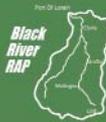


# Living Along French Creek

## A User's Guide



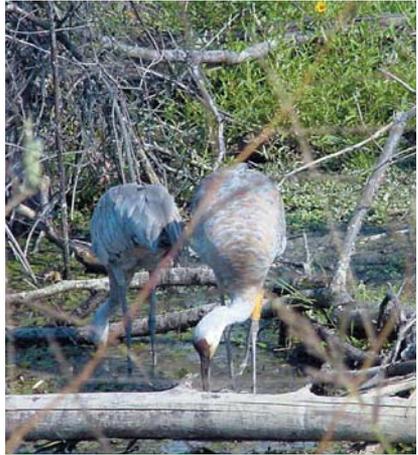
US Army Corps  
of Engineers  
Buffalo District



Our River. Our Responsibility.

*A stream, or river, flows from one place to another. You can see it flow from your neighbor's property to yours, or from your town to the next town or village. Whatever happens to a river in one place is carried downstream to the next place.*

Since very little of the water in French Creek is spring fed; most arrives by way of rain or snowmelt. The streams are fed either directly from over the land (called runoff) or indirectly from one or more streams that join them. These joining streams are called tributaries. The entire network system of smaller streams feeding larger ones is the concept of a watershed. Watersheds are nature's boundaries. They collect the water in a particular area and



The French Creek Watershed supports all types of life.

*Photo: Jay Miller*

transport it to another area. Of course wetlands include lakes, streams, rivers and wetlands, but and most importantly, watersheds include the surrounding land. You live work and play in one watershed or another.

### *~ We all live in a watershed ~*

Sometimes extreme rainfall amounts overwhelm a stream's capacity to carry water, but there is a natural built-in release mechanism. The low flat areas adjacent to the streams that can handle the larger flows are called floodplains. In the floodplains, the force of water slows, allowing sediments to fall out. The slower flows also create less erosion. Sometimes the floodplains have wetland areas associated with them. Wetland areas are important floodplain features as well, because they can store excess water and filter the runoff. In addition, wetlands create exceptional habitat refuges.



The French Creek

*Photo: Jay Miller*

The naturally vegetated area next to streams and rivers also serve important functions. These areas are called the riparian corridors and the roots of the trees and bushes along the stream hold the stream banks in place. The trees, bushes and shrubs slow the flow of water over the land, reducing erosion of the streams. Riparian areas filter out sediments and excessive nutrients from runoff before they can get into the streams. The branches and leaves form a cover, or canopy, over the stream. This shades the stream, keeping the water cooler. Finally, the riparian areas also serve as

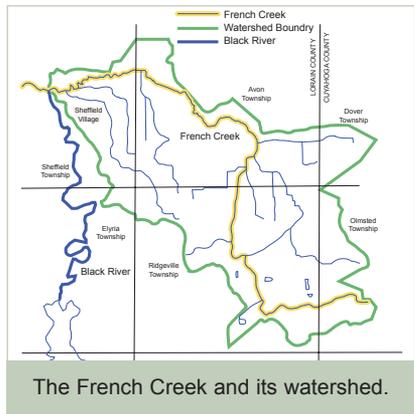
important habitat sites and migration corridors for wildlife.

Natural streams have definite features associated within them. Riffles are the white-water areas of the waterway, just like the rapids in larger rivers. Riffles serve to add needed oxygen to the water and also serve as habitat sites for the smaller creatures like insect larvae, small fish and crayfish. Pools are deeper, quieter waters and are good fishing spots. Runs or glides are faster moving water. The associations of good riffle-pool-run sequences demonstrate healthy river dynamics.

## *The French Creek Watershed*

French Creek is the largest tributary to the mainstem of the Black River and an important natural resource for the region.

The U.S. Army Corps of Engineers and the Black River Remedial Action Plan Coordinating Committee have developed this French Creek handbook in an effort to help you learn about the French Creek and its geology, history, wildlife, and beauty. The handbook will also explain the findings of an intensive environmental survey conducted for the Black River RAP by the Army Corps during 2002-2003. Finally, the handbook will present some ideas of how you, your neighbors and your community can help protect this valuable natural resource of yours.



**"Unless someone like you  
cares a whole awful lot,  
nothing is going to get better.  
It's not."**

Theodor Geisel (Dr. Seuss)

Watershed Size . . . . .	38.3 Square Miles
Streams . . . . .	53.4 Miles
Average Stream Gradient . . . . .	7.6 feet per mile
Drainage Density . . . . .	1.39 Stream Mile/per Square Miles
Rail Lines . . . . .	12 Miles
Municipal Roads . . . . .	66.2 Miles

## *Geology and History*

During the Ice Age, advancing glaciers covered the French Creek watershed, along with all of northern Ohio. The glaciers, towering more than 200 feet high, scraped

Since the retreat of the last glacier, what is now known as Lake Erie has gone through some major changes. The early versions of Lake Erie were much higher and larger and had names like Lake Warren, Lake Whittlesey and Lake Maumee.



Shale formations created by silt deposits on ancient lakebeds.

*Photo: Ted Conlin*

the ground as they moved southward and brought with them a lot of material from far away. As they melted, the land was blanketed with a 50-foot thick deposit of the material, which is called glacial till, a mixture of clay, sand, gravel and boulders. Many of the rocks and boulders of the region likely came with the glaciers from Canada.

Lake Erie's present elevation is about 575 feet above sea level. Lake Warren was about 100 feet higher, Lake Whittesley was about 150 feet higher and Lake Maumee was up to 200 feet higher. As the water levels changed, the beaches of old lake versions remained as sandy ridges on the landscape. Early settlers found these ridges to be convenient travel routes as the sandy soils and slight elevations rarely flooded. Today, parts of many of these beach ridges are still important roadways. They now carry names like Center Ridge Road and Chestnut Ridge Road.

The glacial till left by the glaciers and the silty bottoms of the ancient lakes are the predominant soil types for the region. These soils types are generally comprised of mostly clay and silt loams. These soils have a slow permeability resulting in a seasonally high water table and a ponding of runoff waters in level areas.

Normal yearly precipitation for the French Creek watershed is about 35 inches of rain and 42.5 inches of snow. Approximately one third of this results in stream flow. The French Creek watershed has about 1.39 miles of streams per square mile of land, which is normal for this region.

In some areas, you can see where centuries of silt deposits on the ancient lakebeds were compressed and over time formed extensive shale formations. Here, fossils of pre-historic fish can be found.

*One important discovery was a fossil uncovered in the shale formations around Sheffield. It is called "Dunkleosteus" and is the remains of a 20-foot long armored fish. It has been called "Tyrell's Terrible Fish."*

Dunkleosteus lived in a vast inland sea that covered the area and even sharks were suspected to have been on its menu. Preserved in shale for over 300 million years, the French Creek "Dunk" is now on display at the Cleveland Museum of Natural History.

The French Creek watershed has always been a popular site for human settlements. The Adena, Hopewell, Woodland and other Native American people frequented the area to hunt and fish along the streams and Lake Erie. Some set up villages in and around the watershed.



300 million years ago, this imposing creature inhabited the French Creek area.

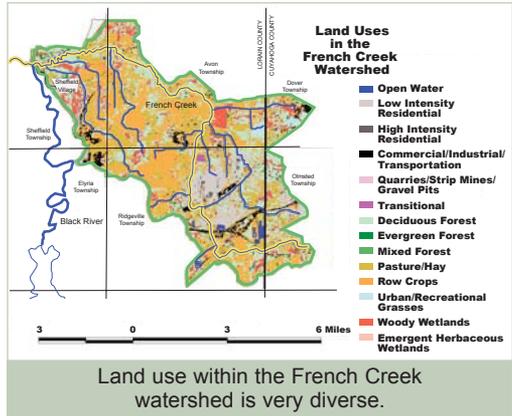
Illustration: Karen Carr - [www.karencarr.com](http://www.karencarr.com)

Wars with competing tribes compelled some to construct fortifications high on the shale bluffs overlooking French Creek. Important Native American artifacts, such as tools, ceramics, ornaments and pipes have been found at the Eiden and Burrell Fort archeological sites, near where French Creek meets the mainstem of the Black River.

In more recent times, the French Creek area was an important stop on the old Underground Railroad. Slaves from the South arrived at the Burrell House in Sheffield and eagerly awaited passage down the Black River to Lake Erie and freedom in Canada.

## Land Uses

The French Creek watershed displays a kaleidoscope of land uses. The beauty of the watershed comes from its rural/suburban nature. Almost half of the land in the watershed is used for agricultural purposes and woods cover another third of the land. As development continues in the French Creek area, the land uses will change quickly.



## Wildlife

Within the waters and along the banks of the French Creek watershed, a variety of plant and animal life can be discovered. Of course, ducks, teals, herons and geese are abundant. But lucky individuals can also spot pheasants, wild turkeys and a variety of hawks and owls. Deer, foxes and beavers can be found along the waterways, but one important individual might be missing.

The River Otter was once common in Ohio until the pressures of habitat loss from the late 1800s to the early 1900s drove their numbers down. They have not been seen in the greater Black River watershed for some time.

From 1986 to 1993, the Ohio Department of Natural Resources reintroduced the species into the Grand River, Killbuck Creek, Little Muskingum River and Stillwater Creek. The bordering states of Indiana, Kentucky, Pennsylvania and West Virginia had River Otter reintroduction programs as well. The restocking has been so successful, River Otters have been spotted in 51 Ohio counties. To date, none have been seen in either French Creek or the Black River watershed. Although tracks have been seen that are believed to be from river otters, one has not been spotted in French Creek or the greater Black River watershed. If you spot a River Otter, you are asked to report it to ODNR, Division of Wildlife at 330-644-2293.



The River Otter has been sorely missed in the area.

Photo: Courtesy of [www.otternet.com](http://www.otternet.com)

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## *Recreational Opportunities*

There is an ample supply of things to do in the French Creek watershed. Stretch your legs on one of the many nature paths in the French Creek Metroparks - may be you can find one of the animals noted above. Golfers have a variety of spots to hone their games and shoppers can browse through the French Creek District Shops in Avon.

Recreational Opportunities in the French Creek Watershed include:

Lorain Metroparks -

- French Creek Reservation
- James Day Park

Golf Courses -

- Avondale, Hilliard Lakes,
- Bob O'Links, Red Tail

French Creek District Shopping

Steelhead Fishing in French Creek

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## *Living Along French Creek*

As you can see, the French Creek watershed is full of ecological, historical and recreational importance. So, who wouldn't want to live here? The area has a small town feel with quiet communities but is close to both the Lake Erie north coast and the metropolitan areas of Elyria, Lorain and Cleveland. The French Creek watershed area has a strong historic background with beautiful vistas and peaceful green areas.

But the face of the French Creek watershed is changing. With the westward expansion of Greater Cleveland and the eastward expansion of Lorain, the French Creek watershed is caught in the middle. It is the northeastern gateway between Lorain County and Greater Cleveland. With that fact comes the head on collision of the needs of the natural watershed and the changing land uses of development.

During these times, it is extremely important to get involved in enhancing and protecting your watershed.

*"Uncontrolled growth and degradation of our natural resources will provide a few with immediate gain, but will ultimately cost the entire populace."*

Lorain County Comprehensive Plan 2000

"Living along French Creek" can remain a positive venture. And as you help protect the French Creek watershed, you, as a homeowner, may be helping yourself in the process.

In studies that compared the value of residential properties, the appraised value of homes along natural streams is three times higher than a comparable home along a channelized stream. Most people enjoy natural settings and wildlife viewing and are willing to pay a higher price to enjoy these benefits. The closer the property is to a natural area, the higher the price prospective buyers are willing to pay.

# U.S. Army Corps of Engineers

## Survey of French Creek

### 1 - Survey

Beginning in the summer of 2002, the U.S. Army Corps of Engineers (USACE) - Buffalo District initiated a comprehensive survey of the French Creek Watershed. The purpose of the survey was to perform evaluations on all of the streams and tributaries within the French Creek watershed utilizing:

- Qualitative Habitat Evaluation Index (QHEI) on the larger streams, and,
- Primary Headwaters Habitat Evaluation Index (HHEI) on the smaller streams (streams with drainage area of less than 1 square-mile).

In addition, any adjacent wetland areas were evaluated utilizing the Ohio Rapid Assessment Method (ORAM).

The objective of conducting the QHEI, HHEI and/or ORAM evaluations was to facilitate a comprehensive 'walk-over' of the watershed to ascertain baseline conditions of the riverine habitat. Utilizing numeric habitat assessments, such as those noted above, any changes to the habitat 'health' of the watershed can be monitored over time.

The initial intent of this French Creek sub-watershed evaluation was to be able to identify areas within the watershed where conditions are good, and more importantly, identify areas where conditions are becoming or currently are poor. The French Creek survey also provides for the

development of recommendation measures to improve the overall condition of these areas and the watershed as a whole.

The stream segments investigated during this survey included portions of the following:

- French Creek
- Unnamed Tributary to French Creek at River Mile 0.38 (Quarry Ditch<sup>1</sup>)
- Jungbluth Ditch (Sugar Creek<sup>2</sup>)
- Walker Ditch (Fish Creek<sup>2</sup>)
- Kline Ditch
- Avins Ditch
- Unnamed Tributary to French Creek at River Mile 8.9 (Schwartz Ditch<sup>1</sup>)
- Mills Creek
- Unnamed Tributary to French Creek at River Mile 12.8 (French Ditch<sup>1</sup>)
- Unnamed Tributary to French Creek at River Mile 14.3 (Nagle Ditch<sup>1</sup>)

Aerial photographs, existing GIS databases, and traditional paper maps were used to determine potential sampling points for the investigation. Points were selected mainly at road crossings, access trails, or other readily accessible features. A total of 70 locations were identified as potential sampling points, however, actual evaluations were conducted at only 51 of these sites (Table 1).

# Table 1

#	River Mile	Location
		<b>FRENCH CREEK SITES</b>
1	FC 0.1	Near Mouth (at Black River)
2	FC 0.38	At Mouth of "Quarry" Ditch
3	FC 0.54	At East River Road (mouth of Jungbluth Ditch)
4	FC 1.4	At FCNP Bridge (mouth of Walker Ditch)
5	FC 3.2	At Abbe Road
6	FC 4.0	At Mouth of Avins Ditch
7	FC 4.5	At I-90 Crossing
8	FC 5.5	At Bridge Point Trail Road
9	FC 6.1	At Detroit Road
10	FC 6.9	At Stony Ridge Road (RTE 611)
11	FC 7.65	At Center Road
	<i>FC 8.4</i>	<i>At Kellar Street</i>
12	FC 8.9	At Jaycox Road (Mouth of "Schwartz" Ditch)
13	FC 10.4	At Mills Road
14	FC 10.7	At Chesterfield Avenue
	<i>FC 11.8</i>	<i>At Mildred Street</i>
15	FC 12.4	At Center Ridge Road
16	FC 12.7	At Root Road
	<i>FC 13.4</i>	<i>At Pitts Blvd</i>
	<i>FC 13.7</i>	<i>At Debbie Drive</i>
17	FC 14.1	Lear-Nagle Road
	<i>FC 14.3</i>	<i>At Brownstone Lane</i>
		<b>"QUARRY DITCH" SITES</b>
18	QD 0.0	At Mouth of Ditch (French Creek RM 0.38)
		<b>JUNGBLUTH DITCH SITES</b>
19	JD 0.0	Mouth of Ditch (French Creek RM 0.54)
20	JD 1.0	Upstream of Park Road Bridge
21	JD 1.6	At French Creek Road
	<i>JD</i>	<i>At Wheaton Drive (College Heights Estates)</i>
22	JD 3.15	At Abbe Road
23	JD 4.13	At Case Road
		<b>WALKER DITCH SITES</b>
24	WD 0.0	Mouth of Ditch (French Creek RM 1.23)
25	WD 0.6	At end of FCNP Hiking Trail
26	WD 1.7	At Abbe Road
27	WD 2.2	At French Creek Road
	<i>WD 3.1</i>	<i>At Deercreek Court</i>
28	WD 3.3	At Reserve Way
29	WD 3.45	End - at Reserve Way by Pond

NOTES: River Miles (RM's) for most of the ditches as well as the final four French Creek sites have been estimated using ArcView in conjunction with the 1999 aerial maps. These estimated RM's are not intended to replace the official RM's contained on OEPA's official RM maps, but are instead being used as a reference point for the purposes of these investigations (as actual RM's were unavailable). Likewise, due to discrepancies between several different maps and the lack of assigned names on some creeks, names were assigned to the waterways for reference purposes only. Those names appear above in quotation marks.

No QHEI/HEEI conducted at sites where names above are depicted in italics.

**Table 1 (continued)**

#	River Mile	Location
		<b>KLING DITCH SITES</b>
30	KD 0.0	Mouth of Ditch (French Creek RM 3.9)
31	KD 0.85	At Greenfield Drive
32	KD 1.22	At French Creek Road
33	KD 2.15	At Detroit Road
		<b>AVINS DITCH SITES</b>
34	AD 0.0	Mouth of Ditch (French Creek RM 4.0)
35	AD 0.47	At Chester Industrial Parkway
		<b>"SCHWARTZ DITCH" SITES</b>
36	SD 0.0	Mouth of Ditch at Jaycox Road (RM FC-8.9)
37	SD 0.3	At Schwartz Park
38	SD 0.52	At Sandy Lane
39	SD 0.71	At Nagle Road
	<i>SD 1.25</i>	<i>At Williams Street</i>
	<i>SD 2.12</i>	<i>At Bradley/Hillard Roads (Cuyahoga County)</i>
		<b>MILLS CREEK SITES</b>
	<i>MC 0.0</i>	<i>Mouth of Creek (French Creek RM 9.3)</i>
40	MC 0.22	At Jaycox Road
	<i>MC 0.75</i>	<i>At St. Maron Blvd.</i>
41	MC 1.32	At Nagle Road
42	MC 1.55	At Mills Road
43	MC 2.5	At Mills Creek Lane (in sports park)
44	MC 2.7	At Center Ridge Road
45	MC 3.21	At Woodland Drive
46	MC 3.45	At Fieldstone Circle
	<i>MC 3.79</i>	<i>At Barton Road</i>
	<i>MC 3.95</i>	<i>At Bradley Road</i>
		<b>"FRENCH DITCH" SITES</b>
47	FD 0.0	Mouth of Ditch (French Creek RM 12.85)
48	FD 0.5	At Bainbridge Road
49	FD 1.3	At Chestnut Ridge Road
50	FD 1.93	At Lorain Road
	<i>FD 2.1</i>	<i>At Root Road (2)</i>
		<b>"NAGLE DITCH" SITES</b>
	<i>ND 0.0</i>	<i>Mouth of Ditch (French Creek RM 14.3)</i>
51	ND 0.37	At Boulder Drive
	<i>ND 0.65</i>	<i>At Lear-Nagle Road</i>
	<i>ND 0.92</i>	<i>At Lear-Nagle Road</i>
	<i>ND 1.0</i>	<i>At Chestnut Ridge Road</i>
	<i>ND 1.54</i>	<i>At Lorain Road</i>

NOTES: River Miles (RM's) for most of the ditches as well as the final four French Creek sites have been estimated using ArcView in conjunction with the 1999 aerial maps. These estimated RM's are not intended to replace the official RM's contained on OEPA's official RM maps, but are instead being used as a reference point for the purposes of these investigations (as actual RM's were unavailable). Likewise, due to discrepancies between several different maps and the lack of assigned names on some creeks, names were assigned to the waterways for reference purposes only. Those names appear above in quotation marks.

No QHEI/HEEI conducted at sites where names above are depicted in italics.

Although formal QHEI/HHEI evaluations were not conducted at the remaining sites, mainly due to lack of access, photographs and general site notes were taken at all of the sites, including those where evaluations were not conducted.

## 2- Survey Findings

*Lack of riparian corridors is the main concern in the French Creek Watershed*

### A - QHEI Survey Results

In general, the QHEI survey conducted on French Creek and its tributaries showed a downward trend in QHEI scores, starting from the mouth and progressing upstream through the headwaters of the creek. The sites within the first section (RM's 0.1 - 6.9) of the creek received on average favorable scores that are consistent with the creek's designation as warmwater habitat (WWH).

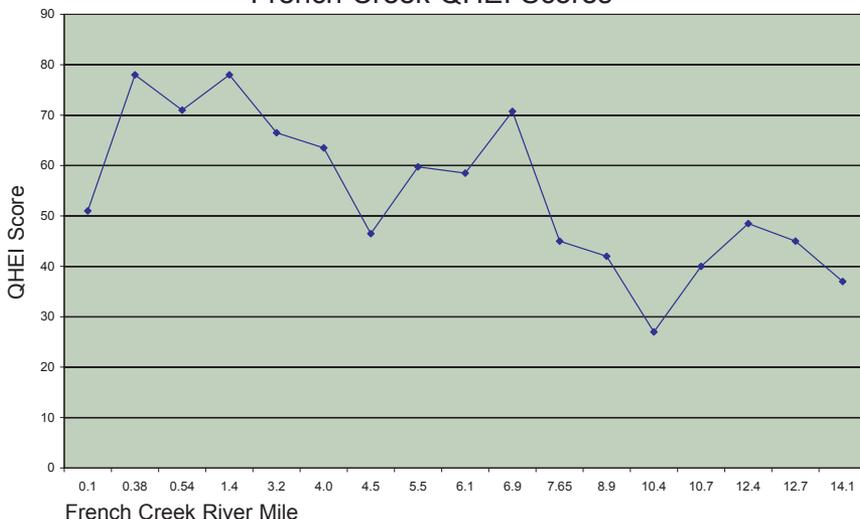
*Warmwater Habitat defines the 'typical' warmwater communities of aquatic organisms for Ohio rivers and streams. WWH represents the principal restoration target for the majority of water resource management efforts in Ohio.*

The second section of the creek (RM's 7.65 - 14.1) received scores that would put the creek in non-attainment of its WWH designation. Figure 1 depicts a schematic of the French Creek watershed, and show the QHEI scores attained at each of the French Creek sites.

The following pages give a brief description of the findings and observations derived from the survey in each portion of French Creek.

**Figure 1**

French Creek QHEI Scores



River Mile 0.1 through 6.9: With the primary exceptions of the site at the mouth of French Creek (RM 0.1) and the site located near the I-90 crossing (RM 4.5), the lower 7 river miles received QHEI scores that would be consistent with a designation as WWH, with an average score of 63.5. The site at the mouth of the creek received a low score due to several factors. First, the river bottom at the site, while dominated by gravel, was highly embedded with silt. Silt deposits that blanket a river bottom can impair aquatic life such as insects and crayfish. Amplifying this effect is that this portion of the creek is relatively straight, over 1 meter deep, extremely slow moving (some flow reversal effects were also noted from the Black River mainstem) and demonstrates no true riffle/pool complex. Riffles provide for air/water mixture increasing the amount of available dissolved oxygen for fish and insects.

The artificially straightened river conditions decreases stream flow velocity, allowing for a significant amount of suspended sediment in the creek to settle out in this location. The suspended sediment in the river can even cause an irritation to or a clogging of fish gill tissues.

At the I-90 crossing site, the creek was evidently re-routed for the construction of the I-90 and also maintains a glide habitat. Due to the relocation of the creek, the area is almost completely straight, and demonstrates moderate silt embeddedness, slow flows, and little riffle/pool complex. This portion of the creek is also

adjacent to an old fly-ash disposal area, and is also in close proximity to two large gas stations, one of which had a large fuel spill into the creek in December of 2002.

*The above exceptions aside, the majority of this portion of the creek runs through areas with minimal development (such as the Lorain County Metro Parks - French Creek Reservation) and is of relatively good quality.*

In general, this portion of the creek has moderate to wide riparian buffers zones (over 10 meters), dominated by forested and/or old-field habitat. Substrates in this portion of the creek were dominated by cobble, gravel, sand and bedrock with normal levels of silt embeddedness. Because the creek runs through areas with wide to moderate riparian buffers, in-stream cover was generally good, and reasonable channel development with deep pools (over 70 cm) and riffles (over 10 cm) dominated. Two wetlands were also identified within this portion of the watershed. One is connected to French Creek by "Quarry" Ditch at RM 0.38 and is a wetland created by past quarry mining activities (around 23 acres). The other is located near the northwest corner of the intersection of French Creek and East River Road. This wetland is a small (around 2.5 acres) forested floodplain wetland, which is seasonally flooded by French Creek.

Although this portion of the main stem of French Creek is of relatively good quality, some unfavorable issues were noted in the tributaries in this section of the watershed. Five tributaries flow into French Creek in this portion of the watershed: "Quarry" Ditch (at RM 0.38), Jungbluth Ditch (at RM 0.54), Walker Ditch (at RM 1.23), Kline Ditch (at RM 3.9), and Avins Ditch (at RM 4.0). A total of 20 sites were investigated on these tributaries, and 15 of the 20 sites received QHEI scores that were well below the level for the attainment of WWH designation, with an average score of 49.2. The only sites that received QHEI scores above the level for WWH designation attainment were each of the first two sites on Jungbluth Ditch and Walker Ditch where they flow through the Lorain County Metro Parks French Creek Reservation, and the first site taken at Kline Ditch. The primary problems identified at the remaining sites were issues associated with runoff from the extensive residential development in the watershed. Most sites had little, if any, riparian buffer areas with mowed lawns up to the streambanks. In many cases, the streams had been re-routed or culverted to accommodate development, or were 'ponded' into retention basins within developments. Several instances were noted where ongoing construction offered little, if any, best management practices to protect the streams from the impacts of the land disturbance activities. All of these issues are causing significant run-off and sedimentation into the streams, and are impacting and/or

eliminating in-stream habitat and also having an adverse effect on water quality.

River Mile 7.65 through 14.3: The sites investigated on this portion of the main stem of French Creek all received scores that would put the creek in non-attainment of its WWH designation. The average QHEI score of the sites in this portion of French Creek was 40.6. In this portion of the watershed, the creek flows through an area that is developed to a greater extent than the downstream portions, and is dominated by residential and commercial uses. Here, the primary water quality and river habitat problem noted was the lack of riparian buffers. In most cases, riparian buffers measured less than 5 meters in width, and in many cases no buffer was present.

*The lack of adequate buffers leads to very flashy storm flows, increased riverbank erosion and increased run-off and sedimentation, which were noted in substrate evaluations.*

While some moderate amounts of cobble, gravel, and bedrock were present at many of the sites, a predominance of silt and sand substrates was evident. Also attributable to the lack of riparian buffers was a general lack of high quality in-stream cover in this portion of the creek. Most sites investigated within the creek also were channelized, re-routed, or otherwise altered to accommodate

residential and commercial development, which has impacted the creek's sinuosity and development of riffle/pool complexes. Riffles and pools tended to be much shallower in this portion of the watershed, also.

As seen in the French Creek mainstem, the sites investigated in the tributaries to French Creek in this portion of the watershed also received QHEI scores that would be in non-attainment of WWH designation. Four main tributaries flow into French Creek in this portion of the watershed: "Schwartz" Ditch (at RM 8.9), Mills Creek (at RM 9.3), "French" Ditch (at RM 12.85), and "Nagle" Ditch (at RM 14.3). The average QHEI score of the sites investigated on these tributaries was 45. The main factors contributing to the low scores are similar in nature to those that affect the main stem of the creek, as well as the tributaries in the other portion of the watershed. These include extensive development, stream modifications/relocation, lack of riparian buffers, silt embedded substrates, run-off/sedimentation, and construction impacts.

## **B - Water Quality Data and Trends**

In late May of 2003, water quality data were collected at each of the 51 sites where QHEI evaluations were conducted. This data was collected using a Hydrolab field monitor, Hach field tests, and a turbidity meter. Parameters tested during this effort included:

- Water Temperature (F°),
- Dissolved Oxygen (mg/L),
- Conductivity (mS/cm),

- Salinity (ppt),
- pH,
- Redox Potential,
- Ammonia Nitrogen (mg/L),
- Free Chlorine (mg/L),
- Total Chlorine (mg/L),
- Phosphate (mg/L),
- Phosphorus (mg/L),
- Nitrate nitrogen (mg/L),
- Nitrite nitrogen (mg/L), and
- Turbidity

In general, no significant exceedances of State water quality standards were noted during the water quality data collection effort. The primary parameters that were found to be at levels of some concern included low dissolved oxygen and high nitrate/nitrite nitrogen.

Several sites throughout the watershed exhibited low levels of dissolved oxygen. Typically, sites that had low dissolved oxygen levels tended to be the ones that also had elevated levels of nitrate/nitrite nitrogen. The lack of riparian buffers, particularly in the upstream portion of the watershed, allows the elevated levels of nitrogen to enter the river system. Urban runoff containing high levels of fertilizers and other compounds containing nitrogen is carried to the creek virtually unfiltered in many cases, and is likely a primary cause for the elevated nitrogen levels. Elevated turbidity levels (lack of water clarity) were also noted in several sites, and are also likely caused by the introduction of suspended silt-laden runoff due to the lack of adequate riparian buffers.

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### ***3- Restoration Recommendations***

***Several measures can be taken to encourage improvements in the habitat and water quality of French Creek and its tributaries:***

- Improved enforcement of existing State and local storm water regulations. Many construction sites encountered during the French Creek study did not appear to be in compliance. Silt fences were not used regularly where required along stream channels, etc. Local municipalities need to be educated on the regulations and held responsible for compliance.
- Improved enforcement of existing Federal and State Section 404 and 401 regulations. Suggest that municipalities be educated and held responsible for ensuring that compliance with these laws is obtained prior to, during, and after the construction of new residential subdivisions, commercial and industrial developments. Several instances of severe impact to stream channels were encountered during the French Creek study, including drastic alterations to the channels themselves, widespread culverting and constructing retention ponds within the former channels.
- Encourage (both voluntarily and with the use of incentives) the development of wooded buffers adjacent to French Creek and its tributaries. The development of buffers improved both habitat and water quality.
- Create wetland filtration wetlands in areas where severe erosion is adding to the sediment loads of the creek and its tributaries. Restore existing wetland areas. These wetlands serve the dual purpose of improving water quality by absorbing nutrients and filtering out sediment and limiting flood damage to adjacent structures.
- Enforce local health department regulations in relation to residential septic systems. Various failures of these systems were noted during the French Creek study. Coordination with the Health Department and OEPA is encouraged to rectify the discharge of raw sewage into the creeks. Opportunities may exist through the Ohio Environmental Infrastructure authority (Section 594).
- Construct bioengineering erosion control projects where severe erosion is occurring along stream banks.
- Curtail discharge of stormwater runoff from urban areas directly into French Creek and its tributaries. Encourage the development and use of storm water detention basins (not retention basins).

# *But What Can I Do In My Little Backyard?*

## *Lawns and Landscaping*

Many times, the things we do to improve our vistas or our lawns disrupt the natural systems that are necessary for the health of the streams in our backyards.

Removing natural vegetation along the stream banks or replacing it with lawns might look nice in the short run, but it will lead to an erosion of the stream bank. The roots of the trees and shrubs hold the stream banks in place; without them, there is nothing to slow the force of the moving waters. Pretty soon your pretty stream scenes will be replaced with an eroding riverbank and a loss of what could be sizeable portions of your land. Allow a little shrub/tree corridor between your lawn or field and the stream, don't plant lawn or mow to the river's edge; you are just inviting the problems of erosion onto your property.

The fertilizers you use on your lawn can be too powerful for the stream; so don't over-fertilize your lawn. These chemicals can be carried with runoff waters directly to a stream, especially if there is

no natural shrub/tree corridor to absorb them. In a stream, the fertilizers can lead to unsightly blooms of algae, a decrease of available dissolved oxygen, and fish kills.

Don't dump your lawn clippings in the stream. In addition to degrading the beauty of a stream, their decomposition can lead to a decrease in dissolved oxygen and fish kills.

Use pesticides and herbicides according to the manufacturer's instructions. Excessively applied amounts of these chemicals can make their way to the streams and wreak havoc with the natural system. Proper disposal of these materials is critical. Contact the Lorain County Solid Waste Management District at 440-329-5440 for more information or collection days for these chemicals.

Plant only native species near the water's edge. Native plants are accustomed to the climate of your area and won't be affected by the extremes in Ohio's weather like some non-native species would be. Your local greenhouse or the Lorain Soil and Water Conservation District may be able to help you in selecting appropriate native plant species.

By following these simple suggestions, you will be rewarded with a more natural stream in your backyard, increasing numbers of wildlife species, and possibly an increase in property values as well.



Excessive fertilizer runoff can lead to increased algae growth.

Photo: Jay Miller

## Decrease the Amount of Runoff

Slowing the surface runoff from places like roof, patios and driveways will minimize the amount of soil that can get to the streams. Excessive amounts of soil reaching the streams are a major problem throughout the entire Black River basin, including French Creek.

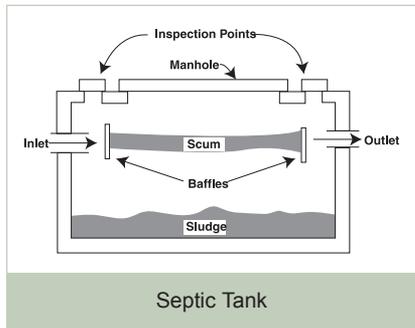
Look for and repair areas in your yard that show the signs of erosion. You should look for bare spots on your property and exposed tree roots. Small stones appearing on soil surface and the appearance of rills and gullies are other indications of erosion. The Lorain Soil and Water Conservation District has developed a brochure called the Lorain County Water Quality Guide that will help you understand the problems of erosion and what to do about it on your property.

## Maintain Your Septic Tank System

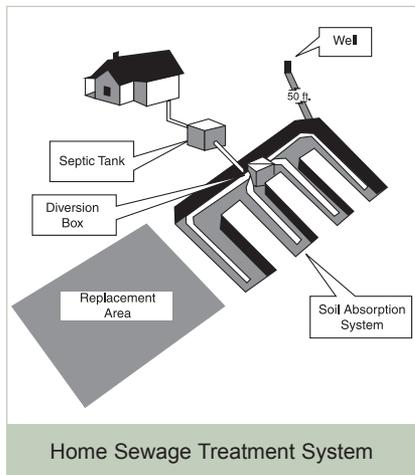
Properly located and maintained, your septic tank and leach bed system can be an effective means for the treatment of household wastes. For this type of system (called a Home Sewage Treatment System or HSTS) to work effectively, it must be located in proper soil types and not within an area of extremely sloping ground. It is the soil and bacteria in the soil that actually treat the wastes. A system located on a severely sloping ground can cause a rapid runoff of the liquid wastes therefore not allowing for the time necessary for bacteria to treat the wastes.

Improperly located, installed or maintained systems can severely degrade the streams and can allow bacteria and viruses to potentially cause serious health problems.

An HSTS system is not a "set and forget" system and must be periodically inspected by qualified personnel to ensure that it is operating properly. In addition, the septic tank must be routinely pumped of accumulated solids and scum.



Drawing: Ohio State University Extension



Drawing: Ohio State University Extension

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Information on HSTS systems can be obtained through the Ohio State University Extension Office or the Lorain County General Health District. Some fact sheets and additional information can be found on the web at:

Lorain County General Health District:

<http://www.loraincountyhealth.com/environmental.shtml>

Ohio State University Extension:

<http://ohioline.osu.edu/aex-fact/0740.html>

<http://ohioline.osu.edu/aex-fact/0741.html>

<http://ohioline.osu.edu/aex-fact/0742.html>

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## ***Other Useful Suggestions To Help Preserve The French Creek Watershed***

*Don't dump anything into streams or storm sewers. Storm sewers will deliver the wastes to the streams without treatment. Follow the mantra of today's more ecologically sound lifestyles, "Reduce - Reuse - Recycle."*

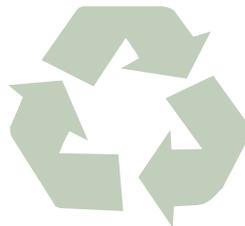
Use alternative products instead of hazardous household materials. A list of alternative products can be found in the "Lorain County Water Quality Guide." When you must use a potentially hazardous material, read the label and follow the directions carefully. Do not flush these chemicals down the drain into either a public sewer system or a home sewage treatment system. The Lorain County Solid Waste District has set up collection dates and times for household hazardous wastes.

Old fluorescent tubes, thermostats and mercury thermometers can contain considerable amounts of mercury. In a river system, that

mercury can be transformed into a more toxic type of mercury, called methyl mercury. Please dispose of these items by turning them into approved collection facilities. The Lorain County Solid Waste District has set up collection dates and times for fluorescent tubes and ballasts.

To contact the Lorain County Solid Waste District for additional information or for a schedule of upcoming collection days call: 440-329-5440. Or you may access them on the web at:

<http://www.lorcnty.org/waste/default.asp>



Learn about and be able to recognize potentially troublesome invasive species, like Purple Loosestrife and Phragmites. The proliferation of these invaders is a severe problem throughout the Great Lakes by replacing native species and clogging waterways. Learn the best method of controlling the spread of these plants.



Purple Loosestrife

*Photo: Jay Miller*



Phragmites

*Photo: Paul Anderson*

Since most of your travels throughout the French Creek watershed will start and end by automobile, it is important to keep your car in good working order. Oil and gasoline leaked onto driveways, parking lots and streets find their way to the water system by way of ditches and storm sewers. Don't dump used or unwanted oil into a storm sewer; take it to a recycling center.



Try to keep your automobile in good working order.

*Photo: Ted Conlin*



Leaking oil and gasoline will find it's into the water system.

*Photo: Dave Stroud*

## *What can my community and I do together?*

*"Achieving a balance between the needs of the environment and the desire for growth and economic gain is key to the well being of the County."*

Lorain County Comprehensive Plan 2000

Ensure that Best Management Practices are used during and after construction of new developments. These practices have been designed to keep exposed soils from getting into the streams.

Encourage and support a wetland design of new storm water retention basins in new subdivisions. The new designs will create new habitat for wildlife and will reduce the amount of soil getting into the French Creek water system.

Develop and support an initiative to control the spread of invasive species, like Purple Loosestrife and Phragmites. Incorporate the best methods of controlling the spread of these plants in small and large-scale infestations.

Many communities are now understanding the importance of native streamside vegetation and its ability to reinforce the stream banks and to decrease the amount of sediment, nutrients, pesticides and herbicides that can enter the stream. These communities have developed setback ordinances in the planning stages of development.

Some communities are also incorporating the protection of wetland areas as well. For the sake of the French Creek basin, it is important for you and your community to adopt, support and enforce stream protection ordinances, especially those designed to protect riparian areas and wetlands. These ordinances not only protect your property from flooding and erosion; they help your downstream neighbors as well.

Identify areas of the watershed that could be protected, improved or rehabilitated, like eroded stream banks and wetland areas. Support efforts to repair, enhance and preserve these areas. The U.S. Corps of Engineers has identified several of these areas, as part of their Black River RAP/French Creek assistance project. The Black River RAP Coordinating Committee may be able to assist you in seeking funds for these projects.

Encourage programs that deal with the handling, storage, and proper use and disposal of hazardous wastes. Develop clean-up days that provide for drop-off locations of these products.

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## *And Finally...*

Talk to your neighbors, friends, community officials and organizations about the importance of everyone pitching in to protect their valuable water resource. A good idea might be the formation of a French Creek watershed

group or a watershed stewardship program. The Black River RAP would be happy to help you form such a group. Suggested members of the group would be local homeowners & businesses and local government officials.

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## *Contacts*

Lorain County Soil & Water Conservation District  
440-326-5800

Lorain County General Health District  
440-322-6367  
[www.loraincountyhealth.com/environmental.html](http://www.loraincountyhealth.com/environmental.html)

Lorain County Solid Waste Management District  
440-329-5440  
[www.lorcny.org/waste/default.asp](http://www.lorcny.org/waste/default.asp)

Lorain County Community Development Department  
440-244-6261

Lorain County Metroparks  
440-458-5121  
[www.loraincountymetroparks.com](http://www.loraincountymetroparks.com)

Lorain County Community Alliance  
440-366-4160

Ohio Environmental Protection Agency  
330-963-1131 (Ted Conlin-Black River RAP Coordinator)

Ohio Department of Natural Resources, Division of Wildlife  
330-644-2293

U.S. Environmental Protection Agency  
440-250-1720

U. S. Department of Agriculture-Natural Resource  
Conservation Service  
440-326-5800

Black River Remedial Action Plan  
[www.noaca.org/blkrp.html](http://www.noaca.org/blkrp.html)  
[www.epa.gov/glno/aoc/blackriver.html](http://www.epa.gov/glno/aoc/blackriver.html)

Northeast Ohio Areawide Coordinating Agency  
216-241-2414 (Pam Davis-Black River RAP Secretariat)

Isaak Walton League-Lorain County Ely Chapter  
440-647-5074

The Ohio State University Extension  
<http://ohioline.ose.edu>

Your local government officials

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## *Resources*

### *Publications*

Explorations of a Watershed, The Natural History of the Black River, Edited by Brad Masi, Oberlin College, Oberlin Ohio

Common Groundwork, A Practical Guide to Protecting Rural and Urban Land, Third Edition, Joseph H. and Mary M. Chadbourn, 2000, Chadbourne & Chadbourne

Engineers For The Public Good, A History of the Buffalo District U.S. Army Corps of Engineers, Nuala Drescher, U. S. Army Corps of Engineers

Black River Study, An Interpretive Study of the Black River for Inclusion into Ohio's Scenic Rivers Program, Russell W. Gibson, Ohio Department of Natural Resources, August 29, 1977, Appended March 1998

The Lorax, Dr. Seuss, Dr Seuss Enterprises. L.P., Random House, 1971

Soil Survey Map of Lorain County, Ohio, USDA, ODNR, July 1976

### *Web Sites*

Lorain County Metroparks  
[www.loraincountymetroparks.com](http://www.loraincountymetroparks.com)

West Virginia University  
[http://www.nis.wvu.edu/2002\\_Releases/OttersStudy.htm](http://www.nis.wvu.edu/2002_Releases/OttersStudy.htm)

River Otter Alliance  
<http://www.otternet.com/ROA/news.htm>

Yahooligans.com  
[www.yahooligans.com/content/animals/trach/3909.html](http://www.yahooligans.com/content/animals/trach/3909.html)

Connecticut Rivers Joint Commission - Buffer Websites  
[www.crjc.org/buffers/Introduction.pdf](http://www.crjc.org/buffers/Introduction.pdf)  
[www.crjc.org/buffers/Backyard%20buffers.pdf](http://www.crjc.org/buffers/Backyard%20buffers.pdf)  
[www.crjc.org/buffers/Guidance%20for%20Communities.pdf](http://www.crjc.org/buffers/Guidance%20for%20Communities.pdf)  
[www.crjc.org/buffers%20for%20Agriculture.pdf](http://www.crjc.org/buffers%20for%20Agriculture.pdf)  
[www.crjc.org/pdfiles/rivdynero.pdf](http://www.crjc.org/pdfiles/rivdynero.pdf)  
[www.crjc.org/corridor-plan/plan-riverwide1.html#Goals-river](http://www.crjc.org/corridor-plan/plan-riverwide1.html#Goals-river)

National Academies Press Riparian Areas: Functions and Strategies for Management  
(2002) [www.nap.edu/books/0309082951/html](http://www.nap.edu/books/0309082951/html)

U.S. EPA  
[www.epa.gov/owow/watershed/wa1.html](http://www.epa.gov/owow/watershed/wa1.html)

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## ***About the U.S. Army Corps of Engineers***

The United States Army Corps of Engineers has, at its disposal, the talent, skill, ingenuity and resourcefulness that are requisite for the creation of a viable defense establishment, as well as the construction of numerous public works projects erected for the public good; it has played a key role in the discovery and development of the wealth of the Great Lakes Region.

## ***About the Water Resource Development Act:***

The Water Resource Development Act of 1990 authorizes the U.S. Army Corps of Engineers to support the development and implementation of Remedial Action Plans at U.S. Areas of Concern on the Great Lakes. Section 401 of the Act enables the Corps to provide technical support to State and Local Governments, and non-profit agencies.

## ***About the Black River Remedial Action Plan:***

The Black River Remedial Action Plan Coordinating Committee is a group of watershed stakeholders, representing local public agencies, state and federal agencies, industries and private commercial groups and citizen representatives that have been working together to restore the Black River Watershed. The Black River Watershed is the only Great Lakes Area of Concern in Ohio that encompasses the entire watershed.



US Army Corps  
of Engineers  
Buffalo District

Created by the U.S. Army Corps of Engineers  
Under the Water Resource Development Act  
Assistance to The Black River Remedial Action Plan

