TMDL Assessment Summary

Mere Brook a.k.a. Mare Brook

Watershed Description

This **TMDL** assessment summary applies to the entire 8-mile length of Mere Brook located in the City of Brunswick, Maine. Mere Brook begins in a wetland area near Matthew Drive. The stream crosses Bettina Lane and flows southeast through a small forested area. Just below Seahawk Avenue, Mere Brook continues underground for approximately 1 mile, as it flows through the Brunswick Naval Complex, emerging near Swampy Brook. Mere Brook then flows east through a wetland, eventually emptying into Harpswell Cove. The Mere Brook watershed covers approximately 3,648 acres in the City of Brunswick.

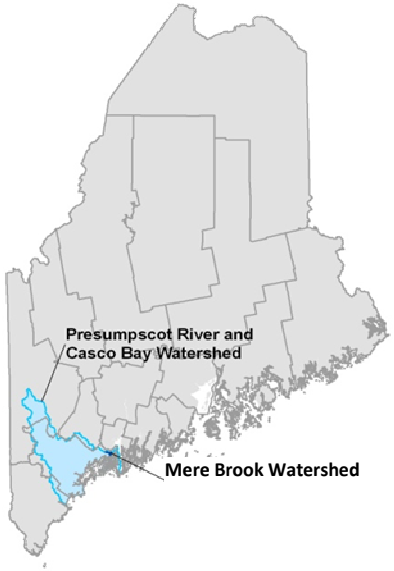
- Stormwater runoff from **impervious cover (IC)** is likely the largest source of pollution to Mere Brook. Stormwater falling on roads, roofs and parking lots in developed areas flows quickly off impervious surfaces, carrying dirt, oils, metals, and other pollutants, and sending high volumes of flow to the nearest section of the stream.
- Most of the Mere Brook watershed is developed (55%), particularly in the northeastern portion of the watershed near the intersection of Orion Street and Seahawk Avenue. The majority of this development is classified as high-intensity development or developed open space.
- Brunswick Naval Complex is located in the center of the Mere Brook watershed.
- Wetlands and woodlands near the headwaters and the mouth of Mere Brook absorb and filter stormwater pollutants, and help protect both water quality in the stream and stream channel stability.
- Mere Brook is currently on Maine's list of Urban Impaired Streams.

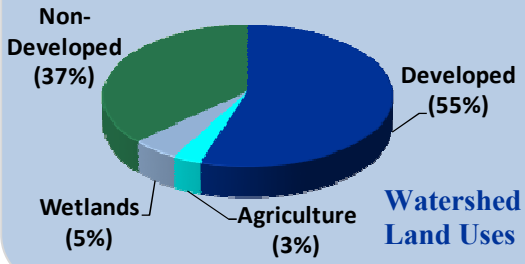
Definitions

- **TMDL** *is an acronym for* ***Total Maximum Daily Load****, representing the total amount of a pollutant that a water body can receive and still meet water quality standards.*
- **Impervious cover** *refers to landscape surfaces (e.g. roads, sidewalks, driveways, parking lots, and rooftops) that no longer absorb rain and may direct large volumes of stormwater runoff into the stream.*

Waterbody Facts

- **Segment ID:** ME0106000106_602R02
- **City:** Brunswick, ME
- **County:** Cumberland
- **Impaired Segment Length:** 8 miles
- **Classification:** Class B
- **Direct Watershed:** 5.7 mi² (3,648 acres)
- **Watershed Impervious Cover:** 21%
- **Major Drainage Basin:** Presumpscot River and Casco Bay Watershed





Watershed Land Uses

Why is a TMDL Assessment Needed?

Mere Brook, a Class B freshwater stream, has been assessed by DEP as not meeting water quality standards for aquatic life use and has been listed on the 303(d) list of impaired waters. The Clean Water Act requires that all 303(d)-listed waters undergo a TMDL assessment that describes the impairments and establishes a target to guide the measures needed to restore water quality. The goal is for all waterbodies to comply with state water quality standards.

Mere Brook downstream of S-144.
(Photo: DEP Biomonitoring Program)

The impervious cover TMDL assessment for Mere Brook addresses water quality impairments to aquatic life use (based on stream habitat and benthic macroinvertebrate assessments). These impairments are associated with a variety of pollutants in urban stormwater as well as erosion, habitat loss and unstable stream banks caused by excessive amounts of runoff.

Sampling Results & Pollutant Sources

DEP makes aquatic life use determinations using a statistical model that incorporates 30 variables of data collected from rivers and streams, including the richness and abundance of streambed organisms, to determine the probability of a sample meeting Class A, B, or C conditions. Biologists use the model results and supporting information to determine if samples comply with standards of the class assigned to the stream or river (Davies and Tsomides, 2002).

Mere Brook has benthic-macroinvertebrate data collected by DEP in 2000-2003 at four sampling stations (S-143, S-144, S-331, and S-457). Data collected at these stations indicate Class B Mere Brook meets the lower Class C criteria or is "non attaining" (NA), meaning it does not meet Class A, B, or C conditions on different sample dates.

Sampling Station	Sample Date	Statutory Class	Model Results
S-143	9/11/2000	B	C
S-143	8/7/2001	B	C
S-143	8/24/2001	B	C
S-143	8/14/2003	B	NA
S-143	9/30/2003	B	NA
S-144	9/11/2000	B	NA
S-144	8/7/2001	B	NA
S-144	8/24/2001	B	NA
S-144	9/30/2003	B	NA
S-331	9/11/2000	B	NA
S-331	8/7/2001	B	C
S-331	7/31/2002	B	C
S-457	9/11/2000	B	NA
S-457	8/7/2001	B	C
S-457	7/31/2002	B	NA
S-457	8/14/2003	B	NA
S-457	9/30/2003	B	NA

Impervious Cover Analysis

Increasing the percentage of impervious cover (%IC) in a watershed is linked to decreasing stream health (CWP, 2003). Because Mere Brook's impairment is not caused by a single pollutant, %IC is used for this TMDL to represent the mix of pollutants and other impacts associated with excessive stormwater runoff. The Mere Brook watershed has an impervious surface area of **21%** (Figure 1). DEP has found that in order to support Class B aquatic life use, the Mere Brook watershed may require the characteristics of a watershed with **8%** impervious cover. This WLA & LA target is intended to guide the application of

Best Management Practices (BMP) and Low Impact Development (LID) techniques to reduce the *impact* of impervious surfaces. Ultimate success of the TMDL will be Mere Brook's compliance with Maine's water quality criteria for aquatic life.

***8% IC** represents an approximate **62% reduction** in stormwater runoff volume and associated pollutants when compared to existing pollutant loads.*

Impervious Cover GIS Calculations

The Impervious Cover Calculations are based on analysis of GIS coverage's presented in Figure 1. These maps were derived from a detailed field assessment conducted by DEP Staff, as described in the TMDL.

Next Steps

Because Mere Brook is an impaired water, stormwater runoff in the watershed should be considered during the development of a watershed management plan to:

- Encourage greater citizen involvement through the development of a watershed coalition to ensure the long term protection of Mere Brook;
- Address existing stormwater problems in the Mere Brook watershed by installing structural and applying non-structural best management practices (BMPs); and
- Prevent future degradation of Mere Brook through the development and/or strengthening of local stormwater control ordinances.

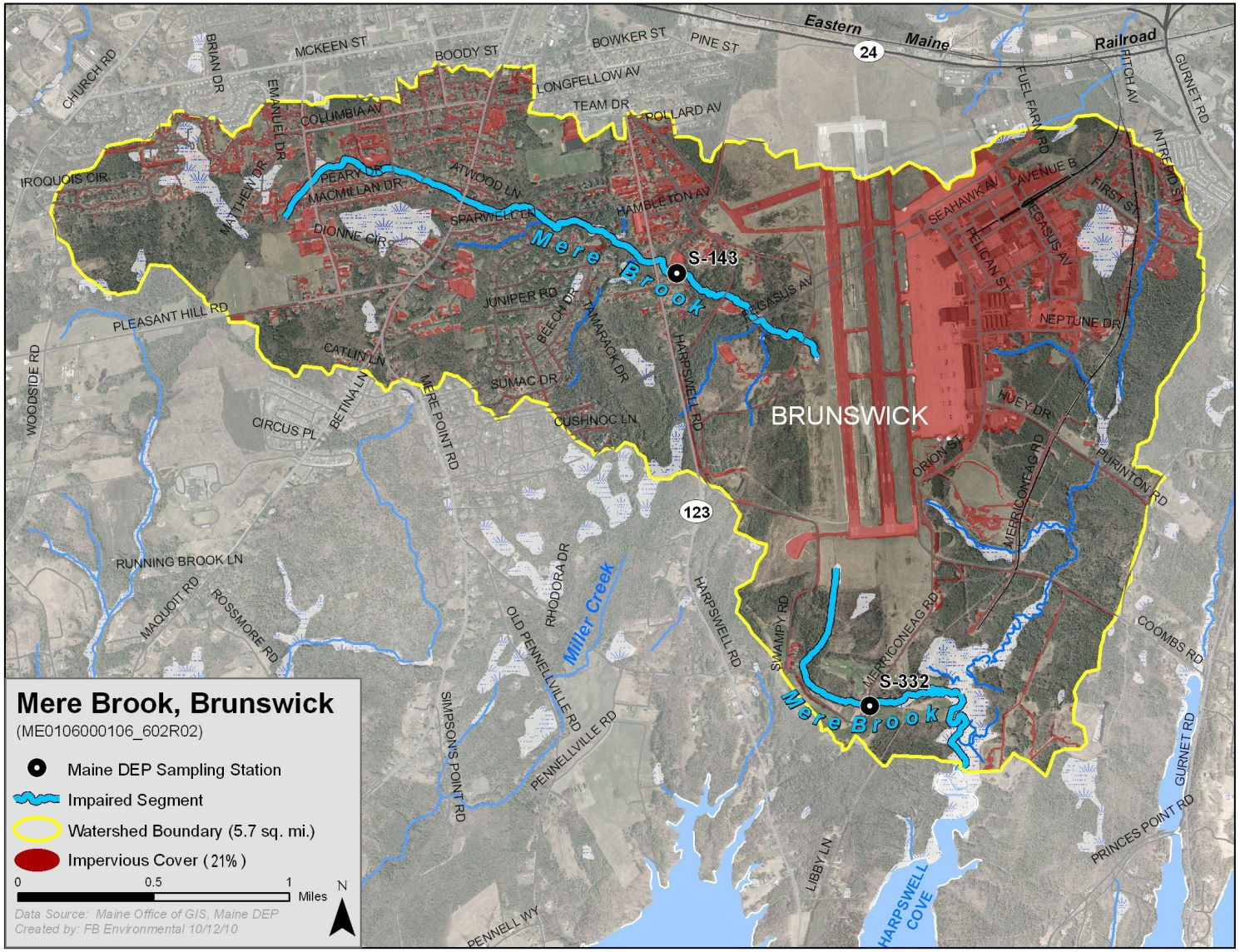


Figure 1: *Map of Mere Brook watershed impervious cover.*

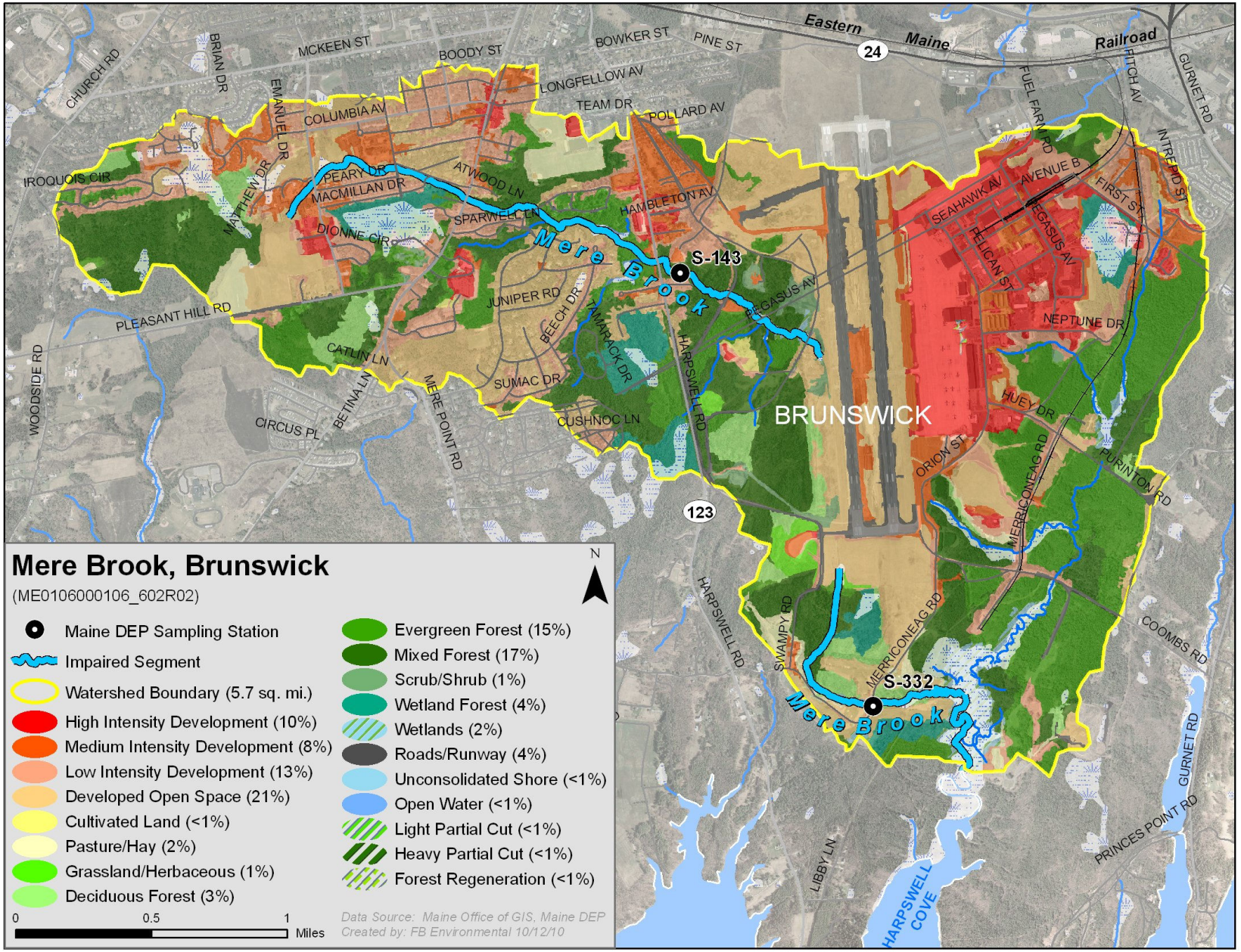


Figure 2: *Map of Mere Brook watershed land cover.*

References

Center for Watershed Protection (CWP). 2003. Impacts of Impervious Cover on Aquatic Systems. Watershed Protection Research Monograph No. 1. Center for Watershed Protection, Ellicott City, MD. 142 pp.

Davies, Susan P. and Leonidas Tsomides. 2002. Methods for Biological Sampling and Analysis of Maine's Rivers and Streams. Maine Department if Environmental Protection. Revised August, 2002. DEP LW0387-B2002.

Maine Department of Environmental Protection (DEP). 2010. Assessment Database Detail Report for Mere Brook. Bureau of Land and Water Quality, Augusta, ME.