



Taney Brook

Watershed Description

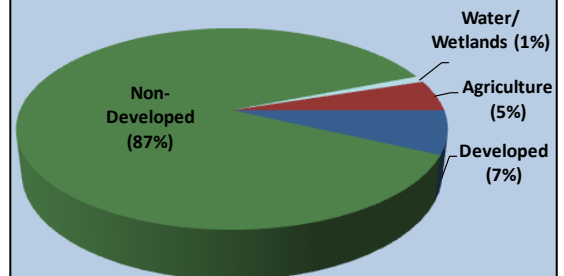
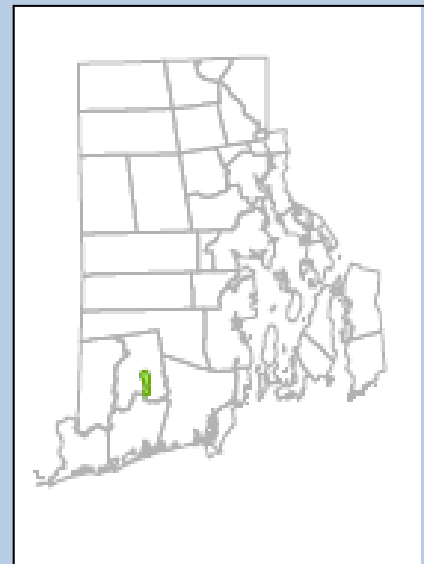
This **TMDL** applies to the Taney Brook assessment unit (RI0008039R-23), a 1.7-mile long stream located in Richmond, RI (Figure 1). The Town of Richmond is located in the southwestern portion of the state and is bordered to the east by South Kingstown, to the west by Hopkinton, to the north by Exeter, and to the south by Charlestown. Taney Brook is located in the southern portion of town, near the Charlestown border. The Taney Brook watershed is presented in Figure 2 with land use types indicated.

Taney Brook begins in a wetland area northeast of the low-density residential development on Pinecrest Road. The brook flows south through a predominately forested area and crosses Shannock Hill Road. The area around Shannock Hill Road is characterized by agricultural activities, including vegetable and dairy farms and horse stables. The brook continues south and empties into the Pawcatuck River, another bacteria-impaired river, on the town border of Richmond and Charlestown.

The Taney Brook watershed covers 1.9 square miles. The watershed is predominately non-developed (87%), particularly in the northern portions of the watershed. Developed uses (including residential and commercial uses) occupy approximately 7% and are concentrated around Shannock Hill Road. Agricultural land uses are also concentrated in the southern portion of the watershed around Shannock Hill Road and occupy 5% of the land use (Figure 3). Wetlands and other surface waters, occupy 1% of the land use in the Taney Brook watershed.

Assessment Unit Facts *(RI0008039R-23)*

- **Town:** Richmond
- **Impaired Segment Length:** 1.7 miles
- **Classification:** Class B
- **Direct Watershed:** 1.9 mi² (1192 acres)
- **Impervious Cover:** 2.1%
- **Watershed Planning Area:** Wood-Pawcatuck (#23)



Watershed Land Uses

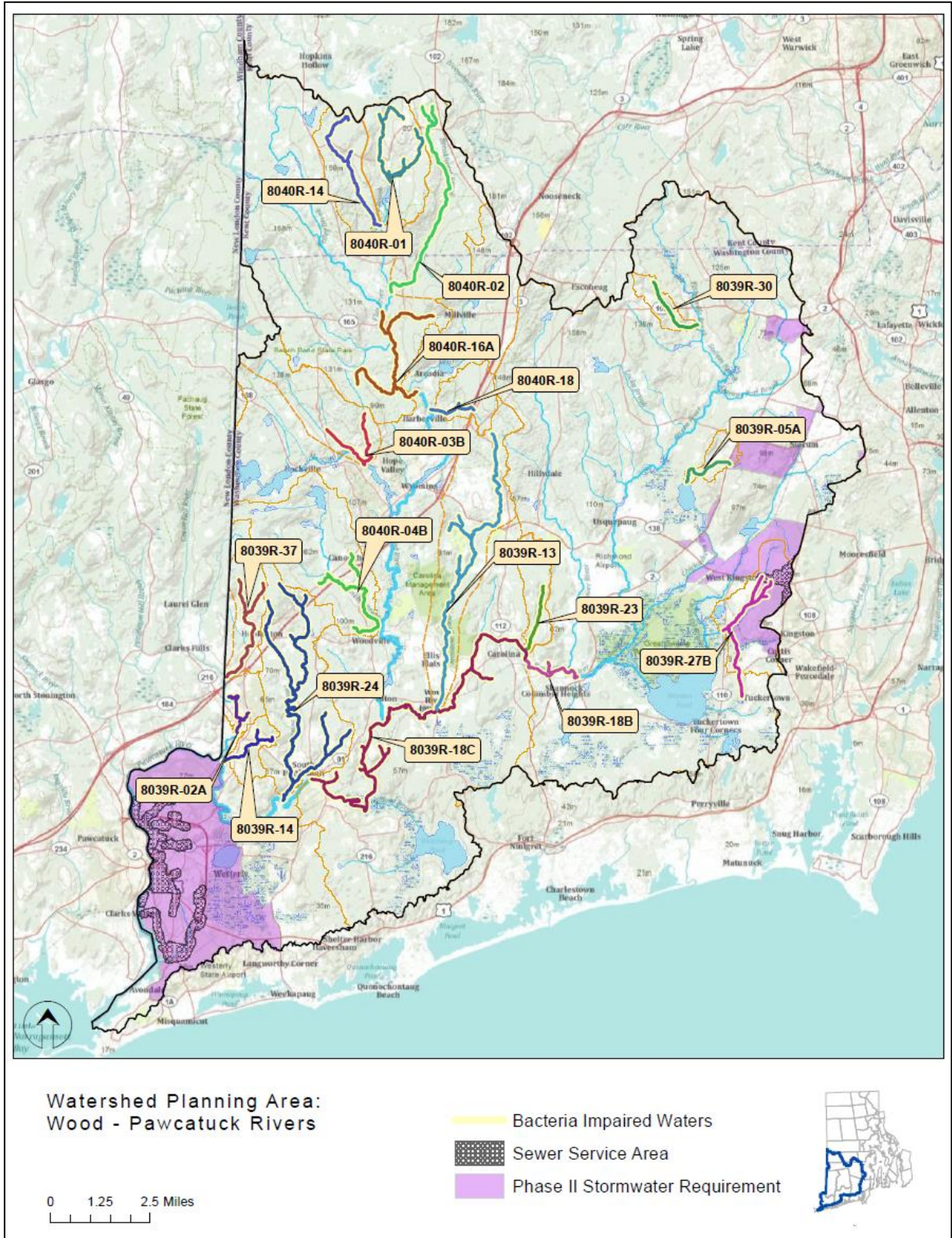


Figure 1: Map of the Wood-Pawcatuck Planning Area with impaired segments addressed by the Statewide Bacteria TMDL, sewer service areas, and stormwater regulated zones.

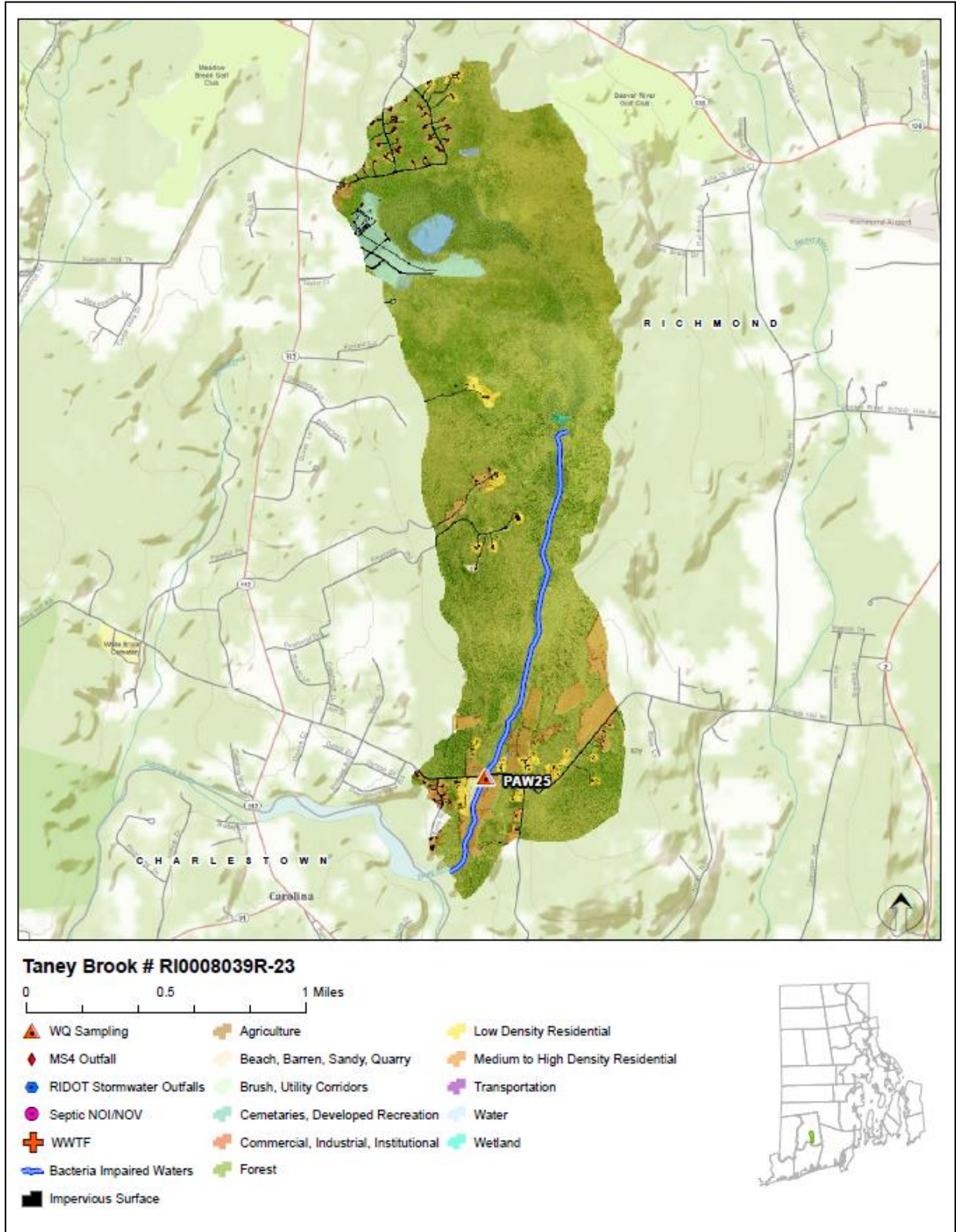


Figure 2: Map of the Taney Brook watershed with impaired segment, sampling location, and land cover indicated.

Why is a TMDL Needed?

Taney Brook is a Class B fresh water stream, and its applicable designated uses are primary and secondary contact recreation and fish and wildlife habitat (RIDEM, 2009). From 2005-2006, water samples were collected from one sampling location (PAW25) and analyzed for the indicator bacteria, enterococci. The water quality criteria for enterococci, along with bacteria sampling results from 2005-2006 and associated statistics are presented in Table 1. The geometric mean was calculated for station PAW25 and exceeded the water quality criteria for enterococci. All samples were taken in dry-weather conditions. Possible dry weather sources are described in the sections below. Potential sources include improperly operating onsite wastewater treatment systems (OWTS), wastes from agriculture activities, as well as wastes from waterfowl, wildlife, and domestic pets.

Due to the elevated bacteria measurements presented in Table 1, Taney Brook does not meet Rhode Island's bacteria water quality standards, 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. The goal is for all waterbodies to comply with state water quality standards.



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

Potential Bacteria Sources

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

Onsite Wastewater Treatment Systems

All residents in the Taney Brook watershed rely on onsite wastewater treatment systems (OWTS) such as cesspools and septic systems. Failing OWTS can be significant sources of bacteria by allowing improperly treated waste to reach surface waters (RI HEALTH, 2003). 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, there have been no OWTS Notices of Violation/Notices of Intent to Violate (NOV/NOIs) issued by the RIDEM Office of Compliance and Inspection in the Taney Brook watershed.

Agricultural Activities

Agricultural operations are an important economic activity and landscape feature in the state's rural areas. As shown in Figures 2 and 3, the Taney Brook watershed has multiple agricultural operations particularly in the southern portion of the watershed near Shannock Hill Road. Many of these operations include horse and dairy farms (Fuss and O'Neill, 2007). Agricultural runoff may contain pollutants, including bacteria. Agricultural practices such as allowing livestock to graze near streams, crossing livestock through waterbodies, spreading manure as fertilizer, and improper disposal of manure can contribute to bacterial contamination.

Waterfowl, Wildlife, and Domestic Animal Waste

Most of the Taney Brook watershed is non-developed. 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.

Residential development is concentrated in the southern portion of the watershed. Waste from domestic animals, such as dogs, in these residential neighborhoods, may also be contributing to bacteria concentrations in Taney Brook.

Developed Area Stormwater Runoff

Though only a small portion of the Taney Brook watershed is developed, most of the development is concentrated in the southern portion of the watershed near Shannock Hill Road, close to the outlet of Taney Brook to the Pawcatuck River. The Taney Brook watershed has an impervious cover of 2.1%. 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 Taney 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.

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 Taney 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.

Onsite Wastewater Management

All residents of the Town of Richmond and the Taney Brook watershed rely on OWTS (septic systems or cesspools) (Fuss and O'Neill, 2007). The Town of Richmond has a draft Onsite Wastewater Management Plan that provides a framework for managing the OWTS. As part of an onsite wastewater planning process, Richmond should 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).

Richmond is not currently eligible for Rhode Island's 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 the town develop a program to assist citizens with the replacement of older and failing systems.

Agricultural Activities

If not already in place, agricultural producers should work with the RIDEM Division of Agriculture, and the U.S. Department of Agriculture Natural Resources Conservation Service (NRCS) to develop a conservation plan for farming activities, particularly at the horse farms in the watershed. NRCS and the RIDEM Division of Agriculture should continue to work with agricultural operations in the watershed to ensure that there are sufficient stream buffers, that fencing exists to restrict access of livestock and horses to streams and wetlands, and that animal waste handling, disposal, and other appropriate BMPs in place..

Waterfowl, Wildlife, and Domestic Animal Waste

The Town of Richmond should develop education and outreach programs to 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. Richmond should work with volunteers to map locations where animal waste is a significant and chronic problem. The town should also evaluate strategies to reduce the impact of animal waste on water quality. 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. The Brook's shores are largely vegetated. However, if the shore has been cleared, residents can allow tall, coarse vegetation to grow in areas along the shores of Taney 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 Taney Brook and can harm human health and the environment.

Stormwater Management

RIDOT is a municipal separate storm sewer system (MS4) operator (RIPDES permit RIR040036) has prepared a Phase II Stormwater Management Plan. The Town of Richmond is not currently regulated under the Phase II program. However, it is anticipated that Richmond will be regulated within the next few years (Fuss and O'Neill, 2007).

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.

The Town of Richmond has developed an initial Phase II SWMPP in anticipation of Phase II regulations in the future. This SWMPP outlines existing stormwater programs and notes goals for these programs in the future. Richmond currently has an annual cleaning and inspection program for its 450 catch basins, and an annual street sweeping program (Fuss and O'Neill, 2007). The town has not mapped or identified their stormwater outfalls or adopted an IDDE ordinance.

The Town of Richmond does not currently have an ordinance to address illicit discharges (Fuss and O'Neill, 2007). 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 this sampling location be monitored to check for illicit discharges. Illicit discharges can be identified through continued dry weather outfall sampling and microbial source tracking.

As it is assumed that stormwater runoff is not the major contributor of bacteria to Taney Brook based on the watershed's imperviousness, RIDOT will have no changes to their Phase II permit requirements and no TMDL Implementation Plan (TMDL IP) will be required at this time.

Land Use Protection

Woodland and wetland areas within the Taney 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 the majority of the land use in the Taney 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 Taney Brook.

Table 1: Taney Brook Bacteria Data

Waterbody ID: RI0008039R-23

Watershed Planning Area: 23 – Wood-Pawcatuck

Characteristics: Freshwater, Class B, 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: 35% (Includes 5% Margin of Safety)

Data: 2005-2006 from RIDEM

Single Sample Enterococci (colonies/100 mL) Results for Taney Brook (2005 - 2006)

Station Name	Station Location	Date	Result	Wet/Dry	Geometric Mean
PAW25	Taney Brook at the USGS Gage 1117480 on Shannock Hill Road, Richmond	10/27/2006	11	Dry	77 (35%)*
PAW25	Taney Brook at the USGS Gage 1117480 on Shannock Hill Road, Richmond	8/9/2006	160	Dry	
PAW25	Taney Brook at the USGS Gage 1117480 on Shannock Hill Road, Richmond	5/31/2006	23	Dry	
PAW25	Taney Brook at the USGS Gage 1117480 on Shannock Hill Road, Richmond	9/21/2005	870	Dry	
Shaded cells indicate an exceedance of water quality criteria *Includes 5% Margin of Safety					

Wet and Dry Weather Geometric Mean Enterococci Values for Station PAW25

Station Name	Station Location	Years Sampled	Number of Samples		Geometric Mean		
			Wet	Dry	All	Wet	Dry
PAW25	Taney Brook at the USGS Gage 1117480 on Shannock Hill Road, Richmond	2005-2006	0	4	77	NA	77
Shaded cells indicate an exceedance of water quality criteria Weather condition determined from rain gage at URI in Kingston, RI							

References

- Fuss and O'Neill (2007). Stormwater Management Program Plan. Town of Richmond, RI. October 2007.
- RIDEM (2008). State of Rhode Island and Providence Plantations 2008 303(d) List – List of Impaired Water Bodies. Rhode Island Department of Environmental Management.
- RIDEM (2009). State of Rhode Island and Providence Plantations Water Quality Regulations. Amended December, 2009. 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.