

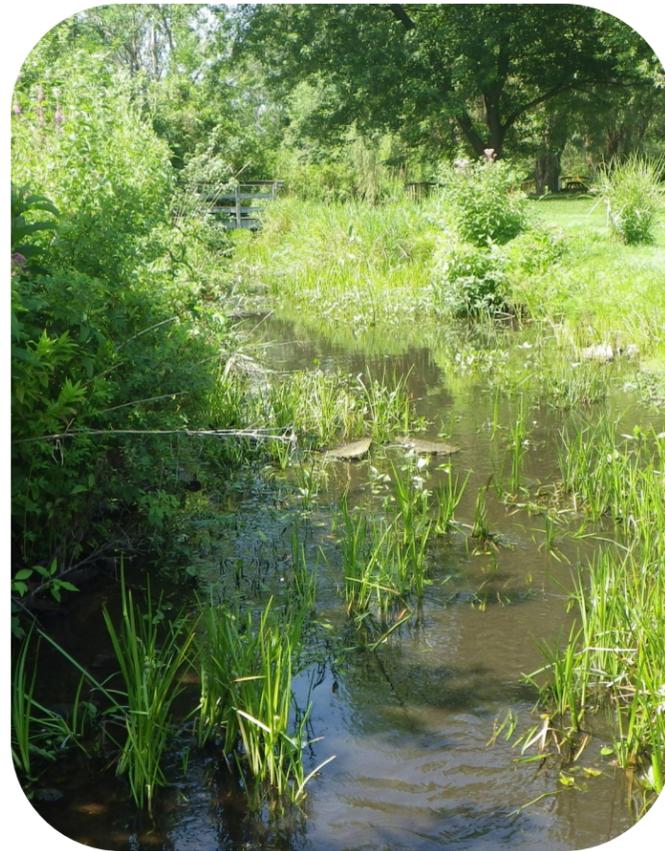
## Successes & Challenges

### Successes

- Despite a suburban residential land use pattern, aerial photos show that much of the creek enjoys a natural forested riparian buffer. Buffers filter polluted runoff and help keep the creek clean and cool. It will be important to maintain these vital natural features.

### Challenges

- While the creek still has forested buffers protecting it, there are very few larger intact natural areas in the creekshed. Once more, only a small fraction of those natural areas and forested buffers are protected from development. It will be important for the local governments in Woodruff and Mann creeksheds to ensure protection of these buffers through building setback requirements.
- Conductivity levels are slightly high in Mann Creek, indicating the presence of some amount of unknown pollution. This is a very difficult parameter to hunt down, but pinpointing the source(s) would be useful in improving water quality.



Woodruff Creek flows slowly along a grassy yard near the aquatic insect sampling point on Buno Road. Credit: HRWC

## What you can do!

### At home

- Minimize your turf lawn; instead put in deep rooted native plants that do not need to be fertilized or watered.
- If you live on one of the many lakes in Woodruff and Mann creeksheds, consider installing a natural lakeshore. A natural lakeshore is better for lake life and water quality than mowed grass and seawalls.
- If you own property with a natural area, work with a land conservancy to establish an easement to protect it from future development.

### In your community

- Learn to identify environmental impairments like algal growth in waterways and erosion on land—and follow up with HRWC when you see something wrong.



Much of Mann Creek flows through a wide wetland riparian area. Credit: HRWC



# Woodruff & Mann Creekshed Report

## Creekshed Profile

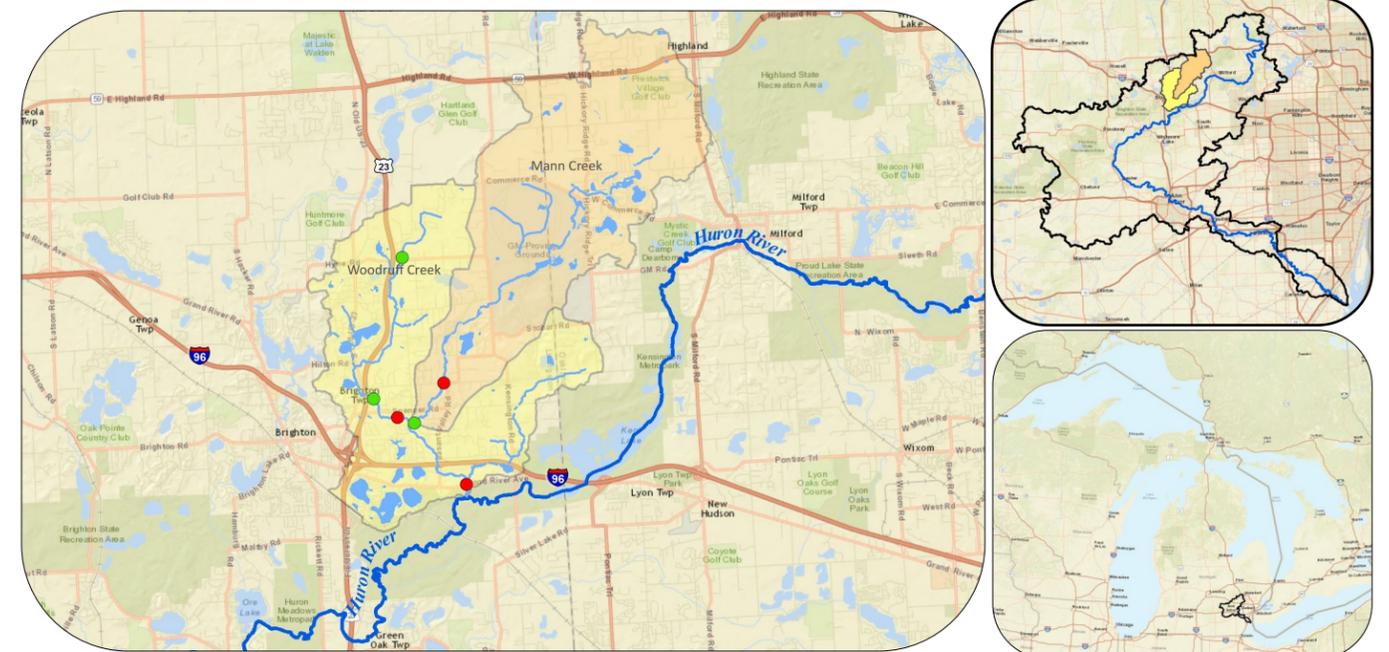
Woodruff and Mann creeksheds lie in a glacial landscape of coarse sand and gravel deposits, and were once predominantly oak barrens, with tamarack and hardwood swamps growing in low areas. Oak barrens are now considered a critically imperiled ecosystem in the state by the Michigan Natural Features Inventory due to their massive clearing for agriculture during European settlement and continued development. Tamarack and hardwood swamps have also been much reduced throughout in the Huron River watershed.

In the spring of 1833, Evert Woodruff moved his family to a 160 acre piece of land that included a moderately sized creek, and built a house, a saw-mill, and a grist-mill. The mills were powered by the creek, which became known generally as Woodruff's Creek. Evert Woodruff bore a reputation far and wide for sound business principles and honesty. His son, Egbert Woodruff, was the first child born in Brighton township. <http://www.brightontwp.com/1971/An-1880-Text-History-of-Early-Settlers>. Mann Creek is possibly named after the Newman family, who arrived to the region in 1859 and eventually owned hundreds of acres along the creek, including part of what would become the General Motors Proving Grounds.

From the times of these settlers, much of the Woodruff and Mann creeksheds have been developed, and are now home to many sand and gravel operations and a suburban residential land use pattern.

The Woodruff creekshed is 19 square miles, contains 16 lakes (open water > 5 acres) and 19 ponds (open water <5 acres), and the creek runs through 19.1 miles of branching creeks with an average gradient of 9.8 feet per mile. The Mann creekshed is 22 square miles, contains 20 lakes and 21 ponds, and the creek runs through 19.7 miles of branching creeks with an average gradient of 8.1 feet per mile.

The townships of Brighton and Hartland (and little bit of Green Oak) in Livingston County and Milford and Highland in Oakland County, as well as those counties' Water Resources Commissioners all make decisions that affect the creeks.



● Monitoring sites for Aquatic Insects, Stream Habitat, and Stream Temperature For more details on these parameters, please see inside.

● Monitoring site for Stream Flow, Phosphorus, Total Suspended Solids, and *E. coli*

# Creekshed Status and Trends



HRWC creekwalkers discover the location where Mann and Woodruff Creeks join. Credit: HRWC

## Creekshed Land Use

### Encroaching impervious surface

Total creekshed Size: 41 square miles  
Land use based on the year 2000:  
Agriculture: 9%, 4 square miles  
Residential & urban: 52%, 21 square miles  
Forest: 9%, 4 square mile  
Open: 17%, 7 square mile  
Wetland: 10%, 4 square mile

Total impervious surface: 11%, 5 square mile

Numerous studies have shown that fish and insect communities are less diverse when the amount of impervious surface exceeds 10-12% of the total watershed area. Since 11% of the Woodruff and Mann creeksheds is currently impervious, this means that the system is at the tipping point of losing much of its biological diversity.

## Creekshed Natural Areas

### Many natural lands yet unprotected

The creekshed's forests, wetlands, and grasslands soak up rainwater and runoff, filter pollutants from runoff, and provide wildlife habitat and beautiful places for us all to enjoy. Only about 17% of the creekshed remains as intact natural areas; only a small fraction of these areas are protected from development (about 0.7% of the creekshed). Without intact natural areas, the creekshed faces an uncertain future. It will be important to keep these lands natural, so they can keep the creek as healthy as possible.

## Stream Habitat

*Some areas are slightly degraded, but much of the habitat is undisturbed.*

Woodruff and Mann creeks' stream beds are formed of an approximate even mix of small rocks, gravel, sand, silt, and clay. Little agriculture in the watershed means that very few sections have been ditched and straightened, and much of the creek meanders through a wooded and wetland riparian zone. Pools, riffles, bends, and woody debris provide for numerous hiding places for the living creatures here. Lack of vegetative buffers and undersized culverts result in poor habitat where subdivisions about the creek and where the creeks flow under highways and roads.

## Fish Community

### A coolwater fish community

A fish survey conducted in 1999 reported the presence of a coolwater fish community. Species found include small-mouth and largemouth bass, northern pike, various kinds of sunfish, and a wide array of suckers, redhorse, minnows, and darters.

## Aquatic Insect Community

*Excellent in Mann Creek; Moderate in*

*Woodruff Creek*

Mann Creek has an excellent aquatic insect community. Stoneflies are easily killed by pollution, but four families of them are regularly found here in large numbers. This is the only place in the Huron River watershed where we see this level of stonefly diversity and abundance. The aquatic insect community at Woodruff Creek is average and indicates a creek with moderately healthy habitat and water quality.

## Stream Water Temperature

*Cool to hot depending on location*

Woodruff and Mann creeks receive a mix of cold groundwater and warmer surface runoff. Temperature measurements show that the water temperatures range between 70-85 °F during July and August. Temperatures in the 70's are normal for creeks of this size in this area of Michigan. Temperatures in the mid-80's are considered hot and could create low dissolved oxygen situations.

## E. coli

*Unknown*

E. coli bacteria is a useful water quality indicator for the presence of fecal contamination. In Woodruff and Mann creeksheds, bacteria measurements have not been made by HRWC or any other known organization or individual.

## Phosphorus

*Low*

Phosphorus is the limiting nutrient in most freshwater systems, and too much phosphorus can cause algal blooms and water quality problems. The target for area streams is < 30 µg/l. The mean total phosphorus (TP) for Woodruff and Mann creeks combined is 30 µg/l, which represents healthy nutrient runoff overall.

## Dams and Impoundments

*Only one present*

While dams provide recreational benefits, they greatly alter a stream's hydrology and degrade fish and insect habitat. There is one small dam on a Woodruff Creek tributary at Hyne Road that creates or deepens a small lake.

## Color Coded Ranking

Excellent

Fair

Poor

## Total Suspended Solids

*Low*

Total suspended solids (TSS) is a measurement of the amount of sediment and organic material held by the stream. A high TSS indicates high turbidity and erosion problems. Good TSS values during rain storms are below 80 mg/l; the average for both of these creeks is 8 mg/l., with little difference between the two.

## Conductivity

*Normal to Slightly Elevated*

Conductivity is a measurement of the amount of ions (also known as salts) dissolved in water. Conductivity is a quick and easy measurement to make, and is useful as an indicator of potential problems, since conductivity is highly correlated with total dissolved solids (TDS). Conductivity levels in Woodruff Creek are normal, and slightly elevated in Mann Creek.

## Stream Flow

*Insufficient Data*

Stream flow is an important underlying factor for determining likely erosion rates, stream habitat quality, and aquatic community diversity. HRWC and other organizations have not yet collected sufficient stream flow data from these creeks to determine the characteristics of the stream flow regime.