



TMDL Assessment Summary

Sucker Brook

Watershed Description

This **TMDL** assessment summary applies to a 2.5-mile section of Sucker Brook, located in the City of Bangor and Town of Hampden, Maine. Sucker Brook, a small tributary to the Penobscot River, begins near the southeastern end of the runway at Bangor International Airport on the southern side of Odlin Rd. The stream flows south through the exchanges off of I-95 exit 182, between I-95, I-395, and US Rt. 2. It then flows south into a forested area as it passes the town line into Hampden near Perry Rd. The brook then flows through open pasture before and after it passes under US Rt. 202. It flows under ME Rt. 9 / US Rt. 1A into medium intensity development. Shortly thereafter, it flows southwest into the Penobscot river. The Sucker Brook watershed covers 1,766 acres in the City of Bangor and the town of Hampden.

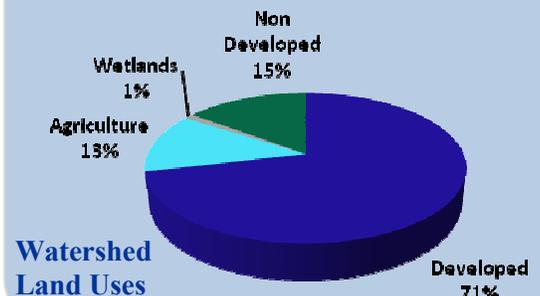
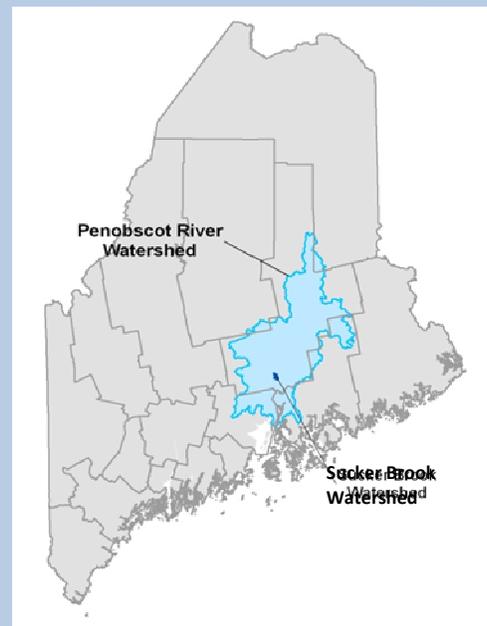
- Stormwater runoff from **impervious cover (IC)** is the largest source of pollution and stream channel alteration to Sucker Brook. Stormwater falling on roads, roofs and parking lots in developed areas flows quickly off impervious surfaces, carrying dirt, oils, metals, and other pollutants, and sending high volumes of flow to the nearest section of the stream.
- I-95 and I-395 are heavily traveled roads. All of the stormdrains and drainage ditches near exit 182 funnel runoff from these highways directly down to the Brook.
- The large sections of open space and pasture currently in the southern portion of the watershed could become developed in the future, further stressing Sucker Brook.
- A small section of mixed forest near Perry Rd. in the center of the Sucker Brook watershed, helps absorb and filter stormwater pollutants, and protects both water quality in the stream and stream channel stability.

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:** ME0102000511_225R02
- **City:** Bangor & Hampden, ME
- **County:** Penobscot
- **Impaired Segment Length:** 2.5 miles
- **Classification:** Class B
- **Direct Watershed:** 2.76 mi² (1,766 acres)
- **Watershed Impervious Cover:** 25%
- **Major Drainage Basin:** Penobscot River Watershed



Why is a TMDL Assessment Needed?

Sucker Brook, a Class B freshwater stream, has been assessed by DEP as not meeting water quality standards for dissolved oxygen, and 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.



*Sucker Brook downstream of Station 624.
(Photo: DEP Biomonitoring Program)*

The impervious cover TMDL assessment for Sucker Brook addresses the water quality impairments to dissolved oxygen levels and aquatic life use (benthic-macroinvertebrate assessment). 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

Sampling Station	Sample Date	Statutory Class	Model Results
S-624	8/16/2002	B	C
S-624	8/24/2004	B	C

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).

Sucker Brook impairment is based on data collected by DEP in 2002 and 2004 at the sampling station just downstream of Old County Road (S-624). (DEP, 2010b). Data collected at these stations indicates Class B Sucker Brook is only meeting Class C, meaning it does not meet the necessary criteria for its statutory class. If a stream can only meet a class below its designated statutory class, it is considered impaired. Sucker was also sampled in 2011 and those results will be available in 2012.

*8% IC represents an approximate **68% reduction** in stormwater runoff volume and associated pollutants when compared to existing pollutant loads.*

Impervious Cover Analysis

Increasing the percentage of impervious cover (%IC) in a watershed is linked to decreasing stream health (CWP, 2003). Because Sucker 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 Sucker Brook watershed has an impervious surface area of **25%** (Figure 2). DEP has found that in order to support Class B aquatic life use, the Sucker Brook watershed may require the characteristics of a

Impervious Cover GIS Calculations

The Impervious Cover Calculations are based on analysis of GIS coverage's presented in Figure 1. The impervious area is derived from a combination of source; detailed field assessment conducted by DEP Staff around the Bangor Airport and 2007 1 meter satellite imagery. The watershed boundary is also a combination of field assessments and estimation based on contours and digital elevation models.

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 Sucker Brook's compliance with Maine's water quality criteria for dissolved oxygen and aquatic life.

Next Steps

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

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

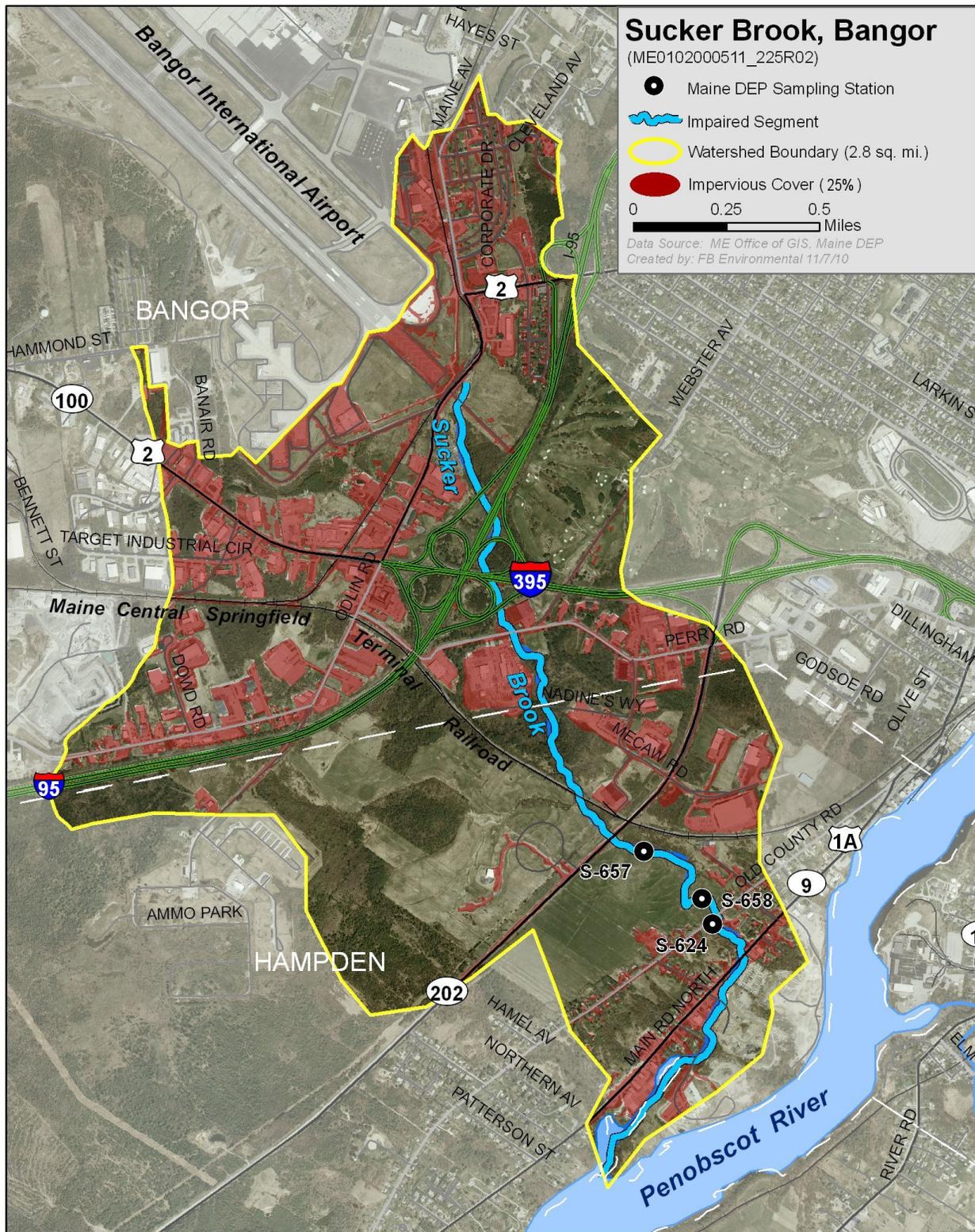


Figure 1: Map of Sucker Brook watershed impervious cover.

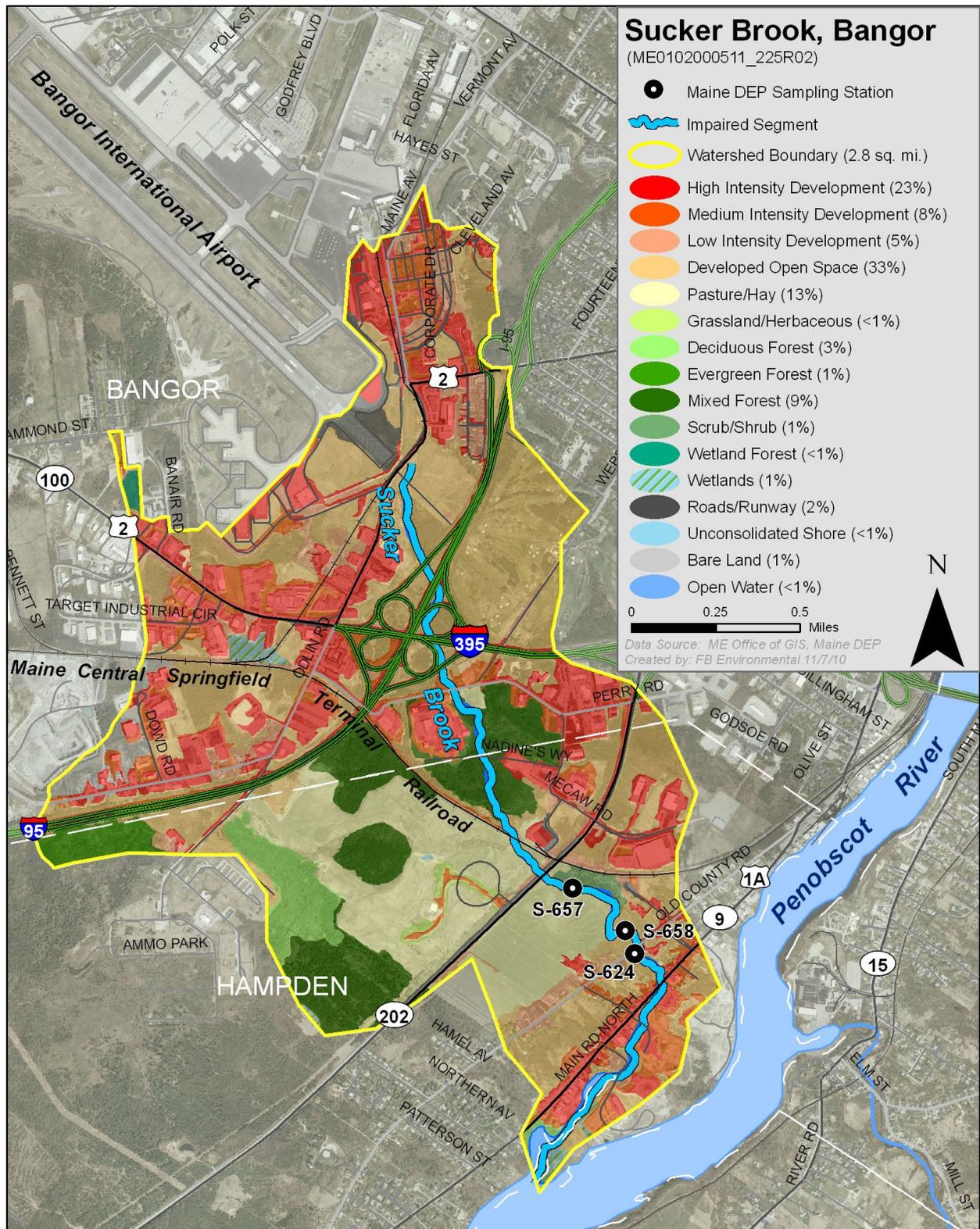


Figure 2: Map of Sucker Brook watershed land cover.

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 of Environmental Protection. Revised August, 2002. DEP LW0387-B2002.
- Maine Department of Environmental Protection (DEP). 2010a. Draft 2010 Integrated Water Quality Monitoring and Assessment Report. Bureau of Land and Water Quality, Augusta, ME. DEPLW-1187.
- Maine Department of Environmental Protection (DEP). 2010b. Assessment Database Detail Report for Sucker Brook (Hampden). Bureau of Land and Water Quality, Augusta, ME.