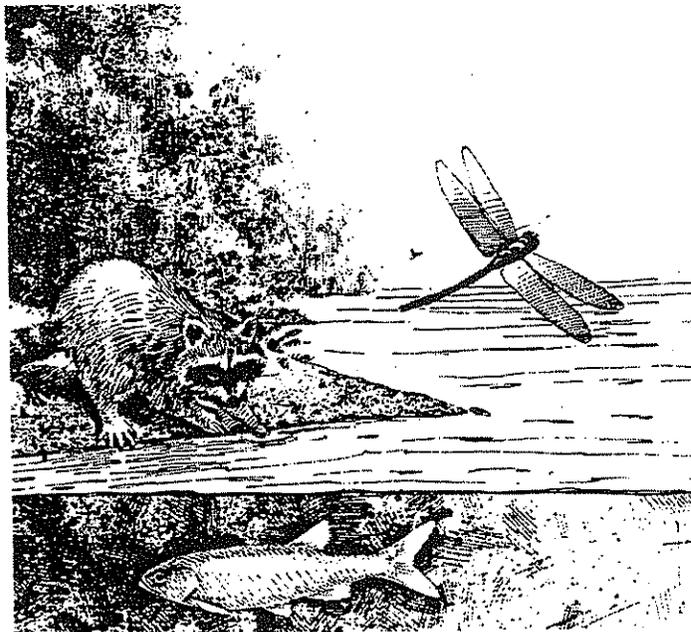


BLACK RIVER STUDY

An Interpretive Study of the Black
River for Inclusion into Ohio's Scenic
Rivers Program



Prepared by:
Russell W. Gibson
NW Ohio Scenic River Coordinator

August 29, 1997
Appended: March, 1998

Ohio Department of Natural Resources
Division of Natural Areas & Preserves
1889 Fountain Square
Columbus, Ohio 43224

ACKNOWLEDGMENTS

A number of individuals provided invaluable assistance and local perspective while completing this assessment of the Black River. Their assistance, encouragement and support throughout the study process is greatly appreciated.

Doug Hill, Rivers Unlimited
Ken Pearce, Lorain County Health Department
Karl Schneider, USDA
Linda Lagunzad, OEPA
Andy Vidra, NOACA
Sharon Halkovics, NOACA
Cheryl Wolfe, Oberlin College
Mary Ann Mahl, Elyria Public Library

Additionally, several members of the Division of Natural Areas & Preserves provided welcome and needed assistance during the course of completing this study.

Debbie Woischke, Natural Heritage Section
Yetty Alley, Scenic Rivers Section
Dan Rice, Zoologist
Monica Ostrand, NW OH Stream Quality Monitoring Coordinator
Stu Lewis, Assistant Chief

PREFACE

The majority of this report represents an assessment of data and information compiled between May, 1996 through June, 1997. In June of 1997, the Ohio Environmental Protection Agency announced that a follow-up survey of fish and macroinvertebrate life in the Black River would be completed during the summer of 1997. Following conversations with OEPA and others, it was determined that prior to completing this assessment of the Black River, it would be beneficial to consider the findings of OEPA's 1997 sampling. Where appropriate, preliminary data from 1997 is also included in this assessment.

As of the completion date of this report, preliminary 1997 data concerning fish community performance in the East Branch of the Black River was available for our consideration. Macroinvertebrate and physical habitat data for 1997 was not available. All references to physical habitat conditions and macroinvertebrate community performance are based upon OEPA information that was published in 1992.

BLACK RIVER STUDY

TABLE OF CONTENTS

ACKNOWLEDGEMENTS

TABLE OF CONTENTS

GENERAL INTRODUCTION AND PURPOSE	SECTION I
Overview of Ohio's Scenic Rivers Program	I-1
Purpose	I-2
General Introduction to the Study Area	I-3
DESCRIPTION OF THE ENVIRONMENT	SECTION II
Geological History of the Watershed	II-1
Topography	II-2
Water Resources	II-2
Soils of the Region	II-3
Geological & Mineral Resources	II-4
Land Use	II-5
Ecological Communities	II-7
Natural Communities	II-8
Endangered/Threatened Species	II-10
OVERVIEW OF HABITAT CONDITIONS	II-16
Black River Mainstem: Relative Quality & Description	II-18
East Branch: Relative Quality & Description	II-20
West Branch: Relative Quality & Description	II-22
WATER WITHDRAWALS IN THE BLACK RIVER	II-24
PERMITTED WASTEWATER DISCHARGES	II-25
RECREATIONAL RESOURCES	II-28
HISTORICAL RESOURCES	II-34
FISH AND WILDLIFE	II-40
Mammals	II-40
Reptiles	II-42
Amphibians	II-43
Birds	II-44
Fish Communities	II-47
Aquatic Macroinvertebrate Communities	II-54
OVERVIEW AND CONCLUSIONS	SECTION III
REVIEW OF CRITERIA AND CONCLUSION-West Branch	III-2
REVIEW OF CRITERIA AND CONCLUSION-Mainstem	III-5
REVIEW OF CRITERIA AND CONCLUSION-East Branch	III-8
PROGRAM RECOMMENDATIONS	III-11
BIBLIOGRAPHY AND REFERENCES CITED	SECTION IV

LISTING OF TABLES & GRAPHS

TABLE II-6:	Black River & Major Tributaries	I-3
TABLE II-1:	Bigmouth Shiner Collections in the Black River	II-12
TABLE II-2:	Silver Lamprey Collections in the Black River	II-13
TABLE II-3:	Endangered or Other Bird Species of Interest	II-14
TABLE II-4:	Insect, Reptile & Amphibian Species of Interest	II-14
TABLE II-5:	Plants, Trees & Shrubs of Interest	II-15
TABLE II-7:	Habitat Conditions of the Black River Mainstem	II-20
TABLE II-8:	Habitat Conditions of the East Branch	II-22
TABLE II-9:	Habitat Conditions of the West Branch	II-24
TABLE II-10:	Permitted Water Withdrawals on the Black River	II-24
TABLE II-11:	Black River Permitted Wastewater Dischargers	II-25
TABLE II-12:	Black River Canoe Access Facilities	II-33
TABLE II-13:	Mammals of the Black River Watershed	II-41
TABLE II-14:	Turtles of the Black River Watershed	II-42
TABLE II-15:	Snakes of the Black River Watershed	II-42
TABLE II-16:	Amphibians of the Black River Watershed	II-43
TABLE II-17:	Birds of the Black River Watershed	II-44
TABLE II-18:	Fish of the Black River Watershed	II-47
TABLE II-19:	Fish Community Losses in the Black River	II-49
TABLE II-20:	Fish Community Comparison (1992-1997)	II-53
TABLE II-21:	Macroinvertebrates of the Black River	II-7

LISTING OF GRAPHS

GRAPH II-1:	QHEI & IBI Values Black River Mainstem	II-19
GRAPH II-2:	QHEI & IBI Values East Branch of the Black River	II-22
GRAPH II-3:	QHEI & IBI Values West Branch of the Black River	II-23
GRAPH II-4:	Black River Mainstem QHEI-ICI Values	II-55
GRAPH II-5:	West Branch QHEI-ICI Values	II-56
GRAPH II-6:	East Branch QHEI-ICI Values	II-56

BLACK RIVER STUDY

General Introduction & Purpose



*"The intent of the storyteller must be to evoke
honestly, some single aspect of all that
the land contains."
-Barry Lopez*

OVERVIEW OF OHIO'S SCENIC RIVERS PROGRAM

Ohio pioneered the river preservation movement with enactment of Senate Bill 345 by the 107th General Assembly on February 28, 1968. The Ohio Wild, Scenic and Recreational Rivers Law was the first of its kind and predated the National Wild and Scenic River Act. The purpose of establishing scenic rivers is to assist in the protection and preservation of the few remaining natural rivers in the state. The main concerns of Ohio's Scenic Rivers Program are the protection and improvement of aquatic species and the maintenance of sufficient streamside forested corridors.

Ohio's Scenic Rivers Law provides for three different categories of designation. Wild Rivers are those rivers that are generally inaccessible, the floodplain is undeveloped, the river is free flowing and 75% of the adjacent corridor is forested to a depth of at least 300 feet. Scenic River designation is representative of a waterway which still retains much of its natural character for the majority of its length. Shorelines are for the most part undeveloped, but the river may exhibit signs of disturbances by human activities. The adjacent river corridor must be forested to a minimum depth of 300 feet for 25% of the stream's length. Recreational Rivers are those rivers which do not possess the same degree of natural quality found in Wild or Scenic Rivers, yet warrant protection due to their cultural and/or historical attributes of statewide significance. The influence of human activity is much more apparent on rivers with this classification.

Ohio currently has eleven designated wild, scenic and/or recreational rivers and nine designated tributaries. More than 600 river miles are protected in Ohio's Scenic Rivers Program. Three state designated streams, the Little Miami River, Big & Little Darby Creeks and Little Beaver Creek also are nationally designated wild and scenic rivers.

Ohio's Scenic River Program recognizes partnerships and local cooperation as the most effective method for river preservation efforts. Rivers are studied for possible designation only after receiving resolutions of support from a majority of local governments adjacent to the river. Designation studies incorporate extensive field investigations and the assistance and input of numerous local organizations and individuals. If a river is determined to be suitable for inclusion into Ohio's Scenic River System, the director of ODNR issues a public declaration of intent to designate the river. Public notice is provided and local input and feedback is solicited for a period of sixty days.

Upon designation of a river as wild, scenic or recreational, the director of ODNR appoints a ten member scenic river advisory council comprised of a broad representation of local interests within the river valley. Members often include private citizens, local government officials, conservation organizations and many others. Local advisory councils provide the crucial service of advising ODNR on local attitudes, interests and areas of concern related to preservation of the designated river.

BLACK RIVER STUDY-INTRODUCTION & PURPOSE
Section I-2

Designation as a wild, scenic or recreational river is not a river restoration tool designed to successfully restore a degraded stream to an improved natural condition. It is much more effective as a means for recognizing the unique characteristics of a stream and coordinating river preservation activities among diverse state and local governments, organizations and individuals. When combined with statutory authority to review and approve or disapprove publicly funded projects on scenic rivers, designation helps to assure that decisions and activities affecting a scenic river are conducted in environmentally sensitive and responsible ways.

PURPOSE

The purpose of this examination of the Black River watershed is to determine whether the Black River meets state wild, scenic or recreational river designation criteria. Additionally, this report presents a series of recommendations related to whether any portion(s) of the watershed should be recognized as a component of Ohio's Scenic River System.

To best understand the context of the information provided in this report, it is important to recognize that the role of Ohio's Wild, Scenic and Recreational River Act is to identify and protect those rivers and streams possessing important natural qualities. Ohio's Scenic Rivers Program, administered by the Division of Natural Areas & Preserves attempts to identify and designate the few remaining river systems that retain their most natural qualities and/or cultural attributes of statewide significance. The information contained in this report has been compiled to help ascertain whether the Black River meets any or all of these conditions.

GENERAL INTRODUCTION TO THE STUDY AREA

The Black River watershed encompasses portions of Lorain, Medina, Ashland and small sections of Huron and Cuyahoga counties in northeast Ohio. The watershed drains nearly 300,000 acres with more than 880 miles of perennial streams. Flowing through portions of the Lake Plains, Till Plains and Glaciated Low Plateau physiographic regions of Ohio, the Black River carves its way through sandstone and shale bedrock deposited more than 300 million years ago.

The Black River Watershed drains approximately 470 square miles (298,880 acres) with 887 miles of perennial streams in Lorain, Medina, Ashland, a small part of Cuyahoga and Huron counties. The watershed is comprised of three major components: the East Branch, West Branch and the Black River mainstem.

The East Branch of the Black River drains approximately 216 square miles of land in Medina and southeast Lorain counties. The West Branch drains nearly 175 square miles primarily in southwest Lorain county. The mainstem of the Black River forms in Elyria at the confluence of the East and West Branch, flowing 15.3 miles north before emptying into Lake Erie.

BLACK RIVER STUDY-INTRODUCTION & PURPOSE
Section I-3

Table II-6
BLACK RIVER & MAJOR TRIBUTARIES

STREAM	LENGTH	GRADIENT	DRAINAGE AREA
Black River Mainstem	15.3 miles	3.6 ft/mile	466.80 mi ²
French Creek	15.8 miles	13.1 ft/mile	32.00 mi ²
East Branch	56.70 miles	9.0 ft/mile	215.90 mi ²
East Fork	9.30 miles	27.8 ft/mile	18.16 mi ²
West Fork	17.20 miles	16.0 ft/mile	36.90 mi ²
Salt Creek	5.80 miles	30.0 ft/mile	6.08 mi ²
Crow Creek	5.40 miles	38.7 ft/mile	4.80 mi ²
Clear Creek	5.40 miles	42.0 ft/mile	7.35 mi ²
Coon Creek	7.7 miles	18.16 ft/mile	27.80 mi ²
West Branch	37.8 miles	9.9 ft/mile	175.40 mi ²
Plum Creek	7.3 miles	14.7 ft/mile	14.54 mi ²
Elk Creek	5.7 miles	16.0 ft/mile	7.32 mi ²
Wellington Creek	17.6 miles	21.6 ft/mile	30.50 mi ²
Charlemont Creek	11.5 miles	29.8 ft/mile	25.19 mi ²
Buck Creek	7.5 miles	22.9 ft/mile	20.79 mi ²

Like most of northern Ohio, the watershed is the product of the Ice Age, having been formed with the retreat of the last of the Wisconsin glaciers more than 13,000 years ago. Ancient beach ridges and large flat regions predominant the landscape in northern sections of the watershed. Southern sections are influenced by the gently rolling hills of the Defiance and Spencer moraines. Groundwater resources in the region are quite limited and the relatively impervious bedrock results in very little contribution of groundwater into the river's flow. Dependent upon precipitation and surface runoff, the Black River is subject to wide seasonal variations in flow.

Fish and wildlife communities within the region are common to most northern Ohio rivers, however they vary in abundance and diversity. Although some areas of the Black River have yet to fully recover from previous human impacts, others manage to retain an interesting and important collection of fish and wildlife. For example, the West Branch is home to one of only two Ohio populations of the state threatened bigmouth shiner (*Notropis dorsalis*). These small pollution-sensitive fish reside within headwater streams and several small tributaries in the upper West Branch.

Unfortunately, water quality problems have plagued the mainstem of the river since the mid-1800's. This section of the Black historically has suffered from the impacts of industrial discharges and inadequately treated wastewater. Although many of these problems were successfully addressed with implementation of the Clean Waters Act, current water quality concerns focus on erosion and sedimentation resulting from agricultural activities. Silt and other suspended solids have eliminated pollution sensitive species of fish such as the horneyhead chub, black redhorse sucker and several other species of fish that no longer reside within the watershed. According to recent surveys by the Ohio Environmental Protection

BLACK RIVER STUDY-INTRODUCTION & PURPOSE
Section I-4

Agency (OEPA), fish communities within the mainstem are functioning at Warmwater Habitat standards at only one reference site.

Public recreational facilities abound along the Black River. For example, Lorain County Metroparks within the watershed enjoy wide popularity and heavy use by park visitors. Numerous other recreational areas, city parks golf courses and public fishing and hunting areas provide a multitude of additional recreational opportunities for area residents.

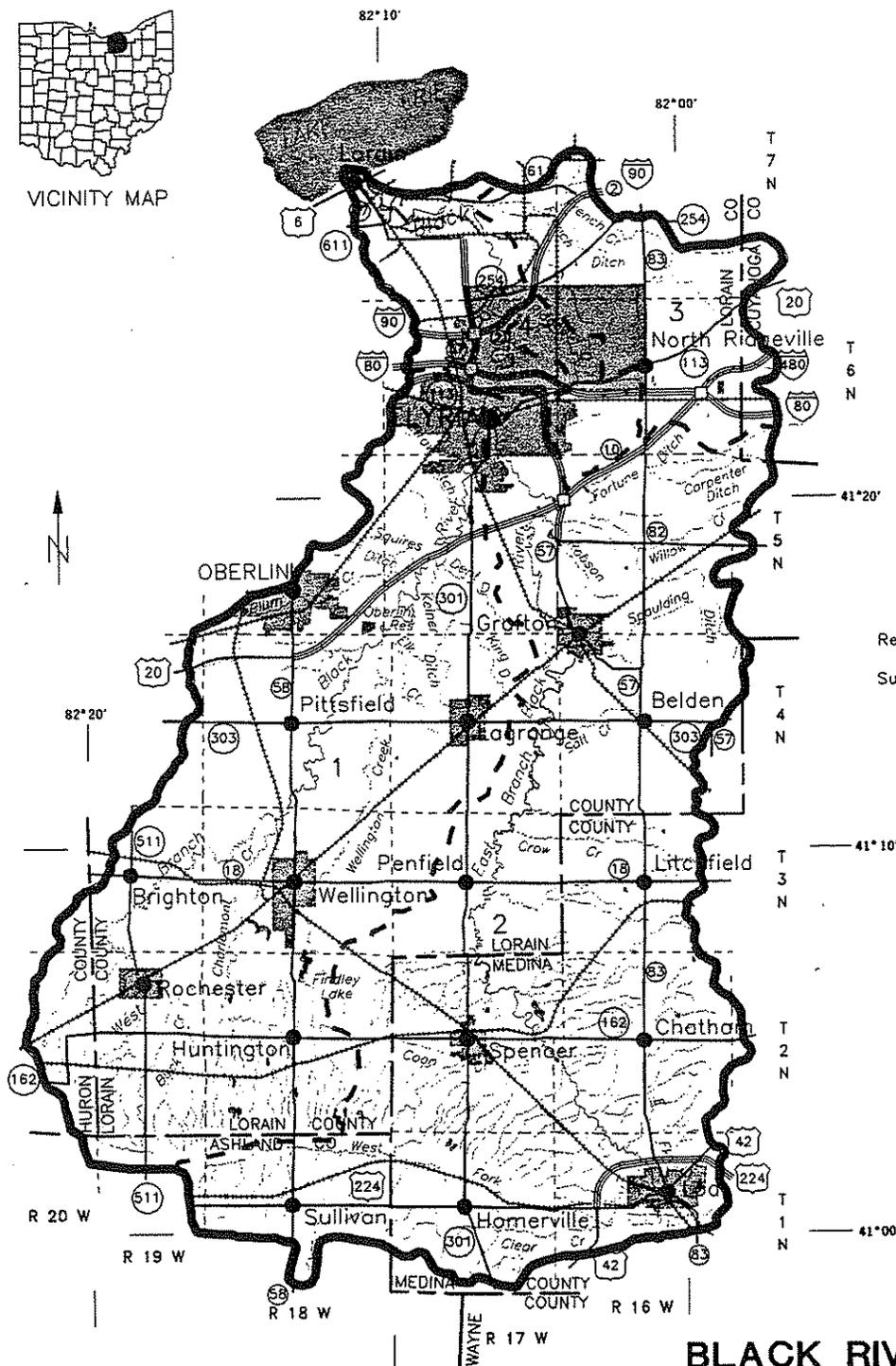
A rich and diverse body of history also is found within the Black River region, including use by the earliest of Ohioans. Historical and archaeological evidence indicates that the Black River valley was inhabited by prehistoric Hopewell and Late Woodland Indians and more recent native Ohioans such as the Wyandots, Hurons and Eries. Early European settlement in the region is also well represented in the form of remnants of mid-1800's gristmills and other historic structures adding to the character and wealth of history throughout the watershed.

Efforts to restore and protect the Black River from further degradation have recently been implemented by the Black Remedial Action Plan (RAP). The RAP is a collection of concerned citizens, state and local government officials and area business and industry representatives. The RAP's goal is to develop a comprehensive plan incorporating river restoration, public education and awareness, and public and private partnerships to resolve environmental problems being encountered throughout the watershed. Several members of the Black RAP provided valuable information and assistance during the completion of this study.

This Scenic River Designation Study of the Black River was initiated following receipt of resolutions of support from a majority of local governments along the Black River. A general introduction to Ohio's Scenic Rivers Program and the designation study process is included in Section I while Section II provides a comprehensive inventory and description of the natural, historical and recreational characteristics of the river. Section III details an assessment of findings with respect to scenic river designation criteria. The report concludes with a listing of cited references and bibliography.



VICINITY MAP



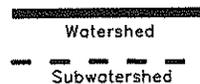
LEGEND

- COUNTY LINE
- - - MINOR CIVIL DIVISION
- ▬ CITY LIMITS
- COUNTY SEAT
- TOWN
- 80 INTERSTATE HIGHWAY
- 20 FEDERAL HIGHWAY
- 511 STATE HIGHWAY
- ▬ DIVIDED ROAD
- ▬ PRIMARY ROAD
- ▬ RAILROAD
- ▬ DRAINAGE
- ▬ DITCH
- ▬ LAKE

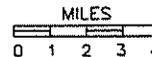
HYDROLOGIC UNIT CODE

Region 041 Accounting Unit 10001040 - Watershed
 Subregion 1 Cataloging Unit 060

- 1 WEST BRANCH 040
- 2 EAST BRANCH 050
- 3 FRENCH CREEK 060
- 4 RIDGEWAY DITCH 060

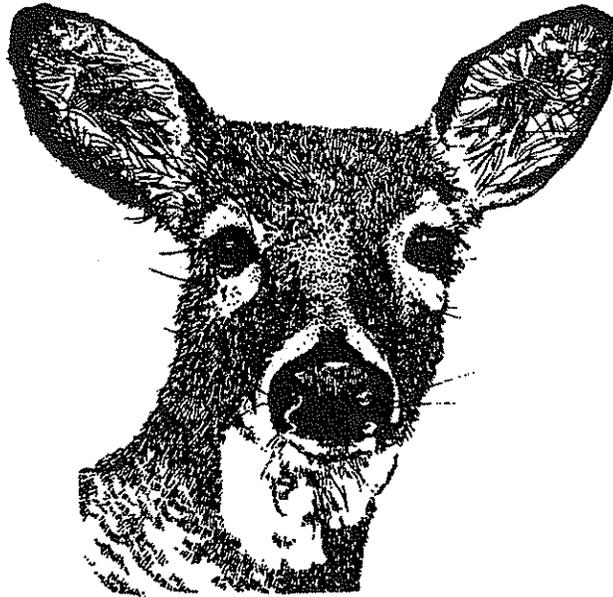


**BLACK RIVER WATERSHED
 HYDROLOGIC UNIT MAP**
 PORTIONS OF
 ASHLAND, CUYAHOGA, HURON, LORAIN
 AND MEDINA COUNTIES, OHIO



SOURCE:
 DIGITAL INFORMATION DERIVED FROM 1990 TIGER LINE DATA
 AND INFORMATION FROM SCS FIELD PERSONNEL.
 MAP PREPARED USING AUTOMATED MAP CONSTRUCTION WITH FOCAS EQUIPMENT.
 NATIONAL CARTOGRAPHIC CENTER, FORT WORTH, TEXAS 1991.

BLACK RIVER STUDY
Description of the Environment



*"One learns a landscape not by knowing the name or
identity of everything in it, but by perceiving the
relationships in it"*

-Barry Lopez



GEOLOGICAL HISTORY OF THE WATERSHED

Ohio's upper bedrock layers are sedimentary legacies of the great seas covering the state more than 300 million years ago. Within the Black River watershed, evidence of these seas is borne in the shale and sandstone bedrock of the Mississippian and Devonian periods.

The most common of the Mississippian rocks are the Berea sandstone and the Cuyahoga shale. The mainstem of the Black River winds through this bedrock, in some places exposing high rock walls and impressive cliffs. The falls of the East and West Branch in Cascade Park provide dramatic displays of Berea sandstone and the underlying Cuyahoga shale.

More recent geological events shaping the watershed occurred about 25,000 years ago when the last of the Wisconsin glaciers entered Ohio. The glaciers advanced slowly, (160 feet per year), but eventually covered nearly two-thirds of Ohio's 88 counties. The ice sheets were powerful, constantly changing and scouring the landscape with each push forward, leaving ridge deposits of boulders, sand, gravel and other debris behind with each retreat. Geologists refer to these glacial ridges as end moraines. The gently rolling hills in the southern areas of the watershed reflect the influence of two such moraines -- the Defiance and Spencer Moraines.

The Black River watershed lies within three physiographic regions of Ohio, the Glaciated Low Plateau, Lake Plains and a small portion of the Till Plains. The Glaciated Plateau stretches nearly 300 miles from northeastern Ohio to Ross County in south-central Ohio. Both the East and West Branches of the Black River flow through the Glaciated Plateau where unconsolidated glacial deposits overlay bedrock of shale and sandstone.

A portion of south-western Lorain County lies within the Till Plains physiographic region. This region is characterized by extensive flat to very gently rolling plains and heavy till soils. Although not encompassing a large portion of the watershed, the Till Plains serve as a transitional zone between the extensive flat areas of the Lake Plains and the rolling hills of the Glaciated Low Plateau in the southern portion of the watershed.

North of Butternut Ridge Road in Lorain County, the mainstem of the Black River flows through the Lake Plains physiographic region. Vast shallow lakes created when the Wisconsin glaciers receded from Ohio more than 13,000 years ago formed the Lake Plains. The melting ice formed a number of such lakes. The largest was Lake Maumee whose shoreline crested at an elevation of 780 feet. Other prehistoric lakes included Lake Whittlesey (735 feet) and Lake Warren (680-

BLACK RIVER STUDY-DESCRIPTION OF THE ENVIRONMENT
Section II-2

700 feet). As a point of reference, the shorelines of these ancient lakes were more than 200 feet higher than the current shoreline of Lake Erie.

With each recession of the glacial lakes, wave action smoothed fine clay sediments on the ancient lakebeds. The resulting landscape is an extremely flat plain, interrupted only by remnants of ancient beach ridges. In Lorain County, these ancient beaches are still evident in the form of local roads aptly named, Murray Ridge, Butternut Ridge, Center Ridge and Middle Ridge. As the glacial ice retreated for the last time, meltwater filled the great depression that is now Lake Erie.

The Black River as we see it today, is no more than 14,000 years old, which in geologic terms is very young. Like other tributaries to Lake Erie, the current Black River formed as glaciers receded and meltwater flow shifted from the south to the north. As a very young stream, the Black River's flow was probably quite impressive, carrying heavy loads of coarse grit, sand and boulders. The scouring action of such sediment carved most of the river valley that we see today.

TOPOGRAPHY

Like most of northern Ohio, the Black River watershed is relatively flat in the north to gently rolling in southern areas. Sloping gently from its highest elevation in Medina and Ashland counties, the Black River flows to its lowest elevation at Lake Erie in Lorain. Topography in the southern areas is influenced by the Glaciated Plateau and the Spencer and Defiance Moraines. The Black River mainstem, flowing through the Lake Plains in Lorain county is flat except for the ancient beach ridges near Elyria.

Stream gradients range from 0.8 feet per mile at the confluence of the Black River mainstem and French Creek to a maximum of 29.8 feet per mile in the West Branch. The mainstem flows from an elevation of 629 feet at Cascades Park to 573 feet at it's mouth. The average stream gradient for the mainstem is 3.6 feet per mile, however from Elyria to the confluence of French Creek at RM 5.1 the stream is free-flowing, dropping approximately 6 feet/mile. From French Creek to Lake Erie, stream flow decreases significantly as the river becomes estuarine.

The West Branch drops from a peak elevation of 1002 feet in Ashland county to its lowest point of 629 feet at Cascades Park. Average stream gradient for the West Branch is 9.9 feet per mile. The East Branch flows from an elevation near Lodi of 1138 feet to its lowest point at Cascades Park. The average stream gradient for the East Branch is 9.0 feet per mile.

WATER RESOURCES

Ground water is a product of the region's geology. The impervious layers of sandstone and shale bedrock offer little chance for precipitation and surface water to percolate into groundwater aquifers. Although there are isolated exceptions, ground water resources in the region are quite limited.

According to OEPA's 1992 Water Quality Study of the Black River Watershed, ground water yields an average of only 5-25 gallons per minute. One notable exception is the extreme southeastern zone of the watershed where

groundwater from a buried valley aquifer yields 100-500 gallons per minute. Groundwater in the clay and silt deposits near the mouth of the Black River is extremely limited, yielding less than 5 gallons per minute.

Dependence on ground water in the watershed for public water supply is minimal. Less than 5% of the 77,000 households in the region rely upon wells for drinking water. A well-established network of upground reservoirs and intakes in Lake Erie provide the bulk of public water supplies in the watershed. The cities of Oberlin, Grafton and Wellington withdraw water from the Black to recharge upground reservoirs used for public water supply. Additionally, USS/KOBE Steel has a cooling water withdrawal in the mainstem. *(Additional information concerning water withdrawals is addressed in later sections of this report).*

The flow of the Black River is also not dependent upon ground water. This is particularly true of the mainstem where impervious shale bedrock restricts any significant contribution of groundwater. Generally, the Black River derives its flow mostly from runoff and precipitation averaging 35 inches per year. Because of this dependence upon precipitation, the Black River experiences wide fluctuations in stream flow.

SOILS OF THE REGION

The soil associations of Mahoning, Trumbull and Ellsworth silt loams represent 90 % of the soils within the Glaciated Plateau and Till Plain regions of the watershed. Mahoning and Ellsworth soils are glacial till soils, classified as somewhat poorly drained. They are comprised of medium to fine textured silt loams or silty-clay loam. Such soils are typical of nearly level to gently rolling landscapes and erode somewhat easily when exposed.

The Trumbull soil association is hydric in nature, occurring in geographic depressions and drainage areas within the southern two-thirds of the watershed. It is poorly to very poorly drained, although its wetland characteristics have been lost to agricultural activities and artificial drainage. Miner and Lorain soils are also associated with the Mahoning and Ellsworth silt loams. These soils have seasonably high water tables, low permeability and very wet characteristics. As a result, these soils present severe limitations for septic and other on-lot sewage treatment systems and cause wet basements for many homeowners.

Within the Lake Plains portion of the watershed, the Haskins-Jimtown-Oshtemo soils associations are characteristic of the beach ridges, outwash plains and stream terrace areas. They are deep soils, somewhat poorly to very poorly drained and level to gently sloping in nature. These soils are found only in the northern part of Lorain County and currently are used for cultivating horticultural crops and residential development.

Also associated with the Lake Plains portion of the watershed are extensive flats of poorly to very poorly drained hydric soils. Such flats are found between the ancient beach ridges. Historically such flat areas have been drained and used for cropland. However, current trends in the area are converting these areas to extensive residential, commercial and industrial uses.

Soils within the Black River watershed have a soil loss tolerance of 3 tons/acre/year. In 1982, the U.S. Army Corps of Engineers reported that the majority of cropland within the watershed is eroding at an average rate of 4.7 tons/acre/year (substantially more than the loss tolerance). The Corps further

BLACK RIVER STUDY-DESCRIPTION OF THE ENVIRONMENT
Section II-4

identified that more than 100,000 acres of cropland within the watershed is eroding at twice the tolerable soil loss rate. More precisely, approximately one-third of the watershed's 298,752 acres is currently eroding at extremely high levels. According to the Corps Report, agricultural erosion within the watershed is the major source of sediment in the Black River.

Soil erosion depends upon local soil types, slope and predominant land use. The greatest soil loss in the watershed is currently occurring in western Medina and southern Lorain counties. This area comprises most of the East and West Branches of the Black River. The predominant land use in this region is cropland production and other agricultural activities, however residential and light commercial development is also increasing.

In addition to high rates of agriculturally related erosion, naturally occurring erosion and sedimentation rates in the upper stretches of the East and West Branches are high. Steep slopes and river banks, combined with deep soil depths contribute to high erosion rates. For example, within upper reaches of the East Branch, exposed banks are contributing significant sediment loadings into the stream flow during periods of high water.

Soil erosion and streambed sedimentation are detrimental in many ways. Soil loss affects agricultural productivity, damages and clogs the drainage network and most importantly, severely affects the biology of the Black River. Sedimentation interferes with reproductive and biological functions of fish life, aquatic macroinvertebrates and reduces sunlight penetration available to aquatic rooted vegetation.

The impact of excess sedimentation on Black River aquatic habitat appears to be significant. According to OEPA, much of streambed upstream from Elyria is covered with silt and bedload sediments. Within the East Branch, the most severe impact of sediment loading is upstream from Grafton (RM's 41.5-24.6). The impact of excess sedimentation caused by general agricultural activities to the West Branch and its tributaries as reported by OEPA is quite severe.

GEOLOGICAL & MINERAL RESOURCES

Mining is an economically important industry in Ohio. The mining of coal in southeastern Ohio is widely recognized, however the extraction of many other valuable minerals is less known, but equally vital. For example, Ohio ranks eleventh nationally in coal production, first in limestone and dolomite production, third in sand and gravel production and eleventh in sandstone and conglomerate production.

Sand & Gravel:

Virtually all sand and gravel deposits in Ohio are the result of Pleistocene glaciers. Sand and gravel deposits of commercial value are those that have been sorted by the action of water, concentrating the sand and gravel by washing out clay and silt. Such stratified deposits are nearly always found in association with one or more of the following glacial features: moraines, kames, eskers, lateral stream terraces, glacial deltas, outwash plains and valley trains.

Sand and gravel deposits in the Black River watershed holding commercial value are restricted to the Glaciated Low Plateau region of the southern watershed. According to the Division of Geological Survey, no commercial mining

of sand and gravel was taking place in Lorain County during 1994. There were two significant sand and gravel mining operations in Medina County in Harrisville and Westfield townships. Located in southwest Medina County, these operators are extracting sand and gravel deposited in association with the Defiance and Spencer end moraines. Due to their location in the southern-most reaches of the Black River watershed, these operations have little or no impact upon the river system.

Sandstone & Conglomerates:

The Berea sandstone bedrock underlying much of the Black River watershed has been of commercial value for many years. In most places in Ohio, Berea sandstone is only 10-40 feet thick. However, in South Amherst, deposits are nearly 200 feet thick. The South Amherst Quarries are the largest and deepest sandstone quarries in the world. In addition to the Amherst Quarry, the Golden Crescent Construction Company also quarries Berea sandstone in Amherst township.

Berea sandstone is commercially important as material used for dimensional building sandstone blocks. Many old bridge foundations and buildings in northern Ohio are constructed of sandstone quarried from the Amherst Quarry.

Other Mining Influences

There are no other commercial mineral extractions occurring within the Black River Watershed. It is also likely that no future mining operations will commence within the watershed. The potential for negative impact to the Black River by mining operations is extremely small. There are no known mines and/or quarries operating adjacent to the river or any of its tributaries. No threats of seepage of mine waste or excess sedimentation caused by mine run-off and/or erosion are evident along the Black River.

LAND USE

The Black River Watershed drains approximately 470 square miles (nearly 300,000 acres) with 887 miles of perennial streams in parts of Lorain, Medina, Ashland and small portions of Huron and Cuyahoga counties. Although flowing through the highly urbanized areas of Lorain and Elyria, the river itself flows mostly through agricultural countryside. According to the Black Remedial Action Plan, 51% of the land within the basin is used exclusively for agricultural purposes, with row crop and livestock production predominant uses, while only 1% of the land within the watershed is strictly industrial. Remaining land uses are broken down as follows: 38% of the watershed is rural residential, 7% is urban residential and commercial uses comprise the remaining 3% of acreage. Different sources identified different percentages of land use. However, all sources identified agriculture as the highest percentage of land use within the basin.

The Black River watershed, like many others in northern Ohio, is undergoing a period of transition, experiencing dramatic increases in residential growth and light commercial development. Portions of the watershed which were rural as recently as five years ago, are being converted to residential housing, small strip-mall shopping centers and other light commercial uses such as garden centers, restaurants and other consumer driven businesses. This is particularly true in the

southern sections of Lorain County and the northern section of Medina County. Both the East and West Branches of the Black River are experiencing this increase in development activity and concerns are mounting about the impact that such activities will have on these rivers. One simply needs to travel the southern sections of the watershed on State Route 301 to observe the spurt of active development taking place.

A recent moratorium imposed upon on-site sewage treatment permits (aeration & septic systems) in Lorain County slowed construction activities for a short time, only to have it resumed when the moratorium was recently lifted. Within weeks, the Lorain County Health Department received more than 25 applications for on-site wastewater treatment. Clearly this trend in residential and commercial development will continue with many such developments (particularly residential), continuing to occur in previously rural sections of the watershed. Unless managed very carefully, such development will very likely further stress the East and West Branches of the Black.

Land use within northern sections of the watershed is a combination of urban/suburban residential, commercial and heavy industrial use. Most heavy industry is located in the mainstem, from Elyria south to the confluence with Lake Erie in Lorain. Fortunately, many previous point-source dischargers have dramatically decreased their discharges and improved the quality of discharge they are still contributing to the river. However, industrial point-source discharges are continuing to adversely influence water quality. For example, of the 28 permitted industrial dischargers active on the Black, according to OEPA nearly 25% are out of permit compliance in any given month. Continued improvements are needed to restore high quality water to the Black River. Increased urban nonpoint and storm water runoff is also contributing to depressed water quality in the Black River.

Although suburban housing development continues to expand, the southern portions of the watershed continue to be predominately agricultural. Reports estimate that more than 1,860 farms, averaging approximately 90 acres each are operating throughout the watershed. More than 200 of these farms are active dairy operations. The influence of dairy operations in the watershed is significant, since nearly 65% of the existing dairy operations were found to lack adequate manure storage facilities. Livestock operations, as well as an abundance of failing septic systems and unsewered residential areas, contribute to periodic elevations of fecal coliform bacteria levels in all branches of the Black River.

70% of cropland in the watershed is planted to corn and soybeans due to inherently poor internal drainage characteristics of the soil. Such poor drainage restricts the growth of alfalfa and other crops that more effectively serve to stabilize soil and reduce stream bank erosion. Although significant efforts have been undertaken within the agricultural community to expand the use of grass buffer strips, no-till planting and other conservation technologies, the impact of agriculture on water quality in the basin continues to be a concern.

During the late 1980's, only 5% of tillable acres within the basin were using conservation tillage methodology. Presently, only 7% of row crops are planted using no-till technology and 30% are planted using other conservation techniques. The remaining acreage is conventionally tilled with an estimated 90% of these acres fall plowed. Consequently, erosion and soil loss within the region is quite high, exceeding the average soil loss tolerance rates in nearly all cases. As

mentioned in other sections of this report, agricultural runoff and stream bank erosion due to loss of riparian habitat are two of the most critical concerns within the Black River watershed.

Acquisition of sizable parcels of riverfront land by the Lorain County Metroparks should serve to better preserve and enhance significant portions of the river throughout the watershed. Lorain County Metropark holdings include Carlisle Reservation (1,500 acres), Charlemont Reservation (750 acres) and Caley Woods Reservation (487 acres) on the West Branch; Indian Hollow Reservation (300 acres) on the East Branch; and French Creek Reservation (428 acres) and the Black River Reservation (883 acres) on the mainstem. Unfortunately, escalating land prices within southern portions of the watershed likely will restrict additional Metroparks purchases in the future. The Ohio Department of Natural Resources also owns several large parcels within the watershed, including Findley State Park and the Wellington Wildlife Area south of Wellington and the Spencer Wildlife Area just outside of Spencer. At the time of this report, no additional state acquisitions within the watershed are anticipated.

Although public acquisition of riverfront property will be helpful in restoring the biological integrity of the river, the US Army Corps of Engineers in a study completed in 1982 determined that agricultural erosion is the largest contributor of sediment into the Black River system. Only through concerted efforts to greatly expand conservation and no-till technologies, combined with enhanced efforts to restore vital riparian corridor will the nonpoint pollution impacts to the Black River be diminished.

ECOLOGICAL RESOURCES

Nearly two centuries of extensive agricultural and industrial use have dramatically altered Ohio's landscape. The earliest European settlers encountered an immense forest in Ohio, interrupted by small pockets of prairies, bogs or marshland. Shortly after settlement, the woodlands were cleared, wetlands drained and what once was a great forest was quickly transformed to productive agricultural land and cities and towns.

Today, walking through Ohio's second growth woodlands, small woodlots and the few tracts of remaining old growth forest, one can only imagine the immensity of the original forests once covering the region. Although native forests are long lost, remnants of these natural communities continue to exist throughout the Black River watershed. It is the natural function of these riverine forest communities that will determine the future health of the Black River. Where existing stands of unbroken forest corridor are found, water conditions and the natural functions of the river are clearly evident. Where the riverine forest corridor is absent, stream banks are eroding, water quality is impacted by excess sedimentation and the biological communities are suppressed. Therefore, it is imperative that efforts to promote preservation and successional growth of existing forested lands along the Black River continue. Land acquisition, combined with river restoration and educational efforts should continue to improve natural conditions along the Black River.

NATURAL COMMUNITIES

The following natural communities existed in the Black River watershed at the time of the earliest land surveys in Ohio. Beech-sugar maple and mixed mesophytic forests once covered more than 90% of the watershed and continue to be the dominant remnant natural communities.

Beech-Sugar Maple Forests

The most abundant forest community associated with the Black River is the Beech-Sugar Maple forest. These communities are dominated by American Beech (*Fagus grandiflora*), Sugar Maple (*Acer saccharum*), and often one or two additional less dominant species. Beech and Maple often comprise as much as 70% of the canopy species present in this forest community. Other tree species associated with the Beech-Sugar Maple forest include:

American Beech, <i>Fagus grandiflora</i>	Tuliptree, <i>Liriodendron tulipifera</i>
Shagbark Hickory, <i>Carya ovata</i>	Black Cherry, <i>Prunus serotina</i>
Black Walnut, <i>Juglans nigra</i>	Red Maple, <i>Acer rubrum</i>
White Oak, <i>Quercus alba</i>	Sugar Maple, <i>Acer saccharum</i>
Red Oak, <i>Quercus rubra</i>	Basswood, <i>Tilia americana</i>
American Elm, <i>Ulmus americana</i>	White Ash, <i>Fraxinus americana</i>
Slippery Elm, <i>Ulmus rubra</i>	

Beech-Maple communities occur throughout much of Ohio but are most common in the Till Plains, Lake Plains and Glaciated Plateau regions of the state. The community usually occurs on rolling or slightly sloping topography in areas of medium moisture levels. On wetter sites in the region, the community shifts away from beech-maple dominance to "wet-beech" communities.

Timber cutting and livestock grazing have adversely affected beech-Maple forest communities. Examples of this forest community may be found throughout wooded portions of the Black River watershed. However, where once extensive woodlands thrived, only remnant woodlots remain.

Mixed Mesophytic Forests

The northern-third of Lorain County within the Black River watershed was comprised mostly of the Mixed Mesophytic forest community. Mixed mesophytic forests are woodlands with a mixture of hardwood species dominating the community. Species associated with mixed mesophytic forests include:

Hickory, <i>Carya spp.</i>	Black Cherry, <i>Prunus serotina</i>
Black Walnut, <i>Juglans nigra</i>	Red Maple, <i>Acer rubrum</i>
Beech, <i>Fagus grandiflora</i>	Sugar Maple, <i>Acer saccharum</i>
White Oak, <i>Quercus alba</i>	Yellow Buckeye, <i>Aesculus octandra</i>
Red Oak, <i>Quercus rubra</i>	Basswood, <i>Tilia americana</i>
Tuliptree, <i>Liriodendron tulipifera</i>	White Basswood, <i>Tilia heterophylla</i>
Cucumbertree, <i>Magnolia acuminata</i>	White Ash, <i>Fraxinus americana</i>

This forest type is often confused with the Beech-Maple forest community, however Mixed Mesophytic Forests have a large number of species dominating the

forest canopy, with Beech and/or Maple occurring in far lower numbers. Other trees occur (or once occurred) in this community in varying numbers. For example, Chestnut (*Castanea dentata*) was formerly a very dominant tree in the Mixed Mesophytic Forest Community. The Chestnut largely disappeared from Ohio's woodlands during the early 1900's. (*Historic tree records from Cascade Park in Elyria show that in 1928 nearly fifty mature Chestnuts were found. Today, there are none*). White Basswood and Yellow Buckeye are other common species forming the canopy of Mixed Mesophytic Forests.

Mixed Mesophytic communities are limited to the Lake Plain region of northern Lorain County within the Black River watershed. They once were quite common in the region. However, large stands of the most complex Mixed Mesophytic Forests are now quite rare, due to timbering activities and the general loss of the once dominant Chestnut.

Maple-Cottonwood-Sycamore Floodplain Forest

Where the floodplain of the Black River widens, a common forest type found in the watershed is the Maple-Cottonwood-Sycamore Floodplain community. This community is common throughout Ohio, occurring to some degree in the floodplain of nearly all Ohio rivers. Very few of these communities are "old growth" with most having been timbered or diminished by agricultural activities.

In the Black River watershed, examples of the Maple-Cottonwood-Sycamore Floodplain forest may be found in portions of the Lorain County Metroparks and other tracts of undeveloped land.

The Maple-Cottonwood-Sycamore floodplain community is a rather distinct community, usually separated on one side by the river channel and on the other by differing tree species (or in many cases agricultural row crops), on the terraces leading away from the river. The best examples are found in areas subject to frequent flooding, leaving them less vulnerable to agriculture or other disruptive activities. Common associated species include:

Cottonwood, <i>Populus deltoides</i>	Honey Locust, <i>Gleditsia triacanthos</i>
Sandbar Willow, <i>Salix interior</i>	Boxelder, <i>Acer negundo</i>
Black Willow, <i>Salix nigra</i>	Silver Maple, <i>Acer saccharinum</i>
Hackberry, <i>Celtis occidentalis</i>	Ohio Buckeye, <i>Aesculus glabra</i>
American Elm, <i>Ulmus americana</i>	White Ash, <i>Fraxinus americana</i>
Sycamore, <i>Platanus occidentalis</i>	Green Ash, <i>Fraxinus pennsylvanica</i>

Although variations occur, the cottonwoods, soft maples and sycamore are consistently dominant species. At the time of settlement, it is likely that the American Elm was also fairly dominant in the forest canopy. However, Dutch Elm Disease relegated the American Elm to an understory species.

An important characteristic of this community is its dynamic nature. These forests are continually receiving (and losing) soil and silt during periods of annual flooding. Vegetation is subject to the meandering of the stream channel, resulting in a constantly changing ecological community.

Elm-Ash Swamp Forests

Small pockets of Elm-Ash Swamp Forests also existed in the Black River watershed at the time of Ohio's first land surveys. This community was found in northern Medina County with isolated pockets also found in poorly drained areas along the West Branch in western Lorain County.

Historically, Elm-Ash Swamp Forests were comprised of White Elm (*Ulmus americana*), Black Ash (*Fraxinus nigra*), White Ash (*Fraxinus americana*) and Silver Maple (*Acer saccharinum*) or Red Maple (*Acer rubrum*) as the dominant canopy species. Extremely wet sites also included Cottonwood (*Populus deltoides*) and/or Sycamore (*Plantanus occidentalis*). However, Dutch Elm Disease decimated mature Elm trees and widespread drainage of wet woods further spelled the demise of Elm-Ash Swamp Forests in the region. Small localized remnants are likely all that remains of this community within the Black River watershed.

Other Natural Communities

Several other natural communities were present in various locales throughout the Black River basin. These include the Submergent Riverine Community, which is comprised of rooted aquatic plant species. Sedimentation and siltation have all but eliminated the submergent riverine community in many of Ohio's rivers and streams, including the Black River.

Other communities, small remnants of which still exist, include the mixed emergent riverine community, comprised of cattail, smartweed, docks, various types of rushes and other plant species. This community occurs in the margins and shallows of Ohio rivers and streams that have not been recently channelized and/or dredged. Although a common Ohio plant community, large stands of riverine emergents are quite uncommon.

Water-willow riverine communities are another common plant community in nearly all of Ohio's rivers and streams. Water-willow communities are most prevalent during the summer and fall months during periods of lower flow and serve as important nurseries for the young-of-the-year fish of many species. In some streams, such as the Olentangy River in central Ohio and the shallow riffle areas in the Maumee River, water-willow communities are very abundant. Several examples of this community are scattered throughout the Black River watershed.

ENDANGERED/THREATENED SPECIES

In addition to supporting many of Ohio's most common fish, wildlife and plant species, the Black River also provides vital habitat for several state endangered, threatened and/or otherwise protected species. Two species of state threatened fish were collected during the 1992 Black River Water Quality Study completed by OEPA. These include the bigmouth shiner (*Notropis dorsalis*) and the Silver Lamprey (*Ichthyomyzon unicuspis*). The population of bigmouth shiners located in the West Branch (and several tributaries) is of particular importance since only two rivers in Ohio are known to possess these fish. The Silver Lamprey is a Lake Erie species whose populations are diminishing due to habitat loss. There is no evidence of a resident population within the Black River, with collected

individuals representing those that have been brought in by a host fish from Lake Erie.

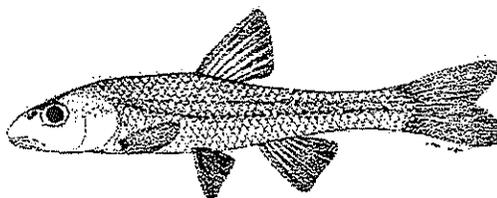
Although no endangered and/or threatened mammal species are believed to have populations within the Black River watershed, C. William Limbach discovered tracks of a river otter along the banks of the Black River during his 1993 Riparian Wildlife Census. River otters are rare Ohio mammals who recently were reintroduced by the Division of Wildlife in the Grand River watershed further to the east. No reproducing populations of otters are believed to be residing within the Black watershed.

Endangered birds nesting in the region include the sedge wren (*Cistothorus platensis*). Nesting records for this species include a 1994 record from Charlemont Creek. The common barn owl (*Tyto alba*) was known to nest in the region in 1977. No more recent records have been received and it is now believed that barn owls are no longer nesting in the watershed. Other bird species of special interest within the Black River region include the solitary vireo and the cliff swallow. Although neither species is endangered, both species are of special interest to the Division of Natural Areas & Preserves.

The Black River watershed also possesses several state threatened and/or protected plant species. These include northern water-plantain, canadian buffalo-berry, long beech-fern, radiate sedge, closed gentian, purple sand-grass, northern fox-grape and yellow vetchling. State protected tree species within the watershed include the butternut, round leafed dogwood, pumpkin ash, american chestnut and the swamp cottonwood. Plant records for the region are relatively recent (1993-1995).

Records for state threatened and/or endangered species within the watershed were obtained from the Ohio Natural Heritage database maintained by the ODNR-Division of Natural Areas & Preserves in Columbus, Ohio. Additional details concerning threatened and/or endangered species found within the Black River watershed are included on the following pages.

Endangered Species



BIGMOUTH SHINER (*Notropis dorsalis*)
STATE THREATENED

CHARACTERISTICS: Adults to 3' in length; the back an olive-yellow with distinct mid-dorsal stripe; sides silvery, often with a faint dusky stripe.

STATE RANGE AND HABITAT REQUIREMENTS: The Bigmouth Shiner occupies similar habitat as the Silverjaw Minnow (*Ericymba buccata*), reaching its greatest abundance in brooks and small streams of moderate gradient where sands on the bottoms of pools, bars and riffle areas are relatively free of clayey silts. Because of their similiar requirements, the Bigmouth Shiner is in direct competition with the Silverjaw minnow in Ohio. Where an adequate population of Bigmouth Shiners exists within a stream, the Bigmouth is the more dominant of the two species. However, when populations of Bigmouth Shiners are depressed, the Silverjaw Minnow will dominate. Within the West Branch of the Black River, Bigmouth Shiners are the more dominant of the two species.

Several locations within the West Branch of the Black River and a number of tributaries house populations of this state threatened species. Specimens have been collected as recently as 1994 in the West Branch, Charlemont Creek Plum Creek, Wellington Creek, Buck Creek and the Kelner Ditch. In Ohio, the only known populations of Bigmouth Shiners are restricted to the upper reaches of the Black and Rocky Rivers.

Most recent collections of Bigmouth Shiners have been taken at the following locations:

TABLE II-1
BIGMOUTH SHINER COLLECTIONS IN THE BLACK RIVER

RIVER/TRIBUTARY	YEAR COLLECTED	NUMBER COLLECTED	COLLECTED BY
West Branch Black R.	1992	84	OEPA
West Branch Black R.	1994	24	OEPA
Plum Creek	1994	52	OEPA
Wellington Creek	1994	9	OEPA
Charlemont Creek	1992	63	OEPA
Buck Creek	1992	10	OEPA
Kelner Ditch	1994	48	OEPA
Guthrie Ditch	1994	12	OEPA

Endangered Species



SILVER LAMPREY (*Ichthyomyzon unicuspis*) STATE THREATENED

CHARACTERISTICS: Adults to 13 inches; dorsal fin single but notched; diameter of sucking disc greater than that of branchial region; adults are parasitic on host fish.

STATE RANGE AND HABITAT REQUIREMENTS: Silver Lampreys were once abundant as parasites on fish in Lake Erie. Spawning runs occurred in all major tributaries of Lake Erie. Current populations are restricted to scattered individuals on fish in Lake Erie, Maumee and Sandusky Bays, as well as major tributaries. Silver Lampreys collected from the Black River are most likely individuals that arrived in the river by host fish. There is no evidence of a resident population existing within the Black River.

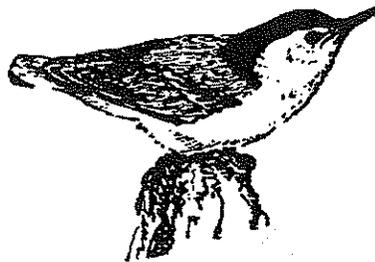
Adult Silver Lampreys require moderate sized streams with sand and gravel riffle substrates for spawning. After hatching, larva (ammocoetes) dig into beds composed of sand, mulch and other organic debris where they spend 4-7 years feeding on microscopic debris floating downstream. Young transform into adults and drift downstream to larger rivers and lakes. Adults spend 12-20 months parasitizing fish such as salmonoids and walleyes. In the spring, adults migrate upstream where they spawn and die.

Pollution, siltation and stream channelization and reductions in host fish populations all pose serious threats to the Silver Lamprey population.

TABLE II-2
Silver Lamprey Collections in the Black River

RIVER/TRIBUTARY	YEAR COLLECTED	NUMBER COLLECTED	COLLECTED BY
Black River Mainstem Lorain County	1992	1	OEPA
Black River Mainstem Lorain County	1978	1	Andrew White John Carroll University

Other Species of Interest



Several occurrences of endangered plant and animal species have been identified within the Black River watershed. Additionally, the Division of Natural Areas & Preserves monitors the status of several species that have no official federal or state endangered status. All bird species noted are records of nesting adults and do not include casual or migratory sightings.

TABLE II-3
ENDANGERED OR OTHER BIRD SPECIES OF INTEREST

SPECIES	SCIENTIFIC NAME	STATUS	DNAP LOCATION RECORD NUMBER	YEAR
Cliff Swallow	<i>Hirundo pyrrhonota</i>	DNAP Special Interest	Black River-009	1984
Solitary Vireo	<i>Vireo solitarius</i>	DNAP Special Interest	Wellington Creek-019 Wellington Creek-045	1985 1983
Common Snipe	<i>Capella gallinago</i>	State Special Interest	West Branch-007	1984
Sedge Wren	<i>Cistothorus platensis</i>	State Endangered	West Branch-016 Charlemont Creek-011	1981 1994
Common Barn Owl	<i>Tyto alba</i>	State Endangered	Plum Creek-009	1977

TABLE II-4
INSECT, REPTILE & AMPHIBIAN SPECIES OF INTEREST IN THE BLACK RIVER

SPECIES	SCIENTIFIC NAME	STATUS	DNAP LOCATION RECORD NUMBER	YEAR
Two-Spotted Skipper	<i>Euphyes bimacula</i>	State Endangered	West Branch-001	1994
Spotted Turtle	<i>Clemmys guttata</i>	State Special Interest	French Creek-005	1976

Plant Species of Interest



TABLE II-5
PLANTS, TREES & SHRUBS OF INTEREST
(Occurrences immediately adjacent to Black River or Tributaries)

SPECIES	SCIENTIFIC NAME	STATUS	DNAP LOCATION RECORD NUMBER	YEAR
Northern Water-Plaintain	<i>Alisma triviale</i>	State Threatened	Black River-002	1993
			Black River-003	1993
Butternut	<i>Juglans cinerea</i>	State Protected	Black River-059	1993
			West Branch-093	1994
			W. Fork-E. Branch-120	1995
			Wellington Creek-064	1993
Round Leafed Dogwood	<i>Cornus rugosa</i>	State Protected	Black River-023	1993
Pumpkin Ash	<i>Fraxinus tomentosa</i>	State Protected	Black River-016	1993
			West Branch-017	1992
			West Branch-019	1993
			Kelner Ditch-020	1993
Canadian Buffalo-Berry	<i>Shepherdian canadensis</i>	State Protected	Black River-034	1993
American Chestnut	<i>Castanea dentata</i>	State Protected	East Branch-002	1993
Long Beech-Fern	<i>Phegopteris connectilis</i>	State Protected	East Branch-005	1955
			East Branch-034	1993
Radiate Sedge	<i>Carex radiata</i>	State Protected	Black River-015	1993
			Charlemont Creek-007	1993
Swamp Cottonwood	<i>Populus hereophylla</i>	State Protected	West Branch-027	1984
Closed Gentian	<i>Gentiana clausa</i>	State Protected	West Branch-023	1989
Purple Sand-Grass	<i>Triplasis purpurea</i>	State Protected	West Branch-036	1993
Northern Fox-Grape	<i>Vitis labrusca</i>	State Protected	West Branch-029	1993
Yellow Vetchling	<i>Lathyrus ochroleucus</i>	State Threatened	Wellington Creek-002	1993

OVERVIEW OF HABITAT CONDITIONS

Physical habitat conditions throughout the Black River Watershed are generally good. Very little channel modification (channelization, etc.), has been done within the various branches of the Black River itself, with the exception of the shipping channel in the lower three miles of the mainstem. However, substantial channelization has occurred in more than 100 miles of tributaries and headwater streams feeding the East and West Branches. Such modifications to headwater streams have had substantial impacts on the biological communities in these headwaters. Channelization and the associated maintenance of drainage ditches continue to be common practices in agricultural areas of Ohio.

The Black River Watershed has been designated as Warmwater Habitat by the Ohio Environmental Protection Agency (OEPA). Warmwater Habitats are those waters capable of supporting reproducing populations of warmwater fish species, associated vertebrate and invertebrate organisms, and aquatic plants on an annual basis. OEPA employs a variety of objective measurements for evaluating stream habitat and whether or not the biological communities within a river system are performing as expected. These measurements include:

- **Qualitative Habitat Evaluation Index (QHEI):** an objective tool for evaluating the physical habitat conditions of a stream based on a variety of physical factors.
- **Index of Biological Integrity (IBI):** a means of objectively measuring and evaluating biological community performance based upon fish community characteristics.
- **Modified Index of Well-Being (MIWB):** an objective method of measuring and evaluating fish community performance. This methodology is a measure of fish community abundance and diversity using numbers and weight information.
- **Community Index (ICI):** The ICI is a method of evaluation applied to macroinvertebrate community performance and characteristics.

In freeflowing (or lotic) sections of the watershed such as the East and West Branches and the mainstem, physical habitat conditions generally range from poor (in areas where riparian forest cover is missing) to excellent (in areas where riparian corridors are relatively intact). OEPA employs an objective method of measuring physical habitat conditions, which examines and assigns numeric values to various attributes of the physical habitat including riparian corridor, substrate types, instream cover, geomorphology, pool and riffle development and others. Known as the Qualitative Habitat Evaluation Index (QHEI), this method is used to evaluate the characteristics of a section of stream, not just a single sampling site. Stream segments with QHEI values greater than 60 have been demonstrated to generally support the establishment of warmwater fish and macroinvertebrate populations. Sites with QHEI's of 75-80, very often have been demonstrated to typify habitat conditions which support exceptional fauna communities.

Performance expectations for the Warmwater Habitat basic aquatic life uses were developed using the regional reference site approach, a method that

basically identifies the types of fish and macroinvertebrates (and their relative abundance) that can be expected to be present in an aquatic environment within a given geographical region. OEPA determines that aquatic life use attainment for WWH is FULL if all three of the above indices meet applicable criteria. In other words, if fish and macroinvertebrate communities are performing within all expected standards, then that particular reference site is in full WWH attainment. PARTIAL attainment is met when at least one index is not attained and performance does not fall below the fair category. An area is in NON attainment of WWH standards if all indices either fail to attain or if any one index indicates poor or very poor performance.

QHEI values reported for the Black River mainstem ranged from a low of 42.0 near RM 3.0 (ship turning basin) to a high value of 87.5 downstream from the confluence of the East & West Branches. Generally, QHEI values for the mainstem averaged slightly more than 60. Physical habitat conditions were generally good with well-defined riffle-pool-run complexes, suitable substrates and ample riparian cover.

OEPA has determined that 6.4 miles (48% of the length evaluated) of the Black River mainstem are performing at FULL WWH attainment levels. Generally, this includes a small section of the mainstem downstream from the confluence with French Creek and the section from the falls of the East and West Branches downstream to the Elyria WWTP. An additional 5.6 miles (42%) of the stream performed at PARTIAL WWH attainment levels and the remaining 1.4 miles (10%) of the mainstem was in NON WWH attainment.

The East Branch of the Black River exhibited the highest quality physical habitat conditions in the watershed. QHEI values as reported by OEPA ranged from a low of 53.5 to a high of 90.0 in the area south of the city of Grafton. Overall, the East Branch QHEI values averaged 67. Physical habitat conditions within the East Branch are very good in several locations with several sections of stream exhibiting QHEI's of more than 70. As a result, biological communities within the East Branch are among the most stable within the entire Black River watershed.

Warmwater Habitat performance expectations are being fully attained on 12.9 miles (23%) of the East Branch, including that section of the river from its confluence with Salt Creek downstream to the city of Grafton. 19.8 miles (35%) of the East Branch, primarily that section within Medina County, were performing at PARTIAL WWH attainment. Approximately 16 miles (28%) of the stream in southern Lorain County is in NON attainment, as well as a portion of the East Branch immediately downstream from Grafton.

Physical habitat on the West Branch is generally good, with most sections of streams receiving QHEI's near or above 60. However, loss of riparian cover, excessive siltation and substrate embededness were observed to be severely suppressing biological functions in several areas. QHEI's for the segments of stream evaluated ranged from a low 49.5 to a high of 84.0. It is important to consider that the only segment of the West Branch that was FULLY attaining warmwater habitat standards was near RM 33.3 (several miles south of Pittsfield) where the corresponding QHEI value was 84.0. One other segment of stream was performing at PARTIAL WWH attainment while the remaining five segments of stream examined were in NON attainment.

The West Branch of the Black River generally performed very poorly when compared to Warmwater Habitat Standards. Only a small stretch of the river (7.8 miles or 19% of river miles surveyed) in far southwestern Lorain County was performing at FULL WWH standards. An additional 7.2 miles (18%) in the same general area was in PARTIAL attainment and the remaining 27.3 miles (63%), flowing from the confluence of the West Branch and Charlemont Creek to Elyria, were in NON-attainment. Biological communities within the West Branch are being severely impacted by the effects of nonpoint pollution and excessive siltation and sedimentation.

Additional detail concerning habitat conditions of the Black River are contained throughout following sections of this report. Although scenic river designation views stream conditions in a broader context than OEPA's water quality studies, the attainment or lack of attainment of warmwater habitat standards is extremely important in determining the natural integrity of a river being studied for designation. For this reason, OEPA's evaluation of habitat conditions and biological community performance is critically important in assisting with an objective evaluation of the Black River.

MAINSTEM-Black River: Relative Quality & Description

The East and West Branches of the Black River converge within the city of Elyria, plunge 40 feet down magnificent outcroppings of sandstone and form the mainstem of the Black River, flowing another 15.6 miles before emptying into Lake Erie. The mainstem is comprised of three distinct sections. From the confluence of the East and West Branches downstream to RM 6.5, the mainstem is a free-flowing river with minimal channel modifications and characterized by well-defined riffle-run-pool complexes. This section of the mainstem flows through the Black River Reservation of the Lorain County Metroparks. Although urban in nature, the stream is scenic, creating the illusion of being relatively remote, except for numerous overhead bridge crossings and associated traffic noise. Characteristically, the mainstem to RM 6.5 is bordered on the inward side by broad Sycamore-Cottonwood-Soft Maple floodplain forests and tall, deeply cut shale high banks on the outward side

Section 2 of the mainstem extends from RM 6.5 to RM 3.0 and represents the shallow-lake mixed section of the river. It is in this section of the river that French Creek enters at RM 5.0. Depths throughout the section range from 5 feet to 15 feet and the river widens considerably to 100-250 feet.

The remaining three miles of the mainstem are estuarine in nature and dramatically influenced by Lake Erie. Hydraulic conditions are affected by the predominant onshore winds and the rise and fall of Lake Erie. Periodic dredging maintains depths averaging 30 feet and the river ranges in width from 350 feet to nearly 1100 feet in the ship turning basin. This section of the river has been dramatically altered and retains little of its natural character.

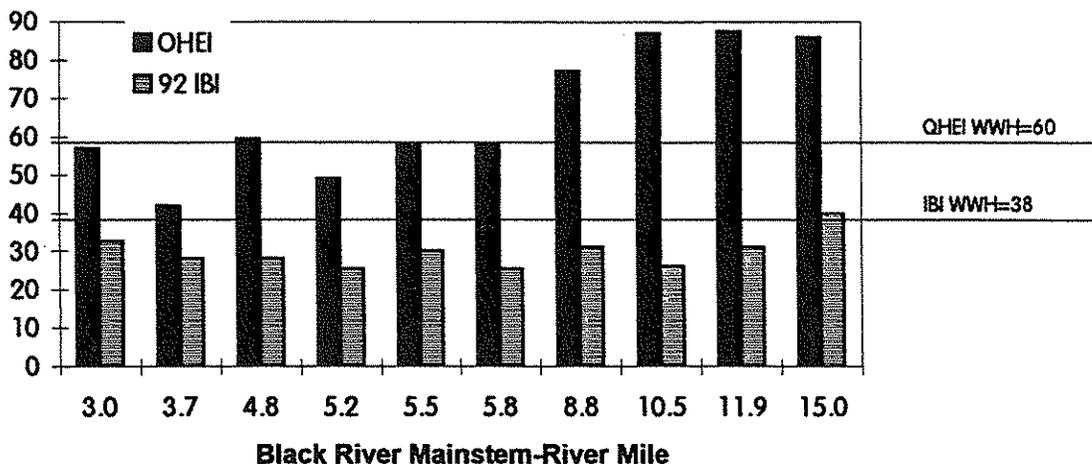
Despite a history of degradation from point source discharges, fish life within the mainstem is moderately diverse, influenced by the seasonal influxes of species more common in Lake Erie, such as freshwater drum, white and yellow perch, walleye and an occasional rainbow trout. In addition to largemouth and

smallmouth bass, the mainstem is also home to many species of shiners, sunfish and other pollution tolerant species such as creek chubs, white suckers, carp and others. Due in part to the influence of Lake Erie, the Black River mainstem is home to 48 species of fish, not including hybrids. The macroinvertebrate population within the mainstem is not well developed, consisting primarily of pollution-tolerant species of mayfly, some caddisflies and a large number of pollution-tolerant midge species and aquatic worms. Shellfish (clams and mussels) populations within the mainstem are limited to zebra mussels (an invader species first introduced to Lake Erie). Although OEPA collected numerous macroinvertebrates during their 1992 study of the Black River, the diversity of pollution intolerant species was very low. It appears that water quality is the primary limiting factor on the benthic community since physical habitat conditions are generally good.

The mainstem of the Black River has long been the focus of environmental scrutiny due to the historic degradation of its water quality and the high concentration of manufacturing industries located in the mainstem's lower reaches. Previous concerns dealt with toxic accumulations of heavy metals and organic toxins in sediments found in the lower six miles of the stream. Although dramatic improvements have been made, point source discharges and urban nonpoint pollutants still remain as threats to the mainstem. The mainstem is frequently turbid from substantial amounts of suspended solids transported from sites further upstream.

OEPA documented improvement in mainstem water quality during their water quality study completed in 1992. Improvements to upstream wastewater treatment facilities and reduced point source discharges are gradually improving water quality and the biological communities within the mainstem. However, accumulated toxins and continued concerns with toxins in some fish tissue merit the continuation of a fish consumption advisory for the lower mainstem as well as a recreational contact advisory. Although recent improvements are encouraging, continued remediation and restoration efforts such as those being conducted by the Black River Remedial Action Plan and other organizations throughout the basin need to continue.

GRAPH II-1
QHEI & IBI Black River Mainstem



The following table provides relevant information about habitat quality, corresponding relative values and various data for sites along the length of the mainstem of the Black River.

TABLE II-7
Habitat Conditions of the Black River Mainstem

River Mile	Gradient (feet/mile)	Substrate Embeddedness	Cover	# of Fish Species	IBI	GHEI	WWH Status
15.0	3.70	Normal	Moderate/Extensive	28	40.0	86.0	Full
11.9	5.62	Normal	Moderate/Extensive	22	31.0	87.5	Partial
10.5	5.62	Normal	Moderate/Extensive	21	26.0	87.0	Partial
8.8	4.00	Normal	Moderate/Extensive	25	31.0	77.0	Partial
5.8	0.01	Normal	Extensive	22	25.3	58.0	Non
5.5	0.10	Normal	Moderate/Extensive	21	30.0	58.0	Partial
5.2	0.10	Normal	Moderate/Extensive	26	25.3	49.0	Partial
4.8	0.10	Normal	Moderate/Extensive	21	28.0	59.5	Partial
3.7	0.10	Normal	Sparse	21	28.0	42.0	Full
3.0	0.10	Normal	Sparse	20	32.6	57.0	Full

EAST BRANCH: Relative Quality and Description

The East Branch of the Black River meanders for nearly 57 miles through northern Medina and southeast Lorain Counties. Upper sections of the East Branch are characterized by an entrenched river valley with outer bank erosion and downed trees somewhat common. Middle and lower stretches of the river display well-defined riffle-run-pool habitat complexes with substrate materials derived primarily from glacial tills (sand, gravel, cobble and boulders). With some exceptions, the banks of the East Branch are moderately forested with Sycamore, Cottonwoods and Soft Maples such as Boxelder being most common tree species represented. Where forest cover is extensive such as through the Indian Hollow Reservation of the Lorain Metroparks, the East Branch is a scenic stream with relatively healthy natural functions. Where cover is absent, stream bank erosion is common, substrates are embedded in silt and the stream's biotic communities are suppressed.

Although the East Branch exhibits the impacts of nonpoint pollution and siltation, it possesses more diverse biological communities than the rest of the Black River watershed. 39 species of fish may be found, including Smallmouth Bass (*Micropterus dolomieu*), and several of the more pollution tolerant of the darter species such as the Greenside, Blackside and Johnny Darters. Relatively abundant macroinvertebrate communities are also evident throughout sections of the East Branch, including pollution intolerant species like mayflies, caddisflies, riffle beetles and an occasional dobsonfly larva. Although not supported by data collected by OEPA in their 1992 study, visual observations suggest that middle stretches of the East Branch possess abundant populations of mussels including

Pyganodon sp., *Pisidium sp.*, and *Spaerium sp.*. Their shells are abundant on gravel bars in several areas of the river. Each of these species is rather tolerant of silt and turbidity and are common to most Ohio rivers and streams. It is important to note however, bivalve communities within the Black River are not well known. Further studies are needed to more objectively determine the status of mussels, clams and bivalves in the watershed.

Fish and macroinvertebrate populations are directly associated with suitable and stable habitat. Where stream habitat is less impacted by sediments and siltation, fish and macroinvertebrate populations in the East Branch are the most stable and diverse of those found within the watershed. In areas where habitat has been altered or affected by nonpoint pollution and excessive sedimentation, fish and macroinvertebrate populations are suppressed.

Portions of the East Branch possess the highest quality habitat in the Black River watershed. This is particularly true in the West Fork of the East Branch, where high stream gradients reduce the impact of nonpoint pollution from agricultural runoff. However, where stream gradients are low, severe habitat impacts associated with turbidity, siltation and substrate embededness are being observed. Such is the case between RM 41.5 and RM 18.9, where stream gradients are low and conditions for sediment deposition from agricultural runoff are high.

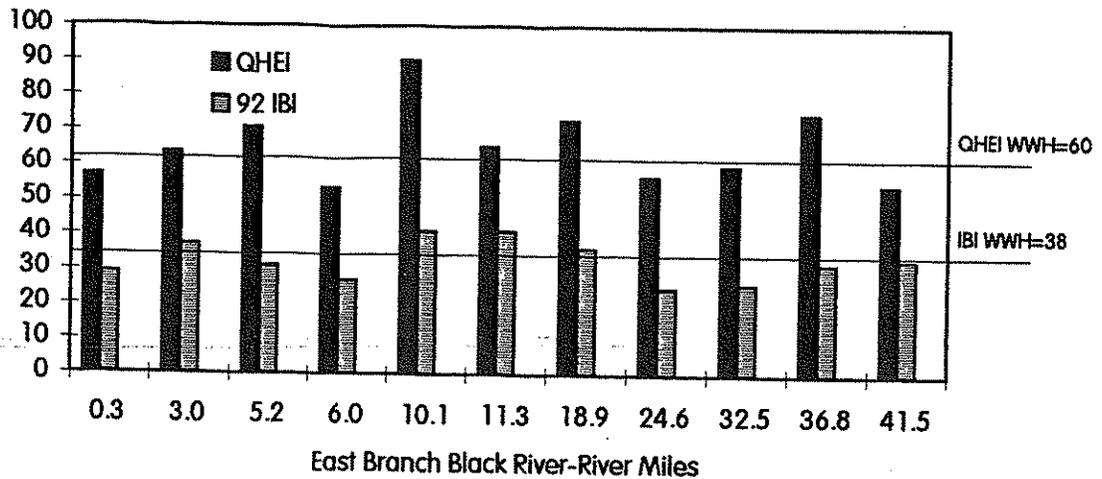
In addition to impacts from nonpoint pollution sources, negative impacts have also been observed downstream from the Lodi Wastewater Treatment Plant on the East Fork of the East Branch. Concerns focus on areas such as reduced dissolved oxygen levels and increased concentrations of cadmium, lead and zinc. Nitrate loadings also increased downstream from the Lodi WWTP. With the exception of the Lodi WWTP, point source pollution concerns on the East Branch are minimal.

From RM18.9 to RM3.0, physical habitat conditions are rather good, evidenced by high Qualitative Habitat Evaluation Index (QHEI) values and other objective measures employed by the OEPA during their comprehensive water quality study conducted in 1992. In this segment of the stream, gradients average more than 10 feet/mile and sediment deposition is minimized. As a result, fish and benthic communities within this segment of the East Branch are performing with the least apparent impacts of any fish communities within the entire watershed.

Point source pollution concerns in this segment of stream include decreased dissolved oxygen levels observed downstream from the Grafton WWTP and increased nutrient loadings observed in an unsewered residential area located near RM 3.0. Point source pollution impacts remain a concern in the Grafton area downstream and then again, in the Brentwood area. According to OEPA, increased development, particularly in the form of additional prison facilities may require expansion to the Grafton WWTP. Stream bank erosion and sedimentation resulting from agricultural activities are of significant concern and appear to present the greatest risks to water quality and biotic communities within the East Branch.

The following graph represents the QHEI and IBI ratings for each site on the East Branch that was sampled by OEPA during their 1992 study.

GRAPH II-2
QHEI & IBI East Branch-Black River



The following table provides additional information about habitat quality, corresponding relative values and various data for sites along the length of the East Branch.

TABLE II-8
Habitat Conditions of the East Branch of the Black River

River Mile	Gradient (feet/mile)	Substrate Embeddedness	Cover	# of Fish Species	IBI	QHEI	WWH Status
41.5	3.34	Extensive	Extensive/Moderate	24	33	54.5	Part
36.8	3.05	Moderate	Extensive/Moderate	20	32	75.0	Partial
32.5	1.55	Extensive	Extensive/Moderate	22	26	60.0	Non
24.6	1.95	Extensive	Extensive/Moderate	12	25	57.0	Non
18.9	2.98	Moderate	Extensive/Moderate	21	36	73.0	Full
11.3	12.82	Normal	Extensive/Moderate	23	41	65.5	Full
10.1	12.82	Normal	Extensive/Moderate	17	41	90.0	Full
6.0	8.33	Normal	Sparse	21	27	53.5	Non
5.2	2.44	Normal	Extensive/Moderate	22	31	84.0	Partial
3.0	13.51	None	Extensive/Moderate	18	37	63.5	Full
0.3	21.74	Moderate	Extensive/Moderate	13	29	57.0	Partial

WEST BRANCH-Black River: Relative Quality & Description

The West Branch is a relatively small river flowing for approximately 38 miles through the heavily agricultural portions of southwestern Lorain County. Approximately two-thirds of the length are designated headwaters and provide little or no opportunities for casual paddlers due to numerous logjams and impassable shallow areas. Where stream corridor is intact, adjacent woodlands

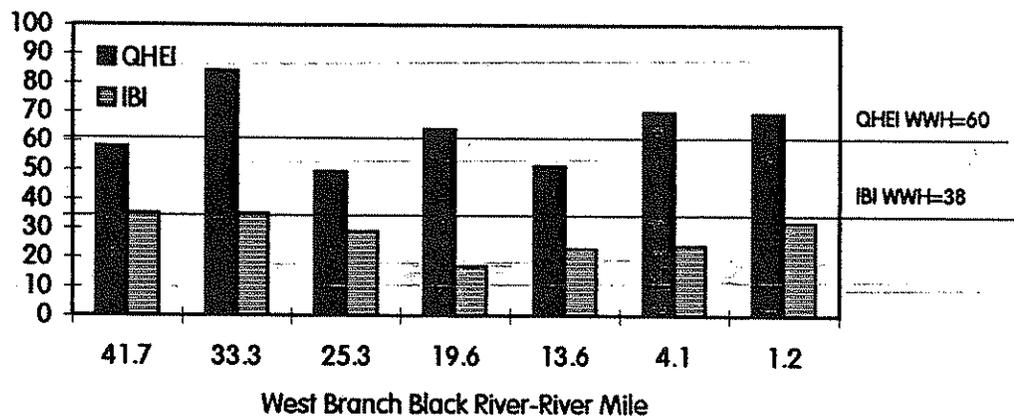
are comprised of mixed soft hardwoods, such as sycamore, boxelder and cottonwoods. Where streambanks are exposed and/or recovering, willows and other pioneer species are most prevalent.

Thirty-four species of fish were collected from the West Branch by OEPA during its 1992 study. The bigmouth shiner (*Notropis dorsalis*), a state threatened species was found in a number of tributary streams and in the upper reaches of the West Branch where nonpoint impacts are less pronounced. Macroinvertebrate communities declined from exceptional at RM 41.7 to fair at those sites nearest to Elyria.

Physical habitat conditions are widely variable from site to site and even in areas where physical habitat is good, both fish and macroinvertebrate communities are performing poorly. Unfortunately, the West Branch of the Black River has experienced considerable adverse impacts from nonpoint pollution and excessive sediments associated with agricultural runoff. FULL and PARTIAL attainment of Warmwater Habitat standards were recorded at only two sites on the West Branch. The greatest majority (more than 60%) of the West Branch is failing to meet WWH standards according to OEPA.

Nonpoint pollution concerns and increased sediment loading have drastically impacted water quality in the West Branch. During OEPA's 1992 study of the Black River, streambed sediments, substrate embededness and general agricultural nonpoint impacts at RM 19.6 was the most severe ever recorded on an Ohio stream. Five of seven reference stations on the West Branch exhibited extensive substrate embededness.

GRAPH II-3
QHEI & IBI West Branch-Black River



The following table provides relevant information about habitat quality, corresponding relative values and other data for sites along the length of the West Branch of the Black River.

TABLE II-9
Habitat Conditions of the West Branch of the Black River

River Mile	Gradient (feet/mile)	Substrate Embeddedness	Cover	# of Fish Species	IBI	QHEI	WWH Status
41.7	8.47	Extensive	Sparse	14	35	58.0	Partial
33.3	14.71	Normal	Extensive/Moderate	19	35	84.0	Full
25.3	3.62	Extensive	Sparse	19	29	49.5	Non
19.6	2.92	Extensive	Extensive/Moderate	13	17	64.0	Non
13.6	1.93	Extensive	Extensive/Moderate	14	23	51.5	Non
4.1	3.52	None	Extensive/Moderate	16	24	70.0	Non
1.2	7.14	Extensive	Extensive/Moderate	19	32	69.5	Non

Water Withdrawals in the Black River

Water diversions from the Black River are regulated and permitted by the Ohio Department of Natural Resources, Division of Water. During 1995, eleven permitted withdrawals were ongoing in the East Branch, West Branch and Black River. Although not inclusive of all water withdrawals on the Black River, the following are permitted water diversions as identified by the ODNR, Division of Water for 1995:

TABLE II-10
PERMITTED WATER WITHDRAWALS ON THE BLACK RIVER

Company Name	Intakes	Capacity	Branch
Oberlin Public Water Supply	1	9.00 mgd	West Branch of Black River
Forest Hills Golf Center	2	.18 mgd	Black River
Elyria Tubular	1	4.60 mgd	West Branch of Black River
Grafton (inactive 12/95) Public Water Supply	1	1.44 mgd	East Branch
Wellington Public Water Supply	not listed	not listed	W. Branch of Charlemont Creek
Elyria Country Club	4	.58 mgd	Black River
Riverside Orchard	1	.29 mgd	Black River
Spring Valley Country Club	1	.50 mgd	Black River
Royal Oaks Golf Club, Inc.	1	.30 mgd	Black River

Oberlin, Grafton and Wellington draw water from the Black River to recharge public water supply reservoirs and in the case of Grafton, an abandoned quarry site that is used for water storage. All three communities limit their withdrawals to periods of optimal conditions, usually the later winter months when sediment load and turbidity are minimized. Currently, no additional treatment steps are

required other than settling, filtration and disinfection. Water withdrawals from these communities generally do not have an impact on the Black River's flow.

Conversely, other large water users along the Black such as Golf Courses and other irrigators in the region, usually conduct their withdrawals during extended dry periods. Such withdrawals occur during periods when the general flow of the Black River is already depressed. However, it is also believed that such withdrawals do not have adverse impact on the biotic community within the river.

PERMITTED WASTEWATER DISCHARGES

The discharge of treated wastewater in the Black River is of interest due to the industrial, commercial and residential nature of portions of the watershed. Although the Ohio Environmental Protection Agency has observed considerable improvements in the discharges of treated wastewater in the years since implementation of the Clean Water Act, biological impacts are still being observed downstream from discharge points in many of Ohio's rivers and streams. Additionally, the Black River is a watershed that derives very little of its flow from ground water. Most of the river's flow is derived from precipitation and surface runoff during periods of high precipitation, and from treated wastewater discharges during extended dry periods. Clearly, understanding the amount and impact of treated wastewater discharges are relevant to studying the water quality with respect to Scenic River designation.

TABLE II-11
BLACK RIVER PERMITTED WASTEWATER DISCHARGES

Discharger	Permitted/Day	Discharge to:
Elyria Wastewater Treatment Plant (Elyria)	7.500 MGD	Black River
Lorain East Wastewater Treatment Plant (Lorain)	15.000MGD	Black River
French Creek Wastewater Treatment Plant (Sheffield)	7.500 MGD	French Creek
Oberlin Wastewater Treatment Plant (Oberlin)	.500 MGD	Plum Creek-W. Branch
Oberlin Water Treatment Plant	0.010 MGD	Plum Creek-W. Branch
Grafton Water Works	0.012 MGD	East Branch-Black River
Grafton Wastewater Treatment Plant (Grafton)	0.750 MGD	East Branch-Black River
Lagrange Wastewater Treatment Plant (Lagrange)	0.160 MGD	
Pheasant Run Wastewater Treatment Plant	0.100 MGD	
Lodi Wastewater Treatment Plant (Lodi)	0.800 MGD	East Fork - East Branch
Polson Rubber Company	0.003 MGD	East Fork-East Branch
Wellington Wastewater Treatment Plant (Wellington)	0.750 MGD	Charlemont -W. Branch
Wellington Water Treatment Plant (Wellington)	0.120 MGD	Charlemont-W. Branch
Sterling Foundry Company	0.003 MGD	Charlemont-W. Branch
Spencer Wastewater Treatment Plant (Spencer)	0.100 MGD	Coon Creek-E. Branch
Spencer Water Plant	0.003 MGD	Coon Creek-E. Branch
Brentwood Lakes Wastewater Treatment Plant	0.100 MGD	East Branch
Findley State Park Wastewater Treatment Plant	0.001 MGD	Charlemont-W. Branch
Findley State Park Campground WWTP	0.014 MGD	Charlemont-W. Branch
Eaton Homes Wastewater Treatment Plant	0.17 MGD	Willow Creek-E. Branch

In addition to the above permitted wastewater treatment discharges, a total of 28 permitted industrial operations discharge wastewater into the Black River watershed. Of the 28 permitted, only USS/KOBE Steel is considered a major industrial discharger of more than 1 million gallons per day. On an average monthly basis, according to the Black Remedial Action Plan 1995 Annual Update, 7 of the 28 industrial dischargers are not in full OEPA compliance with their permits.

More than seventy additional non-permitted manufacturing, schools, institutions and other organizations are discharging into the Black River watershed. Most of these discharges are relatively small and are regulated by the respective County Health Department within their jurisdictions. It is likely that most of these dischargers are small on-site aeration or other wastewater systems, however poorly functioning discharges, even if small have a cumulative adverse impact on a watershed.

The following represents summaries of the impacts of permitted wastewater discharges onto the Black River habitat and water quality. Also included is information regarding improvements and current discharge quality for each site where such information is available:

ELYRIA MUNICIPAL WASTEWATER TREATMENT FACILITY: (Mainstem)

Facility was upgraded in 1988 and continues to contribute to improvements in the water quality of the Black River mainstem. During comprehensive water quality surveys conducted by OEPA in 1982, dissolved oxygen levels in the Black were below the 4.0 mg/l minimum standard for five miles below the Elyria WWTP. During the 1992 OEPA study, dissolved oxygen levels were generally above 8.0 mg/l as far downstream as the navigation channel at RM 3.0-0.10. Much of this improvement is attributed to the \$38 million in upgrades that were completed on this facility in 1988.

OBERLIN WASTEWATER TREATMENT PLANT (Plum Creek-W. Branch)

The city of Oberlin (8,660) operates a ½ MGD contact stabilization activated sludge WWTP that discharges to RM 3.0 of Plum Creek. Flows from the Oberlin WWTP have declined since the city started a sewer rehabilitation project in their service area. A \$4.3 million upgrade was completed in 1988.

VILLAGE OF GRAFTON WASTEWATER TREATMENT PLANT (East Branch)

The village of Grafton (2,2,31) operates a 0.75 MGD bath treatment WWTP with effluent discharged to RM 11.2 of the East Branch of the Black River. A \$1.8 million expansion of this facility was completed in 1988. Since that time, additional flows have been directed to this facility as smaller treatment plants have been tied to the Grafton facility. Pollutant loadings of all permitted parameters have been steadily increasing.

OEPA studies indicate that dissolved oxygen levels steadily declined for four miles below the Grafton WWTP, however levels never dropped below 6.0 mg/l, which is well above the 4.0 mg/l minimum standard. Sampling also indicated that phosphorous concentrations increased below the Grafton WWTP. Other nutrient concentrations also increased below the WWTP. Nutrient loadings may be related to decreases in dissolved oxygen levels and continue to be a concern.

Biological community impacts were noted at RM 6.0, 5.4 and 5.2 and most likely result from sludge handling problems experienced at the Grafton WWTP.

FRENCH CREEK WASTEWATER TREATMENT PLANT (French Creek-Mainstem)

The city of North Ridgeville, (population 21,522) operates the 7.5 MGD French Creek WWTP that discharges to RM 2.8 of French Creek. Flows are also contributed by the city of Avon (7,214) and the village of Sheffield (1,886). Flows from this WWTP have been steadily increasing as sewers are extended further into the service area. Loadings for certain heavy metals and total suspended solids have been increasing while loadings for nutrients have been decreasing.

CITY OF LORAIN WASTEWATER TREATMENT PLANT (Mainstem)

15 MGD Lorain East WWTP discharges at RM 0.2 directly into the navigation channel. Flows are also contributed by the city of Sheffield Lake (10,484). Flows from this facility declined when the Lorain West WWTP was brought online. However, recent trends show an increase in flow being processed and released by this facility. Suspended solids, copper, lead, zinc and other loadings are increasing as well.

USS/KOBE STEEL (Mainstem)

USS/KOBE steelworks, a fully integrated steel mill, discharges cooling water and processed wastewater through six outfalls between RM 5.0 and 2.5 of the Black River mainstem. Pollutants from outfalls 001-003 have declined since the early 80's while flows from outfall 004 and 005 have increased steadily. Outfalls 004 & 005 are growing sources of suspended solids, Amonia and oil & grease discharges into the Black River mainstem. Flows from outfall 006 which services the leachate treatment system at the dredge sediment landfill are declining steadily.

LODI WASTEWATER TREATMENT PLANT (East Fork of the East Branch)

Flows from the Lodi WWTP averaged 0.8 MGD during 1992, a nearly four-fold increase from 1982 when flows averaged little more than 0.20 MGD. Nutrient loadings have been declining during the last 2-3 years. An expansion and upgrade to this facility was completed in 1988.

Effects of the Lodi WWTP that have been observed on the East Fork of East Branch include a depression of dissolved oxygen levels downstream, increased levels of cadmium, copper, and zinc concentrations, increased nitrogen and phosphorus loadings as well an increase in residual chlorine levels. Although impacts are being observed on the East Fork, OEPA studies have been able to detect no impacts from the plant on the East Branch of the Black.

WELLINGTON WWTP (Charlemont Creek-West Branch)

Phosphorous and Nitrate concentrations increased significantly downstream from the confluence of Charlemont Creek and the WWTP tributary. Phosphorus

levels were particularly highest at RM 25.0 where Charlemont Creek enters the West Branch of the Black River.

RECREATIONAL RESOURCES

Public recreational, hunting and fishing opportunities are found in abundance within the Black River watershed, particularly in the southern, agricultural areas of Lorain and Medina counties. The Lorain County Metroparks System is the most significant public recreation land-holder, administering seven park facilities throughout the watershed consisting of more than 4,600 acres. In addition, the Divisions of Wildlife and Parks & Recreation of the Ohio Department of Natural Resources, administer several large facilities, such as Spencer Lake State Wildlife Area and Findley State Park. Additionally, the cities of Elyria and Lorain administer park areas which provide widespread fishing access to the Black River.

Public interest and participation in recreation along the Black River is significant. For example, the Lorain County Metroparks reported visitation at its Black River park areas to be 750,000 during 1996. In response to such demand, Metroparks also presents an aggressive public programming schedule which included more than 1,600 interpretive programs presented by Park Naturalists. More than 110,000 people participated in these programs during 1996. Most years, visitation at Metropark sites along the Black River exceeds one million.

The following are brief descriptions of facilities offering hunting, fishing and other outdoor recreational opportunities along the Black River:

SPENCER LAKE STATE WILDLIFE AREA:

This 618 acre wildlife area is located in Medina County, approximately two miles east of the village of Spencer, north of state route 162. Located in the southern portion of the Black River watershed, this area is characterized by a 78 acre man-made lake constructed in 1968 and rebuilt in 1970 after a severe storm in 1969 washed out the north dam.

The lake was rehabilitated in 1985 and provides fishing for bluegills, largemouth bass and channel catfish. Small game hunting in the area is very popular with an abundance of cottontail rabbits, ring-necked pheasants and fox squirrels attracting most attention from hunters. Other wildlife found in the area include muskrats, raccoons, mink, opossum, skunks, white-tailed deer and wild turkey.

WELLINGTON STATE WILDLIFE AREA:

Wellington State Wildlife Area is located in Huntington Township in Lorain County, approximately 2.5 miles south of Wellington on State Route 58. This was the original state game farm, purchased by the state of Ohio in 1917. The rearing of pheasants and other game animals was discontinued at this site in 1960.

Approximately 72 percent of the area is open field; 18 percent is mature woodland of beech-sugar maple climax forest; and, the remaining 10 percent of acreage is in brush. Small game hunting is the major recreational use of the area.

Wildlife observation, hiking, fishing and bird watching are other popular public uses.

FINDLEY STATE PARK:

Located two miles south of Wellington, Findley State Park was originally donated to the state of Ohio by Guy B. Findley in 1936 to be added to the state forest system. In 1950, the forest was transferred to the Division of Parks & Recreation to be maintained as part of the Ohio State Parks System.

Findley Lake was formed when an earthen dam was constructed across Wellington Creek, (a tributary of the West Branch of the Black River), in 1956. The park encompasses 903 land acres and 93 water acres and provides an abundance of camping, fishing, hiking, picnicking and other recreational opportunities. A 435 feet long sand and grass beach is available for swimmers.

Fishing is popular in Findley Lake with catches of Bluegills, Largemouth Bass and Northern Pike being reported. Waterfowl hunting is permitted at select places in the park during the season.

Black River Reservation (Lorain County Metroparks):

The Black River Reservation is comprised of approximately 883 acres of Black River bottomland and forests. The area lies primarily within the city limits of the cities of Elyria and Lorain and is heavily used by outdoor enthusiasts. The mainstem of the Black River cuts a scenic and meandering path through sycamore-cottonwood-maple floodplain forests while exposing tall shale cliffs.

The focus of the reservation is a 3.5 mile hiking and biking trail running along the shoreline of the Black River. The trail is a twelve foot wide asphalt trail suitable for all forms of non-motorized transportation, except horses. Three picnic areas are located throughout the park as well as drinking water and public restrooms. With 1996 visitation at more than 400,000 park users, this facility is the most heavily visited of Lorain County Metropark sites along the Black River.

French Creek Reservation (Lorain County Metroparks):

French Creek Reservation is a 428 acre facility adjacent to the French Creek in the far northern portion of the Black River watershed. (French Creek empties into the Black River mainstem at River Mile 5.0.) Facilities include more than four miles of hiking trails winding through woodlands and the three scenic streams flowing through the park, and the art-deco French Creek Nature Center built in 1990.

An interesting facility with a wide variety of woodland and old-field habitats, French Creek is an excellent location for birding, hiking and other day-use activities. During 1996, more than 64,000 visitors attended the French Creek Reservation.

Indian Hollow Reservation (Lorain County Metroparks):

Indian Hollow reservation consists of two parcels (nearly 300 acres total) of property along the East Branch of the Black River. A truly scenic reservation, Indian Hollow is a park of historical importance due to the 60-80 acre old

grindstone quarry located on the property. At one point in the early 1800's, the quarry at Indian Hollow provided the stones used by nearly all of the mills active on the Black River. Metroparks staff provide numerous interpretive programs throughout the year highlighting the area's important contribution to the early history of the watershed.

Less heavily used than other Metroparks facilities, Indian Hollow provides the park visitor with a scenic and remote experience. The East Branch of the Black River is particularly scenic through this area, with heavily forested river corridor and an abundance of songbirds and other wildlife. During 1996, park visitation slightly exceeded 50,000.

Carlisle Reservation (Lorain County Metroparks):

Carlisle Reservation is the largest of Lorain County Metroparks properties, consisting of more than 1,500 acres located along the West Branch of the Black River in central Lorain County. The park provides visitors with an interesting variety of habitats to experience such as floodplain communities adjacent to the river to upland forests and old-field meadows. The river also fosters numerous wetlands and their associated diverse communities of plants and animals in low-lying areas near the Black's current and/or former paths.

The Carlisle Reservation also includes a well developed public use area comprised of numerous hiking trails, picnic areas, fishing ponds and the Carlisle Visitor Center. Carlisle is also an important resource for equestrians in the watershed. A full equestrian center is available at the park as well as more than seven miles of bridal trails.

During 1996, more than 200,000 visitors participated in activities and otherwise enjoyed the facilities offered at this park. Carlisle is also home to the administrative offices of the Lorain County Metroparks System.

Cascade/Elywood Park (City of Elyria):

Cascade and Elywood Parks are located within the city of Elyria at the confluence of the East and West Branches. Representing some of the most spectacular land in the Black River watershed, the most striking characteristic of these parks is the river and its impact on the area's geology. The centerpieces of the park are the forty foot high East and West falls and the associated gorge of the Black River. Additionally, there are a number of unique rock formations which have been carved by the river. The park area is also very rich with the local history, having been initially donated to the city by Elyria's founding father, Herman Ely. Remnants of mills and other early structures are scattered throughout the park area.

Cascade Park is an important recreational resource for the Black River, providing vital urban green space and important river buffer protection. The park also represents what may be the most vital historical resource in the basin. Home to many of the earliest native Ohioans, Cascade Park is one of very few sites in the basin where the public may explore the Black River's earliest history. Efforts by the city to upgrade facilities and redefine recreational use within the park recently resulted in the preparation of a Master Plan in 1994 for Cascade and Elywood Parks. Copies of this document are available for review at the reference desk of the Elyria Municipal Library.

Other Related Recreational Facilities:

The most numerous recreational facilities within the Black River watershed are golf courses. Like many other watersheds in proximity to municipal areas, undeveloped rural and semi-rural property attracts golf course development and related recreation. Although not facilities that will directly contribute to public participation in preserving the river, golf courses do provide legitimate outdoor activities that contribute to the value of the watershed as a whole.

It is important to note that many of these golf courses are immediately adjacent to various branches and tributaries of the Black River. As a result, golf course managers have vital roles in becoming responsible land stewards on the river. Mowing and other land management practices which encourage removal of streamside vegetation directly contribute to stream bank erosion and the introduction of sediment and silt to the river community. The golfing community, like the agricultural community, needs to be sensitized to the importance of maintaining streamside forest and other woody cover. Additionally, where current stream bank erosion is occurring on golfing facilities, stream bank stabilization alternatives to rip-rapping and other channel modifications need to be considered and implemented. Organizations such as local soil & water conservation districts, the Black RAP, Seventh Generation and others can play a crucial role in helping to educate golf course managers throughout the watershed to better care for their stream banks and to further protect the water quality of the Black River.

CANOEING AND RECREATIONAL BOATING

When compared to other rivers and streams in Ohio, the Black River does not provide a great deal of recreational boating and canoeing opportunities, with the exception of important Lake Erie access that is provided to power boaters in the Lorain and Sheffield areas. The majority of the Black River system is canoeable only on a seasonal basis and current recreational use of the river by casual canoeists is negligible. One exception is during the spring of the year, when the Black River Canoe Race, sponsored by the Seventh Generation, a local non-profit organization), attracts approximately 100 competitors each year. This event has been held annually for many years in the lower portion of the mainstem.

Nearly all Ohio rivers and streams are dependent upon rainfall and tend to have low flows late in the season which are not conducive to canoeing and/or recreational boating. Canoeing on the Black River is particularly restricted by such seasonal variations in river flow. According to the ODNR-Division of Watercraft, long stretches of the East and West Branches are only seasonally passable and most stretches possess considerable logjams and portages. Even the mainstem of the Black River south of Elyria is difficult to paddle during the late summer and early fall months.

The East Branch is suitable for recreational canoeing on a regular basis from just upstream of the State Route 303 bridge near Grafton to the Coonville Road Bridge in Elyria, where take-out is mandatory due to the impassable waterfalls under the Lake Street bridge in Elyria. In this stretch of river, paddlers can expect several portages around two dams and numerous low-water stretches.

One particular stretch of the East Branch suitable for casual paddling is from Route 303 to just south of the city of Grafton. Although immediate access to

the stream is limited to the roadside and somewhat difficult, paddlers are rewarded by sharing this section of stream only with an occasional deer or Great Blue Heron. This stretch of the river is remote and scenic and possesses adequate flow and remarkably few obstacles. With the exception of a small length flowing through Indian Hollow Lakes Golf Course, much of this portion of the East Branch is bordered by Indian Hollow Metroparks property and long stretches of undeveloped, heavily forested stream corridor. Paddlers can expect to observe wildlife, numerous songbirds and generally pleasant, natural riverine conditions.

Downstream from Grafton to Laporte, the stream is also relatively scenic and passable during periods of moderate water flow. However, the stream flows through long stretches of sandstone bedrock, has a slightly higher gradient and presents more obstacles such as a shallow water, riffles and rapids and generally is not conducive to casual paddling. Additionally, canoeists will encounter increasing numbers of residences and other human intrusions throughout this stretch of the East Branch.

The West Branch of the Black River is largely impassable. Approximately two-thirds of the length of the West Branch are designated headwaters with only a very short segment of stream designated canoeable year-round. Although some public canoe access is available southeast of Oberlin, year-round canoeing is limited to a short stretch northeast of Oberlin to the mandatory take-out at Third Street or Chestnut Street in Elyria.

The mainstem of the Black River provides paddlers with the most abundant opportunities from Cascade Park to the mouth of the river in Lorain. However, canoeing within this stretch of river during high flow periods is treacherous, and during low flow periods, frustrating and difficult. Paddlers will encounter logjams and numerous shallow and impassable riffle areas requiring wading across slick bedrock flats.

The stretch of the mainstem from the Elyria WWTP to its confluence with French Creek flows largely through the Black River Reservation, a Lorain County Metropark. Although the stream itself is relatively isolated, providing the paddler with views of large, deeply cut shale cliffs on one side and heavily forested river corridor on the other, numerous distractions are present in the form of frequent bridge crossings, traffic noise and odors from industrial stacks downstream.

Although suitable for some recreational paddling during periods of moderate stream flow, use of this section of stream by canoeists is almost non-existent. Most recreation within the area is associated with the hiking and biking trails found within the Black River Reservation.

The following is a brief listing of Black River canoe access sites as provided by the Ohio Department of Natural Resources, Division of Watercraft. It is important to note that these sites are primitive and undeveloped. Canoeists should exercise caution and obtain permission prior to accessing the river via private property.

BLACK RIVER STUDY-DESCRIPTION OF THE ENVIRONMENT
Section II-33

TABLE II-12
BLACK RIVER CANOE ACCESS FACILITIES

BRANCH	DESCRIPTION	NEAREST TO	COUNTY	PARKING	CANOE RENTAL	REST ROOM	WATER	PICNIC
EAST	State Route 162 & Spencer Mills Road east of Spencer Roadside Access-River Left	Spencer	Medina	Roadside	No	No	No	No
EAST	Foster Road and Short Road Northeast of Penfield Roadside Access-River Right	Penfield	Lorain	Roadside	No	No	No	No
EAST	State Route 303 Bridge Roadside Access-River Right	LaGrange	Lorain	Roadside	No	No	No	No
EAST	Parson Road in Grafton Roadside Access-River Right	Grafton	Lorain	Roadside	No	No	No	No
EAST	Coonville Rd & East River Rd Roadside Access-River Right	Elyria	Lorain	Roadside	No	No	No	No
WEST	Hughes Rd. Bridge-Oberlin Roadside Access-River Right	Oberlin	Lorain	Roadside	No	No	No	No
WEST	West Rd. Bridge & Kipton Nickel Plate Rd. Roadside Access-River Left	Oberlin	Lorain	Roadside	No	No	No	No
WEST	State Route 10 Bridge Roadside Access-River Left	Elyria	Lorain	Roadside	No	No	No	No
MAIN	Elywood Park off Washington Park Access-River Right	Elyria	Lorain	Parking Lot	No	Yes	Yes	Yes
MAIN	Cascade Park off Floradale St. Park Access-River Left	Elyria	Lorain	Parking Lot	No	Yes	Yes	Yes
MAIN	Black River Reservation off Ford Road Park Access-River Right	Sheffield	Lorain	Parking Areas	No	Yes	Yes	Yes

HISTORICAL & ARCHAEOLOGICAL RESOURCES

"But the classic lore of these wilds is unwritten, no moldering marble points out to us where the redman triumphed."

-Elyria Courier (1853)

The settlement of Ohio occurred primarily along the paths of rivers and streams. Providing important access through the densely forested territories, native Americans and European settlers alike relied upon Ohio's rivers for transportation, food, energy for early mills and important locations for settlements. Virtually every large municipality in the state is located on a river or other major waterway. Rivers continue to have considerable influence in our society.

Every river in Ohio possesses a rich and diverse body of history. Only recently have we begun to recognize the value of how these historic stories contribute to our increased sense of community and the need for responsible stewardship. Hopefully, this brief examination of the history of the Black River watershed will contribute to the efforts being undertaken to restore and preserve this important resource.

PREHISTORIC INHABITANTS-PALEO-INDIANS

Native peoples inhabited North America more than 30,000 years ago, appearing first in the northwest and gradually migrating east and south. In Ohio, the first evidence of inhabitants dates back more than 10,000 years when small nomadic bands of Palaeo-Indians followed the megafauna of the Pleistocene Age into the territory. Flint spearpoints, knives and chopping tools found at ancient campsites indicate that groups of 30-50 hunters lived upon the southern shores of ancient glacial lakes such as Lake Maumee and Lake Whittlesey. Although little is known of the Palaeo-Indians in Ohio, it is believed that this group departed about 7,000 BC as Ohio's climate warmed with the retreat of the last glaciers.

ARCHAIC INDIANS

Descended from the Palaeo-Indians, the Archaic Indians arrived on the southern shores of Lake Erie around 6,500 BC. In addition to being adept hunters of bear, deer, wild turkey and other animals that were becoming abundant, this group was the first in Ohio to become effective gatherers of roots, berries, tubers, leaves and nuts. This period of native history is known as the Foraging Stage and coincided with the significant changes that were occurring with the end of the Ice Age. It is during this period that Ohio's present ecology evolved.

Like their ancestors, the Archaic Indians relied upon flint tools and weapons to secure game. They also lived in small groups, sometimes as small as single families traveling from one campsite to another in pursuit of game animals and ripening berries and seeds. It is believed that the remnants of one such campsite was found in the Elyria area along the Black river. One Archaic group in particular,

the Glacial Kame Indians were believed to use the area. Although no active archaeological sites from this period currently exist within the watershed, it is nonetheless important to note their historic presence.

ADENA-HOPEWELL INDIANS

Around 1,000 BC, the hunter-gatherer lifestyle transformed when the Adena Indians discovered crude agricultural techniques and skills. For example, the Adena Indians were the first people to cultivate corn that was introduced from Mexico to the Ohio region around 800-900BC. Although primarily inhabitants of southern and central Ohio, the Adenas had significant influence upon the tribes who would later settle into the Black River region. For instance, squash seeds left behind in approximately 520BC by descendants of the Adenas were found in Lorain County along the Black River.

Around 100BC, a new group of people, the Hopewell Indians arrived. The Hopewell traveled and hunted throughout northern Ohio and the Black River region. Hopewells were also the first Ohio natives to be magnificent artisans, skilled at creating ornaments and other objects used in ceremonies and/or as symbols of status. Most objects created by the Hopewells were forms in nature, such as hawks, owls, cranes, wildcats, bears and turtles, toads and other animals. Exceptional examples of these artifacts are available for public viewing at the Ohio Historical Society in Columbus, Ohio.

Several archaeological sites along the Black River were inhabited by immediate descendants of the Hopewell. The most intact sites are found within the Eiden Prehistoric District, an area near the confluence of the Black River and French Creek, comprised of three late prehistoric occupation sites. The locations of particular archaeological interest are known as the Eiden site, Colorado Road site and Stormy Acres Village.

The Eiden Road site was partially excavated between 1955 and 1964 by A. Bungart of Avon, Ohio. Hundreds of bone, flint, ceramic and shell artifacts were recovered which possess Hopewellian (or Middle Woodland) components. Although no discernible features of this ancient village are currently visible above ground, it is believed that considerable artifacts still exist underground.

The Colorado Road site was first discovered in the late 1800's by David C. Baldwin. Located on a river bluff just north of the Eiden Road site, Baldwin excavated and documented his findings from this village. Artifacts included four triangular brass points and many flint objects. His collection of artifacts and the reports of his findings are contained within the Baldwin Collection at the Western Reserve Historical Society Museum in Cleveland, Ohio. Like the Eiden site, no discernible features of this village are visible above ground. Both the Eiden site and the Colorado Road site are currently protected on property owned by the Lorain County Metropolitan Park District.

The third site in the Eiden Prehistoric District is located on private property just outside the Lorain County Metropolitan Park District lands. Stormy Acres Village is a significant village site consisting of about 125 meters by 40 meters. Numerous complete and quite intricate artifacts characteristic of the Hopewells have been recovered here, including flint pieces, slate gorgets and pipes.

The archaeological significance of these sites rests in the discovery of the brass pieces that were found. Such artifacts indicate the inhabitants of these villages had some prior contact with some European and/or other "white" cultures. Very few sites in Ohio have clear evidence of pre-historic occupation after white contact. Further research and excavation at these sites will no doubt contribute to our better understanding of how the Indians of the Black River region reacted culturally to the European influences. For these reasons, the Cleveland Museum of Natural History has nominated the Eiden Prehistoric District for inclusion into the National Registry of Historic Places.

The Hopewells disappeared with little explanation around 500AD, leaving many more questions than answers about their culture. It is believed their demise was attributed to either unknown conquerors, epidemics or a cooling of the climate that drastically affected their corn and squash crops.

LATE WOODLAND INDIANS

Late Woodland peoples were most likely Hopewellian descendants. Initially, they were not dependent upon elaborate earthworks or permanent villages. Instead, they appear to have been primarily hunters and gatherers. Ohio's climate was continuing to change and it is believed that climatic conditions during this period may not have been conducive to crop production. Like the Hopewell people before them, the late Woodland Indians were very dependent upon the resources of rivers and Lake Eries. Very few Late Woodland Indian village sites have been found in Ohio.

The Whittlesey Indians were the first of the Late Woodland peoples to construct villages and rely more heavily upon agriculture. At first, they were also believed to be nomadic hunters and gatherers, however archaeologists discovered a Whittlesey village near Cleveland believed to be used around 100AD. Between 1400-1600AD, the Whittlesey people were constructing fortified villages consisting of long houses like those used in later years by the Iroquois. It is believed that at least two Whittlesey villages existed on the Black River.

Commonly known as Old Fort Lot, this fortified village site consisted of several mounds used for burial and fortification purposes. Fort Lot is believed to have been inhabited by a tribe of Late Woodland Peoples of the Sandusky Tradition. These people were known to build houses, flint weapons and tools and were primarily hunters and gatherers of nuts, berries and tubers.

Fort Lot once consisted of four mounds, each constructed in a semi-circle on the west bank of the Black River. Each mound was surrounded with double walls of earth, probably 7-8 feet high, with each mound encompassing an acre or more. First discovered in the middle 1800's, Fort Lot has unfortunately been plowed for agricultural use and little remains of the original fortification. A variety of bones and other artifacts have been recovered from this site throughout the years.

Although less well known than Fort Lot, the second village site on the Black River of Late Woodland age, known as Fort White, is archaeologically of much greater significance. This site, also located within the boundaries of the Lorain County Metropolitan Park District is currently being excavated by archaeologists from the Cleveland Museum of Natural History. Although first documented in the

middle 1800's, major excavation did not begin until April, 1995. Artifacts include flint drill points, fish bones and other items such as pottery.

Beyond the obvious archaeological value, this site has tremendous potential as an educational site. The Cleveland Museum of Natural History periodically conducts excavation activities using school groups as active participants. Newspaper accounts of such school programming, indicate that such hands-on history lessons are invaluable to improving children's understanding of the history of their area.

RECORDED HISTORY OF THE REGION

The recorded history of the Black River dates back to the mid 1650's when Jesuit missionaries and explorers began recording their experiences in the area. The first definite records appear around 1626 when Father LaCrouce Davillion documented preaching to a small group of Huron Indians on the north shore of Lake Erie. From his experience with the Hurons, comes knowledge that the Erie Indians occupied the southern shore of Lake Erie from New York State to Sandusky Bay:

THE ERIE INDIANS

The Erie Indians were powerful warriors, laying claim to the southern shores of Lake Erie and ruling the region for decades and perhaps centuries. It is with some irony, that for the first of Ohio tribe for which there is factual history, we lack any detail. Very few artifacts from this tribe have been found. During the 17th century, the French and other Europeans were deterred from traveling through the south shore of Lake Erie due to conflicts between the Eries and the Iroquois (also known as the Five Nations). The Iroquois were a confederation of five tribes pulled together to expel the war-like Eries from the region. In 1655, the Iroquois completely annihilated the Eries and the southern shore of Lake Erie was confiscated. By the time LaSalle arrived on the Niagara River in 1679, the memory and history of the Eries was mere tradition among the tribes that he encountered. The sole legacy of the Eries is their name for the Great Lake upon whose shores they lived.

WYANDOT & HURON INDIANS

Following the ouster of the Eries, the south shore of Lake Erie remained somewhat uninhabited. The region was primarily used as a common hunting and fishing ground for several of the tribes comprising the Five Nations. Eventually, the Wyandot Indians and small bands of Hurons (who also had been crushed by the Five Nations), began to inhabit the south shore in the early 1600's.

The Wyandot Indians are the most familiar of Ohio natives, in part because they were the last tribe to reside in Ohio. "*Canesadooharie-or stream of freshwater pearls*", is the native name for the Black River and is believed to be Wyandot in origin. The Wyandots and to a lesser extent, the Hurons were the

inhabitants of this region during the period of European settlement. The Wyandots were eventually relocated to a reservation in Seneca and Sandusky Counties during the early 1800's and eventually were moved out of Ohio around 1830. There are no active Wyandot historic sites on the Black River, however a number of interesting stories may be found in regional historical literature such as Mary Beebe Hall's *Reminiscences of Elyria, Ohio* published by the Lorain County Historical Society in 1900. Copies are available for review at the Elyria Public Library's Reference Desk.

EARLY EUROPEAN HISTORY OF THE REGION

The first recorded European inhabitant in the Black River region was a less than willing participant. In 1754, James Smith and a companion were working on a military road to help General Braddock's army reach Fort Duquesne safely. Smith's partner was killed in an ambush by a band of Wyandots and Smith was captured. Smith was taken to an Indian village on the Muskingum River where he was forced to run the gauntlet many times before being adopted as a member of the tribe.

Following his induction into the Wyandots, Smith and a young Indian brave set out on a hunting trip along the shores of Lake Erie. Stopping briefly at a Wyandot settlement on the "*Canesadooharie*", they then traveled to their winter destination in 1755-56 which was near a great falls on the Black River. Historians have little doubt that Smith spent that winter at the site now occupied by Cascade Park in Elyria. Smith eventually escaped and boarded a French ship after five years of captivity with the Wyandots in April of 1759. Smith's life with the Wyandots was later published and the first recorded history of the Black River region was complete.

In 1816, a young bachelor named Herman Ely left his father's home in Massachusetts to become proprietor of 10,500 acres of virgin forest in the Ohio territory. At the time, Wyandot and Seneca Indians still roamed the region, canoeing up the Black River and camping in the big cave below the falls of the Black River. Shortly after his arrival, Ely established a small settlement in the forest a short distance above the East Falls of the Black. This settlement would quickly grow into what is now Elyria, Ohio.

Elyria's location at the junction of the Black River's two branches was ideal for Ely and the other settlers who needed water power for the mills which would become the area's first industries. Within eight years of his arrival, the "Old Red Mill" had been precariously constructed on an overhang above the East Falls. A smaller mill was constructed in the gorge at the bottom of the falls and the seeds of Elyria's commerce were sown. On the west branch of the Black River, below the falls, the Lorain Iron Company was established in 1832 with capital provided by Herman Ely. To this day, a large amount of slag and remnants of the original foundation may still be found on the bank below the West Falls.

Two historic events occurred in the Black River gorge that affected the scenic condition of the Black River Falls. According to historical collections, at about 6AM on July 23, 1872, the town of Elyria was awakened by a tremendous rock fall. It is estimated that the rock that fell from the top of the East Falls was

nearly 65 tons. This large slump block is still visible in the gorge area. A second destructive event was the flood of 1913 which tore up numerous trees, washed out protective banks and further loosened the foundations of other large rocks on the top of the falls, which slumped toward the gorge bottom.

For the sake of this study, detailed histories of Elyria and Lorain County are not necessary or possible due to time limitations and their overall relevance to scenic river designation. However, a number of sites exist within the Elyria area that may have historic significance. At the very least, they provide interesting tales of the region's earlier days. For example, within Cascade Park the "Robber's Den", a cavern located about 100 feet downstream from the West Falls is located on the northerly side of the river. Less-than-precise accounts suggest this was once a rendezvous point for counterfeiters and a secret hiding place for the "famous" Blinky Morgan gang of robbers. The old Iron Foundry site and several old mill sites still exist within the Black River Gorge in Elyria. One operating grist mill exists on the East Branch of the Black River. The "Old Mill", originally constructed in the mid 1800's, is located on Old Mill Road in Chatham Township, Medina County. The mill operates about once a month for those interested in observing the region's earliest form of commerce. However, the waterwheel is no longer functional, so the mill is powered by a John Deere tractor.

The milling age within the Black River region is well represented at Indian Hollow Metropark where grindstones for the early mills were quarried from the site. As a result of rich history in the park, staff incorporates the story of the quarry and early mills into many of their programs.

GENERAL CONCLUSIONS

Clearly, the Black River Watershed possesses an extremely rich and diverse body of history that should be preserved and retold. Unfortunately, many of the sites identified previously have experienced significant disruption, damage, vandalism and/or destruction. With respect to historical and archaeological resources, such sites along the Black River are not highly developed, restored and/or publicly accessible as on other Ohio rivers such as the Little Miami or Maumee Rivers. As a result, the opportunity for the public to access and experience Black River historic sites is minimal.

The pre-historic Indian sites within the Lorain County Metroparks are protected from further damage, however with the exception of the Fort White Site, such sites are unremarkable in their current condition. Additionally, the opportunity for public participation and education about the native history of the region is not generally available. However, a great deal of early historic interpretive and educational programming is conducted by the Lorain County Metroparks Interpretive staff. For example, during 1996, more than 110,000 park visitors attended nearly 1,600 public interpretive programs. Many of these programs, such as those conducted at Indian Hollow Reservation dealt with topics of a historical nature.

FISH AND WILDLIFE RESOURCES



MAMMALS

The only recent census of mammals within the Black River watershed was completed by C. William Limbach in 1992. This survey was completed for the Black River Remedial Action Plan and represents the most recent inventory completed basin wide. Additional information and survey work was completed by the Natural Resources Management staff of the Lorain County Metroparks. Information was also obtained from Dan Rice, Chief Zoologist for the Division of Natural Areas & Preserves and the Ohio Natural Heritage Database.

The Black River Watershed is home to at least 37 species of mammals. Species frequently observed in the region include white-tail deer, raccoon, muskrat, opossum, fox, gray and red squirrels, woodchuck and cotton-tail rabbits. Less frequently observed species but also relatively common within the watershed include: big brown, little brown and eastern pipistrelle bats, mink, red & gray fox, striped skunk and several species of mice and shrews.

Mammals within the watershed are usually more closely associated with one form of habitat than others. For instance, among the riparian forest corridors several species such as fox squirrels, chipmunks, raccoons, short-tailed shrews and deer mice are more common. Species commonly associated with transitional forest communities and edge habitats include opossum, cottontail rabbits, red and gray fox, weasels and white-tail deer. Pastures and other grasslands provide suitable habitat for species such as woodchuck, red fox, meadow voles and many others. Although each of the mammal species may be found in any of the above habitats, some are clearly more abundant in habitat more suited to their preferences.

The mammals residing within the Black River watershed are common to most Ohio river communities. One exception may be the record of river otters inhabiting the watershed. Although once common in Ohio, river otters have only recently been reintroduced in northeast Ohio by the Division of Wildlife. It is likely that the otter tracks observed along the Black river are those of a transient individual migrating to and/or from streams such as the Grand River farther to the northeast. There is no evidence to suggest that a breeding population of otters exist within the Black River watershed.

Another water-related mammal that may be growing more common is the Beaver. Beaver populations along Ohio river's is generally increasing, particularly in the north and eastern portions of the state. Although it is presently unknown

how abundant beaver are within the Black, it is believed that breeding populations in the watershed are increasing.

The following represents a comprehensive listing of all mammal species observed (and or quite likely to exist) within the Black River watershed.

TABLE II-13
MAMMALS OF THE BLACK RIVER WATERSHED

Order	Common Name	Scientific Name
<i>Artiodactyla</i>	White-tail Deer	<i>Odocoileus virginianus</i>
<i>Carnivora</i>	Eastern Coyote	<i>Canis latrans</i>
<i>Carnivora</i>	Gray Fox	<i>Urocyon cinereoargenteus</i>
<i>Carnivora</i>	Least Weasel	<i>Mustela rixosa</i>
<i>Carnivora</i>	Long-tailed Weasel	<i>Mustela fernata</i>
<i>Carnivora</i>	Mink	<i>Mjustela vison</i>
<i>Carnivora</i>	Raccoon	<i>Procyon lotor</i>
<i>Carnivora</i>	Red Fox	<i>Vulpes fulva</i>
<i>Carnivora</i>	River Otter	<i>Lutra canadensis</i>
<i>Carnivora</i>	Striped Skunk	<i>Mephitis mephitis</i>
<i>Chiroptera</i>	Big Brown Bat	<i>Eptesicus fuscus</i>
<i>Chiroptera</i>	Eastern Pipistrelle	<i>Pipistrellus subflavus</i>
<i>Chiroptera</i>	Hoary Bat	<i>Lasiurus cinereus</i>
<i>Chiroptera</i>	Little Brown Bat	<i>Myotis lucifugus</i>
<i>Chiroptera</i>	Red Bat	<i>Laiurus borealis</i>
<i>Chiroptera</i>	Silver-haired Bat	<i>Lasionycteris noctivagens</i>
<i>Insectivora</i>	Hairy-tailed Mole	<i>Parascalops breweri</i>
<i>Insectivora</i>	Least Shrew	<i>Cryptosis parva</i>
<i>Insectivora</i>	Short-tail Shrew	<i>Blarina brevicauda</i>
<i>Insectivora</i>	Star-nosed Mole	<i>Condylura cristata</i>
<i>Lagomorpha</i>	Cottontail Rabbit	<i>Sylvilagus floridanus</i>
<i>Marupialia</i>	Virginia Opposum	<i>Didelphis marsupialis</i>
<i>Rodentia</i>	Beaver	<i>Castor canadensis</i>
<i>Rodentia</i>	Deer Mouse	<i>Peromyscus maniculatus</i>
<i>Rodentia</i>	Eastern Chipmunk	<i>Tamias striatus</i>
<i>Rodentia</i>	Fox Squirrel	<i>Sciurus niger</i>
<i>Rodentia</i>	Gray Squirrel	<i>Sciurus carolinensis</i>
<i>Rodentia</i>	House Mouse	<i>Mus musculus</i>
<i>Rodentia</i>	Woodland Vole	<i>Microtus pinetorum</i>
<i>Rodentia</i>	Meadow Jumping Mouse	<i>Zapus hudsoniaus</i>
<i>Rodentia</i>	Meadow Vole	<i>Microtus pennsylvanicus</i>
<i>Rodentia</i>	Muskrat	<i>Ondatra zibethica</i>
<i>Rodentia</i>	Norway Rat	<i>Rattus norvegicus</i>
<i>Rodentia</i>	Red Squirrel	<i>Tamiasciurus hudsonicus</i>
<i>Rodentia</i>	Southern Flying Squirrel	<i>Glaucomys colans</i>
<i>Rodentia</i>	White-footed Mouse	<i>Permoyscus leucopus</i>
<i>Rodentia</i>	Woodchuck	<i>Marmota monax</i>

REPTILES

At least seven species of Ohio turtles are either known or believed to reside within the Black River watershed. Four species were identified in Limbach's 1992 Black River Riparian Wildlife Census. The Spotted Turtle (*Clemmys guttata*), a species of state special interest, has been found within suitable habitat near French Creek and the Map Turtle and Eastern Box Turtle are also known to exist within this region. Although not observed by Limbach at the time of his study, these two species are included due to previous observations within the watershed.

TABLE II-14
TURTLES OF THE BLACK RIVER WATERSHED

Order	Common Name	Scientific Name
<i>Testudines</i>	Common Map Turtle	<i>Graptemys geographica</i>
<i>Testudines</i>	Common Snapping Turtle	<i>Chelydra serpentina</i>
<i>Testudines</i>	Eastern Box Turtle	<i>Terrapene carolina</i>
<i>Testudines</i>	Midland Painted Turtle	<i>Chrysemys picta marginata</i>
<i>Testudines</i>	Musk Turtle (Stinkpot)	<i>Sternotherus odoratus</i>
<i>Testudines</i>	Spiny Softshell Turtle	<i>Trionyx spiniferus</i>
<i>Testudines</i>	Spotted Turtle	<i>Clemmys guttata</i>

The Black River Watershed is home to at least ten species of common Ohio snakes. It is very likely that other snakes reside within the range of this study, however, current population information is derived from the Limbach study completed in 1992 and information compiled by the Lorain County Metroparks Natural Resources Management staff. Species not collected and/or observed during the Limbach study, but known (or strongly suspected) to occur within the range of this study have also been included. Sources include Dan Rice, Zoologist with the Division of Natural Areas & Preserves and the Ohio Natural Heritage Database. Additional data has been obtained from the Lorain County Metroparks Natural Resources Management staff.

TABLE II-15
SNAKES OF THE BLACK RIVER WATERSHED

Order	Common Name	Scientific Name
<i>Squamata</i>	Black Rat Snake	<i>Coluber constrictor</i>
<i>Squamata</i>	Blue Racer	<i>Coluber constrictor foxi</i>
<i>Squamata</i>	Dekay's Brown Snake	<i>Storeria dekayi</i>
<i>Squamata</i>	Smooth Green Snake	<i>Opheodrys vernalis</i>
<i>Squamata</i>	Queen Snake	<i>Natrix harteri</i>
<i>Squamata</i>	Eastern Garter Snake	<i>Thamnophis sirtalis</i>
<i>Squamata</i>	Eastern Milk Snake	<i>Lampropeltis trianulum</i>
<i>Squamata</i>	Eastern Ribbon Snake	<i>Thamnophis sauritus</i>
<i>Squamata</i>	Northern Ringneck Snake	<i>Diadophis puntatus edwardsi</i>
<i>Squamata</i>	Northern Water Snake	<i>Nerodia sipedon</i>

AMPHIBIANS

Seventeen species of frogs, toads and salamanders have been collected and/or observed within the Black River watershed. However, additional species probably reside within the study area. The collection and identification of frogs and salamanders is somewhat difficult due to color variations and limited periods of activity. For example, most frogs, salamanders and toads are nocturnal and the only documented population study conducted along the Black River was Limbach's 1992 Riparian Wildlife Census. Limbach's observations and collections were conducted during dawn and daylight hours.

As a result, the census of frogs and toads identified in Limbach's study is inconclusive and incomplete. For example, he was unable to capture or observe any Spring Peepers (*Hyla crucifer*), however Spring Peepers are a very abundant Ohio species. The Western Chorus Frog, another abundant species is included in this listing as well. Additionally, it is probable that one or more species of salamanders exist within the watershed but have not been observed and/or collected. For instance, Lorain County has several populations of *Ambystomids* (lunged or mole salamanders). Although not threatened, habitat for these salamanders is shrinking throughout Ohio.

TABLE II-16
AMPHIBIANS OF THE BLACK RIVER WATERSHED

Order	Common Name	Scientific Name
<i>Caudata</i>	Eastern Red-backed Salamander	<i>Plethodon cinereus</i>
<i>Caudata</i>	Jefferson's Salamander	<i>Ambystoma jeffersonianum</i>
<i>Caudata</i>	Silvery Salamander	<i>Ambystoma platineum</i>
<i>Caudata</i>	Slimy Salamander	<i>Plethodon glutinosus</i>
<i>Caudata</i>	Small-mouthed Salamander	<i>Ambystoma texanum</i>
<i>Caudata</i>	Spotted Salamander	<i>Ambystoma maculatum</i>
<i>Caudata</i>	Two-lined Salamander	<i>Eurycea bislineata</i>
<i>Salienta</i>	American Toad	<i>Bufo americanus</i>
<i>Salienta</i>	Bullfrog	<i>Rana catesbeiana</i>
<i>Salienta</i>	Gray Treefrog	<i>Hyla versicolor</i>
<i>Salienta</i>	Green Frog	<i>Rana clamitans</i>
<i>Salienta</i>	Northern Cricket Frog	<i>Acris crepitans</i>
<i>Salienta</i>	Northern Leopard Frog	<i>Rana pipiens</i>
<i>Salienta</i>	Pickerel Frog	<i>Rana palustris</i>
<i>Salienta</i>	Spring Peeper	<i>Hyla crucifer</i>
<i>Salienta</i>	Western Chorus Frog	<i>Pseudacris triseriata</i>
<i>Salienta</i>	Wood Frog	<i>Rana sylvatica</i>

BIRDS

The riparian corridor and adjacent uplands of the Black River support a wide variety of breeding and migratory birds. A combination of Black River bird surveys, including C. William Limbach's Black River Riparian Wildlife Census and census work completed by Lorain County Metroparks Staff concluded that at least 106 species of birds have been observed and/or heard singing within the Black River watershed. Although no specific data exists which would differentiate between nesting species and those observed during spring and/or fall migration, the riparian zone of the river is critically important for many nesting species of songbirds.

Birds most commonly observed in the riparian corridor include american robin, northern cardinal, blue jay, song sparrow, yellow warbler, tufted titmouse, chickadee and many others. Birds most commonly associated with the river environment include the warbling vireo, yellow-throated warbler, great blue heron, kingfisher, wood duck, blue-winged teal and black-crowned night heron. Forest birds found with frequency in the area include downy and several other types of woodpeckers, red-eyed vireo, indigo bunting, rufous-sided towhee and many others.

Additionally, a number of important records of state endangered and/or threatened species are found within the region. These include species such as the sedge wren (*Cistothorus platensis*) which has been observed nesting on the West Branch and Charlemont Creek, the common barn owl (*Tyto alba*) whose last recorded nesting in the area was observed in 1977 and the common tern (*Sterna hirundo*) which has been observed in the lake area of the river.

Other species of interest within the watershed include an expanding population of great blue heron, evidenced by their recent establishment of a rookery on US KOBE steel property near Lorain. At least three, and perhaps as many as seven heron rookeries are active within the Black River watershed. Used by several different species of herons, these rookeries provide important nurseries and reflect upon the improved conditions being found in several areas of the watershed

Most migratory songbirds, particularly warblers, make extensive use of riparian corridors during the course of their spring and fall migrations. Species observed include the blackburnian, blue-winged, brewster's and hooded warblers as well as numerous other migratory species

The following table provides a complete listing of migratory and resident bird species that were observed in the Black River watershed:

TABLE II-17
BIRDS OF THE BLACK RIVER WATERSHED

ORDER	COMMON NAME	SCIENTIFIC NAME
<i>Anseriformes</i>	Wood Duck	<i>Aix sponsa</i>
	Blue-Winged Teal	<i>Anas discors</i>
	Mallard	<i>Anas platyrhynchos</i>
	American Black Duck	<i>Anas rubripes</i>
	Canada Goose	<i>Branta canadensis</i>
<i>Apodiformes</i>	Chimney Swift	<i>Chaetura pelagica</i>
	Ruby-Throated Hummingbird	<i>Archilochus colubris</i>

BLACK RIVER STUDY-DESCRIPTION OF THE ENVIRONMENT
Section II-45

ORDER	COMMON NAME	SCIENTIFIC NAME
<i>Caprimulgiformes</i>	Common Nighthawk	<i>Chordeiles minor</i>
<i>Charadriiformes</i>	Common Tern	<i>Sterna hirundo</i>
	Killdeer	<i>Charadrius vociferus</i>
	Ring-Billed Gull	<i>Larus delawarensis</i>
<i>Ciconiiformes</i>	Black Crowned Night Heron	<i>Nycticorax nycticorax</i>
	Great Blue Heron	<i>Ardea herodias</i>
	Great Egret	<i>Casmerodius albus</i>
	Green-Backed Heron	<i>Butorides striatus</i>
<i>Columbiformes</i>	Mourning Dove	<i>Zenaida macroura</i>
	Rock Dove	<i>Columba livia</i>
<i>Coraciiformes</i>	Belted Kingfisher	<i>Ceryle torquata</i>
<i>Falconiformes</i>	American Kestrel	<i>Falco sparverius</i>
	Coopers Hawk	<i>Accipiter cooperii</i>
	Red-Tailed Hawk	<i>Buteo jamaicensis</i>
	Turkey Vulture	<i>Cathartes aura</i>
<i>Galliformes</i>	Ring-Necked Pheasant	<i>Phasianus colchicus</i>
	Wild Turkey	<i>Meleagris gallopavo</i>
<i>Passeriformes</i>	Acadian Flycatcher	<i>Empidonax virescens</i>
	American Crow	<i>Corvus brachyrhynchos</i>
	American Goldfinch	<i>Carduleis tristis</i>
	American Redstart	<i>Septophaga ruticilla</i>
	American Robin	<i>Turdus migratorius</i>
	Black-billed Cuckoo	<i>Coccyzus erythrophthalmus</i>
	Black-Capped Chickadee	<i>Parus atricapillus</i>
	Blue Jay	<i>Cyanocitta cristata</i>
	Boblink	<i>Dolichonyx oryzivorus</i>
	Brown Thrasher	<i>Toxostoma rufum</i>
	Brown-Headed Cowbird	<i>Molothrus ater</i>
	Cedar Waxwing	<i>Bombycilla cedrorum</i>
	Common Crow	<i>Corvus brachyrhynchos</i>
	Common Grackle	<i>Quiscalus quiscula</i>
	Common Starling	<i>Sturnus vulgaris</i>
	Eastern Bluebird	<i>Sialia sialis</i>
	Eastern Kingbird	<i>Tyannus verticalis</i>
	Eastern Meadowlark	<i>Sturnella magna</i>
	Eastern Phoebe	<i>Sayornis phoebe</i>
	Eastern Wood Pewee	<i>Contopus virens</i>
	Flycatcher, Willow	<i>Empidonax traillii</i>
	Gnatcatcher, Blue-Gray	<i>Poliophtila caerulea</i>
	Gray Catbird	<i>Dumetella carolinensis</i>
	Horned Lark	<i>Eremophila alpestris</i>
	House Finch	<i>Carpodacus mexicanus</i>
	Indigo Bunting	<i>Passerina cyanea</i>
	Northern Cardinal	<i>Cardinalis cardinalis</i>
	Northern Junco	<i>Junco hyemalis</i>
Northern Mockingbird	<i>Mimus polyglottos</i>	
Northern Oriole	<i>Icterus galbula</i>	
Northern Waterthrush	<i>Seiurus noveboracensis</i>	
Nuthatch, White-Breasted	<i>Sitta carolinensis</i>	
Ovenbird	<i>Seiurus aurocapillus</i>	
Purple Martin	<i>Progne subis</i>	

BLACK RIVER STUDY-DESCRIPTION OF THE ENVIRONMENT
Section II-46

ORDER	COMMON NAME	SCIENTIFIC NAME
<i>Passeriformes</i>	Red-Winged Blackbird	<i>Agelaius phoeniceus</i>
	Rose-breasted Grosbeak	<i>Pheucticus ludovicianus</i>
	Rufous-Sided Towhee	<i>Pipilo erythrophthalmus</i>
	Scarlet Tanager	<i>Piranga olivacea</i>
	Sparrow, Chipping	<i>Spizella passerina</i>
	Sparrow, Field	<i>Spizella pusilla</i>
	Sparrow, Grasshopper	<i>Ammodramus savannarum</i>
	Sparrow, Henslow's	<i>Passerherbulus henslowii</i>
	Sparrow, House	<i>Passer domesticus</i>
	Sparrow, Savannah	<i>Passerculus sandwichensis</i>
	Sparrow, Song	<i>Melospiza meodia</i>
	Sparrow, Swamp	<i>Melospiza georgiana</i>
	Sparrow, Vesper's	<i>Pooecetes gramineus</i>
	Swallow, Barn	<i>Hirundo rustica</i>
	Swallow, Cliff	<i>Hirundo Pyrrhonota</i>
	Swallow, Northern Rough-Winged	<i>Stelgidopteryx serripennis</i>
	Swallow, Tree	<i>Tachycineta bicolor</i>
	Thrush, Wood	<i>Hyocichla mustelina</i>
	Tufted Titmouse	<i>Parus bicolor</i>
	Veery	<i>Catharus fuscenscens</i>
	Vireo, Red-Eyed	<i>Vireo olivaceus</i>
	Vireo, Solitary	<i>Vireo solitarius</i>
	Vireo, Warbling	<i>Vireo gilvus</i>
	Vireo, White-eyed	<i>Vireo griseus</i>
	Vireo, Yellow-throated	<i>Vireo flavifrons</i>
	Warbler, Blackburnian	<i>Dendroica fusca</i>
	Warbler, Blue-winged	<i>Vermivora pinus</i>
	Warbler, Brewster's	Hybrid
	Warbler, Cerulean	<i>Dendroica cerulea</i>
	Warbler, Hooded	<i>Wilsonia citrina</i>
	Warbler, Yellow	<i>Dendroica petechia</i>
	Wren, Carolina	<i>Thrythorus ludovicianus</i>
	Wren, House	<i>Troglodytes aedon</i>
Wren, Sedge	<i>Cistothorus platensis</i>	
Wren, Short-billed Marsh	<i>Cistothorus platensis</i>	
Yellow-billed Cuckoo	<i>Coccyzus americanus</i>	
Yellow-breasted Chat	<i>Icteria virens</i>	
Yellowthroat	<i>Geothlypis trichas</i>	
<i>Piciformes</i>	Woodpecker, Downy	<i>Picoides pubescens</i>
	Woodpecker, Hairy	<i>Dendrocopos villosus</i>
	Northern Flicker	<i>Colaptes auratus</i>
	Woodpecker, Pileated	<i>Dryocopus pileatus</i>
	Woodpecker, Red-Bellied	<i>Melanerpes carolinus</i>
	Woodpecker, Red-Headed	<i>Melanerpes erythrocephalus</i>
<i>Strigiformes</i>	Common Barn Owl	<i>Tyto alba</i>
	Great Horned Owl	<i>Bubo virginianus</i>
	Screech Owl	<i>Otus asio</i>
<i>Tringa</i>	American Woodcock	<i>Philohela minor</i>
	Common Snipe	<i>Capella gallinago</i>
	Spotted Sandpiper	<i>Actitis hypoleucous</i>

WILDLIFE RESOURCES-FISH COMMUNITIES

Watershed fish sampling was conducted by the Ohio Environmental Protection Agency in 1992 as part of their comprehensive Black River Water Quality study published in January 14, 1994. Additionally, OEPA conducted follow-up surveys in 1994 on selected stretches of the Black River. The information concerning fish communities in this report was collected from OEPA as well as from the Natural Heritage Section of the Ohio Department of Natural Resources, Division of Natural Areas & Preserves.

Fish sampling conducted by OEPA in 1992 indicates that 60 species of fish (not including hybrids) were collected throughout the watershed. This assessment is further collated to include 48 species residing within the mainstem; 39 species in the East Branch and 34 species in the West Branch.

Data has been collated into three distinct regions: The Black River mainstem; the East Branch of the Black, including its tributaries; and the West Branch of the Black River, including its tributaries.

TABLE II-18
FISH OF THE BLACK RIVER WATERSHED

SPECIES	SCIENTIFIC NAME	MAINSTEM	EAST BRANCH	WEST BRANCH
Alewife	<i>Alosa pseudoharengus</i>	4	0	0
Bass, Largemouth	<i>Micropterus salmoides</i>	544	27	51
Bass, Rock	<i>Ambloplites rupestris</i>	230	453	17
Bass, Smallmouth	<i>Micropterus dolomieu</i>	186	467	86
Bass, White	<i>Moreone chrysops</i>	24	0	0
Brook Silverside	<i>Labidesthes sicculus</i>	6	0	0
Brook Stickleback	<i>Culaea inconstans</i>	0	3	16
Buffalo, Smallmouth	<i>Ictiobus bubalus</i>	5	0	0
Bullhead, Black	<i>Ictalurus melas</i>	0	0	1
Bullhead, Brown	<i>Ictalurus neulosus</i>	93	0	0
Bullhead, Yellow	<i>Ictalurus natalis</i>	74	123	92
Central Stoneroller	<i>Campostoma anomalum</i>	225	504	186
Channel Catfish	<i>Ictalurus punctatus</i>	7	0	0
Common Carp	<i>Cyprinus carpio</i>	594	144	61
Crappie, Black	<i>Pomoxis nigromaculatus</i>	4	0	0
Crappie, White	<i>Pomoxis annularis</i>	28	11	21
Creek Chub	<i>Semotilus atromaculatus</i>	109	281	2329
Dace, Blacknose	<i>Rhinichthys atratulus</i>	0	6	1714
Dace, Redside	<i>Clinostomus elongatus</i>	0	73	0
Dace, Southern Redbelly	<i>Phoxinus erythrogaster</i>	0	6	3
Darter, Blackside	<i>Percina maculata</i>	1	34	28
Darter, Fantail	<i>Etheostoma flabellare</i>	0	57	0
Darter, Greenside	<i>Etheostoma blennioides</i>	120	2220	61
Darter, Johnny	<i>Etheostoma nigrum</i>	6	53	140
Darter, Rainbow	<i>Etheostoma caeruleum</i>	0	30	50
Freshwater Drum	<i>Aplodinotus grunniens</i>	141	0	0
Gizzard Shad	<i>Dorosoma cepedianum</i>	1196	0	0
Goldfish	<i>Carassius auratus</i>	48	0	0
Goldfish X Common Carp	HYBRID	47	0	0

BLACK RIVER STUDY-DESCRIPTION OF THE ENVIRONMENT
Section II-48

SPECIES	SCIENTIFIC NAME	MAINSTEM	EAST BRANCH	WEST BRANCH
Lamprey, Silver (Attached to host)	<i>Ichthyomyzon unicuspis</i>	1	0	0
Logperch	<i>Percina caprodes</i>	39	0	0
Minnnow, Bluntnose	<i>Pimephales notatus</i>	1649	2814	899
Minnnow, Fathead	<i>Pimephales promelas</i>	3	4	2
Minnnow, Silverjaw	<i>Ericymba buccata</i>	2	11	0
Mottled Sculpin	<i>Cottus bairdi</i>	20	194	337
Mudminnow, Central	<i>Umbra limi</i>	0	4	10
Perch, White	<i>Moreone americana</i>	819	0	0
Perch, Yellow	<i>Perca flavescens</i>	208	0	0
Rainbow Trout	<i>Salmo gairdneri</i>	1	0	0
Redhorse, Golden	<i>Moxostoma erythrurum</i>	5	104	0
Redhorse, Shorthead	<i>Moxostoma macrolepidotum</i>	0	1	0
Shiner, Bigmouth (Threatened)	<i>Notropis dorsalis</i>	0	0	108
Shiner, Common	<i>Luxilus cornutus</i>	27	221	624
Shiner, Emerald	<i>Notropis atherinoides</i>	1207	0	0
Shiner, Golden	<i>Notemigonus crysoleucas</i>	121	12	53
Shiner, Mimic	<i>Notropis volucellus</i>	4	0	1
Shiner, Redfin	<i>Notropis umbratilis</i>	4	142	29
Shiner, Sand	<i>Notropis stramineus</i>	186	898	183
Shiner, Spottail	<i>Notropis hudsonius</i>	37	0	0
Shiner, Spottfin	<i>Cyprinella spiloptera</i>	932	355	17
Shiner, Striped	<i>Luxilus chrysocephalus</i>	383	161	18
Striped SH X Common SH	HYBRID	65	1	0
Sucker, Northern Hog	<i>Hypentelium nigricans</i>	28	188	0
Sucker, Spotted	<i>Minytrema melanops</i>	1	0	0
Sucker, White	<i>Catostomus commersoni</i>	302	598	1028
Sunfish, Bluegill	<i>Lepomis macrochirus</i>	587	135	112
Sunfish Bluegill X P'seed	HYBRID	3	0	0
Sunfish, Green	<i>Lepomis cyanellus</i>	208	166	368
Sunfish, Green X Bluegill	HYBRID	1	0	0
Sunfish, Green X Hybrid	HYBRID	37	38	13
Sunfish, Green X Pumpkinseed	HYBRID	3	1	0
Sunfish, Hybrid X Sunfish	HYBRID	2	0	0
Sunfish, Longear	<i>Lepomis megalotis</i>	0	0	1
Sunfish, Pumpkinseed	<i>Lepomis gibbosus</i>	3439	432	3
Trout-perch	<i>Percopsis moiscomaycus</i>	1	0	0
Walleye	<i>Stizostedion vitreum v.</i>	8	0	0

Fish communities throughout the Black River watershed appear to be undergoing dramatic changes. A total of 17 previously collected species of fish were absent in the 1992 OEPA survey and in follow-up sampling conducted at selected sites in 1994. Fish lost from the watershed include pollution and silt-sensitive species such as the hornyhead, river, bigeye and silver chubs, the blacknose and rosyface shiners, the black redhorse sucker, sand darters and others.

The following table represents previously collected fish species now absent within the Black River watershed:

TABLE II-19
Fish Community Losses in the Black River Watershed

SPECIES	Probable Cause	Mainstem	East Branch	West Branch
Lognose Gar	loss of submerged vegetation excessive point source pollution	♦		
Bowfin	loss of submerged vegetation excessive point source pollution	♦		
Northern Pike	loss of submerged vegetation excessive point source pollution	♦		
Muskellunge	loss of submerged vegetation excessive point source pollution	♦		
Tadpole Madtom	loss of submerged vegetation excessive point source pollution	♦		
Silver Chub	excessive point source pollution	♦		
Mooneye	excessive point source pollution	♦		
Sand Darter	excessive point source pollution	♦		
Sauger	excessive point source pollution	♦		
Honeyhead Chub	excess turbidity		♦	♦
River Chub	excess turbidity		♦	♦
Bigeye Chub	excess turbidity		♦	♦
Rosyface Shiner	excess turbidity		♦	♦
Black Redhorse Sucker	excess turbidity		♦	♦
Stonecat	excess turbidity		♦	♦
Brindle Madtom	excess turbidity		♦	♦
Blacknose Shiner	excess turbidity		♦	

The fish communities within the Black River watershed have been dramatically affected by a combination of point source pollution and the negative impacts of agricultural and other nonpoint runoff. An undisturbed fish community within the basin would be comprised of more river and hornyhead chubs than creek chubs, more hog suckers than white suckers, darter species more abundant than blacknose dace, and longear sunfish more abundant than green sunfish. There were no sections of the Black River surveyed that met these conditions.

The mainstem has a fish community comprised of both pollution tolerant and intolerant species of fish, including several species more typically associated with Lake Erie. Although recent surveys are demonstrating improvement, the relatively high abundance of pollution tolerant species such as white suckers, carp and others is an indication that additional improvements are needed before full restoration of the fish community will be achieved. The mainstem also possesses one state threatened species, the silver lamprey, which was attached to a host fish that entered the Black River from Lake Erie. There is no evidence that Silver Lampreys are residents of the watershed.

Fish communities within the West Branch exhibit the most severe disturbances. Creek chubs were the most abundant species recorded, followed by

common shiners, white suckers, green sunfish and blacknose dace. These species are pollution tolerant and their abundance reflects the impact that siltation and other forms of nonpoint pollution are having on the West Branch.

Ironically, the headwaters of the West Branch are also home to one of only two significant populations of state-threatened bigmouth shiners (*Notropis dorsalis*) in Ohio. The bigmouth shiner occupies brooks and small streams where sand on the bottom of pools, bars and riffle areas remain relatively free of silt. Sizable numbers of Bigmouth shiners have been collected from the headwaters of the West Branch, Plum, Wellington, Charlemont, and Buck Creeks, as well as Kelner and Guthrie Ditches. The only two Ohio populations of these fish known to exist are in the upper reaches of the West Branch and in Rocky River farther to the east.

The East Branch of the Black River possesses fish communities that appear to be the least disturbed in the watershed. However, the fish community in the East Branch also appears to be in a state of transition. As mentioned, several species of pollution sensitive fish have been lost in recent years. The current fish community consists of smallmouth bass, rock bass, greenside darters and sand shiners in greatest abundance. Collections obtained at River Mile 10.1 and 11.3 appear to be the most stable in the basin with relatively high numbers of moderately sensitive species.

In addition to the 17 species lost throughout the basin, four species new to the Black River were collected during the 1992 study. These include the white perch, black crappie and smallmouth buffalo within the mainstem, and the brook stickleback collected in the East and West Branches. White perch are a recently established undesirable species in Lake Erie which are believed to be competing with the more desirable white bass. Smallmouth buffalo are believed to have always been present in small numbers within the watershed, however they are difficult to collect. Black crappies are a common panfish stocked in farm ponds and other waters. It is believed they were introduced to watershed from one of these sources. Brook Stickleback are a highly localized coldwater species not believed to be particularly abundant.

Fish communities within the watershed are experiencing significant and in some cases, dramatic change. The loss of so many species, combined with increasing numbers of tolerant fish such as creek chubs and white suckers are of concern to biologists. The most recent evidence (1992) suggests that fish communities within the Black may be in a state of general decline. The only exception may be the mainstem, where overall improvements are being observed as point source pollution discharges are decreasing.

Information concerning the status of fish communities in the Black River was obtained through an analysis of fish collection records obtained by the OEPA in 1992. Although the concerns about fish communities are likely still valid, OEPA is planning to conduct a comprehensive follow-up to their 1992 study during the summer and fall of 1997. Results will not be available until 1998. Due to the current state of transition that fish communities appear to be experiencing, the results of OEPA's 1997 survey will be extremely critical in determining whether improvements are being noted, or conversely if the general decline of fish communities observed in their 1992 study is continuing.

Comparisons between 1992 Fish Community Analysis and 1997 Preliminary Study Data East Branch-Black River

During the summer of 1997, OEPA biologists conducted follow-up fish and macroinvertebrate sampling in the East Branch of the Black River. This sampling was conducted as a routine five-year follow-up to their 1992 Comprehensive Water Quality Study of the Black River. Although important data such as macroinvertebrate results and updated QHEI's are not available as of this report, we have elected to consider the results from 1997 fish sampling for the purposes of scenic river consideration.

Direct comparison of 1992 results with 1997 sampling is difficult. During OEPA's 1992 study, eleven sites along the East Branch were sampled. During their 1997 survey work, only eight sites were examined. Of the eight sites sampled during 1997, three were new sites and only five were sites that had been previously examined during 1992.

Generally, improvements in IBI scores were observed at 4 of the 5 common sites. Two of the four sites demonstrating improvement are still performing well below the Warmwater Habitat (WWH) standards established by OEPA. The remaining two sites exhibited slight improvements which enabled these sites to marginally perform at WWH standards. During the 1992 study, both sites were performing below WWH standards.

Of concern is the decline in IBI rating at RM 11.3 (Parson's Road). This site is in the general vicinity of the Grafton WWTP. IBI's declined from 41 in 1992 when it was performing at WWH standards to an IBI of 38 during 1997. At present, fish communities at this site are performing at the lowest threshold of WWH standards. A nearby site at RM 10.9 which is downstream from the WWTP had an IBI of only 33. Although not sampled in 1997, a nearby site at RM 10.1 had an IBI of 41 in 1992. A drop of 8 points in an IBI from 1992 to 1997 is a significant departure and warrants concern. Variation among five year samples is likely, however the declines in this stretch of the river appear contrary to the otherwise increasing trends exhibited elsewhere within the river. It will be important to also evaluate macroinvertebrate data collected from these sites. If macroinvertebrate community performances are also declining (as measured by OEPA's ICI ratings), then negative impacts from the Grafton WWTP are likely the causative factors. As mentioned in previous sections of this report, recent development in the Grafton area has increased wastewater treatment demands on this plant.

Although direct comparison is difficult, several methods were employed in order to try to best evaluate changes in the fish community performance between the 1992 and 1997 studies. OEPA does not use an average IBI for a river, electing to evaluate river segments individually. For the sake of our comparison, average IBI's from 1992 and 1997 were considered.

Generally, IBI's in the East Branch of the Black River improved from an average of 31.4 during 1992 to an average of 38 in 1997. While the overall IBI of 38 represents an improvement over the 1992 average, the score suggests that the fish community only marginally meets existing WWH performance standards. Further, if one compares only those sites that in 1992 were in ATTAINMENT of WWH standards with similar sites from 1997, there are no differences noted. In 1992 and 1997, average IBI's for sites attaining standards were identical.

Comparing those sites that were not attaining WWH standards in 1992 and 1997 more variation in IBI's is observed. Some of these observations may be of interest to groups such as the Black RAP and other organizations that have been engaged in river restoration activities along the East Branch. During 1992, sites not attaining WWH standards had average IBI's of 27, scores well below the WWH standard. Similar sites following the 1997 study had average IBI's of 32.2. Although these sites continue to perform well below WWH standards for fish community performance, the IBI's demonstrate that conditions are improving. However, substantially more improvement will be required for these sites to meet WWH standards in the future.

The structure of the fish community in the East Branch appears to be only slightly changed from 1992. The fish community continues to be dominated by greenside darters, bluntnose minnows, stonerollers, sand shiners, striped shiners, and smallmouth bass. Results from 1997 also indicate that hog suckers and rainbow darters were collected with greater frequency than in the 1992 study. The most abundant species in the East Branch are quite common in warmwater streams in Ohio. The fish species in the East Branch are characterized by pollution and silt tolerance ratings from sensitive for the greenside and rainbow darters to tolerant for the bluntnose minnow.

Large numbers of greenside darters, stonerollers and bluntnose minnows such as found in the East Branch, are indicators of organic enrichment from both point and nonpoint discharges to the stream. Greenside darters for instance, favor beds of filamentous algae in riffles and runs. Stonerollers, which are herbivores also tend to increase in numbers with increased algae growth in riffle and run habitats.

The increase in numbers and more frequent catch rates for rainbow darters and hog suckers is somewhat encouraging, although additional monitoring is required to determine if this is a continuing trend or a temporary event. Both species are somewhat sensitive to pollutants and siltation.

In the 1997 survey, smallmouth bass ranked 8th in numerical abundance with 11 fish collected per sample. Of some concern is the fact that numbers of smallmouth bass appear to be declining from levels collected during 1992 when they ranked 6th in numerical ranking with 20 fish collected per sample. Again, additional monitoring is needed to determine if this is a significant trend or simply a temporary variation in the population. The numbers of rock bass, a frequent associate of the smallmouth bass, showed an even greater decline between the two surveys. In 1992, 19 rock bass were collected with each sample. During the 1997 study, only 6 rock bass were collected with each sample.

According to the OEPA, fish communities within the East Branch of the Black River are typical of many warm water streams in Ohio and do not approach the diversity and/or abundance of species that are found in higher quality streams in Ohio. Continued non-attainment of biocriteria and the preponderance of nonpoint pollution impacts and diminished habitat conditions indicate a need for continued pollution abatement and restoration activities within this watershed. Additionally, continued monitoring of fish community performance is needed in order to verify whether current trends are improving, declining or in a state of relative stability.

BLACK RIVER STUDY-DESCRIPTION OF THE ENVIRONMENT
Section II-53

TABLE II-20
FISH COMMUNITY COMPARISON
East Branch-Black River

Based on Numerical Abundance by Sampling Period

SPECIES	1992	SPECIES	1997
Bluntnose Minnow (T)**	2814	Greenside Darter (S)*	1701
Greenside Darter (S)*	2220	Bluntnose Minnow (T)**	1183
Sand Shiner (S)**	898	Stoneroller (MT)**	736
White Sucker (T)*	598	Sand Shiner (S)**	642
Stoneroller (MT)**	504	Spotfin Shiner**	193
Smallmouth Bass (S)*	467	Hog Sucker (S)*	191
Rock Bass *	453	Striped Shiner**	162
Pumpkinseed	432	Smallmouth Bass (S)*	162
Spotfin Shiner**	355	Rainbow Darter (S)*	142
Creek Chub (T)*	281	Common Shiner	141
Common Shiner	221	Bluegill (T)*	116
Mottled Sculpin	194	Rock Bass *	90
Hog Sucker (S)*	188	Creek Chub (T)*	88
Green Sunfish (T)*	166	Mottled Sculpin	70
Striped Shiner **	161	Fantail Darter *	67
Carp (T) ++	144	Yellow Bullhead (T)*	61
Redfin Shiner *	142	White Sucker (T)*	50
Bluegill (T)*	135	Silverjaw Minnow*	40
Yellow Bullhead (T)*	123	Johnny Darter (MT)*	34
Golden Redhorse (S)*	104	Green Sunfish (T)*	33
Fantail Darter *	57	Redfin Shiner*	27
Johnny Darter (MT)*	53	Blackside Darter*	22
Hybrid Sunfish	39	Golden Redhorse (S)*	19
Blackside Darter *	34	Carp (T)++	10
Rainbow Darter (S)*	30	Hybrid Sunfish	7
Largemouth Bass (MT)	27	Fathead Minnow (T)*	2
Golden Shiner	12	Largemouth Bass (MT)	2
White Crappie	11	Blacknose Dace	1
Blacknose Dace	6	White Crappie	1
Fathead Minnow (T)*	4	Mudminnow	0
Mudminnow	4	Shorthead Redhorse	0
Silverjaw Minnow*	2	Goldfish	0
Shorthead Redhorse	1	Golden Shiner	0
Redside Dace	1	Redside Dace	0
Goldfish (T)	0	Brown Bullhead (T)	0
Brown Bullhead (T)	0	Black Bullhead*	0
Black Bullhead *	0	Brook Silverside	0
Brook Silverside	0	Black Crappie	0
Black Crappie	0	Pumpkinseed	0

KEY

T-Tolerant to Pollution
MT-Moderately Tolerant to Pollution
S-Pollution Sensitive
I-Insensitive to Pollution

KEY

**-Should be very common in WWH
*-Should be common in WWH
++-Should be uncommon in WWH

AQUATIC MACROINVERTEBRATE COMMUNITIES

The aquatic macroinvertebrates inhabiting a stream represent one of the fundamental building blocks of the aquatic food chain. In addition to providing an important food source for many species of fish, macroinvertebrates also serve to transfer energy which is bound up in leaves and other vegetative debris falling from land sources into the stream. Because so many insect larvae, bivalve molluscs and other macroinvertebrates are relatively long-lived and immobile, they also serve as important barometers of stream quality.

OEPA completed a comprehensive survey of aquatic macroinvertebrates in conjunction with their 1992 Water Quality Study of the Black River. Artificial substrates were deposited in suitable sections of the river, allowed to be colonized by macroinvertebrates and then later removed. The organisms colonizing the substrates were identified and counted and a Macroinvertebrate Community Index (ICI) value was assigned for each site based upon the types of macroinvertebrates found.

Macroinvertebrate communities within the mainstem of the Black River were evaluated at 14 sites. Communities within the free-flowing section of the mainstem (RM's 14.4-8.3) were evaluated as good except for the area just downstream from the Elyria WWTP. A variety of sensitive taxa such as mayflies, riffle beetles and caddisfly larvae were found in relative abundance and diversity. From RM 8.3 downstream, an increasing number of pollution tolerant aquatic worms and midge larvae were collected. No species of bivalve molluscs were found (or observed) in the mainstem except for zebra mussels (*Dreissena polymorpha*) which were found in great abundance from RM 5.6 to Lake Erie.

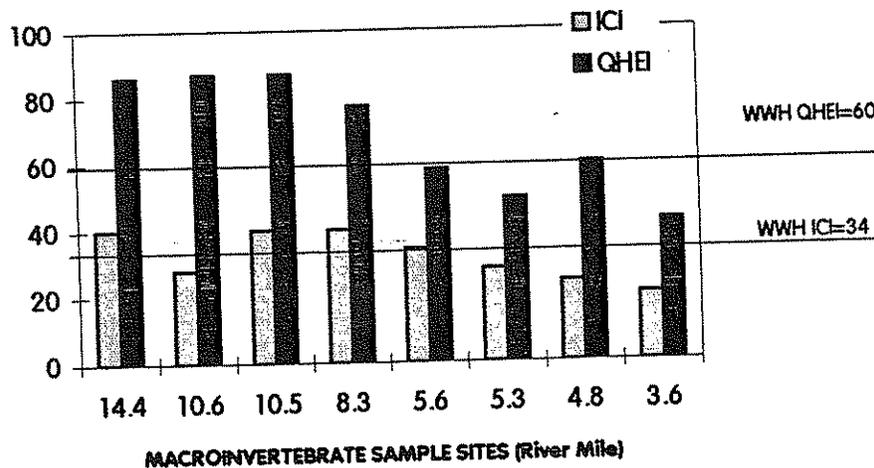
The West Branch macroinvertebrate communities were evaluated at nine locations from RM's 41.5 to 0.1. The communities gradually declined from exceptional at the most upstream site to fair at RM 4.2 and RM 0.1. In good sites, a variety of pollution sensitive mayfly species, caddisflies and riffle beetles were found. The long-lived and highly sensitive stonefly (*Acroneuria evoluta*) was also found at RM 41.7. The West Branch also possesses a population of bivalves including *Sphaeriidae* sp., *Pisidium* sp. and *Sphaerium* sp. Downstream sites exhibited fewer (and less diverse) intolerant species and increased numbers of tolerant organisms such as aquatic worms (*Oligochaeta*) and tolerant species of midge larvae. Generally, the macroinvertebrate communities within the West Branch are reflective of the degraded habitat conditions caused by excessive sedimentation and siltation.

Macroinvertebrate communities within the East Branch of the Black River were very good to exceptional at all of the sites sampled except the two sites immediately downstream from the Grafton WWTP at RM 11.2. Such pollution intolerant species as stoneflies (*Acroneuria evoluta*), mayflies, caddisflies and one dobsonfly larva were found at sites upstream from Grafton. ICI's at sites downstream from the Grafton WWTP decreased due mostly to decreased diversity and fewer intolerant species of mayflies. The East Branch also possesses a rather abundant number of bivalves including *Pyganodon* sp., *Pisidium* sp., and *Sphaerium* sp. Numerous shells and living (or recently dead) specimens were observed on sand and gravel bars upstream from Grafton. Although none of these are particularly sensitive species, their relative abundance is significant considering the apparent void of molluscs (other than zebra mussels) in the mainstem of the river.

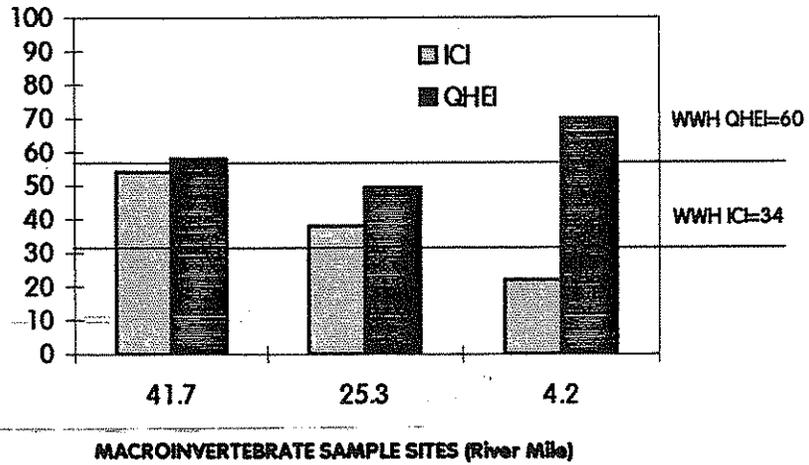
Macroinvertebrate communities within the Black River watershed do not possess the diversity of intolerant species that is found in other high quality streams in northern Ohio. For example, very few stonefly nymphs were collected during the 1992 study. In streams such as the Sandusky and Vermillion Rivers to the west, stoneflies are common inhabitants. Additionally, species such as dobsonfly larvae (or hellgrammites) which are long-lived and relatively intolerant to pollution, are quite common in the Sandusky and several other northern Ohio rivers. However, the entire Black River watershed produced only one dobsonfly larvae in the 1992 survey. Clearly, macroinvertebrate communities within the Black are reflecting the impacts of degraded habitat conditions that are occurring in many sections of the watershed.

During the course of OEPA's macroinvertebrate survey, more than 175 species of aquatic macroinvertebrates were collected. Of these, the most abundant organisms collected were 83 different species of midge larvae represented by nearly 115,000 individuals. Five different species of aquatic worms represented by more than 52,000 individuals were the next most abundant organisms collected followed by 19 species of mayfly nymphs represented by more than 32,000 individuals.

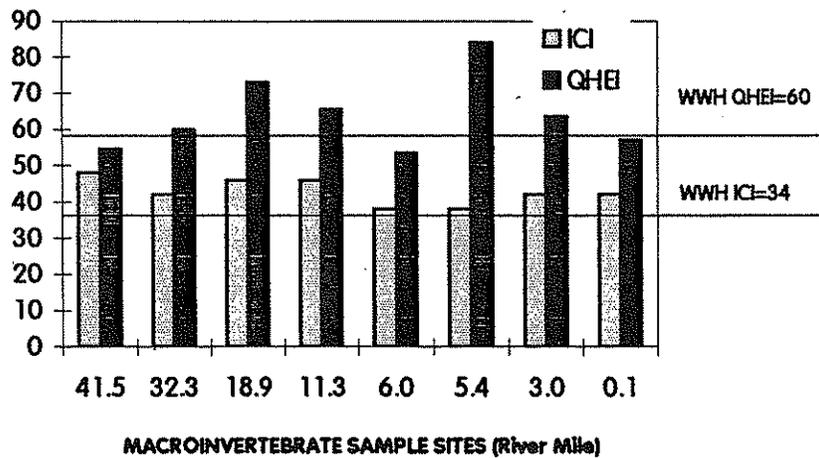
GRAPH II-2
BLACK RIVER MAINSTEM
QHE/ICI VALUES



GRAPH II-3
W. Branch BLACK RIVER
QHEI/ICI VALUES



GRAPH II-4
E. Branch BLACK RIVER
QHEI/ICI VALUES



The following pages provide a comprehensive listing of macroinvertebrate species collected in the Black River by OEPA, including a breakdown of the number of each organism were collected from each branch of the river.

BLACK RIVER STUDY-DESCRIPTION OF THE ENVIRONMENT
Section II-57

CODE	TAXA	SCIENTIFIC NAME	MAINSTEM TOTAL	EAST BR TOTAL	WEST BR TOTAL
1200	COLENERATE	<i>Cordylophora lacustris</i>	123	0	0
1320	HYDROZOAN	<i>Hydra sp</i>	420	32	46
1418	HYDROZOAN	<i>Craspedacusta sowerbyi</i>	1	0	0
1801	PLANARIA	<i>Tubertaria</i>	2794	153	254
3121	BRYOZOAN	<i>Faludicella articulata</i>	0	1	2
3221	BRYOZOAN	<i>Pectinatella magnifica</i>	1	0	0
3360	BRYOZOAN	<i>Plumatella sp</i>	12	5	12
3451	BRYOZOAN	<i>Urnatella gracilis</i>	1	3	5
3600	AQUATIC WORMS	<i>Oligochaeta</i>	38163	3182	5363
3756	AQUATIC WORMS	<i>Dero nivea</i>	1267	0	0
3781	AQUATIC WORMS	<i>Nais communis or N. variabilis</i>	77	0	0
3783	AQUATIC WORMS	<i>Nais elinguis</i>	8	0	0
3864	AQUATIC WORMS	<i>Sylaria lacustris</i>	264	0	0
4661	LEECHES	<i>Helobdella elongata</i>	3	0	0
4935	LEECHES	<i>Erpobdella punctata punctata</i>	3	0	0
5800	SOWBUG	<i>Coccidotea sp</i>	135	1	14
6201	SCUD	<i>Hyalella azteca</i>	227	0	0
6700	SCUD	<i>Crangonyx sp</i>	208	13	31
6810	SCUD	<i>Grammarus fasciatus</i>	36	0	0
8260	CRAYFISH	<i>Orconectes (Crokerinus) sanbornii</i>	0	3	5
8601	WATER MITES	<i>Hydracarina</i>	49	124	132
11020		<i>Acerpenna pygmaeus</i>	0	103	114
11120	MAYFLY	<i>Baetis flavistriga</i>	37	178	192
11130	MAYFLY	<i>Baetis interclaris</i>	820	599	690
11430	MAYFLY	<i>Dipheter hageni</i>	0	10	28
11650	MAYFLY	<i>Procladius sp.</i>	1	0	0
11651	MAYFLY	<i>Procladius sp</i>	0	0	8
11670	MAYFLY	<i>Procladius irrubrum</i>	0	0	0
12200	MAYFLY	<i>Isonychia sp.</i>	9	344	377
13000	MAYFLY	<i>Lucrocota sp.</i>	26	24	60
13400	MAYFLY	<i>Stenacron sp.</i>	3036	986	1348
13521	MAYFLY	<i>Stenonema femoratum</i>	330	248	690
13550	MAYFLY	<i>Stenonema micanum integrum</i>	3	0	0
13561	MAYFLY	<i>Stenonema pulchellum</i>	1056	2651	3157
13570	MAYFLY	<i>Stenonema terminatum</i>	14	67	98
13590	MAYFLY	<i>Stenonema vicarium</i>	0	168	168
15000	MAYFLY	<i>Faraleptophlebia sp.</i>	10	260	986
16200	MAYFLY	<i>Eurylophella sp.</i>	0	17	18
16700	MAYFLY	<i>Tricorythodes sp.</i>	21	37	74
17200	MAYFLY	<i>Caenis sp.</i>	2324	1179	1537
18600	MAYFLY	<i>Ephmera sp.</i>	0	1	1
21200	DAMSELFLY	<i>Culopteryx sp.</i>	8	0	1
21300	DAMSELFLY	<i>Heteragrion sp.</i>	0	0	0
22001	DAMSELFLY	Coenagrionidae	3	0	0
22001	DAMSELFLY	Coenagrionidae	21	0	0
22300	DAMSELFLY	<i>Argia sp.</i>	256	14	14
30000	STONEFLY	Plecoptera	0	93	101
34130	STONEFLY	<i>Acroneuria evoluta</i>	0	6	10
45100	WATER BOATMAN	<i>Palmacorixa sp</i>	0	0	0
47600	ALDERFLY	<i>Stalis sp.</i>	3	1	2
48410	DOBSONFLY	<i>Corydalus cornutus</i>	1	3	3
50315	CADDISFLY	<i>Chimarra obscura</i>	0	3	6
51206	CADDISFLY	<i>Cyrnellus fraternus</i>	1	0	0
51400	CADDISFLY	<i>Nyctiophylax sp.</i>	0	10	11
51600	CADDISFLY	<i>Polycentropus sp.</i>	0	0	3
52200	CADDISFLY	<i>Cheumatopsyche sp.</i>	2463	6066	8572
52430	CADDISFLY	<i>Ceratopsyche morosa group</i>	388	1775	2330
52530	CADDISFLY	<i>Hydropsyche depravata group</i>	47	276	402
52540	CADDISFLY	<i>Hydropsyche dicantha</i>	502	527	717
52570	CADDISFLY	<i>Hydropsyche simulans</i>	0	16	16
52590	CADDISFLY	<i>Hydropsyche venularis</i>	1	23	35
53800	CADDISFLY	<i>Hydroptila sp.</i>	98	17	17
54200	CADDISFLY	Orthotrichinae	301	0	0
58505	CADDISFLY	<i>Helicopsyche borealis</i>	0	2	3
59110	CADDISFLY	<i>Ceraclea ancylus</i>	0	0	0
59500	CADDISFLY	<i>Oecetis sp.</i>	33	0	0
59970	AQUATIC MOTH	<i>Pertophila sp.</i>	0	0	0
60900	BEETLE	<i>Pelodytes sp.</i>	0	0	0
65800	BEETLE	<i>Berosus</i>	18	1	1
68130	BEETLE	<i>Helichus sp</i>	0	2	5

BLACK RIVER STUDY-DESCRIPTION OF THE ENVIRONMENT
Section II-56

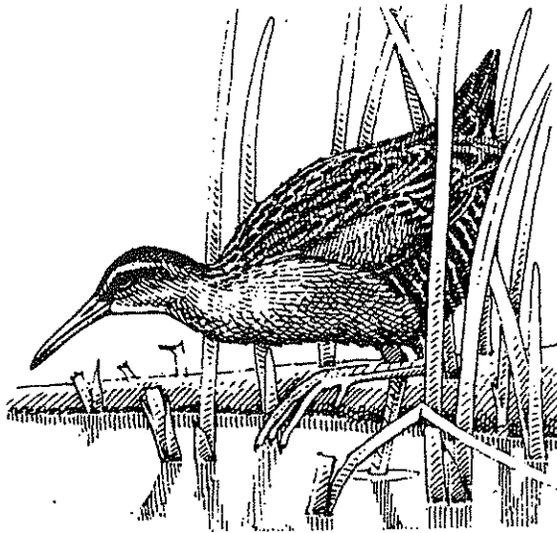
68601	RIFLE BEETLE	<i>Ancyronyx variegata</i>	20	33	34
68708	RIFLE BEETLE	<i>Dubiraphia vittata</i> group	44	28	40
68901	RIFLE BEETLE	<i>Macronychus glabratus</i>	11	86	98
69400	RIFLE BEETLE	<i>Stenelmis</i> sp.	182	132	188
71100	CRANE FLY	<i>Hexatoma</i> sp.	0	1	4
71910	CRANE FLY	<i>Tipula abdominalis</i>	1	1	1
72160	CRANE FLY	<i>Psychoda</i> sp.	0	8	8
74100	BLACK FLY	<i>Simulium</i> sp.	34	558	685
74501	BITING MIDGE	<i>Ceratopogonidae</i>	20	28	70
77120	MIDGE	<i>Ablabesmyia mallochi</i>	676	0	8
77130	MIDGE	<i>Ablabesmyia rhamphe</i> group	240	0	0
77500	MIDGE	<i>Concapelopia</i> sp.	186	516	710
77750	MIDGE	<i>Hayesomyia senata</i>	1328	1055	1604
77800	MIDGE	<i>Helopelopia</i> sp.	1039	561	1061
78130	MIDGE	<i>Labrundinia neopilosella</i>	0	0	11
78350	MIDGE	<i>Meropelopia</i> sp.	35	0	4
78401	MIDGE	<i>Natarsia species A</i>	0	0	4
78450	MIDGE	<i>Nilotanytus fimbriatus</i>	66	20	27
78650	MIDGE	<i>Procladius</i> sp.	2	0	0
79000	MIDGE	<i>Tanytus</i> sp.	0	0	11
79085	MIDGE	<i>Telopelopia okoboji</i>	100	0	0
79400	MIDGE	<i>Zavrelimyia</i> sp.	0	0	7
80204	MIDGE	<i>Brillia flavifrons</i> group	8	20	32
80310	MIDGE	<i>Cardioladius obscurus</i>	0	0	0
80351	MIDGE	<i>Corynoneura</i> n.sp.	0	0	30
80360	MIDGE	<i>Corynoneura "celeripes"</i>	8	16	16
80370	MIDGE	<i>Corynoneura lobata</i>	241	437	996
80410	MIDGE	<i>Cricotopus (C.)</i> sp.	445	450	683
80420	MIDGE	<i>Cricotopus (C.) bicinctus</i>	117	508	757
80430	MIDGE	<i>Cricotopus (C.) tremulus</i> group	441	1687	2279
80500	MIDGE	<i>Cricotopus (Isocladius) reversus</i> group	768	0	0
80501	MIDGE	<i>Cricotopus (Isocladius) sylvestris</i>	8	0	0
80510	MIDGE	<i>Cricotopus (Isocladius) sylvestris</i> group	39	0	0
80720	MIDGE	<i>Eukiefferiella brevicar</i> group	0	15	15
81201	MIDGE	<i>Nanocladius (N.)</i> sp.	87	30	30
81229	MIDGE	<i>Nanocladius (N.) crassicornus</i>	0	0	23
81230	MIDGE	<i>Nanocladius (N.) crassicornus (old)</i>	0	0	75
81231	MIDGE	<i>Nanocladius crassicornus</i>	366	256	373
81240	MIDGE	<i>Nanocladius (N.) distinctus</i>	1160	33	237
81250	MIDGE	<i>Nanocladius minimus</i>	0	15	15
81270	MIDGE	<i>Nanocladius spiniplenus</i>	0	30	53
81280	MIDGE	<i>Nanocladius Plecopteracoluthus</i> n. sp.	0	1	1
81465	MIDGE	<i>Orthocladius carlatus</i>	0	81	81
81471	MIDGE	<i>Orthocladius (O.) oliveri</i>	0	0	37
81631	MIDGE	<i>Parakiefferiella</i> n. sp. 1	85	437	484
81650	MIDGE	<i>Parametrioctenemus</i> sp.	0	6	13
81825	MIDGE	<i>Rheocricotopus (Psilocricotopus) robacki</i>	8	198	268
82101	MIDGE	<i>Thienemanniella xena</i>	0	0	15
82121	MIDGE	<i>Thienemanniella</i>	0	399	399
82130	MIDGE	<i>Thienemanniella similis</i>	0	18	18
82141	MIDGE	<i>Thienemanniella xena</i>	73	398	1053
82200	MIDGE	<i>Tvetenia bavarica</i> group	0	174	197
82710	MIDGE	<i>Chironomus (C.)</i> sp.	61	0	4
82720	MIDGE	<i>Chironomus (C.) riparius</i> group	13	0	0
82730	MIDGE	<i>Chironomus (cC.) decorus</i> group	70	0	31
82770	MIDGE	<i>Chironomus riparius</i> group	8	0	384
82820	MIDGE	<i>Cryptochironomus</i> sp.	52	0	4
82890	MIDGE	<i>Demeijerea</i> sp.	87	0	0
83000	MIDGE	<i>Dicrotenipes</i> sp.	15	0	0
83002	MIDGE	<i>Dicrotenipes modestus</i>	131	0	0
83040	MIDGE	<i>Dicrotenipes neomodestus</i>	485	195	364
83050	MIDGE	<i>Dicrotenipes lucifer</i>	1944	167	377
83051	MIDGE	<i>Dicrotenipes simpsoni</i>	4608	37	142
83300	MIDGE	<i>Glyptotendipes (G.)</i> sp.	18372	67	1252
83600	MIDGE	<i>Kiefferulus dux</i>	0	0	54
83840	MIDGE	<i>Microtenidipes peddellus</i> group	0	1211	1412
83900	MIDGE	<i>Nilothauma</i> sp.	0	33	73
84020	MIDGE	<i>Parachironomus carinatus</i>	51	0	0
84155	MIDGE	<i>Paralauterborniella nigrohalteralis</i>	0	15	34

BLACK RIVER STUDY-DESCRIPTION OF THE ENVIRONMENT
Section II-57

84210	MIDGE	<i>Paratendipes albimanus</i>	5	0	109
84300	MIDGE	<i>Phaenopsectra obediens group</i>	221	6	6
84315	MIDGE	<i>Phaenopsectra flavipes</i>	108	0	33
84450	MIDGE	<i>Polypedilum convictum</i>	1118	1539	2136
84460	MIDGE	<i>Polypedilum fallax group</i>	276	589	838
84470	MIDGE	<i>Polypedilum (P.) illinoense</i>	197	30	30
84475	MIDGE	<i>Polypedilum (P.) ophioides</i>	0	0	7
84520	MIDGE	<i>Polypedilum haterale group</i>	0	6	13
84540	MIDGE	<i>Polypedilum (Tripodura) scalaenum group</i>	378	451	660
84700	MIDGE	<i>Stenocironomus sp.</i>	0	17	34
84750	MIDGE	<i>Stictochironomus sp.</i>	31	6	6
84800	MIDGE	<i>Tribelos jucundum</i>	27	52	64
84960	MIDGE	<i>Pseudochironomus sp.</i>	126	0	0
85230	MIDGE	<i>Cladotanytarsus mancus group</i>	0	20	40
85400	MIDGE	<i>Microsectra sp.</i>	75	0	12
85500	MIDGE	<i>Paratanytarsus sp.</i>	73	84	167
85615	MIDGE	<i>Rheotanytarsus distinctissimus group</i>	0	30	30
85625	MIDGE	<i>Rheotanytarsus exiguus group</i>	2458	6342	7157
85800	MIDGE	<i>Tanytarsus sp.</i>	92	241	448
85802	MIDGE	<i>Tanytarsus curtincornis group</i>		177	214
85814	MIDGE	<i>Tanytarsus glabrescens group</i>	1237	1018	1161
85840	MIDGE	<i>Tanytarsus guerlus group</i>	163	281	308
86401	WATERSNIPE FLY	<i>Atherix lantha</i>	3	1	2
87501	DANCEFLIES	<i>Empididae</i>	183	1366	1721
93025	SNAIL	<i>Bithynia tentaculata</i>	11	0	0
93200	SNAIL	<i>Hydrobiidae</i>	68	0	0
93900	SNAIL	<i>Elimia sp.</i>	0	10	10
94400	SNAIL	<i>Fossaria sp.</i>	0	0	1
95100	SNAIL	<i>Physella sp.</i>	14	1	93
95907	SNAIL	<i>Gyraulus parvus</i>	6	0	0
96120	SNAIL	<i>Menetus (Micromenetus) dilatatus</i>	24	0	0
96130	SNAIL	<i>Menetus (Micromenetus) sampsoni</i>	4	0	0
96900	SNAIL	<i>Ferrissia sp.</i>	44	95	234
96930	SNAIL	<i>Laevapex fuscus</i>	21	0	0
97601	MUSSEL	<i>Corbicula fluminea</i>	1	0	0
97710	MUSSEL (ZEBRA)	<i>Dreissena polymorpha</i>	1601	0	0
98001	MUSSEL	<i>Sphaeriidae</i>	0	0	8
98200	MUSSEL	<i>Pisidium sp.</i>	0	2	2
98600	MUSSEL	<i>Sphaerium sp.</i>	1	10	10
	TOTAL		97923	41547	60079

BLACK RIVER STUDY

Conclusions & Recommendations



*All that I have ever done
Is lost in endless river run
All that I would ever be
Is part of my river's mystery*

-Larry Everson

OVERVIEW AND CONCLUSIONS

Division of Natural Areas & Preserves Mission Statement:

The mission of the Division of Natural Areas & Preserves is to administer a system of natural areas and scenic rivers by identifying, inventorying, protecting and managing the best remaining examples of Ohio's natural diversity for the benefit of present and future generations. The Division conducts and promotes research and educational programs designed to further the preservation of significant biological and geological features.

Consistent with the intent of Ohio's Scenic Rivers Law, this study focused on determining if the Black River represents one of Ohio's premier river systems with respect to the stream's natural, historical and/or recreational character. This was accomplished through a comprehensive evaluation and inventory of the relevant resources found within the watershed. This information was then applied to criteria employed by the Division of Natural Areas & Preserves in determining whether or not a river is suitable for inclusion into Ohio's Scenic River system.

Information was derived from a variety of sources, including the most recently completed studies and publications. For example, the 1992 Black River Water Quality Study completed by the Surface Water Assessment Unit of the Ohio Environmental Protection Agency proved to be an important source of technical information about water quality issues, fish and macroinvertebrate life and the watershed in general. Additional information was derived from review of applicable literature, field investigations, and conversations with persons knowledgeable about the Black River.

Where practical, conclusions about current conditions on the Black River are derived from objective and otherwise valid sources. However, first-hand observations, qualitative judgment and other subjective interpretations of data and information also contribute to the scenic river designation process.

The environmental values described are those used to define a wild or scenic river in the context of Ohio's Scenic Rivers Program and are not restricted to aesthetic "values". For the sake of scenic river designation, various criteria are used to evaluate a river. These include: the integrity of the riparian corridor; water quality; integrity of the biological communities; channel modifications, impoundment or other man-made alteration to the stream's flow; length of the stream; bridge crossings; and, several other considerations. The two most important considerations are the integrity of the riparian corridor and the aquatic ecosystem. Although all factors are considered, it is fundamental and critical that at least one continuous ten-mile segment of stream must meet ALL designation criteria in order for the stream (or segments thereof) to be considered for designation as an Ohio Scenic River.

This report was completed to provide background information and assessments that may be used by the director of the Ohio Department of Natural Resources in determining whether the Black River should be added to Ohio's system of wild, scenic and recreational rivers. It is intended to address issues specifically related to the scenic river designation process established and approved by the Department. Conclusions and recommendations contained in this report are expressed with this sole purpose in mind.

REVIEW OF CRITERIA AND CONCLUSION WEST BRANCH-Black River

1. *For maximum benefit, the total length of the designated section of the stream may be no less than 10 miles; however, sections of the river may be so divided that other river designations are possible. No section may be less than five miles.*

The West Branch of the Black River flows approximately 38 miles through agricultural portions of southwestern Lorain County before converging with the East Branch in Elyria to form the mainstem of the Black River. There are no ten mile continuous segments within the West Branch meeting water quality requirements for scenic river designation. Poor water quality is having a significant impact on biological communities within the West Branch. This criteria is not being met.

2. *At least 75% of the designated section of stream must be free-flowing.*

The West Branch of the Black River is more than 75% free-flowing. However, two lowhead dams are found on the West Branch in Carlisle Township and the city of Elyria.

3. *The area adjacent to at least 25 percent of the stream length, (considering both banks), shall be forested outward from the river to a depth of 300 feet or greater.*

The West Branch of the Black River is 27% forested to a minimum of 300 feet outward from the river bank. However, ongoing loss and/or disruption of the riparian zone on the West Branch is continuing to exert a negative influence on physical habitat in and around the river. For example, two of the seven reference segments sampled by OEPA in 1992 identified sparse riparian vegetation as severely impacting in-stream habitat. The West Branch exhibits the widest variation of QHEI values in the Black River watershed reflective of the inconsistencies in corridor integrity.

4. *The designated section should be accessible by canoe or trail during the normal recreation season.*

The West Branch is a relatively small stream that is not well suited to extensive recreational canoeing. Approximately two-thirds of the West Branch are designated headwaters. Numerous logjams and very shallow reaches make canoeing difficult and/or impractical. Year-round canoeing is available only in a short stretch northeast of Oberlin downstream to the mandatory take-out above the falls in the city of Elyria.

Public access to hiking trails along the West Branch is available in the Carlisle Reservation of the Lorain County Metroparks. Generally, much of the property adjacent to the West Branch is privately owned, therefore public access to the stream is severely restricted.

5. *Pan or game fish should be present in 75% of the designated section.*

Thirty-four species of fish were collected from the West Branch by OEPA during its 1992 study. Panfish present in the West Branch include bluegill, white crappie, rock bass, and several species of sunfish. Game fish collected in the West Branch include largemouth and smallmouth Bass.

Fish communities within the West Branch are numerically dominated by creek chubs, followed by other silt tolerant species such as common shiners, white suckers, green sunfish and blacknose dace. Their abundance reflects the impact of siltation and other forms of nonpoint pollution currently suppressing fish community performance in the West Branch. Panfish and gamefish are not numerically abundant within the West Branch. Using OEPA's Index of Biological Integrity to measure fish community performance, the West Branch fish community is performing rather poorly at all stations but the most upstream sampling station.

6. *Industries may be located in the designated section, but no more than an average of one industry for each five miles may be located closer than 300 feet to the river, except at villages, or unless adequately screened to be out of sight and hearing from the river and associated use areas.*

Large industries are limited to urban areas near Elyria and are sufficiently buffered from the river. Upstream portions of the West Branch are predominately agricultural, however significant increases in housing and light commercial activity are being observed.

7. *No more than 10 percent of the length of the designated section may flow through an urban area.*

A total of 4 river miles of the West Branch of the Black River flows through urban areas. This figure equals slightly more than 10% of the 38 mile length of the West Branch.

8. *Roads paralleling portions of the river are permissible but no more than 50 percent of the total roads on either side of the river may be closer than 300 feet to the river's banks unless the preservation plan approved by the Director of Natural Resources clearly designates and utilizes adjacent roads as an integral part of the plan.*

Primary roads paralleling the West Branch of the Black River total only 3.0 miles or less than 10% of the river length.

9. *Where dredging, channel improvement works, or sand and gravel removal, etc., is part of the plan, the channel and lands shall be restored to harmonize with natural conditions.*

No plans for instream work within the West Branch were discovered during the course of this study.

- 10. Preliminary plans for the general location of recreation facilities and access sites and preservation of scenic features must be approved by the director of Natural Resources. When significant historical, biological or geological features are present within the valley, preliminary plans shall be developed for their preservation, marking, or interpretation to the visitors.***

Assessment of such plans is not appropriate at this time. Most historical, biological and/or geological sites of significance within the West Branch are either currently protected in public park properties or held by private owners.

- 11. Existing water quality must be equal to or exceed the water quality criteria for Aquatic Life-Warm Water Fisheries as adopted by the Ohio Water Pollution Control Board, March 14, 1972. If the quality of the waters at any time falls below these criteria, a means to meet the criteria must be readily available and a pollution control and abatement plan must be developed to meet the criteria and be approved by the Ohio Environmental Protection Agency.***

There are no ten mile continuous segments within the West Branch meeting water quality requirements for scenic river designation. Generally, poor water quality is having a significant impact on biological communities within the West Branch. The impacts of nonpoint pollution and excessive sedimentation are evident in the preponderance of silt and pollution tolerant organisms found within the West Branch.

- 12. These criteria are intended to serve as a general planning guide. Since many factors essential to the definition of a scenic river do not lend themselves to linguistic expression, the director of Natural Resources shall exercise judgment in varying from the criteria to assure that the fullest potentials of the Ohio Wild and Scenic Rivers Act are realized.***

CONCLUSION

While the criteria listed above cover a variety of conditions, they are not listed in a priority order. The two most important issues to be considered are the integrity of the terrestrial (riparian corridor) and the aquatic ecosystems. Several of the criteria listed above are measures of these two important factors. When making a determination concerning inclusion into the state scenic rivers system, these factors weigh heavily in the decision making process.

The West Branch continues to exhibit the negative impacts of human activities. Its natural systems and functions are impaired by excess siltation and continued loss of riparian forest corridor. Consequently, biological performance within the river is stressed and fails to meet warm water habitat standards except at one isolated upstream location. There also are no ten-mile continuous segments of the West Branch meeting WWH water quality standards. As a result, the West Branch of the Black River is not recommended for scenic river designation.

REVIEW OF CRITERIA & CONCLUSION MAINSTEM-Black River

1. *For maximum benefit, the total length of the designated section of the stream may be no less than 10 miles; however, sections of the river may be so divided that other river designations are possible. No section may be less than five miles.*

The mainstem of the Black River forms at the confluence of the East and West Branches in Elyria and flows northward for 15.6 miles before emptying in Lake Erie. The river is only partially attaining standards for warm water habitat. The only segment that reached the warm water standard was in the Cascade Falls area. With respect to scenic river designation requirements, there are no ten-mile segments of the mainstem of the Black River meeting this criteria.

2. *At least 75% of the designated section of stream must be free-flowing.*

With the exception of a small segment of the mainstem near Elyria that is influenced by a lowhead dam, the mainstem of the Black River is a free-flowing stream with well defined riffle-run-pool complexes from RM 15.0 to RM 6.5. From RM 6.5 to RM 3.0, the mainstem is influenced by the influx of Lake Erie. From RM 3.0 northward to Lake Erie, the mainstem is estuarine in nature and dramatically influenced by Lake Erie.

3. *The area adjacent to at least 25% of the stream length, (considering both banks), shall be forested outward from the river to a depth of 300 feet or greater.*

The mainstem of the Black River is 25% forested to a minimum of 300 feet outward from the riverbank. Corridor conditions within the Black River Reservation of the Lorain County Metroparks are particularly good. Much of the mainstem from Elyria southward is in public ownership. Subsequently, corridor degradation is not as dramatic as in other sections of the watershed.

4. *The designated section should be accessible by canoe or trail during the normal recreational season.*

The Black River mainstem is seasonably canoeable during periods of normal flow. During late summer months, water levels drop, rendering much of the middle reaches of the mainstem unsuitable for recreational canoeing.

In areas of the mainstem bordered by the Black River Reservation, public access to the mainstem is excellent. Annual public attendance at the Black River Reservation exceeds 400,000 visitors.

5. *Pan or game fish should be present in 75% of the designated section.*

Due to the influence of Lake Erie, 48 species of fish were collected from the mainstem of the Black River. Panfish found within the mainstem include rock bass, yellow and white perch, white bass, bluegill and white crappies. Panfish are found throughout the mainstem in relative abundance.

Gamefish found within the mainstem include largemouth and smallmouth bass and an occasional lake-run rainbow trout (or steelhead). Largemouth bass are the most common game fish found in the mainstem.

Although water quality improvements are being observed over past severely degraded conditions, a large number of pollution and silt intolerant fish species have disappeared from the river. Additionally, the fish community

continues to be dominated by pollution tolerant species such as white suckers, carp, creek chubs and others. Warm water habitat standards are being met at only one site on the entire mainstem which illustrates the need for additional improvements before the mainstem will be able to meet warm water standards. OEPA studies rate the stream as well-below standards.

- 6. Industries may be located in the designated section, but no more than an average of one industry for each five miles may be located closer than 300 feet to the river, except at villages, or unless adequately screened to be out of sight and hearing from the river and associated use areas.***

The lower mainstem of the Black River, especially in the vicinity of Lorain is a highly industrialized river with steel mills and commercial shipping activities comprising the lower 5-6 miles of the river. The USS KOBE steel mill, although buffered by somewhat narrow riparian forest cover, exerts a considerable influence on this section of the river. Frequent industrial noises such as trains, whistles and other sounds disrupt the otherwise natural "feel" of the mainstem. Odors emanating from industrial sources also are a problem on the lower mainstem.

- 7. No more than 10% of the length of the designated section may flow through an urban area.***

The lower six miles of the mainstem are largely urban/industrial. Middle reaches of the mainstem are urban in flavor, with numerous highway bridge crossings and associated vehicle noise. Portions of the mainstem in Elyria are also urban in nature. Although buffered somewhat by steep valley walls, more than 20% of the length mainstem flows through urban areas. The mainstem does not meet this criteria.

- 8. Roads paralleling portions of the river are permissible but no more than 50 percent of the total roads on either side of the river may be closer than 300 feet to the river's banks unless the preservation plan approved by the Director of Natural Resources clearly designates and utilizes adjacent roads as an integral part of the plan.***

Primary roads paralleling the mainstem total approximately 6 miles or about 40% of the stream's length.

- 9. Where dredging, channel improvement works, or sand and gravel removal, etc., is part of the plan, the channel and lands shall be restored to harmonize with natural conditions.***

No plans for instream work within the mainstem of the Black River were discovered during the course of this study.

- 10. Preliminary plans for the general location of recreation facilities and access sites and preservation of scenic features must be approved by the director of Natural Resources. When significant historical, biological or geological features are present within the valley, preliminary plans shall be developed for their preservation, marking, or interpretation to the visitors.**

Assessment of such plans is not appropriate at this time. Many historical and geological sites of significance within the mainstem are currently protected either in city parks or in the Black River and/or French Creek reservations of the Lorain County Metroparks.

- 11. Existing water quality must be equal to or exceed the water quality criteria for Aquatic Life-Warm Water Fisheries as adopted by the Ohio Water Pollution Control Board, March 14, 1972. If the quality of the waters at any time falls below these criteria, a means to meet the criteria must be readily available and a pollution control and abatement plan must be developed to meet the criteria and be approved by the Ohio Environmental Protection Agency.**

Although water quality improvements are being observed over past severely degraded conditions, a large number of pollution and silt intolerant species have disappeared from the river. Additionally, the fish community continues to be dominated by pollution tolerant species such as white suckers, carp, creek chubs and others. Warm water habitat standards are being met at only one site on the entire mainstem which illustrates the need for additional improvements before the mainstem will be able to meet warm water standards. OEPA studies rate the stream as well-below standards. No ten mile segments of the mainstem are meeting the minimum warm water criteria. The river does not meet this criteria.

- 12. These criteria are intended to serve as a general planning guide. Since many factors essential to the definition of a scenic river do not lend themselves to linguistic expression, the director of Natural Resources shall exercise judgment in varying from the criteria to assure that the fullest potentials of the Ohio Wild and Scenic River Act are realized.**

CONCLUSION

The Black River mainstem, while improving over its past, severely degraded conditions, still has poor performance within the biological community. The highly urban character of the mainstem as well as not meeting the warm water minimum standards for ten continuous miles precludes the mainstem from scenic river consideration. The mainstem is not recommended for designation.

REVIEW OF CRITERIA & CONCLUSION EAST BRANCH-Black River

1. *For maximum benefit, the total length of the designated section of the stream may be no less than 10 miles; however, sections of the river may be so divided that other river designations are possible. No section may be less than five miles.*

The East Branch flows nearly 57 miles through northern Medina and southeast Lorain counties before converging with the West Branch in Elyria to form the mainstem. The longest continuous reach of the stream meeting warm water habitat standards is 8.8 miles (river mile 10.1-18.9), however this stretch of river is threatened by upstream sites where agricultural and other nonpoint impacts continue to adversely influence the downstream biological communities. This criteria is not being met.

2. *At least 75% of the designated section of stream must be free-flowing.*

Three low-head dams in the vicinity of Elyria are the only impediments to stream flow in the East Branch. The East Branch is largely a free-flowing stream with well developed riffle-run-pool complexes in those areas outside of the Elyria area. Substantially more than 75% of the stream is free-flowing.

3. *The area adjacent to at least 25 percent of the stream length, (considering both banks), shall be forested outward from the river to a depth of 300 feet or greater.*

The East Branch just meets the minimum 25% requirement. In some areas, riparian forest corridor is well developed, however riparian forest cover in many other areas is absent or severely degraded. In areas where corridor is present, physical habitat conditions are generally good. In areas where corridor is absent, severe streambank erosion is evident and biological communities are suppressed.

At RM 32.5 and RM 36.8, the riparian corridor is relatively intact and physical habitat conditions are generally good. However, fish communities are performing poorly due to excessive sediments in the stream. Inputs of silt and sediment from these upstream sites pose continued threats to downstream areas.

4. *The designated section should be accessible by canoe or trail during the normal recreation season.*

Canoeing on the East Branch is dependent upon rainfall and provides limited opportunities. In the area above the SR303 bridge near Grafton to the Coonville Road bridge above the falls in Elyria, the river paddler can expect portages around lowhead dams and numerous low water stretches. Due to the ownership patterns along the East Branch, public access to the stream is restricted.

Hiking trail access to the East Branch is also limited. Some access is available at Indian Hollow Metropark, however the majority of land adjacent to the East Branch is privately owned thereby restricting public access.

5. *Pan or game fish should be present in 75% of the designated section.*

Pan and game fish found within the East Branch include bluegill, rock bass, pumpkinseed, white crappies, large and smallmouth bass. However, the fish communities within the stream, while better than those found in the mainstem and West Branch, do not approach the diversity and/or abundance of fish species that are found in higher quality streams.

6. *Industries may be located in the designated section, but no more than an average of one industry for each five miles may be located closer than 300 feet to the river, except at villages, or unless adequately screened to be out of sight and hearing from the river and associated use areas.*

Industry and heavy commercial activities are limited to urban areas near Elyria and are sufficiently buffered from the river. Development activities are increasing in the East Branch, with residential and light commercial activity increasing dramatically in southern sections of Lorain county and northern Medina county.

7. *No more than 10 percent of the length of the designated section may flow through an urban area.*

Less than three miles of the East Branch's 57 miles flows through urban areas. This is primarily within the city of Elyria. Approximately 5% of the East Branch is urban in character, with most of the stream flowing through agricultural countryside.

8. *Roads paralleling portions of the river are permissible but no more than 50 percent of the total roads on either side of the river may be closer than 300 feet to the river's banks unless the preservation plan approved by the director of Natural Resources clearly designates and utilizes adjacent roads as an integral part of the plan.*

Primary roads parallel to the East Branch total less than 3 miles or less than 5% of the river's length. As mentioned, the East Branch is a rather remote stream.

9. *Where dredging, channel improvement works, or sand and gravel removal, etc., is part of the plan, the channel and lands shall be restored to harmonize with natural conditions.*

No plans for instream work within the East Branch were discovered during the course of this study.

10. *Preliminary plans for the general location of recreation facilities and access sites and preservation of scenic features must be approved by the director of Natural Resources. When significant historical, biological or geological features are present within the valley, preliminary plans shall be developed for their preservation, marking, or interpretation to the visitors.*

Assessment of such plans is not appropriate at this time.

- 11. Existing water quality must be equal to or exceed the water quality criteria for Aquatic Life-Warm Water Fisheries as adopted by the Ohio Water Pollution Control Board, March 14, 1972. If the quality of the waters at any time falls below these criteria, a means to meet the criteria must be readily available and a pollution control and abatement plan must be developed to meet the criteria and be approved by the Ohio Environmental Protection Agency.***

The longest continuous stretch of stream meeting warm water habitat standards is 8.8 miles (river mile 10.1-18.9), however this stretch of river is threatened by upstream sites where agricultural and other nonpoint inputs continue to adversely influence downstream biological communities. This criteria is not being met.

- 12. These criteria are intended to serve as a general planning guide. Since many factors essential to the definition of a scenic river do not lend themselves to linguistic expression, the director of Natural Resources shall exercise judgement in varying from the criteria to assure that the fullest potentials of the Ohio Wild and Scenic River Act are realized.***

CONCLUSION

As mentioned under the West Branch, while the criteria listed above covers a variety of conditions, they are not listed in priority order. The two most important issues to be considered are the integrity of the terrestrial (riparian corridor) and aquatic ecosystems. Several of the criteria listed are measures of these two important factors. When making a determination concerning inclusion into the state scenic rivers system these factors weigh heavily in the decision making process.

Although possessing several important characteristics, poor fish community performance and continuing problems with nonpoint pollution present significant concerns for the East Branch. There are no ten-mile continuous segments of the East Branch meeting warm water habitat water quality standards. This lack of extended river miles fully attaining water quality standards and continued impairments to biological communities do not support recommending designation of the East Branch at this time. The East Branch, while minimally meeting many of the above criteria still reflects a marginal stream system when compared to high quality streams throughout the state. When compared to other scenic rivers and in consideration of the mission of the Division, designation of the East Branch would not be appropriate. With continued riparian and aquatic habitat improvements, the East Branch may be reconsidered in the future. For now, the Black River RAP and local community organizations should continue to work together for the long term benefit and restoration of the East Branch and the overall Black River basin.

PROGRAM RECOMMENDATIONS

Throughout the course of this study of the Black River watershed, a number of issues and concerns with the river have been identified, quantified where feasible, and generally discussed with respect to scenic river consideration. Some concerns, such as nonpoint pollution impacts, water turbidity and others are common (to one extent or another) to many streams in Ohio. Other issues are isolated and specific to portions of the Black River.

There are a number of organizations and individuals who are committed to actively working to restore the Black to its natural state. The continuation of these ongoing efforts is vital to continuing the progress that is reflected by the Black River's improved condition. The following recommendations are offered as suggestions that may help with local efforts to restore the Black River.

- ***It is vital that public and private landowners along the river implement concerted efforts to restore critical riparian habitat.***

Riparian forests as narrow as 50 feet wide have dramatic impacts on reducing nutrient enrichment in agricultural areas and nonpoint pollution runoff in urban areas. Virtually all of the Black River watershed is being adversely impacted by these pollutants. Restoration of riparian corridors is vital to diminishing these impacts.

- ***Efforts to encourage farm operators to enroll river bottom cropland into conservation reserve set-asides and/or the planting of grass waterways should be enhanced.***

More often than participation in these programs not only dramatically improves streamside conditions but also frequently result in increased profits for the farm operator.

- ***Concerted improvements in monitoring and enforcement are needed to insure compliance and reduce the harmful impacts of industrial discharges.***

The influence of industrial discharges has generally been reduced through a combination of regulatory action and improved technology. However, OEPA reports that in any given month, more than 25% of permitted dischargers are out of compliance with permit requirements.

- ***Ongoing efforts to expand conservation tillage should be continued and wherever possible, substantially enhanced.***

Agricultural runoff and stream bank erosion are two of the most evident and urgent concerns within the watershed. Educational efforts by local soil and water conservation districts and organizations such as the Black RAP should be coordinated and concentrated in those upstream areas of the East and West Branches where these problems are most prevalent.

- ***The golfing community needs to be sensitized to the importance of maintaining streamside forests and stable stream banks.***

Educational efforts focusing on these (and other recreational) facilities along the Black River should be implemented and/or expanded. Streambank erosion is evident at several golfing facilities along the Black River.

- ***Educational efforts promoting alternatives to rip-rap and other permanent channel modifications should be encouraged and enhanced.***

Several demonstration sites on the Black River exhibit the effectiveness of bioengineering techniques. The development and distribution of educational publications encouraging these techniques should be pursued.

- ***More frequent bio-monitoring within the Black River should be undertaken whenever possible.***

Evidence suggests that aquatic communities are undergoing a significant transition, particularly in the mainstem and East Branch. In rivers where significant restorative efforts are underway, current five to ten year cycles of monitoring are inadequate to identify whether current trends are temporal variations or representative of long term shifts in the aquatic communities.

- ***Establish a volunteer stream quality monitoring program.***

It was evident throughout this study that macroinvertebrate communities within much of the watershed are not as abundant or diverse as physical habitat conditions should permit. Routine monitoring of aquatic macroinvertebrates will provide important data that can help isolate trends in the benthic community. Stream quality monitoring also provides an active and enjoyable way for the public to participate in the restoration activities on the Black River. Such experience nearly always leads to the public becoming more vocal advocates for the river.

- ***Interpretive programs highlighting the natural features of the Black River should be more routinely scheduled throughout the watershed.***

Whether conducted by park naturalists, representatives of the Black RAP or by trained volunteers, interpretive programming is a critical tool in generating public interest and support for ongoing efforts to restore the river.

- ***Creative activities for enlisting general public involvement in the Black River should be conducted more frequently.***

Too often, those of us in the river protection business tend to think only of "river clean-ups" when exploring ways to involve the public. Many creative and meaningful possibilities exist, such as conducting riparian bird surveys, wildflower surveys, public canoe floats and others. We must learn to become more effective at developing appealing and meaningful alternatives to traditional public programs and activities.

BLACK RIVER STUDY

Bibliography & References Cited



"You can only tell the story as it was given to you."

-Barry Lopez

BIBLIOGRAPHY AND REFERENCES CITED

- Anderson, Dennis M., *Plant Communities of Ohio: A Preliminary Classification and Description*, Ohio Department of Natural Resources, Division of Natural Areas & Preserves, Columbus, Ohio, 1982.
- Author Unknown, *A Guide to Surveying Ambystomids in Northern Ohio (Lorain County)*, Friends of Wetlands Newsletter, Lorain, Ohio, March 1994.
- Black River Remedial Action Plan, *Black River Remedial Action Plan, Stage One Report*, Lorain County, Ohio, 1994.
- Brandstetter/Carroll, Inc., *Cascade & Elywood Parks Master Plan for the Elyria Parks & Recreation Department*, Elyria, Ohio, 1994.
- Burt, William H. and Grossenheider, Richard P., *Peterson's Field Guide to the Mammals*, 2nd Edition, Houghton Mifflin Co., Boston, Mass., 1964.
- Conant, Roger, *Peterson's Guide to Reptiles and Amphibians of Eastern and Central North America*, 2nd Edition, 1975.
- Forsyth, Jane L., *Geological History of the Maumee River*, Northwest Ohio Quarterly, Vol. 59, No. 2 (Spring 1987): 39-46.
- Lewis Publishing Company, *A Standard History of Lorain County Ohio*, Volume 1, the Lewis Publishing Company, Chicago & New York, 1916.
- Limbach, C. William, *Black River Riparian Wildlife Census*, Unpublished Manuscript, Lorain County, Ohio, 1993.
- Lopez, Barry, *Crossing Open Ground*, Vintage Books, Random House Publishing, New York; New York, 1971.
- Lorain County Metroparks, *Caley Reservation Natural Resources Management Plan*, Lorain County Metroparks System, LaGrange, Ohio, 1995
- Lorain County Metroparks, *Carlisle Reservation Natural Resources Management Plan*, Lorain County Metroparks System, LaGrange, Ohio, 1995
- Lorain County Metroparks, *Charlemont Reservation Natural Resources Management Plan*, Lorain County Metroparks System, LaGrange, Ohio, 1995
- McCafferty, Patrick W., *Aquatic Entomology: The Fisherman's and Ecologist's Guide to Insects and their Relatives*, Jones & Bartlett Publishers, Inc., Boston, Mass., 1981.
- McGraw-Hill, Inc., *The Life of Rivers & Streams*, McGraw-Hill Publishing, New York, NY, 1967.

- Pennack, Robert W., *Fresh-water Invertebrates of the United States*, 3rd Edition, John Wiley & Sons, Inc., New York, 1989.
- Peterson, Roger Tory, *Peterson's Guide to the Bird East of the Rockies*, 4th Edition, Houghton-Mifflin Co., Boston, Mass., 1980.
- Ohio Academy of Science, *Ohio's Natural Heritage*, Columbus, Ohio, 1979.
- Ohio Department of Natural Resources, *Gazetteer of Ohio's Streams, Report No. 12 of the Ohio Water Inventory Plan*, Columbus, Ohio.
- Ohio Department of Natural Resources, Division of Geological Survey, *Sand and Gravel Resources of Northern Ohio*, Columbus, Ohio, 1949. Reprinted 1982.
- Ohio Department of Natural Resources, Division of Geological Survey, *1994 Report on Ohio Mineral Industries*, Columbus, Ohio, 1995.
- Ohio Department of Natural Resources, Division of Natural Areas & Preserves, *Assorted Records from the Natural Heritage Database*.
- Ohio Department of Natural Resources, Division of Natural Areas & Preserves, *Ohio Statewide River Inventory*, Unpublished Manuscript, Columbus, Ohio, 1991.
- Ohio Department of Natural Resources, Division of Natural Areas & Preserves, *National Wild & Scenic River Application, Big and Little Darby Creeks*, Unpublished Manuscript, 1992.
- Ohio Department of Natural Resources, Division of Watercraft, *Boating on Ohio's Streams*, Columbus, Ohio, 1995.
- Ohio Environmental Protection Agency, *Biological and Water Quality Study of the Black River (with selected tributaries and Beaver Creek)*, Columbus, Ohio, 1994.
- Ostrand, Monica Day, *An Exploration of the Trends in Social Equality Developed through an Examination of North American Indian Cultures*, Unpublished Manuscript, 1995.
- Trautman, Milton B., *The Fishes of Ohio*, Ohio State University Press, Columbus, Ohio, 1981.
- White, George, *Glacial Geology of Northeastern Ohio*, Ohio Department of Natural Resources, Division of Geological Survey, Columbus, Ohio, 1982.
- USDA-Natural Resources Conservation Service, *Black River Watershed Nonpoint Source Pollution Management Plan*, Lorain County Soil & Water Conservation District, March, 1995.