

4.0 NATURAL AND CULTURAL RESOURCES

4.1 The Special Character of Tiverton

More than anything else, the abundance of natural resources and the town's cultural roots in its past characterize what is special about Tiverton. Farms, broad open spaces, forests and miles of scenic roadways in the south, and the rich ethnic and architectural heritage in the north give the town its fascinating diversity. Along the west side lies the beauty of an unspoiled coastline, treed neighborhoods, while lightly developed neighborhoods, farmland, and crossroads hamlets are scattered along the eastern portion of the town. The central spine of the town is the north-south low glacial ridge, along which a large contiguous area of undeveloped forest survives in south Tiverton. These are all precious qualities of small town New England that are rapidly disappearing, and qualities that townspeople fear will be lost in Tiverton's future. A central challenge of this plan is to protect these natural and cultural resources while at the same time providing for economic growth and housing needs. This chapter of the Comprehensive Community Plan describes the town's natural and cultural resource assets, and those planning measures needed to preserve them.

4.2 Natural Resources

Tiverton's natural setting is not only beautiful, but it also creates its own brake on development. Extensive wetlands are protected by state and federal wetlands regulations, while many other areas are not suitable for development because of poor soil conditions for residential septic systems. With the town's Building Official, Planning Board and Conservation Commission monitoring construction activities and state regulatory efforts, development cannot occur in many areas of the town, without massive public expenditures to install public water and sewage disposal systems.

The following sections describe the key natural features of the town and the constraints they impose on future development. The information for this analysis has been compiled from many sources including the Rhode Island Geographic Information System, the U.S. Geological Survey, field observations and the Comprehensive Plan Advisory Committee.

Topography

The surface relief consists of a gently rolling topography that rises from the waterfront to low bluffs along the Sakonnet River. Low lying wetland areas along the coast and inland occupy large areas of the town. Higher elevations are some 200 to 300 feet above sea level. The highest elevation is Pocasset Hill in north Tiverton at about 320 feet. This elevation forms part of the ridgeline that extends north along Main Road to Fall River roughly parallel to the Sakonnet River.

The bluffs overlooking the Sakonnet River rise steeply from the waterfront in north Tiverton. Further south they are separated from the shoreline by a coastal plain that is up to one mile in width. These bluffs offer many scenic views of Aquidneck Island. They also represent another obstacle to development because of ledge formations near the surface.

Along the coastal plain are several important natural features, including ponds, wetlands, marshes and beaches. A 100-year floodplain forms part of the coastal plain and extends from a narrow

strip along the northern shoreline to a broader area in the south. Seapowet Marsh and the Emily Reucker Wildlife Preserve form part of this floodplain.



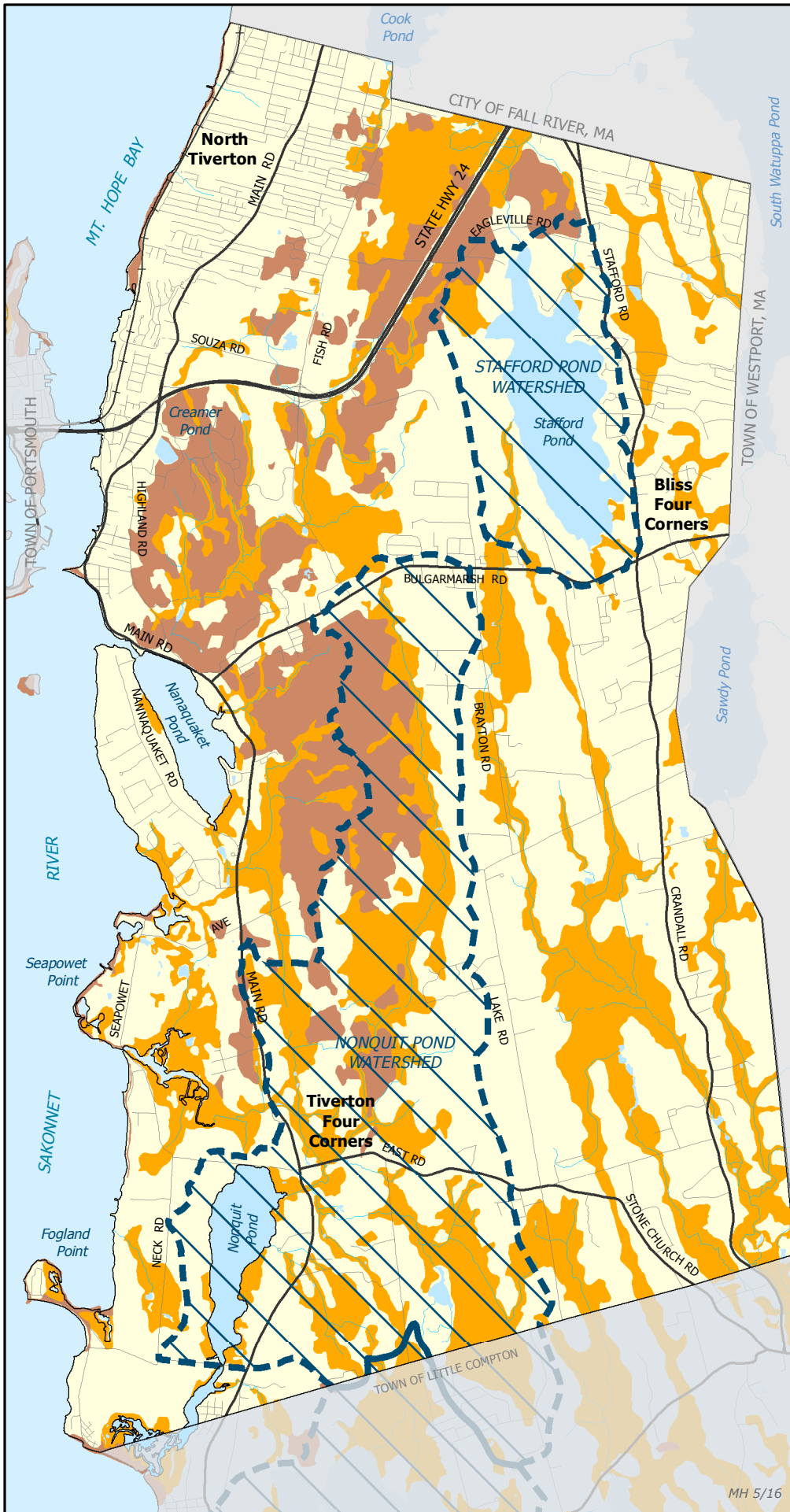
The Sakonnet River

Soils

Soil conditions are poor in many areas of the town—a major factor in any plan for development. An analysis of soils completed using the United States Natural Resources Conservation Service soil survey of Rhode Island showed that large areas of the town are unsuitable for many types of development, and particularly for septic systems. The RIGIS (Rhode Island Geographic Information System) analysis of soils, Figure 4-1, also indicates large areas with development constraints due to poor soil conditions.

Fresh Water Resources

Surface water includes many small ponds and two relatively large ponds that are totally within Tiverton's geographic area. Stafford Pond is a primary source of the drinking water supply for Tiverton. Although the Stafford Pond Watershed Overlay District regulates development, the pond is not fully protected because of ongoing recreational uses sanctioned by the State. The protection of Stafford Pond and its watershed is a unique planning challenge because of growing development along its shores, the complexities of its ownership, long standing recreation use and the lack of a single overall management authority. A comprehensive study initiated in 1996 by the RI Department of Environmental Management (RIDEM) identified two major sources of pollution - animal waste runoff from a dairy farm, and storm water runoff from Stafford Road. Since then, “best management practices” (BMPs) have been established to control both sources of pollution. Moreover, a Total Maximum Daily Load (TMDL) plan has been implemented that sets a loading cap of 390 kg/year of phosphorus entering the pond.



- SOILS DEVELOPMENT GROUP**
- GROUP 4 - HYDRIC SOILS, SEVERELY HIGH WATERTABLE (0-18" DEPTH)
 - GROUP 5 - BEDROCK & SLOPE CONSTRAINTS (>15% SLOPE)

- SURFACE WATER RESERVOIR WATERSHED
- PONDS, OPEN WATER
- STREAMS
- MINOR ROAD
- MAJOR ROAD
- + RAILWAY

Source: USDA/NRCS Soils 2014.



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Figure 4-1
SOILS CONSTRAINTS

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Other steps to protect Stafford Pond include the adoption of a town ordinance requiring mandatory testing of individual septic disposal systems around the pond, the publication and dissemination of a pamphlet entitled “Your Guide to Protecting Stafford Pond” and the proposed creation of a Stafford Pond Watershed Committee, the de-listing of the Pond by the Federal Aviation Administration (FAA) as a sea plane landing area. In August, 2014, the Town Council followed up on the FAA’s action by adopting an amendment to Ordinances of the Town of Tiverton, Chapter 15 (Drinking Water Supply Reservoirs) that prohibits sea plane take-offs and landings on the Pond. This action is consistent with R.I. General Laws 46-14-1 that prohibits any activity that will “pollute or corrupt or impair the purity or quality of a public drinking water supply or which renders the water supply injurious to public health or poses a potential significant risk to public health.” Nevertheless, the quality of water is still threatened by the widespread use of gasoline motors, jet skis, swimming and other recreational uses not compatible with a drinking water supply. Stafford Pond is among the least protected reservoirs in the state.

The other major public water reservoir is Nonquit Pond, part of the City of Newport's water system. As a public water supply it is Tiverton's responsibility to take measures, in cooperation with the Newport Water District, to protect this pond and its watershed. Since 1997, significant steps have been taken to protect approximately 1,320 acres of Nonquit Pond watershed through the purchase of development rights and the purchase and protection of fields, forests and wetlands, including Weetamoo Woods and the Pardon Gray Preserve. Problematic, however, is the threat of contaminated leachate from the Tiverton Landfill. This landfill abuts Cedar Swamp and several private homes that rely on wells for drinking water. Results from test wells around the perimeter of the landfill indicate the presence of lead, cadmium, arsenic and other contaminants, but in trace amounts well within regulatory limits. In 2001, revisions to the town’s zoning ordinance included adding the watershed of Nonquit Pond to the Watershed Protection Overlay District.

In 2014, the Planning Board and the Conservation Commission established a joint committee to consider possible amendments to Tiverton Zoning Ordinance Article VIII: Watershed Protection Overlay District. The committee is currently considering ways to streamline the environmental review procedures, review and improve checklists, identify the exact location of direct tributaries, address commercial/industrial development and better clarify vague and discretionary language. The committee is being assisted by the University of Rhode Island’s cooperative extension program. It is anticipated that the committee will present the Planning Board and the Conservation Commission with recommended amendments to Article VIII and with source water protection plans for both reservoirs in 2015. It is further expected that the two boards will then take joint recommendations to Town Council.

Easily overlooked because it is unseen, is the groundwater of Tiverton. This precious natural resource is just as important as surface water because it supplies major portions of the town with fresh water from private residential wells. Protecting groundwater sources and maintaining drinking water is a major public concern. The State of Rhode Island uses a system to classify groundwater. Class GA is used to identify drinking quality groundwater sources. The town should assure that this classification is maintained. The principal threat to drinking quality groundwater is over-development, with too many houses and other buildings drawing on a limited and finite water source. Given the hydrology and soil conditions of south Tiverton, and especially the Nonquit Pond watershed, the preferred type of housing development is rural compounds. Also

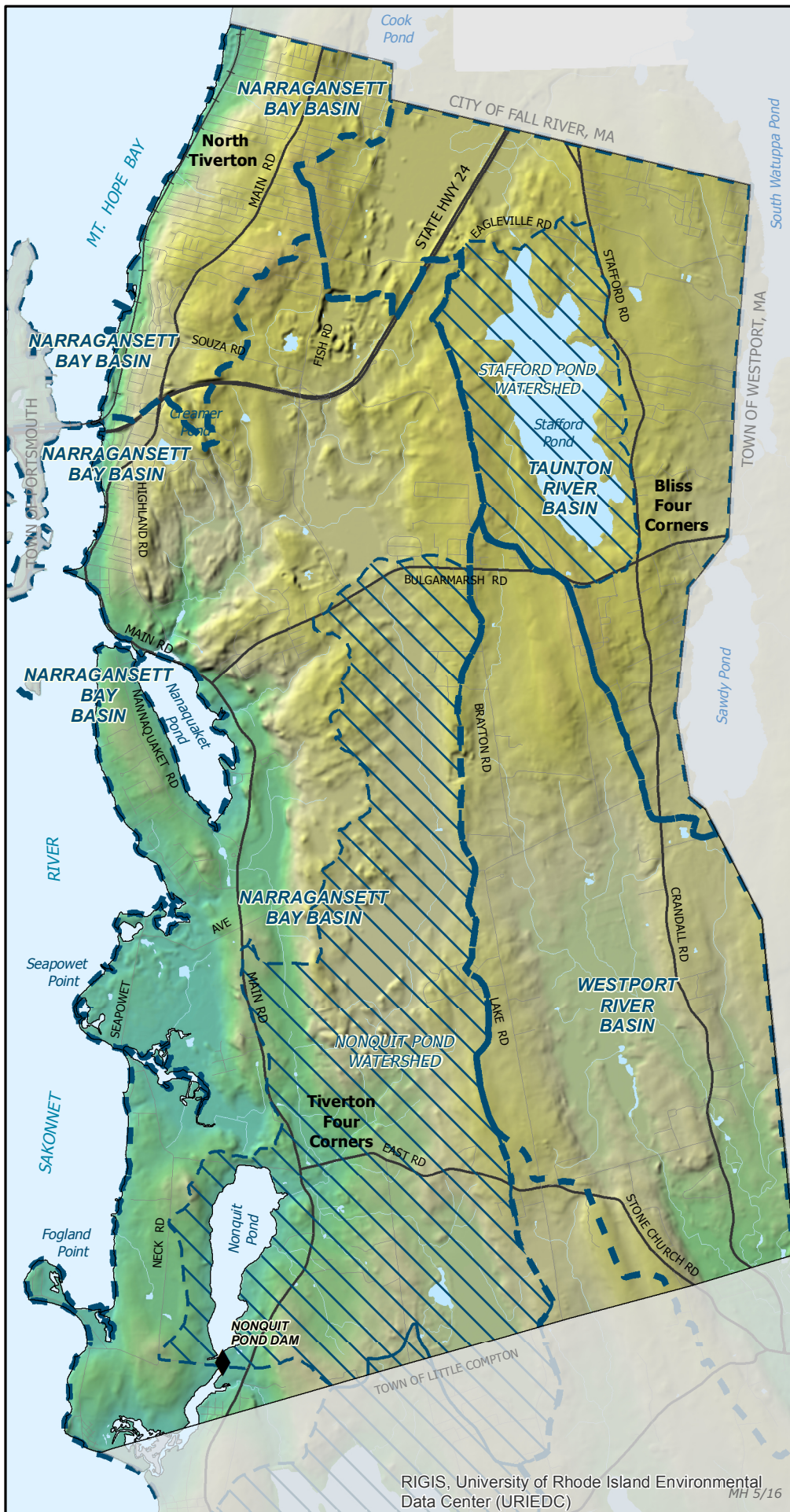
threatening this resource are aging underground oil tanks and failing septic systems. Both problems must be addressed if Tiverton's citizens are to be assured of pure drinking water in the future. In 1997 the town adopted an ordinance prohibiting new underground storage tanks (USTs), and requiring that all owners and operators of USTs register the tanks with the Tiverton Town Clerk. The registration form includes such information as tank size, construction type and material, and contents.

The RI Department of Environmental Management (RIDEM) has delineated wellhead protection areas for all public wells in the state, which define those areas through which water flows in the subsurface to the well. Consistent with RIDEM's wellhead protection program, the Conservation Commission undertook a pollution source inventory for each wellhead protection area to determine potential risks to each well. This effort was followed by a public education program regarding the risks associated with USTs, disposal of household chemicals and septic system maintenance.

The watershed areas of both Stafford and Nonquit ponds, as well as the wellhead protection areas, are depicted in Figure 4-2.



Nonquit Pond



- DRAINAGE BASINS
- SURFACE WATER RESERVOIR WATERSHED
- DAMS
- PONDS, OPEN WATER
- STREAMS
- MAJOR ROAD
- MINOR ROAD
- RAILWAY

Source: Shaded Relief (USGS 2011 LiDAR) courtesy of RIGIS and URI-EDC. Surface Water Drainage Basins (RIGIS). Dams (RIGIS, 2014).



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TIVERTON COMPREHENSIVE COMMUNITY PLAN
Figure 4-2
TOPOGRAPHY & DRAINAGE



RIGIS, University of Rhode Island Environmental Data Center (URIEDC) MH 5/16

Surface Mining

Surface mining operations of sand and gravel adversely impact ground and surface water by eliminating soil filtering capacity and rendering groundwater vulnerable to contamination. Removing deposits decreases the depth to groundwater, often leading to exposure of the water table. The use of heavy machinery in these operations makes the water table susceptible to diesel fuel, motor oil, hydraulic fluids and solvents. The zoning ordinance amendments of 2001 limit the expansion of existing surface mines and new operations are now a prohibited use. In 2010, the Town adopted statutory language (Ordinances of the Town of Tiverton, Chapter 38, Article III, Earth Removal) that addresses hours of operation, setback and fencing requirements, dust control and drainage, among other items. Article III also established a licensing procedure for operations already in existence and penalties for violations.

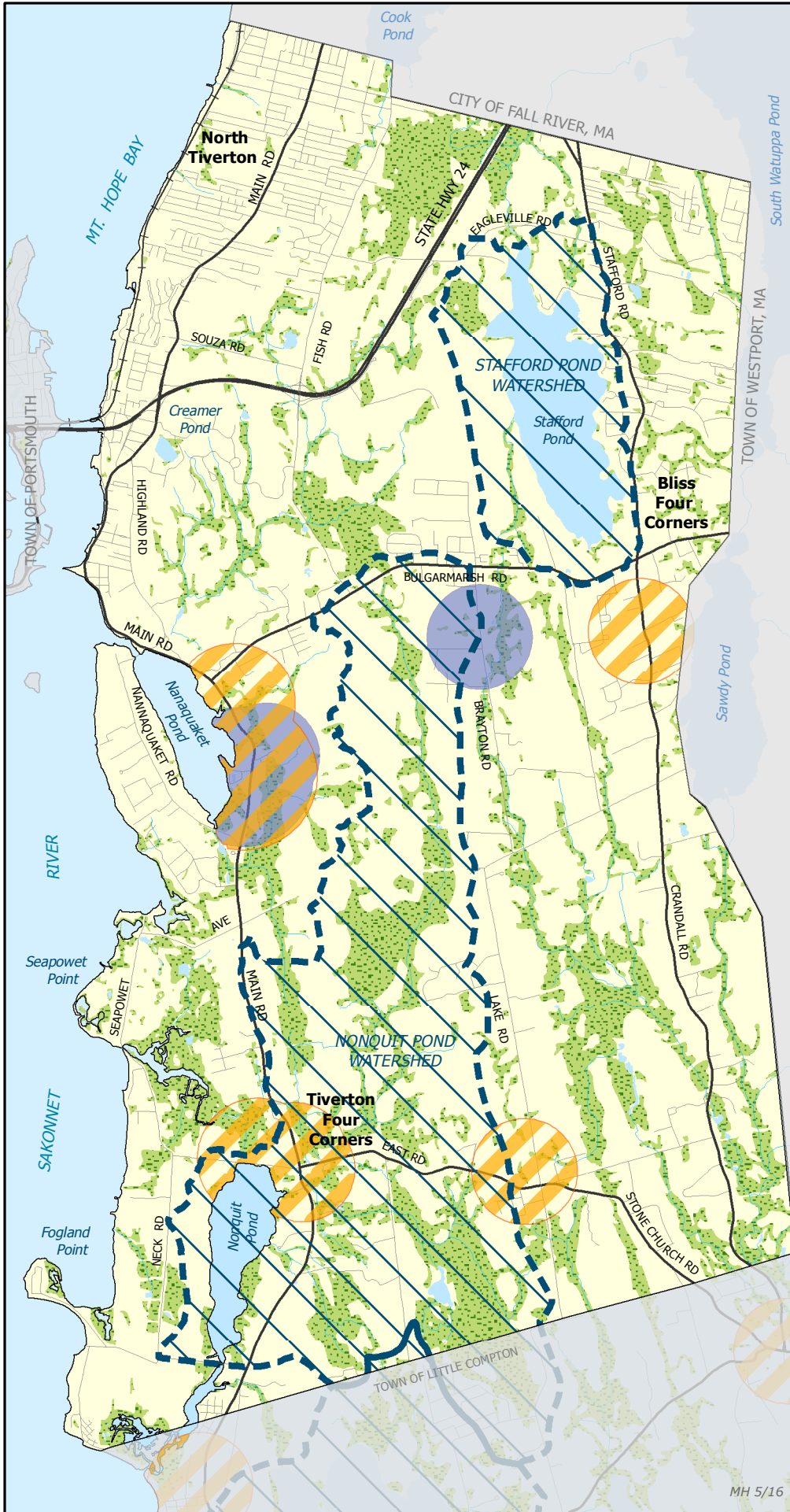
In March, 2014, the Planning Board finalized proposed amendments to Article III and forwarded them to the Town Council for consideration in a public hearing. These proposed amendments are designed to clarify ambiguities, assure public safety, protect groundwater and curb dust, noise and vibration caused by blasting.

Wetlands

Wetlands form a significant component of the land area of the town and are a major natural feature. Coastal wetlands comprise over 528 acres. These include large areas at Seapowet and Fogland Marshes. Inland wetlands comprise nearly 4,500 acres throughout the town. Major areas include Great Swamp and Cedar Swamp in south Tiverton, and Basket Swamp and Pocasset Cedar Swamp in the northern section of town. Wetland areas, by categories, are depicted in Figure 4-3.



Seapowet Marsh is an extensive and scenic coastal wetland and wildlife habitat.



- PONDS, OPEN WATER
- STREAMS
- SURFACE WATER RESERVOIR WATERSHED
- NON-COMMUNITY WELLHEAD PROT'N AREA
- COMMUNITY WELLHEAD PROT'N AREA
- WETLANDS
- MINOR ROAD
- MAJOR ROAD
- RAILWAY

Source: RIGIS, Wetlands (1988), RIDEM Community and Non-Community Wellhead Protection Areas (2012), and RIDEM Surface Water Protection Areas.



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TIVERTON COMPREHENSIVE COMMUNITY PLAN
Figure 4-3
WATER RESOURCES



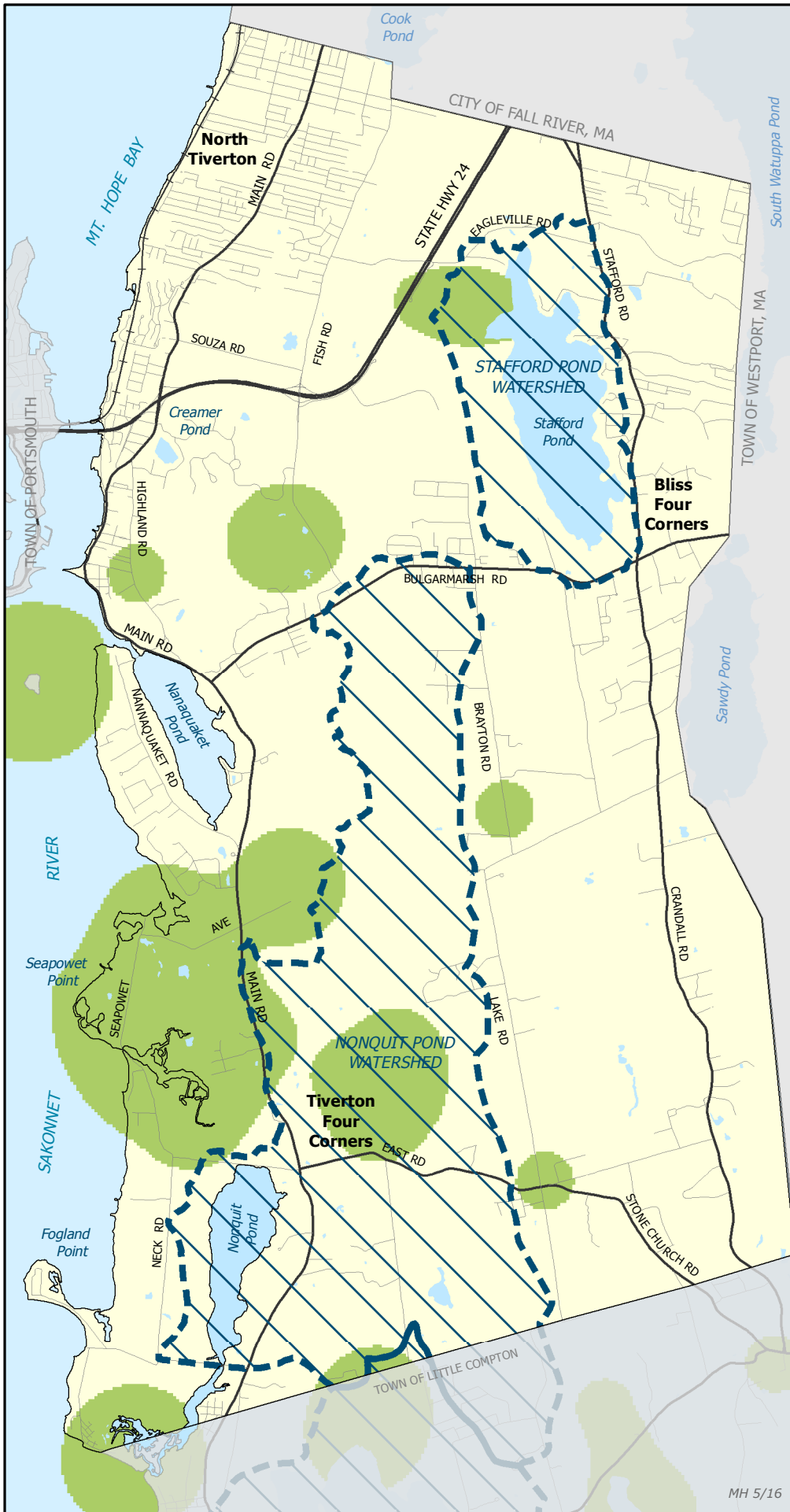
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Rhode Island Natural Heritage Program

The Rhode Island Natural Heritage Program is a section of the Department of Environmental Management, Division of Planning and Development. The basic goal of the program is to identify, protect and manage rare species occurrences and ecologically significant natural communities. The Natural Heritage Program has identified special rare species habitats. These areas, shown in Figure 4-4, are described below:

- **Fogland Marsh** is a Nature Conservancy preserve, with adjacent tracts owned by the Rhode Island Department of Environmental Management. It is located on the Tiverton/Little Compton line, surrounding Almy Brook. This wetland is considered one of the best quality salt marshes in the state, never having been ditched or drained for mosquito control, and thus serves as a fertile nursery for fin and shellfish, and critical habitat for shorebirds and wading birds.
- **Seapowet Marsh** is primarily owned by the Rhode Island Department of Environmental Management with the Emily Reucker Wildlife Refuge, owned by the Audubon Society of Rhode Island, lying just to the north. This exemplary wetland provides breeding habitat for two state listed rare bird species, and is an important feeding area for wading birds, including egrets and ibis which breed nearby.
- **Sin and Flesh Brook** is an area that provides important forest habitat for several bird species rare in Newport County. The maintenance of this large, un-fragmented forest is critical to its value as habitat for these species. A long-term plan for conservation of this area would include protection from development as well as the exclusion of roads, utility rights-of-way, and other interruptions of the forest canopy.
- **Weetamoo Woods and the Pardon Gray Preserve** are large areas south of Lafayette Road containing a globally rare coastal oak-holly forest community, and habitat for five state listed rare species. As threats by encroaching development have grown, the town's Open Space Commission and the private Tiverton Land Trust have responded by protecting, through state open space funding and private funds, several hundred acres. Additional acquisitions with appropriate management would further protect this site.
- **Stafford Pond** supports a population of the plant, Plymouth Marsh Pink, along its northwest shore. It is one of only four such locations statewide. The plant population is considered regionally significant, since in New England it is found only in southeastern Massachusetts and Rhode Island.

In 2001, a study by The Nature Conservancy Rhode Island field office confirmed and expanded on the findings of the Natural Heritage Program. Entitled "A Conservation Plan for Wetlands and Associated Natural Resource Areas in Little Compton and Tiverton, R.I.", the study confirmed at least five state-listed rare species in the natural communities that make up the coastal forest of south Tiverton. They are (1) Acadian Flycatcher, (2) Eastern Ribbon Snake, (3) Henry's Elfin Butterfly, (4) Worm-eating Warbler, and (5) Squawroot.



- NATURAL HERITAGE AREAS
- PONDS, OPEN WATER
- SURFACE WATER RESERVOIR WATERSHED
- MINOR ROAD
- MAJOR ROAD
- RAILWAY

Source: RIDEM (2014).



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TIVERTON COMPREHENSIVE COMMUNITY PLAN



Figure 4-4 NATURAL HERITAGE AREAS

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4.3 Cultural Resources

Cultural resources can be thought of as the human imprints on Tiverton that make it an interesting place to live, the archaeological treasures of its ancient past, the architectural treasures of its colonial past, its farmhouses, stone fences and villages, including the textile mill village of North Tiverton. These give the town depth and texture, and must be held onto if Tiverton is to retain its uniqueness. Three important cultural resource areas are considered in this plan; rural character, scenic resources and historic resources.

Rural Character

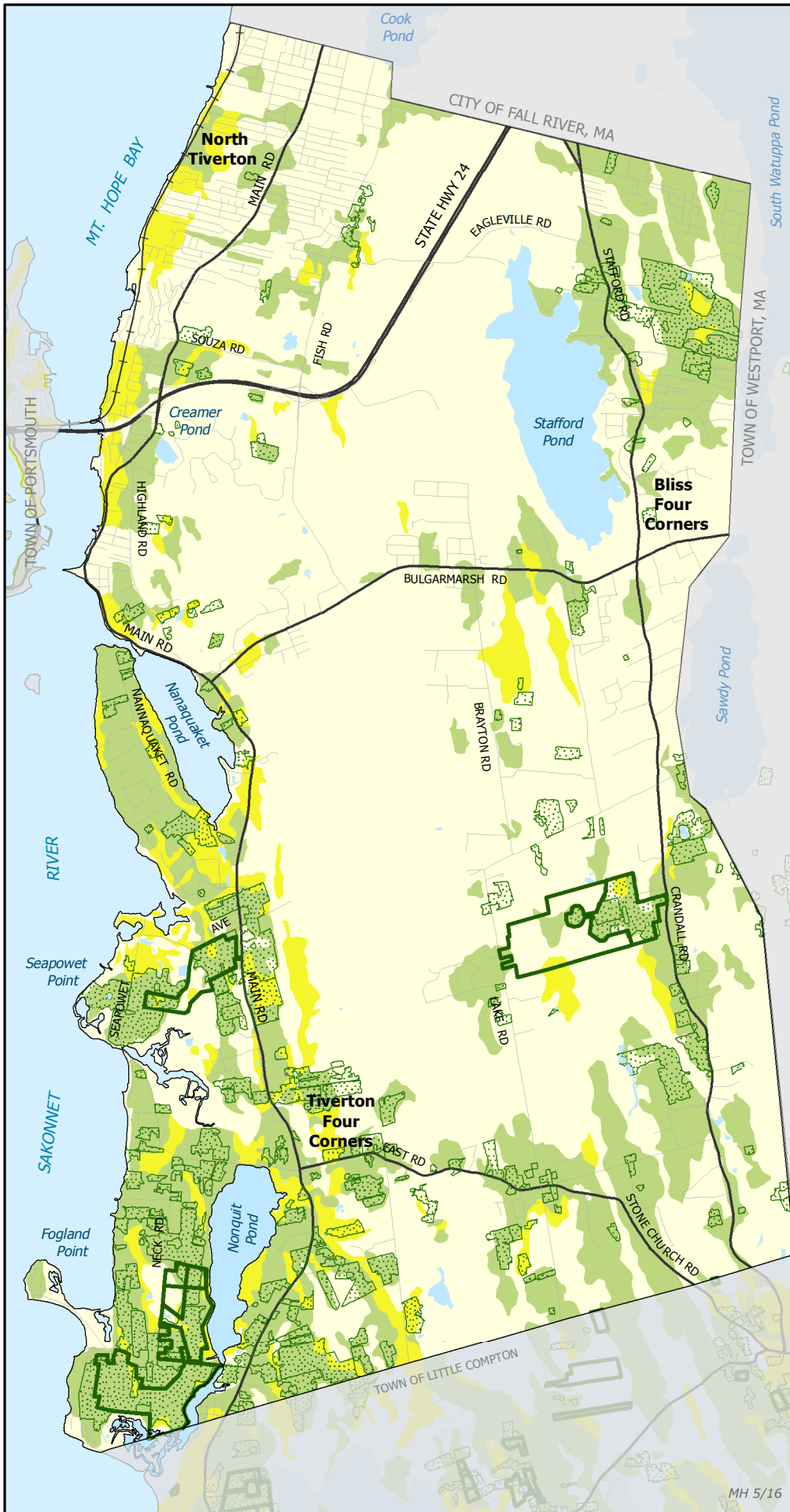
Rural character may be difficult to define, but it is unequivocally clear that the people of Tiverton want to keep it. Rural character is a combination of many "small town" things about Tiverton that makes it charming – its open land, extensive forest cover, scenic views, country lanes, stone walls, historic buildings, farms, wildlife and many other qualities that are associated with "country life" – all the things that disappear in sprawling, unplanned suburban development. But they do not have to disappear if Tiverton is willing to plan and manage its future development. Many tools are available, from administrative actions like zoning and subdivision site plan processes, to volunteer efforts such as land trusts. If these tools are carefully thought-out and implemented, they provide ample opportunity for housing development and economic growth while retaining the town's rural character. In fact, this is not only possible, but studies have shown that such management practices actually enhance rather than inhibit local economies because they ensure a community will continue to be a desirable place to live and work.

Scenic Resources

Tiverton is renowned for its scenic qualities. In 1990, the State of Rhode Island released a landscape inventory of scenic areas throughout the state. Four areas of the town were identified as distinctive or noteworthy. These are Fogland Marsh, Seapowet Marsh, Sin and Flesh Brook and Weetamoo Woods. These areas correspond to the areas identified by the RI Natural Heritage Program as ecologically significant habitat areas, as shown in Figure 4-4. Many roadways in the Town also exhibit scenic qualities worthy of protection. The "Inventory of Rhode Island Roadways with Scenic Character" completed in 1996 for the RI Scenic Roadways Board identified Main Road south of Route 24, Seapowet Avenue, Neck Road, Fogland Road and Pond Bridge Road as all possessing scenic character worthy of designation as state scenic roadways.

Prime Agricultural Land

Farming is a major part of Tiverton's history, and farmland remains an important resource in the town. According to RIGIS there are approximately 4,866 acres of prime agricultural land in Tiverton. Those areas are illustrated in Figure 4-5. Agricultural land is generally well-drained, deep loam soils that are also ideal for building sites. Therefore, there is inevitable pressure to develop on soils that form the best cropland in town. The economic contribution of agricultural lands to the town is discussed in chapter 10.



- PRIME FARMLAND SOILS
- STATEWIDE IMPORTANT FARMLAND SOILS
- AGRICULTURAL LAND USE (2011) -- PASTURE, CROPLAND, ORCHARDS, IDLE FARMLAND, etc.
-
- AGRICULTURAL DEVELOPMENT RIGHTS ACQUIRED
- PONDS, OPEN WATER
- MAJOR ROAD
- MINOR ROAD
- RAILWAY

Sources: RIGIS (2011) Land Use Land Cover, RIDEM (2014) Local and State Conservation Lands data, and RIGIS/USDA Soils 2012.



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TIVERTON COMPREHENSIVE COMMUNITY PLAN
Figure 4-5
CRITICAL FARMLANDS



The State of Rhode Island, through its Agricultural Land Preservation Commission, provides for the purchase of development rights as a means for preserving farmlands. The program is administered by the RIDEM Division of Planning and Development through its Agricultural Land Preservation Program, which provides funding to assist in the purchase of the rights to develop the land residentially, an amount calculated as the difference between the fair market value of land and its value if restricted to agricultural use. The seller continues to hold title to the land, but a covenant is assigned to the property, which restricts the seller and their heirs from any further subdivision or any development other than for agricultural purposes. Additionally, the state’s “Farm, Forest and Open Space Program” allows farmers and other landowners to receive a lower tax assessment on such land, with the resulting tax savings serving as an incentive to keep the land in agricultural use or undeveloped.

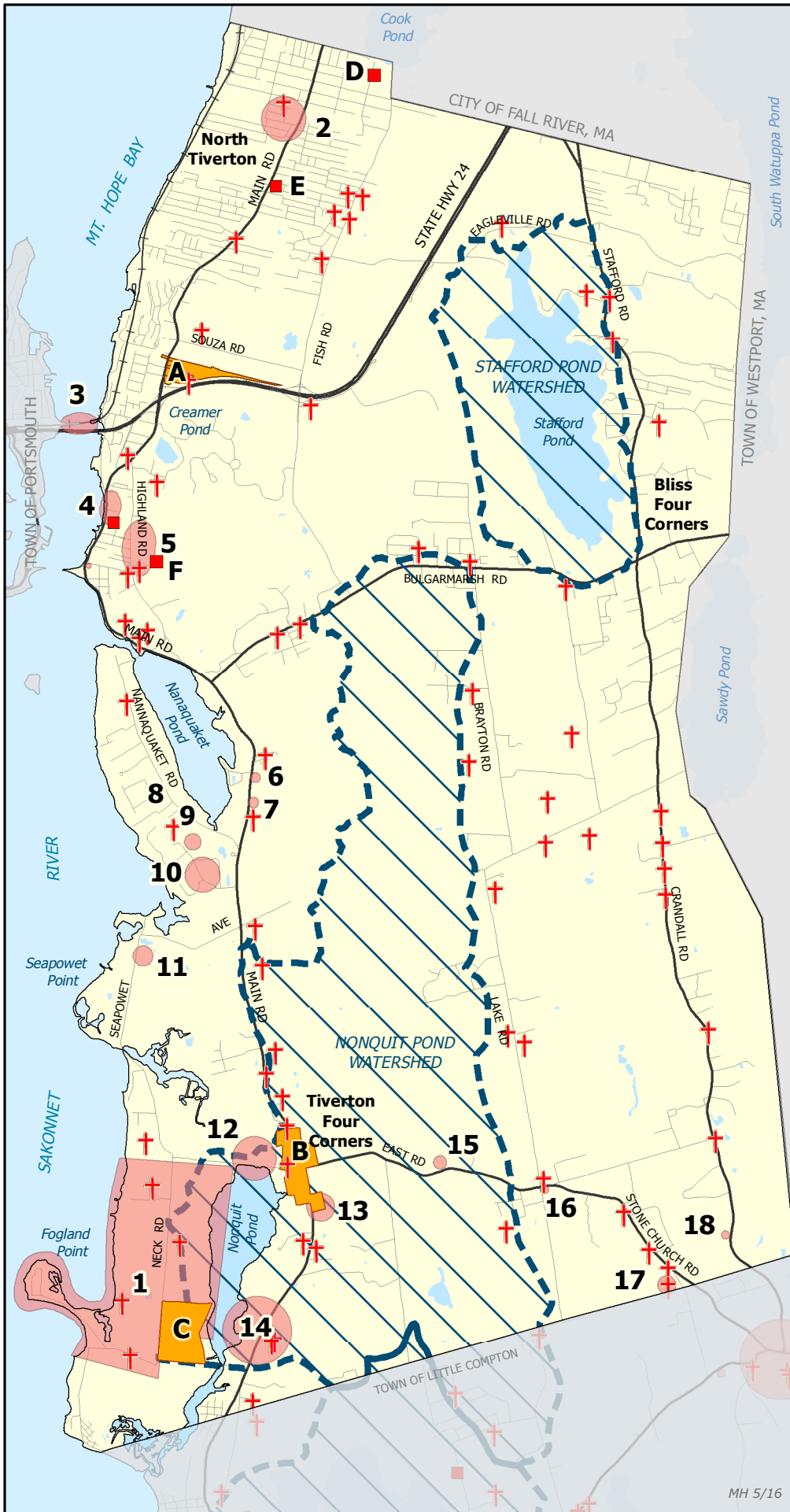
The U.S. Department of Agriculture’s Natural Resources Conservation Service provides additional incentives for landowners who protect and enhance land and water resources. The Wetland Reserve Program, for example, purchases development rights on wetlands, while the Farmland Protection Program, the Conservation Reserve Program and the Forest Legacy Program provide other financial incentives for landowners. More should be done to acquaint landowners with such land preservation programs.

Historic Resources

An inventory of historic and architectural resources prepared by the Rhode Island Historical Preservation and Heritage Commission (RIHPHC) in 1983 identified significant buildings, historic districts and areas, and historic sites in Tiverton. This inventory serves as a basis for prioritizing historic preservation efforts. Figure 4-6 indicates the locations of the resources identified in this survey that are on or eligible for listing on the National Register of Historic Places. These resources are listed in Table 4-1. As of 2016, there are three historic districts formally listed on the National Register: the Tiverton Four Corners Historic District, the Cook-Bateman Farm Historic District, and the Osborne-Bennett Historic District on Main Road, each containing numerous historic structures. There are also two properties individually listed, Fort Barton and the Joseph Hicks House.



The Osborn House is part of Tiverton’s history along Main Road.



SEE FIGURE 4-7 FOR LISTING

- National Register Historic Districts
- National Register District Candidate
- National Register of Historic Places
- + Cemeteries

- SURFACE WATER RESERVOIR WATERSHED
- PONDS, OPEN WATER
- MAJOR ROAD
- MINOR ROAD
- RAILWAY

Sources: RIHPC Historic Buildings & Sites (1995), RIHPC National Register Districts & Candidate Districts (1995, 1992), Historic Cemeteries (2012) courtesy of RIHPC and RIGIS; and Tiverton Planning Department (2014).



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TIVERTON COMPREHENSIVE COMMUNITY PLAN
Figure 4-6
HISTORIC RESOURCES



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TABLE 4-1: Historical and Architectural Resources

<u>Site</u>	<u>Date</u>	<u>Location</u>
National Register Listings		
A. Osborne-Bennett Historic District		
Bennett/Hambly House	c. 1822	<u>Main Road</u> 1137 Main Road
Osborn House	c. 1845	1148 Main Road
Thomas Osborn House	c. 1790	1168 Main Road
Judge Joseph Osborn House	c. 1845	1188 Main Road
B. Tiverton Four Corners Historic District		
Soule-Seabury House	1770, 1809	Main Road/East Road 3852 Main Road
Arnold Smith House	c. 1750, 1820	3895 Main Road
Chase-Cory House	c. 1730	3908 Main Road
Good Templars Hall/Union Library	1867	3832 Main Road
Benjamin F. Seabury House	1840	3842 Main Road
Wilcox-Davol House	1800	3879 Main Road
Andrew P. White Store	1800	3883 Main Road
Pardon Cory House	c. 1850	3920 Main Road
King Cottage	c. 1800	3924 Main Road
Stone Grist Mill	c. 1850	3948 Main Road
Amicable Congregational Church	1832	3804 Main Road
C. Cook-Bateman Farm Historic District	c. 1730	Puncateest Neck Road
D. Fort Barton	1776	Highland Road
E. The Bourne Mill	1881-2	1 Mill Street
F. First Baptist Church	1841	7 Old Stone Church Road
Potential National Register Listings		
1. <u>Puncateest Neck Historic District</u>		
2. Capt. Isaac Church House	c. 1880	Fogland Road/Puncateest Neck Road/Neck Road 1660 Main Road
4. Col. David Durfee House/ Manchester's Home	1826	2698 Main Road
5. William Durfee House	c. 1690, 1768	2794 Main Road
6. Old Durfee Farm	c. 1800	405 Nanaquaket Road
7. Homelands	c. 1760	575 Nanaquaket Road
8. Nathaniel Briggs-Manchester House The Stone House	pre 1777 1919	68 Indian Point Road 43 Penny Pond Road
9. Thomas Gray-Durfee House	pre 1833	432 Seapowet Road
10. Samuel Wilcox House/The Brick Front	pre 1818	200 Neck Road
11. Cory-Hicks-Borden-Gardner -Stevens House	pre 1750, 1856	4100 Main Road
12. Edward Cook House	pre 1815	4340 Main Road
G. Cook Farm	c. 1815	4375 Main Road
White Homestead	c. 1790	4398 Main Road
13. Abraham Manchester House	c. 1780	733 East Road
14. Baker House	c. 1700	1975 Crandall Road
15. Job Gray Horse	1700's	2930 Main Road
16. Almy Farm	1700's	1013 Seapowet Road
17. William Whitridge House	c. 1770	285 Stone Church Road

Source: RI Historical Preservation Commission.

A preliminary archaeological survey by RIHPHC determined that Tiverton is also potentially one of the richest archaeological regions in New England. Its shallow coastal waters and protected upland areas have been home to Native American cultures for thousands of years. The survey resulted in a proposed "Seapowet Archaeological National Register District."

4.4 Natural and Cultural Resources Goal and Objectives

Goal: Preserve and protect the natural features and unique cultural qualities that contribute to the special character, identity, heritage and environmental quality of Tiverton.

Objectives

- Protect the rural character of the community, including working farms, woodlands, the rural landscape and scenic coastline.
- Protect those natural features that sustain the basic functions of the town, including high air quality, surface and groundwater, wetlands and coastal features.
- Preserve biological diversity and integrity through protection and management of state and federally-listed rare species habitat areas and ecologically significant natural communities, and through public education.
- Protect the environment from potential sources of contamination.
- Preserve and enhance the visual quality of the community and its natural beauty.
- Preserve the historic and architectural features and the special areas of the community that contribute to its unique character.



The Old Stone Church

4.5 Natural and Cultural Resource Policies

Rural Character

Action 1: Continue an active program of land acquisition to protect open space and rural character using the selection criteria described in Chapter 9.

Despite areas of urban and suburban development, Tiverton has a strong identity as a rural community. Newcomers and old-timers alike cherish its small town atmosphere and rural setting. Yet there is a delicate balance between the preservation of these qualities and the pressure for growth and change. An active program to identify those areas that should be preserved, and incorporates available conservation techniques, continues to be needed despite the progress made by the Tiverton Open Space Commission and the Tiverton Land Trust in protecting individual parcels of land.

Action 2: Identify and develop an awareness and appreciation of elements of the rural character, such as farms, barns, open fields, stonewalls, mature trees, tree rows, and treed neighborhoods.

Protection of the town's rural character goes beyond aesthetic qualities. It is inextricably linked to other objectives such as protecting water quality, preventing environmental degradation and preserving agriculture. The rural character of Tiverton is defined by the following elements: agricultural activities; wetlands, coastal ridges and other natural features; woodlots; large open fields; stonewalls, barns, silos and other structures; clustered buildings separated by large areas of open space; and similar features. Each of these landscape features requires a degree of recognition and protection as key values of Tiverton.

Action 3: The Planning Board should work with developers to promote rural residential developments as the preferred type of development pattern, particularly in the town's less developed areas. Further, the Planning Board should adopt regulations enabling the services of professional design consultants to review Master Plans at the expense of the developer and assure consistency with the state's Low Impact Development goals. (See Policies 5, 6 & 7).

Conventional development regulations, originating in urban settings, are poorly equipped to protect these values. Large lot zoning, as in the R-60 and R-80 districts, while effective in producing large lots, does not necessarily protect rural character as defined above. A combination of techniques to regulate uses, densities and site design are essential (See Figure 4-7)

Rural residential development, a concept that uses Low Impact Development (LID), provides for the evaluation and protection of the character defining features of a site as part of the development process. As an alternative to conventional subdivisions, rural residential developments incorporate conservation design techniques that protect important features through use of flexible zoning, different engineering and design standards, and in some cases, reduced site density. Amendments to the zoning ordinance in 2001 followed by those to the subdivision regulations in 2003 authorize alternative development plans in the form of rural residential developments in place of

conventional subdivisions. Rural residential developments are mandated within the Watershed Protection Overlay Districts.

Action 4: Promote local stewardship of the town’s tree resources utilizing the Plan for Urban and Community Forestry (State Guide Plan Element 156, May 1999) and continue to require protection of significant trees and to specify replacement trees for new developments and subdivisions.

Protection of the town’s tree resources has aesthetic and scenic value. By enhancing property values and lessening the impacts of residential development, it has a sustainable economic benefit as well. In 2001, the Tree Commission, the Conservation Commission and the Open Space Commission endorsed a Notable Tree Program to identify and record rare and unusual trees and trees of significant age, size, and visual appeal. In 2002, the Tree Commission established a Tiverton Neighborhood Tree Program to provide a permanent source of resources for street tree planting throughout the town.

Action 5: Minimize the impacts of development to natural features and pre-development hydrology by incorporating into Tiverton’s Major Land Development and Subdivision Regulations key provisions of the RI Low Impact Development Site Planning and Design Guidance Manual.

Tiverton is committed to advancing the State’s Low Impact Development (LID) goals. As construction occurs, it is essential to protect as much undisturbed open space as possible. This helps maintain pre-development hydrology that allows precipitation to recharge ground water reserves. Equally important is to maximize the protection of natural drainage areas, streams, surface waters, wetlands and jurisdictional wetland buffers. In addition, land disturbance, such as clearing, grading and blasting of ridges and other natural features, should be minimized to maintain the town’s distinctive topography and avoid erosion. Finally, soil compaction as a result of construction activities or prior development should be minimized.

In 2011, RI Department of Environmental Management and the Coastal Resources Management Council drafted the Rhode Island Low Impact Development Site Planning and Design Guidance Manual. This manual provides developers and municipal planers with guidelines designed to implement the goals of LID.

Action 6: Amend Tiverton’s Major Land Development and Subdivision Regulations with language from the RI Low Impact Development Site Planning and Design Guidance Manual to assure that land alterations minimize high impacts such as excessive impervious cover, destruction of natural features and the use of inappropriate, high-maintenance vegetation.

An important goal of LID is to decrease storm water volume, increase ground water recharge and minimize pollutant loadings from a site. This can be achieved by minimizing impervious cover, leaving natural features undisturbed, and utilizing low-maintenance, native vegetation that encourages water retention and minimizes the need for lawn and garden chemicals.

Action 7: Manage the impacts of construction development at the source to minimize pollution to surface and groundwater.

Another principle of LID is to manage the impacts of construction activities at the source. Examples of this technique would be to:

- (a) Filter precipitation near to the point it reaches the ground using vegetated conveyance and treatment systems,
- (b) Breaking up or disconnecting the flow of runoff over impervious surfaces,
- (c) Providing source controls to minimize pollutants in storm water, and d. re-vegetating previously cleared areas to help restore groundwater recharge and pollutant removal.

Visual Quality

Action 8: Establish written design standards to assist developers in adopting architectural designs for new commercial and mixed use development compatible with the town's historic and rural character.

A great number of things make Tiverton a wonderful place to see, including beautiful landscapes, old buildings and some attractive newer developments. There should be aesthetic standards for commercial areas to encourage the creation of safe, attractive and efficient centers, rather than unsightly strips. The town has general standards for signage and the siting of development within commercial zones. These standards should be reviewed on a district-by-district basis. Additional design guidelines for commercial, mixed use, and major residential developments governing signs, lighting, utility wires, landscaping, buffering, parking and the architectural style and design of development were included in amendments to the subdivision regulations in 2003. In 2005 the town initiated a design standards project to set more detailed building and site design criteria for new development in all commercial districts in town.

Action 9: Adopt specific design standards for Tiverton Four Corners based on the Secretary of the Interior's 'Standards for the Treatment of Historic Properties' and the RIHPHC's 'Easy Guide to Rehab Standards'.

Because of the special historic qualities of the area, the local commercial district around Tiverton Four Corners merits special consideration. The 2001 zoning revisions established a Village Commercial District for the Four Corners area. The name 'Village Commercial' does not recognize or appreciate the significance of the federal and state designation of the entire neighborhood as the 'National Register Tiverton Four Corners Historic District'. Additionally, written design guidelines for this area should be prepared with emphasis on architectural compatibility with the existing historic fabric and with pedestrian amenities, lighting, utility wires and signage.

Action 10: Continue to identify natural and scenic vistas and apply standards for their protection as part of the Planning Board's development review process.



New development in Four Corners should complement its historic character

Surface Water and Groundwater Supply

Action 11: Establish procedures to identify parcels of land that may contain significant sources of surface or groundwater pollutants and that might violate local, state and/or federal regulations.

Underground storage tanks (USTs) containing petroleum products and other hazardous materials pose a threat to surface and groundwater supplies. Most of these tanks are constructed of steel, with no corrosion protection. Currently, the town prohibits new USTs and requires homeowners to register all existing USTs on their property. Federal law (Resource Conservation and Recovery Act, as amended) regulates commercial USTs.

Tiverton should determine the location of abandoned USTs that may be sources of pollution, and establish a program for their clean-up, removal and sealing. In addition, the town should identify potential sources of pollution from gas stations and private pumps by maintaining current maps monitoring their locations. The RIDEM lists approximately 90 registered and regulated USTs at 30 locations in Tiverton. Figure 4-8 identifies locations of USTs that have experienced leaks and other hazardous sites as identified by RIDEM. Tough federal regulations (40 CFR 280-282) impose new construction, monitoring and reporting requirements on regulated USTs, and mandate specific remedial action if spills/releases occur. The town currently issues an annual operating license to commercial UST operators, but should require documentation that operators are meeting all federal and state requirements as a condition for receiving an annual license.

The shipment of hazardous materials through Tiverton and the common disposal of household hazardous wastes are other potential sources of pollution that can injure soil and water resources. Also problematical is the large number of decaying motor vehicles on both residential and business property. As these vehicles rust and decay, harmful substances are released into surface and groundwater.

Action 12: Tiverton should review and update Earth Removal regulations, designed to protect groundwater, assure public safety and curb dust, noise and vibration caused by blasting.

Earth removal operations that involve quarrying of sand and gravel and the blasting of granite and other hard rock formations pose serious risks to groundwater quality and quantity. The Ordinances of the Town of Tiverton's Chapter 38, Article III 'Earth Removal', adopted in 2010 build upon and improve zoning language, adopted in 2001. However, additional measures may be needed.

Stafford Pond

Action 13a: Establish a Stafford Pond Watershed Association that includes representatives of the water districts, town boards and commissions, residents and business people which have an interest in the watershed.

Action 13b: Work together with RIDEM, RIDOT and the Stone Bridge Water District to develop and implement a plan for recreational usage that protects and ensures Stafford Pond's long term viability as a drinking water source.

Action 13c: The Tiverton Open Space Commission (TOSC) should investigate the legal and financial feasibility of acquiring developed parcels in the Stafford Pond watershed. The TOSC, working proactively with the Tiverton Land Trust and the R.I. Chapter of The Nature Conservancy, should develop policies that place a higher priority on the acquisition of land in the Stafford Pond watershed in order to protect the pond's water quality.

The protection of the Stafford Pond watershed is particularly urgent since the pond is the town's principal supply of public drinking water, as distributed by the town's two water districts (see Chapter 7). The establishment of a citizen watchdog group for that watershed area could be particularly effective in monitoring activities which would impact water quality and educate citizens about the need for watershed protection. This group could also guide the development of a management plan for the Stafford Pond watershed. In addition, while the pond benefits from the restrictions contained in the Watershed Protection Overlay District and the use of best management practices at an abutting dairy farm and the Stafford Road storm water drain, the continued use of gasoline motors on the pond is detrimental.

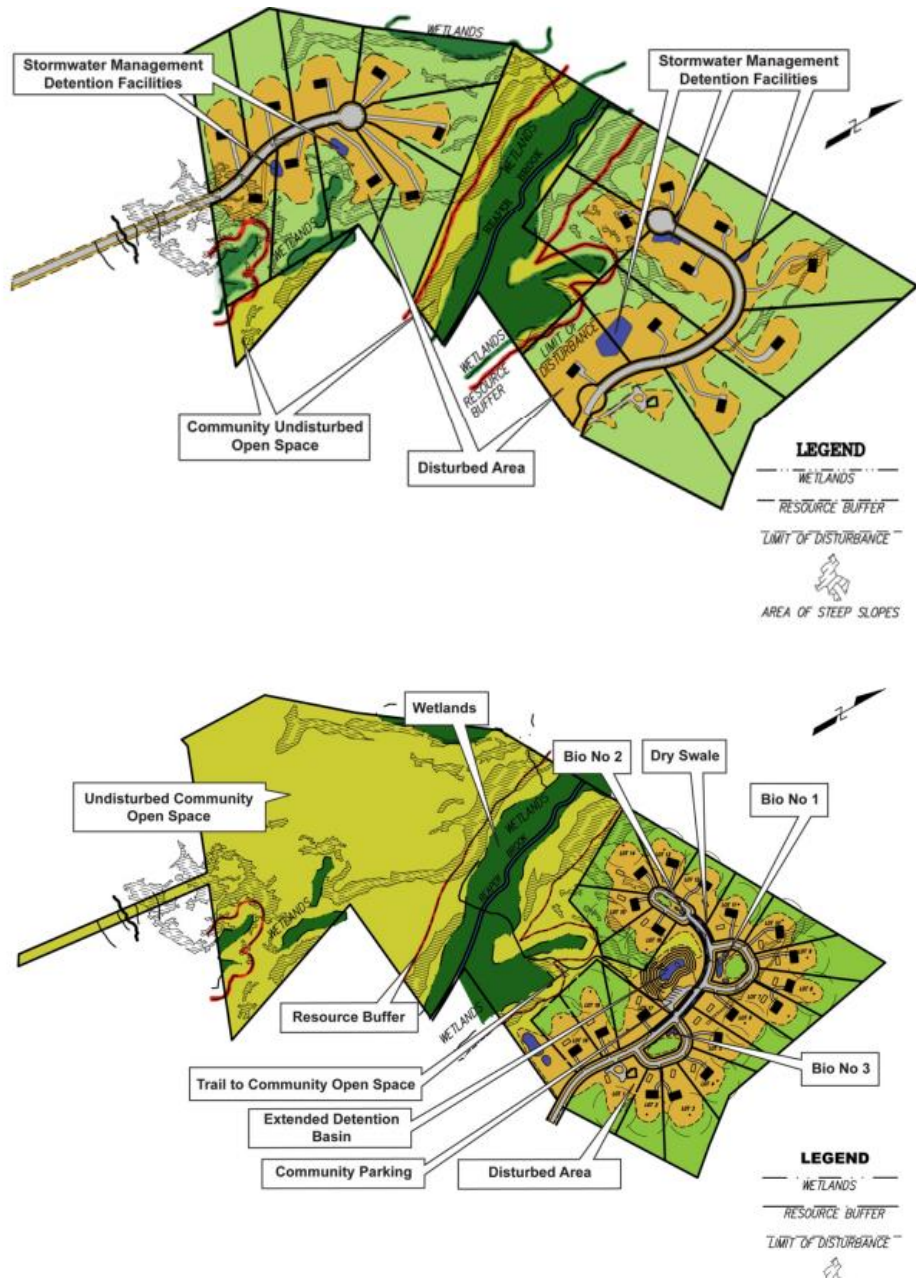
Some progress is being made to buy and preserve undeveloped parcels in Stafford Pond's watershed. However, developed parcels that abut the shoreline also contribute to water pollution. Unlike all other drinking water reservoirs in the state, Stafford Pond's east shore has numerous

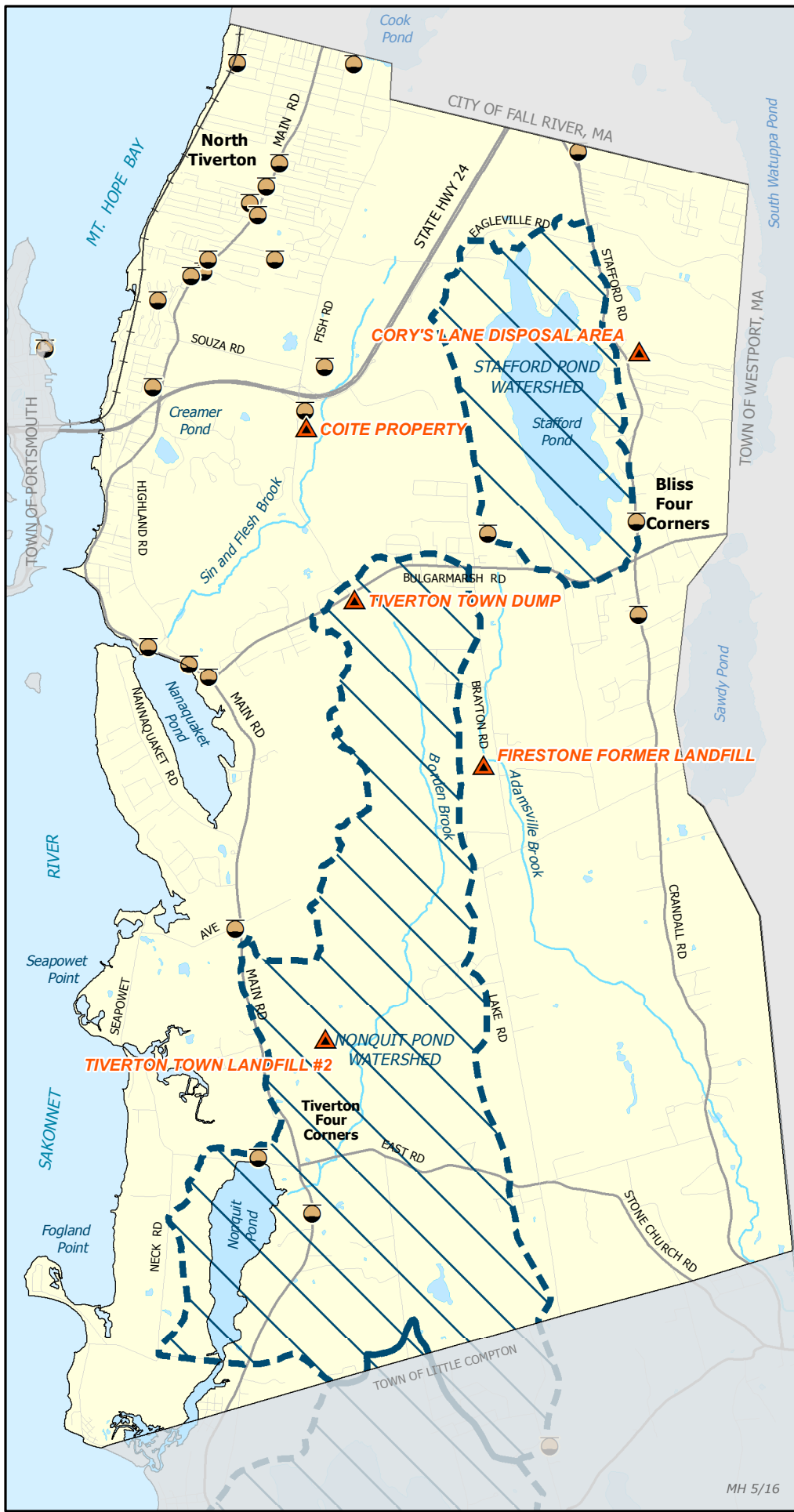
year-round and seasonal residences that pose the threat of polluted storm water run-off, pollution from failed septic systems and pollution from human recreational uses. This threat could be gradually reduced over time by a concerted program of buying shoreline parcels, removing buildings, paved areas and septic systems and returning the land to a natural state.



Stafford Pond, the town's principal public drinking water source

Figure 4-7: Site Design: Conventional versus Conservation





APPROXIMATE LOCATION OF HAZARDOUS MATERIAL SITES DESIGNATED BY THE U.S. EPA and RIDEM

UNDERGROUND STORAGE TANKS USED FOR PETROLEUM & CERTAIN HAZARDOUS SUBSTANCES THAT HAVE EXPERIENCED LEAKS AS DETERMINED BY RIDEM.

SURFACE WATER RESERVOIR WATERSHED

MAJOR STREAMS

PONDS, OPEN WATER

MAJOR ROAD

MINOR ROAD

RAILWAY

Source: RIGIS (2013) LEAKING UNDERGROUND TANKS IN RHODE ISLAND. RIGIS (1997) CERCLIS POTENTIAL HAZARDOUS WASTE SITES IN RHODE ISLAND. TOWN OF TIVERTON (2015).



Disclaimer: This map is not the product of a Professional Land Survey. It was created by Mapping and Planning Services for general reference, informational, planning and guidance use, and is not a legally authoritative source as to the location of natural or manmade features. Proper interpretation of this map may require the assistance of appropriate professional services. The Town of Tiverton or MPS makes no warranty, express or implied, related to the spatial accuracy, reliability, completeness, or currentness of this map.

TIVERTON COMPREHENSIVE COMMUNITY PLAN
Figure 4-8
HAZARDOUS SITES

MH 5/16

Nonquit Pond

Action 14: Continue to monitor potential leachate contamination from the Tiverton landfill.

The City of Newport, which owns the water rights to Nonquit Pond, has worked in conjunction with the RIDEM and the town to protect the watershed through the acquisition of land. These efforts were reinforced when the Watershed Protection Overlay District was extended to the Nonquit Pond watershed as part of town-wide zoning amendments adopted in 2001.

However, the Tiverton landfill is located within the Nonquit Pond watershed, and Borden Brook, which feeds Nonquit Pond, also drains from the landfill. There is clearly potential for contamination by leachate from the landfill. In 2001, the Town Council established a Landfill Committee to monitor possible leachate contamination of Cedar Swamp, Nonquit Pond and private drinking water wells in the area. New monitoring wells have been built and both groundwater and surface water testing has been intensified. Control measures to curb both leachate and surface water runoff through contouring and a new retention pond are being implemented. Engineering analysis has determined that the landfill will reach capacity at about the year 2017, at which point it must be closed and capped.

It should be noted that measures designed to protect Nonquit Pond's water quality also benefit the water quality of drinking water wells which serve the needs of south Tiverton residents.

Action 15: Utilize the services of URI Cooperative Extension to update and improve regulatory requirements in the Zoning Ordinance Article VIII Watershed Protection Overlay Districts.

Tiverton is blessed with an abundance of source water capable of human consumption. But prudent steps must be taken now to assure potable water quality in both ponds ten and twenty years from now when drinking water will be an even more precious commodity than it is at present.

Wetlands

Action 16: Preserve wetlands to protect groundwater recharge areas, control flooding and preserve wildlife habitats by ensuring compliance with the Rhode Island Freshwater Wetlands Act. Consider additional regulatory measures to protect freshwater wetlands and jurisdictional wetland buffers, consistent with state enabling legislation.

The vast inland and coastal wetlands of the town serve essential functions for water quality such as providing groundwater recharging areas and wildlife habitat. They also assist in flood control as storage areas, and act as giant sponges that slow the velocity of storm water runoff.

The RI Department of Environmental Management has responsibility for the identification of wetlands, the determination of their significance and the regulation of activities that would lead to

their decline. An ongoing program to monitor potential infractions of wetlands should be conducted at the local level. Zoning regulations adopted in 2001 require a minimum building area that excludes wetlands and other means to protect these vital natural resources.

Coastal Features

Action 17: Update the Harbor Management Plan as necessary to ensure protection of environmentally sensitive areas, as required by the CRMC.

There are three components to the Tiverton coastline - the harbor area around the Tiverton Basin, the scenic coastline to the north and south, and the coastal environmental features at Fogland and Seapowet Marshes. Each of these areas requires a different treatment.

The harbor area is Tiverton's working waterfront and is important to the town's economy. It is regulated in accordance with an approved and periodically revised Harbor Management Plan. This plan covers the operation of the Harbormaster's Department, which controls mooring assignment and fee collection, as well as oversight of the Harbor Patrol, which is responsible for boating safety and rescue missions. The Harbor Management Plan, which balances marine uses with protection of the ecosystem, must be approved when amended, by the RI Coastal Resources Management Council (CRMC).

Action 18: Consider standards for the protection of coastal scenic views as part of the Planning Board's subdivision review process.

Tiverton's scenic coastline contains unique features and vantage points that add to the town's waterfront character. Views from the coastline and from the water to the coastline are important assets that merit preservation. Key vantage points should be identified. Siting of structures along the coastline should consider the impact on coastal views, and the siting of facilities within environmentally sensitive areas of the coast should consider their impact on the area's natural and scenic qualities.



Tiverton is known for its coastal scenery

Environmental Quality

Action 19: Enact and enforce the proposed amendments to the Soil Erosion and Sediment Control Ordinance as recommended in the Phase II Stormwater Management Plan. Adopt procedures in the Major Land Development and Subdivision Regulations to assure compliance with the Rhode Island Soil Erosion and Sediment Control Handbook and the RI Stormwater Design & Installation Standards Manual, which went into effect January 1, 2011.

The State of Rhode Island has promulgated standards for the abatement and control of soil erosion and runoff of sediments from construction sites. These standards, found in the RI Soil Erosion and Sediment Control Handbook and the RI Stormwater Design and Installation Standards Manual, are an important resource for review procedures, and serve as a starting point for technical guidelines for applicable construction operations, and for sand and gravel site operations and re-stabilization. Tiverton currently has a stringent soil erosion and sediment control ordinance written in accordance with state guidelines. The Phase II Storm Water Management Plan, adopted by Town Council in 2003, calls for amendments to the Soil Erosion and Sediment Control Ordinance.

Historical and Archeological Resources

Action 20: The Historical Preservation Advisory Board should consider policies and programs to encourage the preservation of historic buildings consistent with the Secretary of the Interior's Standards for the Treatment of Historic Properties as interpreted by RIHPHC's Easy Guide to Rehab Standards.

With nearly 100 structures either on or potential candidates for the National Register of Historic Places, the wealth of historic buildings and structures in Tiverton is notable. These resources strongly influence the character of broad areas of the town, such as Stone Bridge, Bridgeport, Nanaquaket and Punkateest. Yet the town has suffered the demolition of many significant structures in recent years. Demolition, alteration and new construction all have the ability to radically alter the qualities of the community that attract residents and visitors alike. The town's historical resources are not as well documented as they should be. The state survey is not current and many properties eligible for the State and National Register listing have not been listed. Better documentation is needed. This service could be a charge of a local Historical Preservation Advisory Board.

Rhode Island law (Chapter 24.1) provides for historical area protection. Although an historic zoning ordinance was rejected in the early 1990s, the town should reflect upon the reasons for defeat and continue to search for ways to encourage the preservation of its historic treasures in the absence of implementing historic district zoning. These steps may include ongoing education regarding the value of historical structures.

The Tiverton Historical Preservation Advisory Board was established by Town Council in 2010. It is a voluntary program to advise and assist property owners on historic preservation matters, and to create community awareness of the benefits of preservation. This board should also coordinate

efforts regarding the proposed Seapowet Archaeological National Register District with the RI Historical Preservation and Heritage Commission.

Action 21: Solicit assistance from the Rhode Island Historical Preservation and Heritage Commission to acquire funds to study the origins of the Eight Rod Way archeological remains and develop a protection strategy that correlates with the open space preservation effort described in Chapter 9.

In the original plat of the great lots that comprised the chartered town plan for the Pocasset Purchase in 1680, an Eight Rod Highway was laid out as the eastern boundary. Down through history, however, the town grew in different directions, with other roadways becoming more frequented thoroughfares. That portion of the original Eight Rod Highway between Bulgarmarsh Road and East Road ceased to be used and became overgrown by forest. However, there are considerable archeological remains, including stone walls, cellar holes and dug wells. These remains could represent an extremely valuable link to the original settlement history of the town, and as such should be studied and preserved.

Action 22: The Historical Preservation Advisory Board should undertake an initiative to locate and secure copies of colonial era land evidence records that are presently located outside of Tiverton.

The research that is needed to reconstruct the Town's colonial history, particularly with regard to settlements along Eight Rod Way, is severely hampered because of the absence of Town land evidence records prior to the mid-18th century. This reflects the era when Tiverton was part of Plymouth, then the Massachusetts Bay Colony, where Tiverton land evidence records from that time were filed. Unfortunately, those records were never transferred, nor systematically copied and filed in the Tiverton Town Clerk archives. This void hampers not only historical research, but also legal research associated with deeds, titles and surveys.



Eight Rod Way, a link to Tiverton's early history