org
- Old Colony Planning Council www.ocpcrpa.org/
- Wildlands Trust of Southeastern Massachusetts www.wildlandstrust.org/
- Manomet Center for Conservation Sciences www.manomet.org/
- Taunton River Wild and Scenic River Study www.tauntonriver.org/
- U.S. Geological Survey information on the Taunton River Watershed <http://ma.water.usgs.gov/basins/taunton.htm>
- Massachusetts Riverways Programs http://www.mass.gov/dfwele/river/riv_toc.htm
- Taunton River Journal www.glooskapandthefrog.org
- Atlantic States Marine Fisheries Commission <http://www.asmfcr.org/>

SUMMARY OF WATERSHED INFORMATION SOURCES

A. WATER QUALITY IMPROVEMENT AND PROTECTION

ISSUES and OBJECTIVES

1. Ensure Healthy Water Quality and protect temperature and dissolved oxygen regimes, and remediate pollution sources such as excess nutrients, pathogens, turbidity, and contaminated sediments.
2. Promote Low Impact Development (LID) techniques to reduce impervious surfaces and stormwater discharges.
3. Protect and restore streamside buffers and bordering wetlands to combat nonpoint source pollution including nutrients, sediment and heated runoff.
4. Support limits on discharges of nutrients (phosphorus and nitrogen) to the river from sewage treatment plants and other permitted discharges.
5. Enact and enforce bylaws to keep stormwater onsite so that post-construction runoff does not exceed pre-construction runoff.
6. Control excess sedimentation by enforcing best management practices at construction sites and controlling runoff of road surfaces.
7. Eliminate illicit sewer connections, repair failing infrastructure, and control impacts associated with CSOs in the watershed.
8. Identify and eliminate leaking sewer systems and sanitary sewer overflows (Taunton River Basin Communities).
9. Decrease the nutrient load in the river, particularly from Brockton wastewater treatment plant.



Northern Arrowwood
(*Viburnum recognitum*)

ACTION ITEMS

General:

1. Develop a Quality Assurance Program Plan for obtaining water quality and flow data from the 25 sub-watersheds.
2. Identify and eliminate illicit discharges (both dry and wet weather) to their separate storm sewer systems by using the guidance document developed by EPA New England (USEPA 2004c) for the Lower Charles River, which provides a plan, applicable to all Commonwealth communities.
3. Inspect, maintain, and upgrade/replace (if necessary) septic systems that are contributing bacteria to the Taunton River watershed (Homeowners and Taunton River Basin Communities).

Monitoring (General):

4. Monitor watershed areas where data are lacking or absent to determine if waterbodies meets use criteria:
5. Monitor areas where BMPs and other control strategies have been implemented or discharges have been removed to assess the effectiveness of the modification or elimination:

- a. Assemble data collected by each monitoring entity to formulate a concise report where the basin is assessed as a whole and an evaluation of BMPs can be made.
 - b. Add, remove and modify BMPs as needed based on monitoring results.
6. Capture water quality conditions under varied weather conditions.
 7. Establish sampling locations in an effort to pin-point sources.

SITE-SPECIFIC:

8. Brockton Wastewater Treatment Plant:

- a. Submit comments from the Stream Team to the EPA on the NPDES permit for the Brockton wastewater plant and advocate for better management and treatment.
- b. Continue to conduct monitoring (biological, habitat and water quality) to evaluate conditions in the Salisbury Plain River resulting from the upgrade of the Brockton Advanced Water Reclamation Facility.
- c. Continue to evaluate the Brockton Advanced Water Reclamation Facility NPDES discharge permit and update with appropriate limits and monitoring requirements. A toxicity identification/toxicity reduction evaluation should also be required if acute/chronic toxicity continues to be problematic.

9. Bridgewater Wastewater Treatment Plant:

- a. Continue to monitor compliance of the Bridgewater WWTF NPDES permit limits and other special conditions of the permit in the Town River (Segment MA62-13). Samples should also be collected upstream from the discharge for use as either dilution water or a control in the facility's whole effluent toxicity tests.
- b. Continue to monitor compliance of the MCI Bridgewater WPCF effluent with their permit limits and other special conditions of the permit in Sawmill Brook (Segment MA62-36).

10. Somerset Power Treatment Plant:

- a. Chlorine is added to control biofouling and is injected upstream from traveling screens in the screenwell at a rate such that the 0.1 limit will be met in the discharge. Because Unit 6 intake is only 2/3 of the discharge, fish in the screenwell will be exposed to TRC >0.1 mg/L; impinged fish may experience much higher levels. The technical advisory committee reviewing the operations at this facility should consider moving the chlorine injection point downstream of the traveling screens.
- b. In 2000 when an on-site visit was conducted, the facility had only a high-pressure (~80 psi) screen wash which would be lethal to many impinged fish. A low-pressure wash should be added ahead of the high pressure wash so that impinged fish can be removed with little or no injury.
- c. The fish return system needs to be altered to lessen potential injury after impingement.
- d. Runoff from the coal pile should be treated prior to discharge to the Taunton River.



Brayton Point Station (Somerset)

- e. Work with the Brayton Point Station Technical Advisory Committee to improve availability/access (electronic or web site) to water quality and biological monitoring data collected from individual stations in the Taunton River as part of the Brayton Point Station's NPDES permit. Currently much of these data are pooled to evaluate conditions in Mt. Hope Bay so isolating data from a particular station is not possible.
11. Middleborough Wastewater Treatment Plant:
 - a. Biological monitoring should be conducted in Nemasket River (Segment MA62-26) to evaluate the impacts, if any, of the Middleborough WWTP discharge and to assess the status of the Aquatic Life Use.
 12. Myers Avenue Water Treatment Plant:
 - a. An investigation of the Abington/Rockland Joint Water Works (Myers Avenue Water Treatment Plant) should be conducted to monitor the facility's discharge and to determine if the habitat in the Shumatuscancant River (Segment MA62-33) is being impacted by the discharge.
 13. The City of Taunton should develop and implement a long-term control plan for their CSO.
 14. Review and implement recommendations in the DMF shellfish sanitary survey reports and the triennial reviews for growing area MHB2.2 for the following river segments: Taunton River (Segment MA62-02, MA62-03), Segreganset River (Segment MA62-55), Muddy Cove Brook (Segment MA62-51), Broad Cove (Segment MA62-50), Threemile River (Segment MA62-57).
 15. Review and implement recommendations in the DMF shellfish sanitary survey reports and the triennial reviews for growing area MHB2.1, MHB2.3, and MHB2.4 for the Taunton River (Segment MA62-04).
 16. Review and implement recommendations in the DMF shellfish sanitary survey reports and the triennial reviews for growing area MHB2.5 for the Assonet River (Segment MA62-20).
 17. Review data and evaluate status of hazardous waste site cleanups along the Rumford River (Segment MA62-39) to monitor progress of improvements and to determine needs, if any, to collect additional data.
 18. The TRWA and/or WAL should continue to conduct water quality monitoring at its established sampling site in the following river segments to meet its sampling objectives. In order for the MassDEP to utilize the TRWA and/or WAL data for water quality assessment reporting purposes, the TRWA and/or WAL should work with MassDEP to meet its Quality Assurance/Quality Control requirements: Taunton River (Segment MA62-01, MA62-02), Cotley River (Segment MA62-41), Cobb Brook (Segment MA62-43), Matfield River (Segment MA62-32), Town River (Segment MA62-13), Snake River (Segment MA62-28), Mill River (Segment MA62-29), Threemile River (Segment MA62-56, MA62-57), Nemasket River (Segment MA62-25, MA62-26).
 19. Continue to evaluate Tweave's whole effluent toxicity testing results in the Wading River (Segment MA62-49).
 20. Evaluate results of the East Bridgewater Public Schools (NPDES permit #MA0022446) whole effluent toxicity tests in the Matfield River (Segment MA62-32).
 21. Determine current monitoring efforts for the fly ash dump along the Assonet River.

22. Review and implement appropriate recommendations from the ESS Nonpoint Source Pollution Assessment Report and Management Plan (ESS 2003) in the following river segments: Lovett Brook (Segment MA62-46), Salisbury Brook (Segment MA62-08), Trout Brook (Segment MA62-07), Salisbury Plain River (Segment MA62-05, MA62-06), Beaver Brook (Segment MA62-09), Meadow Brook (Segment MA62-38), Shumatuscacant River (Segment MA62-33), Satucket River (Segment MA62-10), Matfield River (Segment MA62-32).
23. Continue to review results of the NPDES facilities DMRs and toxicity tests in the Town River (Segment MA62-11) to evaluate compliance with their permit limits. If acute toxicity continues to be problematic, determine the need to require a toxicity identification/toxicity reduction evaluation. Separate waste stream and flow monitoring should be required/implemented as part of the Howard School WWF permit (various waste streams discharge into a common manhole). The need to separately permit these discharges can then be properly evaluated.
24. NPDES permits should be updated in the Taunton River (Segment MA62-01) with appropriate limits and monitoring requirements including consideration of site-specific copper criterion.
25. Ensure that all NPDES permits are current and in compliance in the Taunton River (Segment MA62-02), Shumatuscacant River (Segment MA62-33), Meadow Brook (Segment MA62-38), and Taunton River (Segment MA62-04).
26. Continue to monitor compliance with WMA registration/permit limits and other special conditions of the permits in the following river segments: Taunton River (Segment MA62-01), Segreganset River (Segment MA62-53, MA62-54), Shumatuscacant River (Segment MA62-33), Poor Meadow Brook (Segment MA62-34), Satucket River (Segment MA62-10), Matfield River (Segment MA62-32), Queset Brook (Segment MA62-21), Coweaset Brook (Segment MA62-22), Hockomock River (Segment MA62-35), Town River (Segment MA62-11, MA62-12), Mulberry Meadow Brook (Segment MA62-31), Canoe River (Segment MA62-27), Wading River (Segment MA62-47, MA62-49), Threemile River (Segment MA62-56), Nemasket River (Segment MA62-25), Assonet River (Segment MA62-20).



Coweaset Brook

SUMMARY OF WATERSHED INFORMATION SOURCES

B. WILDLIFE HABITAT AND ECOLOGY PROTECTION (including Water Quantity/Streamflow)

ISSUES and OBJECTIVES

1. Prevent fragmentation of riparian corridors, floodplains, and contiguous upland habitat blocks.
2. Protect Intact Estuary Habitats of the Taunton River, including freshwater and brackish tidal marshes, salt marshes and riparian habitats:
 - a. Increase/maintain tidal flushing of salt marshes where possible. Prevent runoff from altering salinity in salt marsh habitats.
 - b. Preserve and restore salt marsh systems in the estuary through maintenance of shoreline buffers and by limiting runoff.

3. Restore degraded habitats and species communities, including eelgrass beds, salt marshes, shellfish beds, nursery/spawning areas:
 - a. Prevent invasive species from displacing native communities of plants and animals.
4. Restore anadromous fish populations in streams currently blocked to fish migration by dams and/or poor water quality:
 - a. Protect habitats including instream flow for all the life stages of fish – spawning, juvenile stages, migration, feeding, etc.
5. Protect rare coldwater habitats in tributary streams.
6. Protect and restore rare species (e.g. Atlantic sturgeon and Eastern pond mussel).
7. Retain the natural flow regime as much as possible by protecting seasonal fluctuations in flow in the Taunton River, its tributaries and headwater streams.
8. Use Water Management Act permits and other opportunities to restore stream flow to areas that have low flow problems.
9. Support nitrogen and phosphorus limits in the water quality standards for Massachusetts.
10. Encourage fixing inflow and infiltration before looking for additional water supplies.
11. Any construction activities along the river should comply with 401 water quality standards and should maintain consistency with Massachusetts Coastal Zone Management policies.
12. Ensure that all major NPDES permits are current and in compliance and that all minor permits are updated.
13. Protect natural flow regimes critical to long- term viability of aquatic biodiversity:
 - a. Use water conservation strategies as the first line of defense in protecting flow.
 - b. Protect existing wells through zoning, land purchase and other techniques to reduce or avoid new withdrawals from rivers and streams.
14. Ensure natural flow regimes to support the full life cycle of both resident and anadromous fish:
 - a. Promote water conservation, reduced impervious surfaces, reduced inflow and infiltration into wastewater systems and local groundwater recharge as the major tools to preserve water supply and avoid new water withdrawals.
 - b. Promote water conservation and stormwater recharge including minimizing lawn watering and planting native species.



Kings Pond in Massasoit State Park
(Taunton)

ACTION ITEMS

General:

1. Protect Riparian Corridors & Rare/Endangered Species/ Prevent Habitat Fragmentation:
 - a. Create a comprehensive growth management plan for the Taunton River watershed.

- b. Develop a coordinated regional strategy to identify/protect priority parcels.
 - c. Encourage passage of the Community Preservation Act.
 - d. Encourage passage of local growth management bylaws such as transfers of development rights, cluster zoning, and other innovative approaches.
 - e. Encourage the designation of targeted growth areas and protection areas within the watershed.
 - f. Integrate Living Waters, Biomap, and other biodiversity information into municipal Master Plans/ Open Space Plans.
2. Protect Estuary Habitats:
- a. Increase and/or maintain tidal flushing to salt marsh habitats in the Assonet River and other tributaries and coves in the Taunton River estuary.
3. Restore Degraded Habitats and Ecological Communities:
- a. Support strengthening the NPDES permit for Brayton Point power plant to prevent thermal pollution and entrainment of larval fish.
 - b. Address septic system pollution issues in the Assonet River estuary.
 - c. Pursue recommendations listed in the Division of Marine Fisheries anadromous fisheries report for restoration of anadromous fish runs.
 - d. Restore tidal flushing to degraded salt marshes through elimination of tidal restrictions.
 - e. MassDEP and EPA should work with the power plants in the lower Taunton River (Segment MA62-04), to develop fish population estimates in order to better evaluate the impacts related to impingement and entrainment of fish, eggs, and larvae.
 - f. Investigate fish community impacts related to the cooling water intake and discharge along the Unnamed tributary (Segment MA62-48). This should include recommendations for mitigation including an evaluation of fish exclusion barriers.
4. Restore Anadromous Fish Populations:
- a. Investigate feasibility of removing the remaining portion of the Plymouth Street Dam (Bridgewater) to facilitate fish passage into the Town and Matfield Rivers and to remove paddling hazards.
 - b. Investigate feasibility of the removal of the remains of the Cotton Carver Gin Mill Dam below Route 106 on the Satucket River and restore a natural stream channel.
 - c. Reassess the dams on the Assonet River to restore natural stream habitat and to facilitate spawning of anadromous fish including rainbow smelt.
 - d. Assess dams at Kings and Hewitt Ponds along Forge River, in Raynham, for maintenance/safety issues. There is some erosion of the concrete structure and embankment. The Department of Conservation and Recreation Dam Safety office recommended that they be maintained or removed.



Cotton Carver Gin Mill Dam

- e. Investigate fish passage options at Johnson Pond and the small dam located behind the Recreation Department in Forge River, Raynham.
- f. Finalize installation of the fish ladders on the Three Mile River.
- g. Re-establish anadromous fish runs for two communities on the Three Mile River and Fall Brook at Massasoit State Park.
- h. Evaluate the effectiveness of the anadromous fish restoration project (shad and herring passage/data) in the Threemile River (Segment MA62-56).
- i. Evaluate a sustainable water level and flow for the Nemasket River with emphasis on the anadromous fish run and work toward restoring summer flow.
- j. Work with Massachusetts Riverways Program to inventory and evaluate culverts and other barriers to fish passage.

5. Protect Coldwater Habitats:

- a. Conduct additional monitoring of fish populations, dissolved oxygen, and temperature as needed to evaluate DFW's proposal to list the following streams as a cold water fisheries in the next revision of the Surface Water Quality Standards: Raven Brook, Terry Brook, Henkes Brook, Basset Brook, Puddingshear Brook, Spring Brook, and Otis Pratt Brook.
- b. Create an inventory of coldwater streams in the watershed.
- c. Protect flow to small spring fed headwater streams.
- d. Protect forested buffers to provide shading/temperature control to small tributaries.
- e. Protect priority parcels in coldwater watersheds.
- f. Selectively remove unnecessary dams where impoundments are warming temperatures in potential cold-water habitats to maintain connectivity with habitat for different life stages.



Mussels from the Nemasket River

6. Protect/Restore Rare Species:

- a. Continue to monitor rare species/flow/fisheries for the Segreganset River (Dighton).

7. Create a comprehensive water management plan for the Taunton River watershed.

8. Create a water budget for the Taunton River watershed that takes in to account human and ecosystem needs.

9. Create an implementation plan for water use and distribution in the watershed.

10. Ensure Natural Flow Regimes:

- a. Conduct field studies to determine flow rates in tributary systems (currently being conducted with Stream Teams and the River Instream Flow Stewards).
- b. Create a comprehensive water management plan for the Taunton River watershed.

11. Develop comprehensive storm water management programs including identification and implementation of BMPs (Taunton River Basin Communities).

12. Assess feasibility of fish passage at culverts upstream and downstream of the dams.
13. Determine the baseflow from each tributary relative to their drainage areas, by actual measurement, not from regression equations.

SITE-SPECIFIC

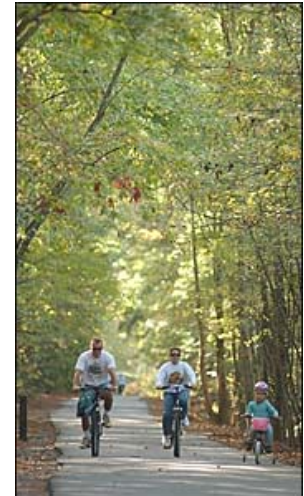
14. Investigate changes in flow through long term photo documentation at selected locations or through the use of stream gauges and/or by looking at macroinvertebrates in the Winnetuxet River in Halifax.
15. Investigate ownership of dams along the Assonet River in Berkley and Freetown and evaluate their status.

SUMMARY OF WATERSHED INFORMATION SOURCES

C. RECREATIONAL USE AND ACCESS

ISSUES and OBJECTIVES

1. Improve quality access to the Taunton River, its tributaries and corridor resources, including:
 - Trails
 - Canoe/Boat Access
 - ADA-Accessible Sites
 - Clean-up Efforts
2. Promote Recreational Access and Waterfront Revitalization in concert with community goals and habitat sustainability:
 - a. Support recreation by emphasizing community boating, canoeing and fishing on the lower river.
 - b. Create waterfront plans that would stimulate recreation, tourism and local economic activity.
 - c. Utilize the local, state and federal coalition of the Taunton River Stewardship Council to ensure that access and scenic issues are incorporated into bridge and roadway projects in the corridor.
 - d. Encourage municipalities to undertake a high profile land protection or recreation projects such as a town park, bike path or trail to generate excitement about river protection and recreation.
3. Preserve the scenic beauty of the Taunton River and its tributaries.



ACTION ITEMS

1. Trails: Develop/improve passive recreation (hike, skiing, riding, etc.) multi-use trails:
 - a. Town-owned site along the Winnetuxet River

- b. Improve trail options at Borden Colony APR land along Forge River, Raynham.
- c. Provide trail access from the new Middle School to Nemasket River in Middleborough.
- d. The abandoned Conrail Line.

2. Canoe/Boat Access:

- a. Develop a town canoe launch/outdoor classroom at Gushee Pond in Forge River, Raynham.
- b. Designate a public access site along the lower Winnetuxet River - near Route 105 or Pratt Street in Halifax with adequate parking and safe launching.
- c. Improve existing canoe access sites to limit erosion and create new access where appropriate in the Town River in West Bridgewater and Bridgewater.
- d. Designate/develop a safe Nemasket River canoe portage at Wareham Street in Middleborough.
- e. Develop a town canoe launch at either Murdock St. or Plymouth St for the Nemasket River.
- f. Follow plans for canoe access points on the Three Mile River.
- g. Utilize former highway barn driveway on Spring Street as an off-road access to the Town River. This area would offer convenient parking/canoe access to downtown area, and could be further designed to include a pedestrian bridge over the Town River to the Stiles & Hart Conservation Area.

3. ADA-Accessible Sites:

- a. Develop a handicapped access site at Hewitt Pond conservation area in Forge River, Raynham.
- b. Develop suitable areas for fishing and boating access that are wheel chair accessible (e.g., Waterfront Park, Somerset).



Waterfront Park in Somerset,

4. Clean-up Efforts:

- a. Conduct a cleanup of specific areas where debris was found in Nemasket River in Middleborough.
- b. Work with the Town of Freetown to establish signage for Porter Pastures and conduct a trash cleanup at the site.
- c. Enlist support from the fast food restaurants along Route 44 in Raynham to clean up litter using Highway Department bags.
- d. A river cleanup should be conducted to remove trash and debris from the Assonet River (Segment MA62-19) and the Rumford River (Segment MA62-39).
- e. Petition the State for the designation of a No Discharge Area (NDA) to controlling pathogen contamination from boats.
- f. Organize a cleanup of Route 44 area along the Three Mile River in Taunton and Dighton.

- g. Conduct cleanups at bridge areas and campsites to collect trash and debris in Town River, in West Bridgewater and Bridgewater.
 - h. Reduce swimmers' contribution to pathogen impairment by making shower facilities available and encouraging use of showers prior to swimming.
5. Preserve Scenic Beauty:
- a. Strengthen Open Space Residential bylaws to support protection of open field and vistas through preservation of trees, stone walls and fields. (Currently Bridgewater, Dighton, Fall River, Middleborough, Raynham, Somerset and Taunton have open space or cluster provisions, but these could be strengthened).
 - b. On the lower river, work with commercial and industrial users to develop public access and scenic vista areas on their properties (for example J&J Marina was required to offer a scenic viewing area through Chapter 91).
 - c. Use the Heritage Landscape Inventory to identify and protect critical viewsheds, both from the river and adjacent roads.
 - d. Designate Scenic Roads and Byways along the river (Summer Street where it crosses the Taunton River at Wooded Bridge along the Bridgewater/Middleborough line is a designated Scenic Road).

SUMMARY OF WATERSHED INFORMATION SOURCES

D. OPEN SPACE, LAND USE, AND SUSTAINABLE DEVELOPMENT

ISSUES and OBJECTIVES

1. Inventory and document historical and archaeological resources of the Taunton River and its tributaries.
2. Seek protection for threatened sites and areas of highest archeological sensitivity.
3. Support local planning efforts to protect open spaces
 - a. Promote a comprehensive, watershed based approach to management of growth, water supply, and wastewater treatment/disposal.
4. Protect connected open spaces in the Taunton River corridor as an opportunity for diverse recreational activities.
5. Support Local Planning efforts to manage development in a way that is compatible with resource identification, preservation and public education objectives.
6. Promote a Bi-State Narragansett Bay Vision that works to preserve the Taunton River as the most ecologically intact subwatershed of Narragansett Bay.

ACTION ITEMS

1. Inventory and Document Historical and Archaeological Resources:
 - a. Identify historic resources along the river through local survey efforts and participation in the Heritage Landscape Program (ongoing).

2. Seek Protection of Areas with High Significance:

- a. Support ACES designation of portions of the Three Mile River in Taunton and Dighton.
- b. Work with land trusts and Historic Commissions to preserve key lands and landscapes.
- c. Encourage passage of the Community Preservation Act to raise funds for protection of key parcels and historic areas.
- d. Work with the National Park Service to ensure that historic and scenic bridge features are replicated during repair or redesign and ensure that unnecessary bridge construction is avoided (including the Berkley-Dighton Bridge which was built in 1986 and is the older of two remaining swing bridges in the state.)
- e. Use a demolition delay by-law to allow extra time to determine alternatives for preservation of historic properties, and educate the public about its use and application (this is in use in Middleborough and Somerset).
- f. Work regionally to protect historic resources through preservation and tourism strategies.

3. Support Local Planning Efforts to Protect Open Space:

- a. Promote municipal adoption of stormwater and erosion control regulations that include requirements for lot coverage, minimum percent open space and maximum percent impervious surface. Strengthen site plan review to ensure that all water protection regulations are met (Raynham Open Space Plan).



Shoreline fishing at Johnson Pond (Raynham).

- b. Limit impervious surfaces wherever possible through the use of natural drainage, reduction of building footprints and parking lot area, use of grass swales and parking lot islands, use of porous pavement and protection of pre-development vegetation (Raynham Open Space Plan).
- c. Promote bylaws that incorporate low impact development and require new development and redevelopment to limit stormwater flow to current or predevelopment levels.
- d. Require an impact evaluation for any extension of new infrastructure to address the impacts to potential development. Define growth boundaries through limitations on infrastructure development including water and sewer connection moratoria (Middleborough Master Plan, 2001).
- e. Consider adoption of a Resource Protection Overlay Zone which would include wetlands and other related overlapping resources such as river frontage, ponds frontage, habitat areas, vernal pools and ACECs. Development near or within these areas would be subject to site plan review (Raynham Open Space Plan).
- f. Explore alternatives to sodium chloride for road salting, use salt more judiciously or designate no salting areas near sensitive waterways.
- g. Encourage passage of bylaws that strengthen Title 5 septic regulations (Halifax and Dighton have retained their percolation rates at 30 minutes per inch).

4. Protect Connected Open Space:

- a. Encourage appropriate public access to existing and future protected open space as a means of continuing and improving public recreational opportunities.
- b. Acquire easements, conservation restrictions, or transfers of land that will provide opportunities for the public to walk the shoreline, and that will preserve the intact ecological qualities of the corridor.

5. Support Local Planning Effort:

- a. Ensure that zoning bylaws protect areas of significant and moderate archaeological sensitivity and require no-build areas and due diligence.
- b. Develop a model by-law for earth removal that includes a depth trigger for archaeology.
- c. Involve earth removal boards and historical commissions in development decisions.
- d. Create Residential/Business zoning for village centers to match current conditions using mixed commercial/residential uses including second floor residential units and multifamily dwellings (Middleborough Master Plan, 2001).
- e. Develop local historic districts to add protection to village centers and landscapes (The City of Taunton has 2 historic districts)
- f. Determine status of the Open Space Committee along Winnetuxet River (Halifax) and reactivate this group.
- g. Analyze properties in Halifax for the Chapter 61A/61B program for future right of first refusal decisions.
- h. Set up a local land trust for Raynham to work on protection of open space.
- i. Promote land protection efforts along the Segreganset River in Dighton.
- j. Update the Freetown Open Space Plan.
- k. Investigate options for land protection such as deed restrictions or purchase of undevelopable portions of lots, and begin discussions with landowners at key properties for the Winnetuxet River (Halifax).
- l. Work with owners of the industrial park to provide shoreline access and protect open space in Berkley and Freetown.



Freetown-Fall River State Forest

6. Promote a Bi-State Narragansett Bay Vision:

- a. Continue to work closely with Rhode Island to provide funding and resources recognizing the importance of the Taunton River to the health of Narragansett Bay.
- b. Incorporate the Narragansett Bay Estuary Program into restoration and education strategies.

SUMMARY OF WATERSHED INFORMATION SOURCES

E. PUBLIC OUTREACH AND EDUCATION

ISSUES and OBJECTIVES

1. Increase Public Awareness of the historical and archaeological resources of the Taunton River and its tributaries.
2. Increase Public Awareness of the importance of adequate stream flow and water quality to the continued enjoyment of the Taunton River as an outstanding resource of regional, state and national significance.
3. Increase public awareness of the ecology of the Taunton River Watershed:
 - a. Increase Public Awareness and appreciation of the Taunton River and its tributaries through access, field based education, and interpretation programs.
 - b. Increase public awareness of the biological diversity and intact ecology of the Taunton River ecosystem.
4. Develop educational/interpretive materials and signage to promote public access.

ACTION ITEMS

1. Increase Public Awareness of Historical and Archaeological Resources:
 - a. Create interpretive signage for historical sites along the Segreganset River in Dighton.
 - b. Promote local river history and events that celebrate town character.
 - c. Develop a local river history curriculum for schools at all grade levels.
 - d. Develop a “local history week” or other regional celebration of local history that includes the Taunton River.
 - e. Continue using the historic markers of the Taunton Heritage River Program to interpret historical sites along the river.
 - f. Promote participation in powow’s and support programs celebrating the culture of Native People.
 - g. Promote public displays of local river history within permanent spaces such as museums and historical society libraries.
2. Increase Public Awareness of River Water Quality, Quantity and Pollution Prevention:
 - a. Provide education to landowners about management practices for septic system tanks and riverfront land along the Assonet River in Berkley and Freetown.
 - b. Develop an educational packet for river abutters, including information about riverfront buffers, landscaping practices and the rare species and special habitats of the Forge River.
 - c. Provide educational opportunities for landowners to learn better maintenance practices on their properties along Segreganset River in Dighton.

- d. Use public access cable to show educational videos about issues such as septic tanks, landscaping, and stormwater for the Three Mile River in Taunton and Dighton.
 - e. Use municipal hazardous waste collection days to educate residents about the importance of proper disposal.
 - f. Educate residents about the impact to water quality from the use of pesticides and fertilizers through partnerships with municipalities and watershed groups.
 - g. Educate the public about routine septic system maintenance and/or require proof of maintenance records through partnerships with municipalities and watershed groups (Taunton Master Plan).
 - h. Increase awareness about the importance of stream side buffers, ecological landscaping and water conservation.
 - i. Promote public involvement and comment in permitting processes throughout the watershed.
 - j. Support Stream Teams in their education and outreach efforts and in implementing projects from their action plans.
3. Increase Public Awareness of the Ecology of the Taunton River Watershed:
- a. Encourage the use of Pratt Farm (Middleborough) for school environmental education programs.
 - b. Partner with local groups such as Green Futures in Fall River and Save the Bay in Rhode Island to offer tour boat rides of the Taunton River that include information on history, archeology and ecology.
 - c. Work with Fall River Heritage State Park to offer interpretive programs about the Taunton River.
 - d. Develop a funding structure that will allow the Natural History Center at Bristol County Agricultural High School to again offer interpretive programs to the public and to increase use of the museum as an interpretive center.
 - e. Work with Bristol County Agricultural School to develop programs that integrate tourism and hospitality with agriculture, river recreation and other rural activities through continued use of their Natural History Center.
 - f. Develop kiosks at town parks that provide education material and recreation information about the Taunton River.
 - g. Work with Conservation Commissions, Planning and Zoning Boards, developers, watershed associations and Stream Teams to promote understanding of the importance of riparian buffers and ecological diversity.
 - h. Educate landowners and the public about their roles in protecting the river; water conservation, pollution prevention, and habitat protection.
 - i. Promote Biodiversity Days and other citizen led ecology initiatives.
 - j. Provide each municipality with a Taunton River Watershed sign, installed by the local highway department, for display within their community.
 - k. Provided educational anadromous fish signage for five communities.
 - l. Hold public forums on the economic value of purchasing lands to control municipal budgets, the introduction of desalinated waters versus extension of the MWRA drinking

- water system to watershed communities, and development of a land purchase priority system.
- m. Provide maps to 22 watershed communities that show the location(s) of undeveloped groundwater resources and existing community zoning.
4. Develop educational/interpretive materials and signage to promote public access:
- a. Create river crossing signs to identify Winnetuxet River throughout Halifax.
 - b. Develop educational signs for launching areas and parks, interpreting the history/ecology of Town River.
 - c. Create educational materials on the Town River, including a brochure that shows connections from municipal- and state-owned properties to the Bay Circuit Trail System and the Wampanoag Commemorative Canoe Trail.
 - d. Work with the Department of Conservation and Recreation and the Friends of Dighton Rock to provide better access to Dighton Rock State Park and museum.

2.3 WATERSHED PLANNING MAPS

GeoSyntec produced several maps to assist the Watershed Advisory Committee in identifying the watershed planning priorities and action items discussed in Section 3. The maps were presented in draft format for review during the public planning forums. Each of the maps described below are included as Appendices to this report.

A. Watershed Land Uses: This map identifies land uses throughout the watershed, as obtained from MassGIS.

B. Water Resources: This map consists of water resources features readily available from MassGIS, including:

- Major river basin and sub-basin watershed boundaries
- Rivers and streams
- Lakes and ponds
- Wetlands
- Public water supplies and their Zone II wellhead protection areas
- Flood zones (100-year and Velocity Zone)
- Outstanding Resource Waters



Three Mile River through the Gertrude M. Boyden Wildlife Refuge in Taunton.

C. Wildlife Habitat / Ecological Resources: This map consists of wildlife habitat and ecological resources features readily available from MassGIS, including:

- Certified and Potential Vernal Pools
- Wetlands
- Priority/Estimated Habitat for Rare Wildlife
- Areas of Critical Environmental Concern
- BioMap Core Habitat/Supporting Natural Landscapes
- Living Waters Core Habitat and Critical Supporting Watersheds
- Major basin and sub-basin watershed boundaries



Atlantic Sturgeon
Acipenser oxyrinchus oxyrinchus

SECTION 3: THE FIVE-YEAR WATERSHED ACTION PLAN

3.1 WATERSHED ACTION PLANNING CATEGORIES

At the project kickoff meeting on February 24, 2006, the WAC discussed the process of developing a Watershed Action Plan and developed the discussion order of action planning categories. The Committee reached consensus on working within the framework of the five planning categories listed below.

TAUNTON RIVER WATERSHED ACTION PLANNING CATEGORIES

Priority actions for the Taunton River watershed for:

- **Water Quality Improvement & Protection**
- **Wildlife Habitat and Ecology Protection** (including Water Quantity Protection)
- **Recreation and Access**
- **Open Space, Land Use and Sustainable Development**
- **Public Outreach and Education**

3.2 WATERSHED ACTION PLAN

The Watershed Advisory Committee and public participants worked over the course of three public forums toward reaching consensus on priority goals and actions for the 5-year Action Plan. After reviewing summaries of previous watershed assessments prepared by GeoSyntec, discussion was organized around the five planning categories listed above. The WAC initially worked to establish a regional consensus on broad goals and actions, and then worked toward the prioritized recommendations described on pages 16-28.

Within each of the five planning categories listed above, the WAC voted to select the top three high priority action items. The high priority action items are identified throughout the Action Plan by the star symbols below. In several categories, the voting resulted in a tie between two action items for designation as the top priority.



#1 Priority Action Item for the Planning Category



High Priority Action Item (top 3 for the Planning Category)

For quick reference, a **Watershed Action Plan Summary Matrix** is provided in Section 3.3 (page 50) of this report. The matrix summarizes the action items in a three-page table format and includes information on potential funding sources and a timeline for implementation of the action items.

TAUNTON RIVER WATERSHED – FIVE YEAR ACTION PLAN

A. WATER QUALITY IMPROVEMENT AND PROTECTION

OBJECTIVE #1: Improve wastewater management.

About Wastewater Treatment Plant Outfalls

Wastewater treatment plant outfalls are potential sources of pollutants that can lead to the degradation of receiving waters. Outfalls are routinely sampled as a means to evaluate the treatment process and possibly for permit compliance. Monitoring results may be compared with baseline data to help assess any impact of the discharge to the receiving water. Wastewater treatment plant outfalls may be potential sources of:

- nutrients, specifically nitrogen and phosphorus;
 - biological oxygen demand (BOD);
 - suspended solids;
 - total organic carbon (TOC);
 - alkalinity; and
 - grease.
- More information on wastewater treatment plants and monitoring can be found at the US EPA Wastewater Management website at <http://www.epa.gov/owm/>.
 - The MA-DEP provides information about wastewater treatment plants and plant locations within the Commonwealth on the MA-DEP Water, Wastewater, and Wetlands website: <http://www.mass.gov/dep/water/wastewater/wastewat.htm>.

ACTION ITEMS



1. Increase **monitoring at all six wastewater treatment plants** (WWTPs) in the Taunton watershed.

- Conduct monitoring at 20 new points at the Brockton WWTP and expand monitoring from 10 to 20 points at the Taunton WWTP.
- Develop a MA-DEP and EPA-approved Quality Assurance Project Plan (QAPP) for volunteer monitoring data.
- Establish a point of contact at the MA-DEP where volunteer groups can submit sampling data.

Responsible Parties: TRWA, MA-DEP, Bridgewater State College (BSC), WWTPs



Outfall of Brockton WWTP



2. Investigate new wastewater treatment technologies to apply at facilities within the Taunton River watershed.

- Identify sources of funding to research innovative wastewater treatment technologies that can be applied to treatment facilities in the watershed.

Responsible Parties: SRPEDD, BSC (and other state colleges), MA-DEP, TNC

3. Ensure proper monitoring scope at the Brockton WWTP upon completion of facility upgrades.

Responsible Parties: TRWA, MA-DEP, MA-Riverways, BSC and TRSC

4. Develop a wastewater management plan for all towns in the watershed and integrate these into a regional wastewater plan.

Responsible Parties: SRPEDD, OCPC, BSC, TNC

OBJECTIVE #2: Increase water quality monitoring where data are lacking or absent.

ACTION ITEMS



1. Increase water quality monitoring of fisheries within the Taunton River watershed.

- Identify and register rare cold water fisheries within the watershed (similar to the protocol used for state certification of vernal pools). Develop a Quality Assurance Project Plan (QAPP) for volunteers to ensure data integrity.
- Increase water quality monitoring of anadromous fisheries.

Responsible Parties: MA-DEP, MA-Riverways, and TNC



Juvenile alewives

2. Establish names and register unnamed tributaries of the Taunton River.

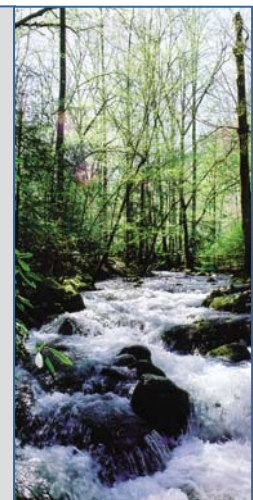
Responsible Parties: TRWA, TRSC, MA-DFW

What are Cold Water Fisheries?

Cold water fisheries support fish that prefer clear, cold waters; are not tolerant of extreme temperature changes; and cannot survive for long periods with temperatures above 68 degrees F. Species such as trout, salmon, and grayling are recognized as cold water fish. A cold water fishery Resource (CFR) is defined as a water that meets one of the following criteria:

- Brook, brown, or rainbow trout reproduction has been determined;
- Slimy sculpin or longnose sucker are present; or
- The water is part of the Atlantic salmon restoration effort or is stocked with Atlantic salmon fry, parr or smolts.

Coldwater fisheries are very sensitive to land use changes and are probably the most threatened aquatic habitat in the Taunton River system.



OBJECTIVE #3: Promote groundwater recharge, low-impact development and related by-laws.

What is Low Impact Development (LID)?

LID is a site design strategy for maintaining or replicating the **pre-development hydrologic regime** through the use of design techniques to create a functionally equivalent hydrologic landscape. LID design strategies include:

- Promote groundwater recharge;
 - Maintain volume and frequency of storm water discharges;
 - Control storm water at the source;
 - Reduce impervious surface areas;
 - Lengthen flow paths and increase runoff time; and
 - Preserve and protect environmentally sensitive areas.
- More information on LID technology can be found at the **Low Impact Development Center** webpage at <http://www.lowimpactdevelopment.org/>.
 - The Massachusetts Metropolitan Area Planning Council has developed an **LID Toolkit** that includes a set of materials designed to help citizens, public officials and developers implement LID. The LID toolkit is available at <http://www.mapc.org/LID.html>.

ACTION ITEMS



1. Identify sites for low-impact development retrofits.

Apply Low Impact Development (LID) retrofits at "example" sites that can be used to showcase LID function. These showcase sites can also be used for public outreach and awareness to promote the use of LID technologies within the watershed.

Responsible Parties: municipalities, MA-EOEA agencies

2. Review local by-laws and regulations to identify barriers to LID techniques.

Sources of funding to conduct review may include the MA-EOEA Smart Growth Technical Assistance Grants. For more information on this program, see <http://commpres.env.state.ma.us>

Responsible Parties: municipalities, MA-EOEA (Community Preservation initiative)

3. Create model LID tools for municipalities within the watershed.

Examples of LID development tools may include design schematics, educational print materials (e.g. guidance manuals, brochures) and model bylaws.

Responsible Parties: regional planning agencies (RPAs)



A raingarden installed as a LID technique to treat residential runoff.

OBJECTIVE #4: Promote improved municipal and regional stormwater management.

ACTION ITEMS

1. Improve operation and maintenance reporting, including development of a pilot on-line form that municipalities could use to access and submit information.

Responsible Parties: local DPWs, regional planning agencies (RPAs), MA-DEP

2. Increase NPDES Stormwater Phase II support and enforcement through:

- Increasing MA-DEP and EPA staff support.
- Update town by-laws to incorporate Phase II enforcement.
- Establish a MA-DEP point of contact for Phase II compliance reporting.
- Establish and maintain an interactive electronic map of permitted outfalls.

Responsible Parties: municipalities, MA-DEP, EPA

3. Update local wetland by-laws to include **operation and maintenance requirements** to promote improved storm water management. The soon to be enacted DEP Storm Water Policy update, which will include revised information and more detail and requirements for storm water system operation and maintenance, may provide a good starting point.

Responsible Parties: MA-DEP, municipal Planning Boards, RPAs

OBJECTIVE #5: Improve flood control.

ACTION ITEMS

1. Conduct **dam inspections** and establish a **dam certification process**, including identification and removal prioritization of "unused" dams and hazardous dam structures not intended for flood control. Funding will be required to assess sediment quality upstream of dams.

Responsible Parties: MA-Riverways, MA-DCR, dam owners

2. Evaluate the **post-dam removal flow regimes** for potential dam removal sites. Use a predictive floodplain model (e.g. HEC-RAS), to evaluate flow regimes and post-removal floodplain conditions. The review of post-dam removal flow regimes must ensure that removal of the dams will not result in an increase in upstream or downstream base flood elevations.

Responsible Parties: MA-Riverways, MA-DCR

3. **Identify and catalog undersized culverts** that have caused flooding.

Responsible Parties: MassHighways, municipal highway departments and DPWs



Whittenton Pond Dam, Taunton

4. Increase awareness and encourage the use of **wetlands for flood control**. Example sites of wetlands used for flood control include:
- The wetland complex adjacent to Grove Street in Brockton; and
 - Cobb Brook wetland complex in Brockton.

Responsible Parties: Conservation Commissions, MA-EOEA

Massachusetts Dam Inspection Requirements

The **MA-DCR Office of Dam Safety** maintains records of dams located throughout the Commonwealth, ensures compliance with acceptable practices pertaining to dam inspection, maintenance, operation and repair of dams. Current Massachusetts General Laws that regulate dam safety are the Dam Safety Statute, MGL Chapter. 253 §§ 44-50 and the Amendments to Dam Safety Regulations 302 CMR 10.00-10.16. These regulations require dam owners to register, inspect, and report inspection results to the Office of Dam Safety. The Program requires that dams be inspected:

- every 2 years for **High Hazard Potential dams** that refers to dams located where failure will likely cause loss of life and serious damage to home(s), industrial or commercial facilities, important public utilities, main highway(s) or railroad(s).
 - every 5 years for **Significant Hazard Potential dams** that refers to dams located where failure may cause loss of life and damage home(s), industrial or commercial facilities, secondary highway(s) or railroad(s) or cause interruption of use or service of relatively important facilities.
 - every 10 years for **Low Hazard Potential dams** that refers to dams located where failure may cause minimal property damage to others. Loss of life is not expected.
- The MA-DCR Dam Safety Program website has information for dam owners and concerned citizens: <http://www.mass.gov/dcr/pe/damSafety/index.htm>.
 - The Massachusetts General Laws pertaining to dam safety can be found at: <http://www.mass.gov/legis/laws/mgl/gl-253-toc.htm>.

B. WILDLIFE HABITAT AND ECOLOGY PROTECTION (including Water Quantity/Streamflow Protection)

OBJECTIVE #1: Protect riparian corridors to prevent fragmentation and degradation.

ACTION ITEMS



1. **Protect established NHESP Priority Habitat areas** (areas of known state-protected rare plant and animal species occurrences in Massachusetts).

- Update municipal by-laws and regional plans to protect Priority Habitat areas, using available tools such as Bio-Map and Living Waters Map.
- Obtain more support from NHESP to municipalities through hiring of an Outreach Coordinator.
- At the regional level, purchase/acquire lands in Priority Habitat areas, with assistance from the Taunton River Campaign.
- Protect habitat areas of globally rare species. Examples of areas in the watershed include the Segregansett River, Nemasket River, Three Mile River and Hockomock Swamp.



Triangle Floater
Alasmidonta undulata

Responsible Parties: Taunton River Campaign, NHESP and municipalities

What are NHESP Priority Habitats?

Priority habitat is the mapped geographical extent of **known habitat for all state-listed rare species**, both plants and animals by the **MA Natural Heritage and Endangered Species Program**. Habitat alterations within Priority Habitats may result in a take of a state-listed species, and is subject to regulatory review by the Natural Heritage & Endangered Species Program.

- Current Priority Habitat maps are available through an on-line interactive web viewer at: <http://www.mass.gov/dfwele/dfw/nhregmap.htm>.
- The MA Natural Heritage and Endangered Species Program can be found at: Current Priority Habitat maps are available through an on-line interactive web viewer at: <http://www.mass.gov/dfwele/dfw/nhregmap.htm>.

2. **Encourage basin-wide adoption of the Community Preservation Act** (and other regulatory tools such as wetland bylaws, watershed districts, etc.) to protect habitat.

Responsible Parties: Municipalities

OBJECTIVE #2: Restore degraded habitats and natural communities in the watershed.

ACTION ITEMS

1. Restore salt marsh and estuary habitats, including:

- Restore small tidal creeks of the **Assonet River** and improve overall estuary habitat by increasing public awareness of homeowners around the estuary (e.g., septic system maintenance, lawn care, and bilge pump water management);
- Mitigate **tidal flow restrictions** at sites listed in the Mt. Hope Bay Atlas, including Labor-in-Vain Brook, Broad Cove and the Assonet River.

Responsible Parties: Municipalities, Massachusetts Coastal Zone Management (MA-CZM)

2. Manage invasive species through supporting existing control programs, regulations and conducting inspections.

- The spread of Eurasian milfoil and Fanwort in the **Assawompset Pond Complex** (Lakeville) is an example of how invasive species can impact habitat, recreation and public water supply.

Responsible Parties: Towns of Lakeville, Freetown, Middleborough, and Rochester, MA-DCR



Eurasian Milfoil

3. Conduct a feasibility study to assess alternatives for **daylighting the Quequechan River.**

Responsible Parties: City of Fall River, ACOE, MA-EOEA

4. Restore rare Atlantic white cedar swamp habitat. Example restoration projects include:

- Repair the flow control structure at **Burrage Pond**;
- Protect Atlantic white cedar in the Assonet Cedar Swamp in the rail line expansion area in Lakeville;
- Improve/remove flow control structures on **decommissioned cranberry bogs** that drain to white cedar swamps.

Responsible Parties: FARE/TEAMS (local resident group), MBTA, US-ACOE, USDA-NRCS, MA-DFW, MA-EOEA Wetland Restoration Program



Atlantic White Cedar

Why Protect Atlantic White Cedar Swamp Habitat?

Atlantic white cedar swamps are a **globally rare** type of natural community that are geographically restricted to freshwater wetlands in a narrow band along the eastern coastal United States ranging from Maine to Mississippi. Atlantic white cedar swamps are known to harbor imperiled species such as the Hessel's hairstreak butterfly and serve as breeding grounds for many birds, including downy woodpecker, brown creepers, magnolia warblers, black-throated blue warblers and ovenbirds.

- More information on Atlantic White Cedars can be found at <http://uio.mbl.edu/awc/>.

OBJECTIVE #3: Protect anadromous fisheries.

About Anadromous Fisheries

Anadromous fish live in the sea but must enter fresh water rivers and streams to spawn. Massachusetts coastal systems support **16 species** of anadromous fish. Species such as the rainbow smelt, American shad and river herring (alewives and blueback herring) play an important role in the recreational and commercial fisheries. These species of anadromous fish are not only targeted by active fisheries but also serve as an important food source for the high-ranking predators such as striped bass and bluefish.

Conflicts between anadromous fish and agriculture operations have occurred historically and persist today within the watershed. Agricultural impacts include blockage of passage, diversion of stream flow, entrapment and stranding of juveniles.

- The **MA-DMF Anadromous Fish Dynamics and Management Program** is responsible for the management of the anadromous fish resources of Massachusetts. More information on anadromous fisheries can be found at the MA-DMF website at: <http://www.mass.gov/dfwele/dmf/programsandprojects/anadrom.htm#anadromous>



Blueback Herring

ACTION ITEMS



1. Support completion of the ongoing watershed-wide assessment and prioritization of culverts and other **barriers to fish passage**.
 - This inventory is being conducted by MA-Riverways, but requires funding for completion

Responsible Parties: MA-Riverways, MA-EOEA
2. Reduce **fish entrapment at cranberry bogs** by installing screens, control devices, etc.
 - The MA-Division of Marine Fisheries (DMF) has a list of key cranberry bog sites where fish entrapment is occurring or likely. Work with cranberry growers/land owners at these sites to install screens or other control devices.

Responsible Parties: MA-DMF, MA-Riverways
3. Support **enforcement of herring-taking bans** and increase awareness through public education and posting signage.

Responsible Parties: MA-DEP, MA-DFW
4. Implement recommendations from the forthcoming **Atlantic States Marine Fisheries Commission report** for the protection of range-wide anadromous fisheries.

Responsible Parties: Atlantic States Marine Fisheries Commission (ASMFC), MA-DFG, MA-Riverways, TRWA

5. **Monitor herring runs** (at inflow and outflow) and follow-up on results. Specific sites include:

- 3-Mile River
- Town River
- Nemasket River

Responsible Parties: MA-Riverways, TRWA



Nemasket River Herring Run in
Middleborough

OBJECTIVE #4: Raise awareness of cold water fisheries and increase their protection.

ACTION ITEMS

1. Conduct a basin-wide **inventory of cold water fisheries** and officially register these fisheries (stream reaches) with the MA Division of Fisheries & Wildlife.

Responsible Parties: MA-DEP, MA-DFW, TRWA

C. RECREATION AND ACCESS

OBJECTIVE #1: Establish and maintain trail systems within the watershed and make ADA-accessible where possible.

ACTION ITEMS

1. Develop a trail system along the Forge River at **Borden Colony Park** in Raynham. The trail system could potentially link to Taunton.

Responsible Parties: Town of Raynham

2. Develop and implement plans for **school trail systems**. Project funding may be obtained through the Safe Routes to Schools Program. For more information on this program, go to <http://www.saferoutestoschools.org/>.

Responsible Party: Municipalities



3. Develop a **walking and equestrian trail system at the Assawompset Pond Complex** including signage, public awareness programs, trail maps, parking areas and ADA-accessibility.

Responsible Parties: Town of Lakeville



4. Develop a **basin-wide trail system map** to identify existing trail systems. The map would also be a planning tool to identify potential connection points between trail systems. Assess the previously completed "Taunton River Trail Plan" as a starting point for this effort.

Responsible Parties: SRPEDD

5. Review the existing **Quequechan multi-modal trail system** to identify potential trail network connections, including linkage to the East Bay Trail in Rhode Island. Implement the "Urban River Visions" plan for this trail system.

Responsible Parties: MA-EOEA

6. Establish a trail system at the **Burrage Wildlife Management Area** (Hanson, Halifax). The trail system could extend from the Elm Street dike to Robin's Pond.

Responsible Parties: MA-DFG, Town of Halifax, Town of Hanson

7. Develop an **interpretive trail for the blind** at Dighton Rock State Park.

Responsible Parties: MA DCR, MA-DFG



Recreational Trails Programs

Greenway trails are corridors of land and water that connect and protect natural, cultural, and recreational resources. Greenways are an important part of our natural "green infrastructure" and include many types of trails and walkways, river corridors, bicycle paths, wildlife corridors, and conservation lands linked by trails.

- **The FHWA Recreational Trails Program (RTP)** is an assistance program of the Department of Transportation's Federal Highway Administration (FHWA). Federal transportation funds benefit recreation by making funds available to the States to develop and maintain recreational trails and trail-related facilities for both non-motorized and motorized recreational trail uses.
 - More information on the FHWA Recreational Trails Program can be found on their website: <http://www.fhwa.dot.gov/environment/rectrails/index.htm>.

- **The MA-DCR's Greenways and Trails Program** works in partnership with greenways and trails advocates in Massachusetts to promote and support the creation of greenways and trails at the local, regional, and state levels. To advance this goal, the Program provides small grants, information, and technical assistance to communities, user groups and non-profit organizations for planning and developing greenways and trails throughout Massachusetts. DCR also works to protect greenways of statewide significance through statewide planning and technical assistance, as well as through direct land protection efforts.
 - More information on the MA-DCR Greenways and Trails Program can be found on their website: <http://www.mass.gov/dcr/stewardship/greenway/index.htm>.

OBJECTIVE #2: Establish, improve and maintain canoe and boat access points.

ACTION ITEMS

1. Improve the canoe access point by working with the Halifax Highway Department to remove a section of guardrail on Cherry Street at the **confluence of the Matfield and Town Rivers**.

Responsible Parties: Public Access Board, Halifax Highway Department



2. **Remove remnants of the Plymouth Street Dam in Bridgewater.** This would allow for a "source to the sea" continuous canoeable passage from the Matfield River to Fall River. The dam remnants are currently a safety hazard.

Responsible Parties: MA-Riverways, MA-DCR

3. Establish canoe access point near Route 105 in Halifax at the **lower Winnetuxet River**.

Responsible Parties: Town of Halifax



4. Improve canoe access points to the **Nemasket River** at Wareham Street and Murdock Street.
Responsible Parties: Town of Middleborough
5. Establish a formal **canoe launch at the Boyden Wildlife Refuge** in Taunton, including leveling the existing access road and posting signage.
Responsible Parties: City of Taunton
6. Complete installation of the canoe access point to the **Town River at Spring Street, Bridgewater.**
Responsible Parties: Town of Bridgewater, National Park Service (NPS)
7. Ensure follow through of the existing plans to develop the **Berkeley Waterfront Park** at the Berkeley Bridge.
Responsible Parties: Town of Berkeley
8. Establish canoe access points as part of the **multi-modal trail system at Broad Cove Park in Somerset.**
Responsible Parties: Town of Somerset



Wetlands bordering Watson Pond
in Taunton

D. OPEN SPACE, LAND USE AND SUSTAINABLE DEVELOPMENT

OBJECTIVE #1: Protect and preserve historical and archeological sites.

ACTION ITEMS

1. **Evaluate the MA-DCR/Public Archeology Laboratory study** on historic and archeological resources in the watershed, and incorporate the report's recommendations into local planning.
 - Promote designated historical and archeological districts, including investigation of potential financial incentives (e.g. Community Preservation Act, grants from the MA Historical Commission, etc)

Responsible Parties: Municipal Planning Boards (MPBs) and Historical Commissions

2. **Preserve and protect existing historical and archeological sites** including posting signs with historical information. Examples of sites include
 - The Setauket River Fish Weir (Bridgewater): construct interpretive signage and get site on Historic Register
 - Friendship Rock (Berkeley):
 - Peace Haven (North Fall River and Freetown); and
 - Council Oak (Dighton).

Responsible Parties: MA-EOEA, municipalities

3. Promote establishment of a statewide program for **reporting historic and archeological sites**.

Responsible Parties: MA-EOEA

OBJECTIVE #2: Preserve and protect high priority open spaces.

ACTION ITEMS



1. **Identify and prioritize cold water tributaries** of the Taunton River for mapping and official designation with the state. Examples of previously identified cold water tributaries include a Brook Trout stream in Taunton (approximate 1.5 mile reach) and a trout stream near the Taunton solid waste facility.

Responsible Parties: NPS, MA-DFG, MA-Riverways, municipalities, Land Trusts



Brook Trout



2. **Purchase/acquire land around the Oxbow in Raynham.** This landform is unique for the Taunton watershed and includes globally rare species.

Responsible Parties: Town of Raynham, Wildlands Trust of Southeastern Massachusetts

Massachusetts Community Preservation Act

The Massachusetts Community Preservation Act (CPA) is a tool to help communities preserve open space and historic sites, and create affordable housing and recreational facilities. The CPA provides new funding sources which can be used to address three core community concerns:

- Acquisition and preservation of open space;
 - Creation and support of affordable housing; and
 - Acquisition and preservation of historic buildings and landscapes.
- More information on the MA Community Preservation Act can be found on their website: <http://www.communitypreservation.org/index.cfm>.

3. Designate the **Three Mile River** as an Area of Critical Environmental Concern.

Responsible Parties: TRWA, MA-EOEA



The Three Mile River



4. Preserve and protect **working and historic farms** and other sites of value for preserving community character (e.g. scenic vistas). Tax incentives for site preservation can be obtained under Chapter 61A and 61B of the Massachusetts General Laws (see description below). Examples sites include:

- Milky Way Farm on Route 106 (Maple St.) in Stoughton, W. Bridgewater and Easton;
- Dorchester Brook farm
- Oliver Ames land in Brockton and Easton
- Cumberland Farms site (the Hasiotes property) at the confluence of the Winnetuxet River and the Taunton River in Halifax and Middleborough.

Responsible Parties: municipalities, land trusts

5. Promote updated **Open Space Protection Plans** in all towns in watershed, specifically those that are greater than 5 years old.

Responsible Parties: Municipalities, RPAs (SRPEDD, OCPC)

6. **Catalog open spaces** and create a **basin-wide digital information layer** that can be distributed and used by towns for planning.

Responsible Parties: Town Planning Offices, MassGIS, TRWA

7. **Promote and protect connections to open spaces** through establishing a local or regional land trust to cover the entire watershed, such as the Buzzard's Bay Regional Land Trust.

Responsible Parties: Wildlands Trust of Southeastern Massachusetts (WTSM)

8. Continue ongoing collaboration with Narragansett Bay Estuary Program on updates to the Comprehensive Conservation and Management Plan (CCMP). Ensure that the Taunton watershed is fully integrated into the planning process.

Responsible Parties: TRWA, TRSC, Save the Bay, Narragansett Bay Project

E. PUBLIC OUTREACH AND EDUCATION

OBJECTIVE #1: Establish signage at key points throughout the watershed.

ACTION ITEMS



1. Develop and install **signage to promote awareness of important features of the Taunton River Watershed**. Examples of signage may include “Entering the Taunton River Watershed” on major roads, tributary stream signage at major stream crossings, Water Supply Protection Areas, and Source Water Protection Areas.

Responsible Parties: MassHighways, municipal DPWs, TRWA, TRSC

2. Post educational signage (including ADA-accessible signage) at select **historical, archeological and ecological sites** within the watershed. Example sites include Borderland State Park in Easton, DW Field Park in Brockton, and Fall River Heritage State Park.

Responsible Parties: MA-DCR, municipalities

3. Post **anadromous fish signage** at fish ladders that include a description of the importance of anadromous fish. Example sites include the Town River (Bridgewater), Mill River (Taunton) and Setucket River (Bridgewater).

Responsible Parties: MA-DMF, TRWA, municipalities



Fall River Heritage State Park

OBJECTIVE #2: Develop and distribute printed educational materials.

ACTION ITEMS



1. Develop **basin-wide recreational maps** that identify canoe access points and historical sites. Printed copies of the maps may be provided at kiosks within the watershed. In addition, develop a digital, interactive watershed map of that incorporates information from existing digital Public Access Board maps.

Responsible Parties: TRWA, MA-DCR, Public Access Board



2. Develop laminated canoe trail maps for canoeable rivers in the watershed and distribute them in kiosks at canoe access points. These maps may identify historical and archeological sites. Some example sites include the Three Mile River, the Mill River and the Town River.

Responsible Parties: TRWA, MA-DCR, Public Access Board

3. Review existing printed-material distribution binder for the watershed and update using information available such as the **Massachusetts Nonpoint Source Pollution Management Manual** (<http://projects.geosyntec.com/NPSManual>). Examples of topics for materials to be distributed include: river ecology, riverfront land management, Title V, stormwater BMPs, and toxins in storm drains.

Responsible Parties: municipalities, TRWA, RPAs

National Pollutant Discharge Elimination System (NPDES) Program

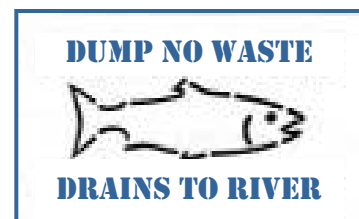


NPDES Overview: The NPDES program was established with the 1972 Federal Water Pollution Control Act or **Clean Water Act** which prohibited the discharge of any pollutant to waters of the US from a point source unless the discharge was authorized by a NPDES permit. Early NPDES program efforts focused on reducing pollutants in discharges of industrial wastewater and from WWTPs. Recent efforts (Phase I and II) focused on storm water runoff from construction sites as well as discharges from MS4s.

- **NPDES Phase I** (November 1990) sources included storm water discharges associated with industrial activity and storm water discharges from large construction sites (i.e., greater than 5 acres) and municipal separate storm sewer systems (MS4) located in municipalities serving a population of 100,000 or more.
- **NPDES Phase II** (December 1999) is the next step in EPA's effort to preserve, protect, and improve the Nation's water resources from polluted storm water runoff. The Phase II Program expands the Phase I program by requiring additional operators of Municipal Storm Sewer Systems (MS4) in urbanized areas and operators of small construction sites (i.e., between 1 and 5 acres), through the use of NPDES permits, to implement programs and practices to control polluted storm water runoff.

- For more information, including an overview and fact sheets on **the NPDES Program**, see: <http://cfpub.epa.gov/npdes/stormwater/swfinal.cfm>.

4. Install signage and/or stencils on storm drains as part of municipal activities under the NPDES Stormwater Phase II program. Funding sources include the MA Environmental Trust, private foundations, and state and federal grants (e.g. s.319 Nonpoint Source (NPS) Program and CZM Coastal NPS Grants). Storm drain stenciling can be conducted through municipalities and the Taunton River Watershed Coalition.



Responsible Parties: municipalities, TRWA, non-profits, Massachusetts Environmental Trust (MA-ET)

OBJECTIVE #3: Develop and hold educational programs and events.

ACTION ITEMS

1. Develop **education programs and events** to increase public awareness and watershed outreach (e.g. clean-up days).

Responsible Parties: TRWA, TRSC

2. Promote communication between watershed communities, including an **online information clearinghouse** (e.g., web/blog site) where people can post and view information.

Responsible Parties: TRWA, TRSC

3. Develop an on-going **educational seminar series** at facilities such as Bristol County Agricultural High School.

Responsible Parties: TRWA, TRSC

4. Organize and host **watershed fund raiser events or river history events**. Examples of these events may include a Riverboat Music Festival and a “watershed day”. Examples of event forums may include the Robbins Museum, the Old Colony Museum in Taunton and Boyden Park in Taunton.

Responsible Parties: TRWA, TRSC

3.3 WATERSHED ACTION PLAN SUMMARY MATRIX

For ease of reference, the Action Items described in Section 3.2 are summarized on the following pages as part of a 3-page Watershed Action Plan Matrix table. A key to acronyms used in the matrix table is provided below

Watershed Action Plan Matrix Acronym Key	
ACRONYM	NAME
TRWA	Taunton River Watershed Alliance
MassDEP	Massachusetts Department of Environmental Protection
BSC	Bridgewater State College
WWTP	Wastewater Treatment Plant
SRPEDD	Southeastern Regional Planning and Economic Development District
TNC	The Nature Conservancy
TRSC	Taunton River Stewardship Council
OCPC	Old Colony Planning Council
MA-DFW	Massachusetts Division of Fisheries and Wildlife
MA-EOEA	Massachusetts Executive Office of Environmental Affairs
RPA's	Regional Planning Agencies
DPW	Municipal Departments of Public Works
RPA's	Regional Planning Agencies
NHESP	Natural Heritage & Endangered Species Program
MA-CZM	Massachusetts Office of Coastal Zone Management
NRCS	Natural Resources Conservation Service
MA-DMF	Massachusetts Division of Marine Fisheries
MA-DFG	Massachusetts Department of Fish and Game
CPA	Community Preservation Act
CPR	Coastal Pollution Remediation Funds
CWRP	Coastal Wetlands Restriction Program
FHWA TEA	Federal Highway Administration Transportation Equity Act
MET	Massachusetts Environmental Trust
ASMFC	Atlantic States Marine Fisheries Commission
MPBs	Municipal Planning Boards
WTSM	The Wildlands Trust of Southeastern Massachusetts

Taunton River Watershed-Five Year Action Plan Matrix

A. WATER QUALITY IMPROVEMENT AND PROTECTION

OBJECTIVE #1: Improve wastewater management

Action Item	Responsible Party	Funding Sources	Year
*1. Increase monitoring at all 6 WWTPs: monitor at 20 new points at Brockton WWTP and expand monitoring from 10 to 20 points at Taunton WWTP	TRWA, MassDEP, BSC, WWTPs	WWTPs	1
*2. Investigate new wastewater treatment technologies: identify sources of funding to research innovative wastewater treatment technologies for application in watershed treatment facilities	SRPEDD, BSC (and other state colleges), MassDEP, TNC	Sources should be identified by SRPEDD	2
3. Increase water quality monitoring scope at the Brockton WWTP	TRWA, MassDEP, MA-Riverways, BSC, TRSC	Brockton WWTP	2
4. Develop wastewater management plan for all towns	SRPEDD, OCPC, BSC, TNC	604(b) grants	2

OBJECTIVE #2: Increase water quality monitoring where data are lacking or absent

Action Item	Responsible Party	Funding Sources	Year
*1. Increase water quality monitoring of fisheries: identify and register rare cold water fisheries in watershed, develop QAPP for volunteers to ensure data integrity, increase water quality monitoring of anadromous fisheries	MA DEP, MA-Riverways, TNC	604(b) grants	1
2. Establish names and register unnamed tributaries of the Taunton River	TRWA, TRSC, MA-DFW	TRWA, MA-DFW	3

OBJECTIVE #3: Promote groundwater recharge, LID and related by-laws

Action Item	Responsible Party	Funding Sources	Year
**1. Identify sites for LID retrofits: apply LID retrofits at "example" sites for showcasing LID function, which can be used for public outreach and awareness in promoting LID technologies in watershed	municipalities, EOEa agencies	s.319 Grant, CPR	1
2. Review local by-laws and regulations to identify barriers to LID techniques	municipalities, MA-EOEA	MA-EOEA Smart Growth Grants, CPA, s.319 Grant,	2
3. Create model LID tools for municipalities (e.g. design schematics, educational print materials (e.g. guidance manuals, brochures) and model bylaws	RPA's	Municipalities (see MAPC webpage for example), CPA	3

OBJECTIVE #4: Promote improved municipal and regional stormwater management

Action Item	Responsible Party	Funding Sources	Year
1. Improve operation and maintenance reporting: includes development of a pilot on-line form that municipalities could use to access and submit information	DPWs, RPA's, MassDEP	DPWs	4
2. Increase NPDES Stormwater Phase II support and enforcement: increasing MassDEP and EPA staff support, update town by-laws to incorporate Phase II enforcement, establish a MassDEP point of contact for Phase II compliance reporting, establish and maintain an interactive electronic map of permitted outfalls	municipalities, MassDEP, EPA	Municipalities	5
3. Update local wetland by-laws to include operation and maintenance requirements. The soon to be enacted DEP Storm Water Policy update, which will include revised information and more detail and requirements for storm water system operation and maintenance, may provide a good starting point.	MassDEP, municipal Planning Boards, RPA's	Municipalities	5

OBJECTIVE #5: Improve flood control

Action Item	Responsible Party	Funding Sources	Year
1. Conduct dam inspections and establish dam certification process: including identification and removal prioritization of "unused" dams and hazardous dam structures not intended for flood control; funding required to assess sediment quality upstream of dams	MA-Riverways, MA-DCR, dam owners	MA-DCR, Riverways	3
2. Evaluate post-dam removal flow regimes: use predictive floodplain model (e.g. HEC-RAS), to evaluate flow regimes and post-removal floodplain conditions. The review of post-dam removal flow regimes must ensure that removal of the dams will not result in an increase in upstream or downstream base flood elevations.	MA-Riverways, MA-DCR	MA-DCR	3
3. Identify and catalog undersized culverts that have caused flooding	MassHighways, municipal highway depts, DPWs	Municipalities	4
4. Increase awareness and encourage using wetlands for flood control; example sites of wetlands used for flood control include: wetland complex adjacent to Grove St in Brockton; and Cobb Brook wetland complex in Brockton	Conservation Commissions, MA-EOEA	604(b) grants	4

B. WILDLIFE HABITAT AND ECOLOGY PROTECTION (including Water Quality/Streamflow Protection)

OBJECTIVE #1: Protect riparian corridors to prevent fragmentation and degradation

Action Item	Responsible Party	Funding Sources	Year
**1. Protect established NHESP Priority Habitat areas: update municipal by-laws and regional plans to protect Priority Habitat areas, using available tools like Bio-Map and Living Waters Map; obtain more support from NHESP to municipalities through hiring of Outreach Coordinator; at regional level, purchase/acquire lands in Priority Habitat areas; protect habitat of globally rare species (e.g. Segregansett River, Nemasket River, Three Mile River and Hockomock Swamp)	Taunton River Campaign, NHESP, municipalities	Municipalities, CPA funds	1
2. Encourage basin-wide adoption of Community Preservation Act	Municipalities	CPA and MA-EOEA	3

** Green highlight indicates #1 Priority Action Item for the Planning Category

* Yellow highlight indicates a High Priority Action Item (top 3 for the Planning Category)

Taunton River Watershed-Five Year Action Plan Matrix

OBJECTIVE #2: Restore degraded habitats and natural communities in the watershed			
Action Item	Responsible Party	Funding Sources	Year
1. Restore salt marsh and estuary habitats: restore small tidal creeks of Assonet River and improve overall estuary habitat by increasing public awareness of homeowners around estuary (e.g., septic system maintenance, lawn care, and bilge pump water management); mitigate tidal flow restrictions at sites listed in Mt. Hope Bay Atlas, including Labor-in-Vain Brook, Broad Cove and Assonet River	Municipalities, MA CZM	CPR, CWRP	2
2. Manage invasive species through supporting existing control programs, regulations and conducting inspections	Towns of Lakeville, Freetown, Middleborough, and Rochester, MA-DCR	Municipalities, DCR	3
3. Feasibility study to assess alternatives for daylighting Quequechan River	City of Fall River, ACOE, MA-EOEA	604(b) grants, CPR	3
*4. Restore rare Atlantic white cedar swamp habitat	FARE/TEAMS, MBTA, ACOE, NRCS, MA-DFW, CZM-Wetland Restoration Program	CZM Wetland Restoration Program	4
OBJECTIVE #3: Protect anadromous fisheries			
Action Item	Responsible Party	Funding Sources	Year
*1. Support completion of ongoing watershed-wide assessment and prioritization of culverts and other barriers to fish passage	MA-Riverways, MA-EOEA	MA-Riverways, MA-EOEA	1
2. Reduce fish entrainment at cranberry bogs by installing screens, control devices, etc: MA-MA-DMF has list of key cranberry bog sites where fish entrainment is occurring or likely; work with cranberry growers/land owners at these sites to install screens or other control devices	MA-MA-DMF, MA-Riverways	MA-MA-DMF	2
3. Support enforcement of herring-taking bans and increase awareness through public education and posting signage	MassDEP and MA-MA-DFG	MassDEP and MA-MA-DFG	2
4. Implement recommendations from Atlantic States Marine Fisheries Commission report for the protection of range-wide anadromous fisheries	ASMFC, MA-MA-DFG, MA-Riverways, TRWA	ASMFC, MA-MA-DFG	4
5. Monitor herring runs at sites including: 3-Mile River, Town River, Nemasket River	MA-Riverways, TRWA	MA-MA-DFG	4
OBJECTIVE #4: Raise awareness of cold water fisheries and increase their protection			
Action Item	Responsible Party	Funding Sources	Year
1. Conduct basin-wide inventory of cold water fisheries and register fisheries with MA-DFW	MassDEP, MA-DFW, TRWA	MA-DFW	2

C. RECREATION AND ACCESS

OBJECTIVE #1: Establish and maintain trail systems within the watershed and make ADA-accessible where possible			
Action Item	Responsible Party	Funding Sources	Year
1. Develop trail system along Forge River at Borden Colony Park in Raynham which could potentially link to Taunton trail systems.	Town of Raynham	FHWA TEA	1
2. Develop and implement plans for school trail systems	Municipalities	Safe Routes to Schools Program	1
*3. Develop walking/equestrian trail system at Assawompset Pond complex including signage, public awareness programs, trail maps, parking areas and ADA-access	Town of Lakeville	FHWA TEA, Town of Lakeville	2
*4. Develop a basin-wide trail system map to identify existing trail systems; map would also be planning tool to identify potential connection points between trail systems; assess the previously completed "Taunton River Trail Plan" as a starting point for this effort	SRPEDD	SRPEDD	1
5. Review existing Quequechan multi-modal trail system to identify potential trail network connections including linkage to the East Bay Trail in Rhode Island; implement the "Urban River Visions" plan for this trail system	EOEA	FHWA TEA	2
6. Establish a trail system at Burrage Wildlife Management Area: the trail system could extend from the Elm Street dike to Robin's Pond	MA-MA-DFG, Halifax, Hanson	FHWA TEA	3
7. Develop interpretive trail for the blind at Dighton Rock State Park	MA-DCR, MA-MA-DFG	FHWA TEA, MA-DCR	3
OBJECTIVE #2: Establish, improve and maintain canoe and boat access points			
Action Item	Responsible Party	Funding Sources	Year
1. Improve canoe access point with Halifax Highway Dept to remove section of guardrail on Cherry St at confluence of Matfield and Town Rivers	Public Access Board, Halifax Highway Dept	Town, Municipalities	5
**2. Remove remnants of Plymouth Street Dam in Bridgewater allowing for "source to the sea" continuous canoeable passage from Matfield River to Fall River	MA-Riverways, MA-DCR	Town of Bridgewater, MA-DCR	1
3. Establish canoe access point near Rte 105 in Bridgewater at lower Winnetuxet River	Town of Bridgewater	Town of Bridgewater	5
4. Improve canoe access points to Nemasket River at Wareham St and Murdock St	Town of Middleborough	Town of Middleborough	5
5. Establish formal canoe launch at Boyden Wildlife Refuge in Taunton, including leveling the existing access road and posting signage	City of Taunton	City of Taunton	5
6. Complete installation of canoe access point to Town River at Spring St, Bridgewater	Town of Bridgewater, National Park Service	Town of Bridgewater	5
7. Ensure follow through of existing plans to develop Berkeley Waterfront Park at Berkeley Bridge	Town of Berkeley	Town of Berkeley	5
8. Establish canoe access points as part of multi-modal trail system at Broad Cove Park in Somerset	Town of Somerset	Town of Somerset	5

** Green highlight indicates #1 Priority Action Item for the Planning Category

* Yellow highlight indicates a High Priority Action Item (top 3 for the Planning Category)

Taunton River Watershed-Five Year Action Plan Matrix

D. OPEN SPACE, LAND USE AND SUSTAINABLE DEVELOPMENT			
OBJECTIVE #1: Protect and preserve historical and archeological sites			
Action Item	Responsible Party	Funding Sources	Year
1. Evaluate MA-DCR/Public Archeology Laboratory study on historic and archeological resources in watershed, and incorporate report's recommendations into local planning; promote designated historical and archeological districts, including investigation of potential financial incentives	Municipal Planning Boards and Historical Commissions	Towns	3
2. Preserve and protect existing historical and archeological sites including posting signs with historical information	MA-EOEA, municipalities	Municipalities	3
3. Promote establishment of statewide program for reporting historic and archeological sites	MA-EOEA	No Funding Source Identified	4
OBJECTIVE #2: Preserve and protect high priority open spaces			
Action Item	Responsible Party	Funding Sources	Year
**1. Identify and prioritize cold water tributaries of Taunton River for mapping and official designation with the state	NPS, MA-MA-DFG, MA-Riverways, municipalities, Land Trusts	MA-DFG, MA-Riverways	1
*2. Purchase/acquire land around the Oxbow in Raynham; this landform is unique for Taunton watershed and includes globally rare species	Town of Raynham, Wild lands Trust of Southeastern MA	Land Trusts, Towns, MET	1
3. Designate Three Mile River as an Area of Critical Environmental Concern	TRWA, MA-EOEA agencies	No Funding Source Identified	3
4. Preserve and protect working and historic farms.	municipalities, land trusts	CPA Funds (Chapter 61A and 61B)	2
5. Promote updated Open Space Protection Plans in all towns in watershed, specifically those that are greater than 5 years old	Municipalities, RPA's (SRPEDD, OCPC)	Municipalities	4
6. Catalog open spaces and create a basin-wide digital information layer that can be distributed and used by towns for planning	Town Planning Offices, MassGIS, TRWA	TRWA	4
7. Promote/protect connections to open spaces through establishing local/regional land trust to cover the entire watershed, such as Buzzard's Bay Regional Land Trust	WTSM	Land Trusts, MET, WTSM	5
8. Continue collaboration with Narragansett Bay Estuary Program on updates to CCMP; ensure that Taunton watershed is fully integrated into planning process	TRWA, TRSC, Save the Bay, Narragansett Bay Project	TRWA, Save the Bay	5
E. PUBLIC OUTREACH AND EDUCATION			
OBJECTIVE #1: Establish signage at key points throughout the watershed			
Action Item	Responsible Party	Funding Sources	Year
*1. Develop and install signage to promote awareness of important features of watershed; examples of signage may include "Entering the Taunton River Watershed" on major roads, tributary stream signage at major stream crossings, Water Supply Protection Areas, and Source Water Protection Areas	MassHighways, DPWs, TRWA, TRSC	MET, MA-Riverways	1
2. Post educational signage (including ADA-accessible signage) at select historical, archeological and ecological sites within watershed; example sites include Borderland State Park in Easton, DW Field Park in Brockton, and Fall River Heritage State Park	MA-DCR, municipalities	MA-DCR, Towns	3
3. Post anadromous fish signage at fish ladders that include a description of importance of anadromous fish; example sites include Town River (Bridgewater), Mill River (Taunton) and Setucket River (Bridgewater)	MA-MA-DMF, TRWA, municipalities	MA-MA-DMF	4
OBJECTIVE #2: Develop and distribute printed educational materials			
Action Item	Responsible Party	Funding Sources	Year
**1. Develop basin-wide recreational maps that identify canoe access points and historical sites; printed copies of maps may be provided at kiosks within watershed; develop a digital, interactive watershed map of that incorporates information from existing digital Public Access Board maps	TRWA, MA-DCR, Public Access Board	MA-Riverways	1
*2. Develop laminated canoe trail maps for canoeable rivers in watershed and distribute in kiosks at canoe access points; maps may identify historical and archeological sites; some example sites include Three Mile River, Mill River and Town River	TRWA, MA-DCR, Public Access Board	Towns	1
3. Review existing printed-material distribution binder for watershed and update using information available such as MA Nonpoint Source Pollution Management Manual; examples of topics for materials to be distributed include: river ecology, riverfront land management, Title V, stormwater BMPs, and toxins in storm drains	municipalities, TRWA, RPA's	Municipalities (under Phase II Storm Water Requirements)	3
4. Install signage and/or stencils on storm drains as part of municipal activities under NPDES Stormwater Phase II program; storm drain stenciling can done through municipalities and Taunton River Watershed Coalition	municipalities, TRWA, non-profits, MET	MET, municipalities (NPDES Phase II), private foundations	5
OBJECTIVE #3: Develop and hold educational programs and events			
Action Item	Responsible Party	Funding Sources	Year
1. Develop education programs and events to increase public awareness and watershed outreach	TRWA, TRSC	MET, TRWA	3
2. Promote communication between watershed communities, including an online information clearinghouse (e.g., web/blog site) where people can post and view information	TRWA, TRSC	MET, TRWA	3
3. Develop an on-going educational seminar series at facilities such as Bristol County Agricultural High School	TRWA, TRSC	MET, TRWA	4
4. Organize and host watershed fund raiser events or river history events; examples may include a Riverboat Music Festival and a "watershed day"; examples of event forums may include the Robbins Museum, the Old Colony Museum in Taunton and Boyden Park in Taunton	TRWA, TRSC	MET, TRWA	4

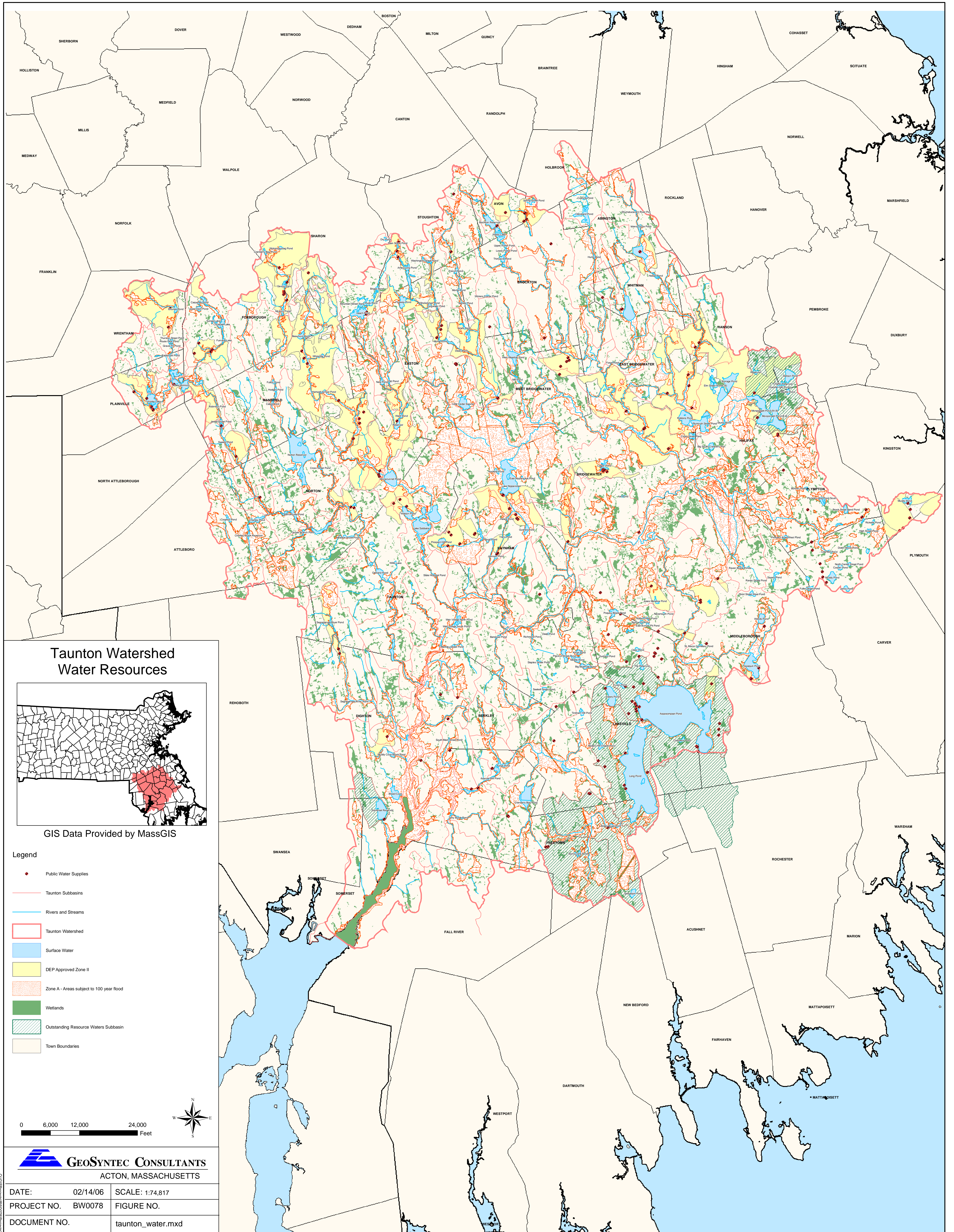
** Green highlight indicates #1 Priority Action Item for the Planning Category

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MAP 1:
TAUNTON RIVER WATERSHED
LAND USE MAP

MAP 2:

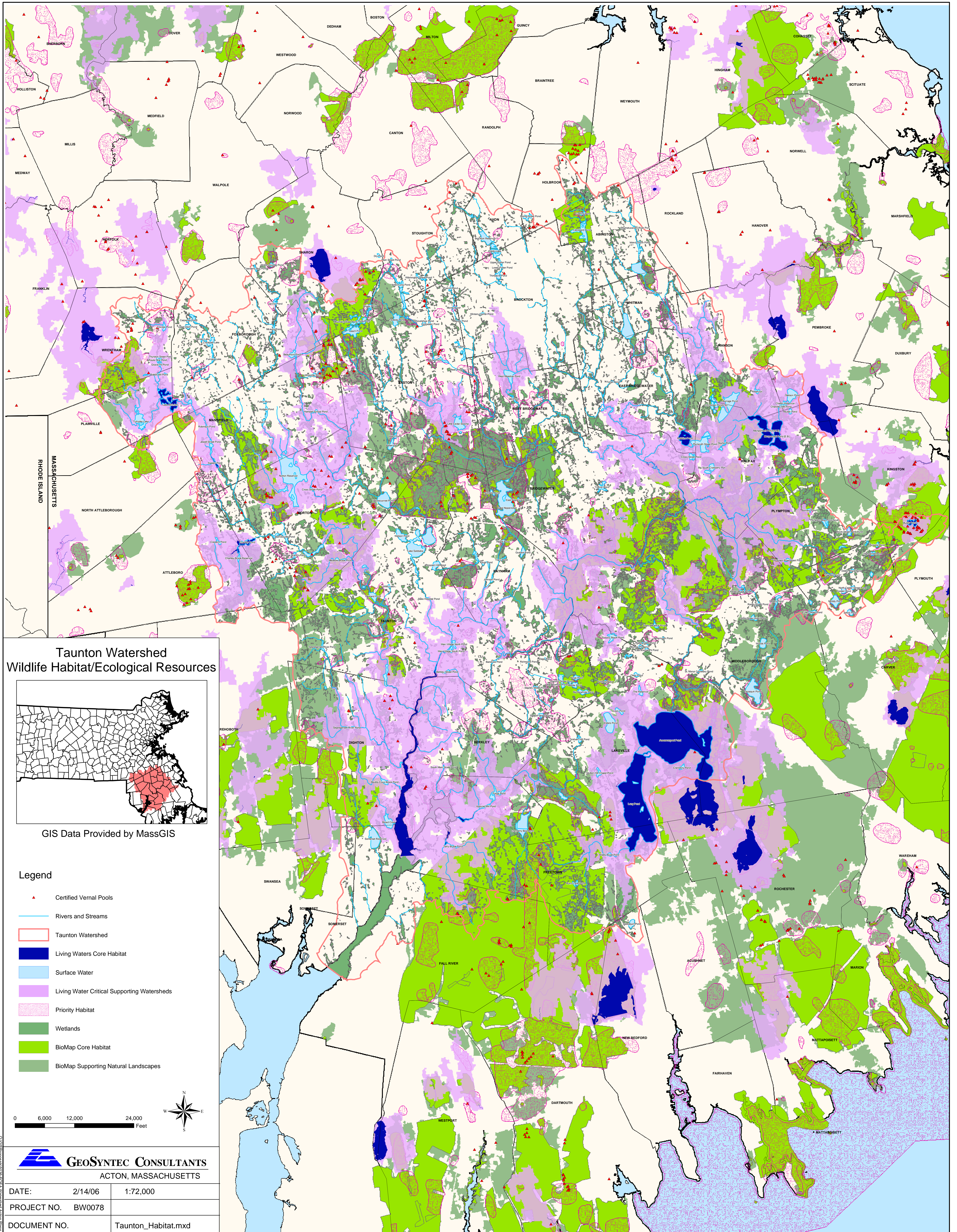
TAUNTON RIVER WATERSHED
WATER RESOURCES MAP



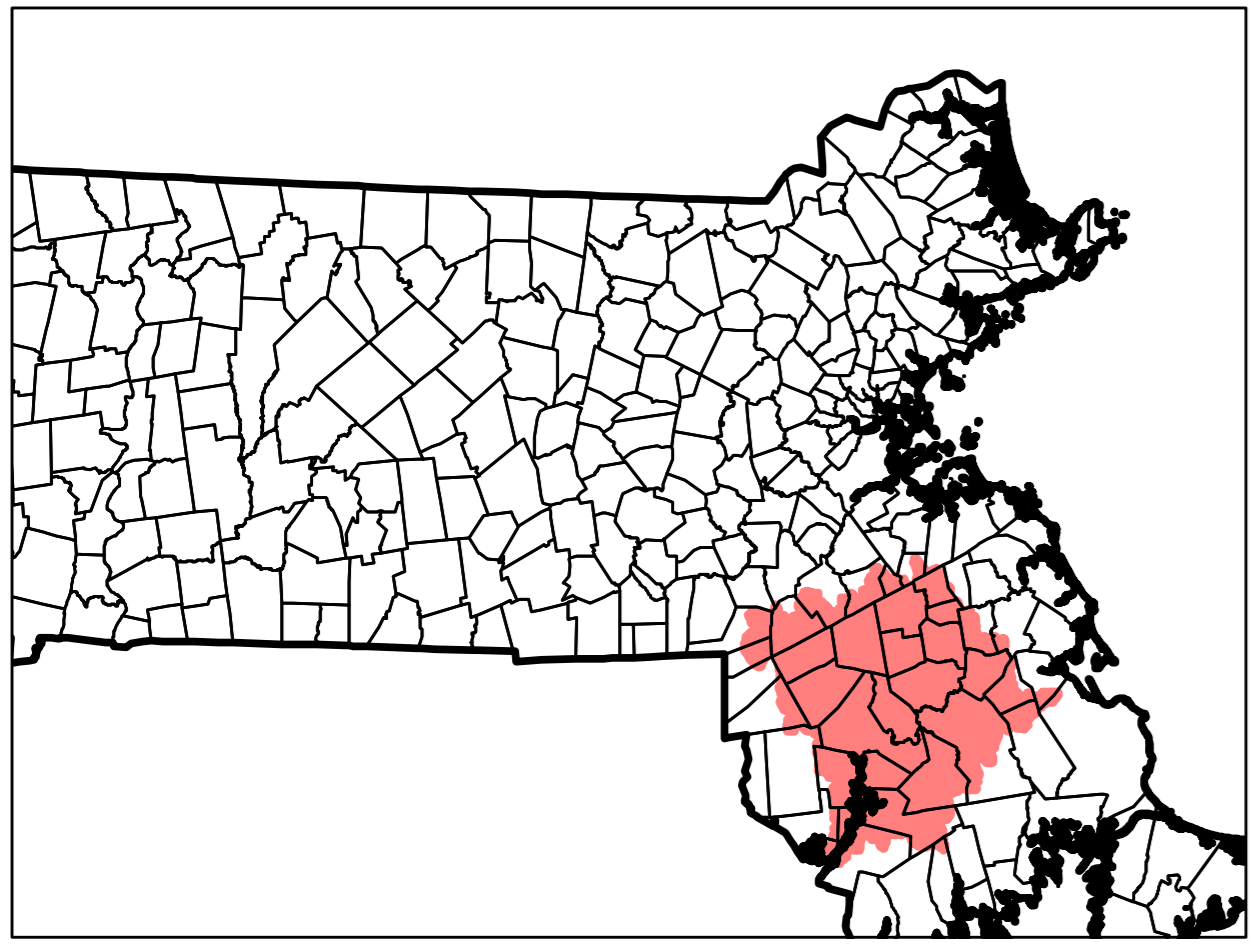
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MAP 3:

TAUNTON RIVER WATERSHED
WILDLIFE HABITAT MAP



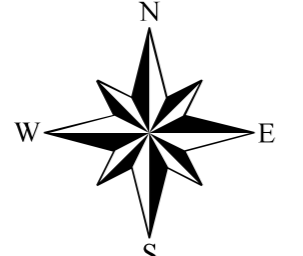
**Taunton Watershed
Wildlife Habitat/Ecological Resources**



GIS Data Provided by MassGIS

Legend

- ▲ Certified Vernal Pools
- Rivers and Streams
- Taunton Watershed
- Living Waters Core Habitat
- Surface Water
- Living Water Critical Supporting Watersheds
- Priority Habitat
- Wetlands
- BioMap Core Habitat
- BioMap Supporting Natural Landscapes



GEOSYNTEC CONSULTANTS
ACTON, MASSACHUSETTS

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DOCUMENT NO.	Taunton_Habitat.mxd	

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APPENDIX 1: SUMMARY OF MAJOR WATERSHED INFORMATION SOURCES

2001 Taunton River Basin Water Quality Assessment Report (MA-DEP)

- The Assonet River, Matfield River, Rumford River, Salisbury Brook, Salisbury Plain River, Taunton River, Three Mile River, Trout Brook, and Wading River are on the 1998 303(d) list of impaired waters for Pathogens.
- 73% of the river miles assessed in the Taunton Basin support the **Aquatic Life Use** while 27% are impaired. The Aquatic Life Use is impaired for the following freshwater water bodies: Segreganset River (MA62-53 and MA62-54), a 0.4 mile portion of Salisbury Brook (MA62-08), Salisbury Plain River (MA62-06), a 4.9 mile portion of Shumatuscacant River (MA62-33), Matfield River (MA62-32), Robinson Brook (MA62-14), a 5.0 mile portion of Rumford River (MA62-39), and a 2.80 mile portion of an unnamed tributary (MA62-42). One of the primary known causes of impairment is impacts to the benthic macroinvertebrate communities. Other habitat quality degradation and low dissolved oxygen were also documented causes.
- 10% of the coastal and marine waters assessed in the Taunton Basin support the **Aquatic Life Use** while 90% are impaired. Causes of impairment include industrial thermal discharges, anthropogenic substrate and flow regime alterations, and habitat, biota alterations.
- 100% (5,247 acres) of the lakes assessed in the Taunton Basin are impaired for **Aquatic Life Use**. Few lakes in the Taunton River watershed have been surveyed recently for variables used to assess the status of the Aquatic Life Use (i.e., dissolved oxygen (DO), pH, nutrients, macrophytes and plankton/chlorophyll a). Without these data none of the lakes in the Taunton River watershed are assessed as supporting the Aquatic Life Use.
- Massachusetts Department of Public Health (MA-DPH) issued a site-specific **fish consumption advisory** for the lower 5.0 mile reach of the Rumford River (MA62-39) due to elevated dioxin and pesticides levels in fish tissue as a result of contamination from the Hatheway & Patterson Company Superfund site. The remaining rivers and all of the coastal and marine waters in the watershed default to not assessed for the **Fish Consumption Use** because of the statewide advisory.
- Six lakes, representing a total of 983 acres, are assessed as impaired for the **Fish Consumption Use** because of either mercury contamination or dioxin/pesticide contamination. The water bodies impaired due to dioxin/pesticide contamination include Cabot Pond (MA62029), Fulton Pond (MA62075), Hodges Pond (MA62091), and Norton Reservoir (MA62134). The dioxin/pesticide contamination is associated with the Hatheway & Patterson Company Superfund site. The water bodies impaired due to mercury contamination are Monponsett Pond – east basin (MA62218), and Somerset Reservoir (MA62174). The source of mercury is unknown although atmospheric deposition is suspected. The remaining 92 lakes representing 10,076 acres are not assessed for the **Fish Consumption Use**.
- Information on drinking water source protection and finish water quality is available at <http://www.state.ma.us/dep/brp/dws/dwshome.htm> and from the Taunton River Basin's public water suppliers.
- The **Shellfish Harvesting Use** for this report was assessed by the Massachusetts Division of Marine Fisheries (MA-DMF), using the DMF shellfishing closure list dated 1 July 2000 and published on Massachusetts Geographic Information System (MassGIS) in October 2000 (<http://www.mass.gov/mgis/dsga.htm>) and updated classification information provided by MA-

DMF. All of the coastal and marine waters included in this report (4.86 square miles) are impaired for the Shellfish Harvesting Use because of elevated bacteria.

- 24% of the freshwater river segments included in this report are assessed as either support or impaired for the **Primary and Secondary Contact Recreational** uses. The Primary Contact Recreational Use is impaired for 38.6 river miles and the Secondary Contact Recreational Use is impaired for 24.1 river miles in the Taunton River Watershed. These freshwater river segments include Salisbury Brook (MA62-08), Trout Brook (MA62-07), Salisbury Plain River (MA62-05 and MA62-06), Beaver Brook (MA62-09), Meadow Brook (MA62-38) – Primary Contact Recreational Use only, Shumatuscant River (MA62-33) – Primary Contact Recreational Use only, and the Matfield River (MA62-32). All of these impaired segments are located within the Matfield River subwatershed. The primary cause of impairment is elevated fecal coliform bacteria. Sources, when known, included municipal point source and municipal separate storm sewers, highway/road/bridge runoff in urbanized areas, and illicit connections/hookups to storm sewers.
- The majority of the river miles (55%) are assessed as support for the **Aesthetics Use**. Only 10.3 river miles, three segments, are assessed as impaired. These include a 1.3 mile portion of Trout Brook (MA62-07), Salisbury Plain River (MA62-06), and Matfield River (MA62-32). The primary causes of impairment are odor and turbidity. Sources, when known, included municipal point sources and municipal separate storm sewers, highway/road/bridge runoff in urbanized areas and illicit connections/hookups to storm sewers.
- The **Primary and Secondary Contact Recreational** uses are assessed as support in eight lakes, totaling 2,229 acres and representing 21% of the freshwater lake acreage included in this report. The Recreational and Aesthetic uses are assessed as impaired in six lakes (Ames Long Pond, Monponsett Pond – west basin, Sabbatia Lake, Sassaquin Pond, Watson Pond, and West Meadow Pond), totaling 854 acres (8% of the freshwater lake acreage).

Technical Memorandum - Taunton River Assessment (December 14 2004, MA-Riverways)

This memorandum summarized and provided recommendations (on select issues) developed from a July 21, 2004 meeting and July 22, 2004 site visit to assess portions of the Taunton River watershed.

- Suspected Major Issues included: Stormwater Management in highly urban areas, specifically Brockton, Taunton, Fall River, and Middleborough; Wastewater Impacts on water quality, two treatment plants of concern are the Brockton and Bridgewater treatment plants; Dams; and Local Habitat Degradation.
- Specific issues included the removal of dams along the major tributaries in the Taunton watershed. Some tributaries requiring improvement include:
 - Segreganset River – 5 dams
 - Three Mile River – 2 significant dams one of which needs fish ladder repair
 - Mill River – stormwater issues and 3 dams with no passage.
 - Forge River – 7 dams
 - Nemasket River – 3 dams and culvert issues
 - Assonet River – 3 dams with no passage
- The Taunton watershed has patches of **Coldwater Habitat**, which is rare in low gradient/high wetland watersheds and rare in southeastern Massachusetts. While coldwater segments have been mapped based on fish surveys, the data are not comprehensive and in some cases appear to reflect habitat that either no longer exists or was a stocked fishery rather than native habitat. A more complete assessment of current coldwater habitat could help direct protection and

restoration efforts of these fragile ecosystems. Three mapped coldwater pockets were investigated, Puddingshear Brook at Pleasant Street, Poquoy Trout Brook at Rt. 44, and Unnamed coldwater stream near Pratt Farm at Rt. 105; the unnamed stream appeared to be the only coldwater brook.

- The upper portion of the mainstem Taunton River appears to be incised, such that flood flows go over the banks less frequently. This allows upland species to overtake near-bank areas, limiting **Riparian Habitat** and increasing erosive flood power by concentrating it within the stream channel. The middle portion of the river near the United State Geological Survey (USGS) stream gauge does not appear to be incised. This pattern represents a common sequence resulting from increased flow power due to land clearing and concentrated stormwater flows. Typically such rivers will have an incisional upper portion, a depositional lower portion, and a transitional middle portion. Both gauge information and the relative slope of the river bed can help identify where these portions occur.
- A recent Stream Team Shoreline Survey identified excessive **Bank Erosion** in the Matfield River upstream of Bridge Street. From an aerial photo it can be seen that the river has a highly sinuous meandering pattern, which is naturally characteristic of low gradient broad floodplain rivers like this portion of the Matfield. However, the river continues through a much straighter reach as it approaches Bridge Street. This portion of the river was straightened at some time in the past, which resulted in long-term erosion, as the same amount of water now flows over a shorter distance with less form resistance and therefore carries more erosive power than the same water winding through the meandering stretches. The channel here on the Matfield is gradually eroding to reform its meandering pattern.

Draft Pathogen TMDL for the Taunton River Watershed (MA-DEP and USEPA)

This document provides a framework to address bacterial and other fecal-related pollution in surface waters of the Massachusetts Taunton River Watershed. The Massachusetts Department of Environmental Protection (MA-DEP) is responsible for monitoring the waters of the Commonwealth, identifying those waters that are impaired, and developing a plan to bring them back into compliance with the Massachusetts Water Quality Standards (WQS).

- The Taunton River watershed contains waterbodies classified as Class A, Class B, Class SA, and Class SB. The corresponding WQS for each class are as follows:
 - Class A waterbodies - fecal coliform bacteria shall not exceed an arithmetic mean of 20 organisms per 100 mL in any representative set of samples, nor shall 10% of the samples exceed 100 organisms per 100 mL.
 - Class B, Class SA, and SB not designated for shellfishing - the geometric mean of a representative set of fecal coliform samples shall not exceed 200 organisms per 100 mL and no more than 10% of the samples shall exceed 400 organisms per 100 mL. The MADEP may apply these standards on a seasonal basis for waters classified as Class B, and Class SA and SB not designated for shellfishing.
 - Class SA waters approved for open shellfishing - the geometric mean of a representative set of fecal coliform samples shall not exceed 14 organisms per 100 mL and no more than 10% of the samples shall exceed 43 organisms per 100 mL.
 - Class SB waters approved for open shellfishing - the geometric mean of a representative set of fecal coliform samples shall not exceed 88 organisms per 100 mL and no more than 10% of the samples shall exceed 260 organisms per 100 mL.

- In general, **Shellfish Harvesting** use is supported (i.e., non-impaired) when shellfish harvested from approved open shellfish areas are suitable for consumption without depuration and shellfish harvested from restricted shellfish areas are suitable for consumption with depuration. For an expanded discussion on the relationship between the DMF shellfish growing areas classification and the MADEP designated use support status, please see the “Taunton River Watershed 2001 Water Quality Assessment Report” (MA-DEP WQA; MA-DEP 2005).
- Some dry weather sources in the Taunton River Watershed included:
 - leaking sewer pipes,
 - storm water drainage systems (illicit connections of sanitary sewers to storm drains),
 - failing septic systems,
 - recreational activities,
 - wildlife including birds, and
 - illicit boat discharges.
- Some wet weather sources in the Taunton River Watershed include:
 - wildlife and domesticated animals (including pets),
 - storm water runoff including municipal separate storm sewer systems (MS4),
 - combined sewer overflows (CSOs), and
 - sanitary sewer overflows (SSOs).
- The complete Draft Pathogen TMDL report is available on the MA-DEP’s website at: www.state.ma.us/dep/brp/wm/wmpubs.htm, or by contacting the MA-DEP’s Nonpoint Source Program at (508) 792-7470 to request a copy.

Taunton River Stewardship Plan – Taunton River Wild & Scenic River Study (July 2005, Taunton Wild & Scenic River Study Committee)

The overarching goals adopted by the Taunton Wild & Scenic River Study Committee which serve as the foundation for this Taunton River Stewardship Plan are (1) to understand, preserve and restore the Taunton River corridor as an intact river ecosystem and regional resource; (2) to develop a strong coalition of municipalities, citizens, non-profits and agencies for planning and implementing public education, land-use, recreation and conservation strategies for the Taunton River; and (3) to secure designation of the Taunton River as a National Wild and Scenic River.

- The major threats to the “Outstanding Resource Values” identified for the Taunton River during the study process are described below.
 - Development is the biggest threat to **Agriculture** (agricultural land) and farming. Much of the prime agricultural land with deep topsoil has already been converted into residential developments.
 - Poorly planned development and transportation infrastructure within the Wild & Scenic corridor and the watershed as a whole is the greatest threat to the river **Ecology and Biologic Diversity**. Loss and fragmentation of forest habitats, as well as incremental degradation of riverfront areas threaten long-term ecosystem health. Increasing human demands for water will worsen flow alteration in tributary streams and ultimately impact the Taunton River itself, diminishing habitat quality for fish and other aquatic life. Point and nonpoint source pollution (runoff) degrade water quality in the tributaries and mainstem. Increasing areas of impervious surfaces such as roads and rooftops degrades stream habitat by increasing “flashy” flood events and sources of pollution and raising water temperatures. Invasive plant

species threaten to reduce diversity in tidal marshes and other wetlands along the river. Industrial discharges and sediment toxicity from historic sources limit recovery of fisheries and shellfish habitats in the estuary.

- Industrial uses in the **Estuary**, especially power plants, are causing failure of groundfish stocks through heated discharges and entrainment (trapping) of larval fish and other organisms. Further development of energy facilities, shipping and other port development without consideration for the resources of the Taunton River estuary will continue to cause environmental and safety hazards. High nutrient (nitrogen and phosphorus) and bacteria levels in the estuary lead to water quality and habitat degradation, diminishing the fishery and biodiversity resources. Freshwater allocation and management upstream may prevent adequate inputs into the estuary. Runoff from polluted sites is causing water quality and habitat degradation in the estuary. Tidal restrictions and freshwater runoff degrade salt marsh habitat and encourage invasive species.
- Low flow in tributaries is resulting in low dissolved oxygen, dry reaches and temperature stress for many **Fisheries**. Loss of buffers on the river and its tributaries endanger habitat for fish and shellfish. Increasing development of the watershed is resulting in a decrease in water quality in the tributaries and mainstem and siltation of spawning habitat. Dams on several tributaries prevent fish from reaching spawning areas. Industrial activity and contaminated sediments have polluted shellfish beds in the lower estuary. Heated discharges and entrainment from power plants have reduced populations of winter flounder and other groundfish.
- There is a lack of knowledge and recognition of **Historical Sites** along the river and the tributaries. Many **Archaeological Resources** are not well identified and could be compromised by large projects, soil removal, disturbance, as well as by small projects and disturbances such as sign posts, benches and trampling. Local village centers may lose their specific character without specific zoning changes that allow for mixed uses. Loss of such structures as the Berkley-Dighton Bridge will mean loss of historical identity.
- Water quality and stream flow are threatened by increasing development in the watershed, water withdrawals, and a variety of pollution sources. Polluted sediments and depletion of fisheries have led to closing of fishing opportunities (winter flounder) and shellfish beds. Lack of quality access sites to the river and tributaries reduces the availability of river resources for **Recreation** and public enjoyment. Lack of public awareness of the special values, sites and opportunities associated with the river threatens those resources as development and planning moves forward. Lack of funding for open space and special site protection may result in the loss of key scenic vistas, cultural resource sites, and dispersed recreational opportunities in the corridor.
- **Threats to Water Quality, Quantity and Instream Flow**
 - Additional demand on water supply caused by increasing development and human population could cause flow alteration in the Taunton River as well as the tributary systems, altering habitat.
 - There is a lack of funding for stormwater improvements and maintenance of existing systems.
 - Several communities have reduced their municipal staff such as planners and conservation agents, leaving them with outdated or inadequate zoning.
 - Extension of sewers, while protecting against water quality degradation may invite added development to sensitive areas.

- New percolation rates or other changes to Title 5 septic system rules could open up new previously undevelopable land to development.
- Discharges from municipal wastewater treatment plants create water quality problems in the Taunton River.
- Salting and sanding of roads is adding additional pollutants and sedimentation to the river.
- The BFI landfill in Fall River is unlined in parts and is leaching contaminants to Mothers Brook, a tributary to the Taunton River.
- Contaminated sediments remain in many parts of the river, particularly in the estuary.
- Thermal pollution from heated power plant discharges has degraded water quality in the estuary.

Priorities for the Taunton River Watershed (MA-EOEA)

- Provide each municipality with a Taunton River Watershed sign, installed by the local highway department, for display within their community
- Re-establish anadromous fish runs for two communities on the Three Mile River and Fall Brook at Massasoit State Park, along with providing educational anadromous fish signage for five communities
- Hold public forums on the economic value of purchasing lands to control municipal budgets, the introduction of desalinated waters versus extension of the MWRA drinking water system to watershed communities, and development of a land purchase priority system
- Provide maps to 22 watershed communities that show existing community zoning and show undeveloped lands potentially available for use as groundwater resources
- Develop a Quality Assurance Program Plan for obtaining water quality and flow data from the 25 sub-watersheds

Natural Resource Inventory and Conservation Plan for the Taunton River Corridor (Feb 1998, Wildlands Trust of Southeastern Massachusetts)

Certain areas along the Taunton River are noteworthy for their geographic influence on the natural resources found in that area. Following are summaries of several of these areas which can be considered priority areas for conservation protection.

- **Focus Areas along the Taunton River**
 - The **Tidal Oxbow** area of the river is located in the town of Raynham. The Oxbow area is one of the larger areas of low freshwater tidal marsh in the Taunton River watershed. This is also the highest ranked floodplain wetland in the study area with the highest diversity of wildlife and vegetative communities with many uncommon species. The globally rare Long's Bullrush, 5 species of mussels including the Triangle Floater, Brook Trout, Spotted Turtle, Box Turtle, 7 Vernal Pools supporting breeding Wood Frog and Spotted Salamanders, Black Duck, Wood Duck, Osprey, River Otter and Deer.
 - The **Poquoy/Taunton Confluence** area of the Taunton River is located near the towns of Taunton, Raynham, Lakeville and Middleborough. It is the largest floodplain forest on the

Taunton River and one of the highest ranked floodplain wetlands. Wildlife and vegetative communities that can be found in this area include uncommon plants such as the Rattlesnake Fern and the Trout Lilly, 6 species of freshwater mussel including the Triangle Floater and the Eastern Pond Mussel, native Brook Trout, Spotted Turtle, Wood Turtle, Box Turtle, Blandings Turtle, Hognose Snake, breeding Northern Parula Warbler, Black Duck, Wood Duck, Woodcock, Red-shouldered Hawk, Canada Warbler, Eastern Bluebird, Otter and Mink.

- The **Winnetuxet Confluence** area of the river is located near the towns of Bridgewater and Halifax. It is one of the larger and more diverse floodplain wetlands on the west bank of the Taunton River. The Winnetuxet River is the largest and most intact floodplain meadow/shrub swamp with no trace of exotic vegetation. Significant stands of American Holly in the bottomland forests can be found on the south side of the Winnetuxet. Outstanding warmwater fish habitats, Spotted Turtles, Ruffed Grouse, Spotted Sandpiper and River Otter, 3 species of Tidewater Mucket, and Barn Owl can be found in this area.
- The **Nemasket/Taunton Confluence** area of the Taunton is located in the town of Middleborough. It is one of the best open bog-type wetlands as a possible result of the impoundment from the railroad line. Types of communities found here are Rattlesnake Fern, Bog Copper Butterfly, a noteworthy stand of Chain Fern which is the host plant for the rare Chain Fern Borer moth, native Brook Trout, Bridled Shiner, and abundance of Spotted Turtles, 5 moderately productive Vernal Pools, Musk Turtle, and the highest bird diversity of any site with 71 species including winter waterfowl, Wood Duck, Mallard, Virginia Rail, Woodcock, Ruffed Grouse, Bobwhite, Red-shouldered Hawk, Sharp-shinned Hawk, Coopers Hawk, Eastern Bluebird, Black-crowned Night Heron, Osprey, and Spotted Sandpiper. There is also a very high activity of Otter along the lower Nemasket with an abundant Deer population.
- The **Town River** area is site on the river is located in the town of Bridgewater and is characterized by a small leatherleaf bog with uncommon Atlantic White Cedar groves along the marsh border. It is the most diverse floodplain wetland area studied with the most locally uncommon species. The invasive Purple Loosestrife is problematic in this area. Species found in this area include a very rich invertebrate life in the pools and marshes including abundant fingernail clams and mussel beds, a very good warm water fish habitat, 5 Vernal Pools supporting Wood Frog and Spotted Salamander habitat, nesting Wood Duck, Blue-winged Teal, Mallard, Spotted Sandpiper, Black-billed Cuckoo, Otter, Mink and Gray Fox.

APPENDIX 2:
TAUNTON RIVER WATERSHED CONTACT LIST

Taunton River Watershed Contact List				
Contact	Email	Organization	Title	Phone
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