



Frenchtown Brook

Watershed Description

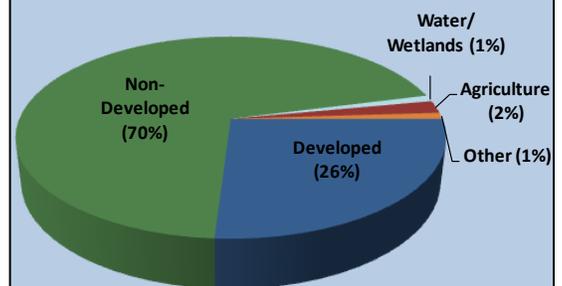
This **TMDL** applies to the Frenchtown Brook assessment unit (RI0007028R-01), an 8.6-mile long stream located in East and West Greenwich, RI (Figure 1). The Towns of East and West Greenwich are located in the central portion of the state. The Frenchtown Brook watershed is presented in Figure 2 with land use types indicated.

Frenchtown Brook begins as two branches on either side of Bates Trail in a forested area to the southeast of Carr Pond in West Greenwich, RI. The branches flow east across the town border with East Greenwich and join in a wetland area near Wightmans Corner. The brook continues east, through residential and commercial developments along Frenchtown Road, and crosses Tillinghast Road. The brook then flows just north of Frenchtown Elementary School and crosses Frenchtown Road near the intersection with Routes 2 and 4. Frenchtown Brook continues east, through a more heavily developed commercial section of East Greenwich including the Stanley-Bostitch Corporation, a hand and power tool manufacturing plant, and eventually empties into the Hunt River near Route 403.

The Frenchtown Brook watershed covers 7 square miles and includes multiple residential neighborhoods in the northwestern section of East Greenwich. Non-developed areas occupy a large portion (70%) of the watershed. Developed uses (including residential, commercial, and transportation uses) occupy 26% of the watershed. Impervious surfaces cover 9.8% of the watershed. Agricultural uses occupy 2% of the watershed. Surface water and wetlands occupy 1% and other uses occupy 1% of the watershed.

Assessment Unit Facts **(RI007028R-01)**

- **Town:** East Greenwich and West Greenwich
- **Impaired Segment Length:** 8.6 miles
- **Classification:** Class A
- **Direct Watershed:** 7 mi² (4480 acres)
- **Impervious Cover:** 9.8%
- **Watershed Planning Area:** Hunt River (#6)



Watershed Land Uses

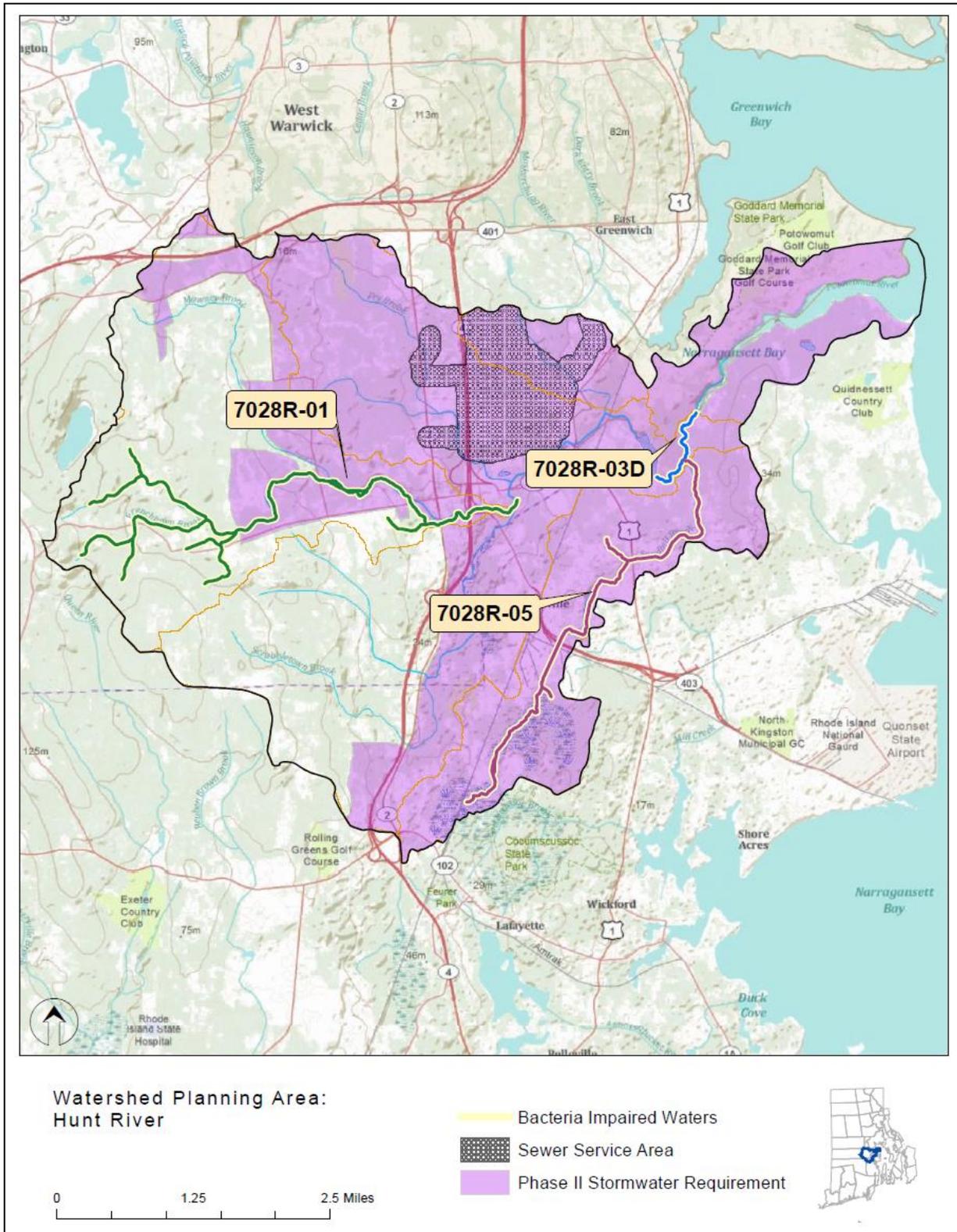


Figure 1: Map of the Hunt River Watershed Planning Area with impaired segments addressed by the Statewide Bacteria TMDL, sewer service areas, and stormwater regulated zones.

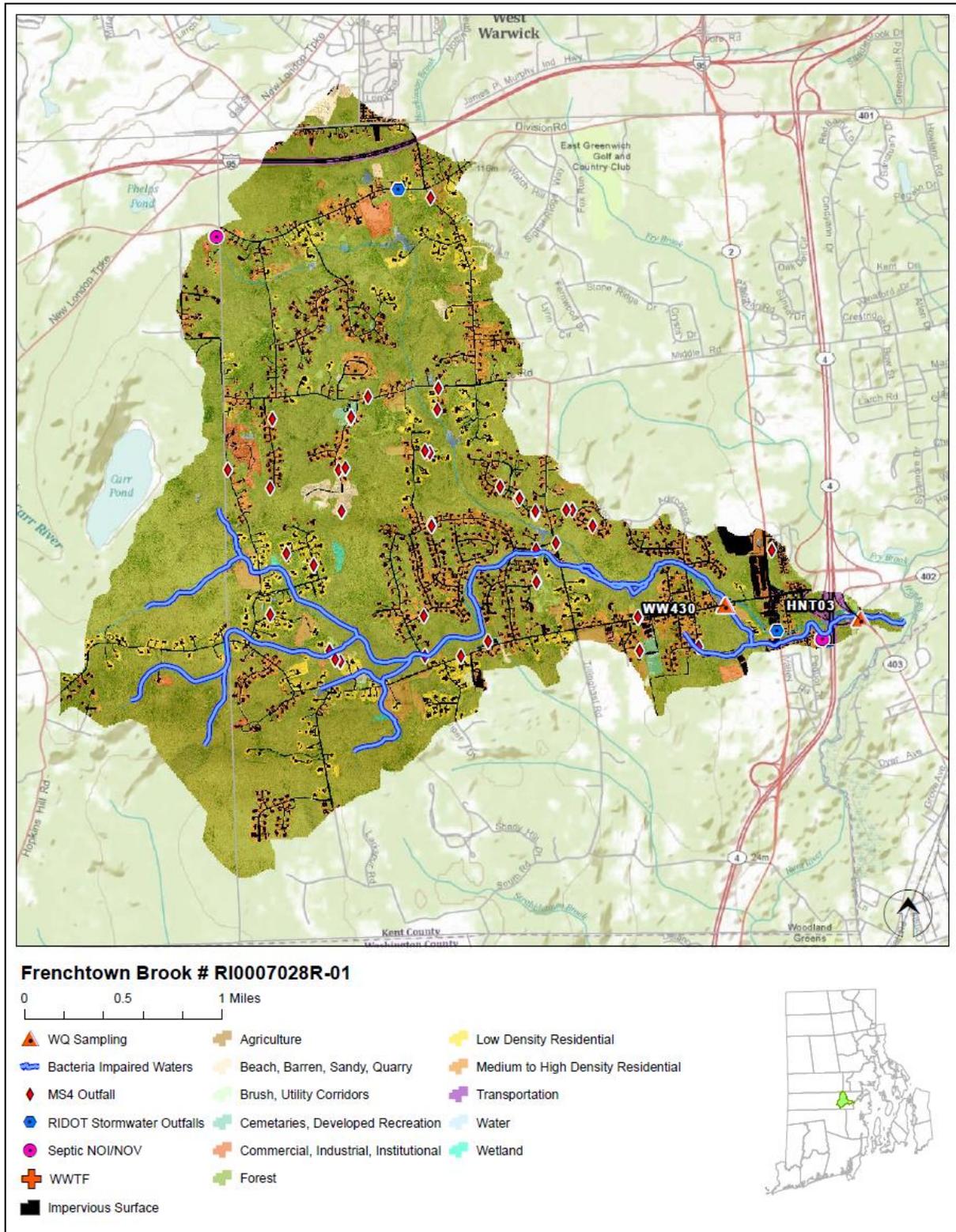


Figure 2: Map of the Frenchtown Brook watershed with impaired segment, sampling locations, and land cover indicated.

Why is a TMDL Needed?

Frenchtown Brook is a Class A fresh water stream, and its applicable designated uses are primary and secondary contact recreation and fish and wildlife habitat (RIDEM, 2009). From 2007-2009, water samples were collected from two sampling locations (HTN03 and WW430) and analyzed for the indicator bacteria, enterococci. The water quality criteria for enterococci, along with bacteria sampling results from 2007-2009 and associated statistics are presented in Table 1. The geometric mean was calculated for both stations and exceeded the water quality criteria for enterococci.

To aid in identifying possible bacteria sources, the geometric mean was also calculated for wet and dry-weather sample days, where appropriate. Both wet and dry-weather geometric mean values exceeded the water quality criteria for enterococci at Station WW430. Since only one wet weather sample was collected at HNT03, only the dry weather geometric mean could be calculated. It exceeded the water quality criteria.

Possible dry and wet weather sources are described in the sections below. Potential sources include improperly operating onsite wastewater treatment systems (OWTS) and wastes from waterfowl, wildlife, and domestic pets. In wet weather, these sources can be carried to the river in stormwater runoff.

Due to the elevated bacteria measurements presented in Table 1, Frenchtown Brook was identified as impaired and was placed on the 303(d) list (RIDEM, 2008). The Clean Water Act requires that all 303(d) listed waters undergo a TMDL assessment that describes the impairments and identifies the measures needed to restore water quality.

Frenchtown Brook has previously been identified as a source of bacteria to the Hunt River in the 2001 Fecal Coliform TMDL for the Hunt River, RI (RIDEM, 2001).

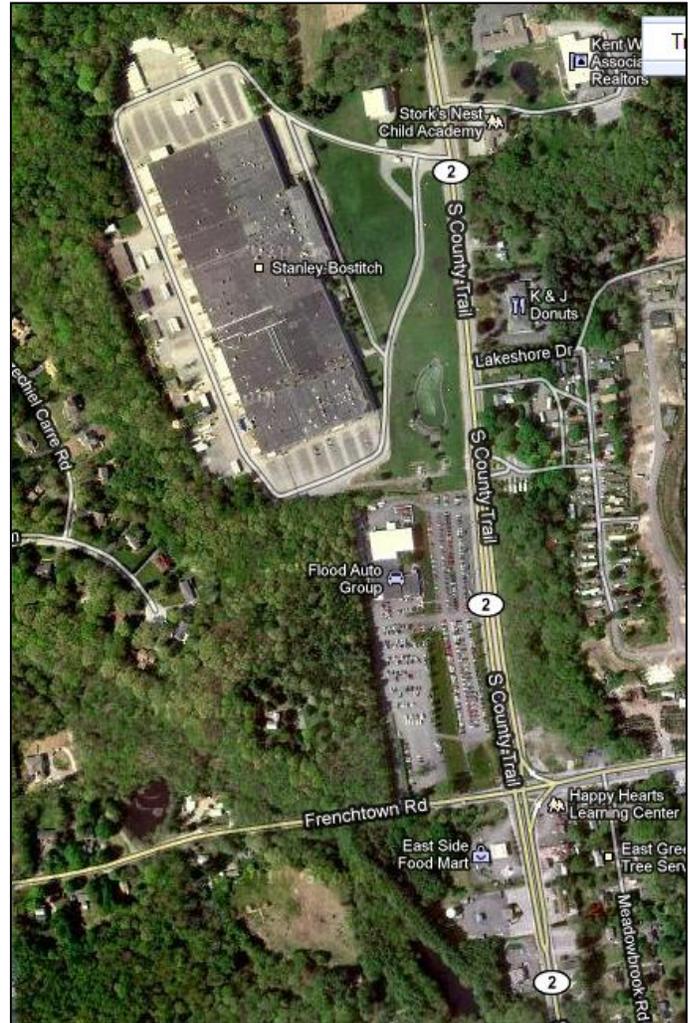


Figure 3: Partial aerial view of the Frenchtown Brook watershed. (Source: Google Maps)

Potential Bacteria Sources

There are several potential sources of bacteria in the Frenchtown Brook watershed including waterfowl, wildlife, and domestic animal waste, malfunctioning onsite wastewater treatment systems, and stormwater runoff from developed areas.

Waterfowl, Wildlife, and Domestic Animal Waste

The Frenchtown Brook watershed is predominately undeveloped, particularly near the headwaters of the brook. These forested areas are also home to various wildlife and waterfowl. Wildlife, including waterfowl, may be a significant bacteria source to surface waters. With the construction of roads and drainage systems, these wastes may no longer be retained on the landscape, but instead may be conveyed via stormwater to the nearest surface water. As such, these physical land alterations can exacerbate the impact of these natural sources on water quality. In the 2001 Hunt River TMDL, waste from these animals has previously been identified as a source of bacteria to Frenchtown Brook (RIDEM, 2001).

Much of the residential development within the watershed is located along Frenchtown Road and in the northern portions of the watershed. Waste from domestic animals such as dogs, may also be contributing to bacteria concentrations in Frenchtown Brook.

Onsite Wastewater Treatment Systems

All residents in the Frenchtown Brook watershed rely on onsite wastewater treatment systems (OWTS) such as cesspools and septic systems. If systems are improperly sized, malfunctioning, or in soils poorly suited for septic waste disposal, microorganisms such as bacteria, can easily enter surface water (USEPA, 2002). As shown in Figure 2, two OWTS Notices of Violation/Notices of Intent to Violate (NOV/NOIs) have been issued by the RIDEM Office of Compliance and Inspection in the Frenchtown Brook watershed. One of these NOV/NOIs was issued to a property located directly along Frenchtown Brook, near its confluence with the Hunt River.

Developed Area Stormwater Runoff

The Frenchtown Brook watershed has an impervious cover of 9.8%. Impervious cover is defined as land surface areas, such as roofs and roads that force water to run off land surfaces, rather than infiltrating into the soil. Impervious cover provides a useful metric for the potential for adverse stormwater impacts. While runoff from impervious areas in these portions of the watershed may be contributing bacteria to Frenchtown Brook, as discussed in Section 6.3 of the Core TMDL Document, as a general rule, impaired streams with watersheds having less than 10% impervious cover are assumed to

be caused by sources other than urbanized stormwater runoff. However, the 2001 Hunt River TMDL identified stormwater runoff from developed areas near Tillinghaust Road, Woodbridge Drive, and Route 2 as a wet-weather source of bacteria to Frenchtown Brook. Wet-weather data from station WW430, located in this section of the brook, exceeded the water quality criteria for enterococci suggesting that stormwater from this area may be a source of bacteria to this section of Frenchtown Brook.

Existing Local Management and Recommended Next Steps

Additional bacteria data collection would be beneficial to support identification of sources of potentially harmful bacteria in the Frenchtown Brook watershed. These activities could include sampling at several different locations and under different weather conditions (e.g., wet and dry). Field reconnaissance surveys focusing on stream buffers, stormwater runoff, and other source identification may also be beneficial.

Based on existing ordinances and previous investigations, the following steps are recommended to support water quality goals.

Waterfowl, Wildlife, and Domestic Animal Waste

Education and outreach programs should highlight the importance of picking up after dogs and other pets and not feeding waterfowl. Animal wastes should be disposed of away from any waterway or stormwater system. The towns should work with volunteers to map locations where animal waste is a significant and chronic problem. This may include installing signage, providing pet waste receptacles or pet waste digester systems in high-use areas, enacting ordinances requiring clean-up of pet waste, and targeting educational and outreach programs in problem areas.

Towns and residents can take several measures to minimize waterfowl-related impacts in the watershed. They can allow tall, coarse vegetation to grow in areas along the shores of Frenchtown Brook that are frequented by waterfowl. Waterfowl, especially grazers like geese, prefer easy access to the water. Maintaining an uncut vegetated buffer along the shore will make the habitat less desirable to geese and encourage migration. With few exceptions, Part XIV, Section 14.13 of Rhode Island's Hunting Regulations prohibits feeding wild waterfowl at any time in the state of Rhode Island. Educational programs should emphasize that feeding waterfowl, such as ducks, geese, and swans, may contribute to water quality impairments in Frenchtown Brook and can harm human health and the environment.

Onsite Wastewater Management

All residents of the Frenchtown Brook watershed rely on OWTS (Berger, 2006). As part of an onsite wastewater management planning process, East and West Greenwich should develop Onsite Wastewater Management Plans and adopt ordinances to establish enforceable mechanisms to ensure that existing OWTS are properly operated and maintained. RIDEM recommends that all communities create an inventory of onsite systems through mandatory inspections. Inspections encourage proper maintenance and identify failed and sub-standard systems. Policies that govern the eventual replacement of sub-standard OWTS within a reasonable time frame should be adopted. The Rhode Island Wastewater Information System (RIWIS) can help develop an initial inventory of OWTS and can track voluntary inspection and pumping programs (RIDEM, 2010b).

The Towns of East and West Greenwich are not eligible for the Community Septic System Loan Program (CSSLP). The CSSLP program provides low-interest loans to residents to help with maintenance and replacement of OWTS. It is recommended that both towns develop a program to assist citizens with the replacement of older and failing systems.

Stormwater Management

The Town of East Greenwich (RIPDES permit RIR040002) and the Rhode Island Department of Transportation (RIDOT) (RIPDES permit RIR040036) are municipal separate storm sewer (MS4) operators in the Frenchtown Brook watershed and have prepared Phase II Stormwater Management Plan (SWMPP). The regulated area in East Greenwich includes the eastern portion of the watershed. Though the Town of West Greenwich (RIPDES permit RIR040029) is regulated by the Phase II program, the Frenchtown Brook watershed is outside of the Phase II regulated area.

East Greenwich's SWMPP outlines goals for the reduction of stormwater runoff to Simmons Brook through the implementation of Best Management Practices (BMPs). East Greenwich has opted to enact its stormwater permit activities town-wide to include all areas of town. Many of these BMPs are now in place, including mapping all stormwater outfalls, instituting annual inspections and cleaning of the town's catch basins, implementing an annual street sweeping program, adopting construction erosion and sediment control and post-construction stormwater control ordinances, and conducting public education activities (RIDEM, 2010a).

The Towns of East and West Greenwich have both adopted ordinances to address illicit discharges. This type of ordinance prohibits illicit discharges to the storm drain system and provides an enforcement mechanism. It is recommended that any stormwater outfalls discharging in the near vicinity of the sampling location be monitored to check for illicit discharges. Illicit discharges can be identified through continued dry weather outfall sampling and microbial source tracking.

RIDOT has completed a SWMPP for state-owned roads in the watershed. RIDOT's SWMPP and its 2011 Compliance Update outline its goals for compliance with the General Permit statewide. It should be noted that RIDOT has chosen to enact the General Permit statewide, not just for the urbanized and densely populated areas that are required by the permit. RIDOT has finished mapping its outfalls throughout the state and is working to better document and expand its catch basin inspection and maintenance programs along with its BMP maintenance program. SWMPPs are being utilized for RIDOT construction projects. RIDOT also funds the University of Rhode Island Cooperative Extension's Stormwater Phase II Public Outreach and Education Project, which provides participating MS4s with education and outreach programs that can be used to address TMDL public education recommendations.

While these first steps are important to reduce the effects of stormwater runoff to Frenchtown Brook, additional efforts may be needed to restore the river's water quality. Previous TMDLs have identified stormwater runoff from developed areas near Tillinghaust Road, Woodbridge Drive, and Route 2 as a source of bacteria to Frenchtown Brook and recommended specific BMPs to address this source (RIDEM, 2001).

The Town of East Greenwich and RIDEM should ensure that the previously recommended BMPs have been implemented and maintained. Any changes to their SWMPPs should be documented in a TMDL Implementation Plan (TMDL IP) and should comply with relevant provisions Part IV.D of the RIPDES Stormwater General Permit (RIDEM, 2010b), which are summarized in Section 6.2 (Numbers 1 through 5) of the Core TMDL Document.

Land Use Protection

Woodland and wetland areas within the Frenchtown Brook watershed absorb and filter pollutants from stormwater runoff, and help protect both water quality in the stream and stream channel stability. As these areas represent a large portion of the land use in the Frenchtown Brook watershed, it is important to preserve these undeveloped areas, and institute controls on development in the watershed.

The steps outlined above will support the goal of mitigating bacteria sources and meeting water quality standards in Frenchtown Brook.

Table 1: Frenchtown Brook Bacteria Data

Waterbody ID: RI0007028R-01

Watershed Planning Area: 6 – Hunt River

Characteristics: Freshwater, Class A, Primary and Secondary Contact Recreation, Fish and Wildlife Habitat

Impairment: Enterococci (colonies/100mL)

Water Quality Criteria for Enterococci: Geometric Mean: 54 colonies/100 mL

Percent Reduction to meet TMDL: 58% (Include 5% Margin of Safety)

Data: 2007-2009 from RIDEM

Single Sample Enterococci (colonies/100 mL) Results for Frenchtown Brook (2007-2009) with Geometric Mean Statistics

Station Name	Station Location	Date	Result	Wet/Dry	Geometric Mean
WW430	Frenchtown Brook at Frenchtown Rd.	10/25/2008	2	Wet	114 [†] (58%)*
WW430	Frenchtown Brook at Frenchtown Rd.	9/20/2008	116	Dry	
WW430	Frenchtown Brook at Frenchtown Rd.	8/16/2008	100	Dry	
WW430	Frenchtown Brook at Frenchtown Rd.	7/15/2008	32	Dry	
WW430	Frenchtown Brook at Frenchtown Rd.	10/20/2007	198	Wet	
WW430	Frenchtown Brook at Frenchtown Rd.	9/15/2007	1002	Wet	
WW430	Frenchtown Brook at Frenchtown Rd.	8/18/2007	501	Dry	
WW430	Frenchtown Brook at Frenchtown Rd.	7/21/2007	387	Wet	
HNT03	Rt 403/Davisville Rd; before on-ramp to Rt 4	8/19/2009	140	Dry	70
HNT03	Rt 403/Davisville Rd; before on-ramp to Rt 4	8/3/2009	276	Dry	
HNT03	Rt 403/Davisville Rd; before on-ramp to Rt 4	7/16/2009	91	Dry	
HNT03	Rt 403/Davisville Rd; before on-ramp to Rt 4	5/14/2009	15	Wet	
HNT03	Rt 403/Davisville Rd; before on-ramp to Rt 4	9/23/2008	32	Dry	
Shaded cells indicate an exceedance of water quality criteria					
*Includes 5% Margin of Safety					
†Geometric mean used to determine percent reduction					

Wet and Dry Weather Geometric Mean Enterococci Values for all Stations

Station Name	Station Location	Years Sampled	Number of Samples		Geometric Mean		
			Wet	Dry	All	Wet	Dry
WW430	Frenchtown Brook at Frenchtown Rd.	2007-2008	4	4	114	111	117
HNT03	Rt 403/Davisville Rd before on-ramp to Rt 4	2008-2009	1	4	70	NA	103
Shaded cells indicate an exceedance of water quality criteria Weather condition determined from rain gage at TF Green Airport in Warwick, RI							

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- RIDEM (2001). Fecal Coliform TMDL Development for Hunt River, Rhode Island. Rhode Island Department of Environmental Management.
- RIDEM (2008). State of Rhode Island and Providence Plantations 2008 303(d) List – List of Impaired Water Bodies. Rhode Island Department of Environmental Management.
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- RIDEM (2010a). MS4 Compliance Status Report for RI Statewide Bacteria TMDL. Rhode Island Department of Environmental Management.
- RIDEM (2010b). Total Maximum Daily Load Analysis for the Pawcatuck River and Little Narragansett Bay Waters (Bacteria Impairments). Rhode Island Department of Environmental Management.
- RI HEALTH (2003). Aquidneck Island Drinking Water Assessment Results, Source Water Protection Assessment conducted by the University of Rhode Island for the Rhode Island Department of Health, Office of Drinking Water Supply.
- USEPA (2002). Onsite Wastewater Treatment Systems Manual – Office of Water, Office of Research and Development – EPA/625/R-00/008. Online:
www.epa.gov/owm/septic/pubs/septic_2002_osdm_all.pdf.