TMDL Assessment Summary

# Whitten Brook

## Watershed Description

This **TMDL** assessment summary applies to a 1.12-mile section of Whitten Brook, located in the City of Skowhegan, Maine. Whitten Brook originates in a forested area north-west of Coburn Avenue. The stream flows for approximately 0.6 miles before crossing Bennett Avenue where it meets an unnamed tributary. Whitten Brook flows another 0.5 miles south-east through a residential neighborhood with six road crossings before flowing into the Kennebec River south of Elm Street.

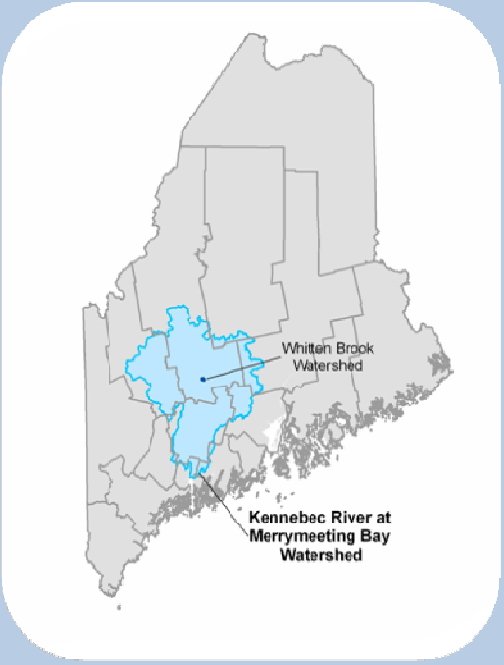
- Stormwater runoff from **impervious cover (IC)** is the largest source of pollution and stream channel alteration to Whitten Brook. Stormwater falling on developed areas flows quickly off impervious surfaces, carrying dirt, oils, metals, and other pollutants, and sending high volumes of flow to the nearest section of the stream.
- A majority of storm drains on busy Route 201 flow directly into Whitten Brook, resulting in erosion, sedimentation, and habitat degradation. Steep, undercut and collapsed stream banks and degradation of natural streamside plant cover is common along the stream length (FBE, 2010).
- Discharging pipes and/or ditches are present in all but one of nine stream reaches. Four major stormwater outfalls have been documented along the length of the stream.
- Former industrial land uses including a tannery, and corn factory resulted in alteration of the stream's natural hydrology (impoundments).
- A large area of undeveloped forestland in the western branch (or headwaters) of the stream is an important and beneficial feature of the Whitten Brook watershed (Figure 2). Whitten Brook is known by local fisherman for its brook trout fisheries.

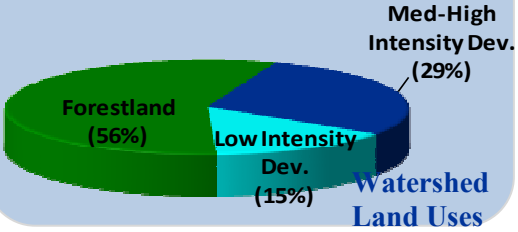
***Definitions***

- **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:** ME0103000306_320R03
- **City:** Skowhegan, ME
- **County:** Somerset
- **Impaired Segment Length:** 1.12 miles
- **Classification:** Class B
- **Direct Watershed:** 0.48 mi² (304 acres)
- **Watershed Impervious Cover:** 14%
- **Major Drainage Basin:** Kennebec River at Merrymeeting Bay



## Why is a TMDL Assessment Needed?

Whitten Brook, a Class B freshwater stream, has been assessed by DEP as not meeting water quality standards for recreational and aquatic life uses, 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.

*(Photo: FB Environmental)*

Recreational impairments in Whitten Brook have already been addressed in DEP's 2009 statewide bacteria TMDL: [http://www.maine.gov/dep/blwq/docmonitoring/TMDL/2009/report.pdf]. The impervious cover TMDL assessment for Whitten Brook addresses the remaining water quality impairments to aquatic life use (benthic-macroinvertebrate and stream habitat 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

| Sampling Station | Sample Date | Statutory Class | Model Results |
|---|---|---|---|
| S-628 | 8/21/2002 | B | NA |
| S-628 | 8/16/2007 | B | NA |

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).

Whitten Brook's impairment is based on data collected by DEP in 2002 and 2007 at the sampling station upstream of Elm Street (S-628). Data collected indicate Class B Whitten Brook is "non-attaining" (NA), meaning it does not meet Class A, B, or C conditions.

## Impervious Cover Analysis

Increasing the percentage of impervious cover (%IC) in a watershed is linked to decreasing stream health (CWP, 2003). Because Whitten 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 Whitten Brook watershed has an impervious surface area of **14%** (Figure 1). DEP has found that in order to support Class B aquatic life use, the Whitten Brook watershed may require the characteristics of a watershed with **8%** impervious cover. This WLA &

***8% IC** represents an approximate **43% 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.*

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 result in Whitten Brook's compliance with Maine's water quality criteria for aquatic life.

## Next Steps

The Whitten Brook Watershed Study (FBE, 2010) identified high-quality coldwater fish habitat, severe habitat or water quality problems, as well as stormwater retrofit opportunities in the highly impervious areas within the watershed. Results of this study will be used to raise public awareness about Whitten Brook restoration efforts, and help prioritize management objectives for stream restoration. A Technical Advisory Committee (TAC) was organized to help with the development and implementation of a Watershed Restoration Plan (FBE, 2011). Next steps in the Whitten Brook restoration process include:

- Presenting the Watershed Restoration Plan to the Board of Selectmen.
- Developing a sustainable funding plan and long-term monitoring plan.
- Developing a strategy for permanently protecting undeveloped land along the western branch.
- Addressing existing stormwater problems in the Whitten Brook watershed by reducing effective impervious cover at the five highest priority stormwater retrofit sites first.
- Preventing future degradation of Whitten Brook by educating commercial businesses owners about the need and importance of on-site stormwater controls, and strengthening local stormwater control ordinances.

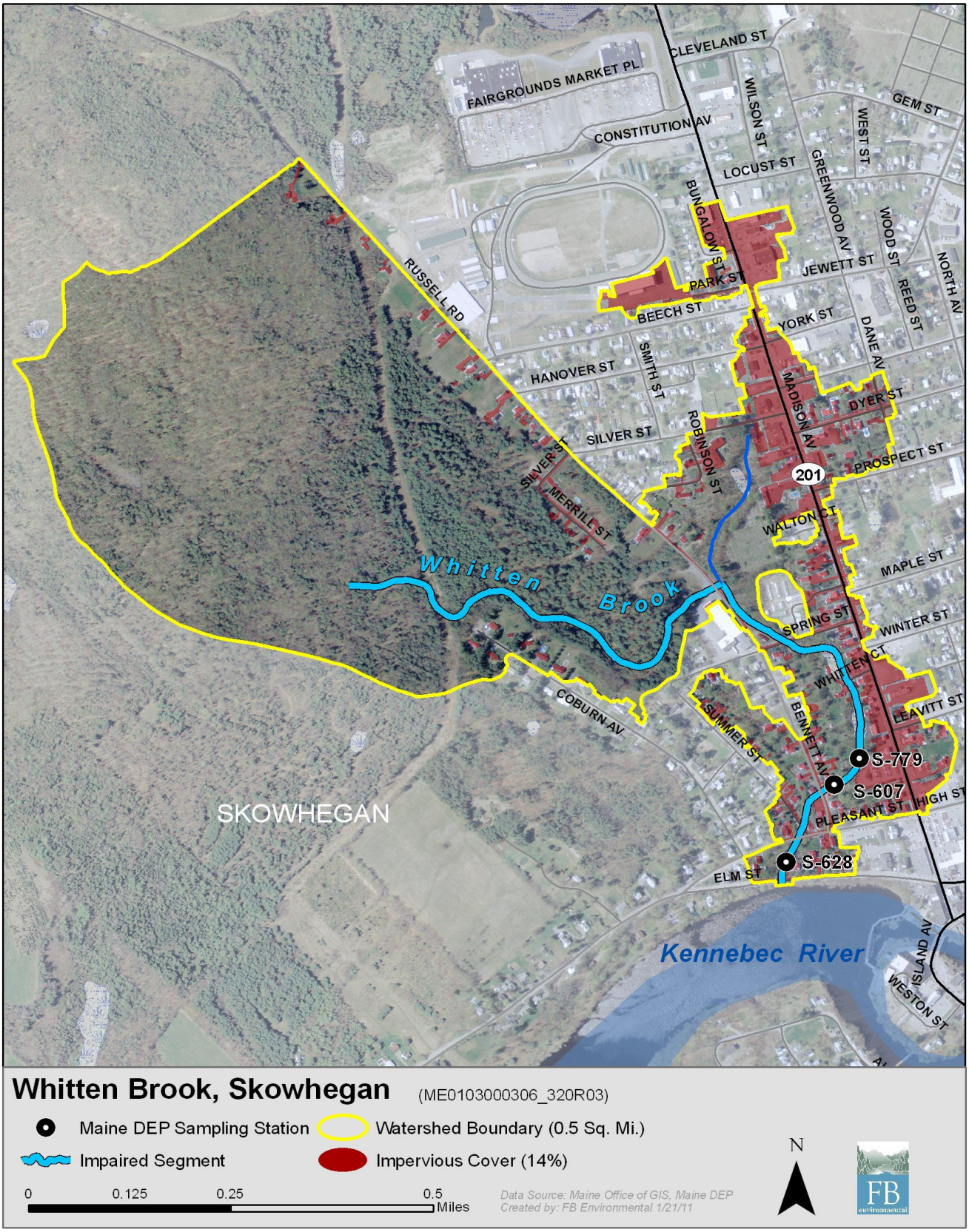



**Figure 1:** *Map of Whitten Brook watershed impervious cover.*

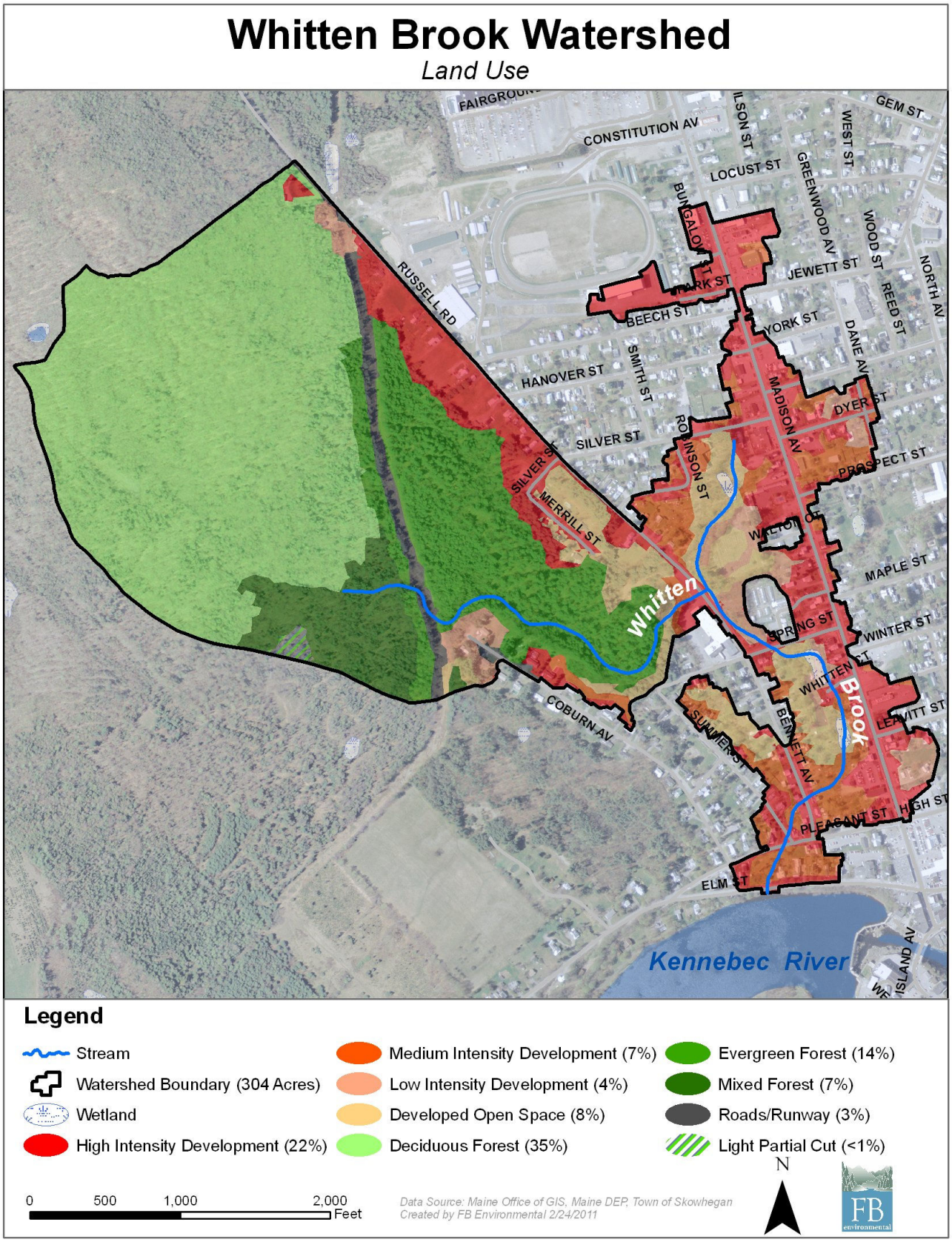



**Figure 2:** *Map of Whitten Brook watershed land cover.*

## 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.

FBE, 2010. Whitten Brook Watershed Study, Skowhegan, Maine. FB Environmental Associates. October 2010.

FBE, 2011. Whitten Brook Watershed Restoration Plan. FB Environmental Associates. March 2011.

Maine Department of Environmental Protection (DEP). 2010. Draft 2010 Integrated Water Quality Monitoring and Assessment Report. Bureau of Land and Water Quality, Augusta, ME. DEPLW-1187.