TMDL Assessment Summary

Dole Brook

Watershed Description

This **TMDL** assessment summary applies to Dole Brook, a 1.6-mile stream located in the City of Portland, Maine. Dole Brook, a small tributary to the Presumpscot River, begins in a wooded area behind Casco Bay High School and west of Washington Avenue in Portland. The stream flows north through a large commercial development off of Riverside Industrial Parkway prior to passing under the Maine Turnpike south of Exit 52. The stream then meanders through narrow stretches of wetland before it passes under Riverside Street. Dole Brook flows through the Riverside Golf Course before it flows into the Presumpscot River in Portland. The Dole Brook watershed covers 896 acres in the City of Portland.

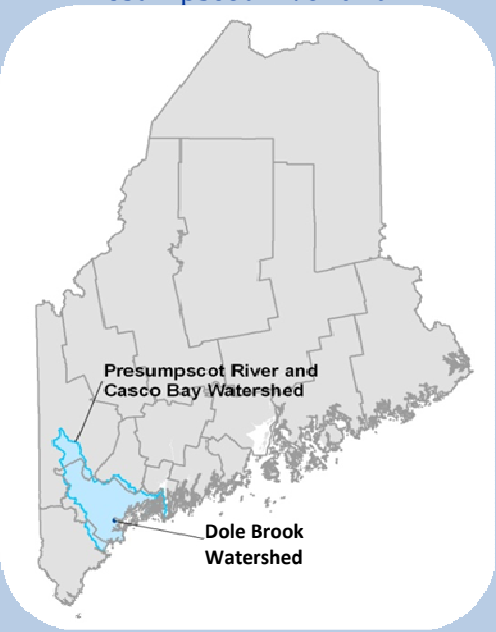
- Stormwater runoff from **impervious cover (IC)** is the largest source of pollution to Dole Brook. Stormwater falling on roads, roofs and parking lots in developed areas flows quickly off impervious surfaces, carrying dirt, oils, metals, and other pollutants, and sending high volumes of flow to the nearest section of the stream.
- A number of large commercial businesses along Riverside Industrial Parkway have extensive impervious areas draining directly to the brook, funneling their runoff down to the stream
- The narrow strips of wetland areas at times surrounding Dole Brook, absorb and filter stormwater pollutants, and help protect both water quality in the stream and stream channel stability.
- Dole Brook's heavily developed watershed means that it meets the criteria for DEP's Chapter 502 Urban Impaired Streams list and will likely be placed on the list when Chapter 502 is next revised.

Definitions

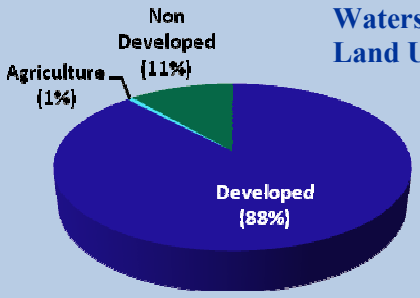
- **TMDL** *is an acronym for* ***Total Maximum Daily Load****, representing the total amount of a pollutant that a water body can receive and still meet water quality standards.*
- **Impervious cover** *refers to landscape surfaces (e.g. roads, sidewalks, driveways, parking lots, and rooftops) that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

Waterbody Facts

- **Segment ID:** ME0106000105_609R01
  ME0106000105_609R01_W026
- **City:** Portland, ME
- **County:** Cumberland
- **Impaired Segment Length:** 1.6 miles
- **Classification:** Class B
- **Direct Watershed:** 1.4 mi^2 (896 acres)
- **Watershed Impervious Cover:** 25%
- **Major Drainage Basin:** Presumpscot River and



Watershed Land Uses



Why is a TMDL Assessment Needed?

Dole 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.

Dole Brook upstream of Station 386.
(Photo: FB Environmental)

The amount of developed land and high impervious cover within the Dole Brook watershed make it difficult for the brook to comply with water quality standards. The development and impervious cover convey large pollutant loads to the stream via high volumes of runoff. The impervious cover TMDL assessment for Dole Brook addresses the water quality impairment to aquatic life use (benthic-macroinvertebrates). This impairment is 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 Station	Sample Date	Statutory Class	Model Results
Stream Sites			
S-385	8/20/1999	B	C
S-386	8/20/1999	B	NA
S-751	8/23/2004	B	NA
S-751	8/27/2007	B	NA
Wetland Sites			
W026	6/2000	B	NA
W025	6/2010	B	NA

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).

Dole Brook impairment is based on data collected by DEP in 2004 at the sampling station downstream of Riverside Street at the Riverside Golf Course (S-751) (DEP, 2010). Data collected at this station indicate Class B Dole Brook is "non attaining" (NA), meaning it does not meet Class A, B, or C conditions.

Additionally, in 2000 and 2010 wetlands were sampled and did not attain aquatic life standards using wetland specifc sampling and analysis criteria. These sites are included in 2012 303d list of Impaired Waters.

Impervious Cover Analysis

Increasing the percentage of impervious cover (%IC) in a watershed is linked to decreasing stream health (CWP, 2003). Because Dole Brook's impairment is not caused by a single pollutant, %IC is used for this TMDL to

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.

represent the mix of pollutants and other impacts associated with excessive stormwater runoff. The Dole Brook watershed has an impervious surface area of **25%** (Figure 1). DEP has found that in order to support Class B aquatic life use, the Dole 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 Dole Brook's compliance with Maine's water quality criteria for aquatic life.

***8% IC** represents an approximate **65% reduction** in stormwater runoff volume and associated pollutants when compared to existing pollutant loads.*

Next Steps

Because Dole 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:

- Consider applying DEP's Chapter 502 Urban Impaired Streams standards to development in the watershed to maximize stream protection.
- Encourage greater citizen involvement (e.g. through the Presumpscot River Watershed Coalition & Presumpscot River Watch) to ensure the long term protection of Dole Brook;
- Address existing stormwater problems in the Dole Brook watershed by installing structural and applying non-structural best management practices (BMPs); and
- Prevent future degradation of Dole Brook through the development and/or strengthening of local stormwater control ordinances.

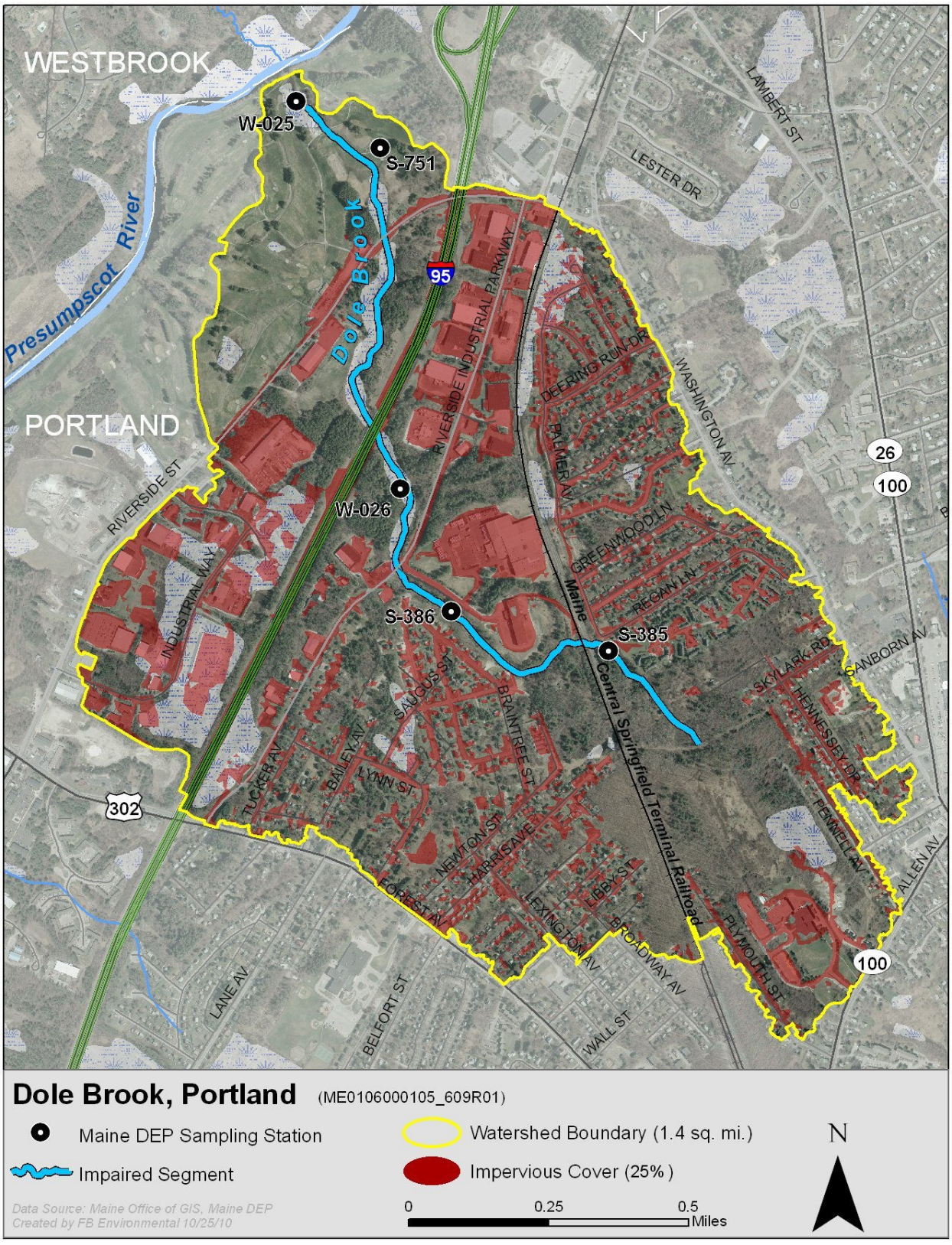


Figure 1: *Map of Dole Brook watershed impervious cover.*

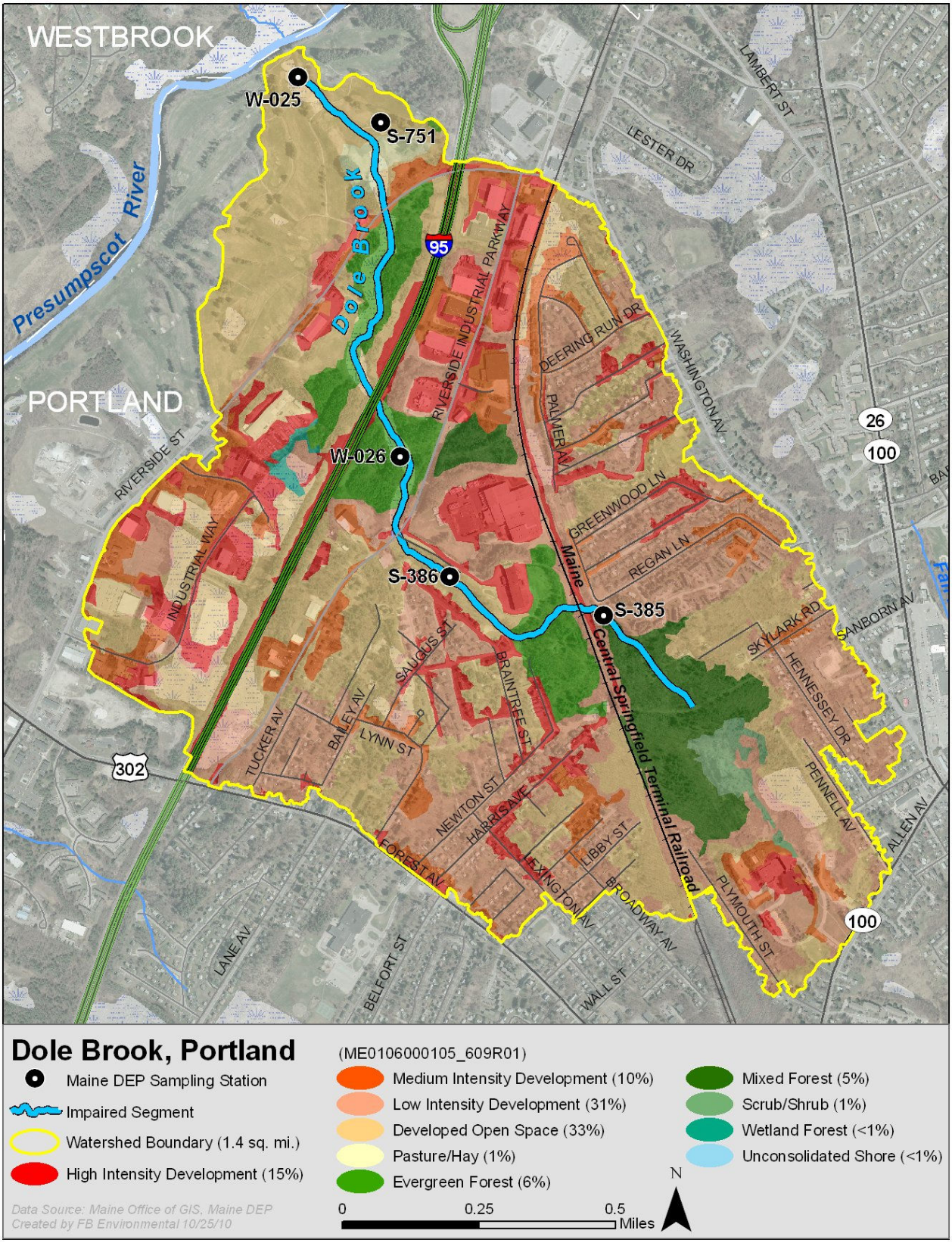


Figure 2: *Map of Dole Brook watershed land cover.*

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 Dole Brook (Portland). Bureau of Land and Water Quality, Augusta, ME.