



TMDL Assessment Summary

Goodall Brook

Watershed Description

This **TMDL** assessment summary applies to Goodall Brook, a 2.5-mile stream located in the Town of Sanford, Maine. Goodall Brook, a small tributary to the north branch of the Great Works River, begins in a small forested area between U.S. Route 202 and Oxford Street in Sanford. The stream travels south-east parallel to the Little League fields at Benton Park. It passes under Roberts Street and flows adjacent to the baseball field at Goodall Park. After the Brook passes under Berwick Road it flows into a large forested area. Goodall Brook continues adjacent to St. Ignatius Cemetery before it passes several abandoned sand pits. Shortly thereafter it continues into a large forested wetland before flowing into the Great Works River between Daylight Avenue and Twombley Road near Margaret Chase Smith Elementary School, in Sanford. The Goodall Brook watershed covers 384 acres in the Town of Sanford.

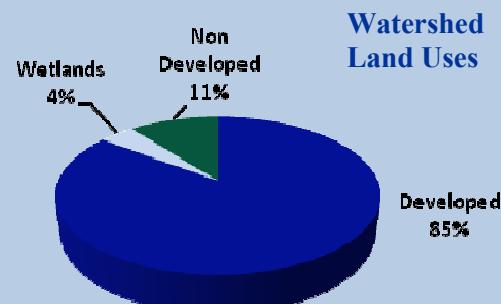
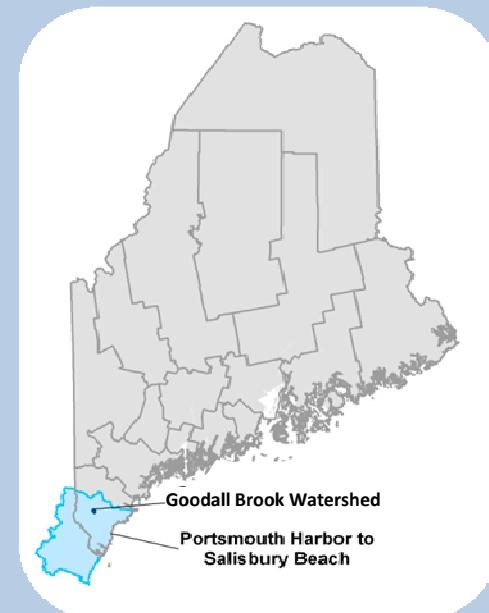
- Stormwater runoff from **impervious cover (IC)** is the largest source of pollution and stream channel alteration to Goodall Brook. Stormwater falling on roads, roofs and parking lots in developed areas flows quickly off impervious surfaces, carrying dirt, oils, metals, and other pollutants, and sending high volumes of flow to the nearest section of the stream.
- A number of Roberts Street storm drains, which are linked directly to Goodall Brook, funnel runoff from roads and parking lots down to the stream.
- The forested wetlands of the Goodall Brook watershed absorb and filter stormwater pollutants, and help protect both water quality in the stream and stream channel stability.
- The Goodall Brook watershed has a very high percentage of developed area (85%).

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:** ME0106000304_625R04
- **City:** Sanford, ME
- **County:** York
- **Impaired Segment Length:** 2.5 miles
- **Classification:** Class B
- **Direct Watershed:** 0.6 mi² (384 acres)
- **Watershed Impervious Cover:** 37%
- **Major Drainage Basin:** Portsmouth Harbor to Salisbury Beach



Why is a TMDL Assessment Needed?

Goodall Brook, a Class B freshwater stream, has been assessed by DEP as potentially not meeting water quality standards for aquatic life use. Results from another sampling season are needed to confirm attainment status. The brook was first assessed in 2004 and did not meet Class B aquatic life criteria (benthic macroinvertebrate assessment). Pending further sampling results, DEP anticipates listing Goodall Brook on the 2012 303(d) list (Maine DEP, 2010a). 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.



Goodall Brook downstream of Station 747.
(Photo: DEP Biomonitoring Program)

Goodall Brook starts in the most built out area of Sanford and follows through dense development for nearly its entire course. This development, especially in the form of impervious cover, has a negative impact on the stream. The impervious cover TMDL assessment for Goodall Brook addresses the probable impairments to aquatic life uses (benthic macro-invertebrate 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-747	7/14/2004	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).

Goodall Brook was sampled for the first time by DEP in the summer of 2004 near the stream crossing on Roberts Street, across from Goodall Park (S-747). The results for that sampling event displayed that Goodall Brook did not meet Class B water quality for aquatic life criteria (DEP, 2004). DEP felt that it would need another year of sampling data before Goodall Brook could be officially classified as impaired. The Brook was sampled again in the summer of 2010. The results of that sampling event have not yet become available (DEP, 2010).

Impervious Cover Analysis

Increasing the percentage of impervious cover (%IC) in a watershed is linked to decreasing stream health (CWP, 2003). Because Goodall 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 Goodall Brook watershed has an impervious surface area of **37%** (Figure 1). DEP has found that in order to support Class B aquatic life use, the Goodall 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

8% IC represents an approximate 78% reduction in stormwater runoff volume and associated pollutants when compared to existing pollutant loads.

Practices (BMP) and Low Impact Development (LID) techniques to reduce the *impact* of impervious surfaces. Ultimate success of the TMDL will be Goodall Brook's future compliance with Maine's criteria for habitat assessment.

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 2004 1 meter satellite imagery and the watershed boundary is an estimation based on contours and digital elevation models.

Next Steps

Because Goodall 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 Great Works River Watershed Coalition and/or Bauneg Beg Lake Association) to ensure the long term protection of Goodall Brook;
- Address existing stormwater problems in the Goodall Brook watershed by installing structural and applying non-structural best management practices (BMPs); and
- Prevent future degradation of Goodall Brook through the development and/or strengthening of local stormwater control ordinances.

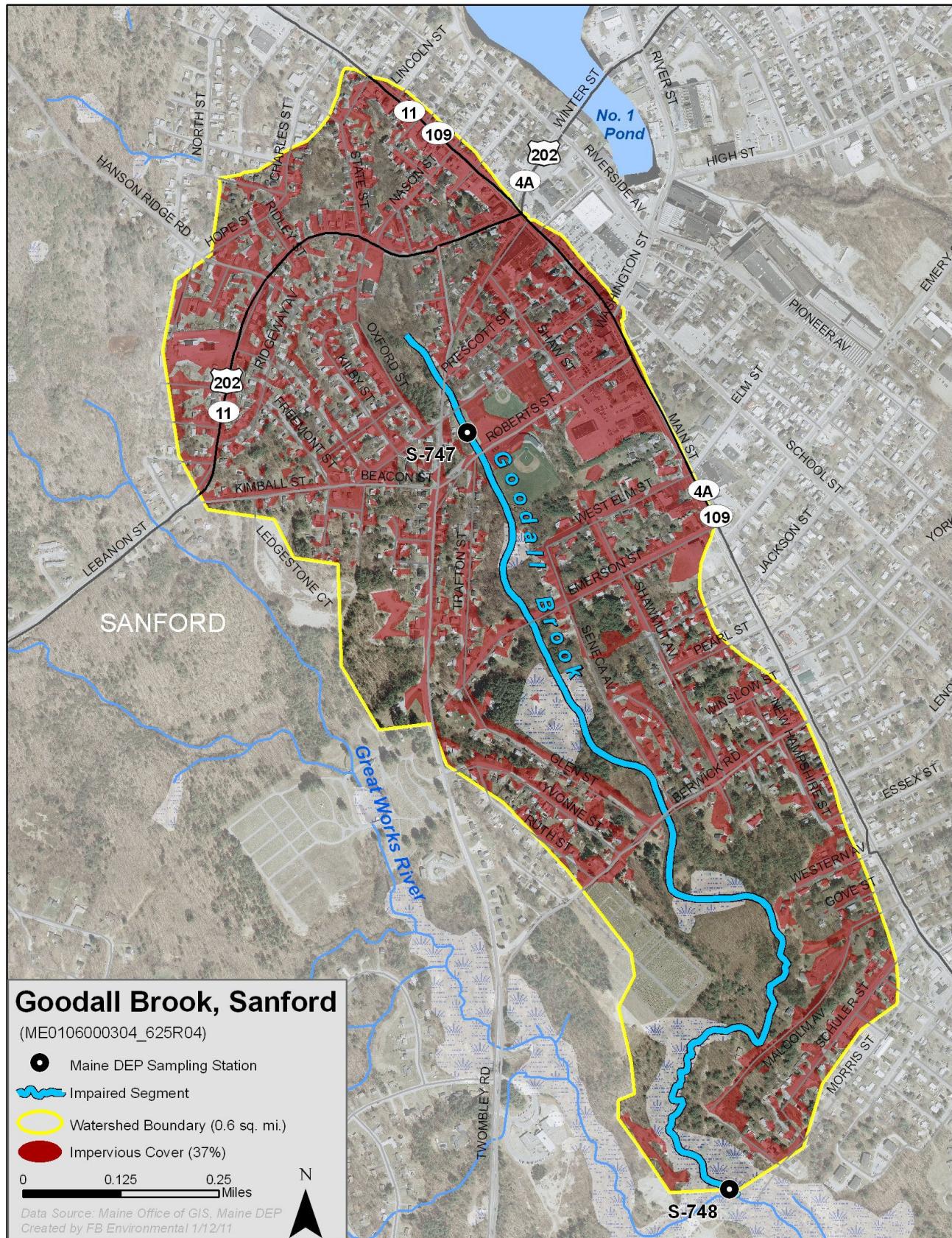


Figure 1: Map of Goodall Brook watershed impervious cover.

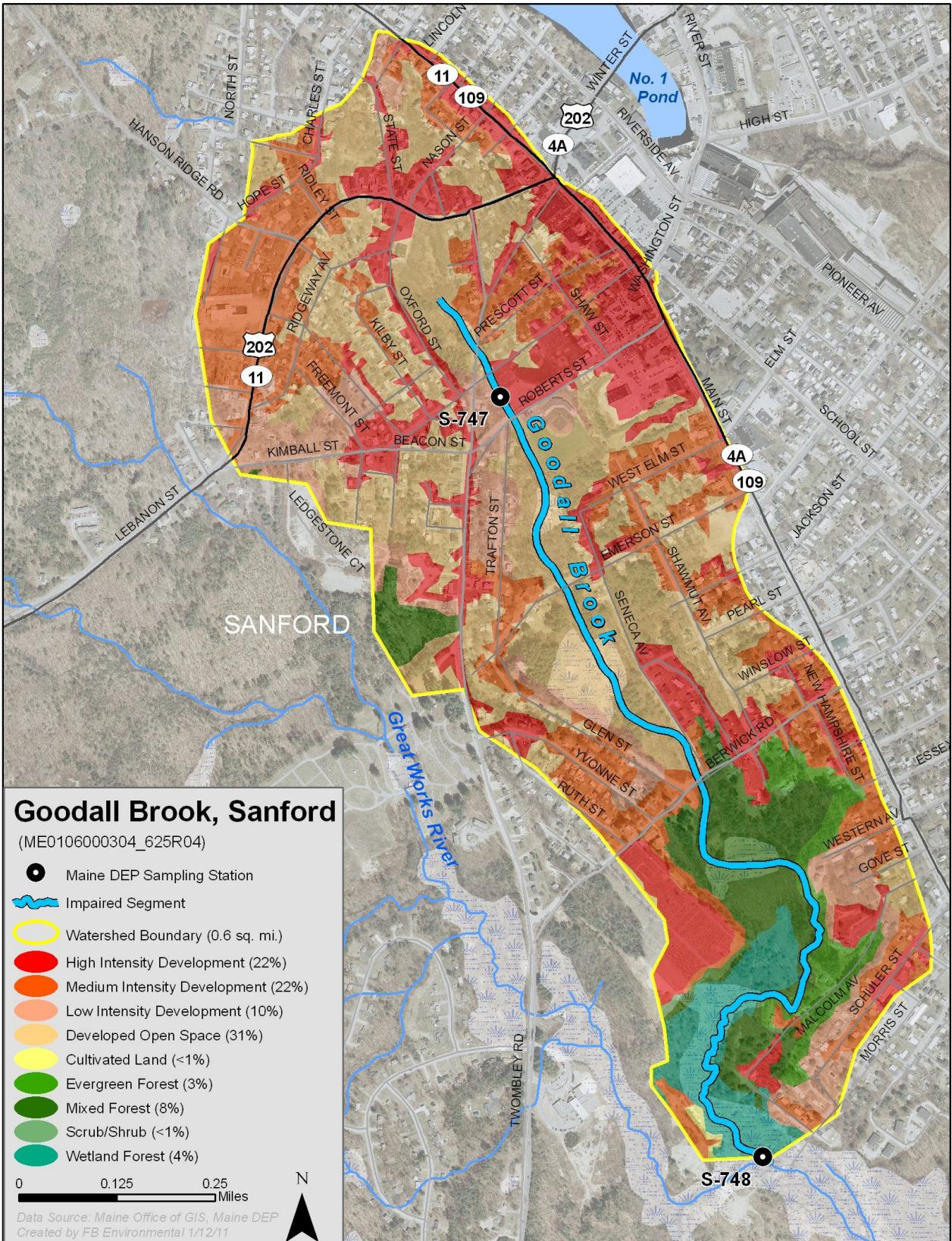


Figure 2: Map of Goodall Brook watershed land cover.

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). 2004. Biological Monitoring Unit, Aquatic Life Classification Attainment Report. Bureau of Land and Water Quality, Augusta, ME
- 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.