Little Compton
Water Quality and Aquatic Habitat Management Plan

August 2022

(Note: The Plan excludes the Watson Reservoir Watershed)

********** Draft**********

Simmons Pond, Photo Credit: Buzzards Bay Coalition

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RI Department of Environmental Management

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I. Introduction

The Town of Little Compton's water resources are some of the town's most valuable natural resources. The purpose of this plan is to protect and restore the water quality, both surface water and groundwater, and aquatic habitats in Little Compton. Protecting these resources is critical for the health and welfare of the town.

This plan will address all of the water resources in Little Compton with the exception of the Watson Reservoir watershed, for which a watershed plan has already been prepared. The plan will provide an overview of the water resources and aquatic habitats in this planning area, threats to these resources and a plan of action to address these threats.

The plan provides an opportunity to:

- Identify and prioritize water quality issues within the town;
- Collaborate across all levels of the public and private sectors to determine and implement actions that are supported by sound science;
- Compile actions into one unifying and integrated vision and action plan for the protection and restoration of water quality and aquatic habitat in the town; and
- Identify partners and stakeholders.

Although Little Compton's water resources are of very high quality overall, several waterbodies in the planning area, however, have elevated pollutant levels resulting in these waterbodies being designated as "impaired" by the RIDEM, which means that the water quality does not meet its standards as an aquatic habitat or as use for recreation. Pachet Brook, Dundery Brook, Cold Brook, and East of Cold Brook tributaries have high bacteria levels and Round Pond has high levels of phosphorus.

This plan is consistent with the Little Compton Comprehensive Plan, which establishes important local goals, policies, and action items to protect and improve water quality. Natural resource goals from the Little Compton Comprehensive Plan include:

- Goal NR1. Protect water quality by reducing or eliminating existing and potential groundwater and surface water contaminants.
- Goal NR2. Ensure that onsite wastewater treatment systems (OWTS) in the community work properly and do not threaten public health, local water resources, or the environment.

Furthermore, this plan will enable the Town to be eligible for US Environmental Protection Agency, Section 319 Nonpoint Source funds that are administered by DEM for projects within the planning area.

II. Planning Area Description

As noted above, the plan will address all of Little Compton, except for the Watson Reservoir watershed, since a plan was previously developed for this Newport Water System drinking water supply. This plan will address the remaining portions of Little Compton that fall within two US Geological Society (USGS) watersheds that are defined by USGS 12-digit hydrologic unit codes (HUC 12) (See Figure 1):

- Sakonnet River (HUC 12 – 010900040910)
- RI Sound-Richmond Pond to Sakonnet Pt. (HUC 12 – 010900020503). This watershed will be referred to herein as the "RI Sound" watershed.

Typically, water management plans are prepared on a watershed basis, such as with the Watson Reservoir. However, the areas addressed in this plan are not "typical" watersheds where all water that drains off of it or moves through the subsurface goes to the same waterbody with one outlet (as is the case with Watson Reservoir). Both of these are coastal watersheds draining to large bodies of water with tidal flushing and wherein the waters drain to multiple points along the shore. Therefore, because of the nature of these coastal watersheds and the fact that the water quality and aquatic habitat concerns are similar throughout Little Compton, it was determined to be appropriate to prepare this plan solely for the town of Little Compton.

A. Surface Waters - Overview

Major Waterbodies:

- Freshwater Ponds: Round Pond, Long Pond, Tunipus Pond, Simmons Pond
- Saltwater Ponds: Briggs Marsh Pond, Quicksand Pond
- Major Streams and Tributaries: Dundery Brook, Sisson Brook, Cold Brook
- Marine Waters: Sakonnet River, Sakonnet Harbor, Atlantic Ocean

Freshwater Public Access (There are no DEM or Town boat ramps):

- Tunipus Pond—Access at end of South Shore Road
- Simmons Pond -- Cold Brook has a small boating access point (for kayaks, canoes) in the DEM Simmons Mill Pond Management Area at the Coldbrook Rd Bridge.

Cold Water Streams

- Cold water streams are those used by certain fish (e.g., trout) that must have lower temperatures to survive and reproduce. Of the 30.7 river miles in the planning area:
    - Cold water river miles – 12.5
    - Warm water river miles – 6.1
    - Unassessed river miles – 12.1

Figure 1. Little Compton Planning Area Watersheds

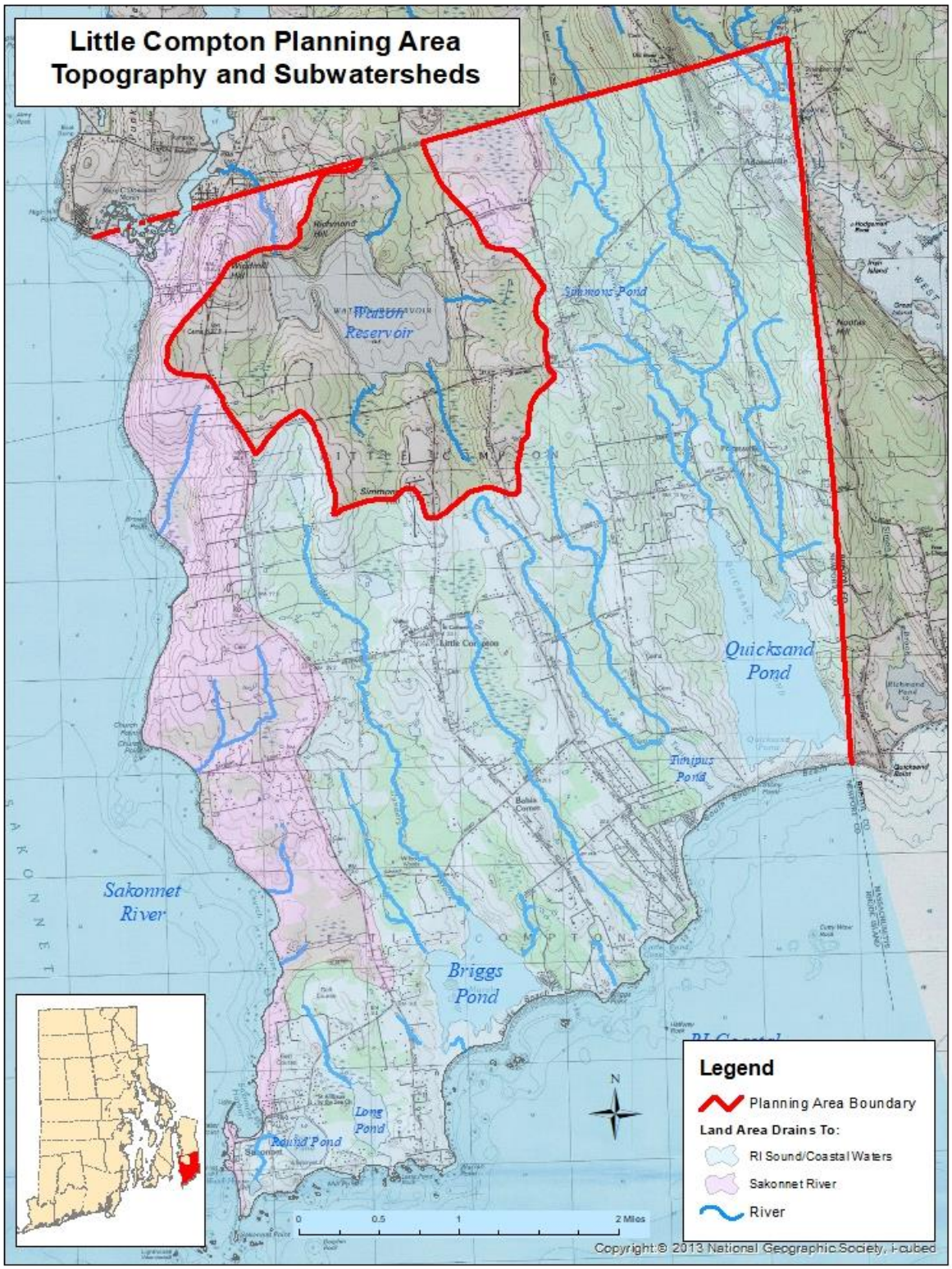
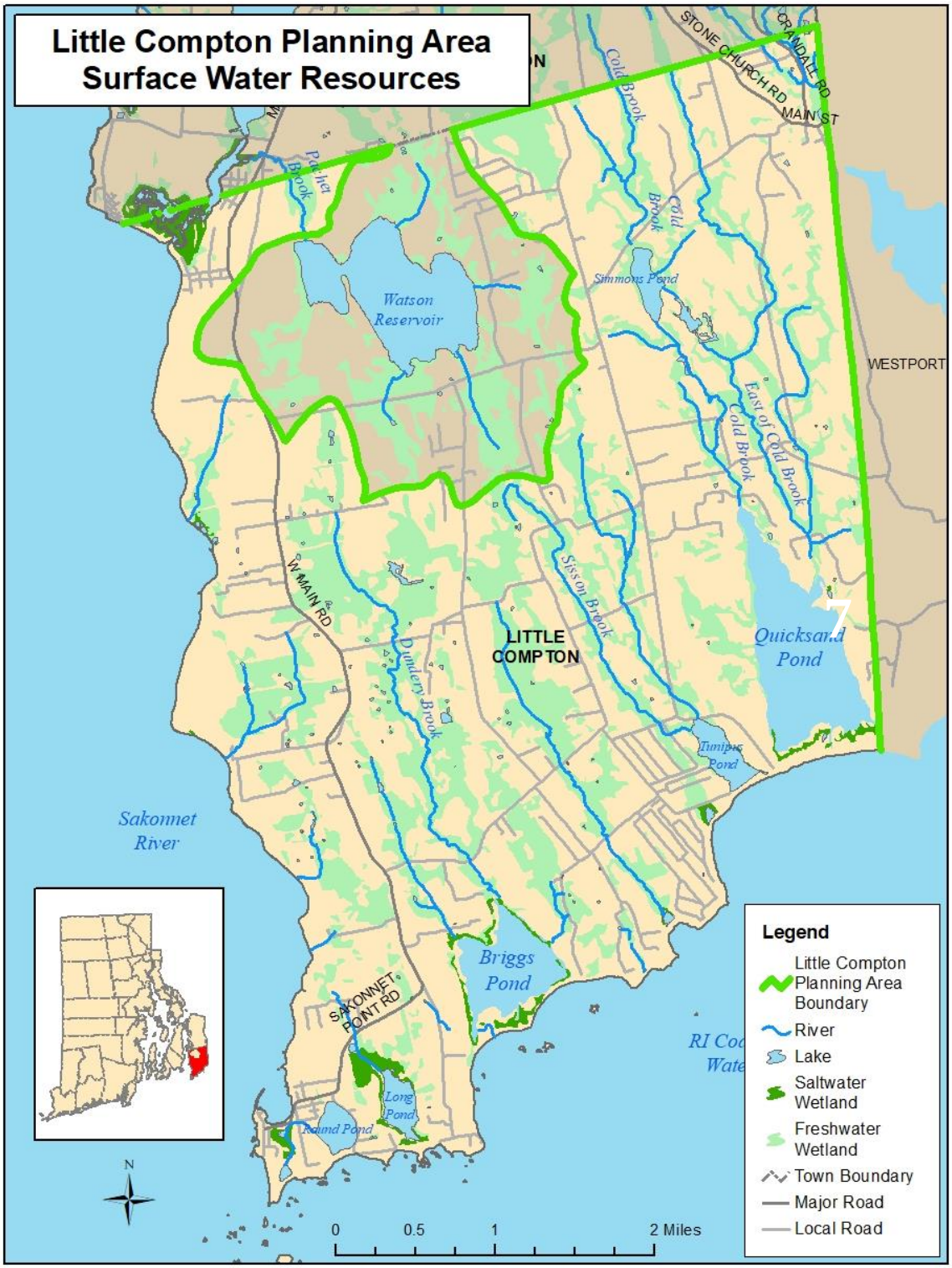


Figure 2. Surface Water Resources



B. Drinking Water Supply -- Groundwater

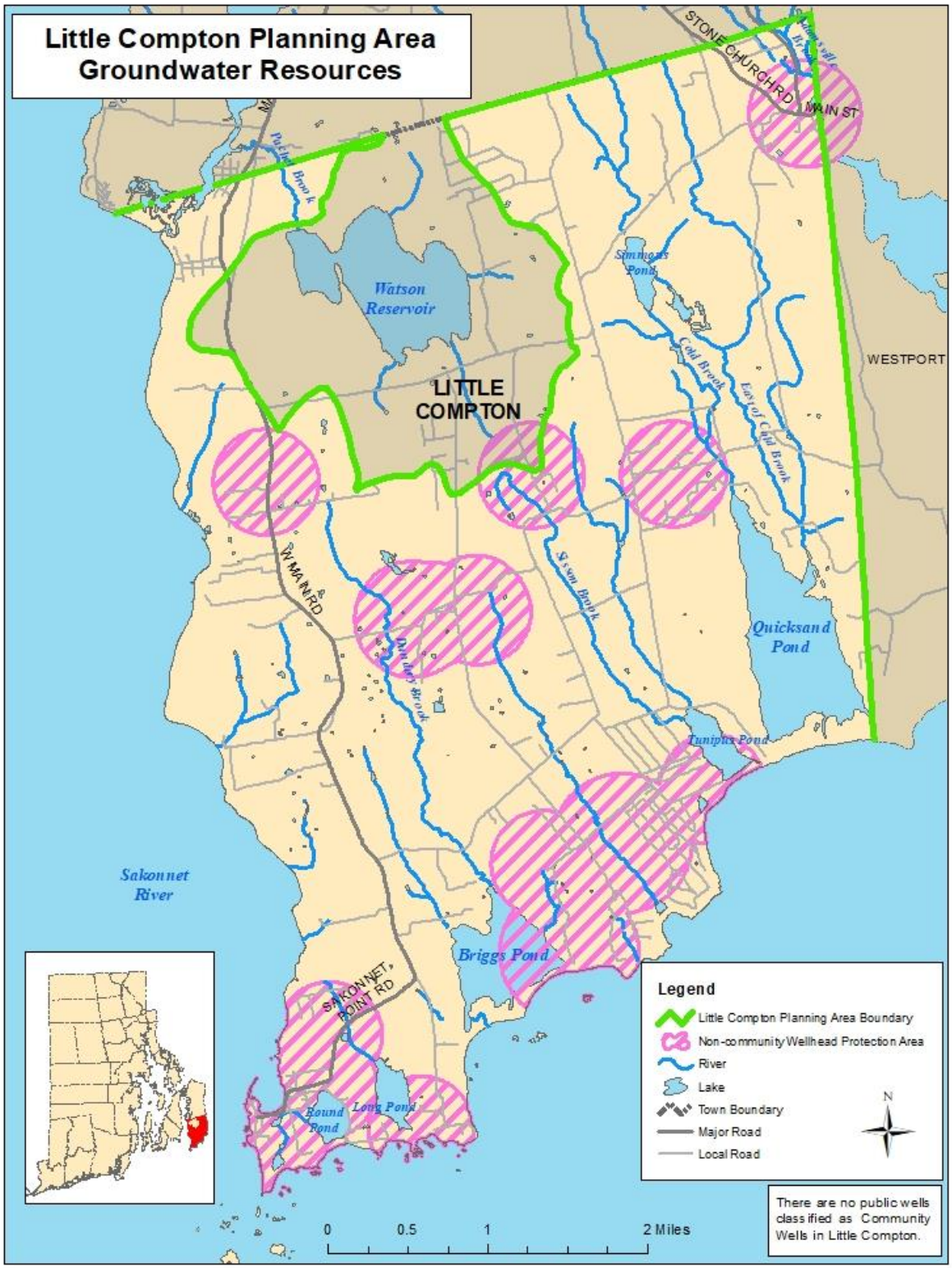
Groundwater and surface water are closely interconnected. Groundwater is recharged by precipitation that filters down through the soils and then moves underground to lower places in the landscape. At some point, the groundwater will discharge to a stream, pond, wetland, or coastal waters. Any pollutants in the groundwater are thus delivered to the surface water. During dry periods, it is the groundwater that makes up the flow in the streams.

All residents and businesses in Little Compton rely on groundwater for their drinking water. Because there are no sand and gravel high yielding aquifers in Little Compton, all of the public wells and most of the private drinking water wells take water from the bedrock aquifer. All of the year-round residents in Little Compton rely on private wells for all domestic water purposes. The water quality of private wells is protected by numerous state regulatory programs, however, individual homeowners are responsible for maintaining and monitoring their private wells.

There are 20 public drinking wells serving 17 non-community water supply systems in Little Compton. "Public" water suppliers are those systems that are monitored by the RI Department of Health (RIDOH) to ensure they provide safe drinking water, and which have at least 15 service connections or regularly serve an average of at least 25 individuals daily at least sixty days out of a year. These wells in Little Compton are all classified as "non-community" public water supplies as they do not serve year-round residents. Non-community water systems serve entities such as schools, restaurants, businesses, hotels, and seasonal beach houses. The distinction between a community and non-community well determines the types and frequency of well testing required by the RIDOH.

DEM has defined a circular wellhead protection area for each of these bedrock wells (see Figure 3). The wellhead protection area is that area through which groundwater is likely to flow towards the well. Because of the unknown nature of the bedrock fractures that the wells intercept, a circular area based on the pumping rate is the best representation at this time.

Figure 3. Groundwater Resources



C. Land Cover

How land is used has a direct effect on water quality. Each type of land use tends to have a telltale mix of pollutants. Stormwater runoff carries these pollutants into nearby waterbodies. In a relatively undeveloped watershed, there is less activity with less pollutants generated and there is less runoff from paved surfaces. As watersheds become more developed with commercial, residential, agricultural, and industrial land uses, the amount of pollutant sources and stormwater runoff increases. The more intensive the land use or disruption of soils, the more opportunity for pollution to be generated and the easier it is to enter our waterbodies and wetlands.

The Little Compton planning area comprises approximately 12,187 acres. 48% of this land is undeveloped forests and wetlands. Agricultural land uses (pastures, croplands, orchards, etc.) cover 23% of the planning area. Residential land uses of mostly low density cover 19%. (See Figures 4 and 5.)

Figure 4. Land Cover Pie Chart

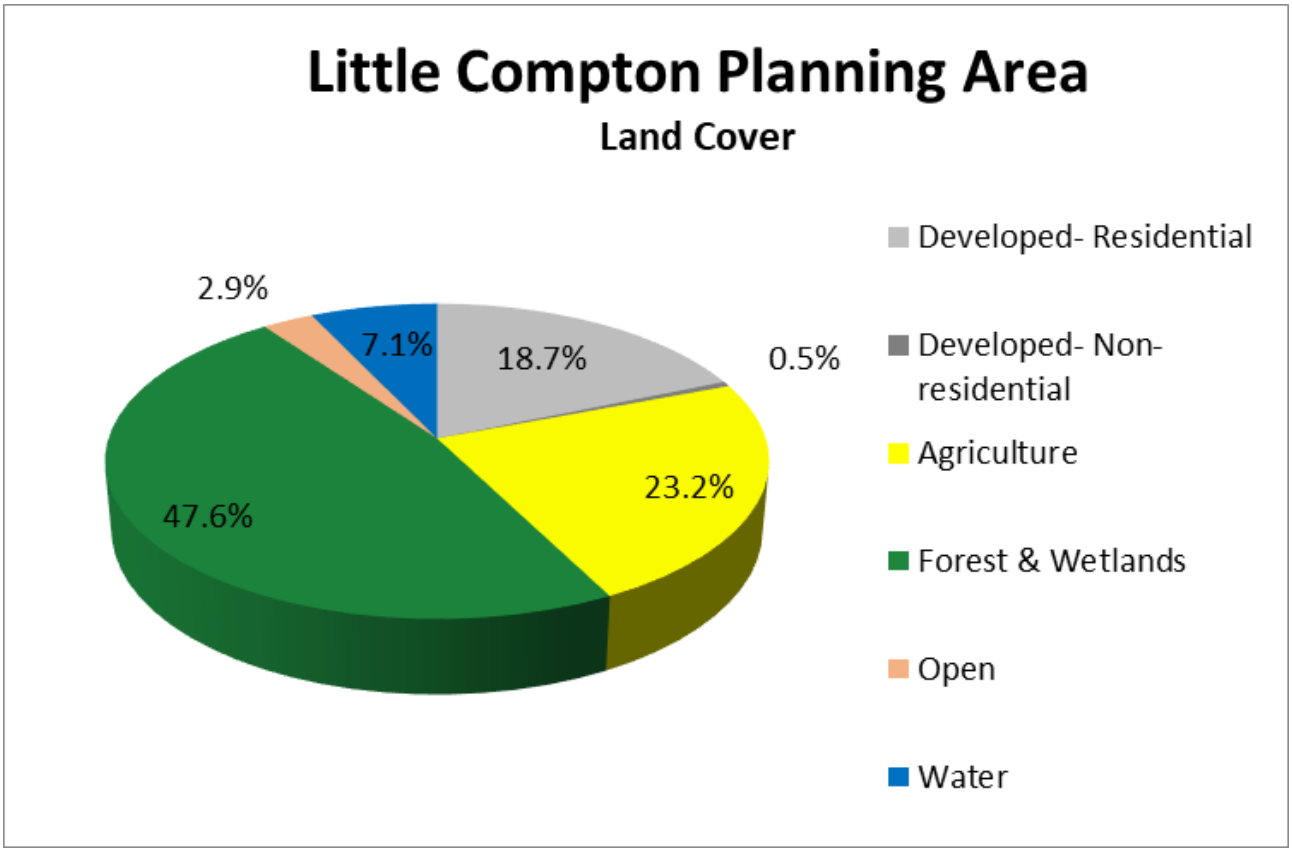
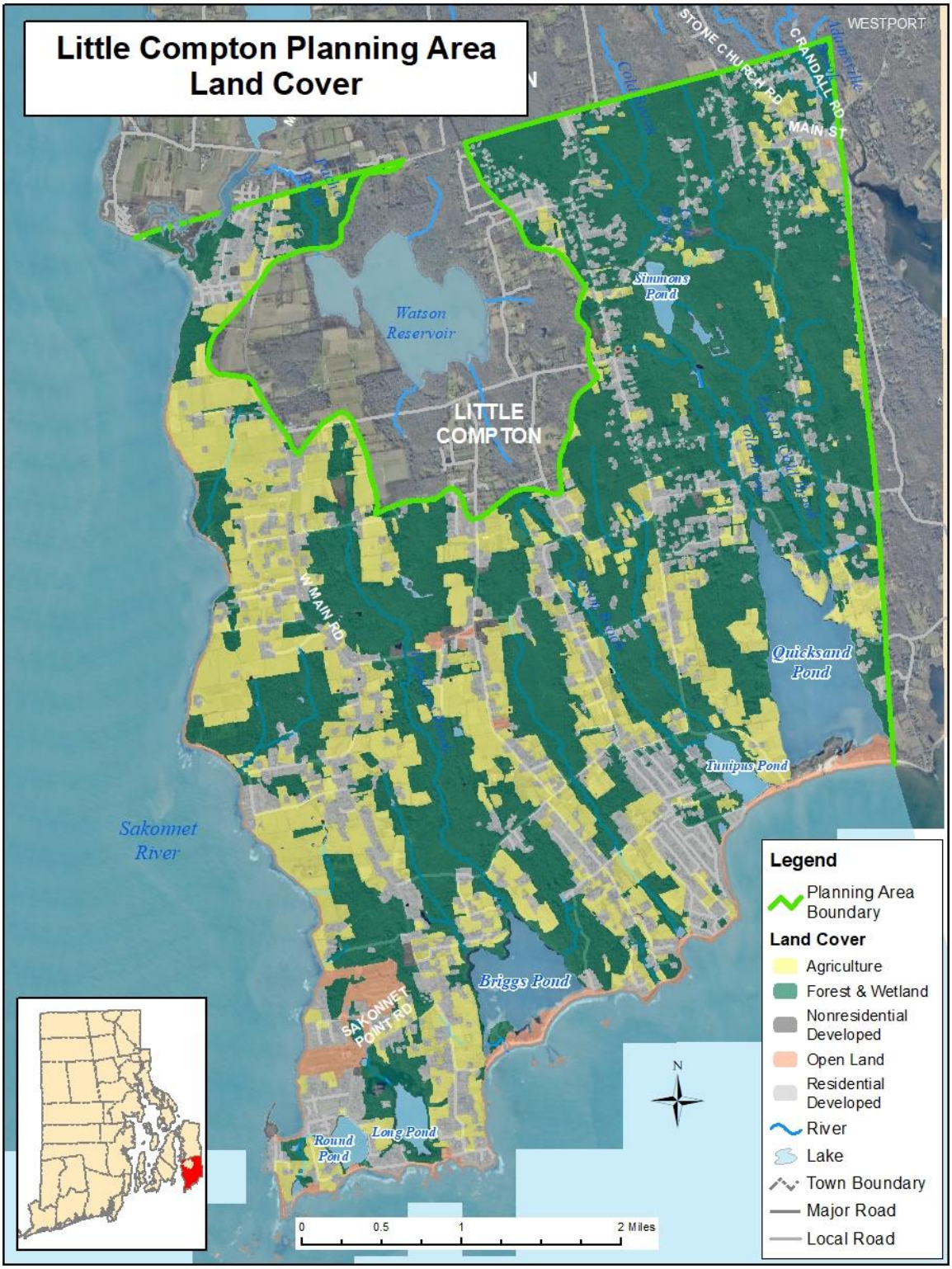


Figure 5. Land Cover



D. Wastewater Management

There are no sewered areas within Little Compton. The entire area is served by individual onsite wastewater treatment systems (OWTS). See description in Section V on OWTS.

E. Conservation Lands

Preserving land in its natural state is an important tool in protecting water quality and aquatic habitat. Natural landscapes remove pollutants through natural processes such as the infiltration of stormwater into the soil and the uptake of water and nutrients by plants. Protecting areas along the shoreline of a waterbody is particularly important as these natural buffers reduce the amount of pollutants that enter the waterbody and provide important wildlife habitat.

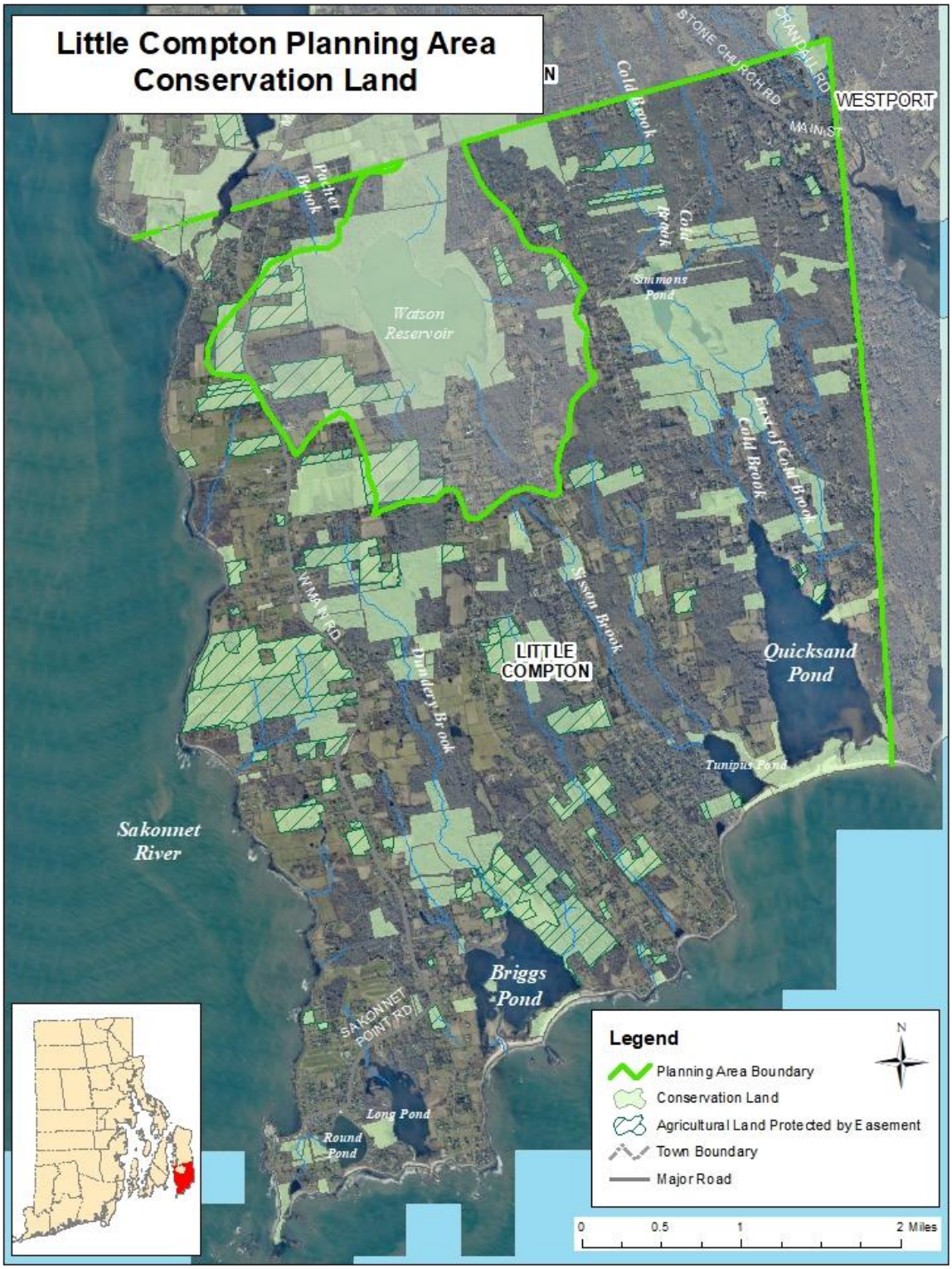
In Rhode Island, natural landscapes are legally protected through conservation easements on private lands, purchases in fee simple, and through conservation development (or 'cluster') zoning provisions. Conservation easements, which permanently limit the use of the land to protect its conservation value, are the most common tool for conserving private lands, and for adding an additional layer of legal protection to open space land. Conservation of land is undertaken by all levels of government (local, state, federal) and non-governmental entities, including land trusts and conservation organizations.

Active land stewards and land preservation groups in this Little Compton planning area include:

- Little Compton Agricultural Conservancy Trust (municipal)
- The Nature Conservancy (private)
- Sakonnet Preservation Association (private)
- Audubon Society of Rhode Island (private)
- Natural Resource Conservation Service (federal)
- State of Rhode Island (state)

Note that some land that is protected from development may remain in agricultural use. Therefore, it can still be a potential source of pollution if sustainable conservation practices and water quality protections are not effectively employed. 24% of the planning area is in conservation lands (see Figure 6).

Figure 6. Conservation Lands



III. Surface Water Quality

A. Overview

A 'pollutant' is any substance, material, or heat which will likely alter the physical, chemical, biological or radiological characteristics and/or integrity of water. The primary water quality pollutants of concern within Little Compton are **bacteria** levels, which inhibit recreational uses of waterbodies and cause beach closures, and excess **nutrients**, which negatively affect aquatic habitats. High levels of bacteria and excess nutrients can be reduced through municipal and individual actions.

The State of Rhode Island Water Quality Rules (250-RICR-150-05-1) specify the criteria each waterbody in the State shall meet based on its designated use (see Table 1). Each waterbody or segment of a waterbody has been given an identification number and a use classification. When a waterbody does not meet the criteria for a designated use, it is considered "impaired" for that use, and the cause of the impairment is identified. Several of the waterbodies in the planning area are impaired. See Table 2 for the status of each waterbody.

Table 1. RI Water Quality Classifications

RI WATER QUALITY CLASSIFICATIONS

Designated Use	Applicable Classifications	Designated Use Definitions
Drinking Water Supply	AA	Supply safe drinking water with conventional treatment.
Primary Contact Recreation/Swimming	**All surface waters**	Swimming, water skiing, surfing or other recreational activities with prolonged and intimate contact by the human body with water.
Secondary Contact Recreation/Swimming	**All surface waters**	Boating, canoeing, fishing, kayaking or other recreational activities with minimal contact by the human body with the water and the probability of ingestion of the water is minimal.
Aquatic Life Support/ Fish, other Aquatic Life and Wildlife	**All surface waters**	Waters suitable for the protection, maintenance, and propagation of a viable community of aquatic life and wildlife.
Shellfishing/ Shellfish Consumption	SA, SA{b}	Supports a population of shellfish and is free from pathogens that could pose a human health risk to consumers.
Shellfish Controlled Relay and Depuration	SB	Suitable for the transplant of shellfish to Class SA waters for ambient depuration and controlled harvest.
Fish Consumption	**All surface waters**	Supports fish free from contamination that could pose a human health risk to consumers.

When a waterbody is determined to be impaired by RIDEM and listed on the State of RI's 'Impaired Waterbody List,' a Water Quality Restoration Plan, also called a Total Maximum Daily Load (or, 'TMDL') analysis, is required to be developed for that waterbody for its specific pollutant and impairment. Key elements of a TMDL include identifying the pollutant sources and the degree of pollutant reduction necessary to attain the applicable water quality standard. Additionally, TMDLs include important recommended mitigation actions to achieve the necessary water quality improvements. TMDLs have not yet been developed for the impaired waters in the planning area.

Table 2. Little Compton Water Quality Use Assessment Status (From 2022 Integrated Water Quality Monitoring and Assessment Report, RI DEM, March 2022)
Saltwater bodies highlighted in green.

Name of Waterbody (Segment ID) Water Quality Classification	**Designated Use Notes**
Sakonnet River (RI0010031E-01B) SA	Fish and Wildlife Habitat and Fish Consumption – insufficient information Primary and Secondary Contact Recreation and Shellfish Consumption – Fully Supporting
Pachet Brook (RI0010031R-03) AA	Fish and Wildlife Habitat -- Fully Supporting Fish Consumption and Public Drinking Water Supply – Not Assessed Primary and Secondary Contact Recreation -- **NOT SUPPORTED due to Enterococcus and Fecal Coliform**
Unnamed Tributary #9 to Sakonnet River (RI0010031R-15) A	Not Assessed
Unnamed Tributary #10 to Sakonnet River (RI0010031R-16) A	Not Assessed
Unnamed Tributary #11 to Sakonnet River (RI0010031R-17) A	Not Assessed
Unnamed Tributary #12 to Sakonnet River (RI0010031R-18) A	Not Assessed
Sakonnet River – Sakonnet Point Harbor (RI0010031E-01D) SA(b)	Fish and Wildlife Habitat and Fish Consumption – Insufficient Information Primary and Secondary Contact Recreation and Shellfish Consumption – Fully Supporting However there is a **Seasonal Shellfish Closure**
RI Coastal Waters – RI Sound (RI0010042C-02) SA	Fish Consumption – Insufficient Information Fish and Wildlife Habitat – Not Assessed

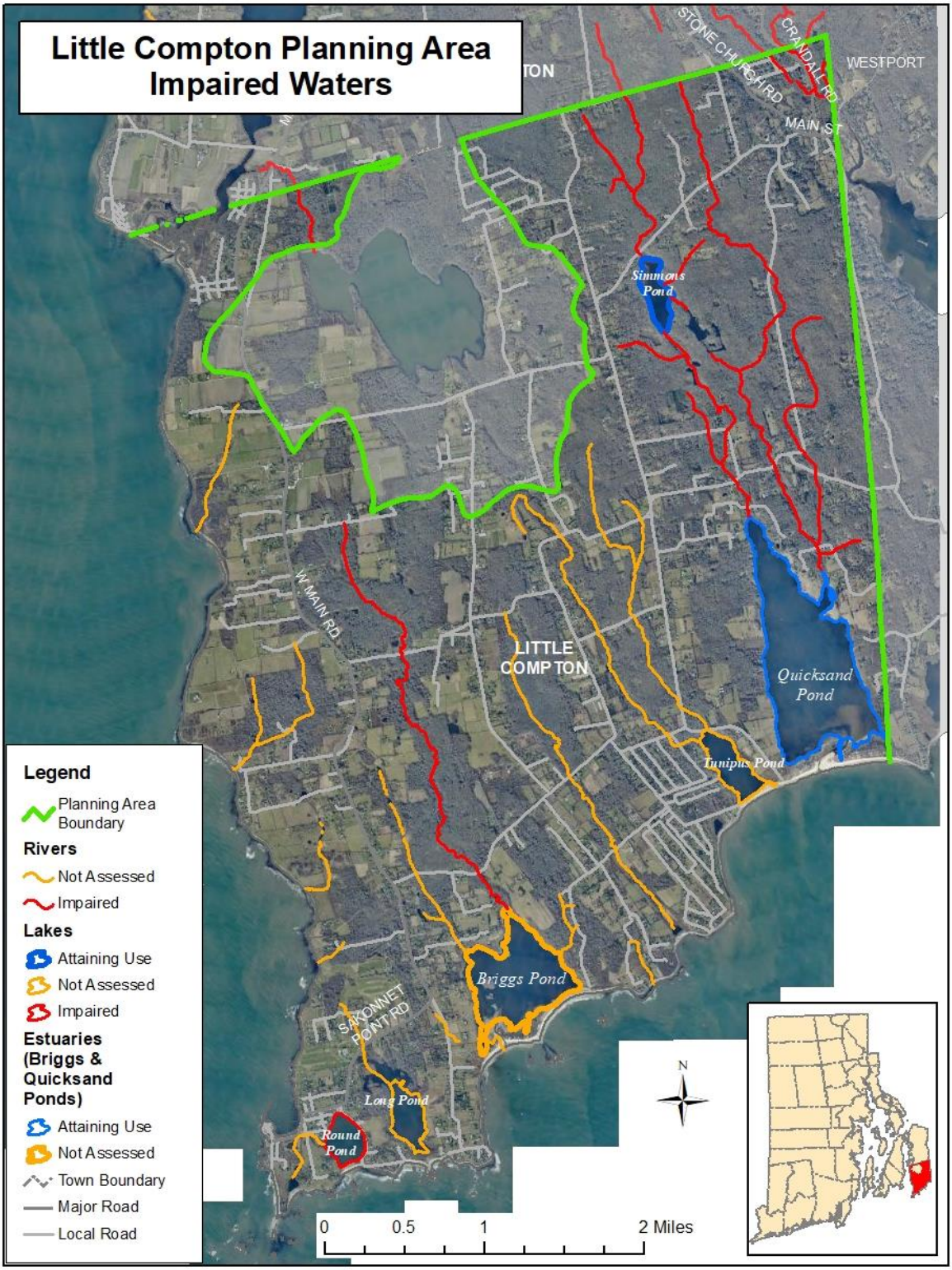
Name of Waterbody (Segment ID) Water Quality Classification	Designated Use Notes
	Primary and Secondary Contact Recreation and Shellfish Consumption – Fully Supporting
Round Pond Tributary (RI0010048R-10) A	Not Assessed
Round Pond (RI0010048L-02) A	Fish Consumption and Primary and Secondary Contact Recreation -- Not Assessed Fish and Wildlife Habitat – **NOT SUPPORTED due to Total Phosphorus**
Long Pond Tributary (RI0010048R-09) A	Not Assessed
Long Pond (RI0010048L-01) A	Not Assessed
Tributaries to Briggs Marsh Pond (RI0010048R-08) A	Not Assessed
Dundery Brook (RI0010048R-02) A	Fish and Wildlife Habitat – Fully Supporting Fish Consumption – Not Assessed Primary and Secondary Contact Recreation – **NOT SUPPORTED due to Enterococcus**
Briggs Marsh Pond (RI0010048E-01) SA	Fish and Wildlife Habitat and Fish Consumption – Insufficient Information Primary and Secondary Contact Recreation and Shellfish Consumption – Not Assessed (**Shellfishing Prohibited)**
Unnamed Tributary #2; Crosses Quaker Hill Farm Road (RI0010048R-07) A	Not Assessed
Unnamed Tributary #1; Begins east of South Commons Rd and west of Maple Ave (RI0010048R-06) A	Not Assessed
Sisson Brook (RI0010048R-04) A	Not Assessed

Name of Waterbody (Segment ID) Water Quality Classification	Designated Use Notes
Unnamed Tributary to Tunipus Pond (RI0010048R-05) A	Not Assessed
Tunipus Pond (RI0010048L-04) A	Supporting Fish and Wildlife Habitat – Fully Supporting Fish Consumption and Primary and Secondary Contact Recreation – Not Assessed
Quicksand Pond (RI0010048E-02) SA	Fish Consumption – Insufficient Information F&W Habitat & Shellfish Consumption – Not Assessed (**Shellfishing Prohibited**) Primary and Secondary Contact Recreation – Fully Supporting
Cold Brook and Tributaries (RI0010048R-01) A	Fish and Wildlife Habitat – Fully Supporting Fish Consumption – Not Assessed Primary and Secondary Contact Recreation – **NOT SUPPORTED due to Enterococcus**
East of Cold Brook and Tributaries (RI0010048R-03) A	Fish and Wildlife Habitat – Fully Supporting Fish Consumption – Not Assessed Primary and Secondary Contact Recreation – **NOT SUPPORTED due to Enterococcus**
Simmons Pond (RI0010048L-03) A	F&W Habitat – Fully Supporting Fish Consumption and Primary and Secondary Contact Recreation – Not Assessed

See Figure 7 for a map of the impaired waters. List of Impaired Waterbodies (Name of Impaired Waterbody -- Cause of Impairment):

Pachet Brook – Enterococcus and Fecal Coliform
Round Pond – Total Phosphorus
Dundery Brook – Enterococcus
Cold Brook and Tributaries – Enterococcus
East of Cold Brook and Tributaries – Enterococcus

Figure 7. Impaired Waters



B. Bacteria Impairments

Enterococcus and fecal coliform are utilized as indicator bacteria to measure a waterbody's potential for disease transmission. Elevated levels of these indicator bacteria (heretofore referred to as 'bacteria') concentrations in surface waters increase the likelihood that associated pathogens are also present. Pathogens are waterborne disease-causing organisms that can adversely affect human health through skin contact, such as swimming, or through ingestion of water, contaminated fish, or shellfish.

Primary sources of bacteria to surface waters include:

- Stormwater runoff
- Failing septic systems and illicit connections to storm drains
- Waterfowl, wildlife, and pet waste
- Agriculture (farm animals)

Four waterbodies in the planning area impaired due to bacteria levels: Pachet Brook, Dundery Brook, Cold Brook and Tributaries, and East of Cold Brook and Tributaries. These waters do not meet their designated water quality standards for the uses of primary and secondary contact recreation (swimming, kayaking, etc.). Currently, residents and visitors in Little Compton do not use any of the three impaired brooks for swimming. Pathogen exposure through boating and wading into the water for fishing is a concern, however.

Beaches and Shellfishing

Elevated bacteria levels can also impact saltwater bodies, resulting in beach closures and shellfish closure areas. As noted in Table 2., shellfishing is allowed all along the south coastal waters and the Sakonnet River, except for a seasonal closure in Sakonnet Harbor due to the increased boat traffic. Shellfishing is prohibited in Briggs Marsh Pond and Quicksand Pond.

RIDOH Beach Monitoring Program collects and analyzes water samples from all state-licensed beaches throughout the beach season to monitor for high levels of bacteria that could pose a health threat to swimmers. There are four regularly monitored, state-licensed beaches in Little Compton and, of these four beaches, Goosewing Beach Preserve is the only beach that has had a closure event (August 2018) since 2000. This historical data indicates that the beaches in Little Compton have generally excellent water quality, which is important to protect and maintain.

Table 3. State-Licensed Beaches in Little Compton

Beach	Access	Ownership	Location
Warren's Point Beach Club	Private	Warrens Point Beach Club	Southeast of Long Pond
Briggs Beach	Private	Briggs Beach, Inc.	South of Briggs Marsh Pond
South Shore/Town Beach	Public	Town of Little Compton	South of Tunipus Pond
Goosewing Beach Preserve	Public	The Nature Conservancy	South of Quicksand Pond

C. Phosphorus Impairments

Phosphorus is found naturally in freshwater in very low amounts and is measured as total phosphorus (TP). The accumulation of nutrients, such as phosphorus, in aging freshwater lakes and ponds is a natural process called eutrophication, which is accelerated by human activities. Excess phosphorus can lead to eutrophic conditions in freshwater lakes and ponds and can also promote algae growth, including toxic algae blooms. Excess phosphorus is often the direct result of human activities, transported by stormwater. Round Pond is listed as being impaired by phosphorus. Although not yet assessed by the RIDEM or listed as impaired, data collected in the past by the volunteer-based URI Watershed Watch indicates that Long Pond, Briggs Marsh Pond, and Quicksand Pond also have elevated TP levels.

The largest external sources of phosphorus to surface waters include fertilizer from agricultural land uses and application on residential, commercial, and recreational lawns and turf; construction site and agricultural field erosion (phosphorus binds to soil particles and is transported along with them); animal waste (livestock, pets, waterfowl, and wildlife); failing septic systems; and illicit connections to storm drains. Some other sources of phosphorus include stockpiled leaf and yard waste, vehicle exhaust particulate deposits on streets, parking lots, and driveways, and atmospheric deposition from wind-blown plant and soil particles.

Once phosphorus accumulates in the ponds from these external sources, it can be released from sediments and "recycled" in the waterbody. This release of old phosphorus is referred to as 'internal cycling or internal loading.' Internal loading can be a significant source of phosphorus in pond waters, recirculating the phosphorus and continuing to cause algae blooms. The ultimate source of most sediment-bound phosphorus is external, so it is important to manage external phosphorus sources before addressing internal accumulation.

Harmful Algal Blooms

Algae blooms, often an outcome of excess phosphorus, degrade aquatic habitat by upsetting the ecological balance and can lead to water quality degradation in a process known as eutrophication. Certain types of algal blooms consisting of cyanobacteria (also called 'blue-green' algae) may result in the release of natural toxins that can be harmful to humans, pets, marine mammals, fish, and shellfish. These blooms are deemed Harmful Algal Blooms (HABs). Human contact with cyanobacteria can cause skin, eye, and nose irritation. If swallowed, humans may experience diarrhea, vomiting, or neurotoxicity. Pets, livestock and waterfowl that ingest water with blue-green algae toxins can also experience sickness, paralysis or even death.

The Rhode Island Department of Health (RIDOH) and the Rhode Island Department of Environmental Management (RIDEM) work cooperatively to detect and respond to the presence of cyanobacteria blooms, evaluate the potential risks to the public, and, when necessary, jointly issue health/recreational advisories when conditions indicate a cyanobacteria bloom poses a risk to public health.

To date, there have been no HABs reported in the Little Compton planning area (note that Watson Reservoir has had several HAB advisories posted over the last10 years). The lack of reported HABs does not mean that blooms in the planning area do not occur, it may be due to a lack of monitoring in the area. If you think you have discovered a blue-green algae bloom, please contact the RIDEM at DEM.OWRCyano@dem.ri.gov.

IV. Groundwater Quality

The RI DEM Groundwater Quality Rules (250-RICR-150-05-3) classify the groundwater in the state using a four-class system. Groundwater classified GAA or GA are groundwater resources that are known or presumed to be suitable for drinking water use without treatment. Groundwater classified as GAA is used for wellhead protection areas for community public wells and aquifers (and their recharge areas) that are potentially capable of serving as a significant source for public water. Almost all groundwater within the town is classified GA as the amount of groundwater available is not capable of serving as a major groundwater supply, nor are there any community public wells. The groundwater underlaying the Little Compton Town Dump is the only area classified as GB, meaning that it is not considered suitable for drinking water use. No groundwater in Little Compton is classified GC, which is designated for active waste disposal.

Because groundwater contamination is usually localized in nature, no ambient groundwater monitoring network has been established in RI. Groundwater quality monitoring presents particular challenges associated with the manner in which pollutants move in different aquifer settings. In general, groundwater moves very slowly (only inches to feet per day) compared to flowing surface waters. Once introduced into an aquifer, groundwater contaminants may form plumes that move very slowly, with very little mixing and at different depths depending on the topography, subsurface geology, contaminant and types of soils. It can be difficult to predict contaminant movement, particularly in some bedrock aquifers. Contaminants are known to persist in groundwater for decades. The result is that groundwater quality can vary greatly and is often localized, which presents challenges within the landscape when designing groundwater quality monitoring programs.

One source of information on ambient groundwater quality is the Department of Health's data on public drinking water wells that are regularly tested to ensure compliance with drinking water standards. When evaluating public or private drinking water well data, nitrate (most commonly from OWTSs and fertilizer application) is often used as an indicator of human impacts to groundwater. Natural background concentrations of nitrate are 0.2 mg/l or less. Five mg/l of nitrate (one–half the drinking water standard of 10 mg/l) is often used as a threshold for determining acceptable levels of impact from existing and proposed development. Nitrate concentrations from the 20 public wells in Little Compton is compiled in Table 4.

Table 4. Nitrate Concentrations in Public Wells in Little Compton Planning Area

Nitrate Concentration (mg/L)	**Number of Wells**				
	2017	**2018**	**2019**	**2020**	**2021**
<=0.2	7	7	8	6	10
.21 - 3.0	8	10	9	11	8
3.1 - 5.0	2	1	2	1	0
5.1 – 10.0	1	0	0	1	1
>10.0	1	1	1	0	1
Total Number of Wells Sampled	19	19	20	19	20

Private well testing is the responsibility of the property owner. Testing is required at property transfers and prior to receiving a certificate of occupancy for a new home. The RI Department of Health has developed a map-based tool to assist property owners in determining which types of water tests should be conducted, and on what schedule, based on the location of the site and known factors contributing to groundwater contamination. Homeowners should be aware of activities on-going near their property and the contaminants that may be released from these activities.

V. Pollution Sources

This Section will describe in detail the threats to both surface water and groundwater.

A. Stormwater Runoff

Stormwater runoff is rain and melted snow that washes over the land surface into nearby rivers, streams, lakes, ponds, drinking water reservoirs, coastal waters, and freshwater and coastal wetlands. Where land is developed, there are impervious surfaces such as paved roads, parking lots, and building roofs, which generate stormwater runoff which cannot infiltrate into the ground where it landed. Even highly compacted soils from unpaved parking areas, inadequate landscaping, and gravel driveways and roads is impervious. Stormwater washes over these various impervious surfaces, accumulating pollutants, and flows directly into nearby waterbodies, often via a network of public drainage catch basins and pipes, if it is not otherwise able to infiltrate the soils and be naturally filtered. The lack of opportunity for stormwater to infiltrate the ground also results in greater volumes of runoff that move much faster. This leads to increased soil erosion, especially where there is a lack of vegetation to stabilize the soil, and increased stream bank and stream bed erosion. Erosion and sedimentation of streams disrupts and degrades aquatic habitat, and the excess runoff can contribute to downstream flooding.

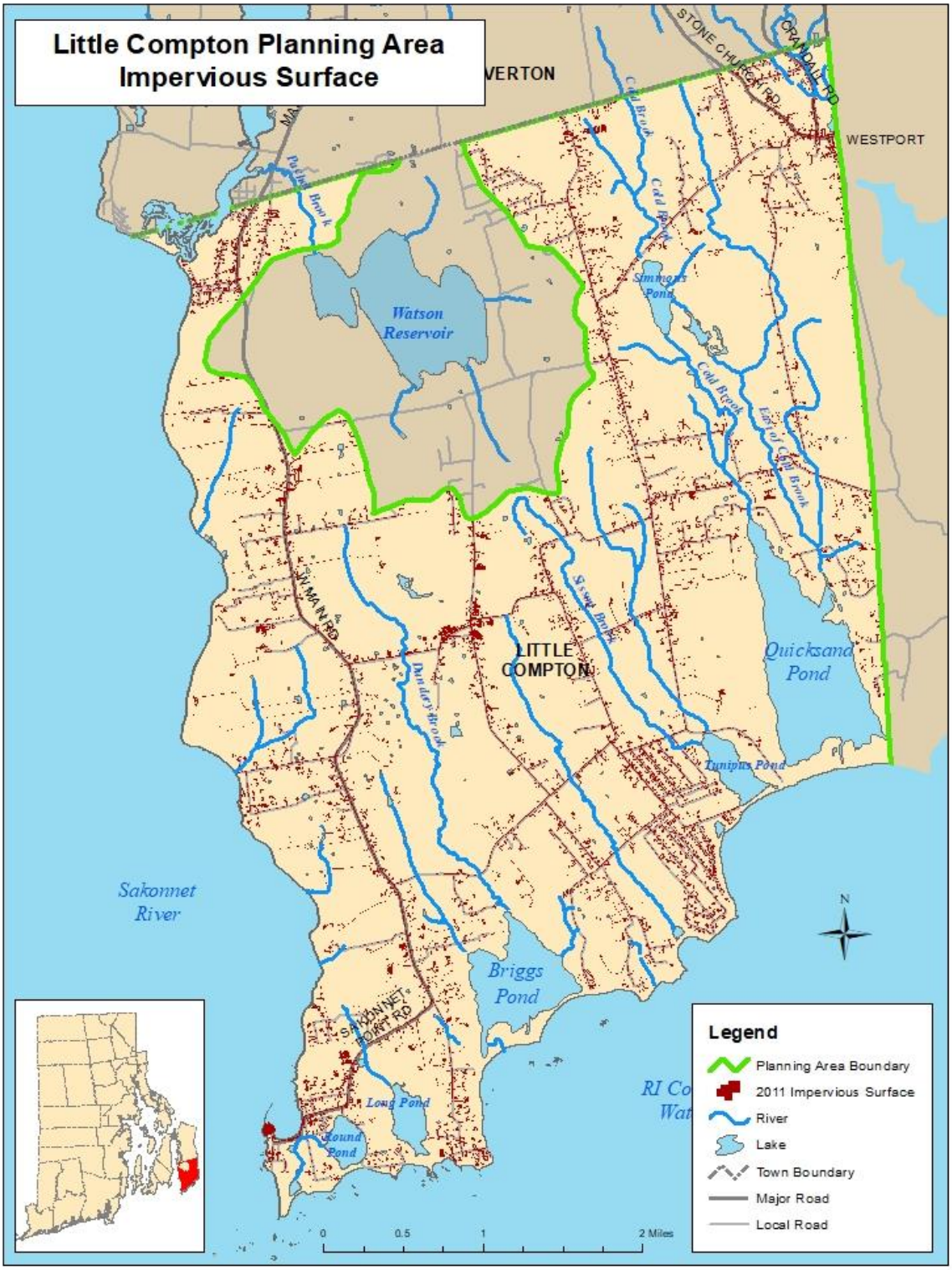
The pollutants carried by stormwater include, but are not limited to, fertilizers and pesticides from residential lawns, recreational fields, and agricultural fields; bacteria and nutrients from pet, livestock, and wildlife waste, and failing septic systems and cesspools; petroleum products and metals from the residue collected on roadways from automobiles; salt from winter road maintenance; and sediment from eroding farm fields and open construction sites and from winter road maintenance.

Impervious surfaces cover 5.4% of the planning area (see Figure 8). This includes all hard surfaces such as roofs, roads, driveways, and parking lots that prevent water from infiltrating into the soil. Studies indicate that watersheds with an impervious cover under 10% generally have streams that experience little to no significant impact from development, whereas watersheds with impervious cover over 10% start to have greater and greater negative impacts to streams.

Historically, storm drain networks were designed to carry this stormwater away from developed land as quickly as possible to prevent on-site flooding with little to no treatment of pollutants. For many of these stormwater outfalls, there is little opportunity to mitigate the pollutants carried by the stormwater before they enter ponds and streams.

Due to small population size and density, the municipal stormwater drainage system and outfalls in the Town of Little Compton are not currently regulated under the RI DEM Pollutant Discharge Elimination System (RIPDES) Municipal Separate Storm Sewer Systems (MS4) General Permit, which requires minimum maintenance practices and pollution mitigating activities. However, the RI DOT is designated as an MS4 entity, therefore, its stormwater outfalls are regulated statewide under this program.

Figure 8. Impervious Surfaces



Low Impact Development

Low impact development (LID) is a comprehensive approach to project design that minimizes the impacts of development or re-development on water quality and aquatic habitats by improving stormwater management. The goal of LID is to design a site so that water moves over and through the site similarly to how it would move under natural, pre-developed conditions. Stormwater treatment practices are placed throughout the site to decrease, infiltrate, manage and treat runoff as close to the point where it is generated as possible.

To assist in incorporating LID into community planning processes, RIDEM, University of RI (URI),and RIDOT have developed "LID Site Planning and Design Techniques: A Municipal Self-Assessment." (See RIDEM webpage at http://www.dem.ri.gov/programs/benviron/water/permits/ripdes/stwater/t4guide/lid-checklist-primer.pdf) The self-assessment contains questions covering a variety of topics related to low impact development (LID). These topics range from conserving open space and minimizing land disturbance to reducing impervious surfaces and controlling soil erosion. Working through the assessment tool allows an in-depth review of the local regulations that shape development in the community and a comparison to LID benchmark techniques and practices. The intent is to identify which LID techniques are in place and which techniques could be improved or employed.

Stormwater Utility

One way for a community to address local funding shortfalls for stormwater management is to explore the feasibility of establishing a sustainable local funding source such as a stormwater enterprise or utility fund that will assess property owners a stormwater fee. A stormwater fee is based on the demand placed on the municipal stormwater system by each user, not on property's assessed value. It is therefore considered more equitable than other funding methods since users with a large burden on the stormwater system will pay their fair share. As with a water or sewer utility, a stormwater utility fee generates revenue based upon the amount of stormwater generated on a property and conveyed to a public stormwater system. These fees are assessed by measuring the amount of impervious cover within a parcel and are determined by the stormwater management financing needs of the municipality. They can be adjusted over time to continually meet those needs. A stormwater utility provides a means for:

- Consolidating or coordinating responsibilities that were previously dispersed among several departments and divisions
- Generating funding that is adequate, stable, equitable and dedicated solely to managing stormwater
- Creating incentives for property owners to reduce the stormwater generated on their properties, and
- Developing stormwater management programs that are comprehensive, cohesive and consistent year-to-year.

The Rhode Island Stormwater Management and Utility District Act of 2002 (http://webserver.rilin.state.ri.us/Statutes/TITLE45/45-61/INDEX.HTM) authorizes municipalities to create stormwater management districts, and empowers them to charge fees, provided that the fee system shall be reasonable and equitable so that each

contributor of runoff to the system shall pay to the extent to which runoff is contributed. Stormwater utilities have focused on a variety of needs, including flood management, erosion control, stormwater treatment for water quantity and quality, and infrastructure maintenance.

B. Wastewater – Onsite Wastewater Treatment Systems

All residents and businesses rely on onsite wastewater treatment systems (OWTSs) in Little Compton. A properly sited, designed, installed, and maintained OWTS will provide decades of use and treatment of wastewater such that the system does not adversely impact public health or the environment. OWTS can fail if they are improperly sited, designed, installed and/or maintained, causing health and water quality concerns as wastewater backs up onto the land surface and flows directly into surface waters, stormwater collection systems, or moves untreated into groundwater. Failing OWTSs and materials improperly disposed of through OWTSs can be sources of nitrates, phosphates, chlorides, bacteria, viruses, personal care products, and household hazardous materials. Lack of maintenance is considered to be a primary cause of system failure.

All OWTS are regulated and permitted by the RIDEM Rules Establishing Minimum Standards Relating to Location, Design, Construction and Maintenance of Onsite Wastewater Treatment Systems (250-RICR-150-10-6), but RIDEM does not inspect these systems once they are operational. Operation and maintenance of existing systems and reporting failing OWTSs is the responsibility of the property owner, however, the town can play a major role in ensuring OWTS maintenance. In Rhode Island, each municipality can establish an Onsite Wastewater Management Plan (OWMP) to enhance maintenance efforts. The Town of Little Compton does not have an OWMP, but establishing such a plan is a priority in the 2018 Comprehensive Plan. Examples of actions the Town's OWTS management plan, supported by the appropriate local ordinances, can address include:

- Required system inspections and municipal tracking
- Strengthen the Town's role in identifying and addressing failed OWTS
- Implement a program to remove and replace cesspools
- Track maintenance agreements for advanced systems and ensure they are renewed.
- Develop local educational program for OWTS use and maintenance.

When a town has an Onsite Wastewater Management Plan approved by RIDEM, this qualifies the municipality for the State's Community Septic System Loan Program (CSSLP). The CSSLP is part of the State Clean Water Revolving Loan Fund program that provides low-interest loans to municipalities so that they may in turn issue low interest loans to homeowners to repair or replace failed, failing, or substandard OWTSs.

Cesspools

Cesspools are a substandard means of onsite wastewater disposal that should be eliminated. They are essentially a hole in the ground which does not provide an acceptable level of treatment, and they are common in residences built before 1970. Failed cesspools anywhere in RI are required to be replaced under the State's OWTS Rules. The Rhode Island Cesspool Act of 2007 required

the replacement of any cesspool located within 200 feet of the inland edge of a coastal shoreline feature bordering a tidal water area or within 200 feet of a public drinking water supply well. Amendments to the Cesspool Act in 2015 require any property sold or transferred anywhere in the state that uses a cesspool to have that cesspool replaced within one year of the sale or transfer.

C. Agriculture

Rhode Island's farms contribute to the state's economic development and provide Rhode Islanders with local food and farm landscapes, as well as tourism opportunities and wildlife habitat. However, it is important to ensure that these operations are conducted in a manner that avoids water quality impacts. 23% of the land within the Little Compton planning area is used for agriculture (see Figure 5.).

The potential surface water and groundwater pollutants from agricultural operations include nutrients (nitrogen and phosphorus) from fertilizers and animal wastes; pathogens and organic materials primarily from animal wastes; sediment from field erosion; pesticides; and petroleum products. Agricultural land is directly adjacent to most of the ponds in Little Compton, and many tributaries run through or border farmlands. Well managed farms that address the following can operate with minimal negative effect on water resources:

- Implementing nutrient management and conservation plans;
- Installing and maintaining grassed or forested buffer strips along farm fields;
- Planting cover crops and manage drainage patterns a way that retains soil in the field;
- Fencing animals out of streams and wetlands; and
- Covering manure piles and locating them over 200 feet away from waterbodies and wetlands.

Farmers are encouraged to contact the local US Department of Agriculture Natural Resources Conservation Service (NRCS) office and the Eastern RI Conservation District for information on grants for installing best management practices and developing conservation plans to prevent impacts to water quality. See Section IX for further information about NRCS's programs.

D. Lawn and Turf Management

Like impervious surfaces, lawns are another high-impact artifact of development. The care and maintenance of residential lawns, and other landscaped areas such as golf courses, athletic fields, and parks can contribute to water quality degradation. Excessive amounts of fertilizer (nutrients) and pesticides, inappropriate formulations of fertilizer, and poor timing of fertilizer and pesticide applications can result in losses to the environment via stormwater runoff and/or leaching to groundwater. Problems can also originate from storage and disposal practices for fertilizers and pesticides.

Most homeowners are not aware of the appropriate best management practices to reduce the impacts to water quality in managing their lawns. Landscape contracting businesses can also overapply fertilizers. Aside from professional pesticide application (which requires a license), no certification or educational requirements exist for lawn care management. Education of homeowners and landscape contractors on proper turf management continues to be the primary strategy to minimize water quality impacts from lawn and grounds management.

E. Commercial and Industrial Facilities

Non-residential developed land comprises <1% of the planning area. (This figure includes institutional and government properties.) In Little Compton there is no urbanized downtown, but several commercial and facilities are congregated around Meeting House Lane and Sakonnet Harbor. Commercial facilities that handle significant volumes of hazardous materials must be registered with the USEPA and RIDEM.

Discovery of active and former commercial and industrial sites that have contamination of soil and groundwater and river sediments from hazardous materials and petroleum products are, unfortunately, a fairly common occurrence in RI. Most of the contamination that has been discovered is a result of activities that predated the environmental regulations that have been in place since the 1980s. Common sites of contamination include leaking underground storage tanks, surface spill sites, and sites of illegal dumping of solid waste and hazardous waste. Contaminated sites are monitored and/or remediated through various RIDEM and USEPA programs. One of the current site investigations is the now closed Little Compton Town Dump (located next to the current Town Transfer Station on Amy Hart Path).

DEM's Office of Land Revitalization and Sustainable Materials Management maintains an inventory of sites and files in its various programs (Underground Storage Tanks, Waste Facilities Management, Federal Facilities and Site Remediation. These lists are current as of the date indicated, and can be viewed on the DEM website at:
http://www.dem.ri.gov/programs/wastemanagement/inventories.php

F. Road Salt and Sand

Road salt and sand are important elements of maintaining safe roadways in winter, however, there is a water quality cost. Salt and sand wash into surface waters impacting aquatic life. Salt can enter groundwater and contaminate drinking water wells. Not only is the water not suitable for drinking, but the salt corrodes the pipes, and can cause harmful metals, such as lead, to leach out into the water. The sand that is applied on the roads during winter can become a major contributor to stormwater BMP failure by clogging the systems. RIDOT estimates that only about five to ten percent of the sand applied to the road is recovered as street sweepings (Road Salt/Sand Application in RI - RIDOA Statewide Technical Paper #163, 2014).

Minimizing impacts to water resources from road salt and sand application while at the same time maintaining public safety presents a unique challenge. Improved technology and best

management practices can be utilized to reduce the amount of salt and sand applied to roads without compromising winter travel safety. In addition, the sand and salt must be stored in a manner to reduce impacts to water quality, primarily by the covering of the salt pile in a structure and containing runoff from the site.

RIDEM Groundwater Quality Rules require that all stockpiles of road salt (state, town, and private) where the groundwater is classified GAA or GA, which is the entire town except or the former town dump that is classified GB, be covered with, at minimum, a durable cover. The Town has an uncovered salt storage facility at the town's transfer station, which is at the site of the former town dump. RIDOT's Little Compton salt storage facility is located at 144 Willow Avenue where the salt is stored in a wooden barn structure.

Another issue that Rhode Island has been experiencing is mild conditions and rain events interspersed between winter storms. This has the ability to accelerate the washing of winter sand and salt into our waterways prior to the typical time when street sweeping is conducted in the Spring. Increasing the frequency of street sweeping, particularly on mild winter days, can help prevent more of this sand and salt from entering waterbodies.

G. Pet Waste

Pet waste can be a significant contributor of bacteria, other pathogens, and nutrients (nitrogen and phosphorus) to surface waters. The primary issue is dog waste, although other backyard pets (horses, goats, etc.) can cause localized problems. Pet waste in developed areas that is left on the sidewalk or on grass near the street can easily be washed into stormwater drainage systems. Pet waste left on beaches and walking trails can wash directly into the water. Dog waste can harbor a host of different bacteria, parasites, and viruses that can cause human illness and disease.

Not only is pet waste a water quality issue, but it is also a nuisance issue when not properly picked up and put in the trash. A growing problem is when people pick up after their pet and then leave the bag on the ground or throw it in the woods or on the side of the road. Many people only associate pet waste pick up with keeping it out of the way from stepping in it, and so throwing it on the road shoulder or in the woods is falsely perceived as being responsible; however, this is also littering. There is a need to strengthen education on the water quality impacts of not picking up and not properly disposing of pet waste.

H. Residential Land Use

As noted in Section II.C, residential land use comprises 19% of land area in the planning area. In addition to the above-mentioned water quality pollution threats from stormwater, OWTSs, lawn management, and pet waste, residential areas pose such threats as:

- Household cleaning chemicals, automotive fluids (oil and gasoline), paints and solvents disposed of down the drain or onto the land surface (aka, Household Hazardous Waste);

- Heating oil storage (above and below ground tanks, further discussed below), and spills; and
- Abandoned wells (can illegally be used as direct conduits for pollution into groundwater).

If taken on an individual basis, the threat from a single residence is normally less than the threat from other land uses, but when factoring them all together, they form a significant source of contamination. Most citizens are unaware of the effects of the potential contaminants stored, used, and disposed of around the home. Education and outreach to the public is important in reducing this source of water pollution.

Underground Home Heating Oil Tanks

Unlike underground storage tanks at gas stations and commercial facilities, underground storage tanks for home heating oil are not regulated by the RIDEM. These tanks are typically single wall steel tanks that will eventually corrode and leak. The leaking fuel can then cause groundwater and surface water contamination. Many homeowners do not realize that a leaking underground storage tank can contaminate their onsite drinking water and that the tens of thousands of dollars in clean-up costs are not covered by homeowner's insurance. The best practice is to remove the underground storage tank and replace it with an above ground tank in the basement or outside with a spill collection barrier.

RI General Laws §46-12.1 enables municipalities to adopt ordinances providing for the regulation and control of underground tanks and establishing procedures for the registration, testing, and removal of such tanks. RIDEM has encouraged municipalities to use this authority to prohibit USTs in sensitive areas (e.g., areas dependent on private drinking water wells) and focus their efforts on encouraging removal of home heating oil tanks. The Town of Little Compton has not adopted such an ordinance.

I. Waterfowl

Waterfowl and wildlife are a natural part of our environment and are enjoyable to watch. However, when they congregate in excessive numbers due to human encouragement, they can have adverse impacts on water quality. There is an important distinction between native and migrating waterfowl, which tend not to be a pollution problem, and nuisance waterfowl—such as resident Canada geese—which do not migrate and congregate in areas for longer periods of time. Feeding of waterfowl, and large lawns near waterbodies that allow waterfowl to land and congregate, can result in unnaturally high concentrations of waterfowl in these locations. Whether by direct excretion of waste into waterbodies, or via stormwater runoff which transports the waste deposited on lawns and parking lots into waterbodies, the pathogens and nutrients in their waste end up negatively affecting the water quality.

Recent concern has focused on the large numbers of resident Canada geese, whose populations have increased greatly over the last 50 years in southern New England. As reported by the RIDEM Division of Fish and Wildlife (DFW), a single Canada goose produces a pound of fecal

waste a day. Although most people find a few geese acceptable, problems develop as local flocks grow and their droppings become excessive where they regularly feed and congregate.

In 2016, USEPA's Eastern RI Conservation District (ERICD) modeled best goose abatement practices in their project "Resident Canada Goose Education and Mitigation in East Bay Watersheds and Aquidneck Island." ERICD held educational workshops in Newport and Bristol Counties, including for Little Compton residents, and conducted the GeesePeace method of egg-oiling for population control in goose nest study sites. Geese are attracted to large open lawn areas adjacent to waterbodies. Other solutions for controlling nuisance waterfowl include modifying the habitat to make it less desirable, such as planting shrubs or trees where potential predators may hide and allowing grasses to grow tall along the shorelines.

VI. Aquatic Habitat Management

Healthy aquatic ecosystems need to have clean water, but they also need to be free from other stressors associated with human activities, such as physical disturbance, climate change, and spread of invasive species. Promoting a healthy watershed includes restoration of critical components of the ecosystem that have been physically changed. While it is always better to protect aquatic habitats and their buffers from alteration, restoration can have an important role because of the valuable functions that can be returned.

A. Wetlands

Freshwater wetlands exist in areas where the groundwater table is close to the surface and often in proximity with other surface waters. Wetlands are the source of the headwaters for many of the area's tributaries. Vegetated wetlands support both aquatic and terrestrial species many of which have specially adapted to the conditions present in wetlands. See Figure 1 for the location and extent of wetlands (freshwater and salt water) in the planning area. (See also Section VII Climate Change for impact on coastal wetlands.) Wetlands perform specific functions and processes, including:

- Wetland plants and soils can store, filter, and naturally treat nutrients and other stormwater pollutants
- Important habitats for aquatic, terrestrial, and avian species, particularly for endangered, threatened, and migratory species, including many of Rhode Island's rare species
- Are among the most productive natural systems regionally and worldwide
- Store water during rainy periods and slowly release it, which controls flooding and keeps streams flowing during dry periods
- Create local microclimates through greater evapotranspiration rates, which has a cooling effect
- Stabilize shores to provide erosion protection from overland flow and storm surge
- Protection from climate change through carbon sequestration.
- Educational, scenic, and historic resources
- Recreational resources such as hunting, fishing, and bird watching

When wetlands or their vegetated buffers are altered, these functions and values are diminished or lost. Direct disturbance to wetlands includes activities such as cutting of vegetation, filling, illegal dumping, excavating, water diversion, or roads and crossings. Prior to regulation initiated in the 1970s, many wetlands were filled, ditched or drained. Wetlands can also be directly altered by an influx of sediment from construction sites, winter road sand, eroding stream banks, and dirt roads and driveways transported in stormwater. Wetlands can also be impacted by hydrologic alterations in a watershed caused by manmade withdrawals of water for watering lawns and irrigation, which may result in loss of riverbed area covered by water, receding wetlands and loss of vernal pools.

B. Vegetated Riparian Buffers

A vegetated riparian buffer is an area of natural trees, shrubs, and other vegetation located adjacent to rivers, streams, lakes, ponds, and wetlands. These areas provide the important functions below:

- Protect waterbodies from those nonpoint pollutant sources discussed above, and other stressors by performing natural functions
- Filter and slow runoff and allow it to soak into the ground to recharge groundwater
- Trap sediment before it can reach the waterbody
- Treat nutrients in stormwater by uptake in vegetation or trapping in the soils, including functioning as a sink for phosphorus
- Transform nitrate in the groundwater, thereby reducing the amount of nitrogen entering the waterbody
- Stabilize and protect stream banks from erosion
- Moderate temperature and provides shading around the waterbody, helping to maintain conditions for the aquatic habitat
- Provides areas for flooding, protecting downstream properties
- Provides important habitat for connecting wildlife to the waterbody corridor system and is also often a special transition area hosting a diversity of wildlife between the aquatic and the upland habitats
- Make habitat less appealing to Canada geese

Much of the riparian buffers are intact in the Little Compton planning area. It is important that these vegetated buffers are maintained to maximize the benefits they provide. However, there are areas where a minimal to no buffer exists, and in these areas, buffer restoration should be promoted wherever possible.

C. Aquatic Invasive Species

Aquatic invasive species (AIS), also called "non-native aquatic species," can out-compete native plants and disrupt ecosystems. Once established, AIS are difficult and expensive to control. Management of AIS is often necessary to improve habitat and public use of a waterbody. Excess nutrients may exacerbate the AIS problem, but do not cause it. The best strategy is to prevent AIS from spreading to uncolonized areas. It is much easier to intervene and contain a small population than attempt to abate and control a widespread, well-established population of aquatic invasive species. Impacts from aquatic invasive species generally include:

- Reduced diversity of native plants and animals
- Impairment of recreational uses such as swimming, boating, and fishing
- Degradation of water quality
- Degradation of wildlife habitat
- Increased threats to public health and safety
- Diminished property values
- Declines in finfish and shellfish populations
- Local extinction of rare and endangered species, and
- Increased expenditures for prevention, eradication or control.

RI DEM has been assessing publicly accessible waterbodies for AIS, and AIS have been documented in 2 locations in the Little Compton planning area:

- Adamsville Brook and Tribs – Variable Milfoil. First documented in 2012. Only time surveyed.
- Quicksand Pond – Eurasian Milfoil. First documented in 2020. Only time surveyed.

Both of these AIS are underwater, rooted invasive plants that create dense stands forming canopies over the surface of the water allowing it to outcompete and displace native plant species. Information about these and other AIS can be found on DEM's website at http://www.dem.ri.gov/programs/water/quality/surface-water/aisplant.php

Eurasian Milfoil

Source: RIDEM Staff

D. Stream Connectivity

Stream connectivity is about ensuring the free movement of fish and other wildlife up and down a stream corridor. Barriers to this movement can be caused by dams and sub-standard road/driveway culverts preventing wildlife from using certain portions of the river system resulting in fragmented aquatic habitat. In some cases, undersized culverts can also cause localized flooding. For some species, such as American eel and River herring, the ability to move freely up and downstream in a river is a critical part of their life cycle. Actions to address stream connectivity include physical removal of barriers, construction of fish ladders, and replacement of undersized and perched culverts with larger structures designed for wildlife passage.

Since dams can pose a safety hazard should they fail, dams in Rhode Island are given a hazard potential rating based on the likely impacts downstream (see Table 5). Simmons Pond Dam is rated as a Significant Hazard by DEM. A "Significant Hazard" dam means a dam where failure or mis-operation results in no probable loss of human life, but can cause major economic loss,

disruption of lifeline facilities or impact other concerns detrimental to the public's health, safety or welfare (RIDEM Rules and Regulations for Dam Safety (250-RICR-130-05-1)). The 6 smaller dams in the Simmons Mill Pond Management Area and 2 other small dams near the Sakonnet River are rated as "Low Hazard" dams, meaning that failure or mis-operation of these dams would result in no probable loss of human life and low economic losses.

Table 5. Inventory of Classified Dams in the Little Compton Planning Area

Dam	Stream/River	Impounded Lake/Pond	Hazard
Sherer Dam	Unnamed ephemeral wetlands stream near Sherer Cove	Unnamed coastal pond that outfalls to the Sakonnet River	Low
Sakonnet Golf Course Dam	Long Pond Tributary	Sakonnet Golf Course Watering Hole	Low
Simmons Pond Dam	Cold Brook	Simmons Pond	Significant
Simmons #2	East of Cold Brook Tributary	Unnamed Simmons Mill Management Area Pond	Low
Simmons #3	East of Cold Brook Tributary	Unnamed Simmons Mill Management Area Pond	Low
Simmons #4	East of Cold Brook Tributary	Unnamed Simmons Mill Management Area Pond	Low
Simmons #5	East of Cold Brook Tributary	Unnamed Simmons Mill Management Area Pond	Low
Simmons #6	Cold Brook	Unnamed Simmons Mill Management Area Pond	Low
Simmons #7	Cold Brook	Unnamed Simmons Mill Management Area Pond	Low

Simmons Pond was created by constructing a dam on Cold Brook pre-1800. The cluster of smaller ponds in the Simmons Mill Pond Management Area were all created by private landowners in the 1960s through the construction of 6 low earthen berms on the Cold Brook and East of Cold Brook tributaries. These dams obstruct wildlife that may have previously migrated and spawned in the ponds and surrounding freshwater wetlands. The Strategic Plan for the Restoration of Anadromous Fishes to RI Coastal Streams (RI DEM Division of Fish and Wildlife, 2002) identifies the interconnected waterbodies of Quicksand Pond, the Simmons Mill Pond Management Area ponds, and the Cold Brook and East of Cold Brook tributaries as critical habitat for populations of Alewife and Blueback herring that are currently obstructed by the dams.

Simmons Pond Dam

Source: GZA Simmons Pond Dam Report 2007

VII. Climate Change

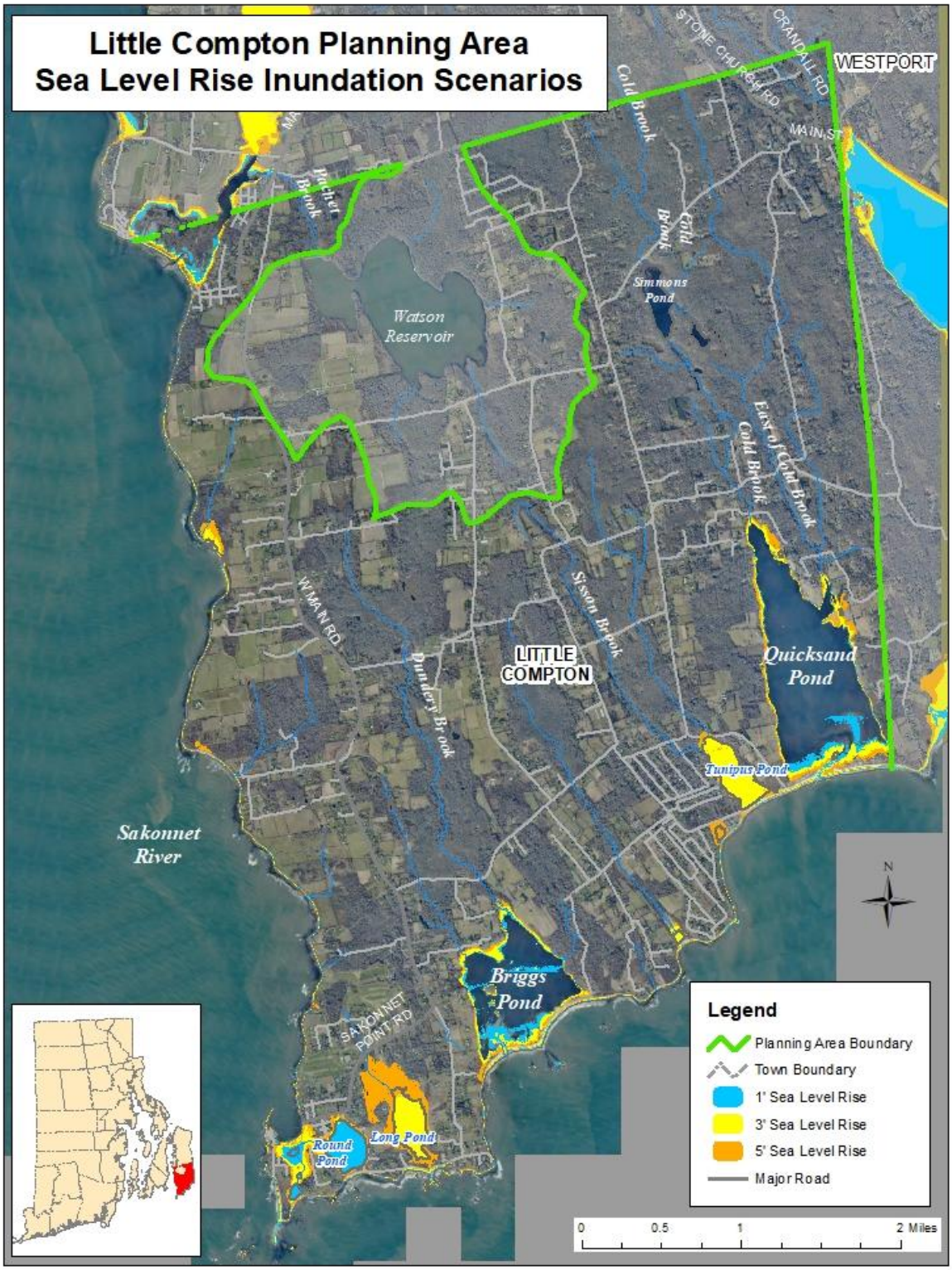
The effects of climate change associated sea level rise (SLR), more frequent and intense weather events, and temperature increases, pose many threats to water quality and aquatic habitats, including the following:

- Increased storm intensity and frequency of intense storms can overwhelm the existing stormwater management structures resulting in improper treatment of stormwater and potential flooding.
- Warmer soil temperatures may decrease the effectiveness of OWTS to treat wastewater.
- Sea level rise can raise water tables along the coast reducing the effectiveness of OWTS treatment.
- Coastal storms and storm erosion can damage OWTS.
- Sea level rise can cause saltwater intrusion further inland impacting drinking water wells.
- Increased frequency and/or severity of droughts reduce water levels in wells used for drinking water and agriculture, and can reduce stream flow to levels adversely impacting aquatic life.
- Warming air and water temperatures can affect fish habitat and water chemistry dynamics. Also, warmer water physically can't hold as much dissolved oxygen, and warmer water encourages the growth of algae, both situations exacerbating cultural eutrophication of lakes and ponds.
- Freshwater wetlands are vulnerable due to changes in hydrology. Changing water regimes and temperatures will impact wetland habitat. For example, the hydroperiod of vernal pools may shorten, affecting the breeding success of species dependent on this habitat, such as amphibians.
- Coastal salt marshes are in critical danger from rising sea level. As sea level rises, new salt marsh habitat would naturally migrate inland as these areas are converted to the new tidal conditions, however, this can only happen if there are no physical barriers, such as hardened shorelines, parking lots, or buildings already occupying these potential migration areas. For more information on sea level rise and salt marsh migration, see the "Rhode Island Sea Level Affecting Marshes Model (SLAMM) Project Summary Report," March 2015, available here: http://www.crmc.ri.gov/maps/maps_slamm.html.

The RI Coastal Resources Management Council (CRMC) and the University of Rhode Island's (URI) STORMTOOLS is an interactive map that aids Rhode Island residents and municipalities in determining what houses, buildings, and infrastructure are at risk of coastal inundation under different scenarios of storm surges and SLR. The CRMC currently projects local SLR of 3-5 feet or more within 100 years. With 3-5 feet of SLR, it is likely that the freshwater coastal ponds (Round Pond, Long Pond, and Tunipus Pond) will experience saltwater intrusion, the estuarine Briggs Marsh Pond and Quicksand Pond will affect new inland areas, and much of the land near Sakonnet Harbor and Sakonnet Point will be inundated. See Figure 9.

The RIDEM recommends that municipalities educate themselves on the impacts of flooding and sea level rise. It is recommended that all municipal board and commission members complete the PREP-RI on-line module series, available here: https://prep-ri.org/.

Figure 9. Sea Level Rise (CRMC StormTools)



VIII. Implementation -- Protection and Restoration

A. Public Action

Public education and awareness are important because everyone in Little Compton poses a risk to surface water, groundwater, and aquatic habitats. Though many actions to improve water quality are the responsibility of government agencies, other actions taken by residents and non-governmental groups have the potential to make a large difference. Most homeowners will work to protect their local water resources and aquatic habitats if they know how to minimize impacts. The challenge has always been how best to inform the public and how to interest the public enough to take actions to make a difference.

Water quality and aquatic habitat protection and restoration in the planning area can only be successful when the people that live and work in the area realize that they play a crucial role. Individual actions may not seem to have much of an effect by themselves, but the overall cumulative impact (positive or negative) on water quality by individuals can be dramatic. Actions that can be taken include:

- Take steps identified in the DEM brochure "Simple Ways YOU Can Help Keep Rhode Island's Waters Clean" in Appendix 1.
- Participate in local activities that benefit the environment.
- Attend public meetings on water related issues.
- Advocate for strong municipal government actions for water resources and open space protection.
- Volunteer and support the efforts of local/regional/statewide non-profit groups that can help make a difference in Little Compton.

Examples of public outreach programs and materials include:

- Sakonnet Preservation Association's educational programs – https://sakonnetpreservation.org/educational-programs/
- URI Onsite Wastewater Training Program – https://web.uri.edu/owt/onsite-wastewater-factsheets/
- ERICD's Residential Guide to Stormwater Management – https://drive.google.com/file/d/1LqCznLVq6D8M4bceWuJbQJLpcTUQVGmE/view

One effective approach to local action is to establish a local water resources/aquatic habitat advocacy group for all or selected waters in Little Compton. The RI Rivers Council has formally designated watershed organizations throughout much of RI. These local watershed groups are then empowered to more actively participate local decision-making regarding water resources in the community. View the RI Rivers Council website at: https://ririvers.org/

B. Implementation Table

This Implementation Table identifies actions for water quality and aquatic habitat protection and restoration in the Little Compton planning area. The action items are derived from the process of developing the plan and from the 2018 Town of Little Compton Comprehensive Plan.

The Implementation Table is divided by management topic, and it includes the information below:

- Action Item
- Responsible Party
- Timeframe: ongoing, 1-2 years, 3-5 years, 5-10 years.
- Cost Estimate: Relative indication of estimated cost as follows:
    - $ = <$25,000;
    - $$ = $25,000 -- $100,000;
    - $$$ = >$100,000
- Priority:
    - H – High
    - M – Medium
    - L – Low

NGO = non-governmental organizations
ERICD = Eastern RI Conservation District
NRCS = US Dept. of Agriculture, Natural Resources Conservation Service

Table 6. Implementation Table

Action Item (Listed by Management Topic)	Responsible Party	Timeframe (years)	Cost Estimate	Priority
Stormwater Management				
Identify stormwater outfall discharges to surface waters and contributing drainage areas.	Town, RIDOT	3-5	$$	H
Implement stormwater BMP retrofits to treat runoff from the identified outfalls as opportunities and needs arise.	Town, RIDOT	5-10	$$$	H
Increase frequency of stormwater BMP maintenance.	Town, RIDOT	1-2 (then on-going)	$$$	H
Ensure adequate resources to properly maintain BMPs.	Town	3-5	$$$	H
Investigate and eliminate illicit sanitary and gray-water connections to storm drains.	Town, RIDOT	3-5	$$	H
Provide public education on 'good housekeeping' efforts that residents can do to reduce pollutants in stormwater runoff (restoring vegetated buffers around streams, discouraging the resident geese, maintaining septic systems, properly disposing of pet wastes, minimizing fertilizer use, ways of reducing stormwater runoff, proper disposal of household hazardous wastes, and prevention of illegal dumping).	Town, NGOs	On-going	$	H
Complete the LID Self-Assessment. Review existing planning and development ordinances to evaluate what LID techniques are included, decide what LID techniques would be appropriate for the community to incorporate, and adopt the use of the selected LID techniques into local development regulations for use in proposed development and redevelopment projects.	Town	1-2	$$	M
Investigate the feasibility of establishing a stormwater utility district as a stable source of funding for stormwater management needs.	Town	3-5	$$	M
Reduce stormwater runoff by encouraging construction of rain gardens, other landscapes, and dry wells which facilitate groundwater infiltration on private and public properties.	Town, Residents	1-2	$$	M
Require erosion and sediment control training for contractors to work in Town.	Town	1-2	$	M

Action Item (Listed by Management Topic)	Responsible Party	Timeframe (years)	Cost Estimate	Priority
Consider adopting local stormwater requirements, including soil erosion control, for development projects smaller than one acre (smaller than the state minimum requirement) for all new and redevelopment applications.	Town	1-2	$	L
Wastewater Management				
Develop and implement an Onsite Wastewater Management Plan (OWMP) that addresses elements discussed in Section V.B.	Town	1-2	$	H
Develop or enhance a local educational program for OWTS use and maintenance.	Town	1-2	$	H
Once the OWMP is approved, apply for the Community Septic System Loan Program (CSSLP) to provide low-interest loans to homeowners to cover costs associated with septic system repairs or upgrades.	Town	3-5	$	M
Agriculture				
Provide guidance and tools for farmers (including small part-time farmers) regarding identification of non-point source pollution, BMPs (nutrient management plans, fencing livestock out of streams, planting cover crops, etc.), and resources available.	Town, NRCS, ERICD	On-going	$	H
Encourage farmers to apply for funding from NRCS to install BMPs on their properties to prevent adverse impacts to water quality.	NRCS, ERICD	On-going	$	H
Farms develop and implement a Farm Conservation Plan tailored to their specific operations that identifies the BMPs needed to minimize adverse impacts on water quality.	Individual Farmers, ERICD	5-10	$$	M
Implement agricultural BMPs on Little Compton Agricultural Conservancy Trust (LCACT) land holdings. Include practicing agricultural BMPs or implementing Farm Conservation Plans in the terms of any future LCACT easements or outright purchases.	Town, Farmers, ERICD	3-5	$$$	M
Adopt municipal ordinances with BMPs for backyard livestock owners to properly control animal wastes.	Town	3-5	$	L
Lawn Management				
Educate landowners on best management practices for lawn care and landscaping.	Town, NGOs	1-2	$	M

Action Item (Listed by Management Topic)	Responsible Party	Timeframe (years)	Cost Estimate	Priority
		(then On-going)		
Adopt requirements for LID landscaping (native landscaping, xeriscaping, limits on lawn areas, etc.) for new residential and commercial development.	Town	1-2	$	L
Implement a local voluntary program for landscapers to commit to pollution prevention, such as the Town of Charlestown RI Recommended Landscaper Process	Town	3-5	$	L
Road Salt and Sand				
Promptly remove winter sand (street sweeping). Consider increasing frequency of street sweeping between winter storms.	Town, RIDOT	1-2	$$$	M
Identify and implement strategies and technology innovations to minimize the use of road and sand.	Town, RIDOT	6-10	$$$	L
Pet Waste Management				
Enforce local ordinances and improve strategies requiring owners to pick up after their pets on all property.	Town	On-going	$$	M
Educate the public about the impact of pet waste on water quality, Strategies include: • Municipalities could hand out or mail a pet waste or water quality brochure along with the license/tags. • Provide veterinarians and other pet services with water quality information (for dissemination to clients).	Town, NGOs	On-going	$	M
Install pet disposal bag stations and establish a collection system in heavily used areas.	Town	1-2	$$	L
Home Heating Oil Tanks				
Educate homeowners on the threat to water quality from existing above-ground and underground home heating oil tanks and the potential financial consequences.	Town	1-2	$	L

Action Item (Listed by Management Topic)	Responsible Party	Timeframe (years)	Cost Estimate	Priority
Prohibit new underground storage tanks for heating oil.	Town	3-5	$	L
Waterfowl Management				
Provide public education on the negative impacts of feeding waterfowl.	Town, RIDEM, NGOs	1-2	$$	M
Implement and enforce effective ordinances and signage to prevent the public from feeding waterfowl.	Town	1-2 (on-going)	$	M
Encourage residents along waterbodies to discontinue mowing to the water's edge and to grow tall, coarse vegetation along waterbody or to install commercially available fencing to restrict waterfowl access to the water. (Consider a demonstration project to educate and spur interest.)	Town	3-5	$	L
Wetlands and Buffer Protection and Restoration				
Target wetlands and ample buffers for open space protection strategies, including purchases, easements, and through alternative zoning techniques that require open space. Focus on assemblage of large areas of protected land in order to provide better protection for wetlands.	Town, NGOs	On-going	$$$	H
Incorporate Low Impact Development techniques in local regulations to the maximum extent practicable.	Town	1-2	$	H
Incorporate public education on the importance of wetlands, riparian corridors, vegetated buffers to waterbodies, open space protection, and green infrastructure in outreach media and activities.	Town, NGOs	1-2 (then on-going)	$	M
Identify areas with limited riparian buffer and work with landowners to promote buffer protection and restoration where possible.	Town, NGOs, ERICD	On-going as opportunities arise	$$	M
Aquatic Invasives				
As opportunities arise, take actions to control invasive species.	Town, NGOs, RIDEM	On-going	$$	H

Action Item (Listed by Management Topic)	Responsible Party	Timeframe (years)	Cost Estimate	Priority
Survey waterbodies in the Town for the presence of aquatic invasives.	RIDEM, Town	3-5	$$	L
Install educational signs at points of public access to waterbodies in the Town.	Town, NGOs	3-5	$	L
Stream Habitat Connectivity				
Conduct an assessment of stream connectivity at road crossings in the Town for wildlife/fish passage and capacity to address increased storm intensity.	Town, RIDOT, NGO's	3-5	$$	M
Climate Change				
Municipal Boards and commissions educate themselves on the impacts of flooding and sea level rise. Recommended for all Board and Commission members to complete the PREP-RI on-line module series.	Town	1-2 (then On-going)	$	H
Upon next update to Hazard Mitigation Plans, consider incorporating flood and storm surge protection projects involving habitat and wetland protection and restoration.	Town	1-2	$	M
Conservation Lands				
Continue to pursue open space conservation, with a priority on areas that contribute to the protection and restoration of water quality and aquatic habitats. Also focus on the connectivity of these areas.	Town, NGOs	On-going	$$$	H
Establish criteria for preservation of open space, including creation of "green corridors" that connect conserved parcels.	Town, NGOs	3-5	$	M
Establish an education initiative to encourage participation in the State's Farm, Forest and Open Space Program.	Town	3-5	$	L
Groundwater - Drinking Water Protection				
Integrate groundwater issues into public education programs: water conservation, household hazardous waste, septic systems, underground storage tanks (home heating fuel), pesticides, and other groundwater information.	Town, NGOs	1-2 (then on-going)	$	H

Action Item (Listed by Management Topic)	Responsible Party	Timeframe (years)	Cost Estimate	Priority
Conduct a Town-wide hydrologic study to provide a quantitative assessment of groundwater resources.	Town	3-5	$$	L
Public Education				
Distribute educational materials relating to steps residents can take individually to prevent water pollution and protect aquatic habitat.	Town, NGOs	1-2	$	M
Provide educational opportunities for Town Staff, Board and Commission members, and citizens regarding the importance of water quality and aquatic habitat protection and land conservation planning.	Town, NGOs	1-2 (then on-going)	$	L
Monitoring and Evaluation				
Work with partners to encourage private citizens to participate in the URI Watershed Watch Program.	Town, NGOs, Citizen, URI Watershed Watch	1-2	$	M
RIDEM continues to monitor water quality in accordance with the statewide monitoring strategy.	RIDEM	Ongoing	$$$	H
RIDEM assess waterbodies in town for designation as cold-water fisheries.	RIDEM	3-5	$$	L
Plan Implementation, Coordination, and Follow-up				
Foster regular dialogue among the Town Boards and Commission members, Agricultural Conservancy Trust, Sakonnet Preservation Association and The Nature Conservancy on the issues in the Plan	Town, NGOs	1-2 (then on-going)	$	H

IX. Financial Support/Implementation Tools

Funding assistance for water quality and aquatic habitat protection and restoration actions is available from various government and private sources. This section provides a brief program overview and contact agency for financial and technical assistance that may be used to implement some of the actions in this plan.

A. Federal Clean Water Act, Section 319 Nonpoint Source Implementation Grants

Section 319 Grants are available for projects to protect and restore water quality through reducing and managing nonpoint source pollution and for projects restoring aquatic habitat. Projects must be consistent with the goals and actions in the USEPA-approved RI Nonpoint Source Management Program Plan. These grants are made possible by federal funds provided to RIDEM by the USEPA under Section 319 of the Clean Water Act.
Eligible applicants: Projects must be in watershed with an approved watershed plan; municipal, state, or regional governments, quasi-state agencies, public schools and universities, and non-profit watershed, environmental, or conservation organizations.
Contact: RIDEM's Office of Water Resources

B. R.I. Infrastructure Bank, Clean Water State Revolving Fund

The Clean Water State Revolving Fund is a federal/state partnership designed to finance the cost of infrastructure needed to achieve compliance with the Clean Water Act. The program is available to fund a wide variety of water quality projects including 1) Traditional municipal wastewater treatment projects; 2) contaminated runoff from urban and agricultural areas; 3) wetlands restoration; 4) groundwater protection; 5) brownfields remediation, and 6) estuary management. Through this program, Rhode Island maintains revolving loan funds to provide low-cost financing for a wide range of water quality infrastructure projects. Funds to establish or capitalize these programs are provided through federal government grants and state matching funds. The interest rate charged to the Clean Water State Revolving Fund is one-third off the borrower's market rate.

In addition to the overall program described above, the Infrastructure Bank has a Sewer Tie-In Loan Fund for homeowners to access funds to connect to the local sewer system. Individual loans are funded from a Clean Water State Revolving Fund loan to a sewer system owner and are administered locally by Rhode Island Housing. Loans to homeowners up to $10,000 are offered at a 2% interest rate for up to a five-year term.

Eligible applicants: Statewide, including municipal, state, or regional governments, and quasi-state agencies. Funds are awarded to projects based on ranking of environmental benefits of the project, readiness to proceed, and availability of funds.
Contact: RIDEM Office of Water Resources; Rhode Island Infrastructure Bank

C. Narragansett Bay and Watershed Restoration Bond Fund

State funds approved by RI voters are periodically available from this bond fund to restore and protect the water quality, and enhance the economic viability, environmental sustainability and resiliency of Narragansett Bay and it the state's watersheds. The fund is meant to provide funding assistance for the feasibility analysis, design, and construction of means to control nonpoint sources of pollution, stormwater pollution control projects, riparian buffer and aquatic habitat restoration projects.
Eligible applicants: Statewide; municipal, state, or regional governments; quasi-state agencies, public schools and universities, and non-profit watershed, environmental, or conservation organizations; and non-governmental for-profit businesses, private schools.
Contact: RIDEM Office of Water Resources

D. U.S. Department of Agriculture Natural Resources Conservation Service (NRCS) Grants

Environmental Quality Incentives Program (EQIP)

This is a voluntary conservation grant program designed to promote and stimulate innovative approaches to environmental enhancement and protection, while improving agricultural production. Through EQIP, farmers and forestland managers may receive financial and technical help to install or implement structural and management conservation practices on eligible agricultural and forest land. Examples of eligible EQIP activities include practices for farm waste storage, nutrient management, riparian buffers and stream bank improvements, wetland restrictions, and groundwater and surface water conservation activities. EQIP payment rates may cover up to 75 percent of the costs of installing certain conservation practices.
Eligible applicants: Any person engaged in livestock, agricultural production, aquaculture, shellfishing, or forestry on eligible land.
Contact: USDA NRCS – RI State Office/Service Center

Wildlife Habitat Incentives Program (WHIP)

This program is a voluntary program for landowners who want to develop and improve fish and wildlife habitat on private agricultural land, non-industrial private forest land, and tribal land. Through WHIP, farmers and forestland managers may receive financial and technical help to develop upland, wetland, aquatic, and other types of wildlife habitat on their property. The current focus of WHIP in RI is on coastal habitats, freshwater wetlands, vernal pools, riparian habitats, upland habitats of State significance (early successional habitats), and the restoration of native habitats impacted by invasive species.
Eligible applicants: Any person owning private agricultural land, non-industrial private forest land, or tribal land.
Contact: USDA NRCS – RI State Office/Service Center

Easement Programs

NRCS offers various easement programs to landowners who want to maintain or enhance their land in a way beneficial to agriculture and/or the environment. NRCS provides technical help and financial assistance to protect private lands through a variety of

programs. These programs include the Farm and Ranch Land Protection Program, the Grasslands Reserve Program, the Healthy Forests Reserve Program, and the Wetlands Reserve Program.
Eligible applicants: Private landowners.
Contact: USDA NRCS – RI State Office/Service Center

E. EPA Southeast New England Program (SNEP)

The US EPA Southeast New England Program for Coastal Watershed Restoration brings together partnerships to protect and restore coastal watersheds of southeast New England from Westerly to Cape Cod. The Program seeks projects and partnerships that leverage multiple resources to generate collaboration to implement innovations and efficiencies in ecosystem management.
Eligible applicants: Municipalities, non-profit organizations, and research/educational institutions.
Contact: US EPA, Southeast New England Program

F. State Open Space Grants

RIDEM administers a grant program to facilitate land conservation relying on State bond funding and Federal program funds. Local Open Space Grants provide up to 50% matching funds to preserve valuable open space through ownership or easements.
Eligible Applicants: Municipalities, land trusts, watershed councils, and non-profit organizations.
Contact: RIDEM Office of Planning and Development

G. Narragansett Bay Estuary Program

The Narragansett Bay Estuary Program is a stakeholder-led organization pursuing place-based conservation across the three-state Narragansett Bay region. Program work spans boundaries to provide independent convening, scientific data analysis, and watershed project funding. The Program supports often under-funded pre-project steps, including studies, assessments, and engineering design.
Eligible Applicants: Typically municipalities, land trusts, watershed councils, and non-profit organizations.
Contact: Narragansett Bay Estuary Program

H. Community Development Block Grants

Title 1 of the Housing and Community Development Act of 1974 authorized the Community Development Block Grant program. The program is sponsored by the US Department of Housing and Urban Development, and the Rhode Island program is administered through the

State of Rhode Island Office of Housing and Community Development. These grants include water and sewer system improvements.
Eligible applicants: Municipalities
Contact: R.I. Department of Administration, Division of Planning, Office of Housing and Community Development

I. Technical Assistance Organizations

University of Rhode Island (URI) Cooperative Extension

As a function of URI's Land Grant mission, URI's Cooperative Extension Water Quality Programs include the following four areas of activity:

- New England Onsite Wastewater Training Program
- RI Nonpoint Education for Municipal Officials (NEMO)- provides information, education, and assistance to local land-use officials regarding how they can accommodate growth while protecting their water resources
- URI Home*A*Syst – provides information and training on pollution prevention for homeowners
- Watershed Watch Program– coordination of volunteer water quality monitoring

Eastern Rhode Island Conservation District (SRICD)

The vision of the Eastern RI Conservation District is to promote and improve long-lasting and environmentally friendly practices that protect natural resources such as soil, water, and air; and to meet that vision through outreach, education, help with environmental questions, and financial assistance. The District works with a variety of people and groups including farmers, landowners, cities, towns, schools, and others in the community.

X. Evaluation- Monitoring and Measuring Progress

There are several indicators of progress that can be used to measure and document improvements in water quality and aquatic habitat protection and restoration. The most direct indicators are water quality measurements, such as concentrations of phosphorus, nitrogen, organic carbon; bacteria; dissolved oxygen; and suspended sediment loads. Monitoring can extend to biological indicators, such as aquatic macroinvertebrates and anadromous fish.

A. Monitoring

Water quality monitoring in the planning area is accomplished by the RIDEM Ambient River Monitoring Program, as well as:

- To protect the public from illness associated with swimming in potentially contaminated bathing waters, the RIDOH Beach Monitoring Program collects and analyzes water samples from beaches throughout Rhode Island from Memorial Day to Labor Day.
- DEM and the RI Department of Health work cooperatively to detect and respond to the presence of cyanobacteria blooms (harmful algal blooms), evaluate the potential risks to the public, and when necessary, issue health advisories notifying the public of health concerns.

RIDEM Ambient River Monitoring (ARM) Program

RIDEM's strategy for monitoring wadeable rivers and streams includes a sampling design to visit freshwater streams around the state over a 4-5 year rotating basin cycle. RIDEM's Ambient River Monitoring (ARM) Program conducts monitoring during late spring to early fall. Water quality samples are collected for chemical and pathogen lab analysis. Additional physical data is measured during field visits. All samples are taken in accordance with a USEPA-approved Quality Assurance Project Plan. The data RIDEM collects is used to characterize general river and stream conditions, identify pollution problems and their causes, support development of water quality restoration plans (TMDLs), and contribute to environmental management and decision-making.

Waterbodies in the Little Compton planning area were sampled by DEM in the 2021 field season. However, DEM was unable to incorporate the results into the 2022 Integrated Water Quality Monitoring and Assessment Report (RI DEM, March 2022), data from which is shown in Section III, Table 2. The 2021 data is expected to be incorporated into the 2024 Integrated Water Quality Monitoring and Assessment Report. DEM is targeting 2025 for the next round of water quality sampling in the area.

URI Watershed Watch Volunteer Water Quality Monitoring Program

The URI Watershed Watch volunteer water quality testing program works with local communities to assess water quality, identify sources of pollution, and provide information leading to more effective management of our water resources. Data collected by the URI

Watershed Watch often contributes to RIDEM decisions on whether to list a waterbody as impaired. Led by trained scientists, URI Watershed Watch helps local governments, watershed, tribal and other organizations recruit and train volunteers to become citizen scientists who gather detailed, quality-assured monitoring data.

There are no waterbodies currently being monitored (as of summer 2022) by a Watershed Watch volunteer in the Little Compton planning area. Over the past decade, 8 locations have been monitored for at least one season: Quicksand Pond, Briggs Marsh Pond, Round Pond, Long Pond, Tunipus Pond, Dundery Brook, Cold Brook, and East of Cold Brook.

B. Measuring Progress

There are several indicators of progress that can be used to measure and document improvements in water quality and aquatic habitat protection and restoration in the planning area. The most direct and straightforward indicators are water quality measurements. Water quality monitoring data can be compared with the water quality criteria for the waterbody classification. Monitoring can extend to biological indicators, such as aquatic macroinvertebrates. Biological monitoring can look at species population levels, species composition, and/or contaminant levels in tissues.

An additional way to measure progress is to systematically track the implementation of the actions in the Implementation Table in Section V. Taking this a step further, the programmatic performance indicators below may be used to measure plan implementation. Although these actions are not a measure of direct environmental improvements, they are assumed to contribute to water quality and aquatic habitat improvements. Some potential performance indicators for water quality and aquatic habitat improvements include:

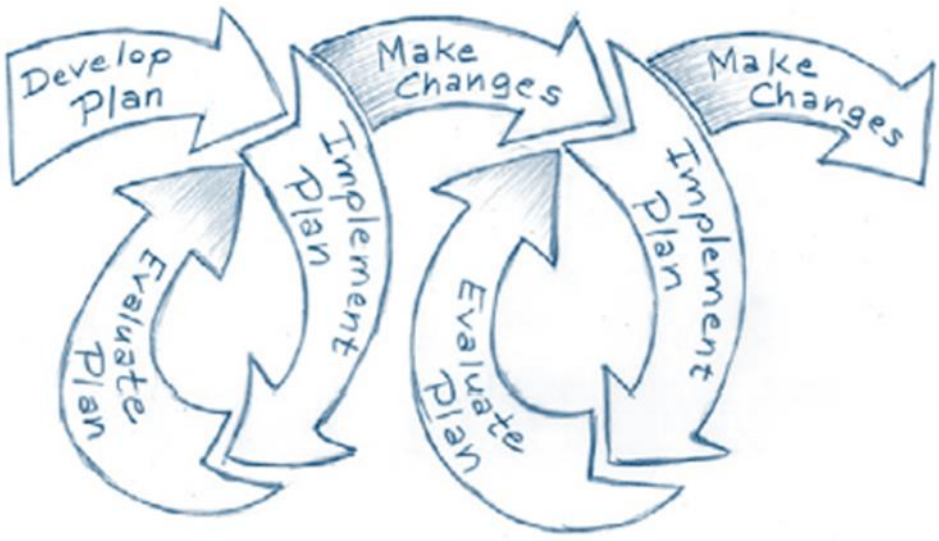
- Number of stormwater BMPs installed.
- Increase in impervious area that is connected to stormwater treatment (area that is disconnected).
- Number of illicit discharges discovered.
- Number of cesspools removed.
- Number of OWTS upgraded, replaced, pumped, etc.
- Reduced number of algae blooms observed.
- Number of waterbodies without invasive species.
- Acreage of open space in conservation.
- Acreage of wetlands protected, and acreage of restored wetlands.
- Number of projects implemented to improve and protect wetlands.
- Acreage of buffers protected, and acreage of restored buffers.
- Number of projects implemented to improve and protect riparian buffers.
- Number of stream connectivity projects implemented to improve connectivity.
- Number of contact hours of educational outreach attained for board members, elected officials, and municipal staff.
- Awareness among residents and other targeted audiences as measured by surveys.

XI. Next Steps

This plan is being provided to the Little Compton community as a tool to use in the long-term protection and restoration of water quality and aquatic habitat. Ideally, local stakeholders, such as town entities and non-government organizations, will assume ownership of this plan and lead efforts to implement strategies in the plan. Development of this plan should be considered the first step in an on-going effort.

The plan will satisfy the requirements for eligibility for USEPA Section 319 funds that are administered by the RIDEM. Projects requesting Section 319 funds must be either identified in the plan's implementation section or at minimum consistent with the intent of the plan, in addition to meeting the criteria of the 319 funding program. The plan will also be useful in showing support for applications to other sources of funding for implementation.

As more is learned about water quality and aquatic habitat in the Town or as additional strategies for protection and restoration are identified, this plan should be amended accordingly.



Source: EPA Handbook for Developing Watershed Plans to Restore and Protect Our Waters

Appendix 1. RIDEM Water Quality Brochure

REDUCE YOUR LAWN by creating "no-mow zones" of native wildflowers, grasses, shrubs, and trees, especially as buffers near ponds and streams. This reduces water, fertilizer, and pesticide use and provides a welcoming habitat for wildlife.

FERTILIZE SMART Have your soil tested before applying fertilizer to your lawn to see if it even needs it. Don't over-fertilize - more is not better. During rainstorms, nutrients from fertilizers can wash off lawns into local waters where the excess nutrients promote algae blooms, including some algae that are harmful to people and pets. Algae blooms cause a decrease in oxygen in the water which endangers aquatic life and can cause fish kills. Use phosphorus fertilizer for new lawns only, unless the soil test shows a need for phosphorus on an established lawn. Sweep up fertilizer that spills on hard surfaces. Leaving grass clippings on your lawn can reduce your fertilizer needs by up to 25%. For more information on soil testing see www.URIMasterGardeners.org

REDUCE USE OF LAWN AND GARDEN PESTICIDES Investigate use of biological controls and products with natural ingredients. Read the labels—apply the right amount at the right time and be aware of the toxicity warnings.

REDUCE RUNOFF Increase the amount of stormwater absorbed into the ground by directing downspouts onto your lawn, not onto paved surfaces where the runoff could pick up oil, yard waste, and other debris. Install a rain barrel— use the water for plantings. Install a rain garden to increase the amount of stormwater absorbed into the ground. For more information, see www.RIStormwaterSolutions.org

DON'T DRAIN YOUR SWIMMING POOL into storm drains, wetlands, rivers, or ponds. Instead drain it onto the ground away from your drinking water well. Drain your pool only when your test kit does not detect chlorine levels so that it won't harm vegetation.

PUMP IT, DON'T DUMP IT! If you own a boat, have your holding tank emptied at one of the local pumpout stations around Rhode Island. For a list of pumpout locations contact DEM.

VOLUNTEER with clean-up efforts or water quality monitoring. Participate in local activities that benefit the environment. Find out if there is a watershed council for your area. YOUR opinion counts! Attend public meetings. Your participation makes the statement that your community is concerned about local waterways. If you see a problem or want something done, say something! If you don't have time to attend meetings, call or contact a city or town official, a state representative, or DEM.

NOW...GET OUT AND ENJOY THE WATER !
Swim, sail, surf, kayak, fish, boat, shellfish, go birding or walk along the shore. Explore Rhode Island's waters.

RI Department of Environmental Management
Office of Water Resources

If you need more information on any of these topics contact DEM Water Resources

235 Promenade Street
Providence, RI 02908-5767
401-222-4700
www.dem.ri.gov

RI DEM

Rev 3/2015

Simple Ways YOU Can Help Keep Rhode Island's Waters Clean

YOU Can Make A Difference!

- **DO YOU EVER STOP AND WONDER** what you can do to make a difference in keeping our waters safe enough to swim in, fish from, or use for drinking? What you can do to protect the groundwater that supplies your drinking water well?
- **WHEN IT RAINS** water travels across our properties collecting pollutants such as animal feces, fertilizers, soil, oil, and chemicals. This runoff then flows untreated into local rivers, lakes, and streams; polluting water for human use as well as plant and animal life.

LEARN ABOUT YOUR LOCAL WATERS Everyone lives in a watershed, which is the area that drains to a nearby river, stream, lake, or pond. Think about washing everything in a sink then letting it go down the drain. The sink is your watershed and the drain is your local river or stream. Find out what waters are closest to you and where they flow.

TAKE CARE OF YOUR SEPTIC SYSTEM Faulty septic systems can pollute local waters. Systems should be inspected every three to five years and tanks pumped as recommended. Don't drive or park anywhere on your septic system. Plant only grass over and near the system. If you have a cesspool, consider replacing it with a septic system.

DON'T FEED THE DUCKS! Feeding geese, ducks, gulls, and other waterfowl can cause large populations of birds to become concentrated in areas that are incapable of supporting them. The waste they produce contributes bacteria to our waterways and results in beach closures and pollution of shellfishing areas.

SCOOP THE POOP Pet waste left on sidewalks, streets or yards can be washed away by rainwater and carried into storm drains and drainage ditches which flow untreated to nearby rivers, ponds and beaches. Pet waste contains bacteria that can cause human illness and contribute to the closing of beaches and shellfish beds. Always carry a baggie - scoop up waste, bag it, and put it in the trash.

DON'T FLUSH MEDICATIONS Old or unwanted prescription drugs and over the counter medications flushed down the toilet or drain can end up in our waters and harm organisms living there. Check to see if you can drop off medications at your police station. If not, properly dispose of them in the trash. Crush pills and tablets. Put the medicine into a sealable plastic bag. Place the sealed bag in the trash.

MINIMIZE THE USE OF HAZARDOUS PRODUCTS as much as possible. Cleaning and other household products contain many hazardous chemicals. Read labels and try to use the least harmful products available. Don't dispose of products down the toilet or drain. Dispose of household hazardous chemicals (e.g., oil based paint, pesticides, drain cleaner, oven cleaner, pool chemicals) using the RI Eco-Depot Program. See www.rirrc.org

DRIVEWAY CARE Driveway sealant can be either an asphalt or a coal tar mixture. Coal tar has much higher levels of chemicals harmful to human health and aquatic life. As sealants wear down, particles wash off in stormwater. If you must seal your driveway, use an asphalt sealant.

WASH VEHICLES ON YOUR LAWN (away from your drinking water well) or use a commercial car wash. Washing on your lawn minimizes the amount of dirty, soapy water flowing into the storm drains that run directly into our waterbodies. If you are unable to wash your car on your lawn, use only biodegradable, phosphate-free cleaners. If washing near a storm drain, temporarily divert the water towards grassy areas. Commercial car washes typically use far less water, recycle their wash water, and treat their water prior to releasing it into the sewer system.

RECYCLE USED MOTOR OIL AND ANTIFREEZE Don't dump automotive fluids down the storm drain or dispose of them in your trash. Contact your local Department of Public Works or see the RI Eco-Depot Program at www.rirrc.org

CONSERVE WATER Don't overwater your lawn. Lawns need only one inch of water per week (from either watering or rain). Excessive water use, especially in summer, can dramatically reduce flow in rivers and streams, harming aquatic life.

If your house is connected to a public sewer, conserving water will help reduce the discharge from your wastewater treatment facility into local waters AND save you money! If you use a septic system, water conservation helps prevent system failures.