

Successes & Challenges

Successes

- The Fleming Creek Advisory Council (FCAC) advises Superior and Ann Arbor townships' Planning Commissions. These townships require FCAC review all proposed developments on their impact on the Creek.
- Superior and Ann Arbor townships have wetlands ordinances (for wetlands of ALL sizes) that provide a variety of protections to wetlands including development setbacks.
- At Parker Mill County Park, students and local businesses have participated in native riparian vegetation improvement projects and learned about the relationship between invasive species and water quality.
- UM Matthaei Botanical Gardens has installed “rock vanes” in a small section of the stream to stabilize the streambank and is working to restore American elms within the floodplain.
- UM has also worked to protect and restore critical habitat for the endangered Eastern Massasauga Rattlesnake within the Botanical Gardens.

Challenges

- Fleming creekshed's communities and residents must promote compact development and preserve natural areas and open spaces. It is extremely important to prevent the creation of more impervious surface in order to maintain the creek's integrity.
- Residential development, agriculture, and historical channelization of many stretches on the East Branch of Fleming Creek have taken their toll on the creek. Restoring natural streambanks and returning the creek to more natural flows will increase habitat diversity and make the creek more inviting to a wider variety of aquatic wildlife.
- We need to reduce phosphorus runoff to Fleming Creek. Likely sources of phosphorus are excessive fertilizers in residential areas and agricultural application.
- While erosion is not a major systematic problem throughout the creekshed, after storms we have observed erosion of streambanks and channel beds in some areas. These areas need to be stabilized.



The beauty of Fleming Creek is in full color on this autumn day at Parker Mill County Park. Credit: Ed Rasch

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.
- Have your septic system checked regularly. Leaking septic systems can be a large source of phosphorus and *E. coli*.
- 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

- Talk to HRWC about joining the Fleming Creek Advisory Council.
- Learn to identify environmental impairments like algal growth in waterways and erosion on land— and follow up with HRWC when you see something wrong.
- Get out and enjoy the creekshed!



Fleming Creekshed Report

www.hrwc.org/fleming

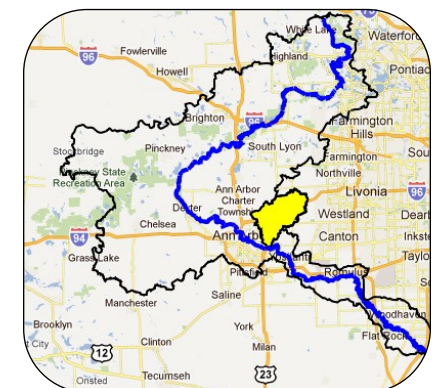
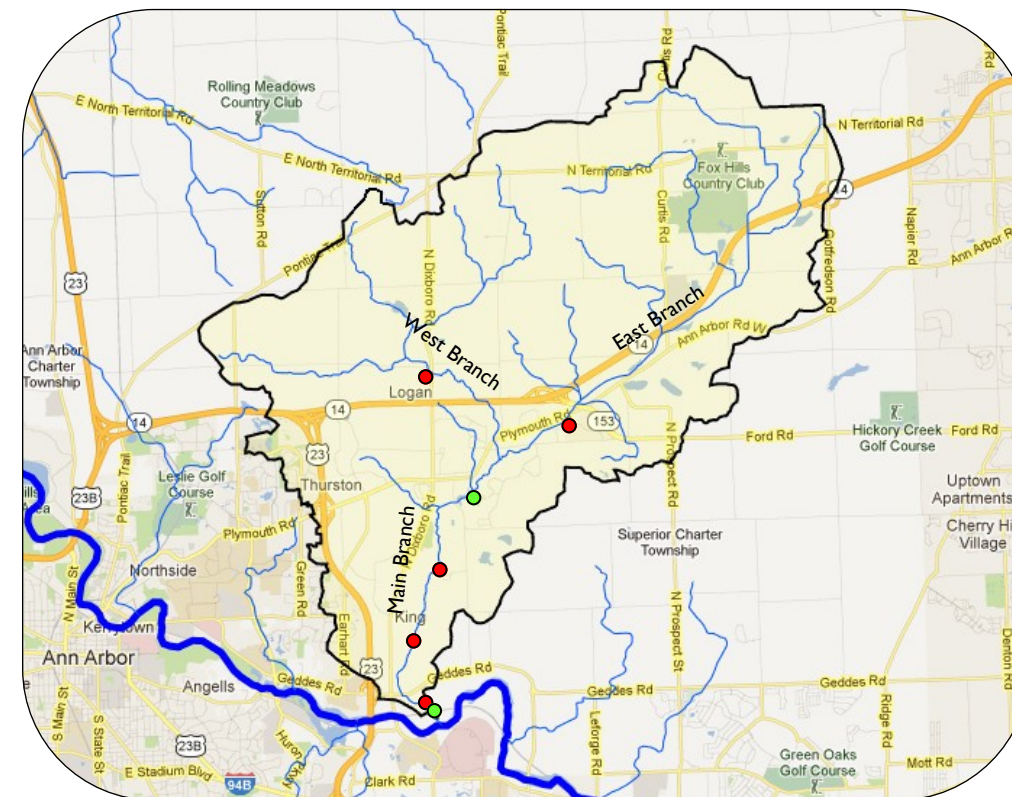
Creekshed Profile

In 1824, Robert Fleming built one of the first mills in the Huron River watershed – a sawmill on what is now known as Fleming Creek. This set the stage for Fleming Creek and the Huron River as an important source of power for the first European settlements in this area. Since that time the creekshed has supported agriculture, several gravel pits, and numerous parks. In recent years, the number of homes has increased substantially and several large research facilities, medical facilities, and golf courses have been built.

Located northeast of Ann Arbor, Fleming Creek meets the Huron River just east of US-23. Ann Arbor, Northfield, Salem, and Superior Townships; the City of Ann Arbor; UM Matthaei Botanical Gardens; Washtenaw County Parks; and the Office of the Washtenaw County Water Resource Commissioner are all major decision makers and landowners in the creekshed. Fleming Creek is also greatly influenced by the residential landowners of the area.

Fleming Creek is composed of 48 miles of branching stream channels, and it drains 31 square miles of land. Over its creekshed, the creek's elevation drops 184 feet. The average slope is 16 feet per mile, which is on par for the Huron River as a whole. The west branch of Fleming Creek is much steeper, averaging 31 feet per mile. A stream with a high slope like this will typically have well established riffle-pool sequences and excellent diversity in fish habitat and water flow.

There are 14 lakes (open water > 5 acres) in the Fleming creekshed. The biggest, Frain Lake, is 17 acres. The creekshed holds 6 ponds (open water < 5 acres).



- Monitoring sites for Aquatic Insects, Stream Habitat, and Stream Temperature
- Monitoring site for Stream Flow, Phosphorus, Total Suspended Solids, and *E. coli*

For more details on these parameters, please see inside.

Creekshed Status and Trends



A volunteer searches Fleming Creek at the Matthaei Botanical Gardens for stoneflies during the annual Winter Stonefly Search. Credit: John Lloyd

Creekshed Land Use

Encroaching impervious surface

For the year 2000:

Total creekshed Size: 31 square miles

Agriculture: 23%, 7 square miles

Residential & Urban: 31%, 10 square miles

Forest: 12%, 4 square miles

Open: 26%, 8 square mile

Wetland: 8%, 2 square miles

Total Impervious surface: 11% , 3 square miles

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 Fleming creekshed 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 to be protected

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. About 23% of the creekshed has natural areas. However, only a small fraction of these areas are protected from development (about 3% of the watershed, including Matthaei Botanical Gardens and Parker Mill County Park). 20% of the creekshed faces an uncertain future. It will be important to keep these lands natural, so they can continue to help keep the creek healthy.

Stream Habitat

Main and W. Branch excellent; E. Branch fair

Fleming Creek's main and west branches have the riffles, pools, bends, and runs that are characteristic of low human impact. However, parts of the east branch are channelized and have less habitat and more fine sediment. Throughout the creekshed, Fleming's banks are largely undisturbed and free from erosion, although particular areas of erosion do exist.

Dams and Impoundments

Present, but do not dominate the system

While dams provide recreational benefits they greatly alter a stream's hydrology, and can degrade fish and insect habitat. Three known dams block Fleming Creek. Two of these dams create small detention ponds and seem to have little impact. The biggest of these dams has created a 7-acre impounded pond east of the intersections of Plymouth and Dixboro Roads, and it physically separates the lower 25% of the watershed from the upper 75% of the watershed.

Fish Community

Small bodied cool-water fish community

Fleming Creek is home to smallmouth and largemouth bass and northern pike, but the stream is not known for great sport fishing. Smaller species and suckers compose most of the fish community, including blacknose dace, creek chub, mottled sculpin, rainbow darters, and hognose suckers. Also, the creek is home to a State endangered species, the redbreast dace.

Aquatic Insect Community

Main and W. Branch excellent; E. Branch fair

Overall, Fleming Creek has a very healthy insect community. The west branch is particularly diverse, being the second most diverse site in the Huron watershed after correcting for stream size. The upper east branch has more fine sediment, parts of it have been channelized, and as a result the aquatic insect community is not as abundant.

Stream Water Temperature

Cool water

Fleming Creek receives a mix of cold ground water and warmer surface runoff. Much of the stream is shaded by natural riparian areas. Temperature measurements show that the water temperature of Fleming Creek rarely gets above 71 °F and rarely drops below 60 °F during July and August. This is a normal water temperature for a creek with these properties and in this area of Michigan.

E. coli

High after rainstorms

E. coli bacteria is a useful water quality indicator for the presence of fecal contamination. In the Fleming creekshed, *E. coli* is normally present in low concentrations that permit for partial body contact (no drinking, but recreational activities are fine). After heavy rain events, *E. coli* can reach levels that are above State standards due to animal and agricultural waste running off the land into the creek. It can take 48 hours for the *E. coli* to return to safe levels.

Phosphorus

Elevated

Phosphorus is the limiting nutrient in most freshwater systems, meaning that too much phosphorus can cause algal blooms and water quality problems. The target for area streams is < 50 µg/l. Fleming Creek's mean total phosphorus (TP) is 66 µg/l, which is elevated, particularly after heavy storms (see below). This is likely due to residential and agricultural runoff.

Color Coded Ranking

Excellent

Fair

Poor

Total Suspended Solids

Low

Total suspended solids (TSS) is a measurement of the amount of material held by the stream. A high TSS indicates high turbidity and erosion problems. Good TSS values are below 80 mg/l. Fleming Creek's mean TSS is 41 mg/l.

Conductivity

Normal

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 Fleming Creek are normal and have been normal since monitoring began in 1993.

Stream Flow

Moderately flashy

Stream flow is an important underlying factor for determining likely erosion rates, stream habitat quality, and aquatic community diversity. An important measure is "flashiness" or the rate a stream rises and falls through a storm event (see below). Fleming Creek has a flashiness rating that is high for comparable Michigan streams, but average for the Midwest.

2010 Storm Event

At Parker Mill Park

