

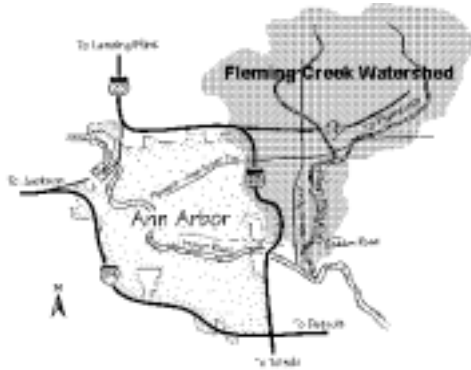
CREEK FACTS

Where is Fleming Creek?

In northeast Washtenaw County, east of Ann Arbor, and north of Ypsilanti.

Who has jurisdiction over land that affects the creek?

The townships of Ann Arbor, Salem, Superior, and Northfield and the City of Ann Arbor. The Washtenaw County Drain Commissioner maintains a portion of the east branch.



*A **watershed** (or basin) is the area of surrounding land that drains into a river or creek. For instance, rainwater carries dirt and debris downhill into Fleming Creek from North Territorial and Plymouth Roads, as it does from other roads, parking lots, and land within the basin (see Fleming Creek Watershed Map on page 2).*



*A steep **slope** allows creeks to run faster, adding to their natural beauty. In addition, cold, clean ground water often seeps into creeks at locations where the surrounding landscape is steep.*



*How large is the **watershed**? How steeply does it flow?*

The watershed drains a total of 31 square miles, with an average **slope** of 16 feet/mile, which is average for the Huron system. The west branch is much steeper, averaging 31 feet/mile with several headwater streams descending at a rate of over 100 feet/mile!

Why does the creek flow so slowly in the upper portion?

Land in the upper, northeastern portion of the watershed is flat and swampy; it tends to retain water and has an unusually broad floodplain. Retention of water there helps protect the lower portion of the creek; it should not be altered to drain faster.

How are people using the land that drains into Fleming Creek?

The land supports many individual homes, several subdivisions, as well as some research facilities and farms, many of which are horse farms. In addition, there are gravel pits, golf courses, and large parks.

Are there any lakes or dams on the creek?

A small lake is located on the west branch, and a large pond is located below the confluence of the two branches, near Dixboro. The pond is popular for fishing and picnicking.

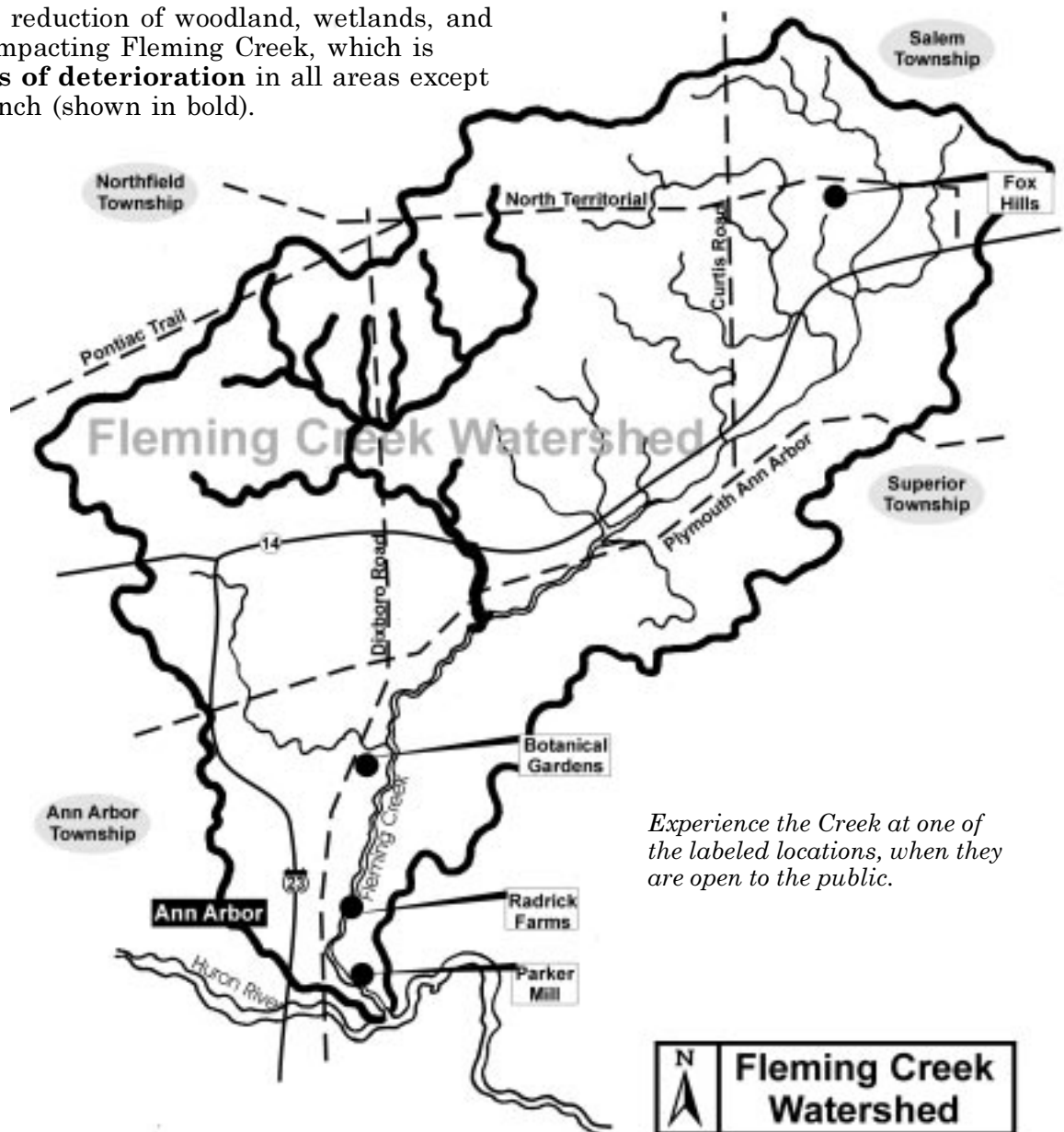
HISTORY

Clear, cool, and powerful, Fleming Creek was an important source of power for the first European settlement in this area. In 1824, Mr. Fleming built one of the first mills on the Huron River system, a sawmill on the creek near the current Botanical Gardens.

Since that time, the watershed has supported agriculture, several gravel pits, and several parks. However, in recent years, the number of homes has increased enormously, and several large research and medical facilities have been built in the watershed.

The resulting reduction of woodland, wetlands, and meadows is impacting Fleming Creek, which is showing **signs of deterioration** in all areas except the West Branch (shown in bold).

Signs of creek deterioration may include eroding banks as well as a decrease in the varieties of wildlife living in or near the creek.



EVALUATING CREEK QUALITY

The Huron River Watershed Council is a non-profit coalition of the communities and people in the basin, whose mission is to protect the entire watershed.

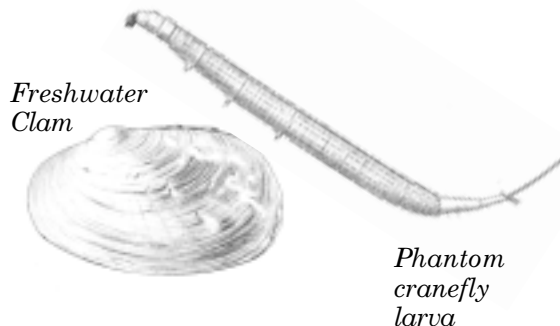
Riffles are “wanna-be rapids”—where the water flows swiftly and ripples over a shallow, rocky or sandy bed.



Silt is an important factor when considering a creek’s quality. Silt in the riffles can limit the number of creatures living in a creek because it fills the spaces between rocks and reduces oxygen in the sediment and interstitial spaces.



*The creatures living on the bottom of a river make up the **benthic population**. We study populations of the invertebrates, creatures that have no backbone, such as clams, immature insects, worms, and crayfish.*

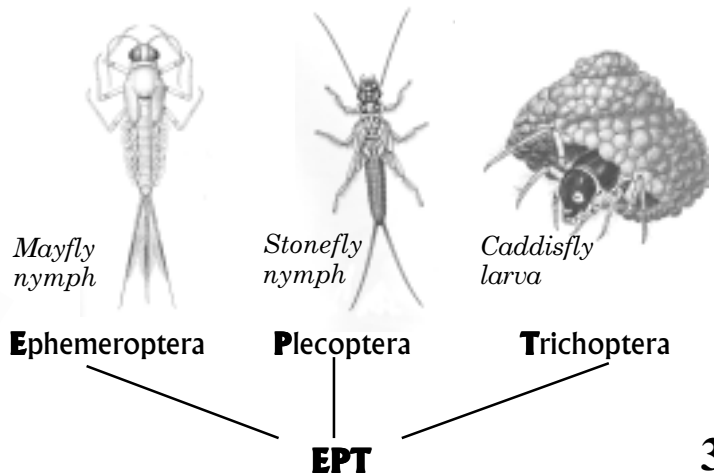


In order to evaluate the current state of the river and its streams, the **Huron River Watershed Council** has been working with local residents and aquatic biologists on a major study of the Huron River system since 1992. The study characterizes the physical state of the waterways and the **benthic populations** living in them. Since the benthic population depends entirely on the quality of the stream, its composition reveals a great deal about the state of both the water quality and the physical health of the stream.

The quality is evaluated relative to other sites in the Huron system. Since larger streams have a more diverse population, each study site is adjusted for size to allow a valid comparison. The population in each stream site is sampled thoroughly in April and September, and all sites in this study have been sampled more than three times, most at least five, to develop a knowledge of the population.

Some of the characteristics that indicate good quality are stable banks with a broad corridor of trees and shrubs, riffles free of silt deposition, fairly stable temperatures, and a benthic population that includes a diverse variety of creatures, including several groups that are sensitive to organic pollution. The population in a degraded creek will be restricted to those few types of creatures hardy enough to survive.

When the stream is healthy, a great diversity of creatures live there, including several that are sensitive to pollution. Since many mayflies, stoneflies, and caddisflies are sensitive to the quality of a site, we note the variety of them as an additional indicator of good quality. This indicator is labeled the "EPT" because the latin names are Ephemeroptera (mayflies), Plecoptera (stoneflies), and Trichoptera (caddisflies).



DETERIORATION OBSERVED

UNIVERSITY STUDIES

Fleming Creek has probably been studied more than any other **tributary** of the Huron River because it is located near two large universities and flows through property owned by the University of Michigan. In 1959, Ken Cummins surveyed the benthic population along the east branch of Fleming Creek for a class project, and in 1973, Robert Potter studied the population near our Ford Road site. While the creek population remains similar today, they found three very sensitive families that we have not found in our 1992-1997 studies.

In 1996, after two classes conducted field studies of Fleming Creek, professors of entomology and aquatic ecology noted that the quality of the creek was deteriorating. In addition, the Southern Redbelly Dace, a threatened fish species in Michigan, used to be common in Fleming Creek. However, students have sampled the fish in Fleming Creek since the early 1970s, and the last year they found this rare species was in 1984.

Fleming Creek receives water from many **springs and seeps**. Since such groundwater remains at about 50° F year-round, it moderates the temperature of the Creek, allowing cool water fish like sculpins to thrive. Glossomatid caddisflies also require clean, cold water and are found in only a few locations in the Huron River system. They were present at the Ford Road site in 1973 and we found a single one there in 1993, but none have been seen in Fleming Creek since then.

***Tributary** is another term for the branches of a stream or river. Here, two branches of a river meet to form a beautiful waterfall.*



***Springs and seeps** occur in locations where groundwater emerges from the land, often forming a cold-water pond or a wetland. A “spring” emerges with more force than does a “seep.”*



The Southern Red Belly Dace, once common in the creek, has not been found here since 1984.

RECENT STUDIES

The HRWC Adopt-a-Stream Program trains people to study sites within the Huron River watershed. Council biologists analyze the data, which has been recognized as the best data set on any river in Michigan.

***Habitat** refers to the places where plants and animals live. In the creek, these places are formed by rocks, crevices, patterns of flow, plants, etc.*



***Bank sloughs** refer to a dramatic falling away of large portions of the bank*



***Sediment** is soil or other matter that is carried and deposited by flowing water.*



People in the **Adopt-A-Stream** Program are studying five sites on the creek, as shown in the map on page 6. Each site reflects what is happening in the creek and in the watershed above the site.

HABITAT AND THE BANKS

Many areas of Fleming Creek have good physical characteristics, such as richly vegetated banks, stable substrate, and a variety of flow patterns. In 1993, a walking survey of the lower two-thirds of the Creek found some areas where the banks had eroded and there were several large **bank sloughs**. Fine **sediment** was a problem in much of the Creek. Deposited on the bottom, it clogs the living spaces required by fish and other aquatic creatures.

BENTHIC POPULATIONS

Benthic populations are generally more diverse as the area of the watershed increases, and also when they are located close to large sources of water, like rivers, from which additional groups can migrate. Thus, the population at the Geddes site, which has the largest drainage area (30 square miles), and is located close to the Huron River, should be more diverse than the sites at Ford Road (15 square miles) or at Warren on the West Branch (6.5 square miles). As seen on page 6, the opposite is true. Both upstream sites have greater diversity than the downstream sites, indicating much better creek quality.

In fact, the diversity of the population in the West Branch is close to the best in the Huron, adjusted for its size. The variety of EPT living there is also relatively large (82%).

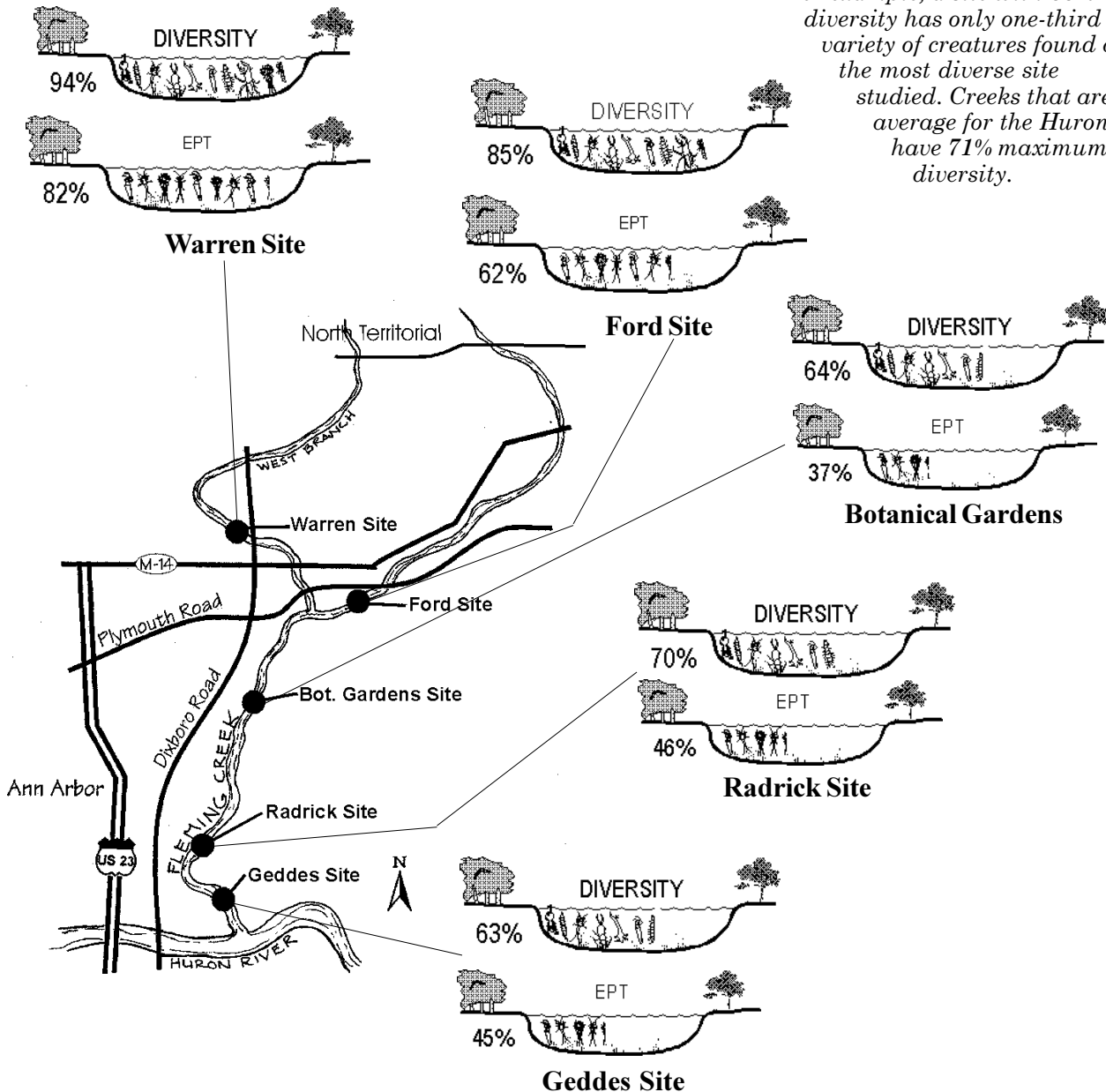
The four sites on the other branch of the creek have moderate diversity and moderate to poor EPT. The site on Ford Road has a much more diverse population and greater EPT than the sites downstream, but, unfortunately, it no longer supports any sensitive families (see page 7). In 1973 Potter found twice as many mayfly families (6) and two additional sensitive caddisfly families compared to our four-year survey of the Ford Road site 20 years later.

POPULATION DIVERSITY

The high diversity found in the West Branch indicates a high quality creek. Diversity was good at the Ford site but only mediocre at the sites further downstream. The data shown here have been adjusted for the size of the creekshed, in order to compare sites of different sizes.

Diversity in the population indicates good creek quality. Greater diversity at a site means that the conditions are good for a variety of kinds of creatures. The % shows how this site compares to the best site in the Huron River system.

For example, a site with 33% diversity has only one-third the variety of creatures found at the most diverse site studied. Creeks that are average for the Huron have 71% maximum diversity.



EPT: Many of the EPT families require a high quality creek. "E" are mayflies (Ephemeroptera), "P" are stoneflies (Plecoptera), and "T" are caddisflies (Trichoptera). If many kinds of EPT are present, the site probably has high quality. The % shows how the EPT indicators of the site compare to the best site in the Huron River system. For example, a site with 25% EPT has only one-fourth the variety of EPT families found at the site with the most variety in EPT. Creeks that are average for the Huron have 48% of the maximum EPT.

THE CREATURES SPEAK

*Taxonomy is a system for categorizing all living things. A **family** is a taxonomic level that includes the genera and the species. For example, mink, otters, and skunks belong to the *mustelidae* family.*



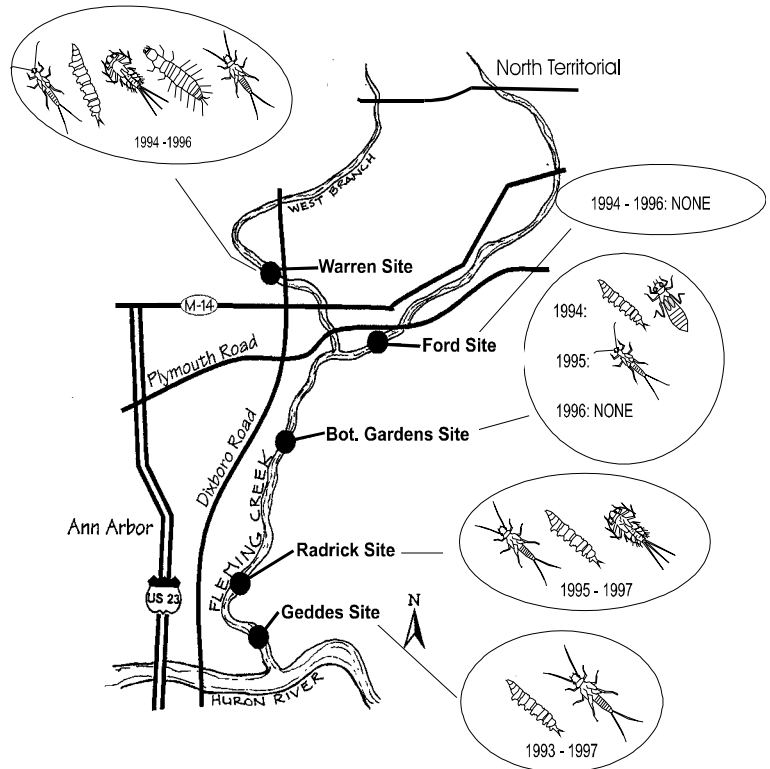
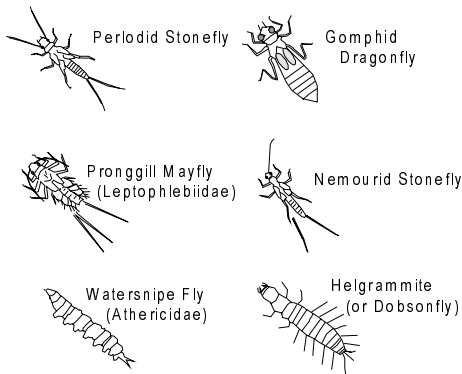
The creatures tell us about conditions of the creek. Populations living in the stream show that the West Branch has much higher quality than does the main branch of Fleming Creek. Many highly **sensitive families** live in the Warren site while very few live in the other four sites.

We found three sensitive families at the Ford Road site in April, 1993, and not in any of the five searches there since then. In fact, in September, 1996 we found a robust diversity of 28 families, but none were sensitive.

The Warren site on the West Branch has more sensitive families (5) for its size than most of the other sites studied in the entire Huron River system. The benthic population there contains a great diversity of creatures (40 families). The East Branch has less diversity and very few sensitive families. Thus we conclude that the quality of the West Branch of Fleming Creek is very good compared to the rest of the Huron River, while the East Branch has deteriorated.

*Sixteen of the 77 benthic families living in the Huron system are highly **sensitive** to organic pollution. The presence of these sensitive families at a site indicates that the site (and upstream of it) has high quality.*

These are the very sensitive families that live in Fleming Creek:



CONCLUSION

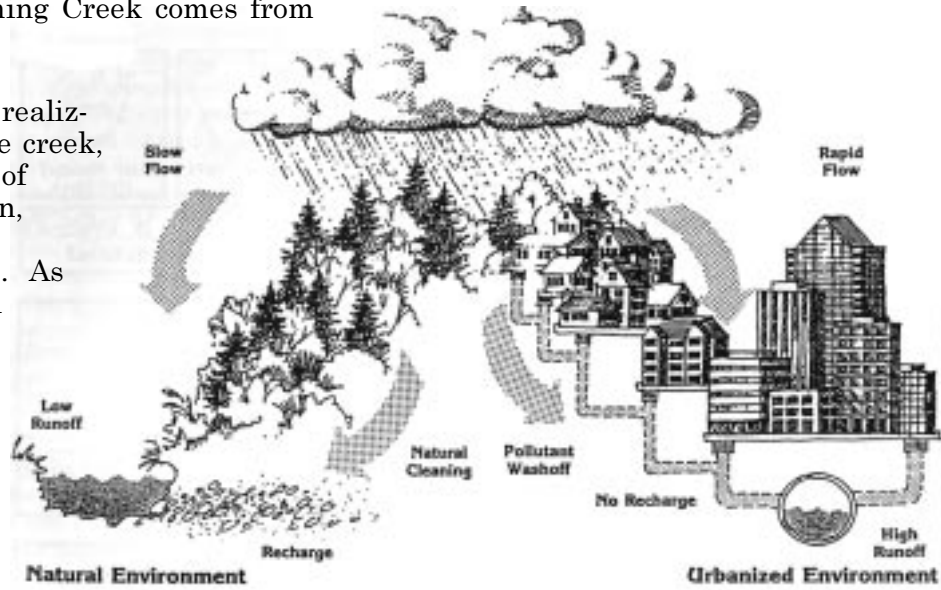
THE PROBLEM

"We have met the enemy and he is us!" -Pogo

The deterioration of Fleming Creek comes from all of us.

We all do things without realizing how they will hurt the creek, such as clearing the land of trees and other vegetation, filling wetlands, or even mowing the stream banks. As we build more homes and roads, we increase the amount of rain water washing over our yards and pavement into the creek.

In undeveloped areas with trees and shrubs, much of this water would be absorbed into the earth and become cool, cleansed groundwater, or would evaporate into the atmosphere. The increased amount that now flows directly into the creek after a storm erodes the stream banks, increases flooding, and carries trash and chemicals from yards and streets into the creek. Fine silt fills the spaces on the bottom needed by fish and other creatures. The creek warms, and ultimately, loses its vitality!



WHAT YOU CAN DO TO HELP

We must work together to ensure that our use of the land, including further development, is planned in a way that protects the creek.

All residents in the watershed can help by making small changes in their daily lives and by telling their township officials that they want the creek protected by careful planning and education.

Ways that you can help the creek appear on the next page. For more information, call the Huron River Watershed Council (HRWC) or join the Fleming Creek Advisory Council (FCAC).

USEFUL NUMBERS:

The area code is (734) unless indicated otherwise.

HRWC: 769-5123

Co-op Extension 971-0079

Drain Commissioner's Office: 994-2525

FCAC: Meroe 459-5386

Soil Erosion: 971-1441

Adopt-A-Stream Program: 769-5971

To report any dumping or spills, call: 911

Township Offices (ask about meeting times):

Ann Arbor: 663-3418

Northfield: 449-2880

Salem: (248) 349-1690

Superior: 482-6099