GREENWAYS

A Plan for Franklin County

Mid-Ohio Regional Planning Commission

Acknowledgments

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Preserving Central Ohio's Quality of Life By Protecting Its River Corridors

(Fig. 1) Franklin County's stream and river corridors provide miles of aesthetic, ecologic and economic opportunity.

THE GREENWAYS INITIATIVE

Franklin County's river and stream corridors comprise an extremely important natural asset. Aesthetically, ecologically and economically they offer us countless opportunities for improving the community's health and enhancing the quality of life. Yet for years they have not been considered from this perspective.

The Franklin County Greenways Plan describes a vision and a plan of action for the city of Columbus, Franklin County and the many jurisdictions which make up the Columbus metropolitan area. This plan asks what our streams and rivers mean to us here in central Ohio, and then attempts to forge a better understanding of their multiple uses. The plan assumes that economic development and natural resource preservation are compatible objectives. It suggests that healthy natural systems — used sustainably — will support healthy economies and vibrant communities.

Research shows increasing urbanization has had a negative impact on the ecological

(Fig. 2) Big Darby Creek

integrity of our rivers and streams (Yoder and Rankin, 1996). The impervious surfaces associated with urban areas, (parking lots, roads, and rooftops) have been shown to adversely affect biological stream quality (Schueler, 1994).

The long term crucial economic, ecological and recreational value of our surface waters is dependent upon our ability to understand and ultimately control different forms of landscape activities that affect our rivers. It is very difficult to create affordable experiments that can manage the many variables associated with streamflow, ecological processes, various weather patterns and the complexities of the urban fabric. Therefore, it is hard to get concrete answers to facilitate large-scale land planning. However, they are vital in order to make informed decisions about how we manage our river systems.

While the solutions are as complex as the many causes of stream degradation, research suggests that some elements of the decline can be forestalled and moderated by preserving healthy, intact riparian areas along streams (Steedman, 1988). Control of point source discharges from pipes has caused great improvement in water quality over the last twenty years. While we don't know exactly to what extent riparian area protection will improve ecological quality, studies show that there is a direct correlation between healthy stream function and the presence of intact riparian zones (Rankin, et.al., 1994). Greenways can be an excellent method of protecting riparian zones as part of the stream ecosystem — hence the reason for this initiative.

HISTORY OF THE GREENWAYS PLANNING PROCESS

On several occasions over the past 20 years, governments in Franklin County have recognized the importance of the area's river systems. Beginning with the 1974 *Watercourse Plan for Columbus and Franklin County*, which set the stage for stewardship strategies for the region's reservoirs and rivers, there has been strong interest in the preservation of green spaces along our waterways. The Watercourse Plan recommends that all waterways in Franklin County be protected as natural corridors to be used by citizens as active and passive recreational amenities. The Columbus Recreation and Parks Commission adopted the plan, and the results of that effort are clearly apparent, especially along the Scioto and Olentangy Rivers and Alum Creek. Additional support for this initiative was also reflected in the *Columbus Comprehensive Plan*, adopted by the city of Columbus in 1993. The recently completed City of Columbus Health Department plan entitled *Priorities 95* contained many recommendations for protecting riparian corridors throughout the county.

In 1985 the Nature Conservancy declared the Darbys "A Last Great Place" in the Western Hemisphere. The river was also designated by ODNR as a State Scenic River. The Conservancy offered to help facilitate a partnership with farmers, land owners, the business community and over forty public and private agencies and organizations. The Partnership has developed an integrated preservation program which includes various projects focusing on riparian corridor restoration, biological assessment, land use planning, environmental education and protection. Conservation work by agencies in the Darby Creek Watershed is not new and can be traced back 48 years ago when the local Soil and Water Conservation Districts were forming. What is new however is the attempt to solve conservation problems on a watershed basis in central Ohio.

The Franklin County Greenways Plan builds on a long history of waterways studies...

While the environmental benefits of rivers and streams have been emphasized, their economic importance is receiving increased attention, as witnessed by the efforts of the Riverfront Commons, Inc., which is in the process of developing recommendations to maximize the potential of the downtown river front.

The Franklin County Greenways Plan builds on a long history of waterways studies, but what makes this planning process different from those of the past?

In 1993 Ohio residents passed a $200 million natural resources bond issue known as NatureWorks. Although primarily directed at state and local park improvement, a small portion of the bond package was reserved for reducing non-point sources of pollution. As defined by ODNR, non-point pollution includes rain-induced runoff from agricultural cropland, urban streets, mined land, and also other forms of pollution resulting from the draining of wetlands, channelization of streams, etc. The Ohio Division of Soil and Water Conservation used the nonpoint pollution bond money to initiate several programs, one of which was called *Streambanking*. The Streambanking program offered up to $600,000 to county Soil and Water Conservation Districts for protection of riparian areas along streams if they would join together with other local government or land protection groups and develop riparian area protection plans.

Seizing the opportunity, the Franklin County Soil and Water Conservation District (FSWCD) and the Mid-Ohio Regional Planning Commission (MORPC) applied to the Streambanking program. In the spring of 1995, the Franklin County Greenways Program became one of six new riparian protection projects in Ohio.

PHASE I: INVENTORY AND OUTREACH

From the beginning, the Franklin County Greenways Initiative was different.

Unlike most government programs, no money was provided for developing a plan, only for implementing one. NatureWorks funding had to be used to acquire lands along rivers and streams through conservation easements or outright purchase. This posed a major dilemma for the project partners, the FSWCD and MORPC. Where was the money going to come from to develop a riparian protection plan?

The accumulation of funding for the preparation of the Franklin County Greenways Plan was a part of the planning

The project has succeeded in part because of the generous contribution of thousands of hours of volunteer time.

process. Recognizing the potential importance of a greenways plan to its objectives, the Columbus Recreation and Parks Department was the first to step forward to the help the new project get started, providing $25,000. Next came Franklin County Development Department, Franklin County MetroParks, the City of Columbus Division of Sewage and Drainage and many others. In all, a total of $180,000 has been contributed by 13 agencies and municipalities to allow the Greenways Plan to become reality.

Typical of most planning projects, the Greenways staff established a Technical Committee composed of agency staff knowledgeable in the many aspects of community planning, natural resource management, recreation and public utilities. To complement the technical component, a Steering Committee was established to provide policy direction. The Steering Committee is composed of representatives of local government agencies having a major legal impact on the waterways of the county, as well as representatives from the development community, and other river protection groups. The Steering and Technical Committees are chaired by Franklin County Commissioner Arlene Shoemaker.

The riparian protection plan stipulated in the grant agreement required that MORPC staff inventory the 180+ miles of rivers and streams in Franklin County. The Franklin County Greenways Plan would justify and lay out a plan for the orderly conversion of these 360+ miles of stream banks into preserved riparian corridors of greenspace. Ordinarily the technical committee would provide the data on which to base planning recommendations. However, three key issues had to be resolved to produce a plan: 1) lack of good base data; 2) there was little consensus over what level of detail would be useful for a greenways plan, and 3) there was concern that the public would not be a major factor in the plan unless they were completely involved at the onset.

There is as yet no comprehensive inventory of riparian zones which would aid in future greenways planning nor are there current fine-grained soils maps on Geographic Information Systems to define the intrinsic suitability of some areas for greenway functions. We acknowledge the qualitative need for healthy riparian zones, but we lack data to support the quantitative relationships between size, type and extent of riparian zone necessary for optimum biological and physical functioning.

With funding secure and goals identified the collection of the plan's basic information presented the next daunting task. It was soon determined that an organized "volunteer" survey of the rivers and streams needed to be completed. At their meeting on November, 1995, Steering Committee members were asked to step down from their traditional role of attending meetings about greenways planning and actually walk the streams and rivers of the county to collect baseline information for the plan. More than that, they were asked to enlist volunteers from the community to help them. Rising to the occasion, Steering Committee members walked the waterways; and aided by numerous community meetings and positive articles and hats donated by the Columbus Dispatch, more than 200

(Fig. 3) Commissioner Shoemaker, Franklin County Greenways Chair, and members of the Columbus Academy's sixth grade class.

volunteers throughout the county joined the effort. Slipping and sliding in the often inclement conditions of Ohio's winter and spring, the volunteers produced thoughtful stream corridor evaluations (Fig. 3).

Volunteers range in age from grade schoolers to retired seniors. They range in background from those who simply like to float down a river to highly trained professionals in the sciences, engineering, planning and local government — all working together towards a common goal.

Many other volunteers, including dedicated workers from Americorps, spent countless hours researching a variety of topics. The project has succeeded in part because of the generous contribution of thousands of hours of volunteer time.

The Franklin County Greenways Plan is the culmination of phase I and the first step and the foundation of the Greenways Initiative. Besides the volunteer effort, the plan includes a general overview of the need for riparian area protection and greenways, the key themes, objectives and components important to the expenditure of public funds for greenways, and some specific examples of how greenways strategies might provide good, long-term planning solutions to enhance our quality of life in central Ohio.

PHASE II: INTERACTIVE PLANNING AND IMPLEMENTATION

The accomplishments and travails of the Franklin County Greenways Plan indicate the need for additional work if greenways are to live up to their full potential in the central Ohio area. Additional greenways planning efforts should include the following:

1) ***More citizen participation.*** Good planning efforts require input from the many interested and affected individuals, organizations, agencies, and government entities who are consulted and involved in the decision making process. Volunteer comments from the first phase of the project could be used to create focus groups to address key issues and lead implementation efforts.

2) ***More highly detailed) intrajurisdictional planning.*** Rivers do not stop at boundaries such as the Franklin County line — corridor planning efforts should not stop at jurisdictional boundaries such as Franklin County. For instance, the aggregate effects of headwaters streams are crucial to the main stem. Riparian corridor buffers along the many headwaters streams contribute to the improvement of the brown (turbid) look of waters such as the downtown stretch of the Scioto River.

3) ***Better quantitative data.*** There is excellent water-quality information on the Scioto and Olentangy Rivers and Big and Little Darby Creeks and some smaller streams collected by the Ohio EPA, US Geological Survey, the Nature Conservancy, and others. However, there is no comprehensive inventory of all the riparian corridors in the county. Nor have any local entities produced data which quantifies the amount of riparian corridor necessary to have a specified effect on the health of central Ohio rivers and streams. We do know that the addition of each greenway corridor benefits the overall health and welfare of the streams of the region, but we can not yet quantify them.

Background

WHY DID WE TURN AWAY FROM OUR RIVERS?

The practice of using streams and rivers for urban drainage is not unique to Columbus, but has been a common practice in the United States for the last 150 years. Because of the way in which our common law evolved, land was valued for private ownership and water was valued for commerce. In Ohio, owners of lands on the banks of navigable streams are also the owners of the river beds all the way to the middle of the stream. The water itself is a shared resource or the last great public commons. But this very strength has been weakened by the benign neglect and abuse so prevalent in America's cities. Because no one owned the waters, people felt free to dump as much trash, chemical waste and sewage as they pleased.

Citizens distrust what comes floating down the river for good reason!

Citizens distrust what comes floating down the river for good reason! In the 19th century, rivers such as the Scioto-downtown carried raw sewage, toxins and slaughterhouse waste, and as a consequence, disease. Cholera and typhoid outbreaks were common. In both urbanized and agricultural areas, wastes were discharged to any water body. Early wastewater treatment facilities in Columbus utilized combined sewers which carry both sanitary wastes and stormwater runoff to treatment plants. Today, combined sewers still exist and are used, but construction of separate storm and sanitary sewers is the common civil engineering practice. During normal flows, water from combined sewers is treated in wastewater treatment plants; during high flows, however, if the treatment facility cannot handle the overloads, raw sewage is released directly into the receiving body of water (much diluted by the added volume of water). Under current practices, separate stormwater flows are often piped and channeled directly to the receiving river or stream: There is no monitoring of water quality.

Land uses such as fat-melting and hide-curing establishments, land fills, levees filled with trash, gravel pits, slaughterhouses and rendering plants have existed on the shores of our rivers for the last one hundred years. In such industrialized locations, rivers have often developed a reputation as places to be shunned. People have gotten into the habit of assuming that they were unclean and unsafe.

WATERFRONTS AND ECONOMIC OPPORTUNITY

Across the country, attitudes about our waterways have shifted in the last 25 years. City after city successfully uses its waterfront as an amenity and engine of economic development. Many cities such as Baltimore, Denver, Portland, Chattanooga, and Buffalo have all produced waterfront developments and greenways; the list is long and distinguished. Waterfronts can act as a last great commons, bringing people a sense of place, connecting them in a positive experience. Not only have waterfront developments vastly improved riverine property values, increasing the tax base, but they define clean, livable places that support good quality of life and significantly boost public and private sector workforce recruitment efforts.

(Fig. 4) Bike Trail at Lou Berliner Park, downtown Columbus

Tourism is another important part of this mix. Many elements are necessary for a city to be a good tourist destination, but one of the key factors is the quality of life portrayed by a location. People don't choose degraded environments, but gravitate towards those areas which seem more attractive and comfortable. The comfort synonomis with Columbus is in large part because it was never a major industrial center like other Ohio cities. It has a clear advantage in the greenways planning process.

The most important catalyst nationwide for waterfront improvement was the 1972 Clean Water Act. Designed to stop the use of our waters as open sewers and begin their restoration, the Clean Water Act proclaimed a simple goal: make the nation's rivers, lakes and shores "swimable and fishable." Set against such a long history of abuse, its effect has been dramatic. As America's cities have used the Clean Water Act to restore their rivers, those waters in turn have begun to heal and restore parts of America's cities. In Columbus, we would not be thinking about using our waterfront for economic gain had it not been for the Clean Water Act.

The Clean Water Act, however, has not solved all our water quality problems here. The simple goal of making the nation's rivers "swimable and fishable" has not yet been reflected on the lower reaches of the Scioto and Olentangy Rivers and Alum Creek. Nor do we know if there is consensus that such a goal is possible or even desirable.

The 1972 Federal Clean Water Act established an end of pipe, point-source water pollution control approach to clean water. Point source discharges, such as municipal and industrial wastewater sources, are included via NPDES permits from the Ohio EPA. NPDES permits have specific numeric values for individual pollutants. To confuse matters further, while most believe that urban runoff is a non-point source, the Columbus Division of Sewers and Drains has informed us that USEPA and the courts have determined that urban runoff is defined as a point source. Thus, it falls under the NPDES permit program for point source discharges.

However, this definition only applies to some parts of the City of Columbus. No other part of the county falls under the NPDES requirements.
As point sources become less prevalent across Ohio, non-point source pollution — previously "masked" pollution that washes off all parts of the landscape — becomes a more pervasive and compelling issue (see Rankin, et.al., 1994). Greenways, or intact healthy riparian areas, are one important means of addressing non-point source problems (Steedman, 1988, Norris, 1993).

WHAT IS A GREENWAY?

In recent years the use of the term greenways has expanded greatly, especially in North America. While the term is sometimes understood as referring to a bike trail or path surrounded by a green linear corridor, (Fig. 4) Ahern provides the following succinct example: "Greenways are networks of land containing linear elements that are planned, designed and managed for multiple purposes including ecological, recreational, cultural, aesthetic or other purposes compatible with the concept of sustainable land use." A key element in this definition is the fact that greenways can be multi-functional, based on the assumed or negotiated spacial and functional compatibility of certain uses. As a result, the process of establishing goals in

greenway planning is particularly important. Since all goals cannot always be achieved equally, trade-offs and compromises are sometimes necessary. For example, the needs of recreation and wildlife habitat are not always compatible, depending upon the goals of the designers (Ahern, 1995).

Greenways can be used to connect parklands, enhance recreational opportunities, provide important wildlife corridors and protect natural habitat and scenic areas. They also can provide solutions to flood and stormwater problems within watersheds.

A greenway can be highly developed, such as the Riverwalk in San Antonio, Texas; it can be a culturally-rich link with another community, or it can simply remain undeveloped as a natural area.

Greenways can also be very long. For example the proposed Ohio to Erie Trail is a 325-mile greenway that will run from the Cincinnati riverfront to the Cleveland lakefront via Columbus. The trail will closely follow former railroad right-of-way and the former Ohio and Erie Canal towpath in northeast Ohio.

(Fig. 5) Floodplain forests and wetlands can store water and improve ecosystem functioning

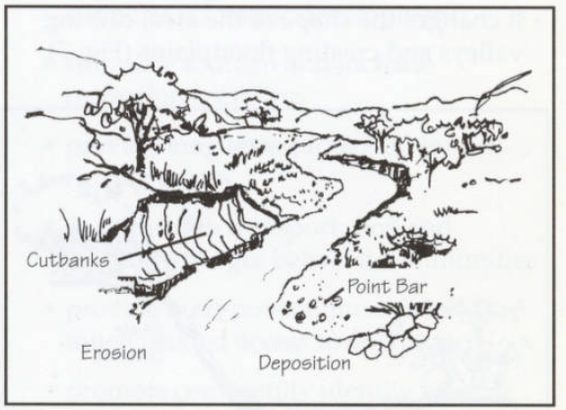
Typically responding to a variety of societal uses, greenways can include trails for passive recreation and alternative transportation, or act as natural sinks, buffers and refuges that encourage ecosystem functioning in an urbanized environment (Fig. 5). They have also been shown to have a variety of positive economic impacts, such as increasing the value of adjacent private properties and providing an attractive setting for low impact commercial uses - e.g. cafes or restaurants (Fig. 6).

FRANKLIN COUNTY GREENWAYS DEFINED

The Franklin County Greenways Plan defines greenways as linear open space or natural areas along watercourses which preserve the physical functioning of the land-water interface. In other words, a healthy riparian corridor provides for good ecological functioning.

(Fig. 6) Riverside Restaurant and Lounge

Limiting the greenway study to the waterways was done for several reasons: 1.) In Franklin County, river corridors are typically inappropriate for development because of floodplains, wetlands and steep slopes, 2.) Franklin County's river valleys provide an alternative to the dominantly flat topography of the area and are aesthetically pleasing natural features, 3.) many planning efforts have pointed to a need for improving

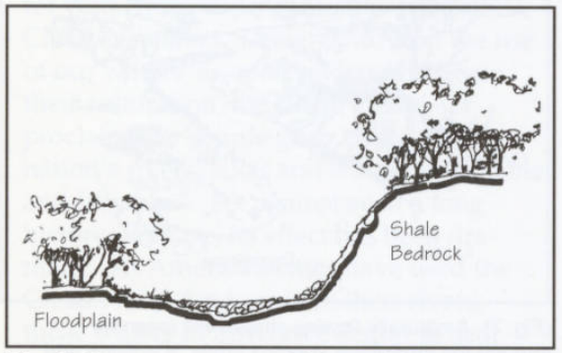


(Fig. 7) A naturally flowing stream will meander through the landscape creating areas of erosion and deposition as it travels.

conditions along central Ohio's rivers; watershed planning will be a key opportunity in the coming years, (greenways are an important tool) and 4.) river corridors have proved to be a particularly important economic asset across the nation when developed or preserved as greenways.

WHAT IS A RIVER CORRIDOR AND HOW DOES IT FUNCTION ?

A river corridor is the interface between a moving body of water and the land through which it flows. As a channel of water moves down through the landscape, it changes the shape of the area, carving valleys and creating floodplains (Fig. 7).



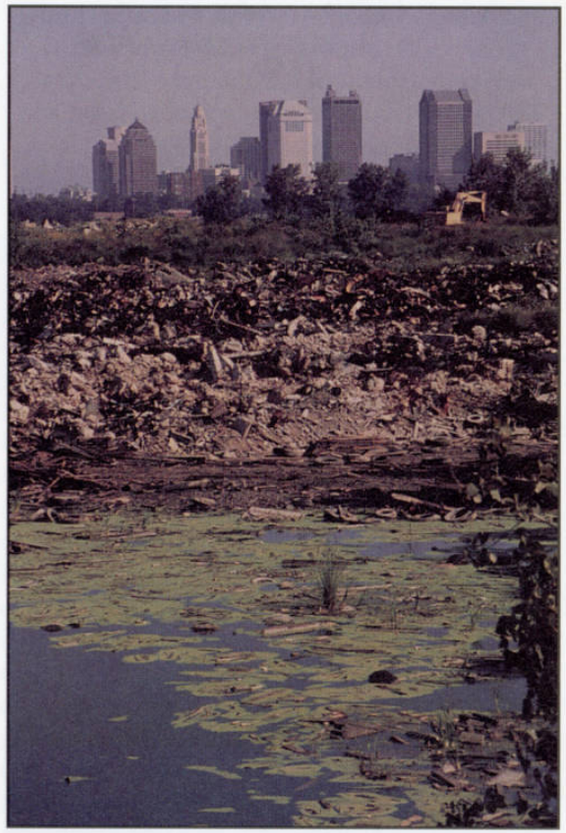
(Fig. 8) Streams are a powerful force which, over time, can carve valleys in a flat landscape.

Because of the nature of the land in Franklin County, many of the streams have cut deep valleys in the otherwise flat landscape of central Ohio (Fig. 8).

Moving water has tremendous erosive force, especially when in contact with the type of soils and slopes found in this area. Even under stable conditions, streams are dynamic systems as they move across the land. When changes occur, such as increases in the amount or speed of the water entering a stream, compensating actions occur downstream. The natural laws of streams have important implications for property owners along the water. At any point on a waterway the two most common and rational responses to stream damage include the need to either: 1.) artificially ensure that the stream cannot move or change at that point, (sometimes a costly and difficult process), or 2) provide enough buffer between land uses and the water to ensure that the stream can naturally move and fluctuate. If the stream is treated to ensure that it remains static at one point in its course, there will be changes downstream so that it can reach some kind of dynamic equilibrium.

Water flows to the lowest point on the land; in this region generally a stream or river. As water flows downhill, it carries with it whatever unconsolidated material it finds in its path. As a result, loose soil, oil, gas, pesticides, and countless other impurities eventually reach the stream channel (Fig. 9).

Our streams reflect the many ways we use our land in Franklin County. They tell a story about who we are as a society and the choices we make intentionally or unintentionally. At present, our river corridors represent some of the best and the worst elements of this county.



(Fig. 9) Neglected streams too often become a dumping ground for refuse as seen here along the Scioto River

WHY ARE RIVER CORRIDORS SO CRITICAL TO FRANKLIN COUNTY?

Franklin County has experienced dramatic growth and change in recent decades. The county is the second most populous county in Ohio with an estimated 1995 population of more than one million. While this economic development has improved Columbus in countless ways, we have not had a chance to assess the impacts this growth has had on our streams or to develop and implement solutions.

The county's high growth rate has resulted in continued loss of natural habitat to the increased development along many waterways. The question is: Do we value our river corridors as important natural and cultural assets, or do we perceive them as ditches that carry away unwanted products of life? Right now we are using them in both ways and clearly heading for conflict.

Most of the scenic areas, remaining forests, significant wildlife habitat, and recreational facilities are located along our waterways and tributary ravines upstream from the land uses described on page 6.

River corridors play host to what are arguably the region's most interesting and valuable residential properties (Fig. 10)

The Scioto River provides the focus for cultural activities in downtown Columbus, and the Olentangy River park and bikeway system serves the recreation and open space needs of thousands of central Ohio residents on a daily basis. All of the river and creek corridors offer emotional and mental relief from an increasingly complex urban landscape.

Not only are Franklin County's stream corridors key elements in our landscape, we have an unusually large number of them - 330+ river miles, more than many jurisdictions in the United States. These waterways include Big and Little Darby Creeks, the Scioto River, Olentangy River, Alum Creek, Big and Little Walnut Creeks, Blacklick Creek, and major tributaries such as Rocky Fork, Hellbranch Run and Hayden Run.

(Fig. 10) Riparian corridors add to residential property value

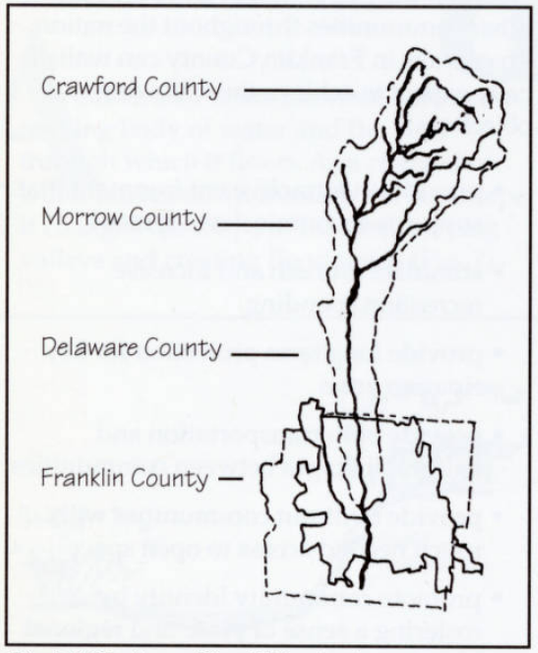
When planning for growth in the region, Franklin County's riverine resources cannot be ignored.

OBJECTIVES OF THE FRANKLIN COUNTY GREENWAYS PLAN:

Based on their application and success in other communities throughout the nation, greenways in Franklin County can realistically expect to achieve the following objectives:

- provide an attractive environment that supports economic development
- stimulate tourism and increase recreation spending
- provide long term protection for key riparian areas
- provide both transportation and cultural linkages between communities
- provide built-out communities with much needed access to open space
- promote community identity by fostering a sense of place and regional identity

- promote integrated watershed management throughout the county
- provide undeveloped land for stormwater management and flood control
- reduce flood protection costs
- restrict development from inappropriate terrain (steep slopes, floodplains)
- reduce flood insurance rates and enhance the Community Rating System (CRS program sponsored by FEMA) for county and city residents.



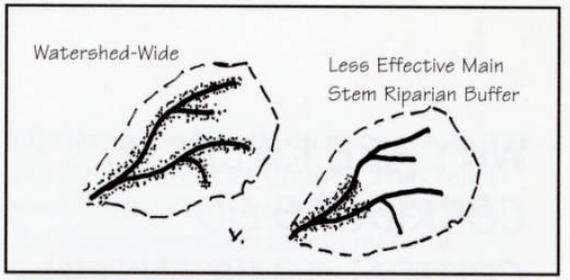
(Fig. 11) Olentangy River Watershed

KEY THEMES IN FRANKLIN COUNTY GREENWAYS PLANNING:

These key principles form the foundation of the Franklin County Greenways Planning Process:

The best results come from watershed planning. Each river in central Ohio is part of an interdependent system or watershed. As a result, changes in land use practices upstream can lead to significant — and typically undesirable — changes downstream. Watershed planning is the best means of dealing with the system as a whole (Fig. 11).

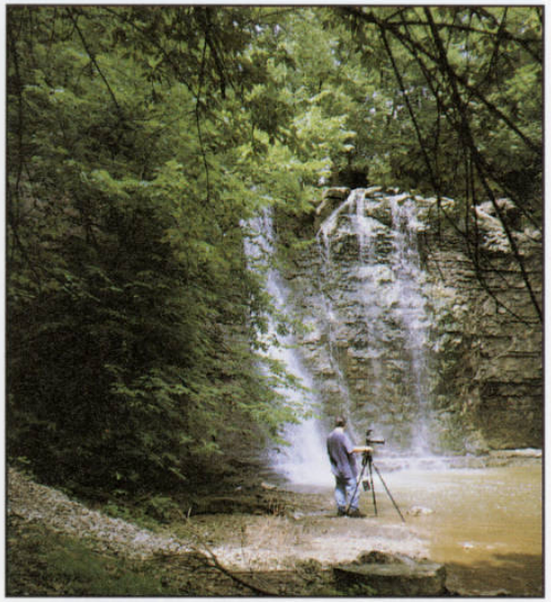
Greenways can have a significant impact on water quality if they comprise an as yet unknown percentage of the watershed riparian corridor (Fig. 12), provided end-of-pipe sources of pollution are under control. Research suggests that the effective use of greenways for the protection of surface water quality depends not only on the physical characteristics of the buffer zones and on the diversity of pollutants encountered, but also on the coordinated arrangement of buffer zones across a catchment area (Fig. 12, Norris, 1993).



(Fig. 12) Riparian corridor protection which includes the entire river corridor and tributaries has a much greater impact than riverine buffers limited to the mainstem (Norris, 1993).

Working with the characteristics of the stream — and not fighting with a complex natural system if a natural approach will provide greater long term benefits. Even under stable conditions, streams naturally move over time — they rarely stay in one place. If enough buffer is provided between land uses and the water ensuring the stream can naturally move and fluctuate and if structures are not built where streams flood naturally, property will be protected at reduced cost.

Multi-disciplinary approaches to problems generate lasting solutions. Too often we look at only one or two aspects of a problem when developing a solution. For example, a traffic engineer might focus exclusively on moving cars quickly across a waterway without considering matters of stream health and aesthetics or community identity. By communicating well with important stake holders through the watershed planning process, individual solutions combine to be greater than the sum of their parts.



(Fig. 13) Limestone cliffs at Hayden Run Falls

Biologically healthy streams contribute to human health and welfare. Acting like canaries in a coal mine, living creatures in a stream provide clues to cumulative changes in water quality. More reliable than chemical testing alone, biological monitoring shows whether a stream is truly healthy — and whether it can support the community sustainably.

The State of Ohio Water Quality Standards, Chapter 3745-1 of the Administrative Code establish minimum water quality requirements for all surface waters of the state. Each body of water in the state is assigned one or more aquatic life use designations, one or more water supply use designations, and/or one recreational use designation. In addition, a water body may be designated a state resource water. This plan primarily uses the Aquatic Life Use Designation because the resident biota in a stream respond to and integrate all of the various factors that affect a watershed; their condition is the cumulative result of what happens within watersheds.

Designation as a greenway is strictly for land use planning and stream corridor management purposes. It does not mean that land will be confiscated, condemned or otherwise taken for public purpose. Specific use of each and every greenway segment will be determined on a parcel by parcel basis.

COMMONALITIES:

While each stream corridor in Franklin County is distinguished by unique features as well as special threats, they all have much in common. These commonalities are basic to the greenways planning process.

NATURAL ATTRIBUTES

The geology and geomorphology of Franklin County: Franklin County is situated on the divide between Devonian aged limestone bedrock to the west (Fig. 13) and the Mississippian aged sandstone's and shales to the east (Fig. 14). The Olentangy River acts as the drainage divide between the two types of rock. Rivers flowing over limestone have alkaline waters which are very supportive of aquatic life. Rivers and creeks flowing over shales and sandstones are more acidic and support a more limited aquatic population. Because the eastern streams, including Alum, Big Walnut, Rocky Fork and Blacklick Creeks have almost no baseflow, temporary dry periods also limit the amount of life compared to the Olentangy and Scioto Rivers.

(Fig. 14) Shale banks on a tributary to the Olentangy River

Glacial deposits cover the uplands and underlie the streams found in the more southerly sections of the county. Buried valleys, rich in the sands and gravels found in these deposits, are rich sources of groundwater and supply most of the base flows that we find in our streams.

Silts and clays are characteristic of our geology; a stream reach in Franklin County might be made up of 30 percent clay, 30 percent silt and 30 percent sand with 10 percent gravel. The brown color so common in Franklin County streams is partly a result of natural stream processes carried out on materials which take a long time to settle, even in still water.

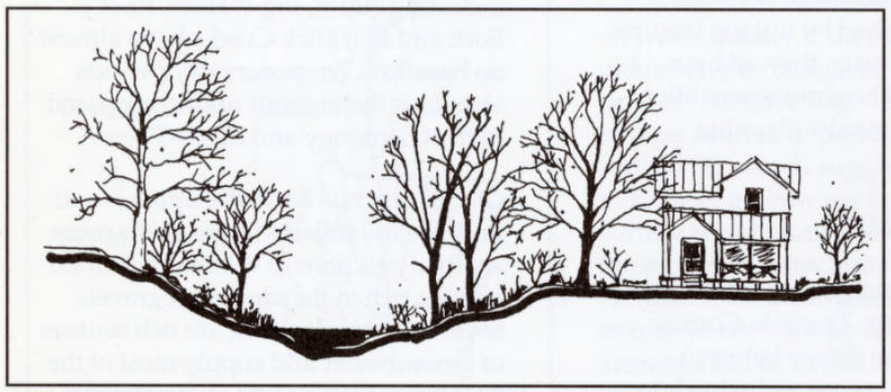
Wooded river corridor buffers:
(Also known as streamside forests and riparian corridor buffer zones)

Riparian corridors provide a transitional zone between upland areas and aquatic systems. They are made up of large trees, a woody understory of tree and shrub species and smaller soft-stemmed plants such as flowers, grasses and groundcovers. This zone is generally dominated by plants that can tolerate long periods of flooding or saturated soils. Plant density is often directly related to the duration of annual flooding.

In central Ohio this is an association of plants including, but not limited to the following (Fig. 15):

TREE SPECIES
Acer negundo, Boxelder
Acer spp., usually silver, red, or sugar maples
Celtis occidentalis, Hackberry
Frazinus spp., Ash
Gleditsia triacanthos, Honey locust
Platanus occidentalis, American sycamore
Populus deltoides, Eastern cottonwood

SHRUB SPECIES:
Lonicera maackii, Amur honeysuckle
Rosa spp., Muti-flora rose
Salix spp., Willow
Rhus radicans, Poision ivy
Vitis spp., Grape



(Fig. 15) Cross section of a small creek, typical in Franklin County. Which includes a variety of species such as Sycamore, Serviceberry, Multi-flora Rose, Boxelder, Hackberry, Cottonwood and Sugar Maple

HERBACEOUS SPECIES
Carex spp., Sedge grass
Equisetum spp., Horsetail
Erigeron spp., Fleabane
Impatiens capensis, Spotted touch me-not

(Fig. 16) A stream well buffered with an extensive riparian corridor in a rural area.

Lobelia cardinalis, cardinal-flower
Monarda didyma, Beebalm
Sanicula canadensis, Canadian black-snakeroot
Viola cucullata, Marsh blue violet

More than 95% of Ohio was once covered with mature forest. Riparian forests were particularly vulnerable to clearcutting practices because of the unrecognized value of these areas. By the early 1900s most of the forests had been cleared for agriculture. Photographs from the early part of the century in the Columbus area show the barreness of our streamsides at that time.

Many scientists consider the loss of riparian forests in eastern North America to be one of the major causes of aquatic ecosystem degradation (Sweeney, 1992). In a natural undisturbed riparian forest, the permanent woody vegetation at the stream edge helps control the physical, chemical and biological status of the stream. Healthy riparian vegetation is credited with contributing to bank stabilty, and minimizing instream sediment loading due to bank erosion. Riparian vegetation also acts as a living filter which traps nutrients, sediments and other waterborne pollutants (ODNR, 1991).

Vegetation controls light quality, moderates temperature, and can even control nonpoint source pollution through the direct root uptake of pollutants. (Nutrient subcommittee of the Chesapeake Bay Program, 1995).

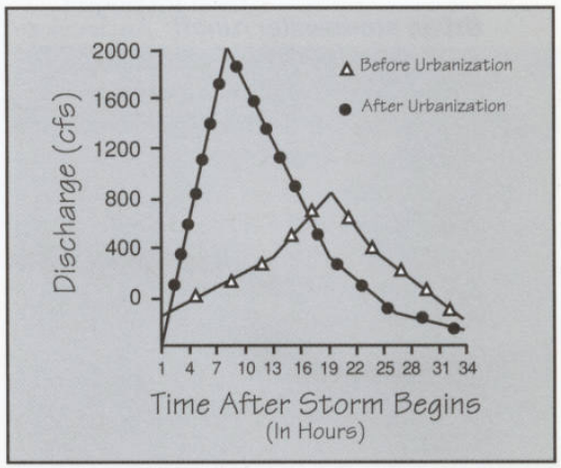
(Fig. 18) "Black Snow" melts into a stormwater drain

Different plants in the Wooded Riparian Corridor are more effective for different functions in the effort to slow stream channel erosion. Surficial erosion, which involves the detachment and transport of individual particles, is best delayed by dense grass swards and low shrubby species that extend many non-rigid branches into the flow (e.g. willows). Mass wasting, caused by slumping or sliding induced by undercutting is best controlled by woody shrubs and trees with strong, deep root systems (Gray and Sotir, 1996).

(Fig. 17) Construction sites can be major sources of erosion and sedimentation

HUMAN IMPACTS

Nonpoint source pollution: A by-product of a variety of human land use practices, non-point source pollution is composed of elements which degrade water quality through cummulative impacts throughout a watershed (Fig. 17). Poor agricultural practices can be a significent source of nonpoint source pollution, not merely the presence of farming. (Many of Ohio's exceptional warmwater streams and rivers, such as Big and Little Darby Creeks, have watersheds with land use predominated by agricultural activities



(Fig. 19) Hydrograph for a small tributary stream before and after urbanization

(Fig. 20) Silt-laden brown water and clay

(Rankin, et.al, 1994). It is important to remember, however, that many of the watersheds for all Franklin County rivers and creeks are in agricultural areas, suggesting a great need for some form of riparian corridor greenway protection upstream.

Primary causes of non-point source pollution in suburban and urban settings include:

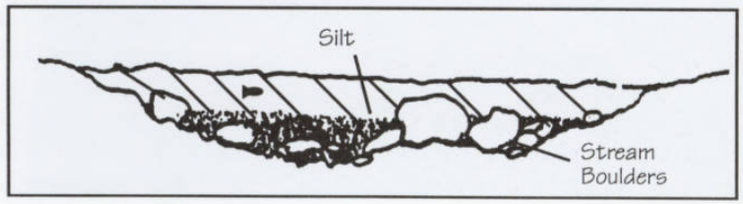
Urban stormwater runoff: As development occurs, the amount of impervious area increases. This increased impervious area results in increased stormwater runoff (total quantity and peak flows), decreased base flows within streams and changes in the types and quantities of pollutants. Urban life results in pollutant sources accumulating on the land surface (Fig. 18). With precipitation, these pollutants wash into storm sewers and subsequently discharge into creeks, streams and rivers. There are opportunities for greenways to solve stormwater related pollutant problems by filtering stormwater flows before they enter rivers and streams.

In combined sewer areas, this urban runoff is conveyed to a wastewater treatment plant, where it is treated and discharged to the rivers, except during extreme rain events.

Increased erosion and sedimentation: In an urbanized area, changes in the stream hydrology caused by stormwater and development related filling within the floodplain, result in higher quantities of water, increased peak flows, and changes in the times that peak flows occur (Fig. 19). Confronted by more severe and frequent flows, stream channels must respond. They typically do so by increasing their cross-sectional area to accommodate the higher flows. This is done either through widening of the stream banks, downcutting of the stream bed, or sometimes both. This phase of channel instability, in turn, can trigger a cycle of streambank erosion and habitat degradation (Schueler, 1994).

Furthermore, areas upstream of urban centers at one time were forested. Land stripped by agriculture has changed river hydrology. Poor agriculture and construction practices contribute a significant share of sediment load. The combined effects of urbanization and upstream deforestation alter river hydrology, resulting in stream bank erosion.

More erosion in the stream means more fine clays suspended in the system, as well as larger material moved downstream by the river (Fig. 20). Erosion outside of the stream itself also significantly contributes to increased instream turbidity or "brown water." While "brown water" is at least partially naturally occurring, due to the amount of clays found in the region, too much turbidity can block sunlight from the river bottom, killing off aquatic plants. Erosion can cause too much silt to find its way into the stream bed, covering the areas between rocks where many organisms such as mollusks are found (see fig. 21). At the next storm event, some of the silt will be resuspended into the water and move downstream. Eventually sediment will show up from upstream areas and be deposited downstream. An example of this process can be seen at the new island



(Fig. 21) Silt covers many organisms in the stream bed

growing just above Greenlawn Dam. Used extensively by wading birds, deposition would be more of a problem in a free flowing stream channel than it appears to be here.

The Franklin County Greenways surveys done by volunteers in the spring of 1996 listed stream bank erosion as a cause for concern in virtually all of the rivers and creeks in Franklin County.

COMPONENTS OF A SUCCESSFUL GREENWAY:

Designed properly, greenways integrate a variety of objectives. These include alternative transportation, passive and active recreation, water quality enhancement, and habitat preservation. An effective greenway also provides community and regional identity.

Each of the following elements contributes to quality of life and has a disproportionate impact on economic tangibles such as property values.

To justify public expense, a multi-objective greenway should provide at least three of the following components:

ENHANCES COMMUNITY IDENTITY

Like mountains, river fronts and stream corridors are geographic features that provide a sense of place and identity to the region. These features are unique to each area. The Scioto is characteristic of central Ohio and does not especially resemble rivers in other parts of the country.

When combined with good physical design appropriate to the region, streams and rivers in more urbanized areas take on a special character that makes them memorable to residents and visitors alike.

PROVIDES COMMUNITY ACCESS, LINKAGES

Greenways are most effective when they connect neighborhoods and destinations such as shops, libraries and schools. Entertainment centers, historic sites, museums and restaurants are also important elements to be accessed by Greenways (Fig. 22). They also can provide much-needed access to open space for densely settled areas.

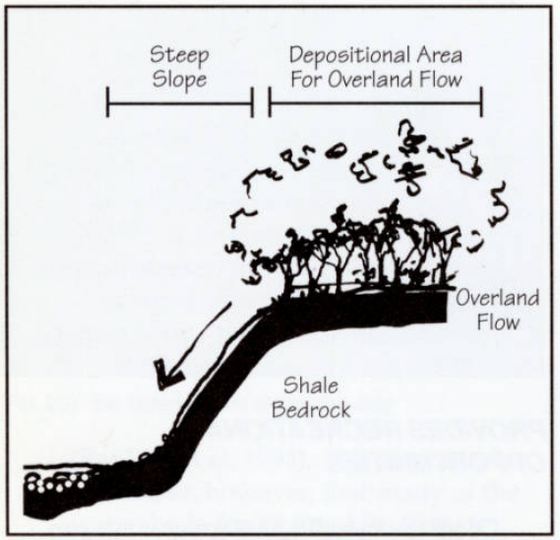
PROVIDES ALTERNATIVE TRANSPORTATION

When used as trails, greenways should be indicators of commuter patterns and community transportation needs. They should provide transportation alternatives which offer choices in the following areas: method of transport (walking, biking, in-line skating), speed of movement, and type of surface. In addition, a good greenway system extends throughout the entire metropolitan area and provides interesting and varied scenery which should be easily accessible.

PROVIDES RECREATIONAL OPPORTUNITIES

Of all the benefits that greenways can provide, the most obvious are recreational and social. A growing urban population with elevated health consciousness and leisure time has led to an increased demand for outdoor activities such as jogging, walking, biking and roller blading. Greenways provide variety and clearly meet an important need.

(Fig. 22) Scenic overlooks provide passive recreation.



(Fig. 23) A buffer is needed to slow runoff and prevent erosion between the river and uplands.

They also provide opportunities for passive recreational pursuits such as bird watching, fishing, wading, picnicing and riverine "messing about." Easy access for watersports, such as canoeing and kayaking are another benefit.

PRESERVES NATURAL HABITAT

Wildlife populations require enough natural space to sustain the living needs of individuals. Fragmentation, common to some urban development patterns, threatens the viability of many animal populations. Greenways overcome some of the effects of fragmentation by acting as habitat, source and connector.

Greenways as habitat: a species' habitat may include wetlands, upland forests and grassland. From upland to riparian corridor to river, greenways can provide access to more that one habitat. The vegetated land-water edge in a healthy river system is biologically important, providing a host of wildlife needs: food, cover, water.

Greenways as connectors: Species, including humans, can move from one location to another traveling along the length of riverine greenways.

Greenways as source: Greenways provide surrounding land with a variety of resources, such as water for wildlife in an otherwise dry area, or seeds to revegetate a downstream area.

ENHANCES THE QUALITY OF THE WATER RESOURCE

A greenway system along a watercourse, properly designed, can serve the basic functions that foster a healthy environment. It helps provide an antidote to some forms of nonpoint source pollution by acting as a filter, conduit and sink.

Greenways as conduit: Conduits are pathways in the landscape along which water, animals, plants and people move. A river corridor is an obvious example of a conduit. Water carries sediment, nutrients, leaves, insects, bacteria, plankton and algae along with it. Acting as a conduit, a river and the adjacent floodplain connects otherwise isolated patches of habitat.

Greenways as filter and sink: As water sheet flows across the land, it picks up many elements. A well vegetated riparian edge allows some of the water to pass through, but slows it down and diffuses the flow allowing different elements, including pollutants, to drop out (Fig. 23). Riparian corridor greenways can also store surface water in a porous floodplain or riparian wetland for a long enough period of time to reduce flooding in peak runoff events.

Greenways can accomplish these crucial functions when there is enough land available and it is appropriately situated relative to the overland or, in the case of the floodplain, channel flow. For example, in Ohio, the soil becomes much less permeable in the winter during freezing periods. Water borne pollutants would have less opportunity to settle out over a similar distance compared to the peak growing season. Particularily hard, impermeable soils, exposed bedrock and steep slopes all would require additional porous buffer to accomplish filter and sink functions (Fig. 23).

Inventory of the Rivers and Streams of Franklin County

(Fig. 24) Area surveyed by volunteers

Introduction

The original goal of the Franklin County Greenways Plan, to inventory all of Franklin County's rivers and streams by volunteers, has provided multiple viewpoints on our waterbodies. After a brief summary of some of the key points made in the surveys, background information on the general characteristics of each major stream corridor will follow. Additional survey results will be provided for each river and creek and some smaller tributaries.

Volunteer Survey Summary

In the late winter and early spring of 1996, one hundred and eighty-five volunteers ventured out into the river corridors of Franklin County to complete the Stream and River Inventory. Besides the main rivers and creeks, many of the tributaries were inventoried as well.

The volunteers participating in this inventory were members of scout troops, school science clubs, interested members of the community and professionals from a variety of fields. Each shared a common appreciation for the rivers and streams of Franklin County.

The inventory process required the volunteers to carefully explore their assigned stretch of river and then record their findings on survey sheets. Many of the respondents drew sketches or photographed what they saw on the river. The Stream and River Inventory covered seven major points. These were:

1) Community resources that are in proximity to the river and their potential to be linked by a trail system.

2) Land uses adjacent to the river most likely or least likely to be developed in the future.

(Fig. 25) Fall color from Highbanks Metropark Overlook

3) Observable pollutants in the river as well as the severity of bank erosion.

4) The level of safety felt while walking along Franklin County streams.

5) Special features observed or known along the river such as interesting natural, historic or scenic areas.

6) Potential uses alongwaterways including recreational and educational possibilities.

7) Recommendations and suggestions for the future of the river corridor (see pg. 44 for suggestions for the Scioto River and Alum Creek).

The following is a general overview of the Stream and River Inventory results:

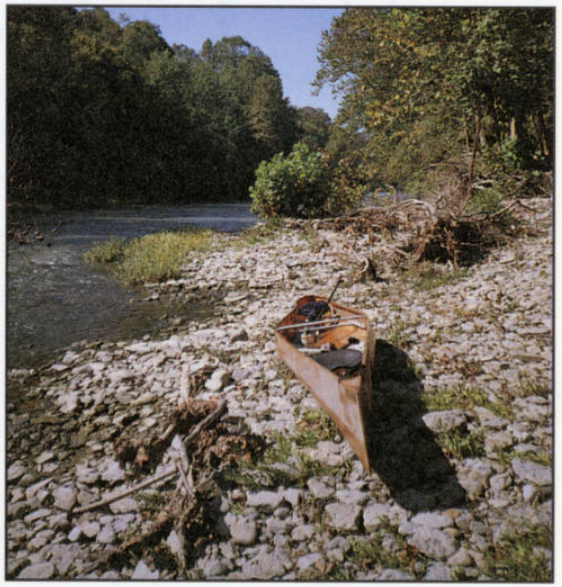
The predominant community resource identified along the surveyed streams were parks or recreational facilities. The volunteers were also asked to identify if the corridor seemed to be used and whether they considered the area appropriate for trail development. ***Almost half of the respondents agreed that the riparian areas they saw are now being used as a passive recreational resource for people.*** *Many encouraged the development of trail systems to link community resources.*

Areas with scattered litter and trash ranked high on the list of observable pollutants in the stream. Potential pollutants listed were lawn chemicals, roads and parking lots associated with dense development.

A very large group identified active and accelerated erosion as a major concern of the river they inventoried. ***The majority of the volunteers considered the rivers and creeks "safe to wade or put hands in." An even larger group felt "safe while walking along the stream."*** *However, over half of the volunteers believed that "steep, slippery banks" create an environment that is unsafe for children or non-swimmers.*

Large wooded areas, high quality habitat, wetlands, and special scenic areas were the special features most noted and photographed by the volunteers. Volunteers noted, scenic enjoyment, walking, open space preservation, and community parks in use along the surveyed stretch of the waterways, but mentioned that paarts could benefit from improvement. Activities or facilities not available but that had the potential for success were fishing, biking and canoeing.

When asked "What can be done?!" to better the stretches of rivers surveyed, the most popular responses were litter removal, stream bank erosion control, trail construction, open space preservation and habitat enhancement.

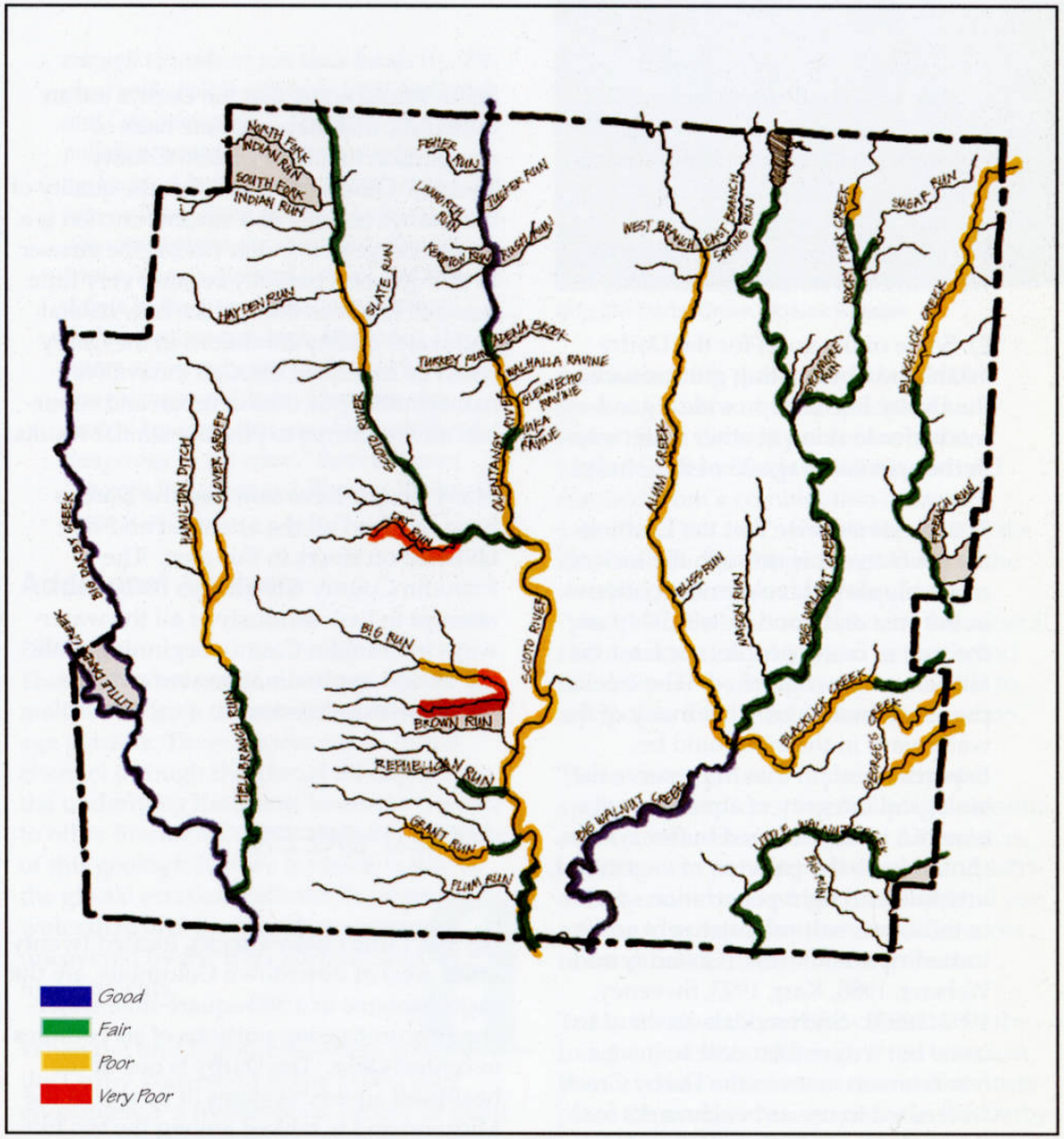


(Fig. 26) Canoe on the Little Miami River

THE RIVERS AND STREAMS OF FRANKLIN COUNTY INVENTORY

The inventory of streams progresses from west to east starting with Big and Little Darby Creeks, than the Scioto and Olentangy Rivers, and finally Alum Creek, Rocky Fork of the Big Walnut, the Big Walnut, Blacklick and Little Walnut Creeks. While surrounding land use varies from urban to rural and the stream corridors themselves vary in size and to a lesser extent in geology, all flow in close proximity to each other and have many elements in common. Primary differences include wide variations in water quality (Fig. 27) and the quality of the riparian corridor, the amount of public land along the riparian corridor and how much care has been taken to preserve the stream and its banks. It is appropriate to start a greenways inventory with the Darbys for several reasons:

1) The Darby is quantifiablely in the best ecological condition of any Ohio waterway with the exception of Fish Creek. It has gained national recognition for its importance as a biological resource. The two creeks provide an important alternative image for the central Ohio region as a place where



(Fig. 27) Overview of Aquatic Life Index, Division of Surface Water, Ohio Environmental Protection Agency

quiet beauty and environmental quality are special traits which can make Ohioians proud. Central Ohio is known for its low unemployment rate, family values, educational opportunities and other quality of life attributes. Why not add the intelligent way that we utilize our natural assets to the list?

2) Some of the goals for the Darby established by existing groups such as the Darby Partners provide a good model for looking at other waterways in the area (see page 23 of this study).

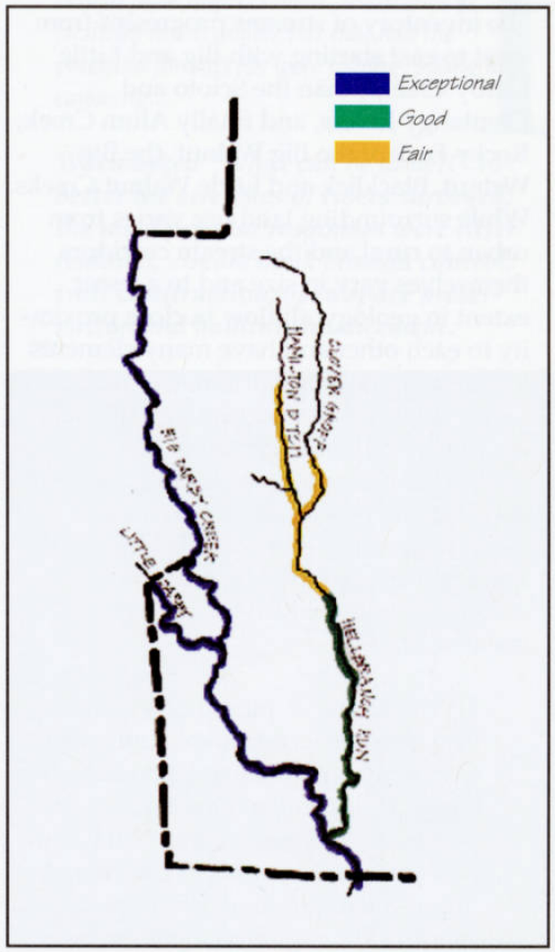
3) Experts surmise that the Darby is the jewel that it is through the luck of relatively slow development patterns in the area and good stewardship on the part of many people, not least the farmers of the watershed. The creeks provide a model for what many of the waterways in the area could be. Experts maintain that to preserve the biological integrity of aquatic ecosystems, an ideal managed buffer system should have the patterns of vegetation, litterfall, and light penetration similar to those in a natural, relatively undisturbed riparian forest (Golladay and Webster, 1988, Karr, 1993, Sweeney, 1992, 1993). Such models are hard to come by; we are fortunate to have a few remnant areas in the Darby Creek watershed to use as benchmarks for the evaluation of other sites.

Some would argue that the Darbys are an unrealistic and inappropriate basis of comparison to other Franklin County streams. Others have said that the quality of the Darbys ecology and stream function is a good local goal. We don't know the answer to this question partially because very little research has been done to see how habitat and water quality conditions in the Darby could be replicated through innovative management practices in urban and suburban environments to produce similar results.

Many people have said that the Darbys have received all the attention and care lavished on rivers in this area. The Franklin County Greenways Plan is an attempt to look seriously at all the waterways in Franklin County beginning with the closest approximation we have of a healthy natural system.

DARBY CREEK

Big and Little Darby Creeks, located twenty miles west of downtown Columbus, are the major streams in a 580-square-mile watershed encompassing portions of six counties in central Ohio. The Darby is one of the healthiest aquatic systems of its size in the Midwest and is ranked among the top five warm freshwater habitats in the region by the Ohio EPA. Land use in the drainage basin has historically been production agriculture, with approximately eighty percent of the land area in fields row-cropped in a corn-soybean rotation.



(Fig. 28) Aquatic Life Index map of Big and Little Darby Creeks

However, because central Ohio is now one of the fastest growing cities in America, conversion of the watershed from agricultural to urban land uses presents an increased threat to the health of this aquatic system.

Volunteer Observations

Twenty-nine groups of volunteers surveyed the Big and Little Darby creeks. The areas inventoried included all of the Little Darby bordering Franklin County and two stretches of the Big Darby, I-70 to Broad Street and Hickory Hills Golf Course to S.R. 665. The following comments were gathered from the volunteers:

The areas inventoried were "very peaceful and beautiful" with large wooded areas, ravines and wetlands." The messag was clear:"very good riparian corridor" and "this area should be kept in a natural state."

Access is limited along the Big Darby. There is a path "made of years of fisherman and sight seers" but little possiblity or desire for a developed trail exists since "the bluffs and ravines would make a bike path difficult to make" and others would "hate to see this area further developed because it would definately ruin the beauty of the area."

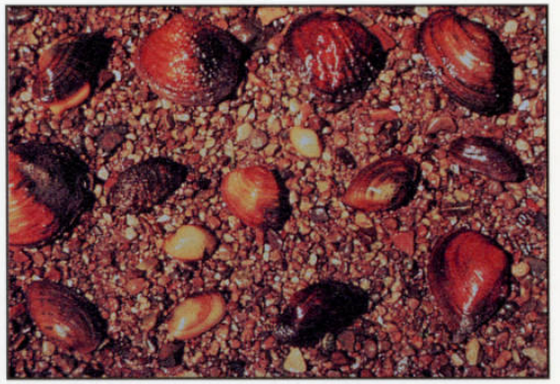
At the time of the inventory, the volunteers were confident that the water was clean enough to wade or put their hands in. The observable pollutants were litter and trash and "muddy water." Potential upstream pollutants came from "home septic" systems. A large number of volunteers felt safe walking along the Big Darby but were concerned about the steep and slippery banks from accelerated erosion and tree debris in the river. A volunteer wrote: "when the water is high, like today, the water moves very fast and could be dangerous to children. There are also several boulders that could be considered dangerous in the creek," however, even "though it is steep and slippery, we should leave it as it is."

Additional Analysis

History

The Darbys arose as an outflow for the melt-water from the retreating Wisconsin age glaciers. These waters cut an initial channel through the glacial till deposits to the underlying limestone bedrock. Similar to other Franklin County streams, evidence of this geologic history is visible today in the glacial erratics scattered throughout the watershed and the limestone outcrops uncovered by the river corridor and highway cuts.

When the first European settlers entered the Darby Watershed in the 1800s, they encountered a tremendous variety of plant and animal life that included over 100 species of fish and forty species of mollusks. Such diversity was rare in the United States outside of this region and resulted from a combination of factors, including: the area's temperate climate; the tree-lined banks; the gentle gradient of the riverbed with its resulting sequence of "pool," "riffle" and run habitats; the mineral and nutrient rich till soil and bedrock; and the ability of the indigenous aquatic life to repopulate the region following glaciation.



(Fig. 29) Darby Creek Mollusk Species

These characteristics of the Darby also apply to other limestone/till plains streams of the area such as the Scioto. Differences in settlement patterns resulting in industrialized and urbanized versus rural land use appear to account for the vast differences in condition between the waterbodies.

Today the diversity of life within the Darbys has changed little, although it has been lost in most other midwestern rivers. Scientists place the number of fish species in the Darby

Creek system at 86, (including the Federally endangered Scioto Madtom), and the number of mollusk species at 39, (including the federally endangered Northern Riffle Shell and the Northern Club Shell).

In further recognition of the river's distinct characteristics, ODNR classified approximately 82 miles of the Big and Little Darby Creeks as State Scenic Rivers in 1984. The same areas received National Scenic River Status in 1994.

The Darby Creek drainage basin lies within many governmental jurisdictions containing a multiplicity of land uses. These factors, and the basin's sheer size, dictate the use of partnerships as the primary method of protecting the Big Darby's biodiversity, for no single agency or organization can hope to make a significant impact working alone.

In conjunction with the Darby Creek Partnership, the USDA named the watershed a "Hydrologic Unit" in 1991 This provided funding to begin the work of "preserving, maintaining and enhancing the aquatic and riparian ecosystem." In 1993, the USEPA chose the Darby as one of five ecorisk sites. These comprehensive risk assessments will provide objective results for understanding how land use decisions can affect the integrity of the Darby's complex ecosystem.

The Darby Partnership

In the past four years, significant strides have been made by the partnership in addressing the various threats to the streams' aquatic system, including reducing the erosion rate of the silty soils within the watershed by 25 percent (according to tillage transect studies by the Natural Resources Conservation Service). Other threats to the streams' aquatic life that are the focus of the partnership include point and nonpoint sources of chemical pollution and nutrient enrichment, disruption of the riparian corridor, streambank destabilization and suburban growth.

The Conservancy and its partners have implemented a comprehensive array of programs designed to address the key threats and to promote compatible economic development within the watershed over the long term. Some of these programs include:

1. Environmentally benign streambank stabilization techniques.

2. Reforestation of high priority areas in the riparian corridor.

3. Removal of exisitng low head dams.

4. Comprehensive monitoring of water quality by USGS.

5. Mapping of land use trends and point source pollution.

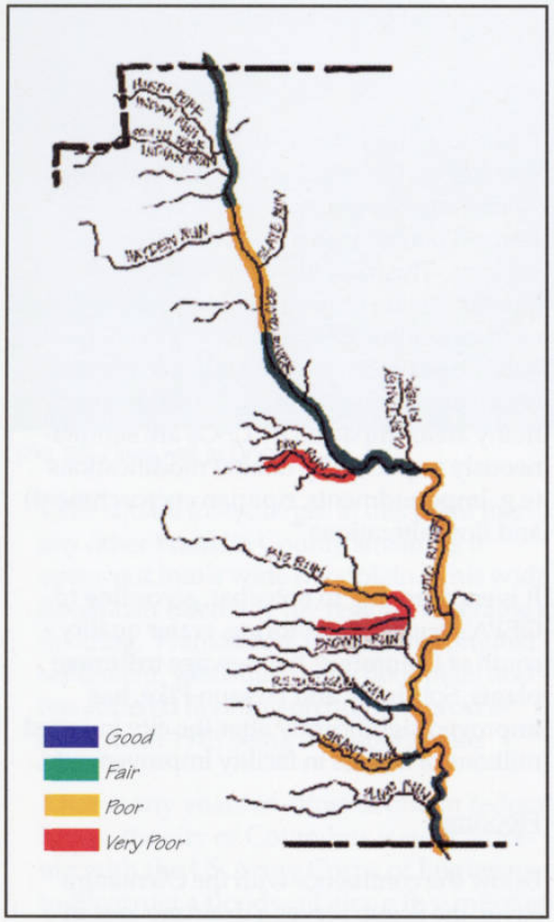
6. Discouragement of the granting of any new National Pollution Discharge Elimination System (NPDES) permits and the promotion of methods that more effectively treat existing outflows.

The results have been encouraging. It appears that there has been no significant loss of fish or mussel species in the streams in the last decade. Mollusk and fish population studies are under way and will be completed in 1997.

SCIOTO RIVER

The Scioto River basin is the second largest watershed in Ohio, draining 31 counties. Flowing almost due north to south, the river collects all the water from Franklin County rivers, streams, and ditches by the time it reaches Circleville. One-hundred- thirty miles downstream from Columbus, the Scioto empties into the Ohio River at Portsmouth. The river is highly scenic and is surrounded by desirable residential areas and waterfront properties.

Besides its role as a corridor for human settlement over the last several thousand years, the Scioto River is known for its great value as a corridor for migrating neotropical songbirds, such as the Indigo Bunting,



(Fig. 30) Aquatic Life Index of the Scioto River

Scarlet Tanager and Yellow Warbler. The gentle terrain, rich flora and fauna and north-south orientation have created what was once an ideal habitat.

Upstream from Columbus, the Scioto River is impounded by two major reservoirs, O'Shaughnessy near Dublin and Griggs near Upper Arlington. There are about five miles of free-flowing water between these reservoirs, and a similar stretch between Griggs Dam and the confluence with the Olentangy.

The entire Scioto River corridor from the Delaware County line south through Dublin to Trabue Road in Arlington is visible from Riverside Drive (State Route 33). A prime candidate for state Scenic Byway status, the road showcases the river corridor while providing access to the many Columbus Recreation and Parks' properties along its course.

Volunteer Observations

Almost the entire Scioto River were inventoried by 20 volunteers. The stretch surveyed ranged from Delaware County to the Grove City area. Their suggestions and observations included:

Special features of the river were often identified as historic in nature, particularly in the downtown Columbus area. Scenic areas were identified as was the rich natural habitat the entire segment provides for "mollusks, frogs, and deer - - too early in the year for migrating birds - - although the area is populated with orioles, warblers, cardinals, turkey vultures. ***South of Greenlawn Dam, many fishers wade and cast.***"

A group of volunteers "put a canoe in at Scioto Park (Leatherlips) where a church service and picnic was in progress, passed approximately 10 people fishing off shore along the river." Several other volunteers identified areas along the Scioto that had ramps for motor boats, access to paddle boats, or areas ideal to put in canoes.

In several areas, the river has "no access other than by car" and along these same routes, volunteers commented that "there could be better places to walk without the possibility of being hit by cars."

Along much of the Dublin and Upper Arlington area, the banks are "not currently used since most land on either side is privately owned, " however, "this is a very nice stretch of river and has great potential

(Fig. 31) Scioto downtown, photo courtesy of Cord Camera

for a trail or bikeway for travel between parks or into commercial areas instead of cars." In the downtown area, a "well maintained bike trail on the west side is a safe distance from the river — offers good views of the river (and litter) when foliage allows."

Litter and trash are serious problems along the entire corridor. In the Greenlawn Dam areas "there is a concern with all the broken glass around the shoreline — if you trip and fall you may be cutting your knees and hands on glass." These are areas that are "inviting for children to play but not safe — broken glass and broken-up cement wall."

In addition to the litter, in "more secluded and less safe areas homeless live under bridges and overpasses and lie around drinking on both sides of the river." In spite of these conditions, over half of the volunteers felt safe while inventorying their assigned stretch of the river.

About half the volunteers agreed the water was safe enough to wade in although, one volunteer wrote "I would not want to wash my hands before touching food, etc." Another added "swimming or wading should not be encouraged due to roller dam danger — drownings have occurred." ***The dangers associated with low-head dams, tree debris and slippery banks were especially apparent in the downtown Columbus and Upper Arlington survey responses.*** *Erosion seems to be less of a concern in the Dublin and Grandview Heights areas.*

(Fig. 32) View of downtown and lowhead dam

Additional Analysis

Water Quality

Overall water quality remains good along the Scioto according to OEPA standards (Fig. 30). USGS and OEPA data confirm that water quality falls off only after the Olentangy empties into the Scioto downtown. As cited in the USGS Water Resources Investigations Report 92-4130, prepared in cooperation with the city of Columbus' Division of Sewerage and Drainage, "sources of fecal-indicator bacteria within the Columbus area include combined-sewer overflows (CSOs), stormwater and direct urban runoff.

The only sewage treatment plant in the area north of Greenlawn Dam was eliminated in 1989. Thus, most of the fecal indicator bacteria in the area was from nonpoint sources: CSOs, small unregulated sanitary sewer discharges and intermittent breakdowns in the sewage collection system.

As described in the 1994 Water Resource Inventory, "the impacts of CSOs and urban stormwater runoff must be considered beyond potential effects on the water column. The most important effects on aquatic life are the cumulative result of what each individual CSO and runoff event leaves behind, not merely what happens to water chemistry during an event. In addition, many areas impacted by CSOs are simultaneously impacted by habitat modifications (e.g. impoundments, riparian encroachment) and flow alterations."

It is encouraging to note that, according to OEPA's aquatic monitoring, water quality south of Columbus' two sewage treatment plants, Southerly and Jackson Pike, has improved significantly after the city invested millions of dollars in facility improvements.

Flooding

Below the confluence with the Olentangy River, the Scioto serves a drainage area of

(Fig. 33) Flood waters in downtown Columbus

(Fig. 34) Flood wall at Dry Run

1,629 square miles, larger at this point than any other Franklin County stream as it opens out into a wide floodplain. This wide floodplain has made the region vulnerable to flooding. Franklinton, the region's original settlement, was built on the floodplain and has suffered flooding on numerous occasions, with 1913 being the most severe.

After many years of effort to obtain federal funds, the city of Columbus is now working with the US Army Corps of Engineers to construct a floodwall along five miles of the Scioto's west bank in the downtown area. Prior to this project, Columbus spent millions of dollars on dam and dredging projects for a variety of uses. The east bank of the river in the downtown area is protected from flooding by concrete walls.

Altered Form

Partially dam controlled, the river varies from about 16,000 CFS (cubic feet per second) to 110 CFS and often has a muddy brown color. The river is considerably wider than it would be naturally due to lowhead dams, which make navigation by anything but small craft quite difficult. In downtown, the presence of 20-foot high floodwalls belie the river's maximum depth of four feet during normal flow conditions.

In its natural state, the Scioto would barely keep a canoe afloat during periods of drought. As it is, the river is difficult to canoe, due to numerous impediments and is clearly not conducive to commercial boating uses.

Public Access

Many miles of the Scioto River corridor is owned by the city of Columbus, including lands adjacent to the two reservoirs and the corridor from the Olentangy confluence south to Frank Road. Most of the Columbus acreage is along the east bank Griggs Reservoir. Dublin also has significant riverfront holdings. (Fig. 63) In the residential areas along the reservoirs, public holdings separate the water from the private parcels on the bank.

Downtown, public lands are more developed, with bike trails extending through town and planned on both sides of the river. Lack of adequate funding for maintenance continues to be a problem for downtown parks, which require significant upkeep. The Whittier Street peninsula section and Berliner Park south of Greenlawn Dam area are known for their bird life, and have a preserve-like character in places. These areas too are in need of maintenance funding.

Next Steps

The Scioto River epitomizes the challenge found throughout Franklin County: **Should we focus our efforts on addressing the restoration challenges found on the lower Scioto, or would attention and money be better spent inventing good development practices for growing municipalities upstream as well as preserving riparian buffers on headwater streams? Is it possible to both restore and preserve? Should we attempt to come up with stream-friendly management practices as we develop a more cost**

(Fig. 35) Yellow-crowned nightheron at Scioto River

effective option?

Greenways planning attempts to justify public expense for projects by ensuring that each greenway provide at least three multi-objective goals, including community identity, community access and linkages, alternative transportation, recreational opportunities, habitat preservation, and enhancement of the water resource. Should these goals be of equal weight or are some more critical? For example, it has been suggested that where preservation is still possible, enhancement of the water resource and preservation of habitat might be a first priority.

Olentangy River

The Olentangy River connects the two oldest settled areas in central Ohio, Worthington and Franklinton. Running north to south the river flows almost 13 miles in Franklin County before entering the Scioto River in downtown Columbus, flowing past dozens of parks, Battelle Memorial Institute, Riverside Hospital and The Ohio State University on the way. While smaller than the Scioto, the Olentangy also flows all year long and has a steeper slope than many other central Ohio waterways.

The presence of SR 315, Olentangy River Road and the popular Olentangy Bikeway

(Fig. 36) Olentangy River with exposed shale banks

ensure that the Olentangy River remains very much in the public eye. Over 100,000 trips per day are taken on SR 315 alone. Additional sections of the bikeway, now extending from Worthington south to OSU, will soon connect the system to downtown Columbus.

The Olentangy corridor is considered among the area's prettiest and enjoys state Scenic River status from Stratford in Delaware County to Wilson Bridge Road. The many ravines formed by tributary streams of the Olentangy contribute to the river's appeal. Exposed bedrock, steep slopes and in a few cases rock ledges and small waterfalls along these tributaries are unique in the otherwise flat terrain of the region. Some well known tributaries and ravines are Potters Creek and Rush Run in Worthington as well as Adena, Overbrook, Walhalla, Glen Echo and Iuka ravines in Columbus. Community groups in both cities have been active stewards of these resources.

Although some segments of the river were channelized during the construction of SR 315, the stream is enhanced by a primarily second growth wooded riparian buffer dominated by cottonwood and sycamore trees. The buffer is least intact at those points where the river is closest to the highway, particularly on the western bank, where virtually no buffer exists at some points. A benefit of highway construction was the accumulation of hundreds of acres of public lands along the river, much of which are used for parks and open space.

Volunteer Observations

Two sections of the Olentangy River were surveyed by five groups of volunteers. These areas were: Highbanks Metro Parks to S.R. 161 and Fifth Ave. to the Scioto River. Comments and observations provided by volunteers included:

> *The riparian area is "an excellent use of this area and well used by local residents - well maintained and clean."*

(Fig. 37) Fall color on the Olentangy River

(Fig. 38) Olentangy River at lowhead dam

However, it is "difficult to access the area, must negotiate steep banks, no clear access to river banks on either side and lots of broken glass on east bank, would be afraid to bring children."

The, "riparian area is used occasionally for recreational fishing. Some evidence of campfires and lots of litter including cans, bottles, etc. indicating visitors. There is no developed trail, though potential exists to link area to existing Olentangy River bikeway."

Litter and trash were observed to be a big source of pollution — "Steep banks with lots of debris line both sides of the river."

"In general the area is highly developed urbanized and congested. The adjacent roadways and the ongoing bridge and highway construction project have no doubt contributed to sediment levels. Drainage from sewers and roads is abundant. However, there certainly is potential to both improve the natural environment and develop recreational uses."

Perceived safety was an issue with many respondents on the lower Olentangy. One wrote: "very isolated, some difficult spots to walk, tent and mattresses under SR 315 bridge on west bank, lots of beer cans and bottles. I was uncomfortable walking alone." Another wrote: "Steep banks with lots of debris line both sides of the river. If something were to happen to children or nonswimmers during high water, especially near the lowhead dams, it would be difficult for emergency personnel to reach them."

A group of volunteers recommended that "space along Perry Street could be developed into a real urban park, making a nice access point to the river and any adjacent trail or bikeway facilities."

Additional Analysis

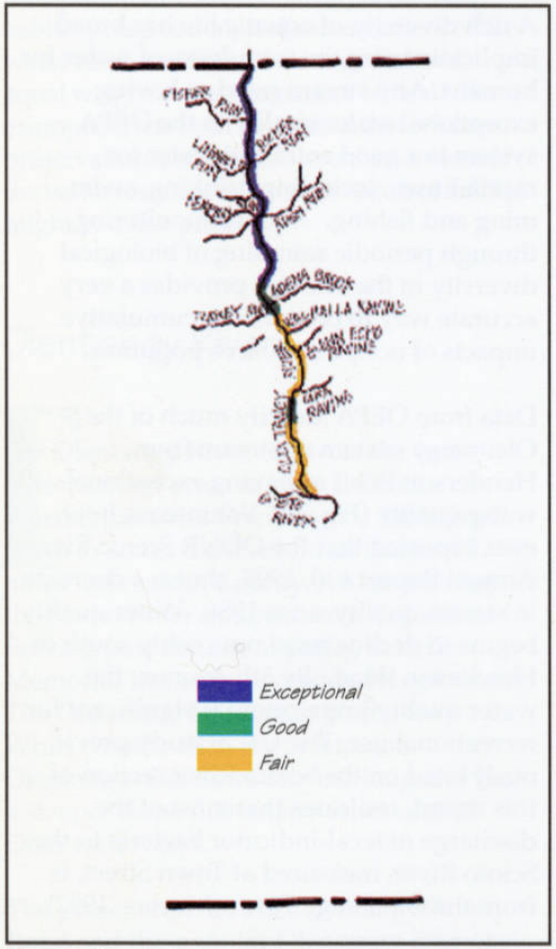
Water Quality

Overall the Olentangy is a surprisingly biologically healthy stream system, worthy of protection from any further degradation. Flowing fairly quickly over a limestone bed, the river supports a broad spectrum of aquatic life, including an array of mollusks and fish species. The Metro Parks staff volunteers who inventoried the Olentangy and its tributaries from Highbanks to I-270 reported the presence of endangered species including the Spotted Darter (*Etheostoma maculata*) and the Bluebreast Darter (*Etheostoma comurum*) and four notable species of mussel.

A rich diversity of aquatic life has broad implications for the usefulness of water for humans. Any stream rated as having exceptional water quality in the OEPA system is a good source of water for myriad uses, including drinking, swimming and fishing. Aquatic monitoring, through periodic sampling of biological diversity in the stream, provides a very accurate way to observe the cumulative impacts of nonpoint source pollution.

Data from OEPA identify much of the Olentangy system upstream from Henderson Road as having exceptional water quality (Fig. 39). Volunteers, however, reported that the ODNR Scenic Rivers Annual Report #10, 1995, shows a decrease in stream quality since 1986. Water quality begins to decline most noticeably south of Henderson Road. By 5th Avenue, the water quality impairment is significant for recreational use. The USGS study previously cited on the Scioto River section of this report, indicates that most of the discharge of fecal-indicator bacteria to the Scioto River, measured at Town Street, is from the Olentangy River (Meyers, 1992).

The lower stretch of the Olentangy River is eligible to be reclassified as Modified Warmwater Habitat by the OEPA. This aquatic life use classification describes conditions downstream and "applies to streams and rivers which have been subjected to extensive, maintained and essentially permanent hydromodifications such that *the biocriteria for the Warmwater Habitat Use are not attainable and where the activities have been sanctioned and permitted by state and federal law*; the representative aquatic assemblages are generally composed of species which are tolerant of low dissolved oxygen, silt, nutrient enrichment, and poor quality habitat." (Yoder, 1996).



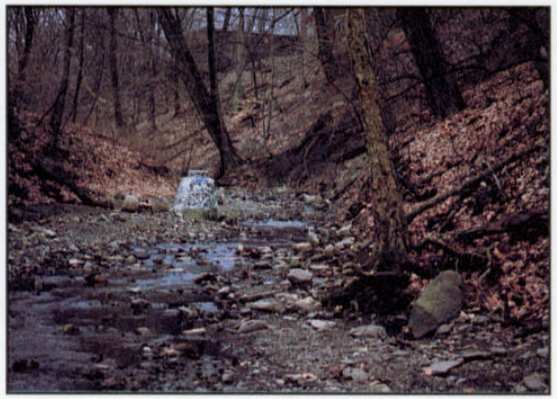
(Fig. 39) Aquatic Life condition of the Olentangy River

Lowhead Dams

Six lowhead dams lie along the Olentangy, more than any other stream in Franklin County. Two smaller structures impound the river on the south side of Worthington; three are located in the one mile stretch between North Broadway and Dodridge Street and a large lowhead sits just north of 5th Avenue.

Impacts from the dams can include alteration of the dissolved oxygen and temperature regimes downstream, altering habitat and eliminating some species of fish, such as darters (Robinson and Buchanan, 1988). Impoundments also hurt the ability of rivers to assimilate organic wastes from combined sewer outfalls and urban runoff (Rankin, 1994).

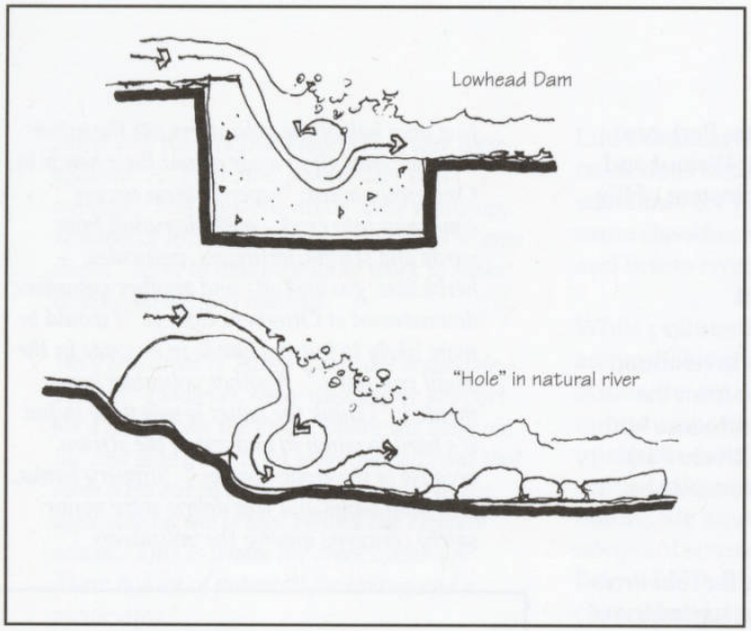
Lowhead dams also generate safety concerns. The uniform wave at the bottom of most of these structures can entrap people in a recirculating "hole" which at some water levels is very hard to escape without rescue (Fig.38). Numerous unnecessary deaths have occurred in Columbus and throughout the country because of these structures.


(Fig. 40) Overflowing sanitary sewer into ravine tributary of the Olentangy River

Lowhead dams, however, also serve an important function which makes their removal very problematic. They provide an inexpensive way to run sewer lines across rivers. All the dams on this river segment serve this function with the exception of the 5th Avenue dam, which is designed to create a water supply pool.

River Protection

The condition of mainstem rivers, such as the Olentangy, are the product of complex influences; tributary streams are much easier to study. The effects of stormwater flows show up very quickly in smaller streams. Adequately sized healthy wooded riparian corridor buffers on small



(Fig. 41) Hydraulic or recirculating wave

streams have an easily discernible effect on water quality and stream function. Urban stormwater runoff controls such as wet ponds and constructed or preserved wetlands minimize protect waterways by acting as a natural filter. They also help to slow the flow of water to the receiving waters and replenish groundwater.

Runoff controls that are pleasing to the eye and safe for children can also lead to increased property values (USEPA, 1995). Sound development and management practices that protect areas such as the ravine tributaries of the Olentangy and Scioto rivers would have many long-term benefits not the least of which are economic.

Next Steps

Like the Scioto, there are many choices facing the region on how best to spend implementation money to enhance and protect the Olentangy. **Should we focus our efforts on addressing the restoration challenges found on the lower sections of the river, or would attention and money be best spent applying good development strategies for growing municipalities upstream , even beyond Franklin County?** Because so much of the Olentangy has exceptional water quality, uniform application of good runoff controls as well as adequate riparian buffers for the mainstem and headwater streams is a key priority.

At the same time, recreational use has been and will continue to be an important element of the Olentangy River. Highbanks MetroPark, Antrim, Whetstone and Tuttle parks could all be connected through a greenway system. The imminent possibility of using the Olentangy for alternative transportation from downtown to north of the county line, with connections to other parts of the region, has great appeal and will do much to bring people to greater familiarity with their river.

(Fig. 42) Olentangy River

ALUM CREEK

Connecting Westerville to the new Easton development and south down to Bexley, the creek flows primarily through the city of Columbus. Several streamfront sites along the creek were recently awarded the first NatureWorks grant money for riparian area protection. The fate of Alum Creek is closely tied to Sunbury Road which closely follows the creek from Morse Road to Leonard Avenue. A winding two-lane road sitting high above the floodplain, Sunbury provides glimpses of the creek. Soon to be studied by the city of Columbus as a possible scenic byway, Sunbury Road has great scenic value that complements the entire river corridor.

Comparable in size to the Little Darby or Blacklick Creek, Alum Creek serves a drainage area of 189 square miles where it flows under Livingston Avenue. It is a small, intimate creek, the kind of place children should be able to play without mishap. It resembles other area creeks in its form, with high forested banks alternating with low floodplain areas. At Three Rivers Park near Obetz, Alum Creek joins the Big Walnut and Blacklick Creeks to form the mainstem of Big Walnut Creek.

(Fig. 43) Bank erosion on Alum Creek

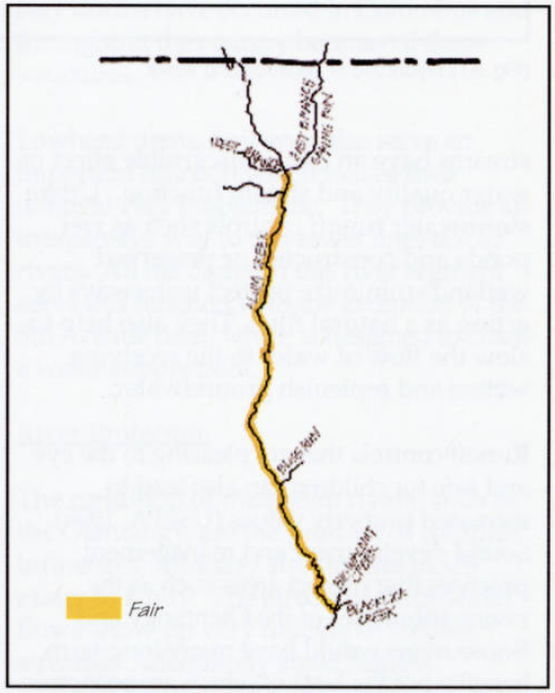
Volunteer Observations

Seventeen groups of volunteers inventoried the entire length of Alum Creek; from the Delaware County line to the confluence with Big Walnut Creek inside Three Rivers Park. The following observations were made by these volunteers:

Special features most noted by the volunteers included: "Large wooded areas, wetlands and rich wildlife habitats." One group of volunteers found "this section was truly a gift. The river retained a natural and uncontrolled feel since it had no low-head dams, obstructions, or man made retaining walls of poured concrete. There were older fieldstone retaining walls, but instead of detracting from the riparian corridor, their age and simple character contributed to the sylvan setting. One really felt that they were no longer in the heart of Columbus, but instead along a natural stretch of river, far removed from the city."

The volunteers felt very safe walking along their assigned stretch of Alum Creek. Near Otterbein College, one group wrote: "Good part of town. There was evidence of fishing, campfires and possibly a homeless person's camp but nothing seemed threatening. Saw evidence of deer, ducks, geese, ground hogs and rabbits."

Just over half of the volunteers felt the water was safe enough to wade or put their hands in. One group noted: "several storm sewers emptying into creek - possible runoff from yards and streets, fertilizers, pesticides, herbicides, gas and oil" and another volunteer, downstream at Otterbein College "I would be more likely to put my hands in or wade in the small tributary." Another volunteer commented: "I think the water is safe to be in but it's hard to climb in and out of the stream because of the eroded banks." Slippery banks, low-head dams and tree debris were major safety concerns among the volunteers.



(Fig. 44) Aquatic Life Index of Alum Creek

Litter and piles of trash along the river were evident. At Holt Ave. a volunteer commented: "this segment needs some clean-up, removal of little and erosion control. The area doesn't seem to require a lot of work to make it more scenic and healthy."

Very few areas of Alum Creek are accessible by trail. However, there was strong support for a trail along the creek "above the bank on the east side there is an undeveloped road that runs adjacent to the creek. It crosses to the west side on the bridge behind the Hebrew school. This is where the creek opens up. There is a lot of potential for hiking and a picnic area."

Habitat

The banks of the stream are forested. In some areas, the entire creek is shaded, a desirable condition for a creek of this size with low flows. In central Ohio, with our hot summers, the trees cool the water allowing better habitat for stream dwelling creatures. Cooler water is also more pleasant for people who might be in and around the creek.

Water Quality

While researchers have suggested that segments of the creek appear to be recovering, the entire Alum Creek from I-270 downstream to the Big Walnut confluence is listed as having fair water quality according to Franklin County Rivers and Streams: Aquatic Life Condition Map, OEPA (Fig. 25). The creek does not meet the OEPA attainment standards for warmwater habitat, and has the same classification as the lower Olentangy and Scioto rivers.

While pollutant discharges into Alum Creek are probably much less than those into the Scioto, the small size of the stream limits opportunities for dilution. Stormwater from upstream development, areas with too many septic tanks in too small an area or septic tank failure, are among the many possible nonpoint source causes of poor water quality. Below I-670, Alum Creek has been channelized, has several lowhead dams and otherwise exhibits characteristics of a disturbed stream system.

Next Steps

Very few areas of Alum Creek are accessible by trail. However, there was strong support for a trail along the creek. At Livingston Avenue , above the bank on the east side there is an undeveloped road that runs adjacent to the creek. It crosses to the west side on the bridge behind the Hebrew school. Where the creek opens up, there is much potential for hiking and a picnic area. At Otterbein College, access is somewhat limited, but could easily be remedied. It would make for a great trail for students' use as well as preschoolers who use a facility on Ohio Dominican College grounds. There are 16 small to medium-sized parks along the Alum Creek, beginning in Westerville and going south to Three Rivers Park. It could be possible to have a hiking trail that connects these parks.

The city of Columbus hopes to designate Sunbury Road as a Scenic Byway. In doing so, funds will become available to help enhance the roadway and Alum Creek. Improving access to the creek and encouraging stream protection by surrounding neighborhoods should help improve the life of the stream. Cleanup campaigns for the Alum and other creeks in the county make great educational service projects for scout troops, church groups and schools.Careful replanting of eroded stream edges and uniform application of good runoff controls, and preservation of the riparian buffers should be a top priority.

(Fig. 45) Idyllic views on Alum Creek

The Rocky Fork and Blacklick Creeks

Although located within a mile and a half of each other and similar in size, the Rocky Fork and Blacklick creeks show some important and constructive contrasts.

(Fig. 46) Rocky Fork of the Big Walnut Creek

Rocky Fork Creek

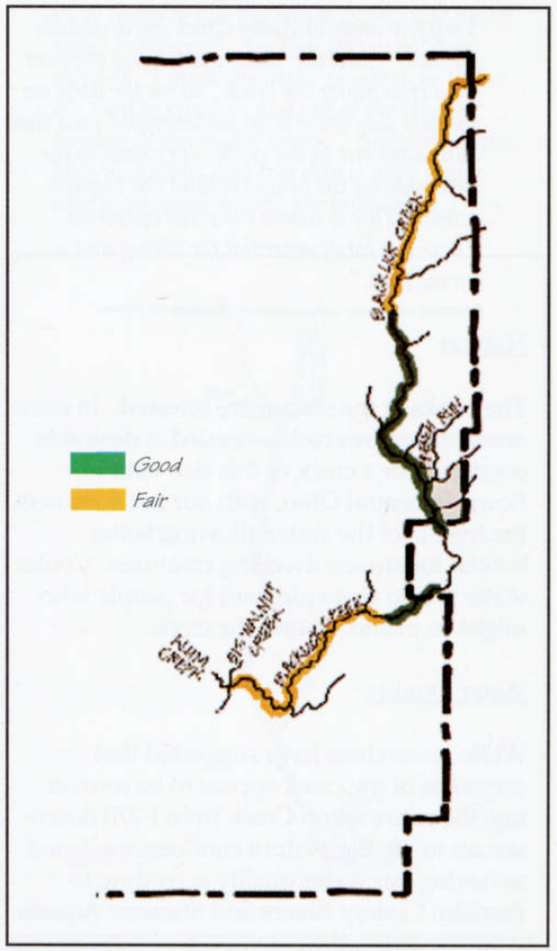
The Rocky Fork Creek begins as a small rural stream similar to Blacklick Creek. Near Headly Road in Jefferson Township, the creek enters a steep walled gorge composed of sandstone and shale bedrock. Surrounded by a Beech-Maple forest, this picturesque gorge is a highlight of the Franklin County waterways system. The creek's unusual scenic qualities are fragile and small in scale and can easily be harmed. The creek is about eight miles long. Beginning in southern Delaware County and terminating where it joins the Big Walnut Creek in Gahanna, the Rocky Fork is special to a number of people in the northeast region of the county. The most active group is the Rocky Fork Protection Task Force.

The task force was established in 1993 by a group of concerned local residents with the assistance of OEPA and ODNR. It provides a good model of a local watershed stewardship group. The group was formed as a result of concerns regarding the rapid development in northeast Franklin County. The creek had sustained significant damage from initial construction activity and residents were anxious to prevent further degradation. The task force works with landowners, developers, local schools, businesses, state agencies and other local governments to ensure proper soil and sediment control practices along the creek and generally monitor the health of the watershed.

Volunteer Observations

Four groups of volunteers surveyed a two mile sample of the Rocky Fork from the New Albany Country Club to Clark State Rd. Due to its relatively discrete nature, the Rocky Fork is unknown to most of Franklin County. Some observations by the volunteers included:

This stretch of the Rocky Fork was described as "truly an outstanding stretch of stream, the physical habitat to support an exceptional aquatic community is abundant. It is secluded from any large development and the area is in a natural



(Fig. 47) Aquatic Life Index of Blacklick Creek


(Fig. 48) Rocky Fork Creek in winter

state with outstanding aesthetics." Access along the Rocky Fork is restricted and development of a trail system is clearly not desired "since all property is private, the potential for public access appears limited. This is an area where the benefits of having a relatively unimpacted stretch of stream outweighs the need for other uses."

Development occurring north of the New Albany Country Club was a major concern for these volunteers, "upstream development is the greatest threat to this stretch. Construction activities have and continue to add sediment to the stream. More impervious areas result in increased runoff. Residential development is resulting in increased nitrogen, phosphorus, herbicides, pesticides and other pollutants being delivered to the stream."

At the time of the survey the volunteers felt the creek was safe enough to wade or put their hands in however slippery banks and tree debris were a potential safety issue "there area several areas where high banks show some significant erosion. These are areas of predominantly shale banks where there is sparse vegetation. In a few areas the erosion has cut the banks enough that large trees have fallen into the stream."

The volunteers felt safe walking their assigned stretch of the creek. The majority agreed that the water was safe enough to wade or put their hands in.

Blacklick Creek

Blacklick Creek has none of the drama found in the Rocky Fork. With an average fall of four feet per mile, and little in the way of rock outcroppings and exposed bedrock, the Blacklick is a pastoral, peaceful meandering stream. A large floodplain alternates on both sides of the creek. Where land has not been cleared for suburban lawns, a generally healthy bottomland hardwood forest persists. Kitzmiller Road closely follows the Blacklick from Walnut Street in Plain Township south to Clark State Road in Jefferson Township. This rural road contributes to the charm of the area. With its uncommon slow paced character, Kitzmiller Road is a good candidate for Scenic Byway status. The Blacklick Creek begins in the northwest edge of Licking County and continues south and west until it joins the Big Walnut and Alum Creek confluence at Three Rivers Park in Madison Township.

Volunteer Observations

Two large areas of Blacklick Creek were inventoried by eleven groups of volunteers. These were: Licking County line to Broad St. and Long Rd. to Three Rivers Park. The many volunteers who observed these two long stretches of creek had these comments:

Blacklick Creek is "very rustic and rural: and very scenic. The vast majority of Blacklick Creek is bordered by private homes of several acres each - especially on the west side of the creek. Probably 50% of the riparian area is in lawns with very little natural growth. The east side of the creek has more old farms and uninhabited areas, but also has some residence of several acres each."

Access along the northern portion of the Blacklick is limited and there is little support to develop a trail system. One group wrote: "we do not feel that the area was suitable for bike paths as so much of it was in private ownership. There were no easy connections to schools, libraries or other public buildings". However, downstream "there is a well worn ATV path which narrows to a foot and mountain bike path on top of the levee on the west bank of the creek. While not necessarily connecting community resources currently, it has the potential to do so."

Scattered litter and trash was a major concern along the Blacklick Creek. A volunteer suspected pollutants entering the

stream from "new residential development - water being discharged (pumped) into stream (brown-colored plume)." Another group wrote: "some people may be putting sewage into the stream - several pipes from people's yards going into the creek." The impacts of future development concerned many of the volunteers "older farms are ripe for development as there is much building going on in the area now. Many of the tributaries are in need of protective measures."

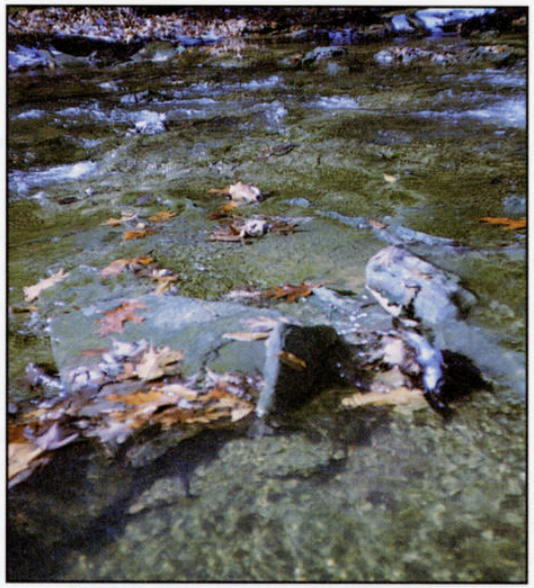
The volunteers felt very safe walking their assigned stretch of Blacklick Creek. The majority agreed the water was "safe enough to wade or put their hands into."

Throughout the study area of both the Rocky Fork and Blacklick creeks, volunteers found extensive unimproved walking paths suggesting a great deal of use throughout the stream corridor. Forty percent of the corridor showed slight bank erosion, with only 12 percent listed as heavy erosion. However, human debris in the corridor was significant, with 103 occurrances such as appliances, cars, and concrete, normally found in a dry landfill.

Additional Analysis

Riparian Areas

Led by the ODNR Department of Forestry staff, the entire Blacklick riparian corridor was censused by Greenways staff and



(Fig. 49) Blacklick Creek

Americorps volunteers. Results of this analysis were encouraging. Overall, the Blacklick Creek has a healthy bottomland forest with good average growth along with large significant trees. The average width of the corridor was 250 feet, sometimes found on both sides of the stream and sometimes not. While the highest percent composition of the riparian corridor was Boxelder (19 percent), Eastern Cottonwood (15 percent), and American Sycamore (12 percent) are also common. There were many Hackberry. These may indicate the floodplain forest is progressing towards a climax that includes not only Hackberry, but also Elm, Sycamore, Ash, Silver and Red Maple and Boxelder. All of these species were found in the understory and regeneration counts.

Water Quality

Both Blacklick Creek and the Rocky Fork are similar in that their water quality improves as it goes downstream. North of Morse Road in Plain Township, increasing development has caused numerous impacts. Heavy instream algae growths, varying dissolved oxygen levels and elevated bacterial counts all showed that this small watershed has problems processing impacts. Combined with intermittent stream flow conditions and failed on-lot septic systems in the upstream area, portions of the stream are polluted (OEPA, 1992). Downstream from Morse Road, low density older residential land uses and considerably slower growth on much larger parcels in Jefferson Township have allowed the condition of the creeks to improve dramatically. Partially as a result of increased perennial flows, the improvement appears to be largely a function of the quality of the existing riparian corridor and floodplain forest which contributes to the healthy functioning of the stream.

According to the Aquatic Life Index, (Fig. 25), water quality along the Rocky Fork remains good until below Clark State Road, where it becomes exceptional to the confluence with the Big Walnut in Gahanna. Blacklick Creek in contrast, is only fair from Walnut Street to Havens Road, where it meets warm water habitat aquatic life standards until it reachs Gender Road near

Pickerington (Fig. 47). From here to the confluence with Big Walnut Creek at Three Rivers, the stream is classified as fair once again.

Land Use

A mixture of rural residential lots of one acre or more and suburban housing developments are the predominant land use in the study area. Construction site erosion and streambank modification are the major types of nonpoint source pollution on the Rocky Fork. Similar effects on the Blacklick have been less intense although it runs through three golf course areas.

Potentially Endangered Species

Due to their small size, both waterways are more susceptible to the effects of adjacent land use than rivers with larger flow. The ODNR Department of Natural Areas and Preserves list a few special species along these creeks. They are the Blacknose Shiner, the Big eye Chub, the Golden-winged Warbler and the Butternut tree.

Next Steps

The groundbreaking *Rocky Fork-Blacklick Accord*, an adopted initiative between the village of New Albany and the city of Columbus to manage and control future growth in the planning area influences a large portion of the Rocky Fork-Blacklick Creek watershed. The accord addresses many of the quality of life issues so important in greenways planning. Some of the important principles of the accord are to:

1) Maintain the aesthetic character of rural roads.

2) Use open space as an organizational element and as part of the infrastructure.

3) Guarantee permanent protection of greenbelts, streams, creeks, woodlands, grasslands, wetlands and historic sites.

4) Maintain a system of bikeways and pedestrian paths, easily connected to transit and other amenities.

The accord also stresses the importance of soil and erosion control. Stream corridor protection is an important strategy to protect the riparian locations in the planning area:

"Stream corridor open spaces are 300-foot-wide strips of land following the centerline of the Rocky Fork and Blacklick creeks (measured as 150 feet from the centerline of the creek). In addition, there is a 100-foot-wide corridor designated along the alignment of the Sugar Run. This open space would remain in or revert to a natural state. It will be created by a combination of development restrictions created by wetland and floodplains protection regulations, easement space that results from abutting residential and commercial projects, and from active public acquisition of open space through easements, tax credits, land banking and the like."

There are no parks or public lands in the study area. Both stream segments host private country and hunt clubs, but no other institutional use. Neither stream is navigable in any but the most extreme high water conditions. Wading up the streams is a common practice. With property lines extending into the center of the creek, riparian protection easements would preserve the area and maintain its private ownership.

Big Walnut Creek

Big Walnut Creek flows through nine separate political jurisdictions and covers over 33 miles on its way through Franklin County. Alum, Rocky Fork and Blacklick creeks are all tributaries of the Big Walnut. The river's origins are north of Columbus in the Morrow County area from where it proceeds to Hoover Reservoir, created by Hoover Dam, which impounds the creek to the north. The reservoir itself covers 3100 acres and supplies roughly 50 percent of the region's drinking water.

In addition to Hoover Reservoir and its associated parklands, the Big Walnut flows by or near Inniswood Metro Park, Blendon Woods Metro Park, several large parks and preserved lands within Columbus, Gahanna and Whitehall, and the 410-acre Three-Rivers Park where Alum and Blacklick creeks join the Big Walnut. The waterway is also bordered by two private and one public golf course.

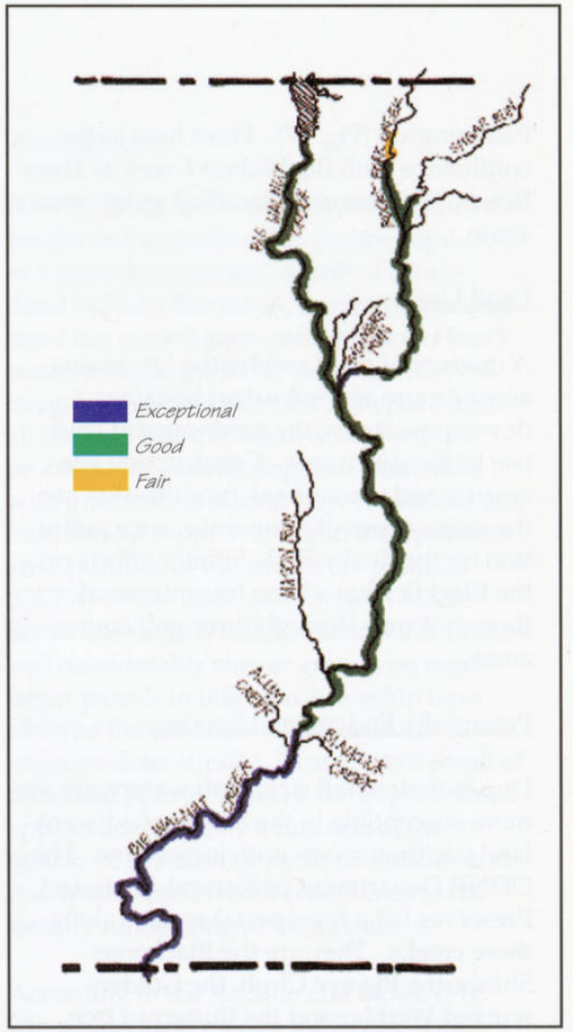
(Fig. 50) Idyllic Big Walnut Creek

Significant other land uses and activity centering along the Big Walnut include The Limited Distribution Center, Port Columbus International Airport, several sand and gravel quarries, two Columbus water plants, and the Rickenbacker International Airport.

Volunteer Observations

Thirty-four groups of volunteers inventoried the entire length of Big Walnut Creek from Hoover Reservoir south to Pickaway County line. The following comments, observations and suggestions were provided by these volunteers:

About half of the volunteers agreed the riparian area was accessible and even more agreed there was potential for a developed trail system. South of Hoover Dam, a volunteer wrote: "I would like to see the Big Walnut Creek more accessible to recreation uses like canoeing, fishing, and birdwatching. Bike or foot paths near the riparian corridor would be highly desirable, but are not feasible in the riparian corridor. Easements for public access for canoeists, fishermen and birdwatchers could easily be purchased." Downstream in Gahanna,



(Fig. 51) Aquatic Life Index of Big Walnut Creek

"the riparian way is used at the soccer field, Friendship Park, and Pizzuro Park. The riparian way can be further developed around these areas for more community access."

(Fig. 52) Sand and gravel operations on the Big Walnut

At Woodside Green Park, "there is a bike-pedestrian pathway from the park to swimming pool - some of the utilities existing roadways might be potential to develop parts of pathway near stream to eliminate use of roadways" and downstream "there was a well-defined, unimproved trail along 90% of this stretch of stream. There is great potential to use this trail." There are opportunities to link many of the parks along Big Walnut Creek. One group wrote: "parks aren't connected. Maybe possible to connect Three Rivers to Elk Run Park and then to Heisel Park with a pike path." Others argued that "access not needed in riparian area. Plenty accessible by roadway. Streambed easily followed through pathways in woods on both sides."

Aside from the dangers of steep slippery banks, tree debris in the river and scattered trash, the volunteers felt very safe inventorying their assigned stretch of Big Walnut Creek. Only half of the volunteers felt the water was clean enough to "wade or put their hands in." "The area at the time of survey was not fit for humans. Too many potential hazards" and "left bank at Woodside Green Park shows significant erosion - may be a candidate for biotechnical erosion control methods".

Development in the area was a major issue for the volunteers. One of the groups wrote: "the biggest concern this stream faces is the accelerating growth of Westerville to the west and of New Albany to the east. The result will be more intensive land use, more development, traffic, and potential from increased pollution from sewage, cars, litter, landscaping etc. Any new development should be kept strictly away from the riparian area."

Additional Analysis

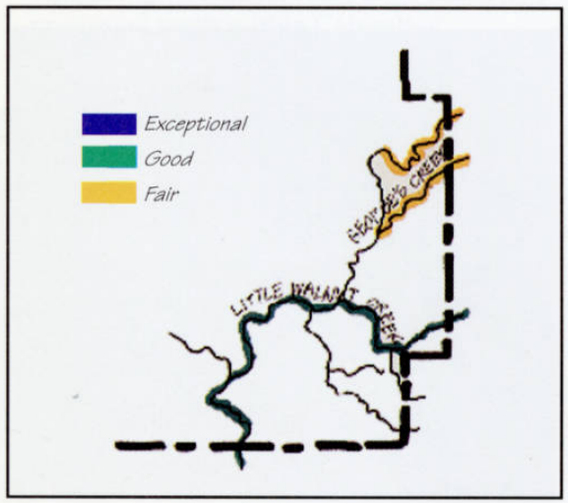
Led by staff of the ODNR, Forestry Division, portions of the Big Walnut riparian corridor were censused by Americorps volunteers and Greenways staff. Results of this analysis were similar to that done for the Blacklick corridor, and suggest the quality of our riparian corridors to be good. Overall the Big Walnut has a healthy bottom land forest with some large diameter (40-inches or more as measured 4.5- feet above the ground). Most of the overstory trees, such as Red or Silver Maples (29 percent) and Box Elder (14 percent) can all be part of a climax forest, as can Hackberry, Sycamore and Fraxinus sp. (ash) which were the next most common species encountered. Water released from Hoover Reservoir for treatment currently travels along the streambed, the several mile distance to the Hap Cremean Water Plant, located on Morse Road.

Big Walnut has great potential as a continuous open space corridor with key connections.

(Fig. 53) River location advertised as an amenity in local developments

LITTLE WALNUT CREEK

Little Walnut (also listed as Walnut Creek by OEPA) may be among Franklin County's least known streams. With origins in Perry and Fairfield counties, it flows through the southeast corner of Franklin County, through Canal Winchester, Groveport and Madison Township. The 54.21-mile creek cuts through the topographical divide between the glaciated Allegheny Plateau to the southeast and the till plains to the northwest with their buried valley and encompasses a drainage area of approximately 129 square miles. The stream enters the Scioto just south of Ashville in Pickaway County.



(Fig. 54) Aquatic Life Index Map of Little Walnut Creek

The Little Walnut is the only predominant east-west stream in the county. It is largely undisturbed and includes many beautiful stretches with riparian buffer forests. Georges Creek is its biggest tributary in Franklin County, serving as a connection between Little Walnut and the Pickerington Ponds wetlands wildlife refuge. This Metro Parks facility is several hundred acres in size and is a favored habitat for a wide array of birdlife.

Volunteer Observations:

Three groups inventoried almost the entire stretch of Little Walnut Creek. These inventories covered Pontius Rd to S.R.674. as well as the covered bridge at Ashbrook Rd. and Washington St. The following are some observations made by the volunteers:

Little Walnut was accessible to the volunteers without the need for a developed trail. However, a trail, or canoe access, would be a good way for more people to enjoy the scenic beauty of this area providing "potential use of riparian area would only be developed with permission from landowners." More important than allowing access to the creek was that "this area be saved for future generations" and that "this section of Little Walnut is for scenic enjoyment."

One group who canoed the creek noted: "we found it to be most enjoyable, with a few dumps and farm field right up to the river." The major pollutants were landscaping practices from a neighboring golf course, run off from crop fields as well as piles of trash. The volunteers felt very confident that the water was clean enough to wade in or put their hands in and they felt safe surveying this stretch of river. Some banks were noted as slippery but overall bank erosion seem to be minimal problem on Little Walnut Creek.

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Adjacent land uses along the corridor are primarily agricultural with some large-lot residential. While the Little Walnut has benefited from a relatively quiet environment, land use transitions, particularly in

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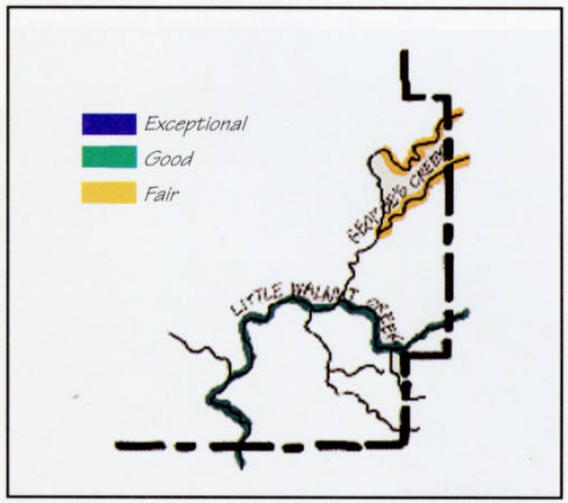

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(Fig. 55) Little Walnut Creek during a spring flood

the Georges Creek watershed, have accelerated and are likely to have an increasingly negative impact on the stream's water and habitat quality. Already its Franklin County tributaries are rated by OEPA as having only fair water quality. Little Walnut itself is considered to have good water quality.

Most of the land use changes occurring to the north of the stream are from agriculture and residential, within Columbus, Groveport and Canal Winchester. Further south, however, the Little Walnut flows along the eastern edge of the Rickenbacker Port Authority's holdings. The Rickenbacker International Airport has experienced rapid growth during its transition from a military to commercial airport.

The port authority has purchased much of the land on the stream's west bank because of high noise levels associated with the runways. This may represent an important opportunity to permanently protect this stretch of stream from encroachment.

Another form of protection for the Little Walnut is the size of its floodplain and the presence of hydric soils, which are often indicators of wetlands. The watershed is not well drained and presents challenges to development.

All three jurisidictions through which the Little Walnut flows; Canal Winchester, Groveport and Madison Township, are considering comprehensive planning efforts in 1997. This is a critical opportunity to further recognize and provide meaningful protection to the stream.

Little Walnut presents a perfect opportunity to link Groveport and Canal Winchester through the establishment of a pedestrian and bike trail. The Ohio to Erie canal bed parallels the river in the Groveport Road area and might provide an alignment for such a trail.

(Fig. 56) Agricultural land with a riparian buffer

Hayden Run Creek

Hayden Run is the smallest of all the waterways studied in the Franklin County Greenways Plan. It is also the only headwaters stream considered by this effort. The run serves a drainage area of about 45 square miles and flows west to east rather than north to south, typical of most of the Scioto River's tributaries. Rising out of the wet flat lands adjoining the Darby plains, the stream has a large marshy floodplain upstream which turns into a steep, narrow limestone gorge before entering Griggs Reservoir.

Many people would describe the central Ohio topography as flat and geographically uninteresting. Few people would have such an impression after seeing the 26-foot Hayden Run Falls. This spectacular natural feature is the last drop by the run into an extremely high, very narrow limestone gorge before entering Griggs Reservoir (Fig. 58). Both the waterfall and gorge lie within feet of Hayden Run and Dublin roads which collectively accommodate about 35,000 automobile trips per day.

(Fig. 57) Limestone cliffs border Hayden Run Creek

Many headwater streams are of disproportionate importance to the water quality of the downstream segments; however, this is not the case with Hayden Run where there is often no flow entering the Scioto during dry periods. It is also doubtful that the stream has great species diversity because of its small size.

Hayden Run does, however, have qualitative importance to the Franklin County area far greater than its size or influence as a hydrologic unit. Its waterfall and gorge make dramatic scenery for relatively flat central Ohio and like much of the Olentangy and Scioto River valleys, the area surrounding the run is littered with archeological artifacts. This is particularly true near its confluence with the Scioto. Clearly the location was used and appreciated by earlier prehistoric and native peoples.

(Fig. 58) Hayden Run Falls

Volunteer Observations:

The entire stretch of Hayden Run, from Cosgray Rd. to the Scioto River was surveyed by four groups of volunteers. The following are some comments and suggestions volunteers provided about Hayden Run:

The riparian area along Hayden Run is not currently accessible by a trail system. One volunteer wrote: "parts of the stream are extremely overgrown with thorns - difficult to get through safely - other areas are grass, and are pleasant to walk along the stream" and "there is talk of widening Hayden Run Rd. and taking out the bad curve at Dublin Rd. It would be great if a bike trail was included in this project. Some areas would allow for the path to be adjacent to the stream."

The amount of construction currently underway around Hayden Run was a

major concern for the volunteers. One of the volunteers wrote: "Construction at the intersection of Dublin Rd. and Hayden Run should be observed. The banks are now barren. Hopefully when construction is completed attention will be given to bank restoration. Important area to watch." Areas with slippery banks due to erosion, in particular around construction sites, tree debris in the stream and scattered litter and trash were problems along the creek. However, the volunteers felt safe walking along Hayden Run and believed the water was "safe to wade or put their hands into."

Hayden Falls is a truly wonderful amenity. Many volunteers commented on the neglect for this unique park. "Hayden Falls is a very beautiful natural area. There is a sign designating this area as a Columbus Park, but there is very little parking there. There is no apparent entrance into the area other than man-made paths." Another group added: "currently there is no marked access routes, trails, or guard rails (safety fencing) along the cliff edge. This is a beautiful space littered with broken bottles and graffiti." The volunteers "recommend this area become a nice park attraction; however extensive work would need to be done to provide pathway and safe walkways in order to preserve the natural characteristics of the area and to provide a safe attraction."

There is genuine concern for the future of Hayden Run. This stream needs to be protected from the impacts of continued development and treatment by existing neighboring landowners. "I truly hope that the city will take a special interest in the preservation of the Hayden Run."

Additional Analysis

Worthy of comparison to a small Smokey Mountain National Park waterfall, Hayden Run is well known by photographers and other individuals interested in scenic attractions and would be treated as an asset in most communities. Although the waterfall, gorge and a small buffer area are in public ownership, there are no signs, walkways or apparent interest in embracing and further protecting this considerable asset. Private houses have been built close to the rim of the gorge, infringing upon the viewshed of the scenic area. All other streamside property along the 14-mile creek is in private ownership.

The state of semi-neglect of the lower section of the run is in stark contrast to the rapid development occurring in the area. Hayden Run Road is now six lanes wide and runs immediately beside the stream and gorge. A 25-foot utility easement owned by the city of Columbus would permit sanitary sewer and water lines to serve unincorporated areas beyond Hilliard. Hayden Run is in the middle of one of the region's most dynamic developing areas.

(Fig. 59) Boardwalk in park setting

Because of the way in which Hayden Run Road and Hayden Run cross back and forth across each other along their narrow corridor, traditional infrastructure improvements could have negative effects on the run; engineers have recommeded channelizing a part of the stream.

The OEPA classifies the run as an impacted stream segment. The waterway shows the non-point source pollution effects of storm sewers, sanitary sewers, construction sites and surface runoff, particularly from the road. However, is not at present a degraded system. As a rural-suburban area in transition, there is still a great deal of good permeable surface left to store excess water, especially in the upper wetland reaches of the stream. Planning for the area is difficult, however, due to its multijurisdictional nature.

The recently adopted 1996 Hilliard Master Plan Update calls out the Hayden Run corridor as a distinct district in need of special protection. Specifically the plan states that:

> *"Special consideration to all new development within this area is needed because of the environmentally sensitive and scenic nature of the Hayden Run Creek."*

The plan calls for overall gross densities in the corridor of between .5 and 1 unit per acre as well as preservation of existing wood lots, open areas, sensitive habitats and natural features.

The plan also introduces the concept of a realignment of Hayden Road beginning just west of I-270 rejoining the existing alignment just east of Cosgray Road. The existing road would remain in service for local traffic, however, the new alignment would serve as the arterial. The new road would run parallel to and about a mile north of existing Hayden Run Road. Construction of this road would alleviate pressure on the Hayden Run corridor and provide a new, much needed east-west connection in the area.

Despite the overall pace of development in the corridor, Hayden Run remains sufficiently intact to make its preservation realistic. Its long-term protection will require the active cooperation of Hilliard, Dublin, Columbus, Norwich and Washington townships. Dublin is currently conducting an update of their Community Plan. Recognition of Hayden Run and consideration of the road's realignment would be important provisions in this document.

Case Studies

INTRODUCTION

This section of the Greenways Plan develops a "prototype for more detailed Greenways planning and implemntation efforts that need to be pursued in the future.

One river and one creek segment were selected to demonstrate some of the ways that Greenways components can be applied to relatively small- and large-scale urbanized streams. Both of these detailed greenways plans were developed by small groups of the Greenways Steering Committee in the fall of 1996 utilizing basic mapped data to organize their analysis of problems and opportunities for riparian protection. The groups applied greenways concepts which have been set forth in the earlier sections of this plan. It is recommended that many more miles of stream corridor planning could be refined in subsequent community based planning efforts.

SCIOTO RIVER

from Main Street to Frank Road

The Main Street to Frank Road section of the Scioto includes a major floodplain in the Scioto system. The recipient of much runoff from developed portions of Columbus upstream, the land on either side of the river hosts uses that must be able to sustain flooding. Railroad lines, highways, landfills, rendering plants and parks are the primary land uses (Fig. 64).

North of Greenlawn Dam, a thin band of woods runs along the river. Now owned by the Columbus Recreation and Parks Department, this riparian corridor includes a bike trail and a surprising amount of wildlife; 200 species of birds have been identified in the area. The list includes sightings of wading birds and rare migrants like the golden plover.

While the area just downstream from the Whittier Street Standby Tanks is heavily used for fishing, the Ohio Department of Health published a consumption and contact advisory for the Scioto River at Greenlawn dam that discourages eating carp and catfish because of PCB and chlordane contamination. The river at this point is not in attainment with the Clean Water Act standards of 1972 for warmwater habitat. The OEPA designates the Greenlawn Dam area as having fair water quality.

Local neighborhoods adjoining this portion of the Scioto River including the Brewery District and German Village have identified lands they would like to see protected and restored in the Greenlawn Dam area.

Strategies to improve the tax base in the area are also being discussed.

RECOMMENDATIONS FOR THE SCIOTO RIVER

Greenways provide many ways to protect and restore the valuable attributes of the lower Scioto River.

1. Establish design guidelines for the lower Scioto waterfront and environs.

Because the Scioto waterfront will be important as an economic engine within downtown Columbus, it is important to formulate design guidelines that ensure continuity between existing historic neighborhoods, new development and park/river areas. Because views are much greater across bodies of water, there is a need for careful planning and design.

(Fig. 60) Fishing below Greenlawn Dam in the Scioto River floodplain forest

(Fig. 61) Floodplain forest in the spring

2. Provide interpretive signage in Greenlawn Dam parklands.

Just as downtown Columbus is the core of the city, as well as an historic meeting place, the lower Scioto is a crucial point where Franklin County's rivers meet. This location provides an ideal setting for interpretation of the river system as a whole. Critical issues associated with riverine systems as well as important historic facts could be well illustrated here. The Greenlawn area could be a source of identity for local neighborhoods and a symbol of river identity for the region as a whole.

3. Provide signage and other design features identifying the bikeway and surrounding parklands to reinforce a sense of place.

In spite of careful maintenance on the part of the Columbus Rec and Parks, the Whittier Street - Greenlawn Dam area lacks visual character.

4. Establish Friends of the Park.

Neighborhood groups in the area, such as the Brewery District Society, have shown initiative and stewardship in their attempt to improve the Whittier Street boat launch area.

5. Establish better connections to the Scioto River, especially from German Village and the Brewery District.

While there is currently tremendous local neighborhood support for the development of the Scioto as a community amenity, the connection between the river and adjoining citizens on both sides of the river is limited. On the east side, access is complicated by multiple railroad tracks which separate Front Street from the river. On the west side, Interstate 71 provides a barrier to residents from Interstate 70 down to SR 104. Once past railroad tracks and highways, a well-maintained bike trail provides access to the river for the entire length of this segment. Still, Greenlawn Avenue and Whittier Street are the only means across the barriers.

In the course of the redevelopment of the Whittier Street peninsula, access from Sycamore and Frankfort Street should be increased. High-density, well-designed development on the Whittier Street Peninsula — sufficiently connected to the Brewery District — would increase the tax base and stimulate desirable features closer to the river.

6. Link communities and ensure public safety.

Continuing construction and development of the bikeway will soon allow a cyclist at SR 104 to ride all the way to Worthington, approximately15 miles. This exciting linkage will also connect the area with I-670 and beyond. Although few problems exist currently, increased visitation in the area will demand attention to public safety issues.

7. Maintain existing riparian corridor.

The lower Scioto has an exceptional floodplain forest below Greenlawn Dam. It is magnificent in scale and speaks well of the foresight and good management of the city of Columbus. However, the forest needs to be protected. While existing mature trees seem to be in good shape, there is virtually no understory of small trees, shrubs or seedlings to sustain the system once the current canopy of trees begins to die out from old age.

8. Protect along the river for migrating and nesting bird species.

Columbus and Franklin County have had the foresight to protect the forested edge of our rivers, thus allowing excellent riparian corridors for wildlife, particularly bird species. (Much of the remaining forest in the developed sections of Franklin County is along streams or in the MetroParks.) These riparian forests are critically important as habitat for long-distance migrating songbirds. They become even more crucial in areas like central Ohio where extensive deforestation has occurred and urban and agricultural lands predominate. River corridors provide essential resources: food, water, cover.

9. Restore floodplain forest as wildlife refuge.

Because of the size of the forested floodplain below Greenlawn Dam on the lower Scioto, it is unusually rich habitat and should be preserved and restored.

10. Promote integrated watershed management throughout the county and region.

The Scioto is not just the product of its immediate surroundings, but of its vast drainage basin. An integrated management program should be promoted. By addressing the range of issues throughout the watershed, the chances for success in the downtown region are greatly increased. A model approach for watershed-wide management currently exists in the Darby Partnership.

11. Establish a riparian forest bank.

Forest mitigation banks are facilities where developers can purchase credits towards riparian restoration in exchange for permits to alter stream or corridor vegetation elsewhere. They are used when destruction or significant alteration of a stream corridor as part of a development project cannot be avoided.

12. Establish a special tax rate for floodplain properties.

The convenience of the Scioto River valley for early travel and settlement became one of the corridors' headaches later on. While much of this 100-year floodplain is owned by the city of Columbus and the state of Ohio, there is privately owned floodplain land subject to development.

Floodplain provides storage areas for excess water during storm events. Leaving a floodplain in its natural state is an effective way to reduce the cost of flood damage, water treatment and stormwater management. Deterring individual property owners from developing in the floodplain is sensible public policy.

(Fig. 62) Bridge crossing high above Alum Creek

A tax discount for landowners who maintain their floodplain property in its natural state would be a powerful incentive that contributed to the public good. The long-term public savings generated by such a program would be significant. Any change in the existing system will require state authorization through the legislature.

ALUM CREEK

Alum Creek, from Morse Rd. to I-670, differs from more rural Franklin County streams like Little Darby and Blacklick creeks in its urban location, surrounding land use and resulting water quality (Fig. 66). Compared to the Little Darby, Alum Creek's water quality is moderate. There is not the rich aquatic fauna found in the Little Darby; instead creek water carries varying amounts of bacteria from sanitary

sewer overflows and unsewered islands upstream.

However, Alum Creek is not beyond recovery. Field work done by the OEPA suggests that water quality in the Morse Road segment is improving.

Land use along the creek consists of mostly large acreage, permeable uses such as parks, golf courses and large nursery properties. Most streamside residential development is also an acre or greater (Fig. 67). These land uses serve to buffer the stream from the negative effects of stormwater. Because of the canopy of overhanging shade trees, the stream presents an aesthetically pleasing and refreshing vista to its visitors. For these reasons, the creek is valuable in its current condition.

RECOMMENDATIONS FOR ALUM CREEK

Greenways provide valuable tools to preserve this reach of Alum Creek. The following discussion highlights some key elements in caring for and enhancing the value of the creek as an important local resource.

1. Provide signage identifying the creek.

People associate meaning with places that have names. Many local people are not aware of what stream they are crossing when they go over the McCutcheon Road bridge, or across the creek at Agler Road. Most road crossings in the Morse Road stretch are high above the creek and barely provide a glimpse of the water. Signage identifying the creek name would go a long way toward establishing the identity of the creek as a significant entity. Creek tributaries should also be named.

2. Promote Sunbury Road as a Scenic Byway.

Both Alum Creek and its river corridor, including Sunbury Road, seem to be undervalued by the community. Scenic Byway status would recognize the importance of this corridor and foster neighborhood pride.

3. Provide interpretive signage about Alum Creek history.

Alum Creek was an important artery in the Underground Railway, helping escaped slaves during Abolition and the Civil War. The Alum Creek Greenway could celebrate this important part of our cultural heritage. Interpretive signage at appropriate locations would enhance trail users' understanding of history.

(Fig. 63) Periods of low flow limit usage of Alum Creek for recreational users and aquatic wildlife

The large percentage of public land in the corridor provides an incentive to link the entire Alum Creek corridor with a trail system. Columbus Recreation and Parks has designed a multiuse trail to travel much of the waterway from Westerville down to the existing bicycle trail on I-670. This route will provide a nonmotorized transportation corridor linking Westerville, Easton and all points to downtown Columbus. The trail will also link many schools along Alum Creek with parks, the two golf courses and all adjoining neighborhoods. The Ohio to Erie Trail will also be linked to the Alum Creek trail providing additional access from Columbus to Cleveland and Cincinnati.

4. Build a constituency for the creek.

Very few people in adjoining neighborhoods consider Alum Creek a potential resource at this time. Many people are not aware of its presence. This reality results in part from the ambiguities associated with streams in urban environments. However, there are other, fairly simple reasons why there is little neighborhood identity with the creek at this time. A few simple changes might go a long way to improve community ownership of this resource.

Educational programs in the local schools and parks using the creek as a resource for science, art and history classes would give the stream more meaning. Physical education classes and day camps could sponsor a host of recreational activities associated with the water and stream corridor. Youth groups could participate in trail maintenance programs and other service projects, learning more about the stream by working around it.

5. Provide better access to neighborhoods including improving infrastructure.

Local community groups have expressed interest in better connections between their neighborhoods and local facilities such as Innis and Mock Parks. Sidewalks, as well as trails on tributary corridors connecting to Alum Creek, would improve the ability of local people to enjoy the resources of their local environment.

6. Maintain the existing riparian corridor and augment canopy and understory density.

Much of Alum Creek has at least a single row of trees along its banks. In many places tree species seem to be doing well; there are no problems with the creation of gullies, and erosion down to the stream is minimal. The creekside vegetation seems able to sustain itself. However, there are areas where the line of trees is too sparse, the one remaining tree is about to topple into the stream due to severe bank erosion, and there are no recruits to fill the gap. Because so much of Alum Creek is public land, the riparian cover could easily be restored to a healthy condition.

One of the most important benefits of greenways from a biological point of view is that it provides good connections for wildlife between larger source areas where species breed. Stream corridors are particularly good for this purpose, as the interface between land and water provides habitat for a wide variety of species. Alum Creek's relatively undisturbed riparian corridor is excellent as a bridge between areas such as Mock Park, Innis Park and Coopers Park.

7. Maintain no net loss of floodplain within the watershed.

Fairly small, narrow stream corridors such as Alum Creek do not have the wide floodplains found downstream in Franklin County. Existing floodplains are very important for flood storage during storms and should be preserved in an undeveloped state at all costs.

8. Maintain present amount of permeable land along stream corridor or comparable functioning.

Ideally existing land uses and density should remain the same along this section of Alum Creek. Realistically, as an inner belt location between Easton and the Columbus downtown, there is likely to be an increase in density in the future. Tax credits and conservation easements might encourage river protection in the immediate riparian corridor. Because 50 percent of the land is already in some form of public ownership, a public/private partnership ensuring a riparian buffer could easily help make the creek a true community amenity.

Key Greenways Recommendations:

SHORT TERM IMPLEMENTATION STRATEGY

1. Involve people in river stewardship by establishing interjurisdictional watershed protection groups.

Few river protection measures are as effective as an informed, committed and proactive community. Civic associations, area commissions, environmental and conservation groups, service organizations, schools, and professional groups all serve as excellent starting points for river protection efforts.

These groups can be particularly helpful for watersheds experiencing a significant land use transition, such as Big Darby Creek, the northern reaches of the Olentangy River, Hellbranch Run, Rocky Fork Creek and Blacklick Creek. Informational resources for such groups are available through many government agencies and private organizations.

Franklin County has several successful examples of river groups on which to build including the Rocky Fork Protection Task Force and the Darby Partnership, Darby Creek Association and Operation Future.

2. Establish a Scioto River Basin Watershed Council with a Greenways subcommittee.

River issues do not begin and end at political boundaries; a central Ohio-wide river council would coordinate and help implement various activities within the watershed. The council would be the logical moderator for discussion and possible solutions for regional environmental issues. Members of this council would include stakeholder citizens, representatives from various environmental agencies, community groups, environmental nonprofits, MORPC, cities and county departments, and the soil and water conservation districts as well as local elected officials.

3. Establish a Greenways Land Trust.

At present there is no way to make a gift of land directly to the Greenways project. Either land or private donation require oversight. A representative of the Greenways Land Trust would be part of the Scioto River Basin Watershed Council. The land trust could also facilitate donations of property or cash to other appropriate public and private agencies.

Examples of existing land trusts are: The Trust for Public Land, The Nature Conservancy and the The National Trust for Historic Preservation.

4. Establish a Greenways clearinghouse.

An information clearinghouse would report to the Scioto River Basin Watershed Council for central Ohio. This nonregulatory clearinghouse would serve the six-county area surrounding Franklin County. The agency would focus on providing environmental data for participating counties in one data bank which could be accessed by anyone. Regulation, scientific data, organizational information and ongoing projects are various types of information that would be available. River-related GIS mapping could be completed.

Many river-related funding sources are now watershed based rather than municipality oriented because of the interjurisdictional nature of rivers. A Greenways clearinghouse would facilitate the Scioto River Basin receiving its fair share of such opportunities. The main objective is to disseminate information. Other projects might include educational efforts, consensus building, planning efforts and coordination of various multicounty environmental activities.

Development of a database including parcel numbers, ownership, acreage, use for each parcel in Franklin County containing floodplain areas would serve as an important resource in the dissemination of riparian stewardship information. Mailings explaining stewardship practices, conservation opportunities, and other information could be conducted with addresses generated by the database. The database would also prove invaluable as a way to establish river and stream protection groups.

5. Encourage regional standards for river related land development regulations.

There are over three dozen political jurisdictions in Franklin County. They use a wide array of subdivision, stormwater management, and erosion and sediment control regulations. As a part of Greenways implementation, steps should be taken to achieve consensus on regional standards for as many of these regulations as possible, particularly erosion and sediment control. This would ensure minimum standards of treatment for riparian areas and ultimately result in a much simpler working environment for the development industry and regulatory agencies. Consolidation of duplicative public functions is another potential benefit.

6. Encourage countywide participation in the Commmunity Rating System of the National Flood Insurance Program.

Most communities in Franklin County participate in the Federal Emergency Management Agency's (FEMA) National Flood Insurance Program (NFIP). Over 2,800 properties in the county are covered by the program which makes affordable flood insurance available to citizens of participating communities. The owners of these properties pay over $1,000,000 per year in premiums and have collected nearly $3,000,000 in claims since 1978. Total coverage for the county exceeds $180,000,000. In exchange for this insurance coverage, FEMA requires that communities adopt standards, typically included in zoning codes, regulating the use of the floodplain.

The Community Rating System (CRS) of the NFIP provides an opportunity for communities to lower the flood insurance premiums of their participating property owners by as much as 45 percent. Communities are given a rating or score based on their incorporation of floodplain management activities. The 18 activities in the program include such things as hazard disclosure for flood-prone properties, provision of flood protection information at local libraries, stormwater management, flood data maintenance, and acquisition and relocation of flood-prone properties or buildings.

Most of the CRS activities are worthwhile initiatives beyond the potential economic benefits to NFIP participants. Local communities can work with the ODNR to learn more about the CRS. Proactive floodplain management by Franklin County communities may also result in a higher likelihood of receiving state and federal grant dollars. Obetz is currently the only Franklin County community participating in the CRS.

7. Promote no net loss of floodplain.

A major objectiive of all the communities in Franklin County should be to promote "no net loss" of floodplains. This idea needs exposure not just in Franklin County but the neighboring counties as well. Using FEMA data along with data generated from other scientific groups, a strong case can be made for the no net loss position. Data on cost alone presents convincing evidence why development of floodplains is needed. The city of Toledo has a no net loss policy.

8. Define and implement a regulatory floodplain for Franklin County

FEMA's primary interest in floodplain protection focuses on protecting the primary conveyance zone of the 100-year flood, known as the "floodway." Lands outside of the floodway, known as the floodway fringe, have not been protected by the FEMA definition. FEMA's flood insurance program has not discouraged development from occurring in flood fringe or flood storage areas.

A review of financial losses and damages occurring from major catastrophic floods occurring in 1993 and 1994 shows the majority of damage occurred within the flood fringe and not the floodway. By purchasing flood insurance, land owners were given the false impression that major flooding would probably not occur during the time they would own flood-prone land.

A regulatory floodplain would change the definition of floodplains throughout Franklin County to include the flood fringe.

The regulatory floodplain would not prohibit land use development on floodplain lands. However, unlike the FEMA program, the landowner would have to prove to the local community that the encroachment would not cause flooding of upstream and downstream properties by providing one-to-one compensation of flood- plain storage.

9. Explore potential for lower tax rates for floodplain poroperties.

Leaving floodplain in a natural state is a cost-effective way to reduce expenditure of tax dollars to pay for flood damage, water treatment and stormwater management improvements. Encouraging property owners to retain floodplain land in a natural state is sensible public policy. However, requiring landowners to pay taxes on that same land at a rate equivalent to developable land is potentially unfair.

A reduced tax rate applied to floodplain lands which are left in a natural states seems an equitable solution. However, while this approach is not known to be in use elsewhere, there are partial models for its application. Ohio, like most state, allows for tax reductions on lands used for agricultural purposes. The Current Agricultural Use Valuation (CAUV) program allows farmers to pay property taxes based on the agricultural, rather than development potential, value of their land. In urban areas, such as Franklin County, this can result in substantial savings. Counties use a table developed by the state to determine the appropriate agricultural value of parcels included in the program.

The Franklin County Board of Revision occasionally considers requests for lower property valuations based on the presence of floodplain. The board, made up of three members representing the Franklin County auditor, treasurer and commissioners' offices may lower or increase the valuation of a property based on evidence provided through sales records and appraisals of similar properties.

Use of this approach would require significant research regarding tax law. State legislative action would be required, as taxes are a function of the state, not local government.

LONG-RANGE IMPLEMENTATION STRATEGIES

1. Greenways bond package or sales tax

Across the nation, public support for conservation and protection of natural areas has been consistently positive. Franklin County communities should allow their residents the opportunity to support increased greenway acquisition, maintenance and implementation measures through specific revenue raising proposals, such as bond packages or sales tax issues.

Park funding measures ranging from $600,000 to $41 million were approved during the first half of 1996 in 14 communities around the country, including Tulsa, Mesa, Arizona; Bath, Ohio; and Winter Park, Florida. Capital bond packages, sales tax increases and property tax increases all were voted in as vehicles to increase open space amenities. Many communities nationally compete with Columbus for a trained, executive workforce. When choosing a place to relocate, such issues can become very important.

2. Institute watershed modeling at projected build-out.

Using projected land coverage at a fully built-out condition, **develop watershed models** in order to determine the size of each floodplain during significant storms - the most important being the 100-year storm. Modeling of the watershed will be accomplished using sophisticated computer methods and proven scientific and engineering formulas. Once completed, the models will define new widths of floodplain for each first- and second-order stream in Franklin County.

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FRANKLIN COUNTY'S RIVER CORRIDORS AND MAJOR TRANSPORTATION ROUTES

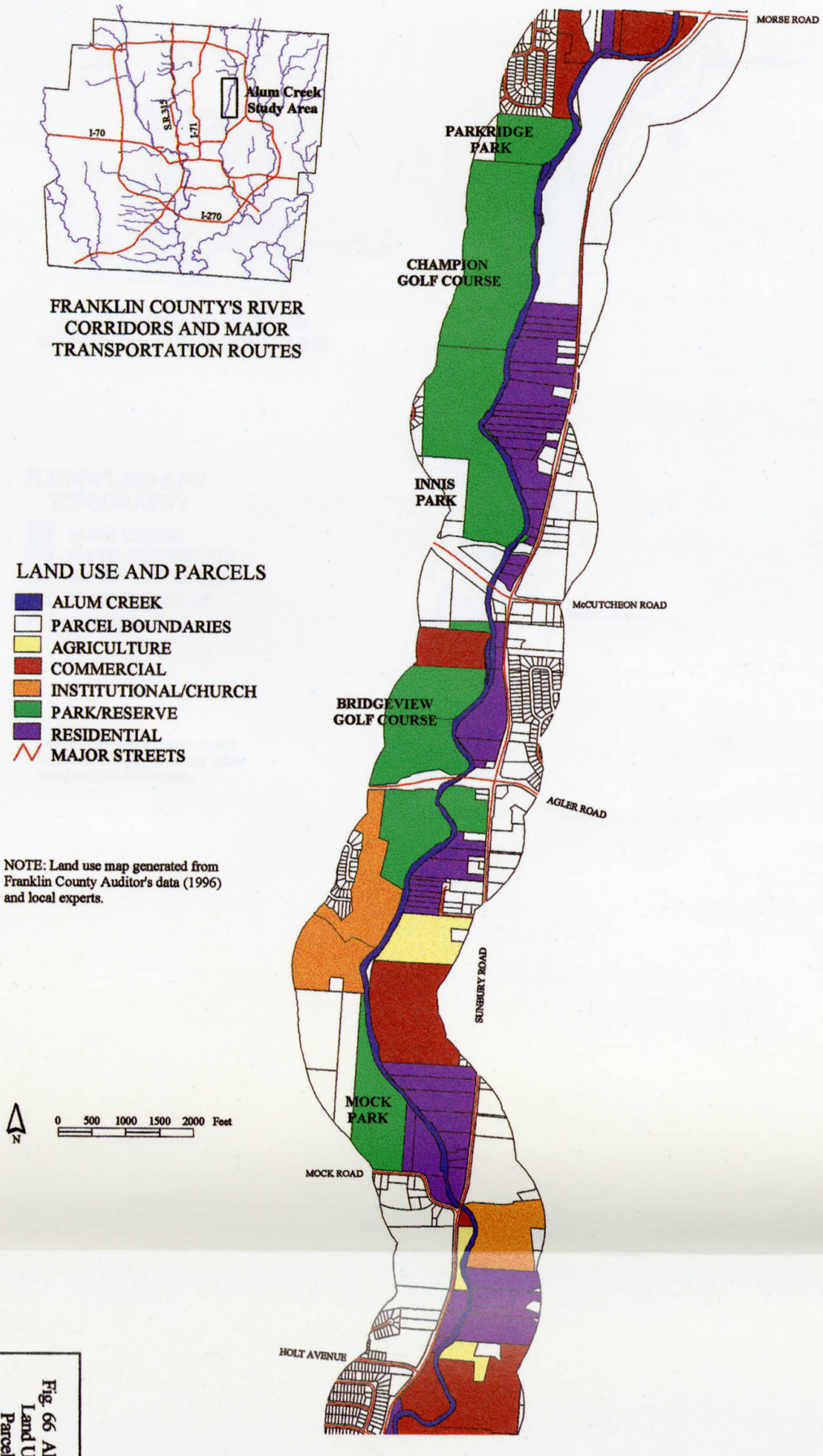


Fig. 66 Alum Creek Land Use and Parcel Map

FRANKLIN COUNTY GREENWAYS

ALUM CREEK STUDY AREA

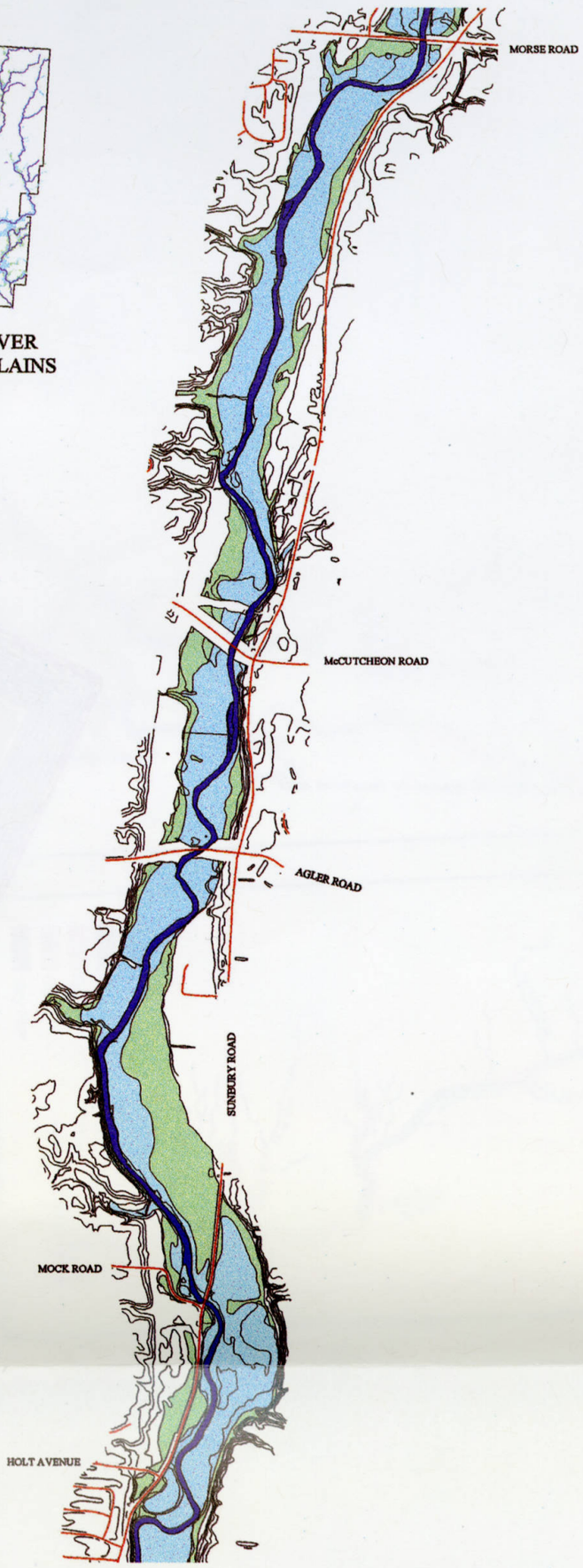
MORSE ROAD TO HOLT AVENUE

FRANKLIN COUNTY'S RIVER
CORRIDORS AND FLOODPLAINS

FLOODPLAIN AND
TOPOGRAPHY

- ALUM CREEK
- 100 YR. FLOODPLAIN
- 500 YR. FLOODPLAIN
- 10 FT. CONTOURS
- MAJOR ROADS

NOTE: Floodplain map generated by Franklin County Auditor's office based on 1995 FEMA data.



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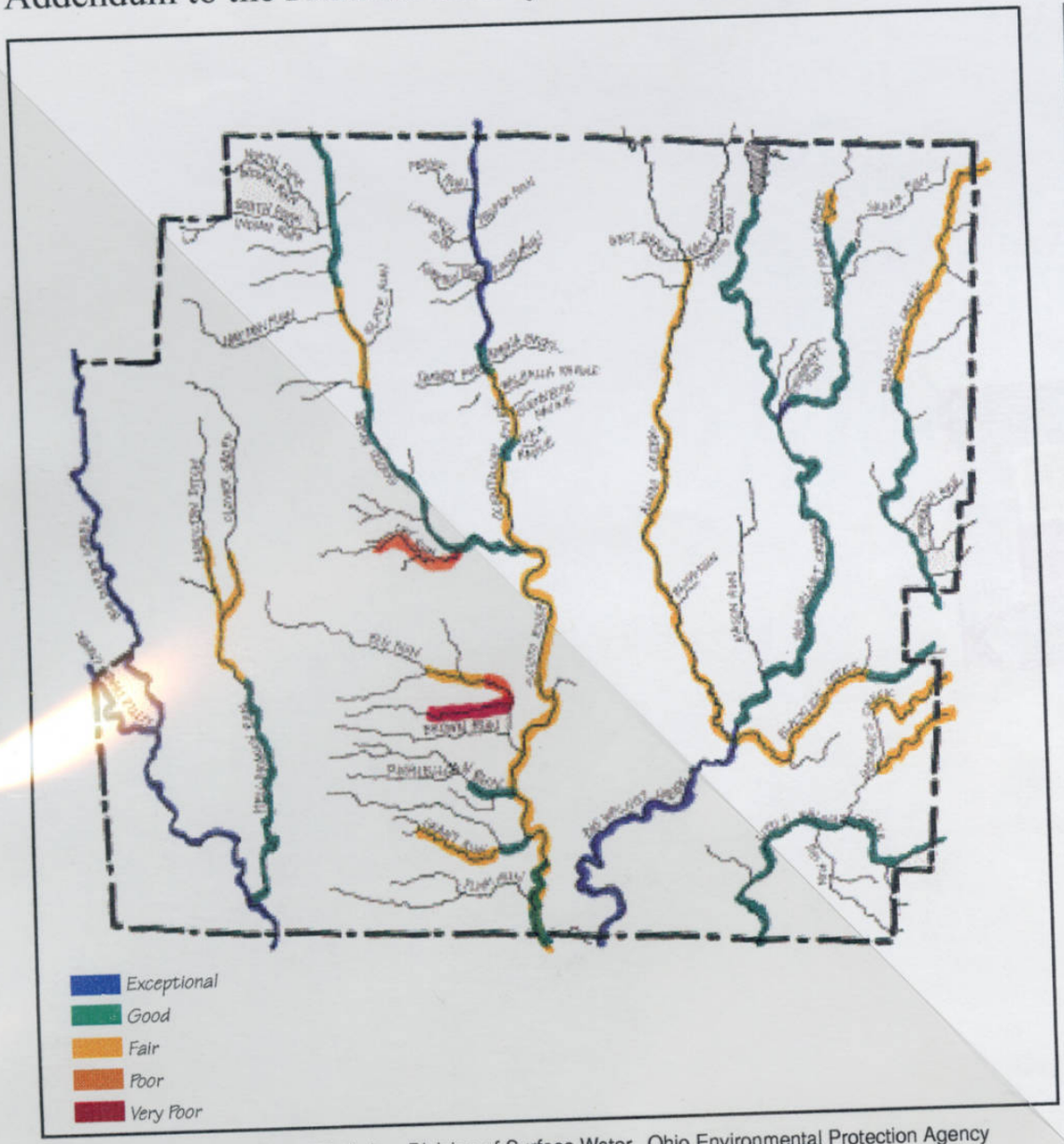
0 500 1000 1500 Feet

Fig. 67 Alum Creek Floodplain and Topography Map

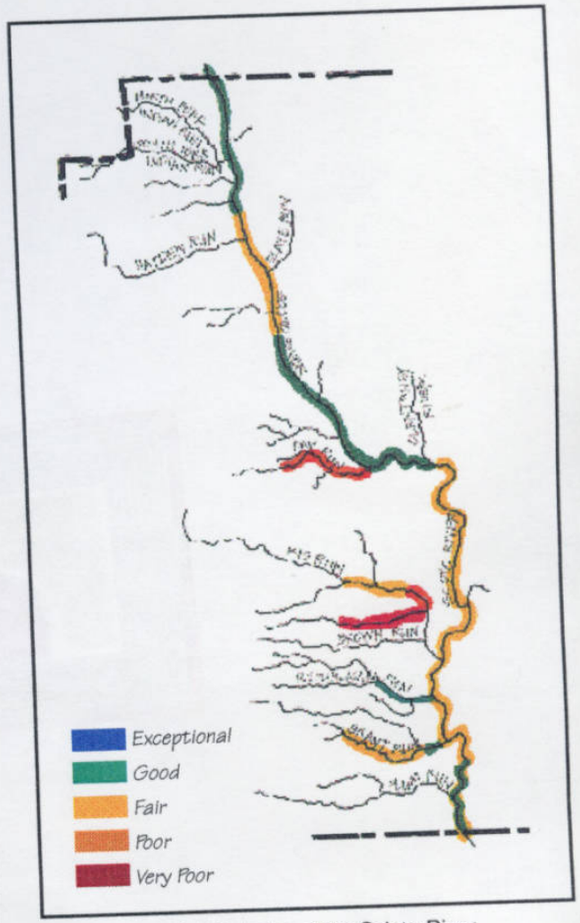
FRANKLIN COUNTY GREENWAYS

ALUM CREEK STUDY AREA

MORSE ROAD TO HOLT AVENUE



(Fig. 27) Overview of Aquatic Life Index, Division of Surface Water, Ohio Environmental Protection Agency



(Fig. 30) Aquatic Life Index of the Scioto River