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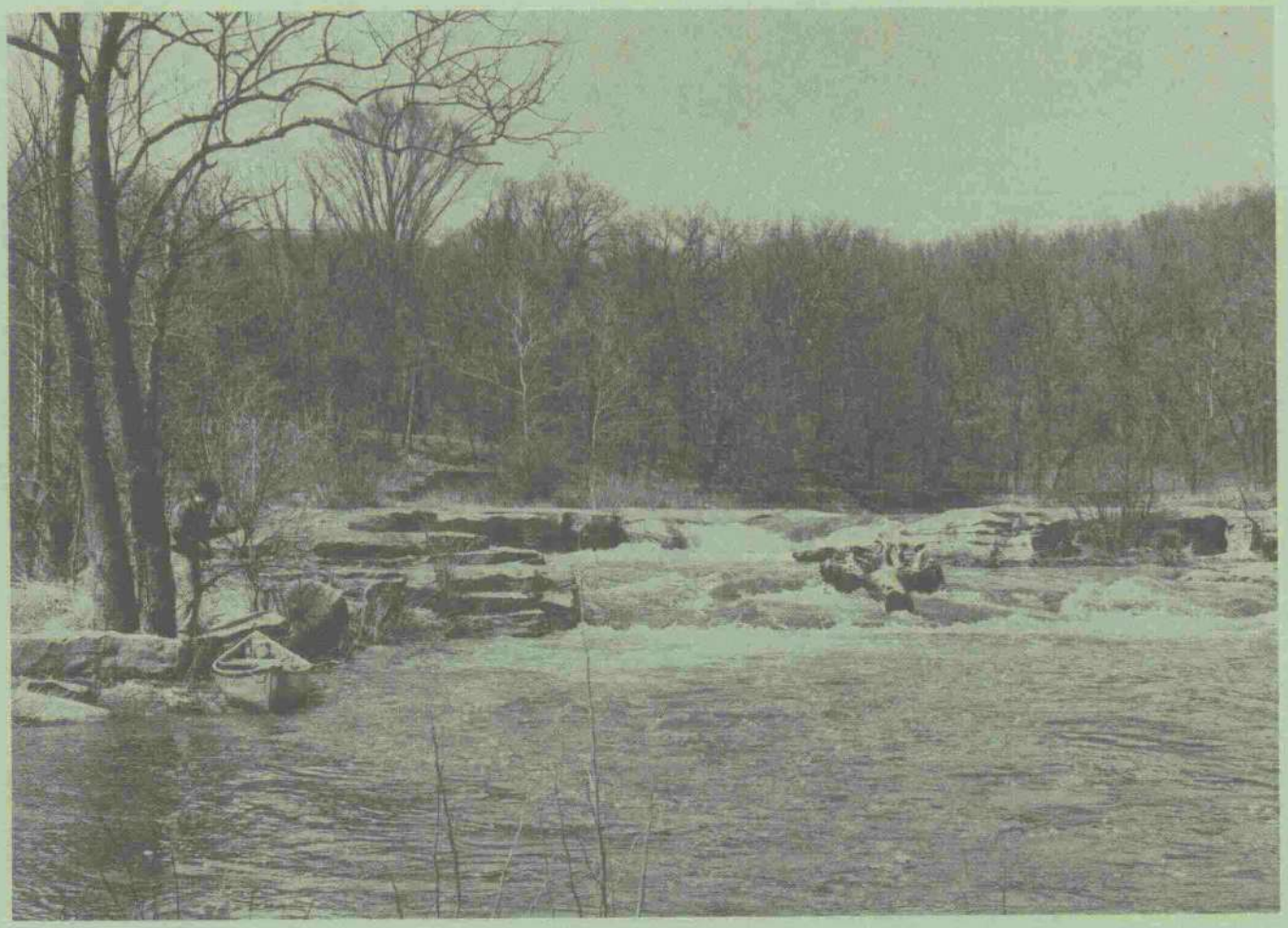
Little Beaver Creek

A WILD AND SCENIC RIVER STUDY



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DEPARTMENT OF THE INTERIOR
Rogers C. B. Morton, *Secretary*
•
Bureau of Outdoor Recreation
James G. Watt, *Director*

925/D-85

THIS REPORT WAS PREPARED PURSUANT TO PUBLIC LAW 90-542. PUBLICATION OF THE FINDINGS AND RECOMMENDATIONS HEREIN SHOULD NOT BE CONSTRUED AS REPRESENTING EITHER THE APPROVAL OR DISAPPROVAL OF THE SECRETARY OF THE INTERIOR. THE PURPOSE OF THIS REPORT IS TO PROVIDE CONSIDERATION BY THE BUREAU OF OUTDOOR RECREATION, THE SECRETARY OF THE INTERIOR, AND OTHER FEDERAL AGENCIES.

LITTLE BEAVER CREEK

Ohio and Pennsylvania

WILD AND SCENIC RIVER STUDY

AUGUST 1974

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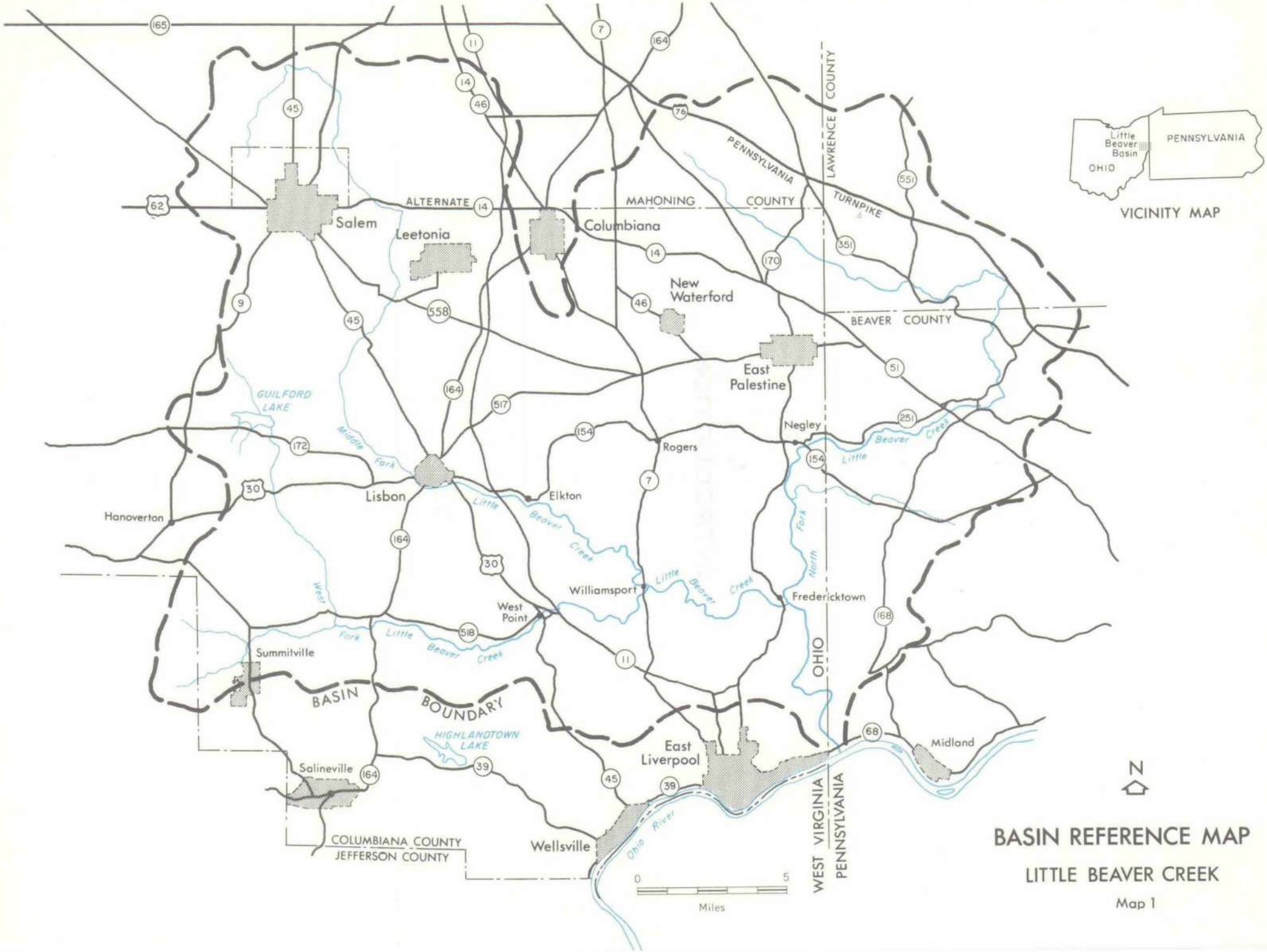
I.
INTRODUCTION


VICINITY MAP
Little Beaver Basin
PENNSYLVANIA
OHIO
Salem
Leetonia
Columbiana
New Waterford
East Palestine
Negley
Rogers
Lisbon
Elkton
Hanoverton
Williamsport
West Point
Fredericktown
Summitville
Salineville
East Liverpool
Midland
Wellsville
ALTERNATE 14
MAHONING COUNTY
LAWRENCE COUNTY
BEAVER COUNTY
PENNSYLVANIA TURNPIKE
COLUMBIANA COUNTY
JEFFERSON COUNTY
BASIN BOUNDARY
GUILFORD LAKE
HIGHLANDTOWN LAKE
Middle Fork
West Fork
Little Beaver Creek
North Fork
Ohio River
OHIO
WEST VIRGINIA
PENNSYLVANIA
N
0
5
Miles
BASIN REFERENCE MAP
LITTLE BEAVER CREEK
Map 1

I. INTRODUCTION

On October 2, 1968, the Congress of the United States enacted the Wild and Scenic Rivers Act, Public Law 90-542. In this Act, the Congress stated:

> "It is hereby declared to be the policy of the United States that certain selected rivers of the Nation, which, with their immediate environments, possess outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values, shall be preserved in free-flowing condition, and that they and their immediate environments shall be protected for the benefit and enjoyment of present and future generations. The Congress declares that the established national policy of dam and other construction at appropriate sections of the rivers of the United States needs to be complemented by a policy that would preserve other selected rivers or sections thereof in their free-flowing condition to protect the water quality of such rivers and to fulfill other vital national conservation purposes."

The Act established the National Wild and Scenic Rivers System, designated eight rivers as the initial components of the system, and prescribed methods and standards by which additional rivers could be added to the system from time to time. Twenty-seven rivers were also designated by the Act for study as potential additions to the National System, including in Ohio and Pennsylvania the following portions of the Little Beaver Creek:

> The segment of the North and Middle Forks of the Little Beaver River (Creek) in Columbiana County, from a point in the vicinity of Negly (Negley) and Elkton, Ohio, downstream to a point in the vicinity of East Liverpool, Ohio."

The Act calls for a determination of the suitability of Little Beaver Creek for inclusion in the National System and, if it is to be included, recommendations and guidelines pertaining to the administration and management of the river environment.

Background

The State of Ohio has shown interest in the protection of its rivers for a number of years. The Ohio Statewide Outdoor Recreation Plan discusses the need for the preservation of the state's remaining natural rivers. Following passage of the Ohio Scenic Rivers Act on February 28, 1968, the state established a scenic rivers program in June of that same year.

It should be noted that the Ohio statute became effective before similar federal legislation was passed and signed by the President. To date six rivers, or segments thereof, have been designated as components of the Ohio Wild and Scenic Rivers System under the wild, scenic, or recreational categories. Several others are pending designation in the near future. The Ohio Department of Natural Resources (Ohio DNR) also has an active ongoing program of river studies to determine potential additions to the state system. A study on Little Beaver Creek by the Ohio DNR concluded that 36 miles of river meet the criteria for inclusion in the state system under the wild and scenic categories. In January 1974, Little Beaver Creek was designated a component of the Ohio Wild and Scenic Rivers System.

The initial request for state scenic river designation, which is a prerequisite for the previously mentioned state study, must come from a local group. In July 1970, the Columbiana County Regional Planning Commission made such a request. Local interest in the protection of Little Beaver Creek was, however, evident before this request. In March 1965, the Columbiana County Regional Planning Commission prepared a plan for the expansion of Beaver Creek State Park. This plan proposed an area of approximately 9,000 acres, included lands in both Ohio and Pennsylvania, and was outlined in the Columbiana County Comprehensive Plan. The proposed park included the major portion of the study segment. In 1960, the Columbiana County Forests and Parks Council was organized to promote the expansion of Beaver Creek State Park and other recreational areas in the county. This council has done much to create interest in Little Beaver Creek.

The recreational and open space potential of Little Beaver Creek has also been recognized in Pennsylvania by the Beaver County Planning Commission and the Western Pennsylvania Conservancy. At one time, Beaver County planned to include portions of the watershed as a county park; however, it has also shown interest in an interstate park in the study area. Both organizations have expressed their desire to cooperate in the protection of that portion of Little Beaver Creek in Pennsylvania.

The naming of Little Beaver Creek for study in the Wild and Scenic Rivers Act (P.L. 90-542) was no doubt due in large part to this intense state and local interest and the recognized exceptional natural and scenic qualities of the Little Beaver. As required by the Act, the federal government conducted a study of the Little Beaver to determine its eligibility for inclusion in the National Wild and Scenic Rivers System.

Conduct of the Study

The Department of the Interior's responsibility for studying rivers named in the Wild and Scenic Rivers Act was delegated by the Secretary of the Interior to the Bureau of Outdoor Recreation. A study team composed of representatives of the Bureau of Outdoor Recreation, U. S.

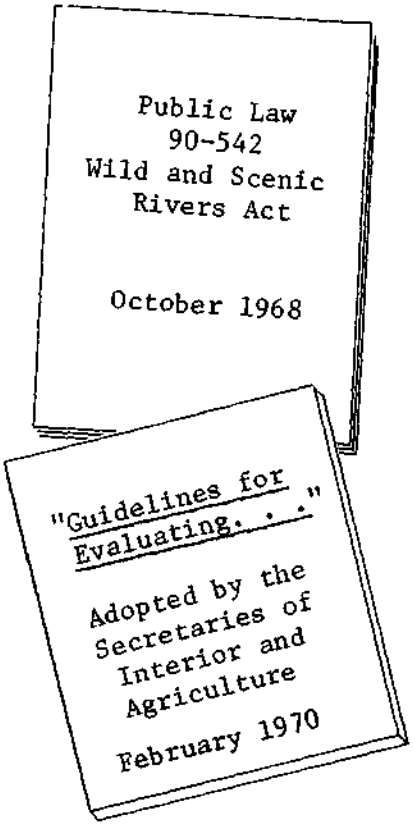
Forest Service, National Park Service, Bureau of Sport Fisheries and Wildlife, U. S. Army Corps of Engineers, State of Ohio, and the Commonwealth of Pennsylvania was organized in September 1971.

A public information meeting was held on November 17, 1971, at Beaver Local High School near East Liverpool to acquaint local citizens with the principles of the Wild and Scenic Rivers Act and to discuss the study framework. Following this, the study team conducted field trips along the river and its surrounding area, gathering the necessary background material for the preparation of an evaluation report. This scenic river report contains basic data concerning Little Beaver Creek, the report findings, conclusions, recommendations, and a discussion of alternative actions. It also includes a conceptual development plan which provides guidelines for the preservation, utilization, and management of Little Beaver Creek.

A second public meeting which announced the study team findings was held on September 13, 1973, at Westgate Junior High School in East Liverpool, Ohio. Although concern was expressed by some local landowners, public sentiment was mostly in favor of including the proposed segments of Little Beaver Creek in the National Wild and Scenic Rivers System.

The first basic task outlined for the Little Beaver Creek Study in the Wild and Scenic Rivers Act was to determine whether or not the river reaches met the eligibility criteria for either wild, scenic, or recreational river areas as set forth in the Wild and Scenic Rivers Act and the "Guidelines for Evaluating Wild, Scenic, and Recreational River Areas Proposed for Inclusion in the National Wild and Scenic Rivers System as Adopted by the Secretaries of the Interior and Agriculture." In other words . . .

COULD THEY QUALIFY FOR THE NATIONAL SYSTEM?



ELIGIBILITY CRITERIA

- FREE - FLOWING CONDITION
- ACCESSIBILITY
- SHORELINE DEVELOPMENT
- WATER QUALITY
- SCENIC QUALITY
- FISH AND WILDLIFE VALUES
- RECREATION POTENTIAL
- GEOLOGIC FEATURES
- CULTURAL AND HISTORICAL VALUES

In addition to these general requirements, every wild, scenic, or recreational river in its free-flowing condition or upon restoration to this condition shall be considered eligible for inclusion in the National Wild and Scenic Rivers System and, if included, shall be classified, designated, and administered as one of the following:

1. Wild river area--Those rivers or sections of rivers that are free of impoundments and generally inaccessible except by trail with watersheds or shorelines essentially primitive and waters unpolluted. These represent vestiges of primitive America.

2. Scenic river area--Those rivers or sections of rivers that are free of impoundments with shorelines or watersheds still largely primitive and shorelines largely undeveloped but accessible.

3. Recreational river area--Those rivers or sections of rivers that are readily accessible by road or railroad, that may have some development along their shorelines, and that may have undergone some impoundment or diversion in the past.

In arriving at a finding or eligibility and stream classification, the study team had to exercise its judgement, not only for each of the eligibility criteria as it applied to a particular segment of a river but on the river system as a whole, and to evaluate the combined effect of all criteria. It should be understood that the criteria are not absolutes. There is no way the criteria can be written so as to automatically indicate which rivers are eligible and what class they must be. Accordingly, the entire stream system and its immediate land area were considered as a unit, with primary emphasis upon the quality of the experience and overall impressions the public would receive while using the stream.

Acknowledgements--During the course of the study, the study team worked closely with many individuals and organizations in the Little Beaver area. The compilation of information and statistical data would not have been possible without the full cooperation of government agencies, universities, quasi-public organizations, and private groups and individuals. Appreciation is expressed to all who helped in their efforts with special thanks to the following organizations and individuals:

Crossroads Resource, Conservation, and Development Project (U. S. Department of Agriculture)
Columbiana County Regional Planning Commission
Columbiana County Forests and Park Council
The Youngstown Vindicator
Mr. P. Max Gard
Mr. William H. Vodrey
Mr. Elmer Hiles and Mr. Fred Steputis, Managers, Beaver Creek State Park

II.
FINDINGS, CONCLUSION, AND RECOMMENDATIONS

II. FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

Important findings of the study team include the following:

The Little Beaver stream system and surrounding valley contains some of the wildest and most scenic areas in Ohio.

The stream segments recommended for inclusion in the National System remain in a free-flowing condition and display a scenic character of exceptionally high quality.

Approximately 12,000,000 people live within 150 miles of Little Beaver Creek. The study area is located within one of the most highly industrialized regions in the nation.

Major highways provide good access to the periphery of the study area and access by secondary roads to the stream is available.

Generally, present water quality in the study segment is good to excellent for recreational purposes.

The study area provides excellent habitat for an impressive array of fish and wildlife species. Sixty-three species of fish have been recorded in watershed streams. Forty-nine species of mammals have been recorded and a total of 269 species of birds use the area on an annual basis. Reptiles and amphibians are plentiful.

The flora of the study area is richly abundant and diverse. The Ohio DNR has to date identified 62 species of trees and 164 species of wildflowers. The Ohio Biological Survey lists three unique natural areas occurring adjacent to or in close proximity to the study area. These natural areas are noteworthy for their geological and botanical significance.

Sites of historical interest having local and regional significance are numerous. Remnants of the Sandy and Beaver Canal, the restored Gaston's Mill, the abandoned Youngstown and Southern Railroad (Montour Railroad), and the Community of Fredericktown provide a fascinating display of early Ohio lore.

The natural and undeveloped character of the area and the numerous sites of historical interest provide a stimulating backdrop for a high quality recreation experience.

Although Little Beaver Creek and its surrounding environment have remained essentially natural and scenic in character, the study team also found several factors which presently or potentially endanger those qualities. These include the following:

- Strip mining activity is prevalent in the portion of Ohio that includes the Little Beaver Creek basin. There are strip mined areas, several of which are visible from the river, that lie on or near Little Beaver Creek.

- The presence of some commercial development and a state highway are impairing the character of the Middle Fork in the vicinity of Williamsport.

- Unattractive permanent home and seasonal cottage development is in evidence along the Little Beaver Creek main stem in the vicinity of Grimm's Bridge.

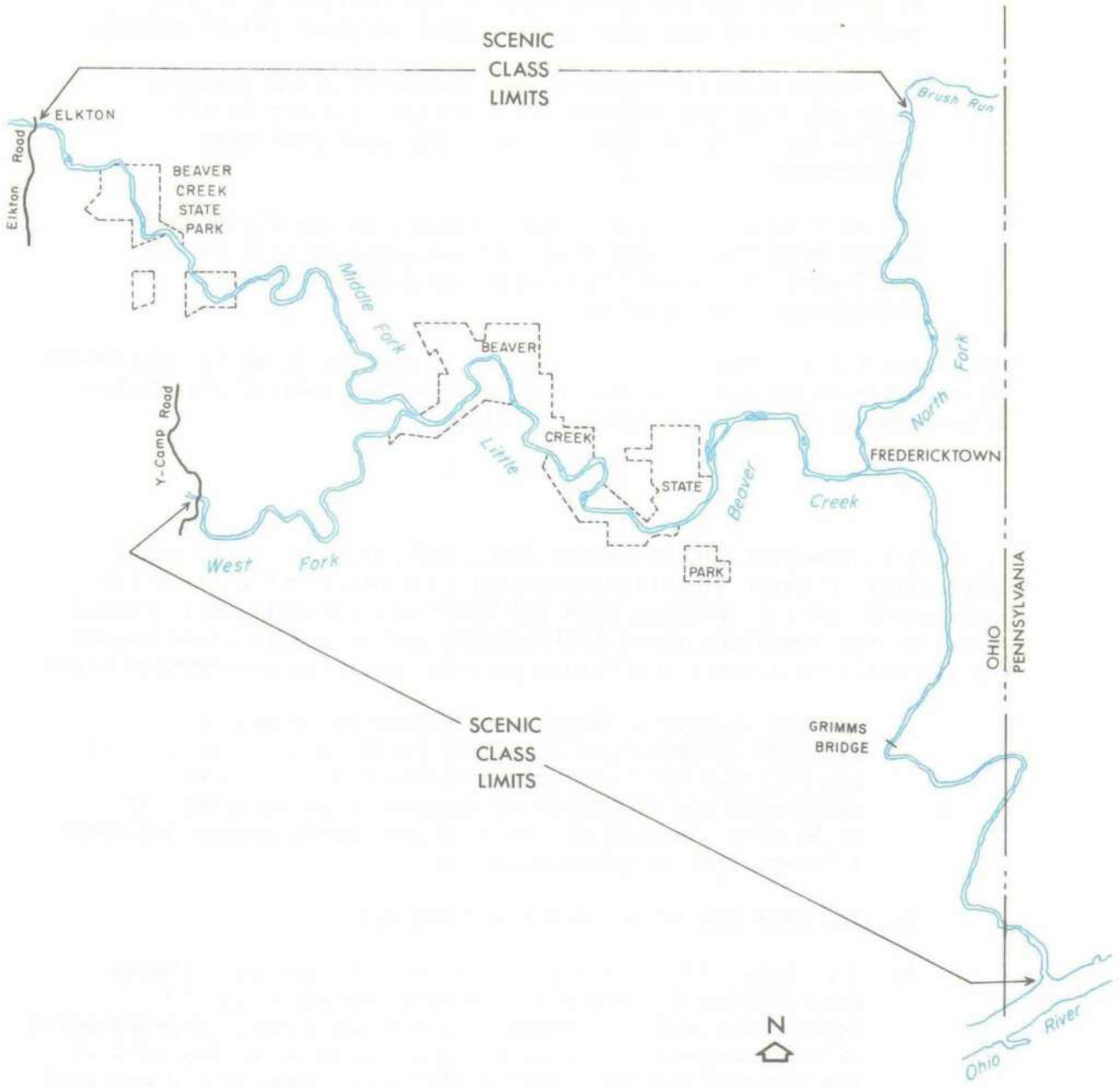
- There is one powerline crossing and several pipeline crossings present on the portions of Little Beaver Creek recommended for inclusion in the National Wild and Scenic Rivers System. There is an electrical transmission line being planned to cross the main stem of the Little Beaver in the vicinity of Grimm's Bridge.

- Recreational use on Little Beaver Creek is increasing. There is a definite possibility that recreational use, if not carefully controlled, will impair the very characteristics which presently make the Little Beaver appealing.

- Although not presently extensive, there is some local tree cutting occurring along the Little Beaver Creek corridor.

Increases in these activities in the areas identified in this report and/or at additional locations could occur. In addition, other types of development that would not be compatible with a wild and scenic river might also occur.

Based on the findings of the study team, it is concluded that approximately 33 miles of the Little Beaver Creek stream system possess outstandingly remarkable natural scenic, recreational historic, fish and wildlife, and geologic values and that the river and its immediate environment should be protected for the benefit and enjoyment of future generations. The following stream segments meet the criteria for "scenic" river classification as defined in the Wild and Scenic Rivers Act and in the supplementary criteria developed by the Secretaries of the Interior and Agriculture.



RIVER CLASSIFICATION

LITTLE BEAVER CREEK

Map 2

a. Little Beaver Creek main stem--From the confluence of the West Fork with the Middle Fork near Williamsport to the mouth--the entire length (16-2/3 miles).

b. North Fork of Little Beaver Creek--From the confluence of Brush Run and the North Fork to the confluence of the North Fork with the main stem at Fredericktown (4-1/4 miles).

c. Middle Fork of Little Beaver Creek--From the vicinity of County Road 901 (Elkton Road) bridge crossing to the confluence of the Middle Fork with the West Fork near Williamsport (7-2/3 miles).

d. West Fork of Little Beaver Creek--From the vicinity of County Road 914 (Y-Camp Road) bridge crossing east to the confluence of the West Fork with the Middle Fork near Williamsport (4-1/4 miles).

The Little Beaver Creek watershed is one of the few areas in Ohio where the opportunity exists to preserve an outstanding natural area before it is markedly degraded by man's activities.

In order to preserve Little Beaver Creek and portions of its major tributaries in their free-flowing state; to protect and enhance the outstanding natural, scenic, fish and wildlife, geologic, and historic values of the immediate river environment; and to assure these values are available to present and future generations it is recommended that:

1. The approximately 33 miles of stream which meet the required criteria and described previously be included in the National Wild and Scenic Rivers System as state designated and administered components as provided for in Section 2(a)(ii) of the Wild and Scenic Rivers Act under a "scenic" river classification.

2. The Ohio DNR be the administering agency.

3. The State of Ohio prepare a master plan for the riverway area setting forth specific boundaries and plans for acquisition and development and for the timely implementation of the management of Little Beaver Creek as a component of the National System. Such a plan would require the approval of the Governor. In developing a master plan for Little Beaver Creek, the State of Ohio should use the concepts, policies, and suggested facility development discussed in the Conceptual River Plan as general guidelines.

4. The Commonwealth of Pennsylvania be encouraged to cooperate with the State of Ohio as appropriate with respect to those portions of the river located in Pennsylvania. Should at any time the State of Pennsylvania decide to have the portions of Little Beaver Creek in that state included in the National Wild and Scenic Rivers System, the Governor of Pennsylvania would make application to the Secretary of the Interior requesting that those portions be included as provided for by Section 2(a)(ii) of the Wild and Scenic Rivers Act.

5. A Little Beaver Advisory Board be established to advise and assist the states and local governmental units in the planning, development, management, and administration of the river as a component of the National System. The membership of the board should include representatives of local units of government to ensure local input into the planning process and to coordinate complementary local programs.

6. The development and management of Little Beaver Creek and its tributaries give primary emphasis to maintaining and enhancing the aesthetic, scenic, historic, fish and wildlife, and geological features. All recreation facility development should be consistent with the protection of those values of the river environment which enabled it to qualify for inclusion in the National System.

7. Any construction of new bridge crossings, renovation of existing structures, powerline or pipeline crossings, and water resource projects be reviewed and approved in advance by the managing agency to ensure that construction is consistent with the purposes of the Wild and Scenic Rivers Act. The Ohio DNR and/or the managing agency should ensure that all planned or proposed powerline crossings, where possible, are rerouted around the segments proposed for inclusion in the National Wild and Scenic Rivers System by authority of the recently created Ohio Power Siting Commission. Existing powerline and pipeline crossings, where possible, should be adequately screened.

8. Every effort be made to restore and maintain historical and archaeological structures and sites and all communities on or near the riverway which still retain some of the historic flavor of the area be encouraged in their efforts to maintain their cultural and historical settings. A detailed inventory of historic, archaeologic, and natural areas should be made and a program developed for their protection.

9. The provisions of the 1972 Ohio strip mining law be enforced in the area along or near Little Beaver Creek. This law provides for more strict controls on strip mining practices and ensures the proper reclamation of abandoned strip mine areas so that scenic values and other environmental qualities will not be degraded.

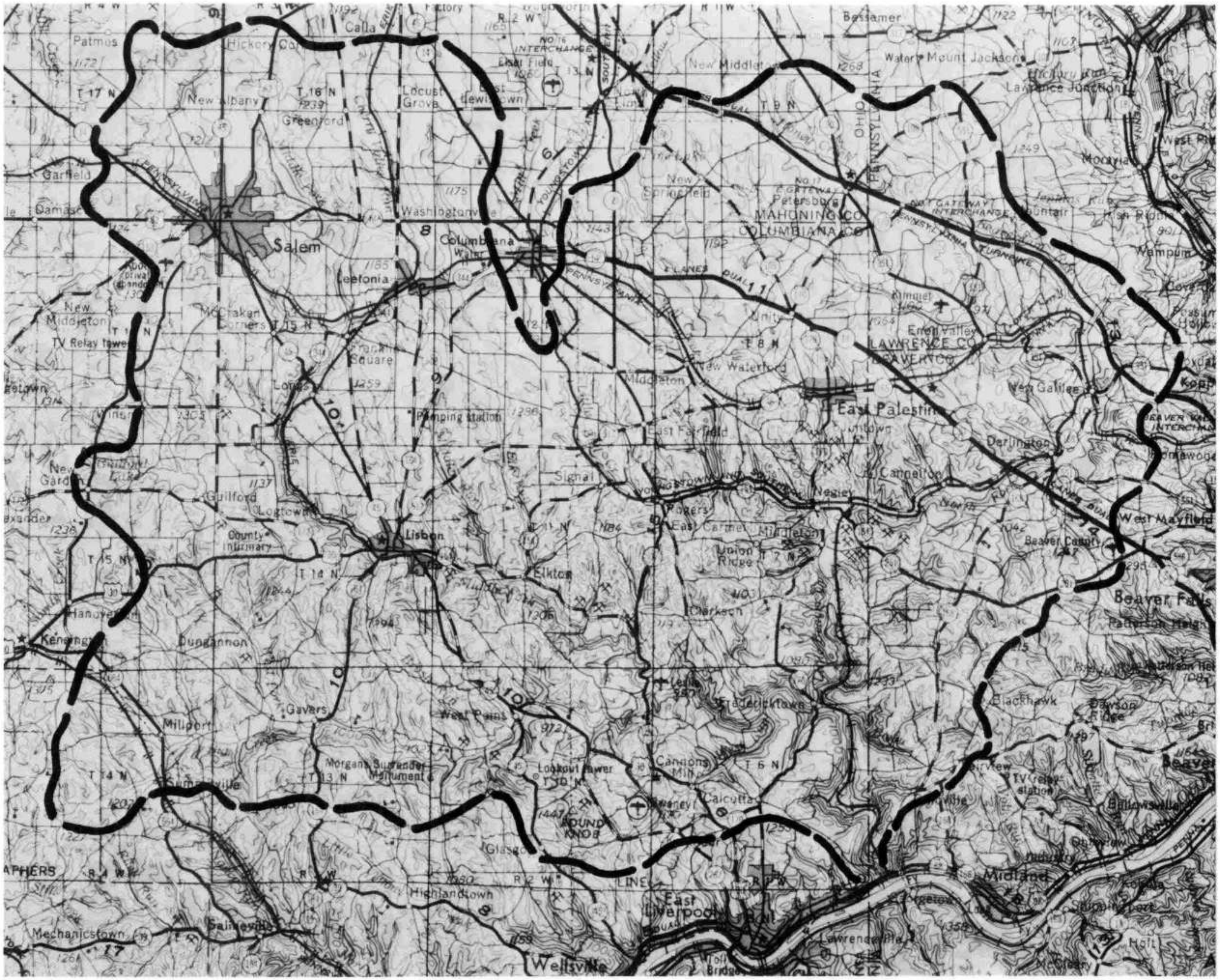
10. Natural areas be established in the area of the West Fork, Purgatory Hollow, and other appropriate areas where access and development of recreation facilities would be kept at a minimum.

11. Appropriate state and federal agencies take the necessary actions to ensure high water quality throughout the Little Beaver watershed through enforcement of water quality standards and the encouragement of compatible soil and water conservation practices. A program for monitoring chemical, biological, and physical water quality characteristics should be established throughout the watershed. All waste collection and treatment facilities throughout the watershed should be upgraded to eventually provide for tertiary or comparable treatment. Septic tank tile sewage disposal systems should not be allowed where soil conditions make possible subsurface pollution of the Little Beaver Creek system.

12. Incorporated municipalities along Little Beaver Creek adopt land use policies and zoning standards which are consistent with the purposes of the Wild and Scenic Rivers Act. Zoning objectives should be to prohibit new commercial, industrial, or residential uses which are inconsistent with the purposes of the Act and to protect the shorelands by means of acreage, frontage, and setback requirements. In addition, local units of government throughout the watershed should give consideration to adopting general zoning and subdivision regulations to promote orderly growth and to ensure that future developments do not degrade the overall quality of the watershed environment. Consideration should be given flood plain and streambank zoning by local units of government and the state to ensure compatible development in those areas of the Little Beaver Creek watershed not recommended for inclusion in the National System.

13. The segments of the old Montour railroad right-of-way which run along the North Fork and the main stem of Little Beaver Creek be developed and maintained as a hiking and horseback riding trail.

III.
REGIONAL SETTING



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BASIN TOPOGRAPHY

LITTLE BEAVER CREEK

Map 3

III. REGIONAL SETTING

Physical Environment

The topography of the Little Beaver Creek basin exhibits three distinct patterns of relief (see Map 3). The boundary of the southernmost advance of the glaciers, which affected the physical characteristics of much of the northern United States, is found in the basin.

In the northernmost portion of the watershed, glaciers covered the land with various depths of glacial drift, or debris, so that the once rough topography now gives the impression of a flat plain. The glacial debris varies in depth from a few feet to over 100 feet. Bedrock is exposed only along eroded stream valleys or on ridge tops. Parts of this area are flat and poorly drained and, in some cases, swampy. Generally, however, the soils in this portion of the watershed are some of the best agricultural lands to be found in the basin. The landscape of the area is similar to that found in most of northeast Ohio.

The mid-section of the watershed is covered by hills or glacial moraines which mark the end of glaciation. This portion has greater relief and variation than the glacial plain. The lower reaches of the hills are moderately steep; the slopes on the upper portions are more gentle. The better agricultural land is found on the upper slopes and ridges, while the valleys are often too narrow and swampy for farming. The deeper valleys, including that of the Little Beaver, expose massive sandstones, shales, clay, and coal strata, exhibiting a gorge-like appearance in many places.

The southern portion of the watershed, which includes the major portion of the study segments, is unglaciated, owing its character to erosion. The landscape here is hilly and rugged, with the only gently rolling land found along the main ridges and the wider valleys of the main streams. The beds of the main streams are 300 to 400 feet below the upland plains, with the walls of the narrower valleys being steep and rough. Most of the southern part of the basin has been bypassed by development and portions of it remain natural in character. However, the presence of strip mined areas scar the landscape in many locations. The landscape in this area is similar to that encountered along much of the Ohio River and in the adjoining states of Pennsylvania and West Virginia.

Population and Economy

Population--In 1970, approximately 3.8 million people lived within 50 miles of Little Beaver Creek, while 12 million people lived within 150 miles, and 35 million people lived within 250 miles. By the year 2000, these figures are projected to increase to nearly 5 million people within 50 miles, almost 16.5 million people within 150 miles, and approximately 51.5 million people within 250 miles.

Little Beaver Creek is nearly surrounded by Standard Metropolitan Statistical Areas (SMSA's). The Canton and Warren-Youngstown SMSA's border Columbiana County on the north and northwest with populations in 1970 of approximately 327,000 and 536,000, respectively. The Steubenville-Weirton SMSA, with a 1970 population of approximately 166,000, borders Columbiana County on the south. Beaver County, Pennsylvania, in which approximately 20 percent of the Little Beaver watershed is found, is a component county of the Pittsburgh SMSA which had a 1970 population of over 2,400,000. Approximately 87 percent of the population within 50 miles of the study segment resides in a SMSA. Fifty-three percent live in the Pittsburgh SMSA alone. Within 150 miles of the study segment, there are 12 SMSA's within a 1970 population of approximately 8.2 million.

The two counties within which the study segment lies had a 1970 population of over 317,000 people, with Beaver County accounting for two-thirds of this total. Approximately two-thirds of this total population is considered urban.

The major urban center in Columbiana County is East Liverpool, located near the mouth of Little Beaver Creek. It had a 1970 population of over 26,000 people. Columbiana County has an approximate density of 200 people per square mile. The growth rate in Columbiana County is lower than national or state averages and below that of adjoining large urban-industrial counties. A continued out-migration results from a lack of economic opportunity in the county, the decrease in the number of family farms, and the greater economic opportunities in the large urban industrial areas adjoining the county.* This out-migration should lessen with the upgrading of State Route 11 to freeway status and the expansion of industry into Columbiana County from the north.

Despite the nearness of high population concentrations and urban areas to the north and east and the relatively high combined populations of Columbiana and Beaver counties, the Little Beaver Creek watershed is only lightly to moderately populated and basically rural in character.

The only incorporated communities on the stream segment under study** are the Glasgow Borough and the Ohioville Borough in Pennsylvania, near the mouth of Little Beaver Creek. These two areas had a combined 1970 population of approximately 4,000 people. Other small unincorporated communities in the study segment include Fredericktown, Negley, and Elkton, Ohio.

Economy--The Little Beaver valley is surrounded by several highly industrialized areas which exert a strong influence on the economy of

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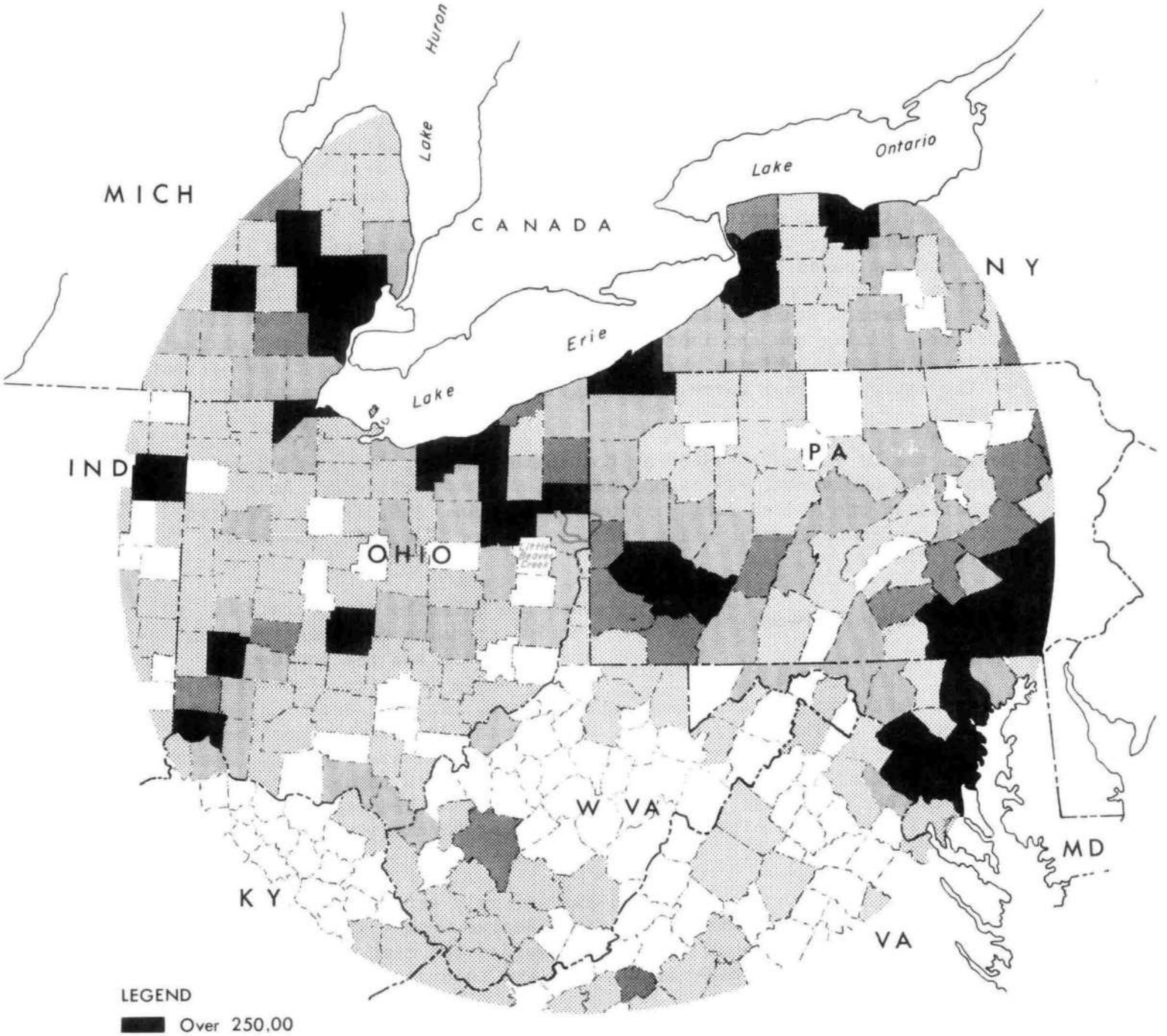
*McLean and McGraw, Report No. 3 - Economic Structure Study--General Development Plan for Columbiana County, Ohio (April 1968).

**The study segment was further defined by the study team as the entire main stem of Little Beaver Creek, the North Fork from the Ohio-Pennsylvania line near Negley to its mouth, the Middle Fork from Elkton to its mouth, and the West Fork from the Y-Camp Road bridge to its mouth.



REGIONAL POPULATION DISTRIBUTION

LITTLE BEAVER CREEK

Map 4

Source: U. S. Bureau of Census.

the study area. The surrounding metropolitan areas tend to attract the labor, capital, industry, and sales which might otherwise be associated with the Little Beaver area.

Nearly 30 percent of the work force in Columbiana County, Ohio, which encompasses most of the study area, is employed outside of the county. In addition the active labor force is decreasing, particularly among the 18 to 30-year-old group. In general, the study area has a higher unemployment rate than the average for the State of Ohio. Persons employed in agriculture and mining have decreased steadily since 1940. Employees in manufacturing, transportation, and utilities increased from 1940 to 1950 and decreased from 1950 to 1960.* Manufacturing is the leading employer accounting for over 45 percent of the employment in Columbiana County. Retail trade ranks second, employing over 16 percent of all workers. Mining and construction account for about six percent of the employed workers. Mining and construction account for about six percent of the employed labor force, while agriculture and forestry employ 4.5 percent.

Median family income in 1969 for Columbiana County, Ohio, and Beaver County, Pennsylvania, was $9,032 and $9,428, respectively. As a comparison, the median family income in 1969 was $10,313 for Ohio and $9,558 for Pennsylvania, while this figure was $9,433 for the entire United States.

Transportation Network

The Ohio Turnpike (Interstate 80, 90, and 76) crossing east-west through northern Ohio and the connecting Pennsylvania Turnpike (Interstate 76) a major east-west route through Pennsylvania, lie just north and east respectively of the study segment. Interstate 79, running north-south in Pennsylvania passes within 25 miles of Little Beaver Creek. Approximately 40 miles to the south is Interstate 70 which connects Columbus, Ohio, to Wheeling, West Virginia, and Pittsburgh, Pennsylvania. Map 5 shows all interstate highways and other major highways within 250 miles of Little Beaver Creek.

The rugged topography in the basin has strongly affected the transportation network which traverses the Little Beaver Creek basin. In the past, major railroad trunk lines have avoided the rougher topography of the lower basin, as have major state and interstate highways.

North-south routes in close proximity to the Little Beaver include U.S. 30; Ohio Routes 7, 9, 11, 45, 164, and 170; and Pennsylvania State Highway 51, 65, and 168 (see Map 6). Ohio Route 7 which crosses the Middle and West Forks of Little Beaver Creek near Williamsport and Ohio Route 170 which crosses the main stem of Little Beaver Creek near Fredericktown are important highway routes affecting travel in the study area. The major east-west routes are Ohio Routes 68, 154, and 558, and

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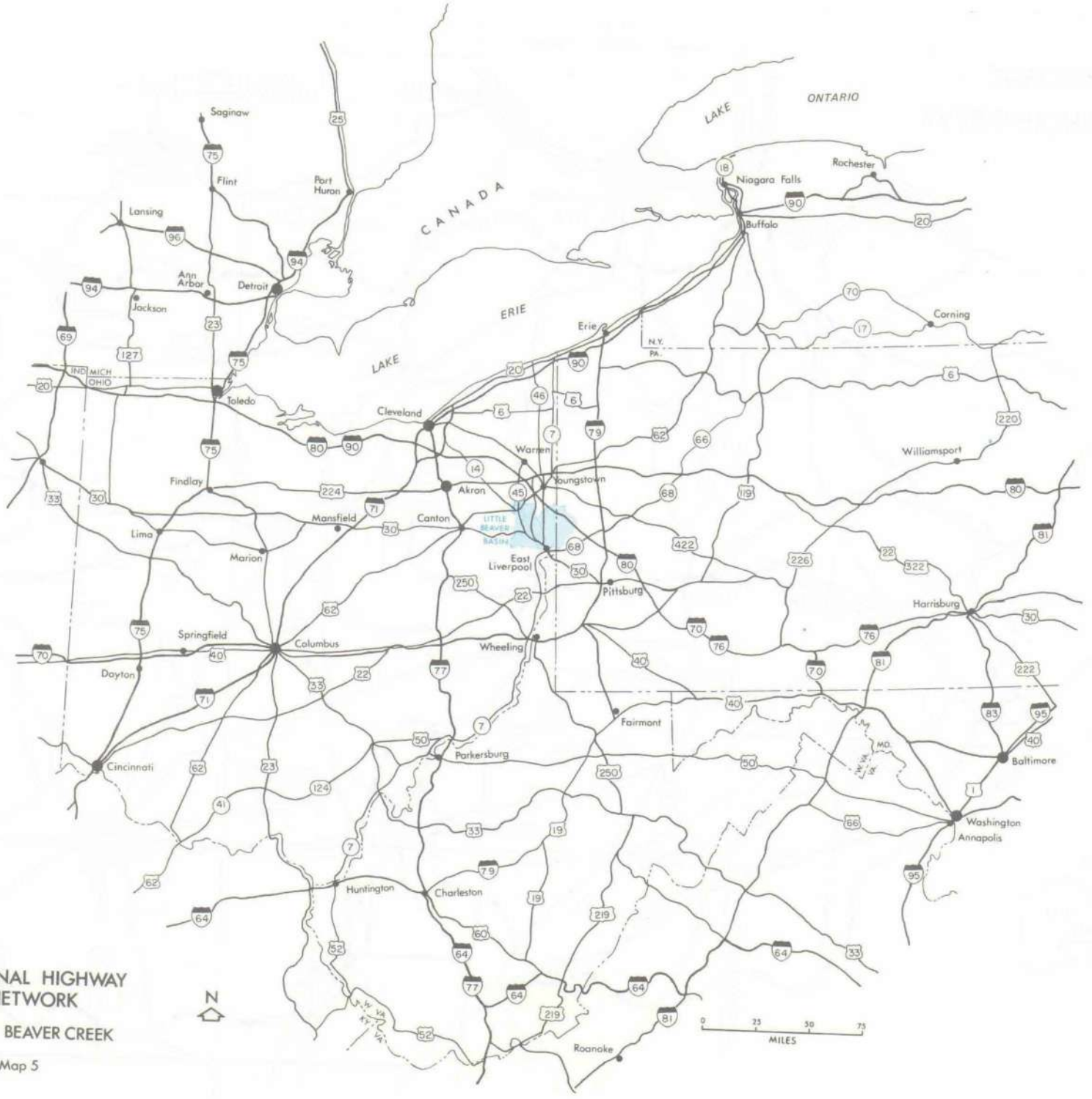
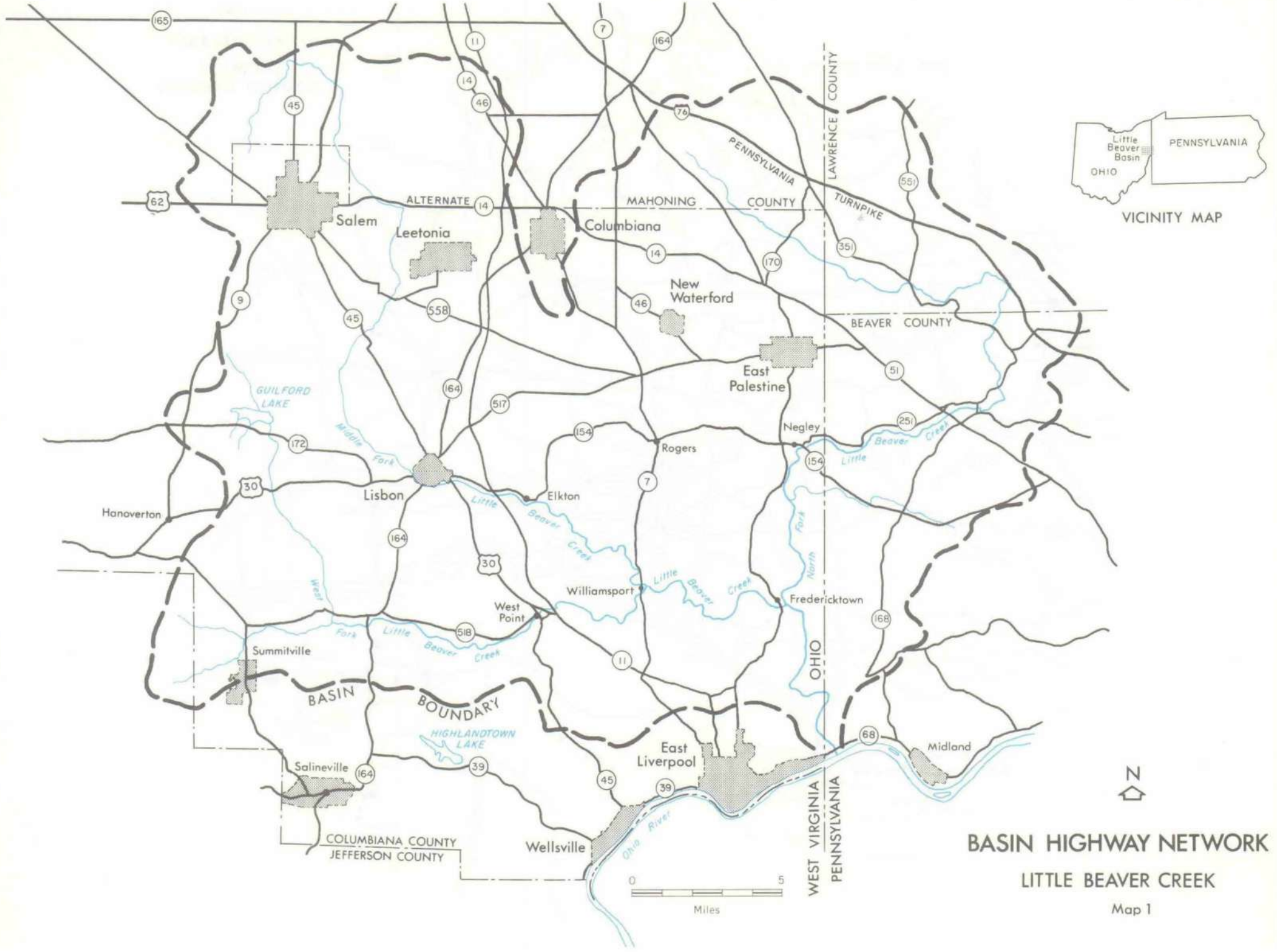
*Ibid



REGIONAL HIGHWAY NETWORK

LITTLE BEAVER CREEK

Map 5


VICINITY MAP
Little Beaver Basin
OHIO
PENNSYLVANIA
BASIN HIGHWAY NETWORK
LITTLE BEAVER CREEK
Map 1
Salem
Leetonia
Columbiana
New Waterford
East Palestine
Negley
Rogers
Lisbon
Elkton
Hanoverton
Williamsport
West Point
Fredericktown
Summitville
Salineville
East Liverpool
Midland
Wellsville
ALTERNATE 14
MAHONING COUNTY
LAWRENCE COUNTY
BEAVER COUNTY
COLUMBIANA COUNTY
JEFFERSON COUNTY
PENNSYLVANIA TURNPIKE
BASIN BOUNDARY
GUILFORD LAKE
HIGHLANDTOWN LAKE
Middle Fork
West Fork
Little Beaver Creek
North Fork
Ohio River
OHIO
WEST VIRGINIA
PENNSYLVANIA
0
5
Miles
N

U.S. 30 west of Lisbon. The only east-west state highways which cross the segments of Little Beaver Creek included in this study are Ohio Route 154 which crosses the North Fork between Negley and the state line and Pennsylvania Route 68 which crosses the main stem near its confluence with the Ohio River.

The recent upgrading of Ohio State Highway 11 in Columbiana County, the programmed upgrading of Ohio Route 14, and the proposed freeway status for U.S. 30 will improve access to the Little Beaver area.

Rough topography has determined the pattern of secondary roads and the orderly road patterns based on section lines characteristics of more northern counties in Ohio, are not found here.

There are no railroad lines presently in operation which parallel the study segment for any significant distance.

Scheduled commercial air flights within 50 miles of the study area are available from the Greater Pittsburgh Airport, the Warren-Youngstown Airport, and the Akron Airport. General aviation facilities are available at small airports near Pittsburgh, the Beaver County Airport, and the Columbiana County Airport.

As shown in the following table, several large urban areas lie within day use or weekend driving distance of the Little Beaver area.

Table 1

Distance and Driving Time from Major Urban Centers to Little Beaver Creek

Urban Center	Distance (miles)	Approximate Driving Time (Hours:minutes)
Pittsburgh, Pennsylvania	40	:50
Youngstown, Ohio	45	1:00
Canton, Ohio	55	1:10
Akron, Ohio	65	1:20
Wheeling, West Virginia	75	1:30
Cleveland, Ohio	100	2:00
Erie, Pennsylvania	105	2:10
Columbus, Ohio	150	3:00
Charleston, West Virginia	180	3:45
Toledo, Ohio	190	4:00
Harrisburg, Pennsylvania	240	4:45
Buffalo, New York	250	5:00
Detroit, Michigan	250	5:00

Recreation Resources

Rivers--The nearest existing component of the National Wild and Scenic Rivers System to Little Beaver Creek is the Little Miami River. This river, lying northeast of Cincinnati, is over 200 miles southwest of the Little Beaver. Three rivers within 150 miles of Little Beaver Creek were included as rivers to be studied under Section 5(a) of the Wild and Scenic Rivers Act. These rivers are the Youghiogheny, Allegheny, and Clarion, all in Pennsylvania. Two other "study" rivers, the Maumee in Ohio and Pine Creek in Pennsylvania, lie approximately 165 and 160 miles, respectively, from the study area.

One river, the Cacapon, lying within 150 miles of Little Beaver Creek, is included on a list compiled by the Departments of the Interior and Agriculture in response to Section 5(d) of the Wild and Scenic Rivers Act. A river listed under Section 5(d) is not necessarily programmed for study; however, its potential as a national wild, scenic, or recreational river area must be considered as an alternative use in all federal water resource planning for that river.

The State of Ohio has an active scenic rivers program. The Ohio Department of Natural Resources has officially designated the Little Miami, Sandusky, Olentangy, Grand, and Little Beaver Creek as components of the Ohio Wild and Scenic Rivers System. A number of other rivers are being considered as possible additions to the state system including the Cuyahoga, the Little Muskingum, the Clear Fork-Mohican, Walhonding River system, the Maumee, the Stillwater, the Tuscarawas, and Big Darby Creek.

Passage of Pennsylvania's Scenic Rivers Act in December 1972 established a state wild and scenic rivers task force within the Department of Environmental Resources. Although studies on specific rivers have not yet begun, the task force has screened some 45 rivers in the state for detailed study. Rivers in Pennsylvania recommended by the state comprehensive outdoor recreation plan for further study include portions of the Susquehanna River, West Branch of the Susquehanna, Allegheny River, Lehigh River, Kettle Creek, First Fork of the Sinnemahoning River, Loyalsock Creek, and Penns Creek.

The State of West Virginia has recognized the need to protect its streams and has established a natural stream preservation system. Three streams were designated as components of this system--the Greenbrier River, the Cranberry River, and Anthony Creek. West Virginia has a number of other rivers with scenic river potential. These include the Cheat, South Branch of the Potomac, Shenandoah, Cacapon, New, and Lost Rivers, Shaver's Fork, Back Fork of the Elk, Laurel Ford, and Seneca Creek.

The river nearest Little Beaver Creek having perhaps the greatest potential to provide additional recreational use for large numbers of people is the Ohio River. Because of the poor water quality, recreational activity is presently limited primarily to partial body contact

activities. Because of its great size and accessibility, this river sustains a great deal of pleasure boating use. Whereas boating use on Little Beaver Creek consists essentially of canoes and other small non-motorized watercraft, many types and sizes of power driven boats are found on the Ohio River. However, in order to realize the greater potential of the Ohio River to support recreation use, major improvements in water quality are needed.

The old locks and dams on the Ohio River are being consolidated and modernized to form 19 high-level lock and dam units. This modernization process will create longer pools and will include additional recreation facility development. These modifications will enhance the recreation opportunities on the Ohio River including the section near the mouth of Little Beaver Creek.

Other Resources--The major areas of federally managed recreation lands within 150 miles of the Little Beaver are contained in three national forests--the Wayne, Allegheny, and Monongahela. These national forests encompass more than a million acres of land, the bulk of which is available for low density recreation activity. The Wayne National Forest is approximately 70 miles south of Little Beaver Creek while the Allegheny National Forest lies approximately 80 miles to the northeast of the study area. The Monongahela National Forest lies in the Appalachian and Allegheny Mountains on the eastern border of West Virginia approximately 130 miles from the study area. Other federally managed areas include the Ottawa National Wildlife Refuge, a 5,600-acre area approximately 70 miles northeast of the study area; and the 350-acre Fort Necessity National Battlefield, approximately 80 miles southeast of the study area.

There are 46 state park and recreation areas found within 100 miles of Little Beaver Creek--including 20 in Ohio, 21 in Pennsylvania, and five in West Virginia. Many of these parks provide opportunities for more intensive use as well as low density recreation activities. State parks lying within 50 miles of the study area are Beaver Creek, Jefferson Lake, Guilford Lake, Mosquito, Nelson-Kennedy Ledges, and West Branch State Parks in Ohio; Raccoon Creek, Hillman, and McConnells Mill State Parks in Pennsylvania; and Tomlinson Run State Park in West Virginia. The total land and water acreage included in these 10 parks is nearly 36,000 acres.

Other State of Ohio public use areas lying relatively near Little Beaver Creek include the Highlandtown Lake Wildlife Area (2,106 acres), the Yellow Creek State Forest (756 acres), and the Zeppernick Lake Wildlife Area (513 acres). Pennsylvania lands lying nearby that are available for limited recreation use include three state game areas having a total of over 1,700 acres.

The Cleveland Metropolitan Park District comprises nearly 18,000 acres of land while the Akron Metropolitan Park District includes over 7,000 acres. Mill Creek Park, a regional park in Youngstown, contains nearly 2,400 acres of land.

Legislation has been introduced to create a Cuyahoga Valley National Historic Park and Recreation Area between the Cleveland-Akron metropolitan areas. This area will include approximately 14,500 acres and will provide recreation opportunities for large numbers of people.

There are no major tracts of county lands in Ohio and West Virginia lying near the study area that are available for general recreation use. However, two Pennsylvania counties, Beaver and Allegheny, have park systems which draw users from the Pittsburgh area. Beaver County administers three major parks--Brady's Run, Brush Creek, and Economy. The three parks include more than 1,600 acres. Eleven regional parks totaling over 12,000 acres are located within Allegheny County.

Conceived as a continuous cross-country riding and hiking trail, the Buckeye Trail, lying between the Ohio River near Cincinnati and Lake Erie near Cleveland, passes within 50 miles of the Little Beaver. This trail utilizes state, federal, and local park and forest lands where possible; however, some sections run along the edges of rural highways and city streets.

The corridor of the proposed North Country National Trail is presently planned to cross the North Fork and to follow a portion of the Middle Fork below Elkton through Beaver Creek State Park.

There are no major natural lakes found in the region surrounding Little Beaver Creek; however, a large number of reservoirs have been constructed for a variety of purposes, including recreation. Within 100 miles of the study segment are 20 major reservoirs (1,000 acres and over) which include nearly 60,000 surface acres of water. Although these reservoirs receive a large amount of water-oriented outdoor recreation use, the type of recreational experience realized at these areas greatly differs from the experience which might be obtained on a natural river such as Little Beaver Creek. Of special interest are five large reservoirs built and operated by the Corps of Engineers within the Muskingum River watershed primarily for flood control purposes. These reservoirs have extensive recreation facility developments and are administered by the Muskingum Watershed Conservancy District. They serve a large portion of the population in eastern Ohio and western Pennsylvania.

Recreation Resource Needs--Appendix H of the Ohio River Basin Comprehensive Study, June 1966, contains a general evaluation of the outdoor recreation needs in a subarea which includes Little Beaver Creek. This subarea encompasses a 15-county area in the upper reaches of the Ohio River and, according to the survey, is experiencing a sizeable imbalance between outdoor recreation supply and demand. In 1960, an unmet need for 5.8 million recreation days existed, and this need was projected to increase to 30.7 million recreation days by the year 2000.

The Ohio Statewide Plan for Outdoor Recreation, 1971-1977, has developed a more specific accounting of recreation needs and includes the study area in the 16-county Lakeshore Uplands Planning Region. This plan indicates that the critical areas of recreation resource needs for all forms of recreational activities are found in and around major population centers. Although the Little Beaver River system lies near large population concentrations, it is able to satisfy only a small portion of this need. Any recreation plan for the Little Beaver Creek area should emphasize the protection of the riverscape, not satisfying large recreation needs.

The outdoor recreation plan, Outdoor Recreation Horizons, of the Commonwealth of Pennsylvania also indicates a need for additional recreation opportunities in the area near Little Beaver Creek. The population of Pittsburgh, a major metropolitan area located approximately 50 miles east of the Little Beaver, accounts for most of this need.

IV.
DESCRIPTION AND ANALYSIS

IV. DESCRIPTION AND ANALYSIS

Riverscape

The Little Beaver stream system and surrounding valley contains some of the wildest and most scenic areas in Ohio. It is a river of steeply incised valleys, abundantly wooded slopes, occasional steep rock outcroppings, boulder strewn, fast moving rapids and riffles, quiet pools, and clear, swift flowing feeder streams. The river exhibits a noticeable absence of man-made developments but supports a great variety of interesting plant, animal, and bird life.

Little Beaver Creek drains a watershed of 510 square miles and is a tributary of the Ohio River. Of the total watershed area, 408 square miles are in the State of Ohio and 102 square miles are in the Commonwealth of Pennsylvania. The major tributaries of Little Beaver Creek are the North, Middle, and West Forks. The Little Beaver is the major drainage system in Columbiana County, Ohio, and drains approximately 64 percent of the county's area. There are approximately 116 total miles of stream in the Little Beaver Creek system. This total includes approximately 33 miles of the North Fork, 24 miles of the West Fork, 42.5 miles of the Middle Fork, and over 16 miles of the main stem.

As discussed under III. REGIONAL SETTING, PHYSICAL ENVIRONMENT, the topography of the lower portion of the watershed is much more rugged than that found in the upper portion. This variation in topographic features is reflected in the following discussions of the various stream segments of the Little Beaver.

Canoeing on the Little Beaver near Sprucevale.

Middle Fork of Little Beaver Creek--The Middle Fork drains an area of approximately 150 square miles and has an average gradient of about 9 feet per mile (see Figure 1). It begins northwest of Salem, Ohio, in Columbiana County, eventually flowing in a southerly and easterly direction until it joins the West Fork at Williamsport. Prior to reaching Elkton, the Middle Fork has a relatively wide floodplain and, especially near Lisbon, a modest amount of agricultural and residential development. Areas associated with several of the tributaries have undergone extensive strip mine operations. Unfortunately, a portion of one of the strip mined areas is visible for a short distance along the south bank at a point about half way downstream along the segment of the Middle Fork qualifying for scenic river status. A small low-head dam has been constructed below Willow Grove Park near Lisbon. At a point below Elkton, up to its confluence with the West Fork, the Middle Fork valley becomes narrower, deeper, and more natural in character. The valley walls along the river occasionally reach heights of 200 feet above the watercourse. Valley walls are often steep due to the presence of massive resistant sandstones which make up the greater part of the strata while the valley floor is quite narrow. At several points along the Middle Fork, from Elkton to Williamsport, remnants of the Old Sandy and Beaver Canal can be seen. Lusk's Lock is located on state-owned land on the north bank of the river, approximately three river miles southeast of Elkton, and is the best preserved lock in the old canal system.

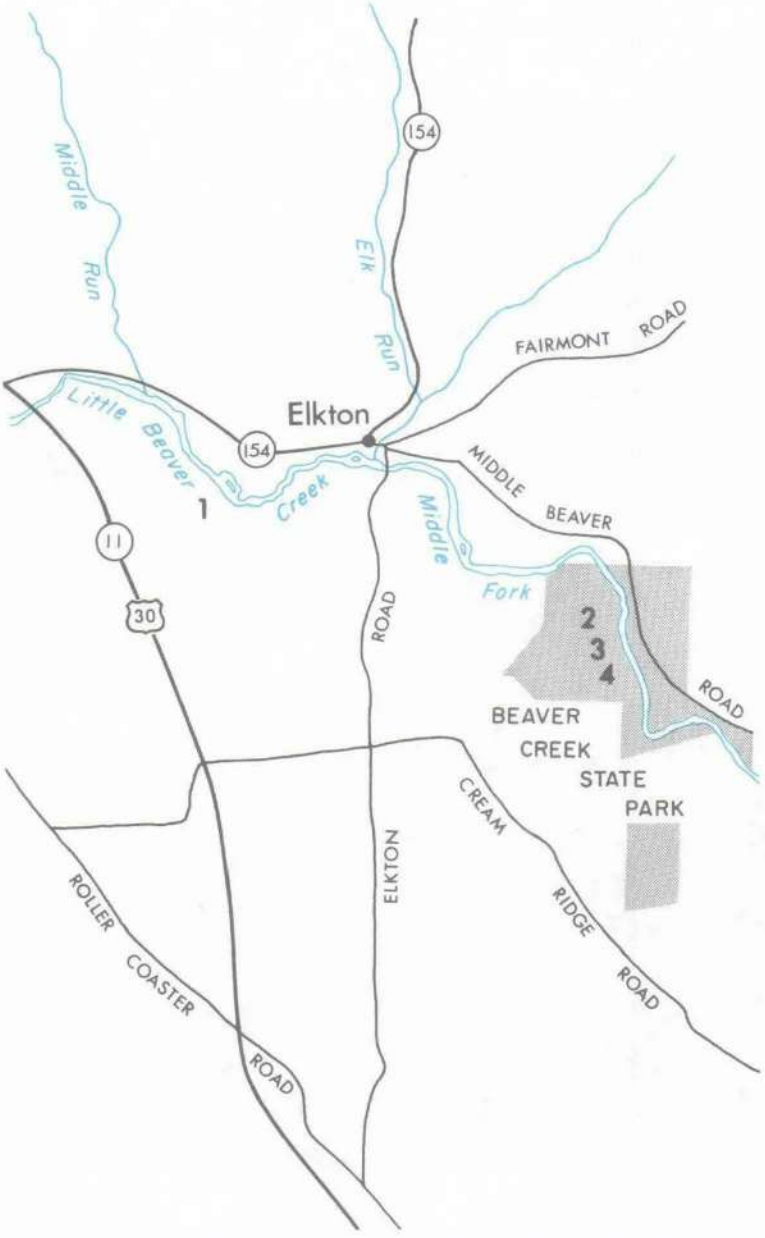
Two bridges span the Middle Fork below Elkton. Bear Hollow Road, a small gravel road, bridges the creek approximately one mile northwest of Williamsport and Ohio Route 7 crosses the Middle Fork just north of Williamsport. Portions of the east riverbank, between these two bridges, a distance of approximately 1.3 miles, has been modified through man's presence. The modifications include an auto salvage yard, several small bankside dwellings, a trailer sales area, and a small cement block plant. Some of this development is screened by a treeline along the creek's banks. Man's presence is plainly evident by sight and sound where Ohio Route 7 closely parallels the creek for a distance of approximately 700 feet, and the stream has been riprapped. One power transmission line and two pipelines cross the Middle Fork between Elkton and Williamsport. With the exception of the Williamsport area, that portion of the Middle Fork within the recommended segment exhibits the characteristics of a small, scenic, near-natural stream.

Little Beaver Creek Main Stem--The main stem of Little Beaver Creek is formed by the confluence of the Middle and West Forks near Williamsport, Ohio. This portion of the Little Beaver flows for nearly 17 miles before emptying into the Ohio River near Glasgow, Pennsylvania. Approximately 1-1/4 miles of the main stem flow through Pennsylvania.

With a few exceptions, this segment is undeveloped and very scenic. Areas of particular beauty are found within the main portion of Beaver Creek State Park, the Sprucevale Area, and the river valley above and below Fredericktown. At each of these locations, man's presence is either only faintly evident or manifests itself in a generally pleasant manner. Most of the state-owned land found on the study segment occurs at Beaver Creek State Park which is located approximately one mile east of Williamsport.

1. Below Elkton the Middle Fork of Little Beaver Creek begins to take on a natural character.

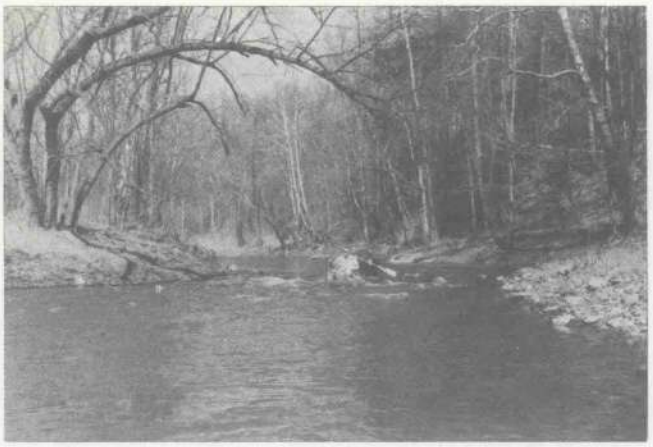
2. As the river winds through Beaver Creek State Park, the valley becomes narrow,



A Photo Trip Down the Little Beaver

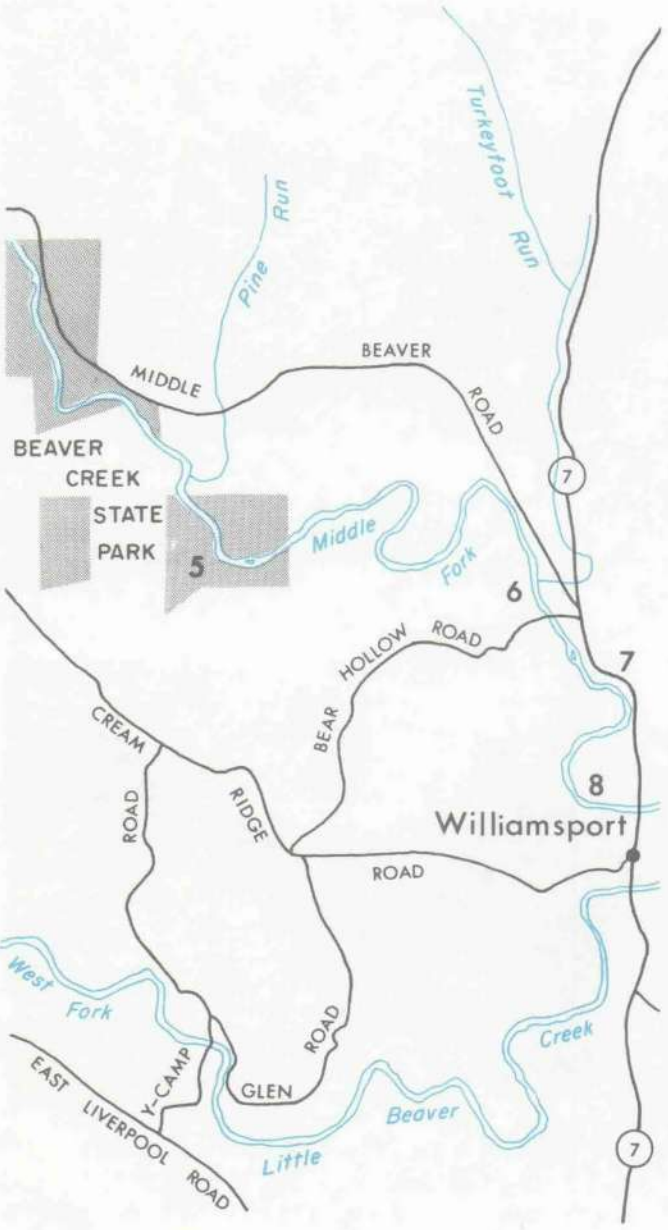
3. and its banks rise steeply away from the river.

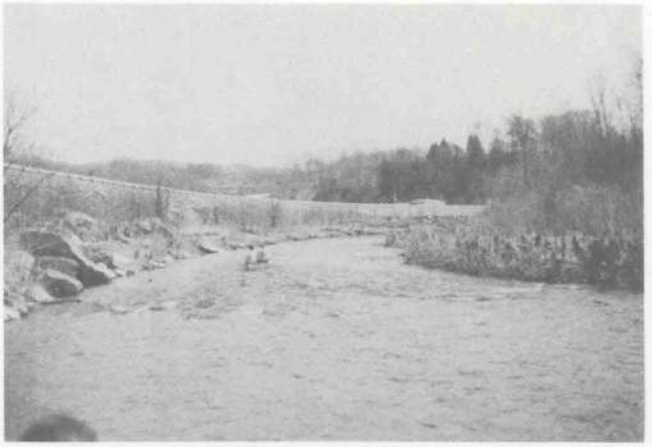
4. Soon may be seen Lusk's Lock, the best preserved of the locks in the old Sandy and Beaver Canal System.



5. As it passes through Beaver Creek State Park, the stream, quiet and pleasant in character, is confined by a combination of steep banks and heavy tree cover.

6. Below Beaver Creek State Park, beginning in the vicinity of Bear Hollow Road



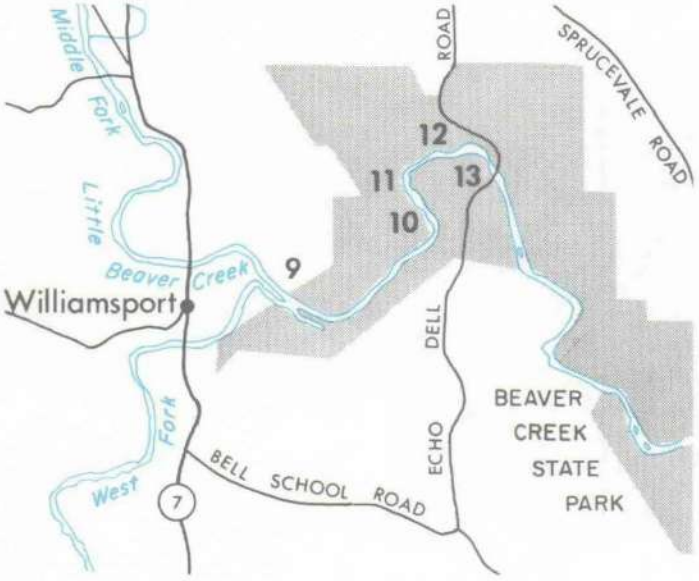


7. and continuing downstream to the State Highway 7 crossing,

8. man's presence becomes gradually more evident.

9. The Middle Fork quickly regains its natural character below Highway 7 and soon joins the West Fork to form the main stem of Little Beaver Creek.

10. After entering Beaver Creek State Park, the valley walls become steep and heavily forested.



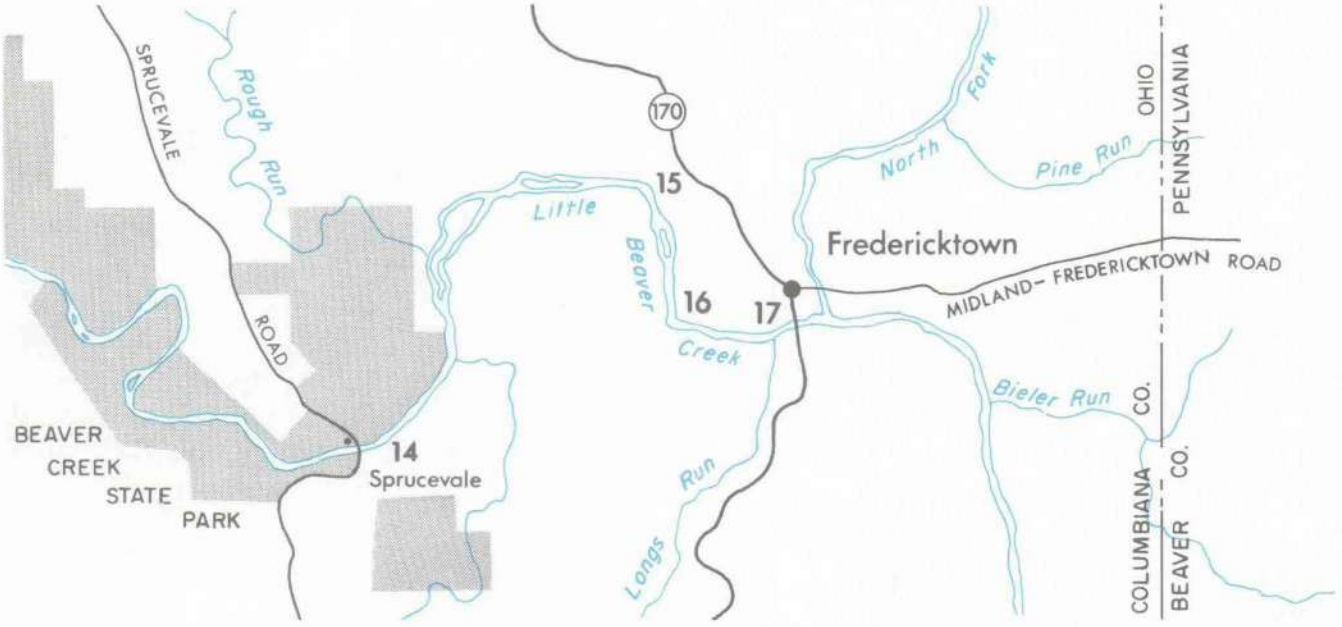
12. Beaver Creek State Park provides a number of interesting attractions, including the restored Malone Covered Bridge.

11. Lookout Point at Beaver Creek State Park provides a panoramic view of the Little Beaver valley and surrounding countryside.

13. The riverscape within the park is primitive and secluded in character.

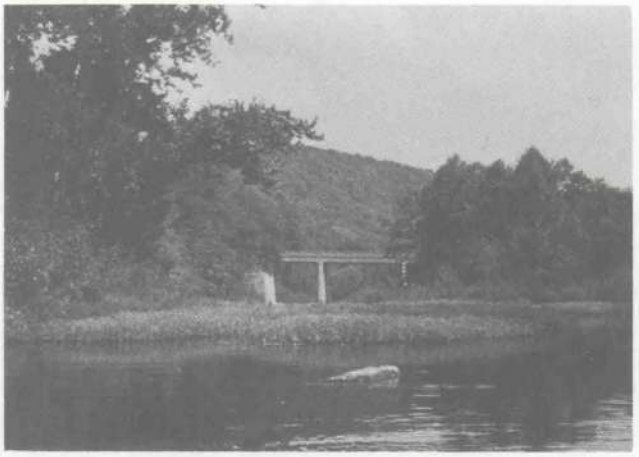
14. In the lower reaches of Beaver Creek State Park is the scenic and secluded Sprucevale area.

15. Farther downstream can be seen Laurel Ridge, a heavily forested and biologically significant area.



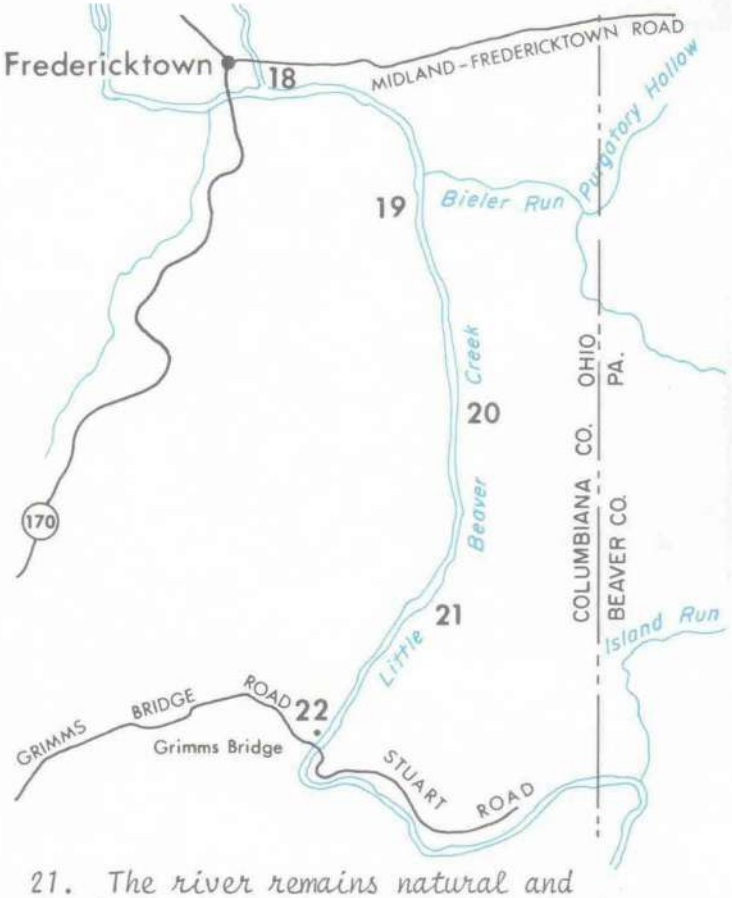
16. The stream retains a quiet and pleasant character as it nears Fredericktown and its junction with the North Fork.

17. As the Highway 174 bridge comes into view, the high hills to the east of Fredericktown can be seen.



18. The North Fork (on the right in the photo above) joins the main stem of Little Beaver Creek at Fredericktown.

19. Just below Fredericktown is Lost Lock, a recently restored lock of the old Sandy and Beaver Canal System.

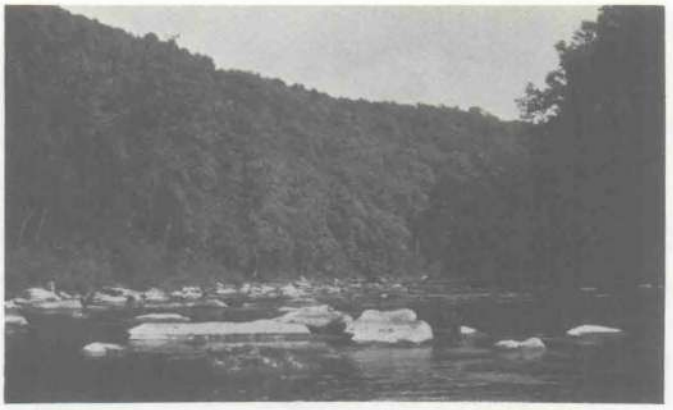


21. The river remains natural and scenic in character to a point about one-half mile above Grimm's Bridge.

20. Below Fredericktown the river broadens, but the valley remains narrow, steep walled, and heavily wooded.

22. However, portions of the river-scape in the vicinity of Grimms Bridge have been visually degraded.

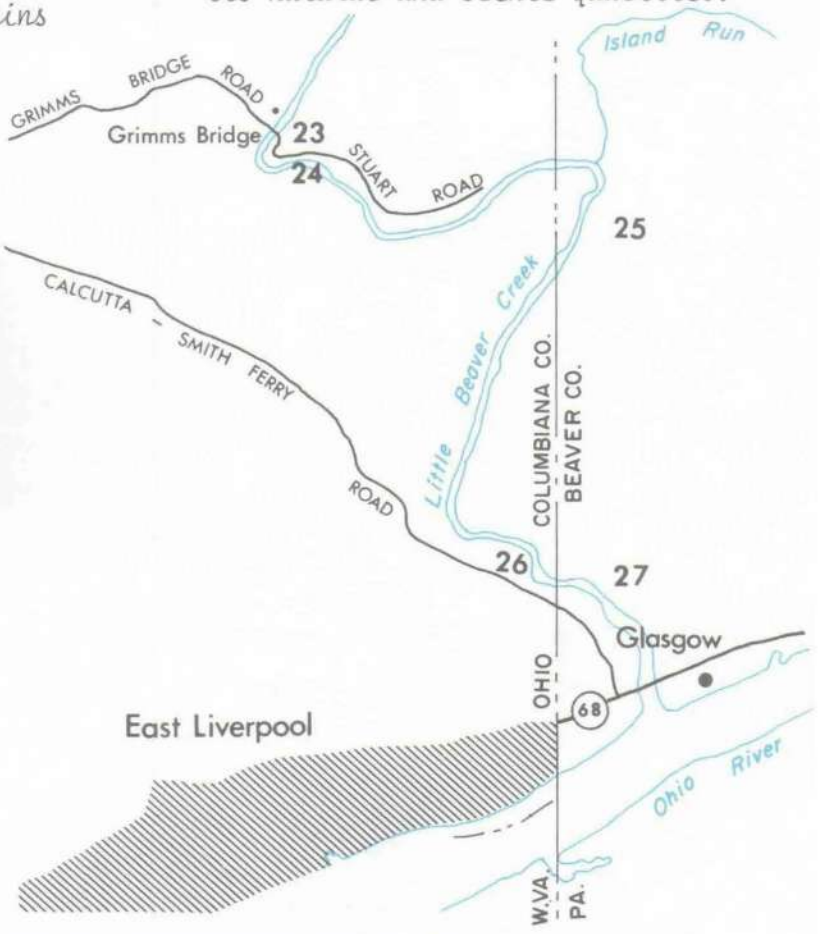
23. Despite these impairments, the river in the vicinity of Grimm's Bridge retains much of its basic natural character.



24. A short distance below Grimm's Bridge the river once again recovers its natural and scenic qualities.

25. Portions of this section of the main stem have interesting stretches of fast water, including this area in Pennsylvania.

26. In the lower reaches of the river the valley walls are steep and higher than anywhere along its course.



27. Little Beaver Creek broadens and deepens and its current slackens as it nears its confluence with the Ohio River.

There are no major roads that parallel the main stem, and it is crossed by six bridges (two of which are located at the mouth), along its nearly 17-mile length. The main stem is crossed by a pipeline at two locations; once at a point below Sprucevale and again at a location south of the Beaver Creek Church Camp, north of Grimm's Bridge. Remnants of the Sandy and Beaver Canal are occasionally found on the riverbank. The only significant developments visible from the river occur at the state park, Fredericktown, Sprucevale, in the vicinity of Grimm's Bridge, and at the mouth.

Valley walls along the stream vary from a minimum height of 150 feet at Williamsport to a maximum of over 400 feet near the mouth. Occasionally rock faces are visible at various places along the river. In some instances, these views are very impressive.

The restoration of several historical sites adds variety to the river scene. A grist mill, covered bridge, and several cabins have been restored in Beaver Creek State Park. Lost Lock below Fredericktown has been restored with private funds.

Rapids and riffles are common in the rock and boulder strewn river bottom, particularly on sharp bends. Seasonal fluctuations of water levels are considerable, and average stream depths can vary from a few inches to three feet or more. The stream has an average drop of approximately 10 feet per mile (See Figure 1). Stream widths average about 60 feet, varying from 30 to 100 feet. However, Little Beaver Creek widens to about 200 feet near its mouth, where water backs up from the Ohio River.

The greatest concentration of bankside development on the main stem occurs primarily at two locations--Fredericktown and Grimm's Bridge. Fredericktown, founded in 1801, is a small quiet community lying at the confluence of the North Fork and main stem of Little Beaver Creek. This interesting community, most of its homes and other structures screened from the view of the river user, tends to provide a pleasant contrast to the river's more natural character.

Approximately 4.5 miles above the river mouth is a developed area known as Grimm's Bridge. Many of the permanent homes and seasonal cottages associated with the area lie unscreened near the river's edge. Most are in a rundown condition and tend to detract from the river's natural and scenic qualities. Also present is a large strip mined area which also impairs the river environment in this area.

Portions of the last mile of the river have been adversely affected by the presence of a gravel mining operation, an old barge loading structure and dock, several areas of trash, and the nearness of County Road 430 along the river's west bank. The waters of the last mile slacken, being affected by the back up of water from the Ohio River. The heavily forested bluffs in this area are as pronounced as anywhere along the study segment.

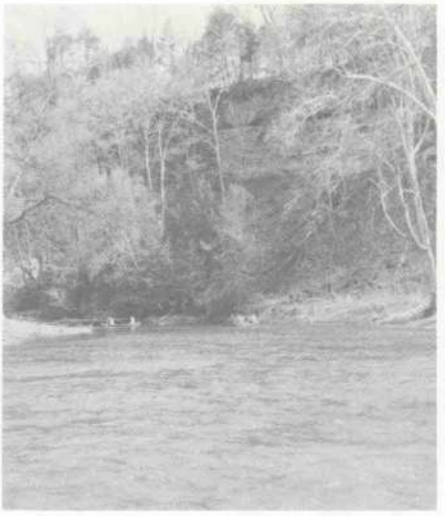
West Fork of Little Beaver Creek--This tributary rises northwest of Lisbon, Ohio, and is the smallest of the three major tributaries. It drains an area of approximately 110 square miles and has a gradient of nearly nine feet per mile (see Figure 1). The headwaters of the West Fork are impounded by Guilford Lake, a reservoir built to supply additional water for the old Sandy and Beaver Canal and now the site of the 500-acre Guilford Lake State Park. Below Guilford Lake, the West Fork is a small stream with a relatively broad floodplain. Throughout most of the year this stream supports low water flows. The West Fork is paralleled by township roads at several locations and has been extensively strip mined in adjacent watershed areas. Although one bank of the West Fork is often bordered by steep forested hillsides, the other bank has been modified to varying degrees by man. Most of the floodplain has been cleared for agricultural use.

A short stretch of the West Fork near its confluence with the Middle Fork does possess outstanding scenic characteristics. For a distance of approximately four and one-fourth miles, the West Fork exhibits a natural and, in places, a gorge-like character. This stream segment and its gorge are considered a unique natural area by the Ohio Biological Survey. The steep bluffs bordering the stream contain hemlock and Canadian yew and, in conjunction with striking rock faces, provide an outstanding area for nature study. This stream segment is referred to as the Beaver High School Gorge.

North Fork of Little Beaver Creek--The North Fork begins in Mahoning County, Ohio, just north of the Mahoning-Columbiana County line, and has a drainage area of over 190 square miles, the largest drainage area of the Little Beaver's three major tributaries. It has an average gradient of nearly 13 feet per mile, the steepest of the river segments (See Figure 1). The upper portion of the North Fork is relatively small; flows through several low, swampy areas; and has a wide floodplain. Throughout the Beaver County, Pennsylvania, portion of the watershed (outside of the study segment) a large amount of strip mining for coal has occurred, mostly within the past 10 years. In Beaver County the North Fork is crossed many times by both primary and secondary roads, and the tracts of the Youngstown and Southern Railroad parallel much of its length. Although the segment of the North Fork that lies in Pennsylvania has a few short pleasant segments, it lacks any outstanding characteristics which would enable it to qualify for inclusion in the National Wild and Scenic Rivers System.

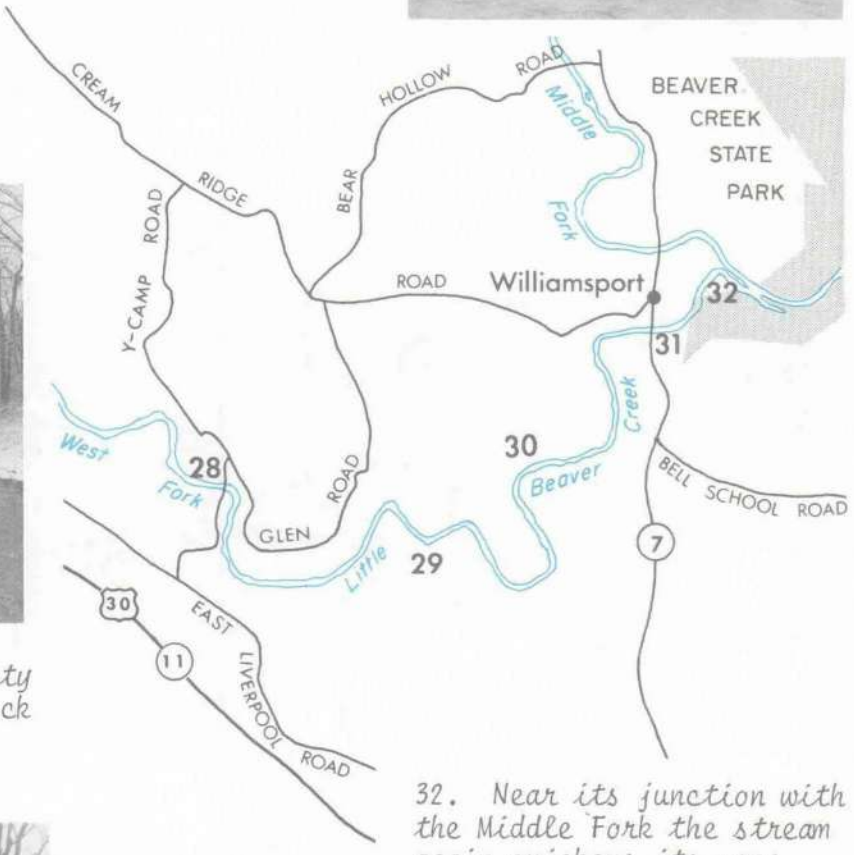
From the Ohio-Pennsylvania state line, the North Fork flows west for a short distance, then south until it meets the main stem of Little Beaver Creek, a distance of approximately eight miles. From the state line east of Negley down to Brush Run, the stream banks show visual evidence of man's presence. Although most of this segment is bordered by a fringe of trees and has a relatively broad floodplain, limited industrial and residential development can be seen from the river. Strip mining has been extensive in the hillsides back from the river; however, this can be seen by the river user in only one area. Other developments in this short segment include a golf course at Achor and a small residential-commercial development just south of the Achor Bridge.

28. Viewed from the Y-Camp Bridge the West Fork is heavily wooded and possesses a quiet and pleasant character.



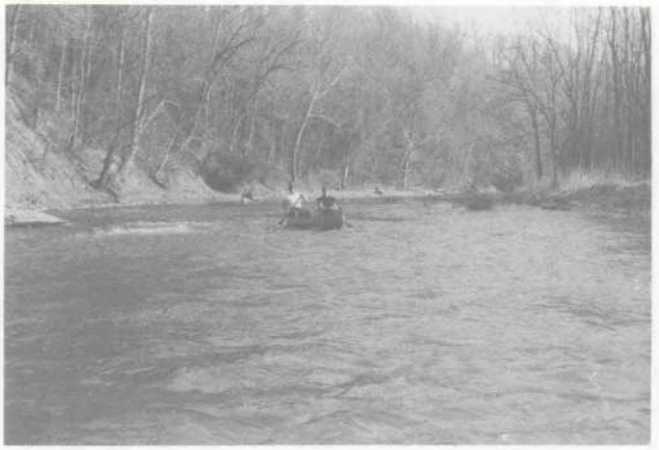
29. Downstream the West Fork flows between steep, heavily wooded banks and an occasional bluff.

30. The banks are lined with a variety of interesting trees, including hemlock intermingled among the hardwoods.



32. Near its junction with the Middle Fork the stream again quickens its pace.

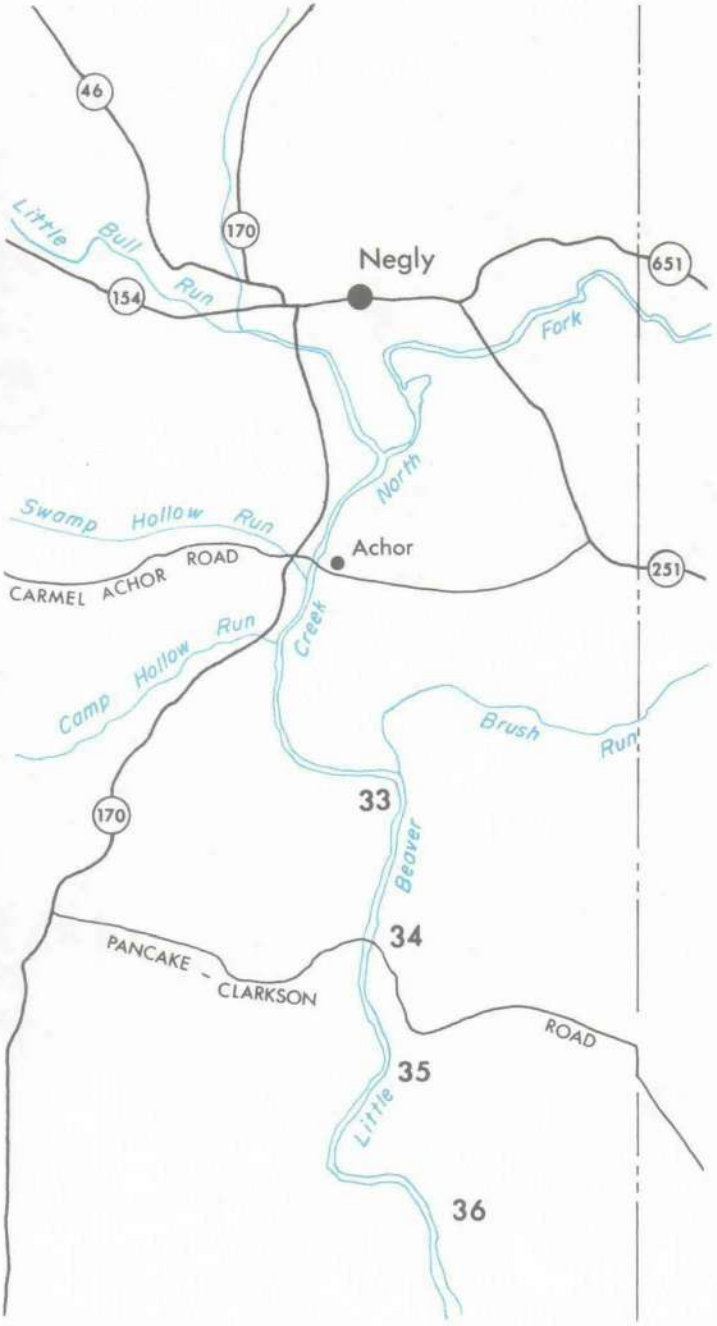
31. Above the Highway 7 Bridge the water slackens its pace and becomes quiet.



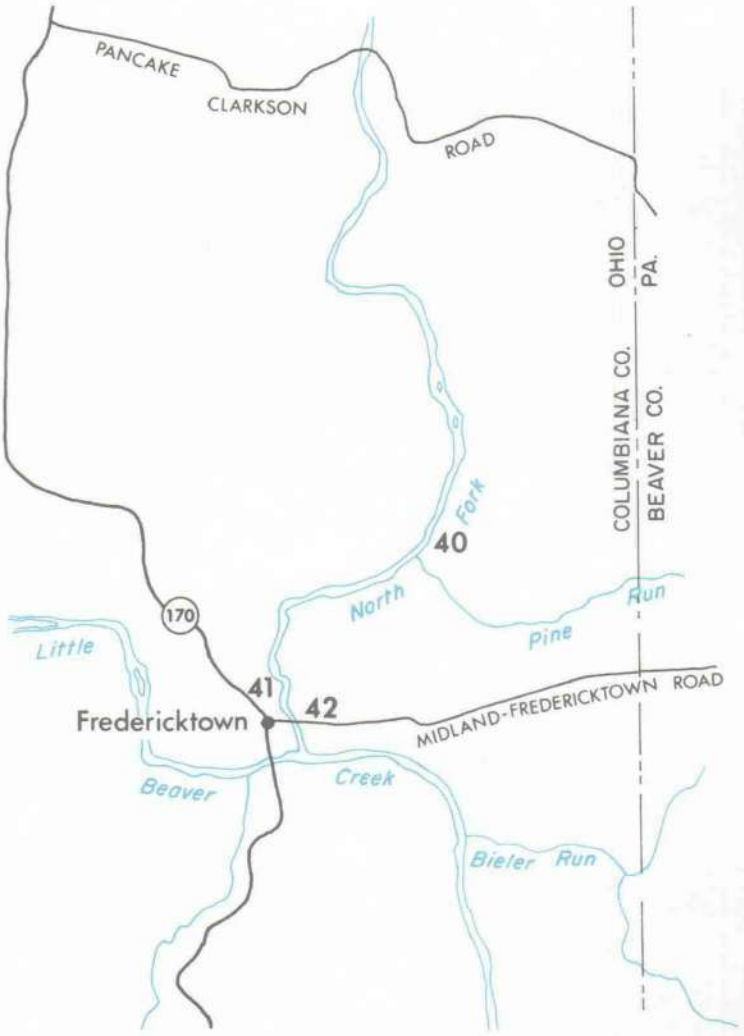
33. At its confluence with Brush Run, the North Fork is natural and rugged.

34, As the river flows southward its character is attractive and pleasant,

35. with only an occasional change in mood--from slowly, placidly drifting

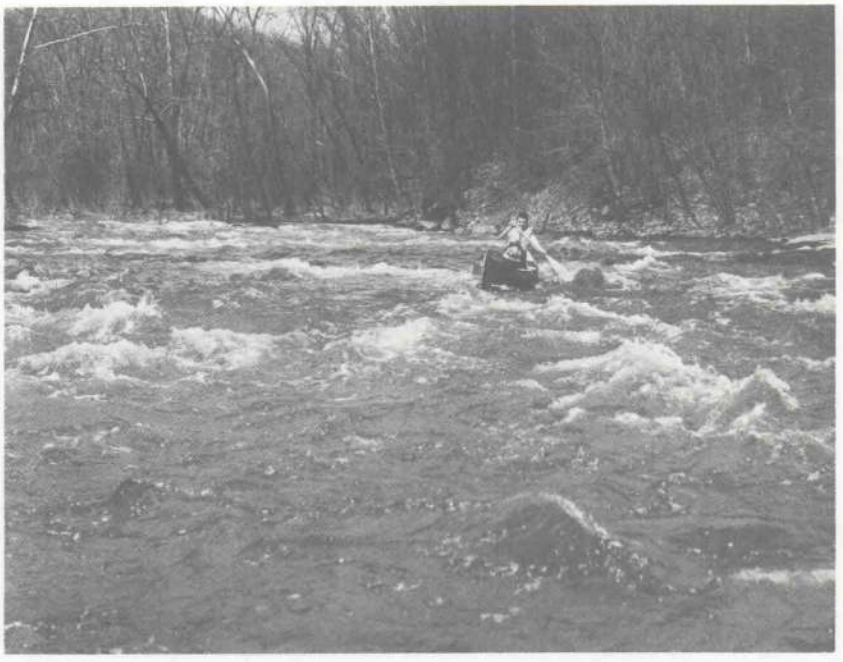


36. to swiftly rippling over gravel shoals.

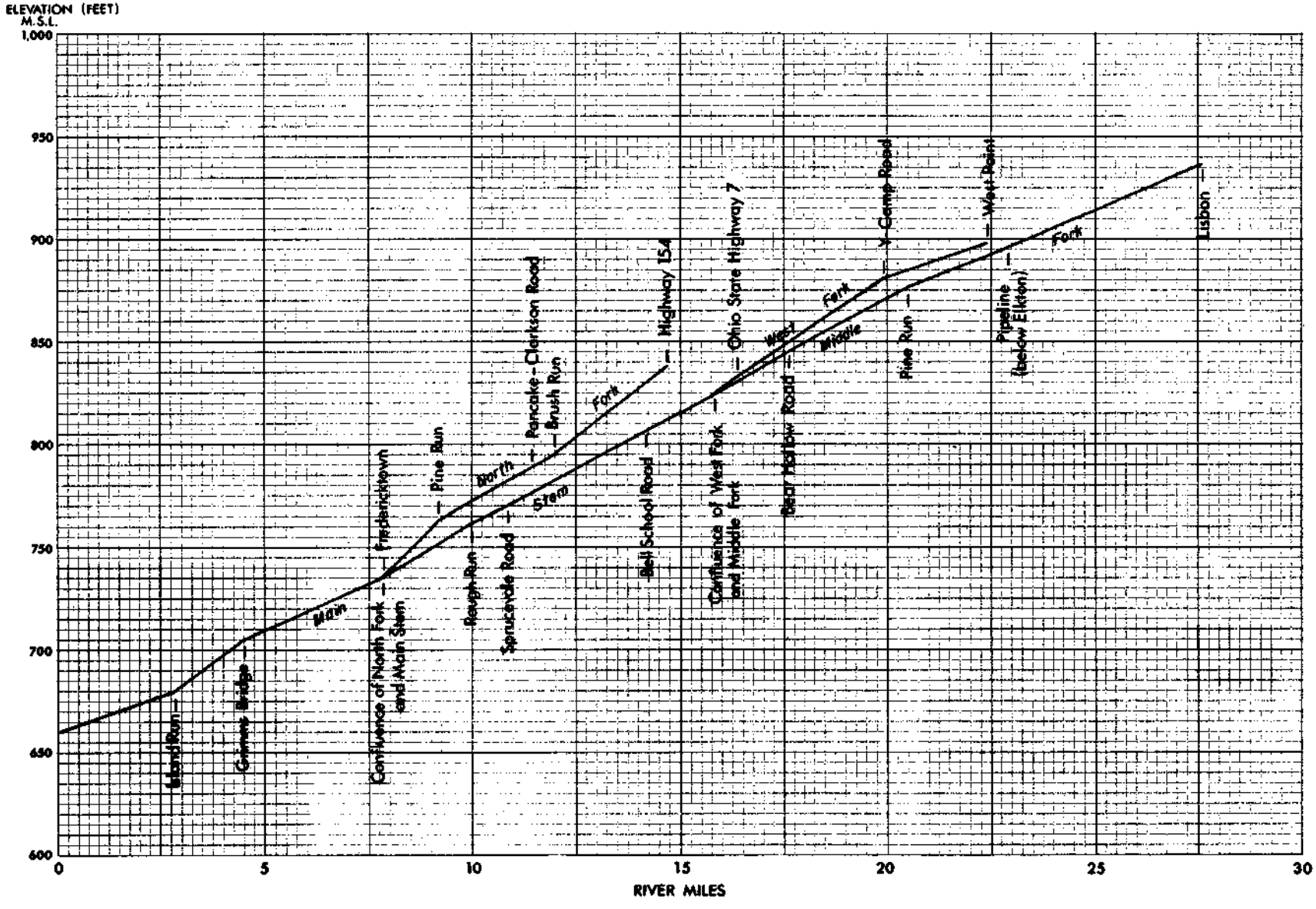


38. Below Pine Run and about a half of a mile upstream from Fredericktown are found the "flat rocks," a formation of ancient bedrock which forms a series of small waterfalls.

37. About three miles below Brush Run's junction with the North Fork, Pine Run, a clear flowing feeder stream, also joins the North Fork.



39. Below the "flat rocks" and down to the confluence with the main stem, the North Fork provides some challenging waters for canoeists during springtime.



NOTE: Mile 0 is the point where the Little Beaver Creek enters the Ohio River.

RIVER PROFILE
LITTLE BEAVER CREEK
Figure 1

Source: U.S. Army Corps of Engineers.

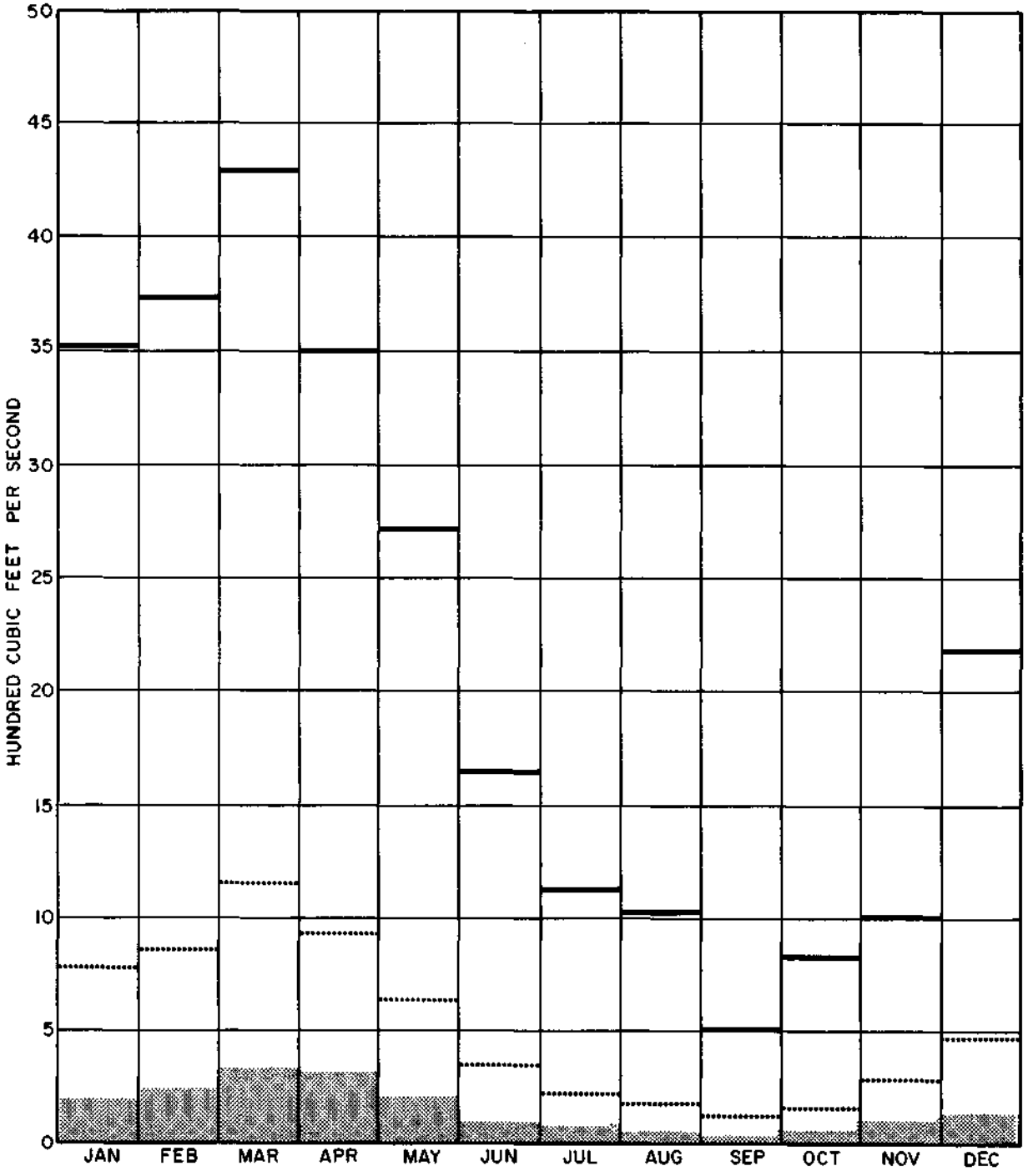
From Brush Run downstream, the scenic qualities of the North Fork are affected very little by man's activities. The outside bends of the river are bounded by steep, wooded bluffs, while the inside bends are bordered by a fringe of trees and small areas of lowlands with adjacent steep hillsides. The valley walls close in on the stream, and the valley becomes steeply sloped and heavily forested. This 4-1/4 mile portion of the North Fork, all privately owned, is very scenic, intimate, and in a near primitive state. The only evidence of man's influence on the valley is one road crossing, an occasional horse trail, an old railroad bridge, a foot bridge north of Fredericktown, and several inconspicuous homes at Fredericktown. Several cabins, a church, an old time school house, and an octagonal store have been restored at this quaint community. The stream width varies from 20 to 40 feet and stream depth varies from quite shallow over gravel beds to several feet in pools.

Just north of Fredericktown is an area of the stream known locally as the "flat rocks." At this point, the North Fork flows over bedrock in a series of small waterfalls. Rock carvings dating back to the mid-1800's are found on many of the exposed rock formations. The Montour Railroad parallels the North Fork from Fredericktown to Negley; however, it seldom can be seen from the river. The river flows swiftly around large boulders near Fredericktown which provide interesting viewing and a challenge for canoeists during periods of high flow.

Flow Characteristics

A necessary consideration in evaluating Little Beaver Creek and its principal tributaries is the amount of water which flows in its course throughout the year. The rate of flow is particularly important during the summer months when recreational use is at a maximum but water levels are at a minimum.

Flow data for the lower portion of Little Beaver Creek are available only from a single gaging station near East Liverpool, Ohio, located approximately 4.5 miles upstream from the confluence of Little Beaver Creek with the Ohio River. The flows recorded at the gaging station include the total flow of the North, Middle, and West Forks of Little Beaver Creek. Figure 2 shows the average maximum, average mean, and average minimum daily flows at the gaging station based on 55 years of record.

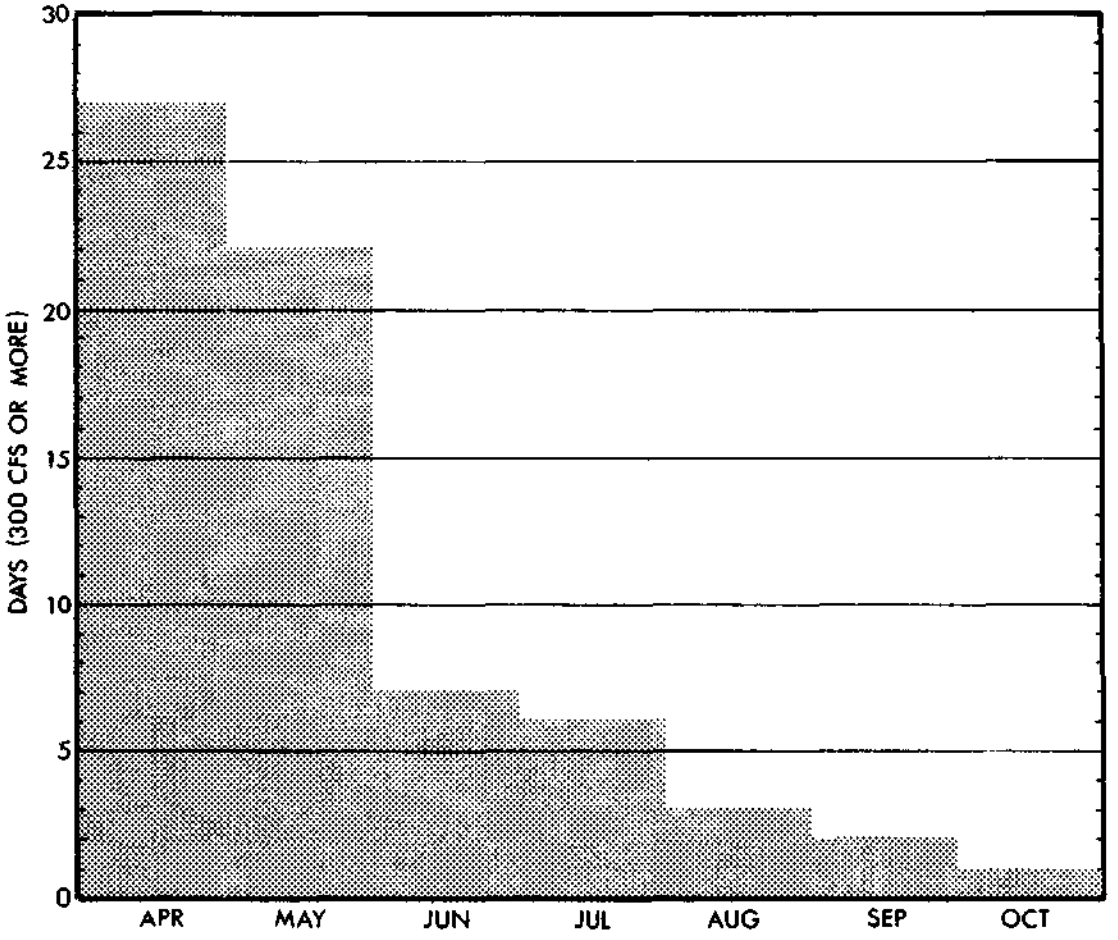


1915–1970 AVERAGE DISCHARGE

LITTLE BEAVER CREEK

Source: U.S. Geological Survey

Figure 2



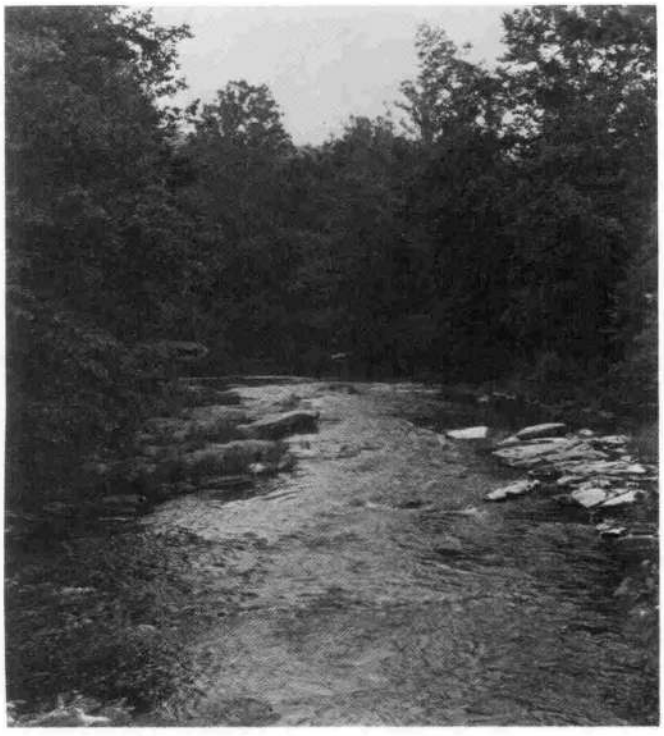
NOTE: Water levels based on 1956 to 1970 averages near East Liverpool.

Source: Bureau of Outdoor Recreation

DAYS OF GOOD CANOEING

LITTLE BEAVER CREEK

Figure 3



As shown by these photos, each of the same location on the North Fork, water flows vary greatly from early spring (upper) to mid-summer (lower).

The North Fork of the Little Beaver near Fredericktown provides challenging stretches of swift and boulder strewn waters for canoeists

and contains some of the cleanest waters in the stream system.

During infrequent periods of intense rainfall, water levels of Little Beaver Creek rise significantly. Due to the sparse development along the relatively narrow floodplain, flooding does not cause large amounts of property damage along the Little Beaver. In addition, because flooding is not frequent during the recreation season, it does not significantly impair recreational activities. It is normally the scarcity rather than the abundance of water that limits recreational activity along Little Beaver Creek.

Canoes and other recreational type watercraft with similar shallow drafts are the most suitable for use on the Little Beaver Creek main stem and its tributaries. Factors such as the draft of a canoe under various loads; the stream velocity; the nature of the streambed; and the tolerance of the canoeist for dragging, towing, or portaging, influence an analysis of what is required for suitable or enjoyable canoeing. However, if average values for each of the aforementioned factors are considered, a flow of 300 cubic feet per second (cfs) average mean discharge at the East Liverpool gaging station is a reasonable amount necessary for satisfactory canoeing on the main stem. Since the flow in each of the three tributaries is considerably less than that of the main stem, it is possible that some dragging and portaging would be necessary on those reaches even during the 300 cfs flow on the main stem. The suitability of the river for canoeing during the normal recreation season is shown graphically on Figure 3. As indicated by the graph, the months of April and May offer the greatest opportunity for canoeing. During June, July, and August, the most intensively used months of the recreation season, canoeing conditions can be considered good for only 17 percent of the time. It should be noted that the figures shown reflect only a 15-year average of flow data and actual monthly conditions will vary each year. Extremely dry or wet years will result in less or more suitable canoeing conditions than those indicated by the information shown in Figure 3. During 1963, for example, the driest year of the 15-year period, the flow on the main stem was above 300 cfs only three percent of the time during the recreation season.

Water Quality

The water quality of Little Beaver Creek from its headwaters to the Ohio River is generally considered to be good to excellent. However, the quality of water in the Little Beaver is being degraded at some locations. Water quality impairment within the stream segments being considered for inclusion in the National Wild and Scenic Rivers System has occurred most noticeably on the Middle Fork.

The principal pollution problems are related to oxygen consuming materials, nutrients, bacteria, chemicals, and the presence of traces of heavy metals. Most of the problems occur along sections of the Middle Fork near Salem and Lisbon, portions of the North Fork and its tributaries near the Pennsylvania-Ohio state line north of the study segment, and a section of the West Fork and one of its unnamed tributaries located west of the study area.

Low dissolved oxygen levels and high coliform counts occur downstream from the sewage treatment facilities of Salem, Lisbon, and Leetonia on the Middle Fork and downstream from New Waterford on Bull Creek and East Palestine on Leslie Run, tributaries of the North Fork (see Basin Reference Map). All of the above listed municipal sewage treatment facilities are listed as being inadequate and none are presently in compliance with downstream water quality standards as established by the Ohio Environmental Protection Agency (Ohio EPA). All of the treatment facilities are presently either under orders of the Ohio EPA to be upgraded or the permits for operation include programmed improvements.

At the present time, East Palestine, Leetonia, New Waterford, and Salem have secondary sewage treatment systems. Lisbon only has a primary treatment facility. Each of these communities has combined sewage and storm runoff systems. During periods of heavy rainfall, the systems are unable to hold for treatment all of the wastes which are combined with the excessive amounts of water. This situation sometimes results in the direct discharge of untreated wastes into the watershed. Each of the facilities, with the exception of the New Waterford plant, has been recommended for expansion and upgrading. An expansion of the Salem sewage treatment plant is nearly completed, whereas the upgrading of Lisbon's sewage treatment facility from primary to secondary should be accomplished soon.

Presently there are 10 industrial plants in operation within the watershed that are depositing some type of waste material into Little Beaver Creek. These waste materials include dissolved solids, organic materials, electrical plating wastes, acids, chemicals, and heavy metals. Wastes from three of the plants are identified by the Ohio EPA as being particularly harmful.

The Rochelle Plating plant on Route 558 is dumping the residue of plating wastes from heavy metals (chrome and zinc) into an unnamed tributary of the North Fork. These are very toxic materials that are exceptionally harmful to aquatic life. The Nease Chemical Company, an organic chemical company operating near Salem, is presently under a "cease and desist" order of the Ohio EPA to stop emptying its organic wastes into the Middle Fork.

The Chemline Corporation has been involved in litigation procedures for polluting the waters of the West Fork. On occasion, this company dumps pickle liquor wastes into a ponded area at a location near Route 518 just east of Highway 164. The dumping has caused conditions of high acid, high dissolved solids, and a high iron content which has resulted in several fish kills in a tributary of the West Fork as well as in the West Fork itself. Up to two days time is required for the waters of the West Fork to flush clean following one of the company's dumpings.

Improperly operating septic tanks are another pollution problem occurring at four major residential areas of the watershed. These four areas are: (1) in the vicinity of Guilford Lake, (2) northeast of Salem, (3) northwest of Lisbon, and (4) in the Calcutta area north of East Liverpool including the Grimm's Bridge settlement. Certain areas in the Pennsylvania section of the watershed are unsuitable for septic tank-tile field systems, particularly if the population density becomes high. Population densities in this area are relatively low, but as scattered residential development occurs this type of pollution is likely to result. There are no municipal waste treatment facilities in the Pennsylvania segment of the watershed. There are, however, three sewage treatment plants in this section of the basin which serve small institutions--an elementary school, a nursing home, and a church camp.

Recommended projects for the four areas in Ohio are in the process of being implemented. These projects are as follows: (1) the Guilford Lake area has a $1.1 million sewage collection and treatment system proposed, (2) the northeast Salem area has a collection system proposed which would provide for the discharge to be emptied into the existing Salem treatment plant, (3) the area northwest of Lisbon has a collection system proposed which would allow the discharge to enter the upgraded Lisbon facility, and (4) the Calcutta area has a sewage system in the preliminary planning stage. At one time, a moratorium on all development was in effect for the Calcutta area pending the construction of a sewage treatment system. This ban on building has since been modified to include only commercial development while exempting the building of homes. Disagreements among local units of government regarding financing have delayed this much needed system.

Evidence of past and present strip mining activity within the Little Beaver Creek basin and Columbiana County is rather widespread. Drainage from nearby strip mined areas is known to be entering small tributaries of the Little Beaver. Although detailed surveys to determine the extent of damage have not been conducted, it can be assumed that some deterioration of basin waters is occurring. Compared to many other areas of strip mining activity, the problem of acid mine drainage within the Little Beaver Creek basin is considered to be minimal. It is believed that the drainage emanating from the strip mined areas in the basin is either nonacidic or only lightly acidic in nature. The alkaline character of the Little Beaver's waters may also be lessening the effects of the drainage by neutralizing any acids present. Low chloride concentrations indicate that the Little Beaver and its tributaries are free of any brine discharges. The water is relatively hard and has a pH which ranges from 7.2 to 8.3. This narrow range of pH reflects the ample buffering capacity of the stream system.

The presence of silts and sediments emanating from nearby strip mined areas is causing another water quality problem more visually apparent than the presence of acid mine drainage. This problem occurs primarily because of the presence of inadequately protected and highly erodible slopes. Heavy rains during the spring and summer months often

choke and clog the channels of the smaller tributaries with silt and sediment. These materials are aesthetically displeasing and can also be harmful to fish and other aquatic life. Improved mining techniques and proper reclamation practices are needed to better control this problem.

With the possible exception of traces of heavy metals present in the water, dissolved solids in the streams of the watershed reflect the characteristics of the underlying geological formations. Copper, nickel, and zinc, although present in small concentrations, are generally indicative of the presence of industrial pollution in the watershed. Such substances occurring in the water can be generally attributed to wastes from plating and metal processing.

Chemical pesticides from agricultural applications are another contaminant that may be affecting the soils and plant and animal life (including the aquatic life) of Little Beaver Creek. However, the extent of such applications is not known and the extent of damages to the plant and animal life of the Little Beaver has not been determined.

The Ohio EPA adopted water quality standards on October 13, 1970, for the waters of the Little Beaver Creek watershed. Based on the adopted standards, the Ohio EPA is implementing and enforcing a planned program for prevention, control, and abatement of existing and any new sources of pollution of the waters within the watershed. All waters in the basin are planned to meet the minimum conditions and criteria for all applicable uses as adopted by the Ohio EPA.

The standards for stream water quality have set minimum conditions applicable to all waters at all places and at all times as follows:

1. Free from substances attributable to municipal, industrial, or other discharges, or agricultural practices that will settle to form putrescent or otherwise objectionable sludge deposits.

2. Free from floating debris, oil, scum, and other floating materials in amounts sufficient to be unsightly or deleterious.

3. Free from materials producing color, odor, or other conditions in such a degree as to create a nuisance.

4. Free from substances in concentrations or combinations which are toxic or harmful to human, animal, plant, or aquatic life.

For recreational purposes including swimming and water-skiing, the stream water quality must also meet the following standards which are

used for evaluating the conditions at any point in waters designed for such use.

> Bacteria: The fecal coliform content (either MPN or MF count) is not to exceed 200 per 100 ML as a monthly geometric mean based on not less than five samples per month; nor exceed 400 per 100 ML in more than 100 percent of all samples taken during a month.

Information presented in this section on water quality was provided by the Ohio EPA.

With the planned upgrading of existing sewage treatment plants and the construction of new treatment plants where necessary, the water quality of the Little Beaver and its tributaries should improve. Improvement will, of course, also be contingent upon adequate controls of nearby streamside industrial and residential developments on the Little Beaver Creek and its tributaries. Improvement in the environmental quality of the Little Beaver area, including greater protection of the waters of the Little Beaver, would be highly desirable for furthering the enjoyment and appreciation of this beautiful portion of Ohio for future users.

Climate

The climate in the Little Beaver Creek area is classified as continental. This type of climate is characterized by large annual and daily variations in temperature and precipitation. Weather changes occur every few days from the passage of cold or warm fronts and their associated centers of high and low pressure.

The average temperature for the three principal months of recreation activity--June, July, and August--is approximately 70 degrees. The daily range in temperature is usually greatest in late summer and least in winter. Winters are moderately cold and cloudy with January temperatures averaging below 32 degrees. Summers are generally warm and humid but hot on occasion when some daytime temperatures exceed 90 degrees. A combination of uncomfortably high temperatures and humidity is likely for one or more periods of up to a week or more during the summer months.

Precipitation varies widely from year to year; however, during normal years the mean annual precipitation is approximately 37 inches. Autumn is the driest season of the year. As is typical of much of Ohio, much of the precipitation during the winter months occurs in the form of rain. However, snowfall may fluctuate widely from the annual mean of 30.3 inches. The probable percentage of sunshine varies from about 70 percent in July to only 30 percent in December.

Geology

The geology and topography of the Little Beaver Creek basin is more diverse than that of most other drainage basins in Ohio. The upper portions of the basin have been glaciated while the lower portions have been modified by long cycles of erosion. The glaciers produced many changes not only by lowering and abrading highlands but also by reversing or modifying drainage systems. Other prominent surface features are remnants of old plains, known as peneplains, which are well developed in the unglaciated portion of the watershed.*

All consolidated rocks now appearing at the surface in the watershed are of sedimentary origin. With few exceptions, these sedimentary beds were deposited in the sea or in extensive fresh water marshes during a general subsidence in the area. Crustal movements then took place, and these newly formed rocks were slowly elevated above the level of the waters. Through weathering, this area was reduced to a low plain. This plain was later elevated and is known as the Allegheny plateau. After a long period of time, this surface in the upper portion of the watershed was greatly modified by the action of ice sheets which changed many of the original drainage lines.

Surface rocks of the Little Beaver Creek area belong to the Pottsville, Allegheny, and Conemaugh formations of the Pennsylvania system. These sedimentary rocks are composed of sandstone, shale, limestone, coal, and associated clay. Important coal beds are mined in the vicinity of Little Beaver Creek. The clay deposits formed a base from which the area's pottery industry was formed.

Due to the glacial influence, the most striking portion of the watershed is the most southerly segment. In this area, the topography is entirely due to usual erosive forces and the landscape is hilly and rugged. This part of the Allegheny plateau has been dissected by both the preglacial stream and the Little Beaver. The preglacial streams had reached the state of rather broad valleys with low and well-rounded hills when their courses were modified or changed by glacial action and the present streams formed. The Little Beaver cut a new gorge-like valley which added to the already broken character of the area.

The actual sequence and placement of glacial events is questionable. The location of the southern boundary of one lobe of the Wisconsin glaciation has been delineated; however, conflicting reports by various geologists have attributed the glacial drift which extends beyond this boundary to all four major glaciations.

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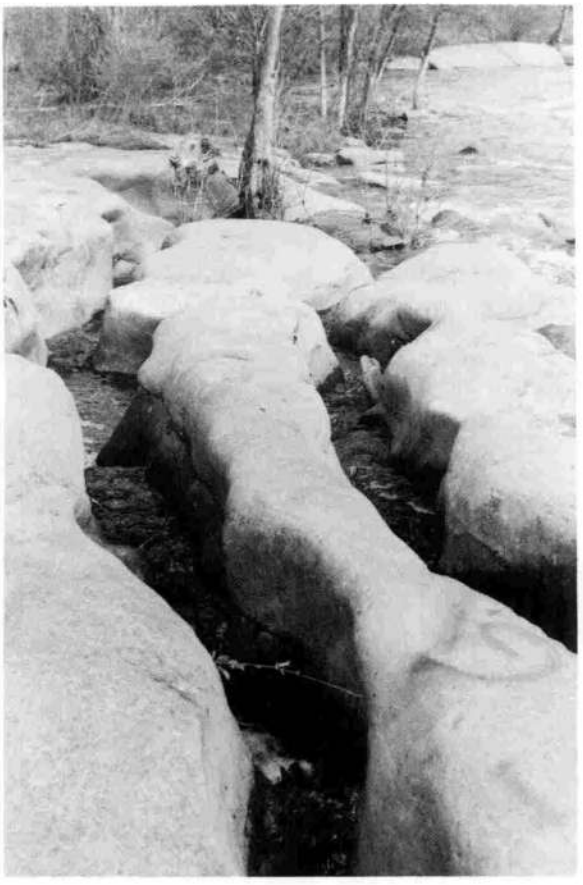
* Geological Survey of Ohio, Fourth Series, Bulletin 28, 1924.



The "flat rocks," an area of limestone bedrock on the North Fork, creates a series of waterfalls and includes some interesting formations that have been grooved and smoothed over time.

The valley of Little Beaver Creek from Williamsport to Fredericktown is generally narrow, and near Sprucevale it is constricted. The narrowness of the valley appears to be due to the presence of resistant sandstones. Whereas remnants of old gradation plains are found near Fredericktown, at Sprucevale, and east of Williamsport, it is evident that this is the route followed by the original stream. Following modification of the drainage by the glaciers, Little Beaver Creek appears to have followed closely the line of the original stream but to have greatly deepened the channel, which thus obliterated much of the evidence of the former drainage line.

From Fredericktown to the Ohio River the valley is narrow and deep, and the walls rise to heights exceeding 400 feet. Valley walls show no terracing except for the occasional outcrops of resistant sandstones.

The valley of the North Fork from Achor to Fredericktown is generally quite narrow. The strata in the walls are largely sandstones. These sandstones resist stream erosion and have had an influence in forming the shape and width of the valley.

The valley of the Middle Fork shows many modifications which suggest the work of more ancient streams. The valley suddenly contracts or expands, is bordered by remnants of old gradation plains, shows marked variations in the dissection of its walls, and in places its trend is not in symmetry with that of tributary channels. It lacks the harmony that should be expected in a valley that has been formed gradually by the processes of erosion. Along the area of the Middle Fork, as the evidence thus indicates, a preglacial stream formed a wide mature valley in which the post-glacial stream cut a narrow youthful channel.

Soils

The soils within the study area consist chiefly of the steep, stony soils on the valley walls, the nearly level to sloping soils on small stream terraces, and the nearly level soils of the floodplains. A detailed soil survey of the area is published in the Soil Survey of Columbiana County, Ohio, 1968, and each individual soil is delineated on a map published with that report.* Detailed soil interpretations are included in this publication for many land uses, including several types of recreational uses.

The study area extends from the glaciated region in the northern part into the unglaciated region in the south. Although individual differences between soils in the study area are great, only the soils of the valley walls and the valley floor are included. In the glaciated part of the area, post glacial erosion has entrenched the stream into the present valley, exposing rock strata similar to those from which the

*This map is available through the Soil Conservation Service, Columbus, Ohio.

soils on the valley walls in the unglaciated part of the area have formed. Soils on the terraces and floodplains of the valley floor formed as deposits from glacial outwash from glacial ice to the north and northwest of the study area, or more recently from stream deposition, and thus are similar throughout the study area.

The following general discussion of soils is subdivided by the major physiographic units to facilitate the presentation:

A. SOILS OF THE VALLEY WALLS--Steep, stony Dekalb soils (DsF) are dominant. They are underlain by sandstone bedrock at depths of 1.5 to 3 feet and, in many cases, extend all the way from the upper part of the valley wall to the terraces or floodplains below. Short rock cliffs and rock outcrops occur in several areas. Steep slopes, stoniness, and shallow depth to bedrock are limitations for most land uses.

   The deeper Laidag soils (LaF) occur in coves and on steep lower slopes, especially in the downstream portion of the study area. They are formed as colluvial deposits from the Dekalb soil areas above and are generally 10 to 50 feet in depth. They are cool, highly productive forest sites well adapted to a wide range of timber species.

B. SOILS OF THE STREAM TERRACES--Throughout the study area a low bench or terrace occurs intermittently just above the floodplain and below the valley wall. Several different soils have formed in the outwash deposits, among which Chili soils (ClB, ClC, ChB, ChC2) are dominant. The upper three to five feet of Chili soils are loamy material. The soil becomes sandier and more gravelly below these depths. Negley soils (NeB, NeC2, NgC2, NgD2) are similar but are more deeply weathered and more acid than Chili soils. They generally occur on slightly higher elevations than Chili soils. There are several areas of Parke soils (PkB, PkC) which are distinguished from Negley soils by the greater amount of silt present in the upper 1.5 to 3 feet layer.

   These soils are all well drained, deep, and have good permeability. They are well suited to a wide range of land uses. They are most extensive where the valley is widest, such as the areas near Achor, Williamsport, Fredericktown, and Grimms Bridge. However, several small areas occur in sections of the study area where the valley floor is very narrow such as near Sprucevale.

C. SOILS OF THE FLOODPLAINS--Chagrin and Lobdell soils, formed in deep deposits of recent alluvium, are dominant in the floodplains. These soils are silty or loamy in texture. Chagrin soils are well drained and Lobdell soils moderately well drained.

Table 2

SOIL CHARACTERISTICS AND LIMITATIONS

Soil Series and Map Symbols by Physiographic Unit	Appropriate Percent of Area	Suitability for: Farming	Suitability for: Woodlands	Degree of Erosion Hazard
A. SOILS OF THE VALLEY WALLS:	60%			
DSF - Dekalb stony loam, 20 to 50 percent slopes	45%	Unsuited	Fair	Moderate
LaF - Laidag stony loam, 20 to 35 percent slopes	10% 55% 1/	Unsuited	Very good	Severe
B. SOILS OF THE STREAM TERRACES:	15%			
ClB - Chili loam, 2 to 5 percent slopes	4%	Good 2/	Good	Slight
ChC2 - Chili gravelly loam, 5 to 10 percent slopes, moderately eroded	4%	Fair 2/	Good	Moderate
NeC2 - Negley gravelly loam, 5 to 10 percent slopes, moderately eroded	3% 11% 1/	Fair 2/	Good	Moderate
C. SOILS OF THE FLOODPLAINS:	25%			
Ce - Chagrin loam	17%	Good 2/	Good	Slight
Ld - Lobdell silt loam	6% 23% 1/	Good 2/	Good	Slight

1/ Total of percentage estimates less than 100% because minor soils excluded.

2/ Some areas inaccessible to farm machinery due to steep slopes or stream nearby.

Source: Soil Conservation Service, Columbus, Ohio

Table 2 (Continued)

SOIL CHARACTERISTICS AND LIMITATIONS

SOIL SERIES	Degree and Kind of Soil Limitations for: Homesite[3]	On-Site Sewage Disposal	Campsites	Park and Picnic Areas	Paths and Trails
A. SOILS OF VALLEY WALLS					
DsF	Severe: steep slopes, depth to bedrock, stoniness	Severe: depth to bedrock steep slopes	Severe: steep slopes, stoniness	Severe: steep slopes, stoniness	Moderate: stoniness, steep slopes erosion hazard
LaF	Moderate to severe: steep slopes, stoniness	Severe: steep slopes	Severe: Steep slopes, stoniness	Severe: steep slopes stoniness	Moderate: stoniness, erosion hazard
B. SOILS OF STREAM TERRACES					
ClB	Slight	Slight[4]	Slight	Slight	Slight
ChC2	Slight	Slight[4]	Moderate: gravelly surface soil	Slight	Slight
NeC2	Slight	Slight[4]	Moderate: gravelly	Slight	Slight
C. SOILS OF FLOODPLAINS					
Ce	Severe: flooding	Severe: flooding	Severe: flooding	Moderate: flooding	Moderate: flooding
Ld	Severe: flooding	Severe: flooding	Severe: flooding,	Severe: flooding soil wetness	Moderate: flooding

3/ Ratings also apply to low recreation structures.
4/ Possible contamination of nearby ground water due to porous substratum.

Source: Soil Conservation Service, Columbus, Ohio

The flood hazard severely limits these soils for many land uses. By their nature they would have a wide range of potential uses if flooding were prevented or if the use were limited to parts of the year when flooding was less likely.

Table 2 illustrates the suitability of the soils for supporting farm use and woodlands, the degree of erosion hazard, and the degree and kind of soil limitations for homesites, on-site sewage disposal, campsites, parks and public areas, and paths and trails for each of the dominant soils in the study area. The approximate percentage that each soil represents of the total study area is also given.

In general, the soils of the stream terraces provide the best sites for homes or recreation structures, on-site sewage disposal, campsites, and picnic areas within the study area. The steep valley walls could in some areas be used for scenic paths and trails if these could be constructed to follow a given contour. Adequate provisions would also have to be taken to control erosion.

The soils of the stream terraces have one essential limitation. They have porous sandy or gravelly substrata which might permit effluent from septic tanks to contaminate nearby streams or groundwater. For this reason, vault type toilets rather than septic tanks should be used.

In summary, the soils in the study area have a wide range of properties which have a pronounced influence on their suitability for the anticipated land uses. By their nature, soils of the valley walls and the valley floor are definitely limited in their capability to provide sites for recreation development and to support recreation use. The published detailed soil survey maps and additional field surveys can guide in the selection of sites for specific uses.

Flora

The flora of the Little Beaver Creek watershed is richly abundant and extremely diverse. Extremes in topography and microclimatic conditions have resulted in the great variety of plant life which abounds in the region. To date, 62 species of trees and 164 species of wildflowers have been identified by the Ohio Department of Natural Resources. This diversity can be attributed to a variety of influence, but none more significant than that of the area's glacial history.

In the headwaters of the Little Beaver, the land is relatively flat with open farmlands. Here, scattered woodlots are primarily beech-maple associations with some white ash, tulip tree, elm, and hickory. Along the river the vegetative cover is sparse, often restricted to a thin, narrow band of maples, sycamore, box elder, willow, and cottonwood.

Tulip tree

Smooth sumac

found along the Little Beaver.

White baneberry

Moccasin flower

As the river flows south, the landscape becomes more gently rolling and somewhat hilly. Forested lands become more abundant, especially on the hillsides in the vicinity of the river. The forest association is primarily mixed mesophytic with beech, maple, white ash, elm, and hickory predominating on the poorly drained soils and the black, red, and white oaks dominating the shallow, better drained soils.

As the hills and gorges become more pronounced in the central and southern reaches of the river, vegetative differences become even more apparent. On the cool, moist, north-facing slopes, northern relic plants such as hemlock, black cherry, yellow birch, and Canada yew predominate. White oak, red oak, shagback hickory, and basswood are also common in the gorges. The south-facing slopes are considerably drier with oaks, elms, ash, tulip tree, and black cherry being the dominant species.

In the bottomlands and along the old canal tow paths, mostly sycamore, silver maple, box elder, elm, black walnut, basswood, and pawpaw occur. Occasionally, elders are abundant in the bottoms.

On the ridges, which are drier and thin soiled, typical Appalachian flora occur. Here, chestnut oak and other oaks predominate with mountain laurel, blueberry, trailing arbutus, rattlesnake plantain, and pink ladyslippers, scattered in locations.

Within the state park, extensive plantings of red and white pine and black locust occur on lands which were previously farmed or strip mined in the vicinity of the river.

The most extensive and least disturbed areas of the forest occur in the rugged terrain and deep gorge areas in the southern part of the watershed. Botanically, this area is the most outstanding. Here, large-flowered trillium, red trillium, bloodroot, Dutchman's breeches, and bellwort lavishly abound on the rocky slopes during the spring. In the summer, monkey flower, blue lobelia, sneezeweed, jewelweed, lizardtail, water willow, and many species of the composite family occur along the river-bottoms.

Near the mouth of Little Beaver Creek and not far from the stream bed, several clearings have begun to revert to trees. Black locust, elm, black cherry, and hawthorne are the principal pioneer tree species. However, sumac, blackberry, and grape vines are also encroaching on the clearings.

In the past, elm has been the dominant species for several hundred feet back from the main stream channel, not only in number but also in tree size. However, in recent years many of these elms have died, apparently the victims of Dutch elm disease. Many of those now alive are not expected to survive. Stinging nettle and poison ivy, each in the pest plant category, are found along the Little Beaver corridor and are plants to be avoided.

The Ohio Biological Survey lists three unique natural areas occurring adjacent to or in the vicinity of the river. These are noteworthy for their geological and botanical significance and include Laurel Ridge and Purgatory Hollow on the main stem and Beaver High School Gorge on the West Fork.

Fauna

Little Beaver Creek and its tributaries, with the excellent habitat surrounding the streams, provide an environment supporting an impressive array of fish and wildlife. Sixty-three species of fish have been recorded in watershed streams (Appendix 1). A significant fishery exists for smallmouth bass, largemouth bass, channel catfish, flathead catfish, rockbass, white crappie, bluegills, and suckers.

Tributary streams of the Little Beaver are among only several in Ohio which provide water cold and clear enough for trout releases. However, summer water temperatures become too high to sustain adequate reproduction and permanent populations of trout. In the past, watershed streams have been stocked with trout and occasionally anglers land larger mature fish which have managed to survive through the years. The Pennsylvania Fish Commission stocks trout both prior to and during the season in the North Fork in Beaver and Lawrence Counties. The Ohio Division of Wildlife has stocked trout in watershed streams in the past.

Lesser known members of the aquatic community are the mollusks and crustaceans. The freshwater bivalve mollusks known as clams, mussels, or naiads are becoming increasingly important as a research tool. They are highly sensitive to water quality conditions and their longevity (5 to 60 years) enables them to reflect certain stream conditions over a long period of time. Water pollution and dam construction are the major factors contributing to the depletion of these stream-dwelling animals. According to reputable sources, mussel populations have rapidly decreased in recent years in the Ohio River system. Of the 70 species of mussels found in Ohio, 11 species were collected in 1969 in a section of Little Beaver Creek in the vicinity of Beaver Creek State Park. Still unclassified collections should account for additional species. Crayfish and snails are plentiful in the watershed, particularly along the West Fork.

Reptiles and amphibians are numerous in the Little Beaver Creek watershed. Included are 14 species of snakes; at least six species of turtles; 11 species of frogs and toads, of which the woodfrog is unusually abundant; and 13 species of salamanders including the hellbender and mudpuppy. The fence lizard and ground skunk are also found in the study area. The poisonous northern copperhead is occasionally found in the watershed.

A total of 49 species of mammals occur in the watershed. One of the most interesting mammals, the beaver, is well established. This has not always been the case. By 1830, the beaver was nearly exterminated in Ohio, primarily due to excessive trapping. Beaver reappeared in Columbiana County in 1947, and since that time their numbers have steadily increased under management by the Ohio Division of Wildlife. In Columbiana County in 1969 there were 50 colonies including 250 beavers, the fourth highest county population in Ohio. Most of the beaver in the study area are streambank den-dwellers, with lodge-dwelling beaver appearing more often in the upper drainage areas of Columbiana and Mahoning counties. Beaver trapping seasons are designed to maintain stable populations. A number of beaver slides can be seen leading up the forested hillsides from Little Beaver Creek and its tributaries.

Good populations of mink, muskrat, oppossum, weasel, fox, and raccoon occur in the watershed. Trapping of these furbearers is considered comparatively heavy, particularly for beaver, muskrat, mink, raccoon, and foxes.

Signs of beaver, such as this gnawed tree, are not uncommon along the Little Beaver.

Populations of cottontail rabbits are considered medium for the entire watershed. Cottontails are more abundant on watershed areas outside of the study area on fertile land where small fields of grain and hay occur intermingled with brush fence rows, woodlots, and similar types of cover.

Squirrel populations occur in varying numbers in the study area. The gray squirrel is the principal species in the denser forests which tend to characterize much of the study area. Fox squirrels can be found; however, they are more common in the scattered woodlots of predominantly agricultural areas.

White-tailed deer are frequently seen along Little Beaver Creek.

Another interesting and important mammal in the watershed is the white-tailed deer. Due to the excessive harvest and habitat destruction, the whitetail was virtually eliminated in Ohio by 1904. In the early 1930's, deer from Pennsylvania migrated to northeastern Ohio. This migration of deer was augmented through a restocking program of the Ohio Division of Wildlife. The Little Beaver Creek watershed contains an estimated number of deer ranging from 26 to 99 animals per township, and this number is probably increasing. Some of the best deer populations in Columbiana County are located in the area of Beaver Creek State Park.

The Indiana bat, Myotis sodalis, ranges through the Eastern and Midwestern United States, including the Little Beaver Creek area, and is an "endangered" native wildlife species, as determined by the Secretary of the Interior.

The Little Beaver Creek watershed supports an outstanding variety of bird life. A total of 269 species use the area on an annual basis. Of this total, 33 species are considered year-round residents; 140 species migrate through and sometimes nest in the watershed; and 96 species migrate through the watershed. Of the 42 primary species of warblers found east of the Rocky Mountains, 37 use the Little Beaver Creek watershed during migrations, of which at least 11 are thought to nest. Twelve species of sparrows use the watershed, of which ten are thought to nest.

Several significant birds of prey range in or near the Little Beaver Creek area. The Little Beaver Creek watershed lies within the migration route and close to the northern limit of the winter range of the Arctic Peregrine Falcon, Falco peregrinus tundrius, classified by the Secretary of the Interior as an "endangered" native wildlife

species.* Another interesting bird of prey, the American osprey, Pandion haliaetus carolinensis, migrates through the Little Beaver watershed and is listed as a "status undetermined" species by the U. S. Fish and Wildlife Service.** During the course of the study, sightings of osprey were made by members of the study team at the following times and locations:

September 21, 1971--One bird seen in the area west of Fredericktown.
May 1, 1973--Two birds seen in the area west of Fredericktown.
May 2, 1973--Two birds seen on the North Fork near Fredericktown. One bird seen on the main stem below Fredericktown.

The sightings in 1973 indicate the possibility that at least one pair of osprey was nesting in the vicinity of Fredericktown.

Wild turkey have been sighted in the study area near Fredericktown, an area that is heavily forested. These birds probably migrated from Pennsylvania. With protection of the existing forest habitat, turkeys can be expected to survive and reproduce.

The ruffed grouse is native to Ohio forests, presently inhabiting the woodland areas of northeastern glaciated Ohio and southeastern unglaciated Ohio. For the most part, these birds are annual residents, and good populations inhabit the forested areas of the watershed. During walks through the forested valleys of the study area, ruffed grouse can often be seen or heard.

The bobwhite quail occurs in the watershed in varying numbers. Populations are highest in the upper watershed where a good mix of diversified agricultural type habitat exists.

Ring-necked pheasants generally are not well represented in the Little Beaver Creek Basin. Some of the better populations exist to the west of the study area. These birds do best on intensively farmed areas where there is adequate nesting and winter cover. Some pheasants have been observed in the study area on agricultural lands and around old strip mine areas where vegetation was opened up and allowed to revert to early plant stages.

Mourning doves are fairly abundant, particularly in the more agricultural areas of the watershed, and are protected from hunting.

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* "United States List of Endangered Fish and Wildlife," Federal Register, Vol, 38, No. 106--June 4, 1973.

** "Threatened Wildlife of the United States," Resource Publication 114, March 1973, Bureau of Sport Fisheries and Wildlife.

Two of the Little Beaver's interesting bird species.

Wood thrush

Broadwinged hawk

The great blue heron, second largest wading bird found in the northern states, is a relatively common sight for river users. These great birds have adapted well within the primitive valley of Little Beaver Creek and probably nest in the area; however, the great blue rarely winters in the valley.

The northern pileated woodpecker, a very striking and interesting species of woodpecker, is reputed to be common in some portions of the Little Beaver Creek area.

Other than Guilford Lake State Reserve and an area on the Middle Fork north of Butcher Road near Greenford, extensive wetlands are not present in the watershed. The watershed streams and those adjoining wetland strips are not especially important as waterfowl areas although the attractive wood duck is a common nester on tree-lined streams such as these. Some scattered nesting of the black duck and mallard has occurred in the Salem area on the Middle Fork. Waterfowl hunters in the basin tend to concentrate primarily on the wood duck and to a lesser extent on the green-winged teal, blue-winged teal, and the baldpate.

No specific fish and wildlife areas are located in the Little Beaver watershed, although a small portion of the 2,106-acre Highlandtown Wildlife Area drains into a tributary of the West Fork. This wildlife area is located about eight miles southwest of the confluence of the West and Middle Forks of the Little Beaver.

Today, the Little Beaver Creek stream system and surrounding valley contains some of the wildest and most scenic areas in Ohio. The plant and animal life of the area are diverse and interesting. The reintroduction of once eradicated wildlife such as beaver and the wild turkey combined with the returning forest cover on each side of the river makes the lower section of Little Beaver Creek much the same as when the earliest European settlers arrived in the valley. This environment provides outstanding opportunities for nature interpretive purposes (education and recreation) in conjunction with compatible hunting and fishing use.

History and Archaeology

The story of man in the Little Beaver Creek valley is one that can be traced back as far as the Ice Age. Most evidence of earlier habitation has been erased by the effects of glaciation.

Although early archaeological findings are very limited, there is evidence that various cultures lived in and near the Little Beaver valley as far back as 10,000 years ago. At a site below Fredericktown,

fluted points and other contemporary artifacts have been found in sufficient quantity to cause it to be listed as a Paleo-Indian site by the Carnegie Museum in Pittsburgh. Several fluted projectile points similar to those found at Clovis and Folsom, New Mexico, have been found in the Little Beaver valley. These points have been found in association with extinct animal bones and have been tested to show their age to be about 10,000 years.

The earliest known inhabitants were nomadic, living in small groups, pursuing games and gathering wild plants. Little is known about the origin, culture, and fate of these earliest inhabitants. It is probable that 5,000 to 6,000 years ago these Paleo-Indian hunters discovered the mussel beds in the Ohio and its tributaries which provided an abundant year-round food source and ultimately led to a more settled way of life.

Several types of projectile points, pottery, and other artifacts which correspond to the later Woodland cultures that inhabited the upper Ohio River valley from 2,000 years ago to historic times are quite plentiful throughout the Little Beaver Creek area. Numerous stone caves and rock shelters in the cliffs beside Little Beaver Creek have been excavated and screened and found to contain prehistoric pottery, flint, and bone relics. Fine displays of these artifacts may be seen in three museums in Columbiana County, the Ohio Hills Indian Museum near Wellsville, the East Liverpool Museum, and the Fort Tuscarora Museum near Guilford Lake.

A striking example of early man's habitation is found on the bedrock of the Ohio River at the mouth of Little Beaver Creek where there are numerous petroglyphs. George Washington and early explorers who passed this point referred to it as the Indian Rocks, and it was a landmark for those seeking the frontier of Virginia or Pennsylvania, as they were within a mile of the "territory north and west of the River Ohio." Several acres of rocks are carved with the images of thunderbirds, snakes, men, turtles, geometric designs, animal tracks, arrows, and many other subjects. Very little research has been done on these carvings. Further study of the petroglyphs may yield much more knowledge of early man's life in the valley. The carvings were visible most of the time until the Ohio River was controlled by dams in the 1920's, and they were inundated. Even so, during periods of low water, in 1948 and again in 1958, the carvings were exposed and were seen by thousands of people. Before they were inundated, transfer likenesses of these carvings were made and are on file in the museum in East Liverpool.

On top of Painter's Knob near Cannelton, Pennsylvania (about four miles east of Negley), beside the North Fork of the Little Beaver there is a large granite boulder with prehistoric carvings resembling a human head with eyes, nose, and mouth which are depressed in the rock and which were probably used as mortars to grind grain. A drawing of a slant-eyed

person was found in the Campbell Cave on Long's Run, a tributary of Little Beaver Creek, suggesting the artist may have been of Oriental origin. It is now at the Ohio Hills Indian Museum.

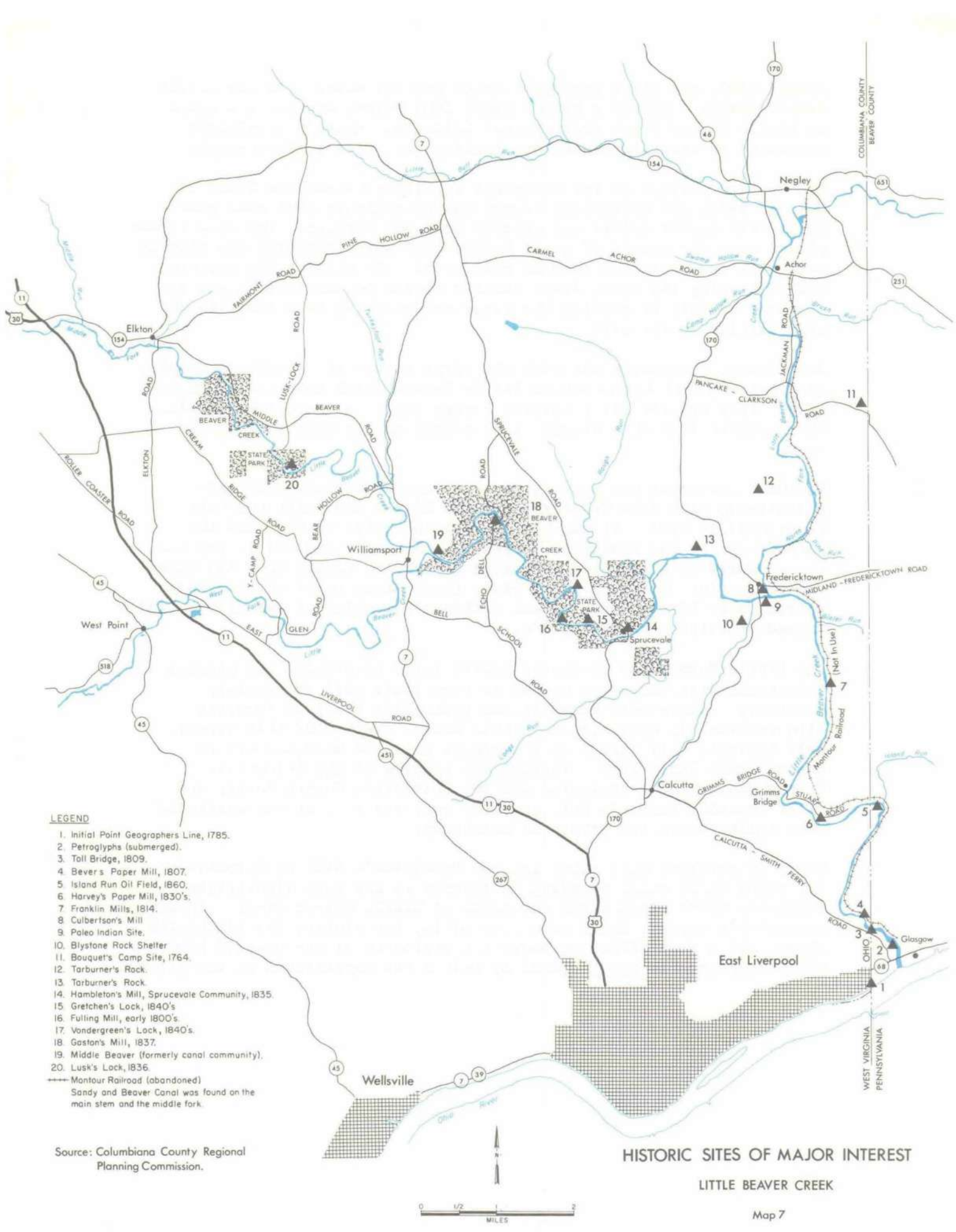
The Senecas claimed this area after they had destroyed the mighty Erie nation near Erie, Pennsylvania, in the 1650's; however, they permitted the Delawares, Mingos, Wyandots, Shawnees, and other displaced Indians to live in the area. The Delawares were the most numerous of local Indians in historic times.

The journal of Colonel James Smith, who was taken prisoner by Indians in 1755 while on his way to join the ill-fated Braddock expedition, tells of his being adopted by the Caughnewaga tribe. They brought him on a beaver hunting expedition to a pond at the headwaters of Little Beaver Creek in the winter of 1756-1757. This was presumably Beaver Lake, at the head of Bull Creek on the North Fork.

The last encampment of Indians known to have occurred in Columbiana County was in 1812 when they camped near the Bear Cave, where Cold Run enters the West Fork of Little Beaver Creek. Following this, only small hunting parties passed through the area.

The first European men appeared on the scene more than two centuries ago when they blazed the Great Trail across the Little Beaver Valley. This trail, often called the Tuscarawas Path, crossed the North Fork at Middleton Township. It led from Pittsburgh to the old Town of Tuscarawas on the Tuscarawas River near what is now the Town of Bolivar, and eventually to Detroit. The Moravian Trail also crossed the Little Beaver valley, south of the Great Trail, leading to the Moravian Mission towns on the Tuscarawas. Most of the great early explorers and soldiers crossed the Northwest Territory by way of these trails. The names of some who have included the area in their journals are Christopher Gist, Colonel Henry Bouquet, Major Rob Rogers, General Lachlan MacIntosh, and many others.

Thomas Hutchins, the first Geographer General of the United States, was directed in 1785 by President George Washington to commence the U. S. Public Land Survey at a point near the mouth of Little Beaver Creek. At the southeast corner of East Liverpool and the eastern corner of the old Northwest Territory, a monument indicates the common boundary between the states of Virginia and Pennsylvania. It turned out to be the greatest subdivision on earth and the first time that land was surveyed before it was sold. This survey inaugurated the use of the rectangular land survey system which resulted from the Ordinance of 1785 "for ascertaining the mode of disposing of lands in the western territory." The system was accurate and convenient and has been utilized since that time in surveying the millions of acres of land making up the 31 states created out of the public domain. The starting point of the original survey is now a National Historic Landmark.


LEGEND
1. Initial Point Geographers Line, 1785.
2. Petroglyphs (submerged).
3. Toll Bridge, 1809.
4. Bever's Paper Mill, 1807.
5. Island Run Oil Field, 1860.
6. Harvey's Paper Mill, 1830's.
7. Franklin Mills, 1814.
8. Culbertson's Mill
9. Paleo Indian Site.
10. Blystone Rock Shelter
11. Bouquet's Camp Site, 1764.
12. Tarburner's Rock.
13. Tarburner's Rock.
14. Hambleton's Mill, Sprucevale Community, 1835.
15. Gretchen's Lock, 1840's
16. Fulling Mill, early 1800's.
17. Vondergreen's Lock, 1840's.
18. Gaston's Mill, 1837.
19. Middle Beaver (formerly canal community).
20. Lusk's Lock, 1836.
++++ Montour Railroad (abandoned)
Sandy and Beaver Canal was found on the main stem and the middle fork.
Source: Columbiana County Regional Planning Commission.
HISTORIC SITES OF MAJOR INTEREST
LITTLE BEAVER CREEK
Map 7
Elkton
Negley
Achor
Fredericktown
Williamsport
West Point
Sprucevale
Calcutta
Grimms Bridge
Glasgow
East Liverpool
Wellsville
Beaver Creek State Park
COLUMBIANA COUNTY
BEAVER COUNTY
WEST VIRGINIA
PENNSYLVANIA
OHIO
Ohio River
Little Beaver Creek
Middle Fork
West Fork
Montour Railroad
(Not In Use)
PINE HOLLOW ROAD
CARMEL ACHOR ROAD
FAIRMONT ROAD
LUSK-LOCK ROAD
BEAVER ROAD
MIDDLE BEAVER CREEK
CREAM RIDGE ROAD
ROLLER COASTER ROAD
ELKTON ROAD
Y-CAMP ROAD
BEAR HOLLOW ROAD
SPRUCEVALE ROAD
DELL ECHO ROAD
BELL SCHOOL ROAD
EAST GLEN ROAD
LIVERPOOL ROAD
PANCAKE - CLARKSON ROAD
JACKMAN ROAD
MIDLAND - FREDERICKTOWN ROAD
GRIMMS BRIDGE ROAD
STUART ROAD
CALCUTTA - SMITH FERRY ROAD
0 1/2 1 2
MILES

Around 1790, the first permanent white settler moved into the Little Beaver valley. He was a hunter named John Quinn, who built a cabin on Little Beaver Creek near present Calcutta. Quinn's livelihood consisted of trapping beaver and hauling the pelts to Pittsburgh.

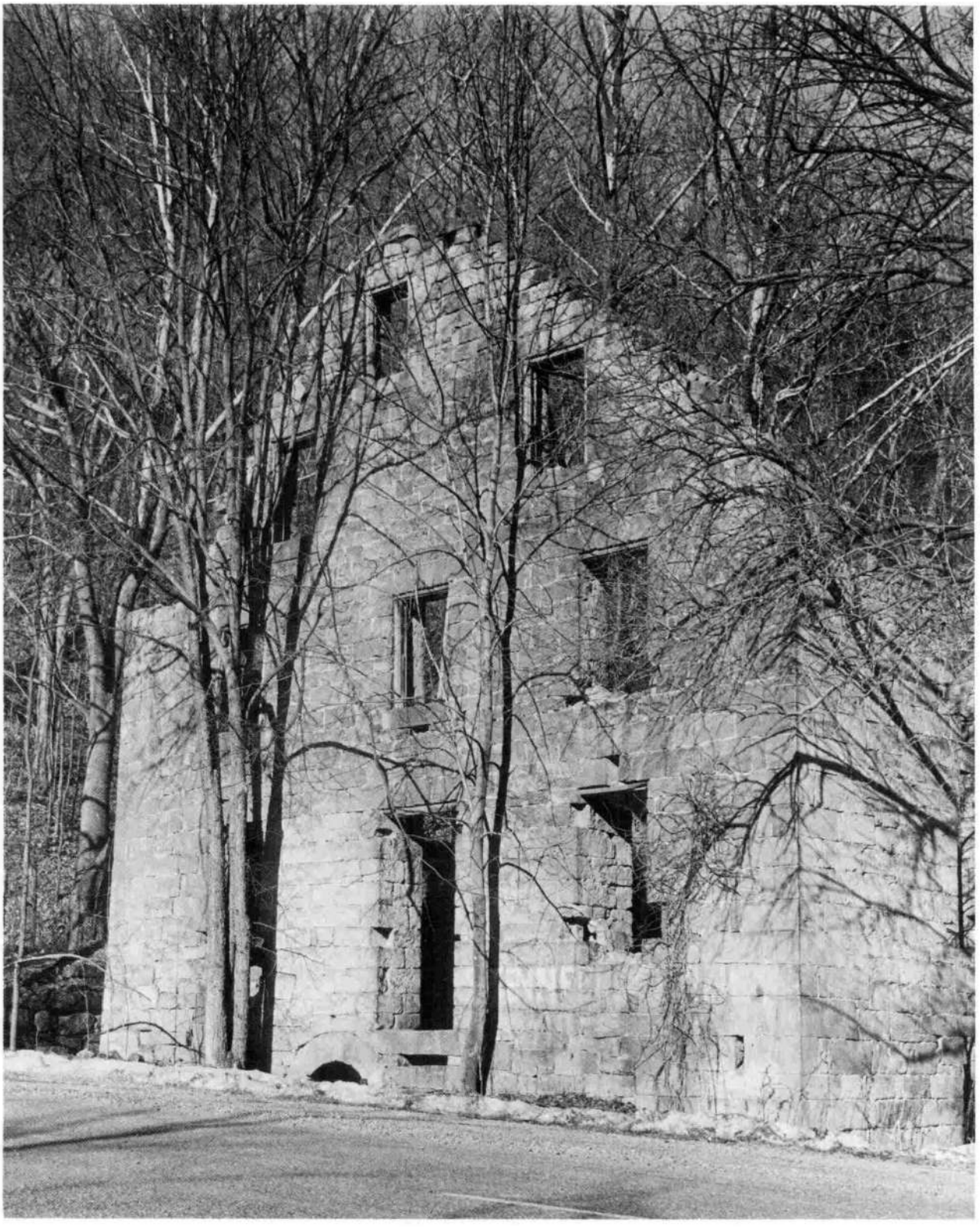
The eastern portion of the Northwest Territory became the State of Ohio in 1803, and Columbiana County was established that same year. The Little Beaver valley was quickly sold and settled. The wide floodplains were the result of great beaver dams which gathered the silt of centuries and deposited them as bottomland. By killing the beavers and destroying the dams, large cleared fields became fertile and productive, capable of feeding the large hard-working farm families who soon settled in the area.

John Bever, a surveyor who made the first survey of Columbiana County, also built a toll bridge across Little Beaver Creek near its mouth in 1809. This was the first covered bridge built in the State of Ohio. The abutment from this bridge still stands on the west bank of the creek.

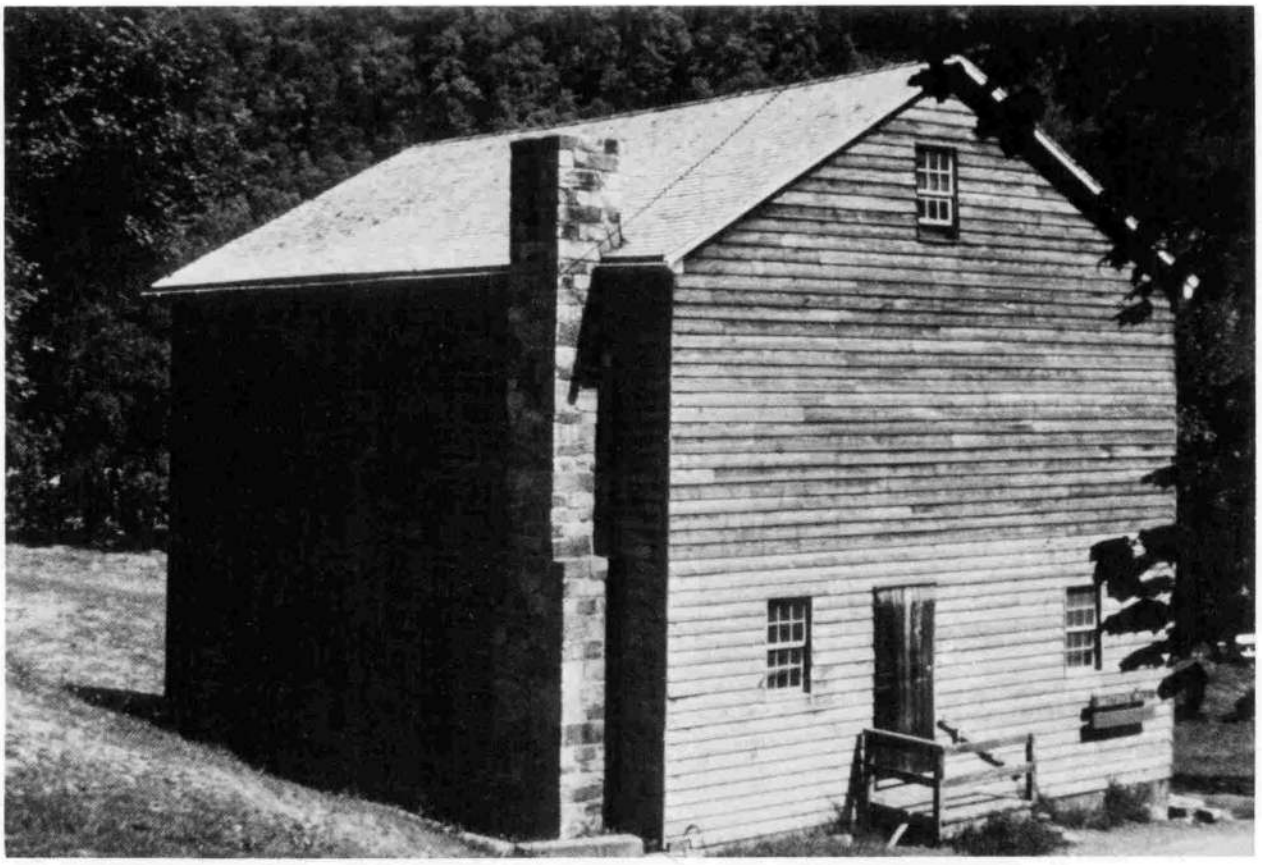
The need for paper was urgent, and the same John Bever went into partnership with John Coulter and Jacob Bowman and built the Ohio Paper Mill in 1807. It was the first to be built in Ohio and the second west of the Allegheny Mountains. The mill and bridge are now commemorated on a historic marker on Columbiana County Road 430 above the mill ruin. Within a short time, three other paper mills were in operation on Little Beaver Creek within a few miles of the first. All ceased operations by the 1850's.

The Little Beaver was an energy source ready to provide the pioneer industries with the power needed to turn their mill and factory machinery. There were sawmills and gristmills and iron furnaces with waterwheels operating on Little Beaver Creek. Of this number, only Gaston's Mill stands as a reminder near the headquarters of Beaver Creek State Park. Through the efforts of the Columbiana County Historical Association and the Columbiana County Forest and Parks Council, Gaston's Mill has been restored so that the waterwheel once again powers the gristmill machinery.

Other interesting mill ruins include Hambleton's Mill at Sprucevale; its stone walls still standing to testify to the once flourishing community which stood along the banks of Little Beaver Creek. In the community's heyday, there were five mills, two stores, two blacksmith shops, and a post office to serve the residents of the hundred homes whose existence is now depicted by only a few depressions in the ground.



Standing on the north bank of the main stem at the site of the old settlement of Sprucevale is Hambleton's Mill, the last remaining structure of that former settlement.



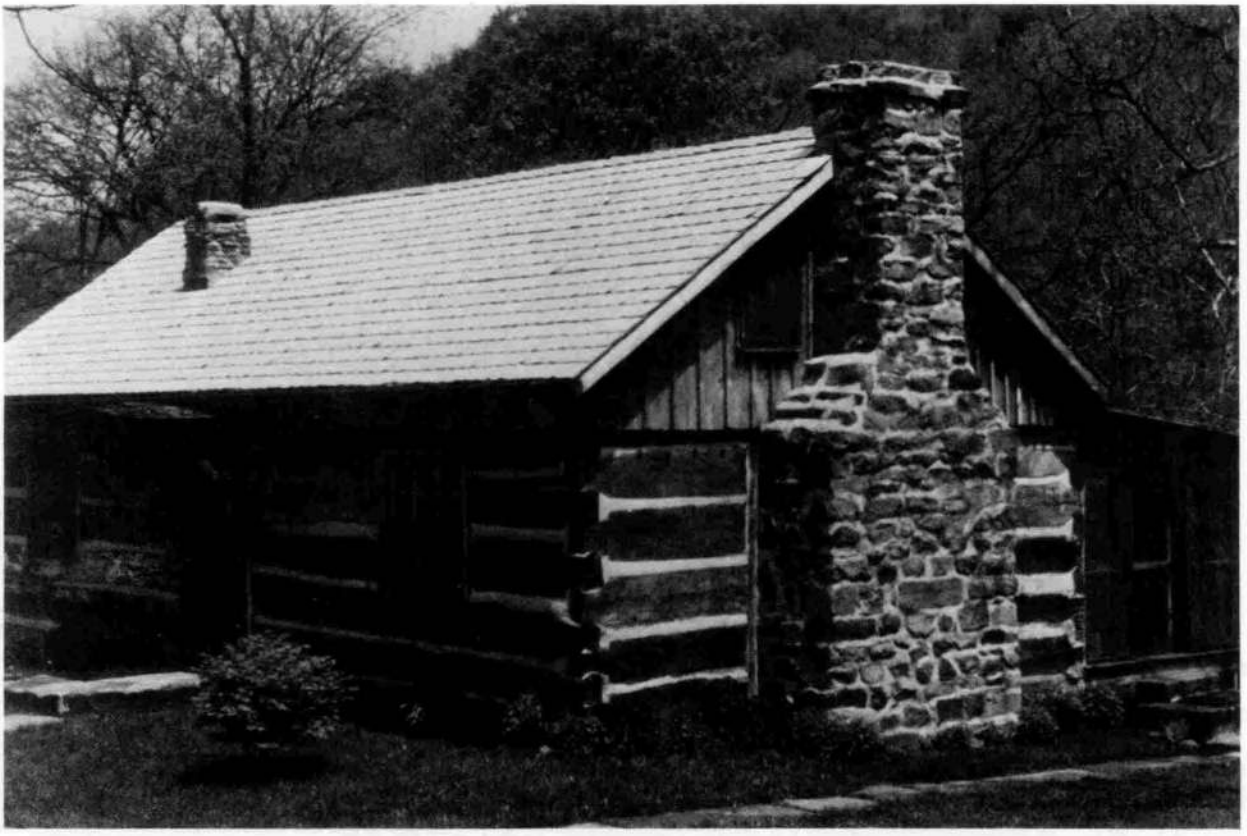
Gaston's Mill at Beaver Creek State Park has been restored at its original location through the efforts of private interests.

The basement walls of Culbertson's gristmill still stand beside the North Fork just above the point where the North Fork meets the main stem of Little Beaver Creek at Fredericktown.

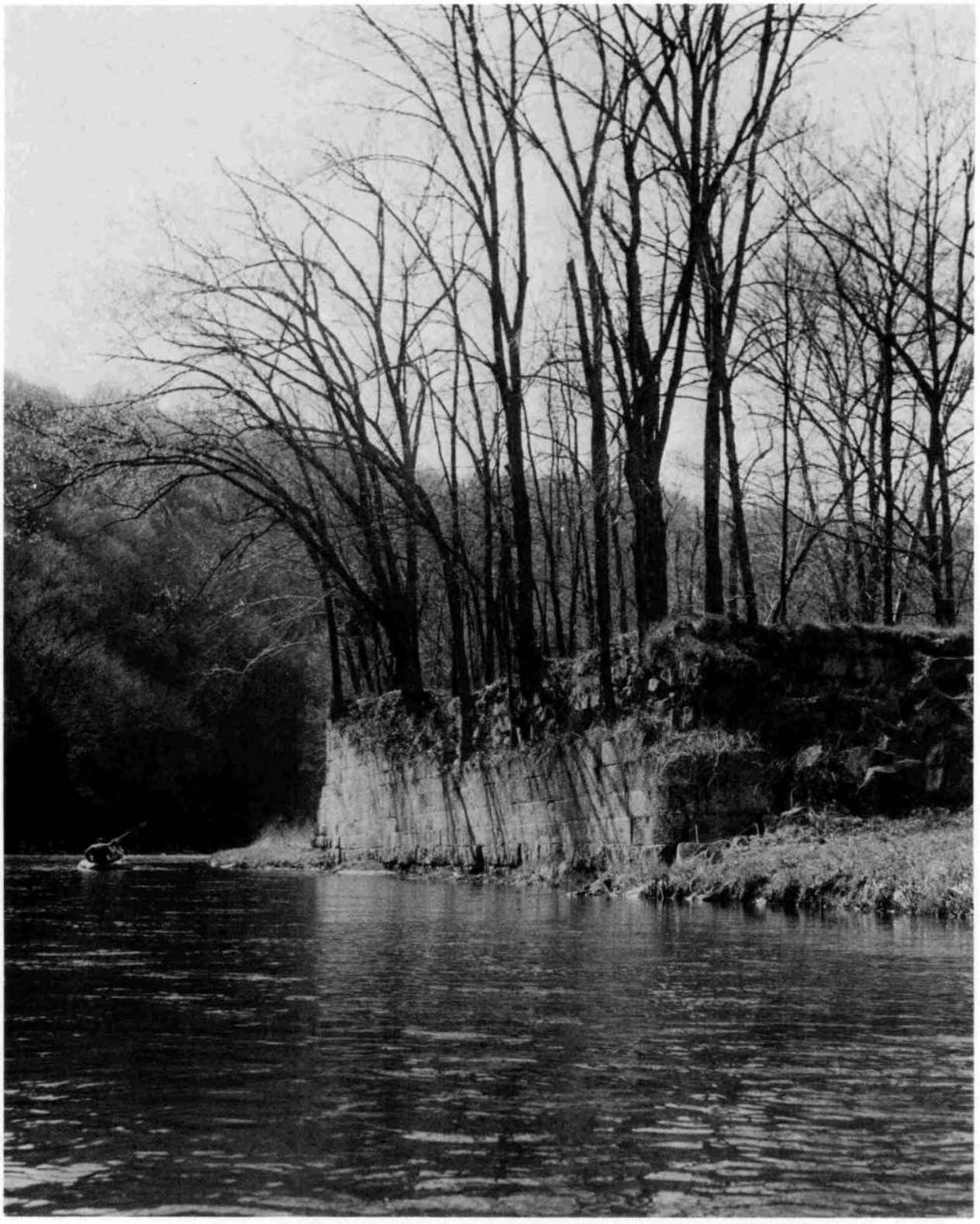
The first brick kiln in Columbiana County was built in 1806. Within a short time the local clay was found to be excellent for pottery and many red ware potteries sprang up. Most china and glassware did not survive the journey from the east over the rough wagon trails through mountainous terrain. Much of the pewter that was brought west found its way into the bullet ladle to form bullets for the settlers' muskets and long rifles. These factors created a ready market for the products of the many potteries that were operating in Columbiana County.

Fredericktown is a small pioneer community more than a century and a half old. Most of its existing structures are original and still in place. To supplement this heritage, William H. Vodrey, Jr., Director of the Vodrey Trust, has an on-going program to restore some of the interesting features which time has erased. In the past few years, he has restored an octagonal general store, a one-room school house, a log cabin, a canal lock, and a number of other structures.

Looking south from the bridge crossing over the North Fork at Fredericktown down to its confluence with the main stem.



Some of the pleasant scenes found along the west bank of the North Fork at Fredericktown.



Above Sprucevale in Beaver Creek State Park is Gretchen's Lock, named after the daughter of one of the construction engineers of the old Sandy and Beaver Canal System.

The abundance of grain and the shortage of cash in the Little Beaver area in pioneer times led to much of the grain being converted into whiskey worth 25 cents per gallon. There were 68 known distilleries in Columbiana County at one time. The industry never ceased completely during prohibition and actually thrived around Fredericktown. A road house stood near the mouth of the Little Beaver during the roaring twenties. Half of it was located in Ohio with the other half in Pennsylvania so that the stock could be shifted quickly when a raid was imminent. The common name for this place was "Hell's Half Acre," a rendezvous for gangsters and the scene of at least one killing. It was generally thought that this was where "Pretty Boy" Floyd was headed for in the fall of 1934 when law officers caught up with him near Sprucevale and shot him.

The combination of rich agricultural lands and the rapidly growing industry of the area resulted in the need for a better system of exporting agricultural products and importing the goods needed to support the growing industries. In recognition of this problem, in 1822 the Ohio Legislature passed a resolution endorsing a system of canals in Ohio. In 1828 the Legislature voted to charter the Sandy and Beaver Canal Company with headquarters in New Lisbon. The main purpose of the canal was to connect the Ohio River to other Ohio and Pennsylvania canal systems. Construction on the canal started in 1834, and the first boat passed through it in 1848, barely meeting the requirements of the charter which required that a boat pass through the canal within 20 years or it would be voided. When completed, the canal was 73-1/2 miles long, with 30 dams and 90 locks. It passed through two tunnels and over a wooden aqueduct and connected the Ohio Canal at Bolivar in Tuscarawas County, Ohio, with the Ohio River at Glasgow, Pennsylvania. There were more than 50 canal locks along the lower Little Beaver and the Middle Fork. Although the canal was heavily used during 1850 and 1851, it was damaged by a flood in April 1852. The last use of the canal occurred early in the year during the dry summer of 1854. Competition from the Cleveland and Pittsburgh Railroad and the flood which washed out the Cold Run Reservoir caused the canal to fail. For the most part, the stone locks in the Little Beaver valley have not been destroyed by progress and the remains of several locks may be seen along the river. In its day, Lusks Lock was considered to be one of the finest canal locks in existence. It still stands beside the creek in remarkably good condition, giving silent testimony to the craftsmanship that went into its construction.

In the summer of 1863, General John Hunt Morgan, the Confederate raider, set out to invade the north with 2,600 men. There were well over 100,000 Union troops in pursuit, and they finally caught up with his ragged force after he had crossed the States of Kentucky and Indiana and was well on his way toward crossing Ohio. He surrendered to Major George Rue near West Point on the West Fork of the Little Beaver. Morgan knew the stream, had relatives there, and desired to pass quietly down this valley to the

crossing place at Glasgow, Pennsylvania, at the mouth of Little Beaver Creek, when he was captured. Nevertheless, he had succeeded in leading Confederate troops farther north than any one else, and a monument by Route 518 proclaims this fact.

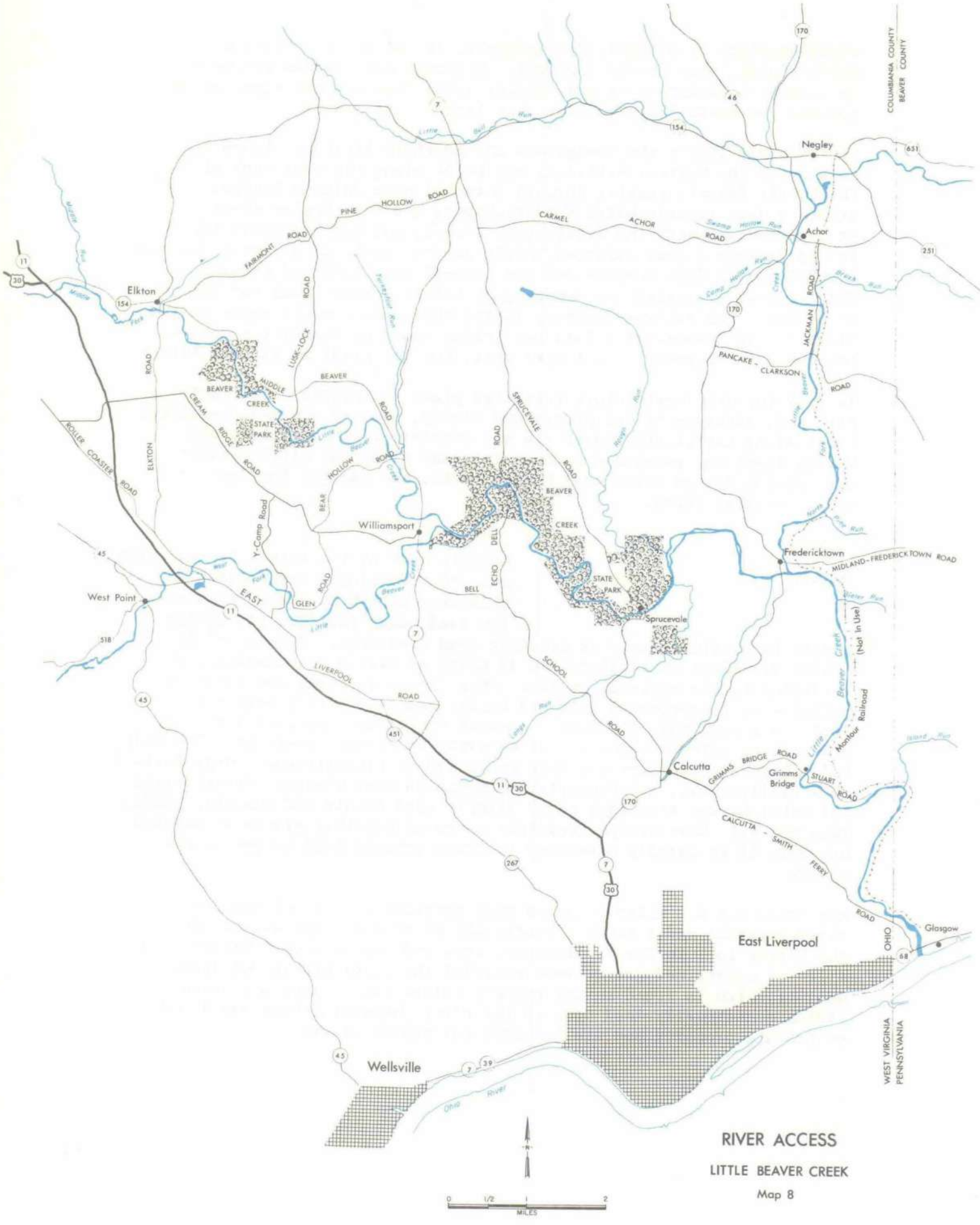
In the early 1930's the Youngstown and Southern Railroad, known locally as the Montour Railroad, was built along the east bank of the Little Beaver, passing through a tunnel near Grimm's Bridge, across a long trestle below Fredericktown, and into Negley where it made contact with the Pittsburgh, Lisbon, and Western Railroad. It was largely a coal railroad, built as the result of a lawsuit between the Pittsburgh Coal Company and the Pennsylvania Railroad Company. This lawsuit prevented the dredging of Little Beaver Creek for the use of barges. The railroad company feared that damage would occur to the piers of the Pennsylvania Railroad bridge spanning the Little Beaver. The Montour Railroad is no longer used, but the grade is largely intact.

In 1945 the Ohio Legislature initiated plans for Beaver Creek State Park and, although it has progressed slowly, some of the most beautiful lands along the Little Beaver are now preserved. In addition, the Vodrey Trust has purchased much of the land along the Little Beaver and, except for an occasional bridle trail, has managed the land in an undisturbed state.

Access

Because much of the Little Beaver study area is undeveloped and natural in character with high steep banks and few roads that parallel its course, access is available only at existing road crossings. A total of 11 bridge crossings exist along the 33 miles of stream recommended for inclusion in the national system. This figure includes one railroad bridge--the Pennsylvania Railroad bridge near the Little Beaver's confluence with the Ohio River. Access is further restricted by the presence of private lands at the majority of bridge crossings. The only major highway crossings are Ohio Route 170 at Fredericktown, Ohio Route 7 near Williamsport, and Pennsylvania Route 68 near Glasgow, Pennsylvania. All other bridge crossings serve lightly used county and township roads. (See Map 8.) Most bridge crossings serve as possible places of access; however, it is usually necessary to cross private land to get to the river.

Approximately 2.5 miles of paved road parallel within 300 feet of the river segments under study. Nearly all of this mileage occurs along the Middle Fork in the Williamsport area and near Elkton. Nearly 1.75 miles of maintained gravel road parallel the river within 300 feet, most of which is found in the Grimm's Bridge area. Jeep and horse trails occasionally lead down to the river; however, these are found on private property and are not used for public access.



RIVER ACCESS

LITTLE BEAVER CREEK

Map 8

The abandoned Montour Railroad which parallels the North Fork and the main stem of Little Beaver Creek below Fredericktown is of special interest. This line, with its rails, ties, tunnels, and bridges basically intact, can be seen only occasionally from the river. It is built well back into the bluff and has the potential to offer access to the river for hikers, fishermen, and horseback riders. At the present time, access from the railroad grade to the river is not available because lands along the river are in private ownership.

This bridge crossing at Beaver Creek State Park is one of the few areas providing easy access to Little Beaver Creek.

Publicly owned and developed access to the study segment is available primarily at three locations in Beaver Creek State Park. Trails follow portions of the river from the vicinity of the state park office and access site on Echo Dell Road and from the Sprucevale access site. A drive-in access site also exists near Lusk's Lock.

A 14-acre plot of land presently owned by the U. S. Army Corps of Engineers lies on the west bank of the Little Beaver near its mouth. This area presently serves as a take-out point for canoeists on Little Beaver Creek.

At the present time, access from private property is available along portions of the river. However, continued permission for access is not assured, particularly if recreational use expands in the future.

Land Use

For the most part land use patterns along Little Beaver Creek have changed little over the last 10 years. Land use for agricultural purposes has been an exception to this trend and has increased somewhat during this time. Changes in land use, particularly for residential purposes, might be expected to occur in the future.

In order to focus more closely on the land adjacent to the river, land use data are presented for the area considered to be within the "visual corridor" of the stream segments recommended for inclusion in the National System. The "visual corridor" is the area that could be seen from the river if there were no shoreline vegetative cover. The delineation of the "visual corridor" boundary is based on land form. There are about 6400 acres of land and nearly 360 acres of water within the "visual corridor." Present land use within this corridor is listed in Table 3 and shown on Map 9.

Agriculture

About 10 percent of the area in the "visual corridor" is used for agricultural purposes. Nearly 60 percent of the agricultural land is cropland while the remaining 40 percent is in pasture. Corn and hay are the most common crops. A variety of fruits and nuts are also grown. The pasture land supports both beef and dairy operations.

Acreages of commercial nurseries are included in the cropland figure. Shrubbery for landscaping is the principal product of these nurseries.

Present agricultural use within the "visual corridor" is generally compatible with the wild and scenic river concept and no large-scale change in this use is expected.

Forestry

Approximately 80 percent of the "visual corridor" is forested. Sixteen percent or about 850 acres of the forest lands lie within Beaver Creek State Park where they are appreciated for their aesthetic and recreational values.

There is one sawmill located near Williamsport on the Middle Fork of Little Beaver Creek. All logs processed at this mill are cut outside of the "visual corridor." Only minor evidence of tree cutting is presently visible along the river corridor, apparently the work of landowners.

Generally, the forest cover along Little Beaver Creek is an effective screening material and enhances the scenic values and other aesthetic qualities of the riverway.

Recreation

Approximately 18 percent of the land within the "visual corridor" is used for public recreation purposes. Nearly 1000 acres of Beaver Creek State Park is found within the visual corridor. Camping, hiking, fishing, and picnicking facilities are available within the park. Several of the Sandy and Beaver Canal Locks are located within the park and have been preserved as historic sites.

Two youth camps comprise 150 acres of the visual corridor. One of these lies adjacent to Beaver Creek State Park and the other is found near Grimm's Bridge.

Fifteen acres of a small golf course near Williamsport also lie within the visual corridor and are included in the recreation category.

Residential

Nearly two percent of the land area within the "visual corridor" is classified as residential. The majority of the acreage placed within this category is found in the areas around Grimm's Bridge and Williamsport and at the community of Fredericktown. Nearly all of this development consists of permanent homes and seasonal cottages, some of which impair the natural and scenic character of the Little Beaver.

Commercial

Only about one-half of one percent of the land area within the visual corridor is considered commercial in character. Two manufacturing operations, the previously mentioned sawmill near Williamsport, and a cement block plant located near State Highway 7 are each visible from the Middle Fork. Also included in this category are a trailer sales (located north of State Highway 7) and a power transmission line, each found on the Middle Fork.

There are several locations on the river segments where pipeline and smaller power and telephone line rights-of-way cross the river. Each of these crossings represents an environmental intrusion along the river corridor.

Table 3
LAND USE WITHIN VISUAL CORRIDOR

	Agricultural 1/	Recreation 2/	Forest 3/	Residential	Commercial	Strip Mine	Total
Acres	667	1,137	4,315	118	29	147	6,413
Percent	10.4	18	67	1.8	.5	2.3	100

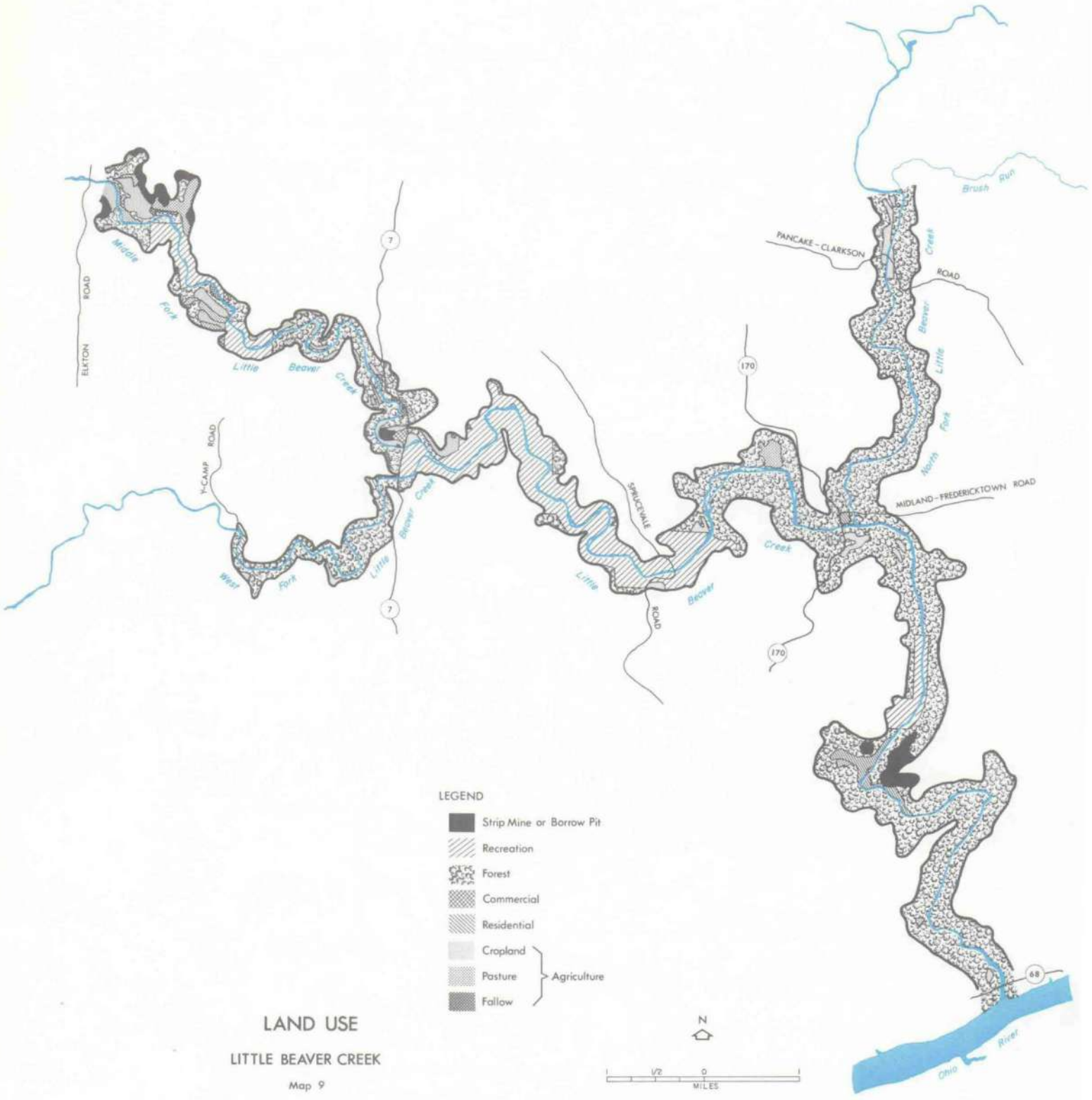
1/ Commercial nurseries are included in agriculture.

2/ 972 acres of this category lie within Beaver State Park.

3/ Within the visual corridor there are 5,166 acres of forest covered land; 851 acres are within Beaver Creek State Park and are classed as productive reserved land.

Strip Mining

Strip mining is a significant land use occurring within the Little Beaver Creek basin. Fortunately only a small percentage of the land area within the visual corridor is presently used for that purpose.



LAND USE

LITTLE BEAVER CREEK

Map 9

Nevertheless, because of its devastating visual effect on the landscape, it is the most likely land use to come in direct conflict with a scenic river proposal for the Little Beaver.

Columbiana County in Ohio has generally been an agriculturally oriented county, especially in the gently rolling northern portions. Nevertheless, land use within the county underwent some change during the 1940's. An accelerated growth of industry and an increasing urbanization in adjacent counties led to a gradual abandonment of farming on submarginal lands. As more and more land became less economically feasible to farm, the use of land for strip mining became an attractive economic alternative.

Since 1948, when more than one million tons of coal were mined, strip mining activity has been occurring at a significant rate in Columbiana County. In 1970, 41 sites were being mined by 24 different operators producing a total of 1.24 million tons of coal.* As of January 1, 1970, approximately 19,302 acres, or 5.64 percent of the county, had been strip mined. Most of the strip mining activity has occurred since the 1948 strip mining law was enacted. Only 4,382 acres were mined between 1914 and 1947. During the period of 1948-1969, 14,920 acres were mined.

As of 1972, there were 29 active sites under license by 22 operators. These operators had posted bond to strip mine 576 acres in Columbiana County. It is estimated that approximately one million tons of coal were mined in 1971 in Columbiana County.

There are many obvious advantages and disadvantages to mining in this manner. It is economically more efficient and less dangerous than other methods of mining. However, the unsightly spoil banks which are often bare and ugly have in recent times brought much criticism and adverse publicity against this type of mining. Probably the greatest problem arising from strip mining is the absence of faster and more complete restoration of the land after mining is completed.

Strip mining practices have significantly affected the landscape of the watershed in the past. Because it is still occuring and may increase in some portions of the basin, it is important to consider the probable effects of this type of land use on the national and state scenic river

Scars of a strip mining operation are evident on a small section of the Middle Fork.

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* . . . . . 1970 Division of Mines Report, Ohio Department of Industrial Relations.

programs proposed for the Little Beaver. There are 147 acres of surface mining disturbances (over two percent of the land area) that are present within the "visual corridor". Most of this disturbed area is screened from the river by natural vegetation during late spring and summer but is visible during the remainder of the year.

Strip mining within the visual corridor of a national or state scenic river would be discouraged. Strip mining would not only have a visual impact on the river corridor but could affect the quality and quantity of water flowing in the river and thus affect its use for recreational purposes. As strip mining activity increases in a particular watershed, a definite change in runoff rates can be anticipated as well as changes in ground water levels in the areas near strip mines. Strip mine spoil slopes which lack vegetation usually accelerate runoff, reduce infiltration, increase soil erosion and stream siltation, and can, in some cases, increase local flooding conditions by blocking river channels. In addition, strip mine areas can cause acid mine drainage which can, in turn, depending on the amount of acid present, adversely affect fish and other aquatic life.

Since strip mining activity will not only impair the scenic beauty of the Little Beaver valley but also adversely affect the preservation and use of the river corridor, it is imperative that adequate steps be taken to ensure that this form of mineral extraction will not adversely affect the river valley and its valuable resources.

On April 10, 1972, a stronger, more complete strip mining law was passed by the Ohio Legislature. This law should improve mining methods and reclamation procedures and assure that environmental damage will be minimized by this type of mining. A section of this new law provides that the Chief, Ohio Division of Forestry and Reclamation may designate as unsuitable for strip mining designated scenic river areas and other lands adjacent to the perimeters of such areas as may be necessary to protect the integrity of them. This provision will greatly enhance the efforts of the Ohio Department of Natural Resources to protect the Little Beaver and other scenic streams in the state.

Land Ownership

The following tabulation shows the land ownership pattern occurring along Little Beaver Creek within the established upstream boundaries and within the visual corridor. No attempt was made to determine the area in township, county, and state-owned highways and roads.

Table 4
LAND OWNERSHIP WITHIN THE VISUAL CORRIDOR

Ownership	Acres	Percent
Federal (Army Corps of Engineers)	14	.2
State	975	15.0
Historical Society (1 acre)		--
Department of Highways (2 acres)		--
Division of Parks and Recreation (972 acres)		--
County	25	.4
Quasi-public*	165	2.4
Private	5,234	82.0
TOTALS	6,413	100.0

*Includes youth camps and golf course.

Table 5 gives the ownership breakdown for lands directly fronting on the river.

Table 5
OWNERSHIP OF RIVER FRONT LANDS

Ownership	River Frontage (Miles)	Percent
Federal	.3	.4
State	16.2	23.8
County	.2	.3
Quasi-public	1.6	2.3
Private	49.7	73.2
TOTALS	68.0	100.0

Land Use Planning and Zoning

If Little Beaver Creek is included in the National Wild and Scenic Rivers System, controls on development will be instituted to protect the natural and scenic values of the immediate river corridor. However, what occurs outside of the immediate river area will be determined largely by state and local land use planning and zoning ordinances. Because development of the surrounding area can affect the environmental quality of the river corridor (notably water quality), it is desirable that proper land use planning and zoning measures be incorporated in these areas. Subdivision regulations can also provide needed controls on residential development.

Wise land use planning is highly important in realizing orderly development at all levels of government and particularly at the county, township, and municipal levels. Without the necessary land use planning, development will occur in a haphazard fashion, allowing some land uses to develop at areas where they should not occur. The mere ability of a land area to support a particular land use should not be the only criteria considered when an area is zoned. Many other factors should also be considered. Consideration should be given for providing areas at which little or no development would be allowed.

The Columbiana County Regional Planning Commission is the agency which has had and will probably continue to have the greatest control over land use planning in the Little Beaver Creek area.

Of the existing land use regulatory tools, zoning is the most influential. When properly implemented, zoning can be a very effective method for realizing sound land use planning. Unfortunately, zoning is too many times influenced by strictly political decisions. None of the local governmental units directly affecting the study segment have yet adopted zoning ordinances. The only township in Columbiana County with zoning is Perry Township which includes the major community of Salem, located north of the study area near the Middle Fork.

Generally speaking, restrictions on land use are not popular in rural areas. However, the Columbiana County Regional Planning Commission and, more recently, the Ohio Department of Natural Resources have been working with townships to encourage the development of zoning ordinances. It is hopeful that these local units of government will institute some type of zoning ordinances in the near future. In Pennsylvania, the community of Ohioville is investigating the creation of zoning ordinances and hopefully this may be accomplished sometime in the near future.

Zoning objectives in the area of Little Beaver Creek should attempt to reduce the effects of poorly planned shoreland development, prevent erosion, provide lots that are large enough to adequately support sanitary facilities, maintain property values, retain the natural characteristics of the area, and avoid the construction of permanent facilities in the flood plain.

At the present time, Columbiana and Beaver Counties each have subdivision regulations in effect. The Borough of Ohioville in Pennsylvania also established such regulations in 1963. Subdivision regulations can affect the development of specific areas by regulating initial layout and by stipulating what public improvements are to be provided. Existing subdivision controls should be strictly enforced and revised as new conditions evolve. Where necessary, such regulations should be established.

Riparian Land and Water Rights

In Ohio the rules determining ownership of the beds of streams or other bodies of water are determined by the laws of riparian rights or boundaries. Where a person owns on both sides of any stream, he owns the river bottom under the stream. Where different persons own on opposite sides of such a stream, in the absence of boundary lines, it is the general rule that each riparian owner owns the river bottom to the center of the stream, and he may exercise any proprietary right over it which will not interfere with the rights of other riparian owners.

A stream is considered navigable in Ohio if it is available for general use of pleasure boats, although not utilized for commercial purposes. The entire Little Beaver Creek, except for portions of the headwaters, is considered by the state to be navigable.

The riparian owner has interest in the stream bed, banks, and water of the rivers of the state, and, thus, all private uses to which the land is susceptible belong to him. Since the owner of land situated on the bank of a navigable or nonnavigable stream owns the bed to the center of the stream, it is considered trespassing for another individual to take sand or other material from the bed of the stream. However, ownership of the banks or even the bed of navigable waters gives the owner no right to prohibit the public from fishing or boating on such waters.

Riparian land must be in actual contact with the water, proximity without contact being insufficient; and most of the courts which have passed upon the question hold that the riparian right to the use of the waters cannot be exercised on nonriparian lands.

The interest of a riparian owner, where his rights are not limited by usage or agreement, consists of a right to use the water as it passes over his land, so long as he does not use it in a manner which will result in damage to other riparian owners. He is required to transmit it by its natural channel to the next occupant and has a right to expect the same treatment from the proprietor above him. This right to use the water in its natural flow is not a mere easement or appurtenance; it is inseparably annexed to the land itself.

It is a well-settled rule of law that a riparian proprietor is not the owner of, and has no right in, the actual flowing water in the stream adjacent to which his property lies. On the other hand, it is also recognized that riparian rights are founded on the common law; that they are property rights and, therefore, property, in legal significance of the term, and within the meaning of the constitutional requirement that compensation be made for private property taken for a public use. Recreational use of a watercourse by the general public under such common law could be interpreted as use of private property and thus require compensation to the riparian owner.

Rights of riparian owners in Pennsylvania differ, depending on whether the stream is navigable or nonnavigable. Navigability is determined by whether or not the watercourse is used or susceptible of being used in its ordinary condition as a highway for commerce over which trade and travel is or may be conducted in customary modes of travel and travel on water. The portion of Little Beaver Creek located in Pennsylvania is considered navigable pursuant to the foregoing standards.

The riparian owner of a navigable waterway in Pennsylvania has the right, title, and interest in property to the normal low watermark of the waterway. However, his ownership of the area between the normal high and low watermark is subject to the use and benefit of the public and its right of navigation. The general principle regarding the stream bed and banks to the normal low watermark is that the Commonwealth owns the property in trust for the public subject to the Federal Government's right to regulate commerce among the states and with foreign governments.

In Pennsylvania, the Clean Streams Law, the Dams and Encroachments Act, and the act creating the Department of Environmental Resources place substantial statutory limitations on the foregoing rights of riparian owners to use the water. The essential thrust of these restrictions is to limit the degree to which the riparian owner may either diminish the quality of water, add to or subtract its flow, change the stream channel or erect encroachments, or conduct other activities which adversely affect quality or quantity of flow. These restrictions, where appropriate, may also include the flood plain. The law in this area is in a state of flux and the statute regulations and case laws should be examined closely.

At the present time recreational use of Little Beaver Creek has not been hindered by the presence of fencing across the stream or the existence and ownership of dams. However, such potential hindrances or hazards to river users and the legal questions concerning their presence on this or other public waterways must be resolved if greater public enjoyment of the stream is to be attained.

Jurisdiction on Little Beaver Creek differs from area to area but, in general, the sheriff has authority within his county and the city police within the municipality through which the stream passes. Game protectors of the Ohio Division of Wildlife have authority to enforce all watercraft laws and all laws and Wildlife Council orders pertaining to hunting, fishing, and stream littering. Park officers may enforce refuse and pollution laws upstream from any state park boundary.

The Department of Environmental Resources has jurisdiction throughout the length of the Little Beaver Creek in Pennsylvania and its officers have authority to enforce all laws bearing on activity involving the stream.

Little Beaver Creek was designated as a component of the Ohio Wild and Scenic Rivers Act in January 1974. Under the provisions of the Ohio Wild and Scenic Rivers Act, the state has control over construction by state and local public bodies within a wild, scenic, or recreational river area. Section 1501.17 of the Ohio Wild and Scenic Rivers Act states that "No state department, agency, or political subdivision may build or enlarge any highway, road, or structure, or modify or cause to modify the channel of any water course within a wild, scenic, or recreational river area outside the limits of a municipal corporation without having first obtained approval of the plans for such highway, road, or structure, or channel modification from the Director of Natural Resources." Thus, the State of Ohio has authority to control activities that may adversely affect the Little Beaver as a component of the Ohio Wild and Scenic Rivers System.

If included in the National Wild and Scenic Rivers System, the acquisition of lands in fee or the acquiring of scenic and use easements would provide the necessary controls on water rights to ensure public use and enjoyment of the waterway without abolishing the rights of property owners.

If included in the National Wild and Scenic Rivers System, Little Beaver Creek would receive protection from any projects requiring federal licensing or involving federal funds. The Federal Power Commission cannot issue a license for any dam or other project, nor can any federal agency provide grants, loans, licenses, or other assistance for projects that would have a direct and adverse effect on the river and its immediate environment, or, if outside the river area, would invade or unreasonably diminish the values present in the river area. There are no restrictions in the Wild and Scenic Rivers Act on state or local projects on rivers in the National System which do not involve a federal license or federal financing.

Nonrecreational Uses of Little Beaver Creek

Water resources within the Little Beaver Creek basin are used for a variety of nonrecreational purposes. These uses are generally in the vicinity of developed areas along the stream or along its tributaries; however, the degree of development and the amount of water used in the Little Beaver Creek basin are not great. Municipal water supply is the greatest use of water in the Little Beaver Creek basin. The 1969 average demand and the 1980 and 1990 projections for public water withdrawals at communities within the Little Beaver Creek basin are as follows:

Table 6
PUBLIC WATER WITHDRAWALS IN LITTLE BEAVER CREEK BASIN

Community	1970 Population	1969 avg. Demand (MGD)*	Projections (MGD) 1980	1990
East Palestine, O.	5,604	1.51	1.82	2.08
Leetonia, O.	2,342	0.18	0.29	0.34
Lisbon, O.	3,521	0.35	0.45	0.55
New Waterford, O.	735	0.06	0.11	0.14
Salem, O.	14,186	1.84	2.34	2.81
Washingtonville, O.	747	0.05	0.11	0.13

*(MGD) - Million Gallons Daily.

All communities shown in the table, according to the 1963 Inventory of Municipal Water Facilities, obtain their water supplies from springs and wells, with the exception of Salem, Ohio, which obtains its water directly from Cold Run, a tributary of the West Fork of Little Beaver Creek. However, it is evident that additional water resources will be required in the future and this could include direct withdrawals from the Little Beaver should ground water sources prove to be inadequate. The Wild and Scenic Rivers Act states, "Designation of any stream or portion thereof as a national wild, scenic, or recreational river area shall not be construed as a reservation of the waters of such streams for purposes other than those specified in this Act, or in quantities greater than necessary to accomplish these purposes." Regardless of how other uses of the waters (public water supply, irrigation, and others) of Little Beaver Creek might be restricted as a result of its becoming a component of the National Wild and Scenic Rivers System, any plans for such other water uses should be carefully considered and controlled to ensure that low flows or other adverse impacts do not affect the values for which the stream was included in the National System.

Several municipalities and communities within the Little Beaver Creek basin discharge effluent from various types of sewage treatment facilities into the Little Beaver or its tributaries. The following table lists the communities that are discharging municipal wastes into the watercourse, the 1970 population served, and a brief description of the treatment facilities. (See reference map for location of municipalities.)

Table 7
MUNICIPAL SEWAGE TREATMENT FACILITIES

Community, Sewer or Sanitary District	Population Served 1970	Type of Facilities	Discharge to
East Palestine, O.	5,604	Activated sludge, Mechanical aeration	Leslie Run to North Fork Little Beaver
Leetonia, O.	2,342	Sludge digestion	East Branch to Middle Fork Little Beaver Creek
Lisbon, O.	3,521	Sludge digestion	Middle Fork Little Beaver Creek
New Waterford, O.	735	Activated sludge	Bull Creek to N. Fork Little Beaver Creek
Salem, O.	14,186	Sludge digestion	Middle Fork Little Beaver Creek
Washingtonville, O.	747	Aeration and Settling tanks	East Branch to Middle Fork Little Beaver Creek
Darlington, Pa.	300	None	North Fork Little Beaver Creek

Manufacturing and industrial activities within the Little Beaver Creek basin are scattered, and much of the water required by industries is obtained from underground sources. Industrial activity is limited to small and somewhat isolated communities, the largest of which is Salem, Ohio, with a 1970 population of slightly over 14,000. Although East Liverpool, Ohio, lies adjacent to Little Beaver Creek, that community utilizes the water of the Ohio River to sufficiently serve its industrial needs.

In addition to industrial and manufacturing uses, one municipal power generating facility in East Palestine, Ohio, uses the waters of Leslie Run. This facility provides hydroelectric power for the municipality of East Palestine, and its usage of water has little or no effect on the Little Beaver.

According to a 1962 survey of available industrial sites in Beaver County, there are approximately 12 potential industrial sites totaling over 900 acres within one mile of the North Fork of Little Beaver Creek in the vicinity of Darlington, Pennslyvania. At least nine of these available sites are located directly on the streambanks where the North Fork would be used as a discharge point for effluent as well as supplemental water supply source to on-site wells. This area is identified as an industrial park, and the presence of railroad facilities, an adequate highway network, and the water resources of the Little Beaver makes the area a potential user of water resources for industrial needs. Consideration should be given to rezoning this area from an industrial to an agriculture or recreation category to avoid any deterioration of the North Fork by industrial wastes. If manufacturers were allowed to develop this area, it would be imperative that pollution of the upstream reaches of the North Fork be held to an absolute minimum.

The only completed flood control project in the basin involved the deepening, widening, and straightening of Cherry Valley Run, a tributary of the Middle Fork of Little Beaver Creek near Leetonia. The Army Corps of Engineers has also proposed a detailed project report for widening, deepening, and realigning approximately one-half of Cherry Valley Run at Washingtonville, upstream from Leetonia.

The Northeast Ohio Water Development Plan of 1971 considered a 1,300-acre regional water supply reservoir on the Middle Fork of Little Beaver Creek east of Salem, Ohio. This reservoir would serve as a regional water supply source for six communities.

The General Development Plan for Columbiana County dated September 1968 and prepared by the Columbiana County Regional Planning Commission also discussed this proposed reservoir. The proposal envisions a reservoir that would impound the headwaters of the north flowing Meander Creek and the south flowing Middle Fork of Little Beaver Creek in Green Township, Mahoning County, and Perry and Salem Townships of Columbiana County. It would be a multi-purpose reservoir which would provide flood control, water supply for both counties, recreation opportunities, and would eliminate the problems created by the existing poor drainage conditions. Both reservoir proposals are conceptual, and no detailed planning has been initiated. When and if planning is begun on this proposal, the need for protection of the lower stream environment and the augmentation of summer water flows to benefit boating must be considered. If carefully planned, a reservoir in the upstream segment of the Middle Fork should have no adverse effects on the lower stream segments.

Recreational Uses of Little Beaver Creek

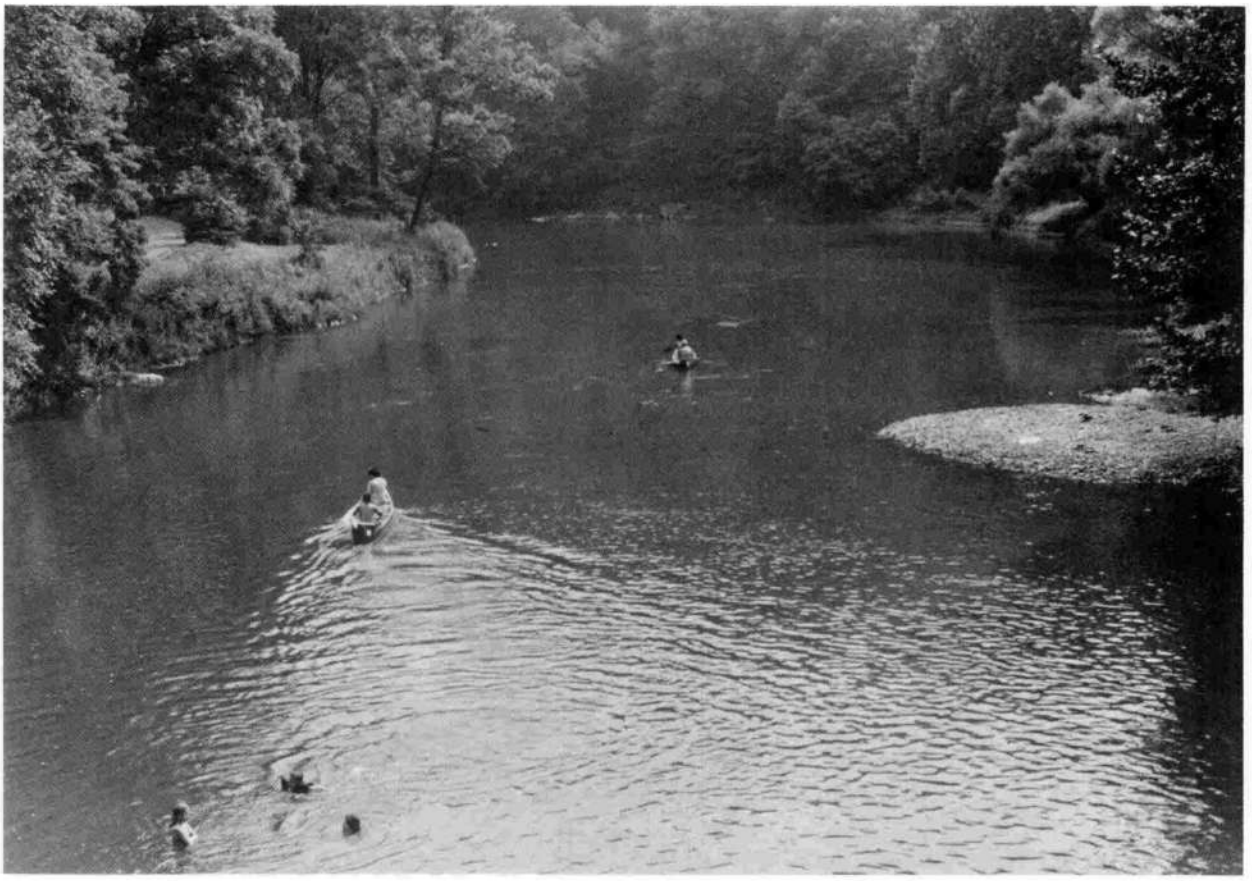
Existing Recreation Facilities--The principal developed public use area located on the study segments of Little Beaver Creek is Little Beaver Creek State Park. This state park includes approximately 3,000 acres of land and water and is rich in wildlife, scenic beauty, and historic reminders of pioneer life. It is composed of several non-contiguous parcels of land which encompass portions of both the Middle Fork and main stem of Little Beaver Creek. Ruins of the locks of the abandoned Sandy and Beaver Canal are located at various places throughout the park. The largest and best preserved of the locks, Lusk's Lock, is found in that portion of the park located on the Middle Fork. Gaston's Mill, a historic gristmill which is presently being restored by the Columbiana County Historical Society, is open to park visitors near the park headquarters on the main stem. Several cabins and a covered bridge have also been restored near Gaston's Mill. The focal point of Beaver Creek State Park is the stream which winds its way through the park and is bordered by steep, heavily wooded slopes in a near natural state. Areas adjacent to the park have been strip-mined for coal. A few of these areas are beginning to revert back to a more natural appearance.

The park presently includes two campgrounds, a family camping area with about 40 sites, and a primitive campground for the use of hikers and horsemen. Hiking trails have been developed throughout the park and make several of the Sandy and Beaver Canal ruins accessible to park users.

Attendance records of the Ohio Department of Natural Resources indicate a total attendance at Beaver Creek State Park of nearly 241,000 visitors for the period of July 1, 1972, to June 30, 1973. Attendance at the park in 1968 was 355,700 visitors. The total number of visitors to Beaver Creek State Park has declined significantly in the past few years. Much of this drop in attendance is probably due to the opening of West Branch State Park, situated approximately 35 miles northwest of Beaver Creek State Park. West Branch is a highly developed state park which opened in 1967. The park accommodated nearly 950,000 visitors in Fiscal Year 1971, while over 766,000 persons visited it in Fiscal Year 1973. Thus, it appears that West Branch State Park may have attracted park users from the Akron and Youngstown areas who formerly used Beaver Creek State Park.

A roadside rest area with picnic facilities is located near the point where Ohio Route 7 parallels the Middle Fork. This area is maintained by the Ohio State Highway Department.

The only other parcel of public land lying along or near the study segment is owned by the Beaver Local School District. This small parcel is located adjacent to Beaver Local High School and encompasses a gorge-like segment of the West Fork. It is used primarily by the school for biological and outdoor education studies.



The main stem at Grimms Bridge is popular with canoeists and swimmers.

A state-owned campground is found along the main stem upstream from the former settlement of Sprucevale.

Two semi-private areas are located on the study segment of Little Beaver Creek. The Beaver Creek United Presbyterian Camp including about 120 acres is situated in a heavily wooded ravine along Little Beaver Creek upstream from Grimm's Bridge. Camp Echo Dell is located adjacent to the central portion of Beaver Creek State Park near the park headquarters and is owned and operated by the Campfire Girls. It includes approximately 30 acres. Both camps provide recreational opportunities each year for several hundred young people.

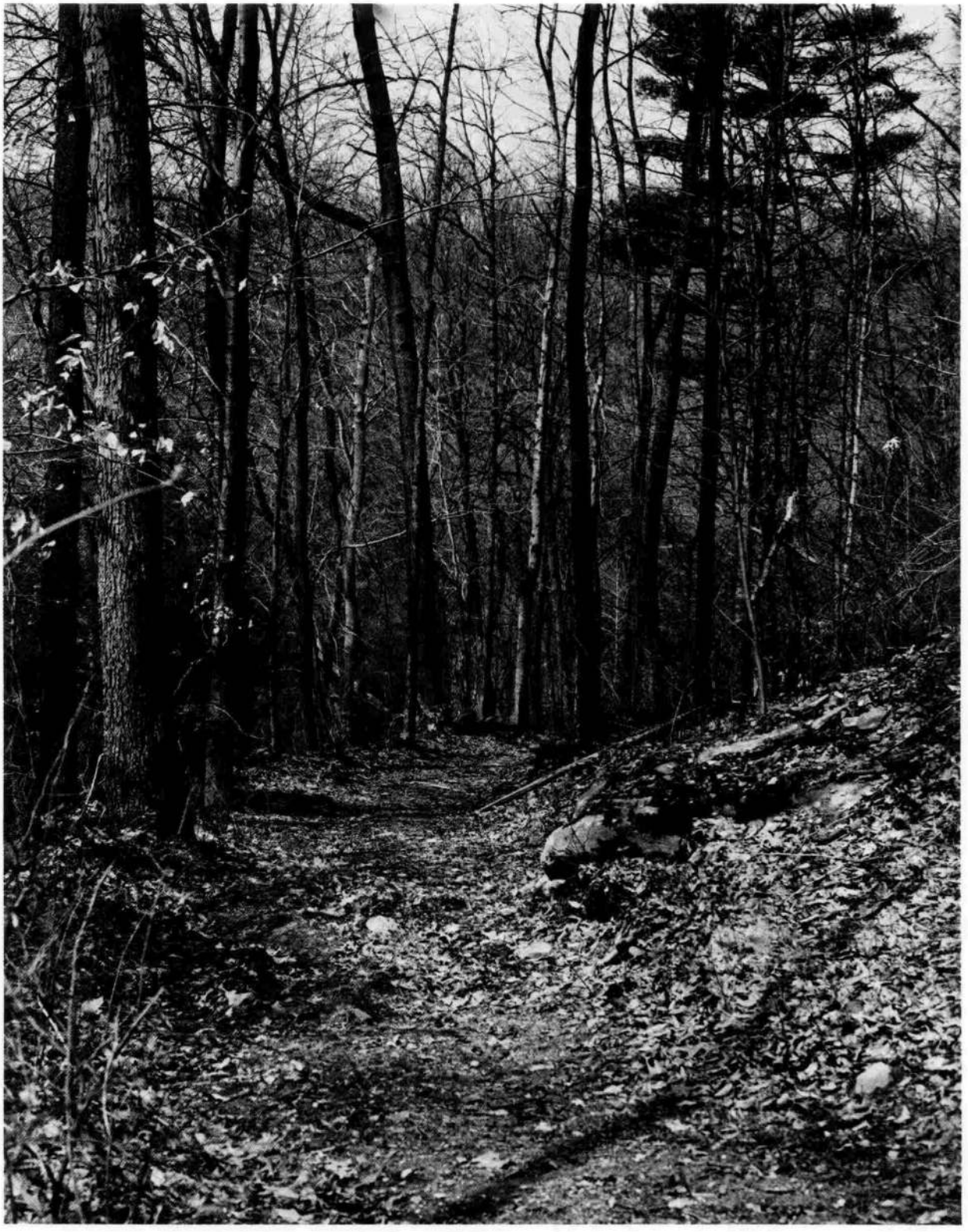
Beaverkettle Farm, a large private area of approximately 4,000 acres, is found along portions of the main stem and the North Fork of Little Beaver Creek. This rugged and picturesque area has been preserved in its natural state and is open for organized field trips with permission from the owner.

A small private canoe livery is located at Fredericktown which provides approximately 20 canoes for rent and use on the main stem.

A number of smaller private recreation developments are found on or near the study segment. The nine-hole East Palestine Golf Course is located on the east bank of the North Fork at Achor. A small, par-three golf course is located near the confluence of the Middle Fork and West Forks. Both courses are open to the public. The Columbiana County Fish and Game Protective Association owns a 30-acre area west of State Route 7 near the Middle Fork which is open to members only. A small three-acre private picnic area is located on the Middle Fork, also near State Route 7. A private campground is presently being developed approximately one mile east of Lusk's Lock on the Middle Fork.

Existing Recreation Use and Opportunities--Little Beaver Creek and its surrounding valley supports a variety of interesting and enjoyable recreation activities in a near natural and scenic setting. Most of the existing use occurs at Beaver Creek State Park. Recreational activities most closely associated with the Little Beaver include camping, hiking, canoeing, hunting, fishing, nature study, picnicking, horseback riding, sightseeing, and swimming.

Although canoeing use on the study segment is limited by low flows during the primary recreation months of June, July, and August, the opportunity for participation in this activity is substantial. Floating the Little Beaver during the spring months of April and May when water levels are higher is an interesting and rewarding trip for the canoeist. Except near its confluence with the Ohio River, Little Beaver Creek is too shallow for motorized watercraft. Only a few public access sites are available for launching a canoe. The provision of better access, additional water flows, and the construction of canoe campsites could make canoeing an even more popular activity on Little Beaver Creek.



A hiking and horseback riding trail found on the privately owned Beaverkettle Farm along the North Fork of the Little Beaver.

Camping in the watershed presently occurs primarily at Beaver Creek State Park and at nearby Guilford Lake State Park. During the 1971 fiscal year, Beaver Creek State Park had approximately 23,900 campers. The number of campers at the park grew rapidly during the early and middle 1960's, and this use has only recently leveled off. Guilford Lake State Park has experienced a decrease in the number of campers in the past five years. Approximately 31,000 campers visited Guilford Lake during fiscal year 1971. Part of the decline in the number of campers is due to the renovation of the existing campground at Guilford Lake and repairs made to the dam at that park. There are a number of areas along the Little Beaver at which additional camping facilities could be provided. In order to maintain an uncrowded and enjoyable recreation experience, the number of campgrounds should be held to a minimum. In addition, except for small primitive camps, campground should be located well back from the river's edge to protect the natural characteristics of the river environment.

Although generally restricted to Beaver Creek State Park, hiking is the recreation activity which can best be enjoyed throughout the year along the Little Beaver. Private bridle and foot trails are found at numerous places along lands bordering the study segment. The privately owned Montour Railroad grade provides an excellent resource and location for developing a hiking trail. A system of trails along the study segment would provide the hiker with a closeup view of the environment of Little Beaver Creek throughout the year.

The Little Beaver is generally too shallow to provide extensive opportunities for swimming. However, a few of the deeper pools do offer persons the opportunity to swim while enjoying other activities such as canoeing. Swimming is now enjoyed at a number of areas, including Beaver Creek State Park near the park headquarters at the confluence of the North Fork and the main stem and at Grimm's Bridge. The latter two areas are not public use areas and are used primarily by local residents.

Nature interpretive programs could be useful in providing visitors with a greater appreciation of the Little Beaver's natural and scenic qualities. Opportunities for persons to enjoy nature study and many of its related activities, including photography and bird watching, could be greatly expanded by initiating a program of only limited recreation development.

Opportunities for interpretation of existing natural features and historical sites along the study segment are numerous. An understanding of the many restored historical sites, the older communities, interesting natural features, and of ruins remaining from pioneer life along the river corridor could add meaning to a visitor's total recreation experience.

Picnicking is presently enjoyed at existing public use areas in Beaver Creek State Park and occasionally occurs at various places along the Little Beaver in conjunction with other recreational activities such as hiking, camping, and floating.

There are opportunities to provide additional recreation facilities on the Little Beaver, making it possible for more persons to enjoy the attributes of this lovely stream system. The amount of additional use that can occur on Little Beaver Creek without impairing its natural and scenic qualities is limited and such use will need to be carefully controlled.

Future Recreation Use--According to the Ohio Statewide Outdoor Recreation Plan, the state is expected to experience a 23 percent increase in population by 1985, and demands for outdoor recreation are expected to increase at rates nearly twice that of the population. Therefore, pressures for greater recreational use of the Little Beaver stream system are expected to increase considerably in the future. If the Little Beaver becomes a component of the National System, the attendant publicity, prestige, and image presented to the public will quite likely increase the demand to use this stream beyond the normal projected increase.

The level of development and management policies must be designed so that increased recreational use will not destroy the high quality recreational experience which is presently available on Little Beaver Creek. Access sites and other facilities should be developed and dispersed in such a manner as to limit the impact from use which could result. The recommended conceptual river management plan presented in this report has been designed to accomplish these objectives. Furthermore, because the long-term and continuing impact of human use on the river and its environment is not known, a system of periodic evaluation and monitoring should be established to determine the protection and management necessary to ensure a meaningful scenic river experience for the river user.

Limiting Factors--Several factors limit, to varying degrees, present and potential recreational use of the study segment. Many of these factors have been discussed in the various subsections of the report; however, some additional discussion is needed to relate these limiting factors directly to recreational use on Little Beaver Creek.

Although water quality is not a serious limiting factor on recreational use at the present time, it could become one. Furthermore, an upgrading of the present water quality would provide a river environment of greater aesthetic appeal and enjoyment. Constant monitoring of water quality and strict enforcement of existing standards must be maintained to ensure that the water quality of Little Beaver Creek does not worsen.

Active and abandoned strip-mine operations throughout the watershed should be examined and evaluated to avoid the seepage of acid-mine wastes into the stream system. Existing municipal sewage treatment facilities affecting the study segment are programmed for upgrading. Once these improvements are accomplished, conditions in the stream system should improve. As discussed in the section on water quality, there are a number of industrial plants in operation that are depositing various waste materials into the Little Beaver. The problems remain unresolved even though efforts have been made to correct them. Septic tank sewage systems, particularly in quantity or in unsuitable locations, can degrade water quality. Permits for the installation of additional septic tanks should be carefully reviewed to lessen the impact of this type disposal system.

As discussed in Section IV under FLOW CHARACTERISTICS, water levels during the summer months limit canoeing or the use of other small watercraft on Little Beaver Creek and its major tributaries. According to the U. S. Army Corps of Engineers, no reasonable alternatives for low flow augmentation appear justifiable to remedy this problem. Low flows do not, however, severely limit other recreational activities associated with Little Beaver Creek.

Future land use patterns along Little Beaver Creek and its tributaries could potentially degrade the natural river environment and its attendant recreational opportunities. Additional residential bankside development would detract from the outstanding scenic qualities of the area and result in a lower quality recreation experience for the river user. Additional strip mining would degrade the river user's visual experience even further, as would expanded industrial activities or extensive timber harvest along the study segment.

The amount of access available along Little Beaver Creek presently limits recreational enjoyment of it. The predominantly private ownership of riverside lands precludes public access to many segments of the river. Inaccessibility, however, has helped much of the river environment to retain its natural, unspoiled character. Any additional planned access should be carefully located to maintain a quality recreation environment and to ensure a feeling of solitude for the river user. Because the river corridor is relatively small and fragile, every effort to prevent overuse should be made.

For the most part, existing uses of riparian lands along the Little Beaver are compatible with recreation use and enjoyment. As discussed previously, however, there are locations in the vicinity of Williamsport on the Middle Fork and around Grimm's Bridge on the main stem at which unattractive developments have degraded the aesthetic values of the river corridor in these areas.

The presence of power lines such as this one on the Middle Fork below Elkton (left) and pipeline right-of-ways such as the one shown on the main stem (below) can impair the visual qualities of any stream.

Another factor which has the ability to lower the overall quality of the recreationists' experience is the introduction of new power line, pipeline, and bridge crossings which detract from the visual quality of the river scene. Any future crossings of this nature should be avoided where possible. In instances where crossings cannot be avoided, the Ohio Department of Natural Resources and the responsible utility should attempt to place it at a location which will have a minimal environmental impact on the river corridor.

V.
CONCLUSIONS

V. CONCLUSIONS

The main stem of Little Beaver Creek, portions of three of its major tributaries, and its immediate environment possess sufficient natural and scenic values and provide recreation opportunities which qualify for inclusion in the National Wild and Scenic Rivers System. Little Beaver Creek is free-flowing and exhibits scenic, recreational, geologic, fish and wildlife, and historic values of an outstanding nature. The stream units are of a sufficient total length (approximately 33 miles) to provide a meaningful recreation experience and have adequate water flows to permit a wide range of water-related outdoor recreation activities. Little Beaver Creek contains water of sufficiently good quality to meet the "Aesthetics--General Criteria" as defined by the National Technical Advisory Committee on Water Quality Criteria, April 1, 1968. There are no water resource projects presently planned on those portions of the Little Beaver recommended for inclusion in the National Wild and Scenic Rivers System.

Classification

The main stem of Little Beaver Creek and portions of the North, Middle, and West Forks exhibit characteristics which enable them to qualify for scenic classification which is defined as: Those rivers or sections of rivers that are free of impoundments, with shorelines or watersheds still largely primitive and shorelines largely undeveloped but accessible in places by roads.

Scenic classification was determined on the basis of the following conditions:

1. All recommended stream segments are free of impoundments.

2. All recommended stream segments are "accessible in places by road" which only occasionally cross the river area. A total of 10 bridges span the 33 miles of riverway recommended for inclusion. Four bridges serve primary roads, five serve secondary roads, and one serves the Penn Central Railroad.

3. All recommended stream segments have shorelines and immediate environs which present an overall natural character and therefore meet the criteria for "largely primitive."

4. All recommended stream segments meet the established criteria for "largely undeveloped." Concentrations of dwellings on or near the shores of Little Beaver Creek are limited to only very short portions of the total recommended area.

The "largely undeveloped" character was evident during the various field evaluations and is further indicated by the following breakdown of land use within the "visual corridor;" 86 percent forest, woodland, or recreation; 10 percent agriculture; and 4 percent residential-commercial-strip mine.

Recommended Administration

It is recommended that the State of Ohio administer Little Beaver Creek as a component of the National Wild and Scenic Rivers System. The Commonwealth of Pennsylvania is encouraged to cooperate with the State of Ohio as appropriate with respect to those portions of the river located in Pennsylvania.

Administration of Little Beaver Creek by the State of Ohio is considered appropriate for a number of reasons: The State of Ohio administers Beaver Creek State Park which encompasses portions of the river corridor. State ownership of river lands along the river segments recommended for inclusion comprises approximately 24 percent of the riverfront lands and 15 percent of the total lands lying within the visual corridor (see tables 4 and 5). State conservation officers are now active in policing and protecting the river; they enforce a number of state laws concerning hunting, fishing, trapping, boating, littering, and conservation that are important aspects in a river protection program. Pollution laws are presently being enforced by the Ohio EPA. Through these and other programs, the state has established good working relationships with local government officials, groups, and individuals.

The Ohio Department of Natural Resources in January 1974 designated Little Beaver Creek as a component of the State Wild and Scenic Rivers System. The selection of the State of Ohio to administer Little Beaver Creek as a component of the National System would require no change in landownership or result in any basic change in administration or management policy.

The majority of local governmental agencies and private interest groups, including many individuals in the Little Beaver Creek area, have expressed their support for the protection of the Little Beaver. The established lines of communications and the high level of favorable local interest should be invaluable to the state in encouraging local participation in a scenic river program and in negotiating and enforcing scenic easements and other land use controls along the river.

There are a large number of jurisdictions having planning, management, or development responsibilities over the type and extent of uses made of the land and water resources both within the river corridor and on adjacent areas. The overall values of Little Beaver Creek would

receive greater protection and enhancement if state and local jurisdictions and residents along the river had a common focal point to coordinate their activities relating to the land and water resources within the designated segment. A Little Beaver Advisory Board should be established for this purpose. Its primary objective would be to advise and assist the state and local governmental units in the planning, development, management, and administration of the river and would provide all interests a voice in the policies and actions with respect to Little Beaver Creek.

Local units of government would be encouraged to provide zoning regulations that would complement state land acquisition programs and to cooperate fully with the two states in implementing a scenic river program.

The State of Ohio is urged to acquire the necessary lands or interests in lands to assure an adequate program of protection for the river and its immediate environment. The Ohio Department of Natural Resources has indicated its willingness to administer and manage the river corridor if adequate funds are available for land acquisition and development. Funds for planning, land acquisition, and development would come from normal state appropriations and applicable federal grant programs.

Federal funds are presently available to the State of Ohio for financing land purchases, improvement, and development for scenic and recreational rivers. These funds are available through the Land and Water Conservation Fund and the Dingell-Johnson and Pitmann-Robertson programs.

Under the Land and Water Conservation Fund program, the Bureau of Outdoor Recreation makes grants to states and through them to their political subdivisions for planning, acquiring, and developing public outdoor recreation areas and facilities. Funds apportioned to the states under this program finance 50 percent of total allowable project costs. The state or local governmental unit must provide the remaining 50 percent. A total of $6.9 million was apportioned from the Fund to Ohio for fiscal 1973.

Under the Dingell-Johnson program (Federal Aid in Fish Restoration Act-1950), the U. S. Fish and Wildlife Service makes cost-sharing grants up to 75 percent to the state game and fish departments for, among other things, the acquisition, development, restoration, rehabilitation, and improvement of water areas adaptable as hatching, feeding, or breeding places for fish. Under the Pittman-Robertson program (Federal Aid in Wildlife Restoration Act-1937), the U. S. Fish and Wildlife Service makes cost-sharing grants up to 75 percent to the state game and fish departments for the acquisition, development, restoration, rehabilitation, and improvement of land and water areas adaptable as feeding, resting, or breeding places for wildlife. It is not expected that much assistance would come from the Dingell-Johnson and Pittman-Robertson Programs due to the small amount of money available and the high demands on these monies across the state.

The administering agency would be expected to prepare a detailed master plan for the Little Beaver and to take the necessary steps to assure implementation of that plan. This master plan would require the approval of the Governor. The Governor of Ohio would then forward to the Secretary of the Interior an application requesting that portions of Little Beaver Creek be included in the National System, as set forth in Section 2(a)(ii) of the Wild and Scenic Rivers Act. If the Commonwealth of Pennsylvania should decide to have the portion of Little Beaver Creek in that state included in the National Wild and Scenic Rivers System, the Governor of Pennsylvania would make a similar request.

Alternative Administrative Arrangements Considered

Other than administration by the State of Ohio, Little Beaver Creek could be administered as a component of the National Wild and Scenic Rivers System by the Federal Government, or possibly by several local administrative authorities.

Federal Administration

Through an Act of Congress, the Department of the Interior would be the agency designated for overall administration of the Little Beaver. Under this arrangement, the Federal Government would be responsible for the acquisition, development, and management of the river corridor. The portions of the nonfederal public lands would either be donated to the Federal Government or proper administrative arrangements would be determined between the Secretary and the concerned nonfederal agency. Under federal administration, the Secretary would establish an advisory council for the Little Beaver National Scenic River and consult with the council from time to time with respect to matters relating to all forms of facility development, maintenance, and administration of the riverway. Membership of the council would consist of representatives from appropriate federal, state, local, and private organizations.

Regional or Local Government

Columbiana County - Under this arrangement Columbiana County would have the primary responsibility for administering the Little Beaver and would acquire, plan, and develop the lands necessary to assure an adequate program of protection for the river and its development. Cooperation with the state in administration of the river would be necessary, as a significant portion of the river is in state ownership. Necessary funds would be provided by the county with financial assistance from the state and possibly through the use of Land and Water Conservation Fund monies. Where appropriate, municipalities

would be encouraged to provide adequate zoning regulations to provide the necessary protection in those areas. It would be desirable for Columbiana County in Ohio to cooperate with Beaver County in Pennsylvania in assuring adequate protection for the Pennsylvania portion of the Little Beaver.

Metropolitan Park District - Administration by a metropolitan park district would require the establishment of such a governmental unit in Columbiana County or among several counties to form a larger park district of which Columbiana County would be a part. The park district would assume the responsibility of acquiring, planning, developing, and managing the Little Beaver. Supplemental financial assistance could be provided with Land and Water Conservation Fund monies through the Ohio Department of Natural Resources. Cooperation with the Commonwealth of Pennsylvania and Beaver County would be necessary.

Conservancy District - Another possible administrative arrangement would be the creation of a conservancy district. Whereas the State of Ohio conservancy district law was originally created for the primary purpose of flood control, the law does allow for the district to develop and manage recreation facilities. There are now about 25 conservancy districts in Ohio, most of which are less than one county in size. The conservancy district would assume responsibility for acquiring, planning, developing, and managing the Little Beaver. As in the other administrative alternatives, cooperation with the Commonwealth of Pennsylvania and Beaver County would be necessary. Monies from the Land and Water Conservation Fund through the state could be provided for financial assistance.

VI.
RECOMMENDED CONCEPTUAL RIVER PLAN

VI. RECOMMENDED CONCEPTUAL RIVER PLAN

This conceptual plan is intended to be a guide for the State of Ohio and, where appropriate, the Commonwealth of Pennsylvania and should not be construed as being the complete or final plan for a scenic river program on Little Beaver Creek. The riverway acreages and suggested facility developments included in this plan are subject to modification, and the state should continue to refine concepts presented in this plan and tailor them to meet the needs of the people of Ohio and adjacent states. It is suggested that the State of Ohio in cooperation with the Commonwealth of Pennsylvania prepare a detailed master plan for the protection and recreational development of Little Beaver Creek.

Area

The area suggested for inclusion in the National Wild and Scenic Rivers System extends along 33 miles of the Little Beaver Stream segments. The figure includes 16-2/3 miles of the Little Beaver Creek main stem, 7-2/3 miles of the Middle Fork, 4-1/4 miles of the West Fork, and 4-1/4 miles of the North Fork. Adjacent lands needed for the protection of the stream and its environment amount to approximately 11,000 acres. Of this total, about 8,700 acres are in private ownership. It is estimated that 3,800 acres would be purchased in fee and easements acquired on the remaining 4,900 acres. These acreage figures are estimates and will undoubtedly be refined as planning for the scenic river program proceeds toward implementation.

Costs

The acquisition of fee and less-than-fee interests in land for the 8,700 acres of privately owned land within the conceptual scenic river corridor is estimated to cost approximately $5.23 million. This total includes $2.66 million for the fee acquisition of 3,800 acres and $2.57 million for the acquisition of easements on 4,900 acres. Costs of the suggested recreational facility developments are estimated to be approximately $285,000. The cost for the operation and maintenance of recreation facilities is estimated to be about $85,000 annually.*

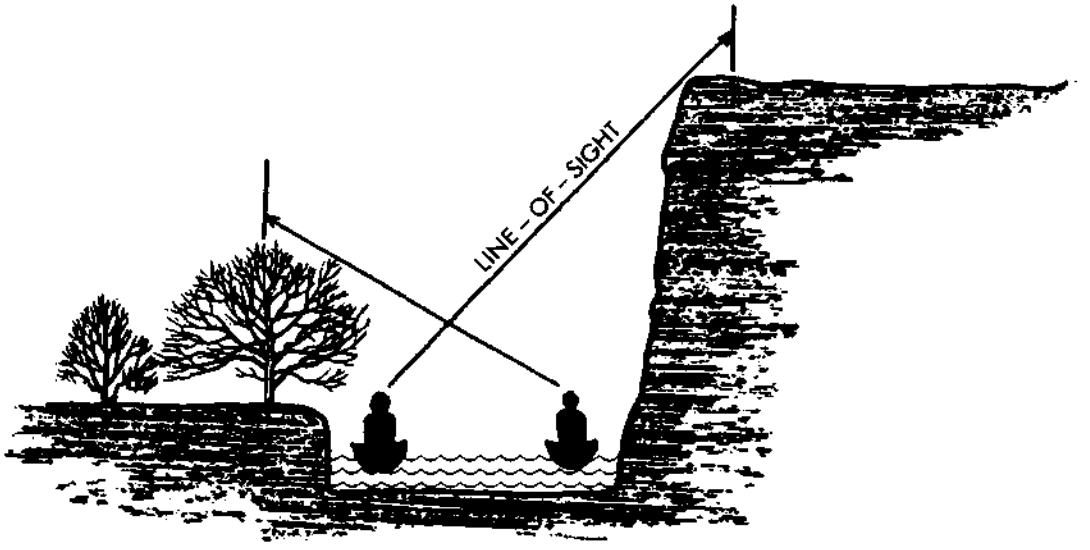
* These estimates assume an average cost of $700/acre in fee (this figure provided by the Real Estate Division of the Ohio DNR). It was further assumed that easements will cost approximately 75 percent of the cost of land purchased in fee. The annual operation and maintenance cost figure was derived by assuming they would be equal to about 30 percent of the total cost of facility development.

Boundary

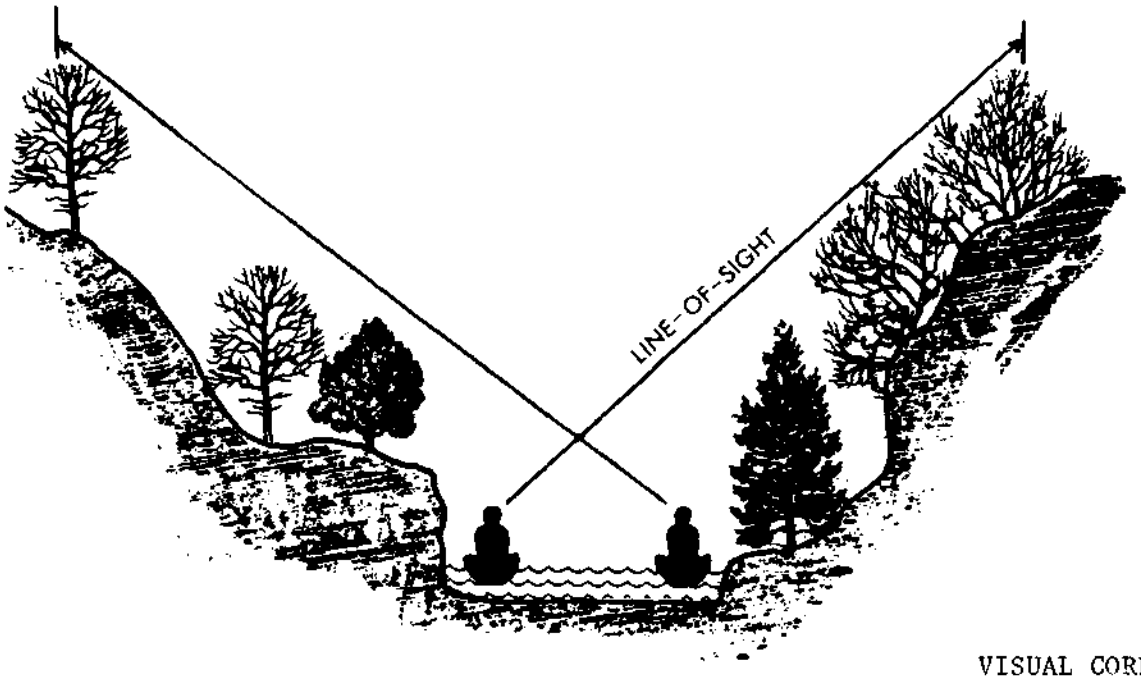
Boundaries for the proposed Little Beaver Creek National Scenic River would be delineated by the administering agency. The actual boundary would be developed using the general guidelines of development as presented in this river plan and three basic criteria including: (1) the "visual corridor concept;" (2) the inclusion of outstanding natural, historical, or archaeological areas outside of the visual corridor; and (3) the minimization of new survey and severance costs.

The primary factor which determines the width of river corridor necessary is the line-of-sight or "visual corridor concept." This concept requires that adequate land be provided to keep the river corridor scenic and pleasant appearing in the eyes of the river user (boater or fisherman) or along the river's edge (hiker). Basically, the visual corridor is the zone of adjacent land which has a visual impact on the river user and, therefore, should be protected from adverse use and development if the natural and scenic integrity of the river is to be retained. In many instances, this can be accomplished through the purchase of scenic easements along a relatively narrow corridor. The width of corridor necessary can vary depending on (1) the height and angle of slope of adjacent riverbanks and (2) the amount of available tree cover. The increase or decrease of either of these two factors will increase or decrease the width of the corridor necessary to protect the resource.

The following sketches illustrate the visual corridor concept as it applies to typical cross sections in the Little Beaver Valley.



VISUAL CORRIDOR
FIGURE 4



VISUAL CORRIDOR
FIGURE 5

The bluffs and steep forested slopes along the Little Beaver corridor are scenic and are also extremely effective in screening the river corridor. However, the height and configuration of the slopes do vary considerably throughout the river corridor.

Where bluffs or hillsides front the river on one or both sides as in the sketches, the boundaries should be drawn beyond the ridge line of the hill or bluff to ensure protection of slopes within view of the stream and to provide room for routing a riverside trail over the rough terrain.

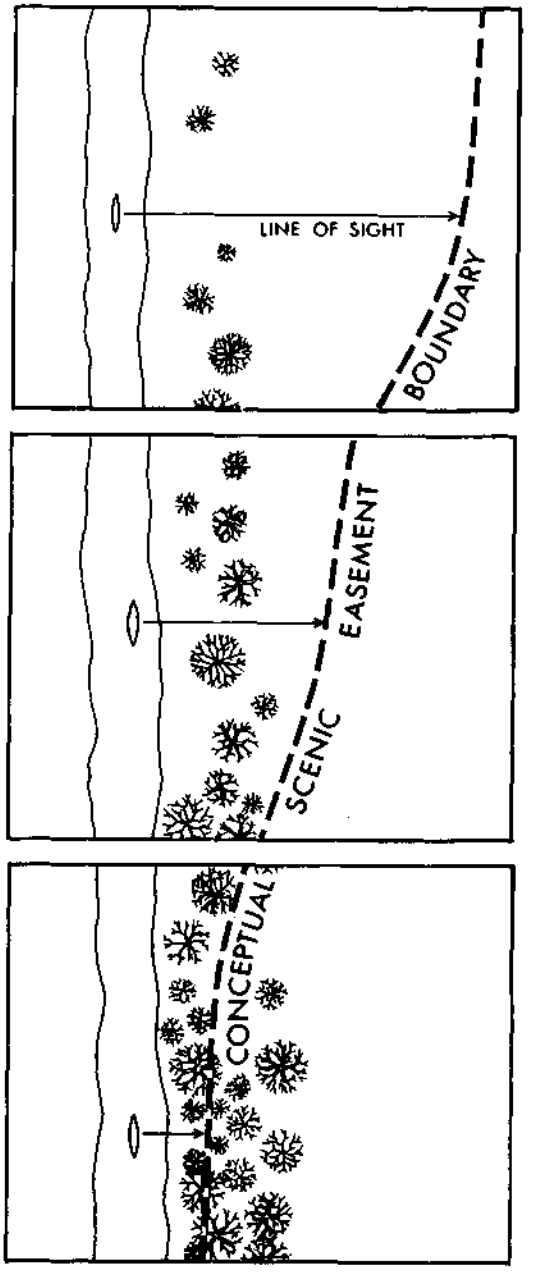
In many cases, the above described lands are also adequate for locating recreation facilities. However, there are instances where expansion would be necessary to provide adequate room to place facilities back from the river or to include some outstanding scenic, natural, historical, or other outstanding nearby feature.

In addition to the minimum areas outlined above, it would be desirable to acquire less-than-fee scenic controls on adjoining lands where adverse development could damage the environment. This is especially true where trails will traverse bluff tops providing extended vistas of the surrounding country and where protection of the view from the river is necessary.

As mentioned previously, the varying degree of screening provided by shoreline vegetation is one of the primary factors in determining the width of a scenic easement required to maintain the visual integrity of the river corridor. This concept is illustrated in the accompanying

drawing which provides an overhead view of three river scenes. When the line-of-sight view from the river is limited by dense vegetation, a minimal scenic easement width would be required. The line-of-sight view from the river partially limited by dense vegetation would require a somewhat wider scenic easement. And, finally, when the view from the river is not limited, a scenic easement substantially wider--perhaps as much as one-quarter of a mile--would be required.

Because much of the boating and hiking use along the Little Beaver occurs during the spring and fall months, it would be desirable to determine the corridor width when a minimum of tree foliage is present.



VISUAL CORRIDOR
FIGURE 6

There are several areas of outstanding natural, historical, and archaeological significance which fall outside of the visual corridor. These areas include Purgatory Hollow and Bieler Run on the main stem and much of the surrounding area associated with the West Fork. It would be desirable to protect these areas by including them within the scenic river boundary.

In order to avoid attendant land costs, such as the payment of new survey fees and severance costs, and to minimize the impact on existing land uses and ownerships, it is suggested that whenever possible the boundary coincide with existing property lines.

Acquisition Policy and Land Use Controls

Property rights acquired within the boundary should be adequate to provide strong protection of natural values and to accommodate the desired level of recreational use. The acquisition of lands in fee is suggested for those acreages needed to provide access and services to the public and to protect the river and resource values which may be jeopardized by less-than-fee control.

An interesting waterfall found in Purgatory Hollow near the main stem of the Little Beaver.

Over one-half of the land area necessary for protection of the riverway can adequately be safeguarded through the purchase of scenic easements. A scenic easement is essentially an agreement or a series of agreements whereby a landowner binds himself and all future owners of the land to refrain from using or developing his land in ways which would detract from the scenic and natural character of the land. Such an easement would not grant rights of ingress or egress to the general public. The use of an easement in lieu of fee purchase permits land to remain in private ownership and, therefore, to remain on the tax rolls.

The easement rights most likely to be negotiated with landowners along Little Beaver Creek are:

Bieler Run, a tributary of the main stem, flows through a valley of quiet and natural character.

1. Restrictions of the land to specific uses and developments, such as single-family residential, agricultural, timber growing, or particular recreational uses.

2. Limitations on the height of future structures, on the exterior appearance of buildings, and on the intensity of development.

3. Prohibitions of strip mining and gravel mining operations.

4. Prohibitions of billboards and advertising signs.

5. Prohibitions of piles of trash or other unsightly materials.

6. Restrictions on the allowable extent of the cutting of trees and native vegetation.

It should be noted that the acquisition of a scenic easement normally entails extensive negotiations with the landowner and requires thorough investigation before any agreement on the extent of such control for each tract can be obtained. In each case, the landowner is paid fair compensation for the easement restrictions agreed upon.

Land use planning and zoning outside of the river boundary is also recommended. Local units of government should be encouraged to establish zoning standards throughout the watershed which will provide increased protection for those lands within the scenic river boundary.

Development

The conceptual development plan for Little Beaver Creek is directed toward the goal of preserving and protecting the river environment while providing suitable recreation facilities required for appropriate visitor use and enjoyment of the river. Any and all developments should be evaluated with respect to the possible consequences on the natural character of the river. Future resource managers should recognize the possibility of environmental degradation by recreational overuse as well as by poorly conceived commercial, residential, and industrial uses.

The developments listed below are suggested in order to provide the recreationists with appropriate service facilities at suitable locations and are intended only as a guide for the managing agency.

Access Points

Much of the scenic river area is undeveloped and relatively primitive. Although some access areas are presently available within Beaver Creek State Park, additional access areas will be needed in order to make the scenic attributes of the area more available to the general public for

use and enjoyment. Such sites must be carefully located and developed so as not to adversely impact the river environment either by their physical presence or by encouraging overuse. At appropriate locations, some access sites should include facilities such as boat launching, parking areas, picnic tables, drinking water, and comfort stations, while others should be limited to small parking areas which can be used for fishing and canoeing access.

Areas where additional access would be desirable are in the vicinity of Elkton, Fredericktown, Brush Run, Grimm's Bridge, and the confluence of Little Beaver Creek with the Ohio River.

Primitive Camps

Primitive campgrounds are suggested for development along the Little Beaver on sites between Elkton and Lusk's Lock and between Sprucevale and Fredericktown. These campsites should be accessible only by water or by trail. Their purpose should be to provide overnight stopping places for floaters or hikers. Primitive campgrounds should be located back from the river to minimize their visual effect on the river environment and they should be spaced at appropriate intervals to permit visitors to participate in journeys varying from a few hours to several days. The facilities should be rustic in design and would include sanitary facilities, fireplaces, water, and trash containers.

Trails

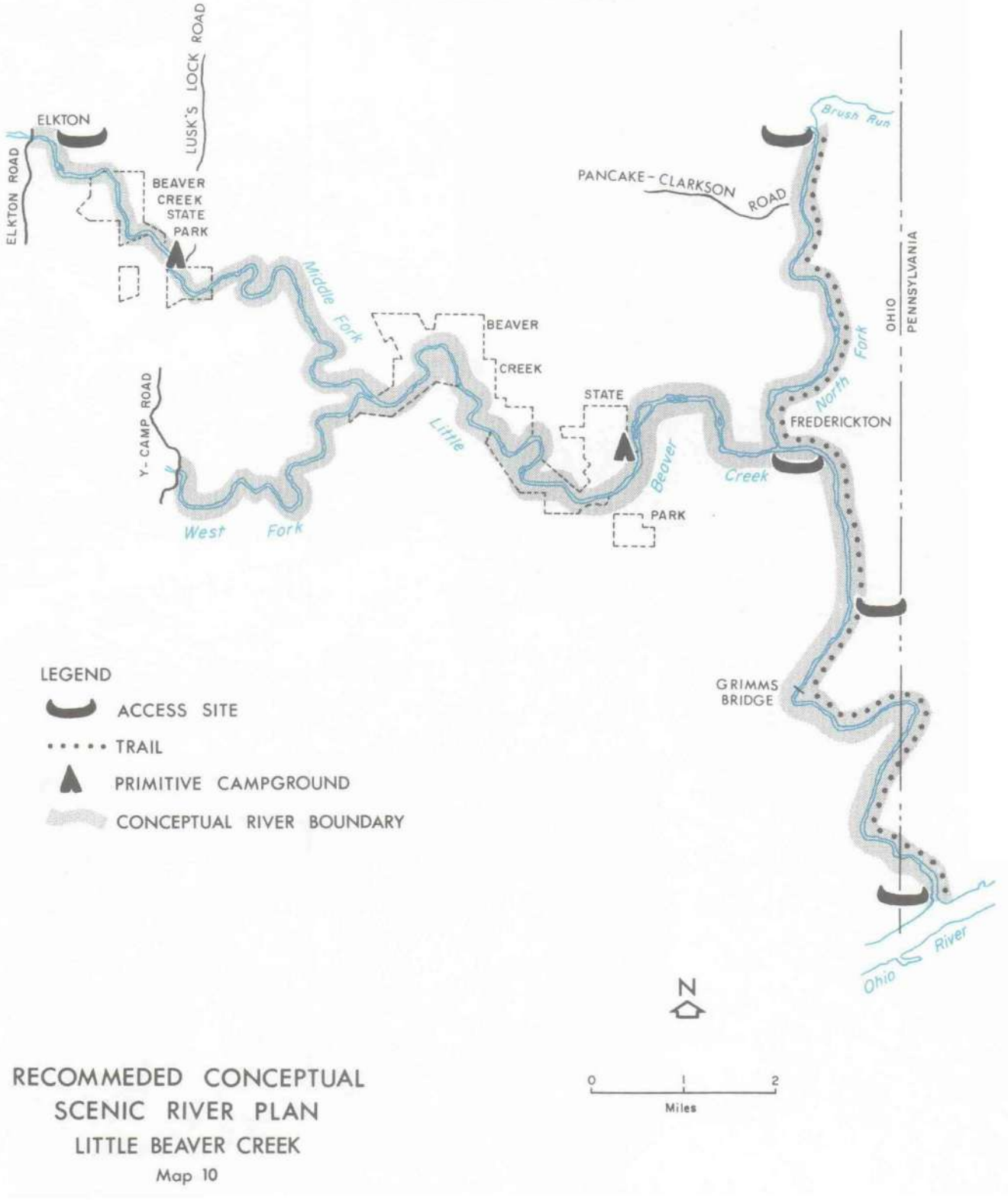
An extensive trail system within the scenic river area should be an integral part of the development plan. Approximately 30 to 40 miles of trail would be needed to connect points of interest with access areas and public campgrounds. It would be desirable to construct loop trails along the North Fork and the West Fork River segments, both of which would provide day outings for the hiker in an area of semi-wilderness character.

The privately owned railroad right-of-way which parallels the main stem and the North Fork of Little Beaver Creek should be considered for development as part of this trail system. Since it is situated on a bluff overlooking the river and is only occasionally visible from the stream, it should provide an excellent trail facility for the hiker and possibly the horseback rider. Trails planned for development should be coordinated with existing trails including the river trail found within Beaver Creek State Park and the Boy Scouts of America trail which runs along the main stem and the Middle Fork.

Management

The management objectives for the proposed scenic river program on Little Beaver Creek should be to protect and enhance the values which enable it to be recommended for inclusion in the National Wild and Scenic River System while providing for additional public enjoyment. The river should be managed to:

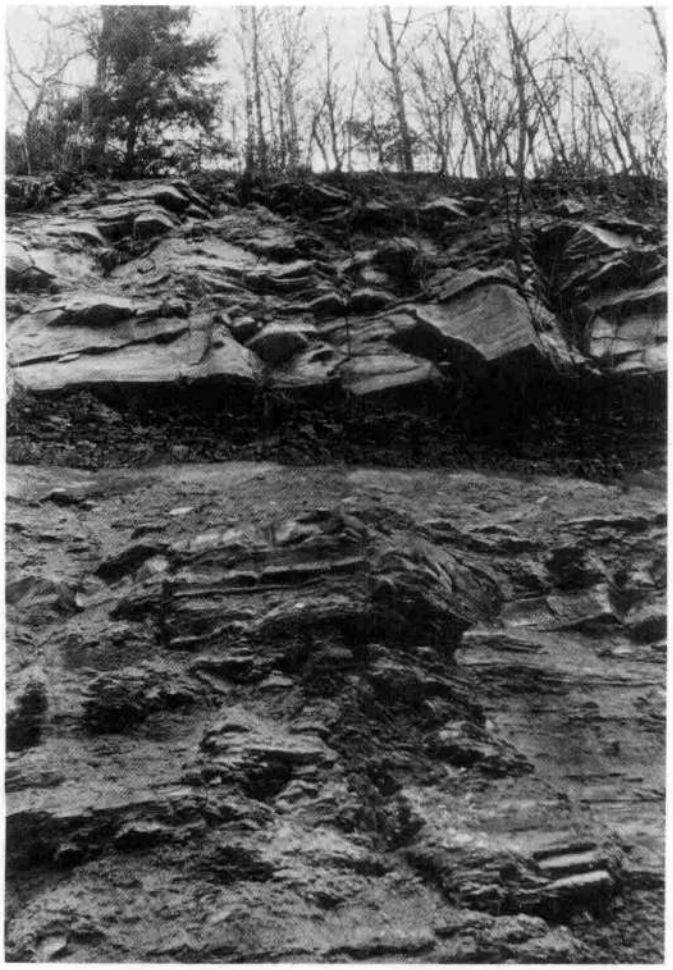
NOTE: Trail proposed along abandoned Montour Railroad.



RECOMMEDED CONCEPTUAL SCENIC RIVER PLAN

LITTLE BEAVER CREEK

Map 10



The old Montour Railroad right-of-way along the North Fork and main stem offers scenic and interesting views of the Little Beaver valley. It would make an excellent hiking trail.

- Maintain its natural free-flowing condition.

- Protect and enhance scenic, recreational, geologic, fish and wildlife, historic, cultural, archaeological, scientific, and other similar resources.

- Provide for public access, use, and interpretation of the important scenic, recreational, geologic, fish and wildlife, historic, cultural, archaeological, scientific, and other similar resources, consistent with protection of the quality of the river and its environment.

- Maintain and enhance water quality.

Some specific management suggestions to achieve the above objectives are:

Recreation

- Visitor-use levels should be established which will not endanger the scenic and natural values of the river system. Access sites and other facilities should be placed and developed by giving careful attention to the use impact that can result. Because the long-term and continuing impact of human use on the river and its environment is not fully understood, a system of perodic evaluation and monitoring should be established to develop criteria for the protection and management necessary to ensure a meaningful scenic river experience for the river user.

- Facility development should not detract from the quality of the river scene. Development sites should be placed back from the river's bank and screened from the view of the river user.

- The managing agency should establish natural areas along the riverway at which only limited recreational activities would be allowed. Areas such as Laurel Ridge and Bieler Run on the main stem and the Beaver High School Gorge on the West Fork should be provided only with minimal trail and access facilities and retained as small natural areas.

- A detailed inventory of historic, archaeologic, and natural areas should be made and a program developed for their protection and, where appropriate, their interpretation. Interpretive devices and signs should be relatively unobtrusive or complementary to the natural and historic scene.

- Where possible, hiking and bridle trails should be developed as separate units.

- The use of motorized vehicles and motor driven watercraft for recreation purposes should be strictly controlled such that the experience of the river user is not adversely affected.

Fish and Wildlife

Habitat management for fish and wildlife should reflect equal consideration of game and nongame species, and all practices employed should be in conformance with maintenance of the natural qualities of the riverway.

Land Resource Use

Where seeding or replanting becomes necessary, native plant species should be used when conditions are suitable. Otherwise, various species of pine should be used. Special management protection measures would be needed for areas of unique biological value.

Protection of the forest resources within and near the river boundaries from fire and insect and disease damage should receive added consideration. Control or salvage measures necessary for diseased or damaged trees or other vegetation should be carefully weighed against possible adverse impacts on the ecological and scenic values of the river corridor.

Maintenance of stable soils and protection of the watershed adjacent to the river are essential. Because much of the recreation activity and development would take place near the river's edge, special emphasis should be placed on preventing and controlling soil erosion. This is true for both natural and man-caused deterioration. Soil stabilization measures and revegetation should be undertaken where feasible on all exposed soil areas.

Local student and civic organizations should be encouraged to clean up riverside areas and develop a program to control litter in the future. Existing strip-mine regulations should be strictly enforced. New strip-mine areas should not be allowed within the visual corridor, nor should existing or future strip-mines outside of this area be allowed to degrade the environmental quality of Little Beaver Creek. Existing abandoned mine areas should be reclaimed where possible.

At places where roads parallel Little Beaver Creek within sight or sound of the portions recommended for inclusion in the National System, such as State Route 7, screening material should be used for the benefit of the river user.

Removal of bankside vegetation should be prevented and cropping restricted where it endangers natural or scenic values.

Efforts should be made to encourage local units of government to apply zoning controls to lands adjacent to the scenic river corridor and in nearby developed areas to ensure that the immediate environment of Little Beaver Creek is further protected by a buffer zone.

Water Resources

Since riverside communities are sources of water pollution and are, in turn, especially susceptible to the effects of water quality degradation, careful attention must be given to the upgrading of existing municipal sewage treatment systems and the planning and construction of other developments along the river and its tributaries that could also be possible sources of water quality degradation. A program for monitoring chemical, biological, and physical water quality characteristics should be established throughout the watershed.

Alteration of the natural channels in the basin that significantly affect the free flow of water should not be permitted unless it is clearly demonstrated that such alterations would have no adverse effect on the scenic and recreational qualities of the river corridor.

Efforts to reduce siltation through land conservation measures throughout the watershed should be intensified.

Utilities

Any construction of new bridge crossings, renovation of existing structures, or power or pipeline crossings should be reviewed and approved in advance by the managing agency. Where possible, the construction of new power line and pipeline crossings of the river should be avoided. If crossings can in no way be avoided, the managing agency and the concerned public utility company should jointly select the location which will result in the least damage to the river environment. Existing power and pipeline crossings should be adequately screened where possible.

VII.
ALTERNATIVE ACTIONS CONSIDERED

VII. ALTERNATIVE ACTIONS CONSIDERED

Other Actions to Protect

Additional alternatives for protecting the scenic and recreational resources of Little Beaver Creek were considered, including five proposals involving the accelerated use of existing facilities. It was felt that the following proposals were worthy of consideration.

Accelerate Existing State and Local Land Acquisition Programs

Additional acquisition funds for the Ohio Department of Natural Resources and local agencies, such as Columbiana County, would substantially increase their capability to acquire more river frontage offered for sale. For example, additional funding for the Ohio Department of Natural Resources would permit the expansion of Beaver Creek State Park along the river. Thus, the study area could theoretically be developed as a large state park. Public agency management of these lands would be designed to protect the scenic and recreational qualities of the rivers.

Administration of the Little Beaver as a State Wild and Scenic River

Little Beaver Creek was designated a component of the Ohio Wild and Scenic Rivers System in January 1974. The scenic, recreational, geologic, fish and wildlife, and historic values of the Little Beaver could be protected solely through its administration as a component of the state system under provisions of Ohio's Wild and Scenic Rivers Act. This Act provides for the establishment, development, use, and administration of scenic river areas under the direction of the Director, Department of Natural Resources.

Water Conservancy District

Existing Ohio statutes allow the formation of watershed conservancy districts, which enable residents within the district to help determine the needs and methods for maintaining and improving the district's water resources for a variety of public purposes. Through the formation of citizen advisory boards, a water conservancy district provides basin residents with some authority and opportunity to decide how the district's water resources should be developed. Citizen input is provided through the district's board of directors which is delegated a wide range of acquisition, construction, management, and taxing authority. The board's authority could permit management for purposes of protecting scenic and recreational river values.

It should be recognized that water conservancy districts must include the entire basin drainage area rather than just the corridor deemed necessary for river protection. A water conservancy district would not necessarily and perhaps quite likely not conform to the intent and requirements of a wild and scenic rivers system. By their nature, water conservancy districts are generally oriented to multiple use. If so, they can allow the construction of dams, impoundments, channelization, and other stream alterations for purposes of flood control, water supply, or recreational use.

Land Use Planning and Zoning

Counties and municipalities have authority under Ohio law to enact land use control and zoning measures. If the river resources of the Little Beaver are to be effectively protected and appropriate public use areas provided, it would be desirable for Beaver County, Pennsylvania, to establish land use controls that could be coordinated with the overall objectives established in Columbiana County's land use plan for the Little Beaver. If the individual county plans were not coordinated, inconsistent and ineffective river protection and use controls could result. Local initiative in establishing coordinated county and regional land use plans could maintain the physical appearance of the rivers as they exist today and ensure their protection in the future.

National land use policy legislation presently being considered by Congress could provide an incentive for local units of government within the basin to enact land use controls which would protect the aesthetic and recreational values of the rivers. If enacted, this legislation would encourage state and local governments to plan and regulate land use in conformance with the capability of the land resource base to best serve the needs of the nation. Recreation and public use areas and the preservation of floodplains have been recognized as having a high priority as this environmentally directed legislation is being prepared.

Metropolitan Park District

The scenic values of Little Beaver Creek could be protected through the formation of a metropolitan park district. A metropolitan park district, unlike a watershed conservancy district, is not established on a watershed basis. Metropolitan park districts can include only one county or a number of counties. Residents can influence the action and policies of a park district through the formation of citizen advisory boards. The powers of the park district's board of commissioners are similar to those of a conservancy district's board of directors. Generally, metropolitan park districts are established in large urban areas for the purpose of preserving open space and natural areas.

VIII.
ENVIRONMENTAL AND ECONOMIC IMPACT OF THE PROPOSED ACTION

VIII. ENVIRONMENTAL AND ECONOMIC IMPACT OF THE PROPOSED ACTION

The following section provides a brief summary of environmental and socio-economic effects as a result of designating Little Beaver Creek a component of the National Wild and Scenic Rivers System. [redacted]. This summary is intended only to give the reader a brief overview of probable effects.

Environmental Impacts

Enactment of appropriate legislation designating Little Beaver Creek a component of the National System and setting forth specific guidelines for its establishment would ensure protection of the river's resources. Inclusion of the Little Beaver in the National System would have an overall beneficial effect of assisting to protect and improve the quality of the river and adjoining lands. The river segments would be preserved in their free-flowing condition and specific land areas would be set aside for the public use and enjoyment of the scenic, recreational, fish and wildlife, and other similar values. Of benefit would be the authority to limit the number of users before overuse could cause degradation of the river's resources.

Adverse effects to the environment of the river corridor would be minimal, with no significant adverse effects on ecological systems foreseen. Some minor effects on vegetation, soils, and wildlife will likely occur at the public use and/or access sites at which expansion is planned and at those additional sites selected for public use and access. These effects will occur as a result of construction and anticipated increased recreational use.

Socio- Economic Impacts

If Little Beaver Creek were included in the National System and established under the acquisition and management guidelines previously described, socio-economic effects would occur and other possible economic benefits would be foregone as a result of national designation. However, most of the existing uses along the river would be unaffected.

As a result of providing public access and use sites and in order to adequately protect some portions of the river corridor, a limited amount of residential and crop and/or pasture land might be eliminated.

Participation in camping, hiking, canoeing, fishing and hunting would continue to increase as the area became better known and facilities were developed. This increased participation could very likely result in the establishment of additional retail services associated with recreation activities, including sporting goods stores and canoe liveries.

Tree cutting restrictions would affect a few local landowners now cutting timber within the river corridor.

Strip mining within the river corridor would be discouraged. As a result, existing mining activity could be terminated and any future mining might not be allowed. This could have an adverse economic impact on those mining companies affected, particularly if they were small operations. It is likely that such occurrences would have only a minimal impact on strip mining on either a regional or statewide basis.

As explained in the Recommended Conceptual River Plan, some restrictions on land use within the established scenic river boundary would be required of those landowners at which scenic easements are negotiated.

Generally, the value of lands immediately adjacent to the proposed river corridor would increase, and it is expected that land values in nearby communities would also rise. There would be exceptions, however. If mining would no longer be allowed, the value of those lands presently being mined or those potentially valuable for mining would very likely decrease.

Lands acquired in fee would become tax exempt. However, this would very likely affect only a very small percentage of the tax base of Columbiana County or of any one school district. Lands under scenic and use easements would continue to provide tax revenues.

In addition to preventing use of the Little Beaver river corridor for increased homesite and cottage development and additional strip mining, the designation of the Little Beaver as a component of the National Wild and Scenic Rivers System would also preclude other possible uses. The construction of any reservoirs would be prohibited along those segments to be included in the National System and any possible multiple use benefits (including recreation) would be foregone. In addition, industry would also be prohibited from building along the river segments which would forego any economic benefits that might be derived from their operation.

IX.
APPENDICES

Appendix I.

Fishes of Little Beaver Creek Watershed

Common Name

1. Brown Trout
2. Rainbow Trout
3. Golden Redhorse
4. Ohio Redhorse
5. Hog Sucker
6. Common White Sucker
7. Carp
8. Hornyhead Chub
9. River Chub
10. Northern Bigeye Chub
11. Western Blacknose Dace
12. Northern Creek Chub
13. Southern Redbelly Dace
14. Silver Shiner
15. Rosyface Shiner
16. Central Common Shiner
17. Northern Common Shiner
18. Spotfin Shiner
19. Northeastern Sand Shiner
20. Northern Mimic Shiner
21. Silverjaw Minnow
22. Northern Fathead Minnow
23. Bluntnose Minnow
24. Ohio Stoneroller Minnow
25. Central Stoneroller Minnow
26. Channel Catfish
27. Flathead Catfish
28. Stonecat Madtom
29. Brindled Madtom
30. American Eel
31. White Crappie
32. Northern Rockbass
33. Northern Smallmouth Blackbass
34. Northern Largemouth Blackbass
35. Northern Bluegill Sunfish
36. Pumpkinseed Sunfish
37. Yellow Walleye
38. Blackside Darter
39. Ohio Logperch Darter
40. Central Johnny Darter
41. Greenside Darter.
42. Eastern Banded Darter
43. Variegated Darter
44. Rainbow Darter
45. Barred Fantail Darter
46. Central Redfin Sculpin
47. Brook Stickleback
48. Brook Trout
49. Central Mudminnow
50. Central Quillback Carpsucker
51. Silver Redhorse
52. Black Redhorse
53. Western Lake Chubsucker
54. Goldenshiner
55. Redside Dace
56. Northern Redfin Shiner
57. Yellow Bullhead
58. Brown Bullhead
59. Black Bullhead
60. Black Crappie
61. Green Sunfish
62. Central Longear Sunfish
63. Yellow Perch

Note: List compiled by U.S. Bureau of Sport Fisheries and Wildlife.

Appendix II.

A Partial List of the Freshwater Bivalve Mollusks of Little Beaver Creek Watershed

	Scientific Name	Remarks
1.	Strophitus undulatis undulatis	Very Common
2.	Lasmigona costata	
3.	Lasmigona copressa	
4.	Elliptio dilatatus	Plentiful
5.	Ptychobranuchus fasciolaris	Plentiful
6.	Lampsilis radiata luteola	Plentiful
7.	Villosa iris iris	
8.	Lampsilis ovata f. ventricosa	Very Common
9.	Anodonta gradis gradis	
10.	Lampsilis fasciola	(sub-fossil, possibly extinct)
11.	Anodontoides ferussacianus	

Note: List compiled by U.S. Bureau of Sport Fisheries and Wildlife. Blanks indicate lack of information.

Appendix III.

Reptiles and Amphibians of Little Beaver Creek Watershed

	Common Name		Common Name
1.	Fence Lizard	24.	Allegheny Mt. Salamander
2.	Five-lined Skink	25.	Red-back Salamander
3.	Northern Water Snake	26.	Slimy Salamander
4.	Queen Snake	27.	Northern Red Salamander
5.	Northern Brown Snake	28.	Northern Two-lined Salamander
6.	Midland Brown Snake	29.	Long-tailed Salamander
7.	Northern Red-Bellied Snake	30.	American Toad
8.	Eastern Garter Snake	31.	Fowler's Toad
9.	Eastern Ribbon Snake	32.	Spring Peeper
10.	Eastern Hognose Snake	33.	Eastern Gray Treefrog
11.	Northern Ringneck Snake	34.	Western Chorus Frog
12.	Northern Black Racer	35.	Mt. Chorus Frog
13.	Eastern Smooth Green	36.	Bullfrog
14.	Black Rat Snake	37.	Green Frog
15.	Eastern Milk Snake	38.	Northern Leopard Frog
16.	Northern Copperhead	39.	Pickeral Frog
17.	Hellbender	40.	Wood Frog
18.	Mudpuppy	41.	Snapping Turtle
19.	Jefferson Salamander	42.	Stinkpot
20.	Marbled Salamander	43.	Eastern Box Turtle
21.	Spotted Salamander	44.	Midland Painted Turtle
22.	Red-spotted Newt	45.	Smooth Softshell Turtle
23.	Northern Dusky Salamander	46.	Spring Softshell Turtle

Note: List compiled by the U.S. Bureau of Sport Fisheries and Wildlife.

Appendix IV.

Mammals of Little Beaver Creek Watershed

	Common Name		Common Name
1.	Oppossum	25.	Striped Skunk
2.	Masked Shrew	26.	Coyote
3.	Smoky Shrew	27.	Red Fox
4.	Pygmy Shrew	28.	Gray Fox
5.	Least Shrew	29.	Woodchuck
6.	Shorttail Shrew	30.	Thirteen-lined Ground Squirrel
7.	Starnose Mole	31.	Eastern Chipmunk
8.	Eastern Mole	32.	Eastern Gray Squirrel
9.	Hairytail Mole	33.	Eastern Fox Squirrel
10.	Little Brown Myotis	34.	Red Squirrel
11.	Keen Myotis	35.	Southern Flying Squirrel
12.	Small-footed Myotis	36.	Beaver
13.	Silver-haired Bat	37.	Deer Mouse
14.	Eastern Pipistrel	38.	White-footed Mouse
15.	Big Brown Bat	39.	Eastern Woodrat
16.	Red Bat	40.	Southern Bog Lemming
17.	Hoary Bat	41.	Meadow Vole
18.	Evening Bat	42.	Pine Vole
19.	Western Big-eared Bat	43.	Muskrat
20.	Raccoon	44.	Norway Rat
21.	Least Weasel	45.	House Mouse
22.	Longtail Weasel	46.	Meadow Jumping Mouse
23.	Mink	47.	Woodland Jumping Mouse
24.	Badger	48.	Eastern Cottontail Rabbit
		49.	Whitetail Deer

Note: List compiled by the U. S. Bureau of Sport Fisheries and Wildlife.

Appendix V.

A Partial List of the Birds of Little Beaver Creek Watershed

-Permanent Residents-

	Common Name	Remarks
1.	Sparrow Hawk	V - C
2.	Ruffed Grouse	FC
3.	Bobwhite	C
4.	Ring-necked Pheasant	U
5.	Turkey	R
6.	Killdeer	R - VC
7.	Rock Dove	C
8.	Mourning Dove	C
9.	Barn Owl	U
10.	Screech Owl	U
11.	Great Horned Owl	U
12.	Barred Owl	U
13.	Yellow-shafted Flicker	U - C
14.	Pileated Woodpecker	VU
15.	Red-bellied Woodpecker	U
16.	Red-headed Woodpecker	U
17.	Yellow-bellied Sapsucker	VU
18.	Hairy Woodpecker	U
19.	Downy Woodpecker	U - C
20.	Horned Lark	R - C
21.	Common Crow	U - C
22.	Black-capped Chickadee	R - C
23.	Tufted Titmouse	R - C
24.	White-breasted Nuthatch	U - C
25.	Carolina Wren	C
26.	Mockingbird	U - C
27.	Eastern Bluebird	R - U
28.	House Sparrow	C
29.	Cardinal	C
30.	American Goldfinch	U - C
31.	Rufous-sided Towhee	U - C
32.	Song Sparrow	Widespread and numerous throughout the year except in northeastern Ohio in winter
33.	Belted Kingfisher	R - C

KEY

ab - Abundant
VC - Very Common
C - Common
FC - Fairly Common
R - Rare
VR - Very Rare
Ac - Accidental

-Migrant Birds Which Sometime Nest
and/or Appear in Winter-

	Common Name	Remarks Nesting	Winter
1.	Pied-billed Grebe	R (May-Jul)	VR
2.	Great Blue Heron	U-C (Apr-Aug)	Ac-R
3.	Green Heron	U-C (Apr-Jul)	Ac
4.	Common Egret	VR (Apr-Jul)	Ac
5.	Black-crowned Night Heron	U (Apr-Aug)	Ac-VR
6.	Yellow-crowned Night Heron	R (Apr-Jul)	
7.	Least Bittern	R (May-Jul)	
8.	American Bittern	R (Apr-Jul)	VR
9.	Canada Goose	VR (Apr-Jul)	R
10.	Mallard	U (Apr-Jul)	U - C
11.	Black Duck	R-U (Apr-Jul)	U - C
12.	Green-winged Teal	VR (May-Jul)	R
13.	Blue-winged Teal	U (May-Jul)	VR
14.	American widgeon	Ac-VR (May-Aug)	R
15.	Shoveler	VR (May-Jul)	VR
16.	Wood Duck	C (Apr-Aug)	VR
17.	Redhead	Ac-VR (May-Jul)	VR-R
18.	Lesser Scaup	Ac-VR (May-Jul)	R
19.	Ruddy Duck	Ac-VR	Ac-VR
20.	Hooded Merganser	Ac-VR (Apr-Jul)	VR
21.	Turkey Vulture	U-C (Apr-Jul)	Ac-VR
22.	Black Vulture	Ac (Mar-Jul)	Ac-VR
23.	Coopers Hawk	VR (Mar-Jul)	Ac-VR
24.	Sharp-Shinned Hawk	VR (Mar-Jul)	Ac-VR
25.	Red-tailed Hawk	U (Mar-Jul)	U - C
26.	Red-shouldered Hawk	R-U (Mar-Jul)	VR
27.	Broad-winged Hawk	Ac-R (Apr-Jul)	Ac
28.	Bald Eagle	Ac-VR (Feb-Jul)	Ac-VR
29.	Marsh Hawk	R (May-Jul)	R - U
30.	Osprey	Ac-VR	Ac
31.	King Rail	Ac-VR (May-Jul)	Ac
32.	Virginia Rail	Ac-U (May-Jul)	Ac
33.	Sora	Ac-U (May-Jul)	
34.	Common Gallinule	VR-U (Jun-Aug)	
35.	American Coot	R-U (May-Aug)	
36.	Piping Plover	Ac (May-Jul)	
37.	American Woodcock	VR-R (Mar-Jul)	Ac
38.	Common Snipe	Ac (Apr-Jul)	Ac-VR
39.	Upland Plover	R-U (Apr-Jun)	
40.	Spotted Sandpiper	U-C (May-Jul)	
41.	Herring Gull	VR (Apr-Jul)	R
42.	Ring-bill Gull	VR (May-Aug)	VR
43.	Yellow-billed Cuckoo	U (Jun-Sep)	
44.	Black-billed Cuckoo	FC (Jun-Sep)	
45.	Long-eared Owl	R (Mar-Jun)	U

46.	Short-eared Owl	Ac-VR (Apr-Jul)	R
47.	Whip-poor-will	U (May-Jul)	
48.	Common Nighthawk	R (May-Jul)	
49.	Chimney Swift	U (May-Jul)	
50.	Ruby-throated Hummingbird	U (May-Aug)	
51.	Eastern Kingbird	U (May-Jul)	
52.	Great Crested Fly-catcher	U-C (May-Jul)	
53.	Eastern Phoebe	R-U (Mar-Jul)	Ac-VR
54.	Acadian Flycatcher	R-U (May-Aug)	
55.	Traill's Flycatcher	R-C (May-Aug)	
56.	Least Flycatcher	Ac-VR (May-Aug)	
57.	Eastern Wood Pewee	R-C (May-Aug)	
58.	Tree Swallow	R-U (May-Jul)	
59.	Bank Swallow	VR (May-Jul)	
60.	Rough-Winged Swallow	R (May-Jul)	
61.	Barn Swallow	R (Apr-Aug)	
62.	Cliff Swallow	Ac-VR (May-Jul)	
63.	Purple Martin	R-VC (Apr-Aug)	
64.	Blue Jay	R-C (Mar-Jul)	R
65.	Carolina Chickadee	AC-VR (Mar-Jul)	Ac
66.	Red-breasted Nuthatch	Ac-VR (May-Jul)	R-U
67.	Brown Creeper	R (May-Jul)	R-U
68.	Winter Wren	Ac (May-Jul)	Ac-VR
69.	Bewicks Wren	R-U (Apr-Jul)	R-U
70.	Long-billed Marsh Wren	R-U (May-Sep)	Ac-R
71.	Short-billed Marsh Wren	R-U (May-Sep)	Ac
72.	Catbird	U-C (May-Jul)	Ac-R
73.	Brown Thrasher	U-C (Apr-Jul)	Ac
74.	Robin	C (Mar-Aug)	Ac-AB
75.	Wood Thrush	U-C (Apr-Aug)	
76.	Hermit Thrush	VR (May-Jun)	Ac-R
77.	Veery	R (May-Jul)	
78.	Blue-gray Gnatcatcher	R-U (Apr-Jul)	
79.	Golden-crowned Kinglet	-	
80.	Cedar Waxwing	Ac-U (May-Sep)	VR-C
81.	Northern Shrike		Ac-R
82.	Loggerhead Shrike	AC-VR (Mar-Jun)	Ac-VR
83.	White-eyed Vireo	VR-R (May-Jul)	
84.	Yellow-throated Vireo	R-U (Apr-Aug)	
85.	Solitary Vireo	Ac-VR (Jun-Jul)	
86.	Red-eyed Vireo	C-VC (May-Aug)	
87.	Warbling Vireo	U (May-Aug)	
88.	Black-and-white Warbler	U (May-Jul)	
89.	Prothonotary Warbler	R (May-Jul)	
90.	Worm-eating Warbler	VR (May-Jul)	
91.	Golden-winged Warbler	Ac-VR (May-Jul)	
92.	Blue-winged Warbler	VR-R (May-Jul)	
93.	Nashville Warbler	VR-R (Jun-Jul)	
94.	Parula Warbler	R (May-Jul)	
95.	Yellow Warbler	UC-C (Apr-Jul)	
96.	Magnolia Warbler	VR (Jun-Jul)	

97.	Black-throated Blue Warbler	VR (Jun-Jul)	
98.	Black-throated Green Warbler	R-VU (May-Jul)	
99.	Cerulean Warbler	UC-FC (May-Jul)	
100.	Blackburnian Warbler	VR (Jun-Jul)	
101.	Yellow-throated Warbler	Ac-VR (Apr-Jul)	
102.	Chestnut-sided Warbler	VR (May-Jul)	
103.	Pine Warbler	VR (May-Jul)	
104.	Prairie Warbler	VR-R (May-Jul)	
105.	Ovenbird	U-C (May-Jul)	Ac
106.	Northern Waterthrush	Ac-R (May-Jul)	
107.	Louisiana Waterthrush	R-C (Apr-Jul)	
108.	Kentucky Warbler	R-U (May-Jul)	
109.	Mourning Warbler	Ac-R (Jun-Jul)	
110.	Northern Yellowthroat	U-C (May-Aug)	Ac
111.	Yellow-breasted Chat	VR-R (May-Aug)	Ac
112.	Hooded Warbler	VR-R (May-Jul)	
113.	American Redstart	R (May-Jul)	
114.	Bobolink	R-U (May-Aug)	
115.	Eastern Meadowlark	R-U (Apr-Aug)	Ac-U
116.	Redwinged Blackbird	U-C (Apr-Jul)	U
117.	Orchard Oriole	U (May-Jul)	
118.	Baltimore Oriole	R-U (Apr-Jul)	Ac
119.	Common Grackle	U	R-U
120.	Brownheaded Cowbird	U-VC (Apr-Aug)	R-U
121.	Scarlet Tanager	U (May-Jul)	
122.	Summer Tanager	U (May-Jul)	
123.	Rose-breasted Grosbeak	R-U (May-Jul)	
124.	Indigo Bunting	U-C (May-Sep)	
125.	Dickcissel	Ac-VR (May-Aug)	Ac
126.	Purple Finch	VR-R (May-Jul)	R-VR
127.	Pine Siskin	VR	Ac-C
128.	Red Crossbill	Ac	Ac-R
129.	White-winged Crossbill	Ac	Ac-R
130.	Savannah Sparrow	U (May-Jul)	Ac
131.	Grasshopper Sparrow	VR (May-Aug)	Ac
132.	Henslow's Sparrow	Ac-U (May-Sep)	
133.	Vesper Sparrow	R-U (Apr-Aug)	Ac-VR
134.	Backman's Sparrow	Ac-R (Apr-Jul)	
135.	Slate-colored Junco	Ac (May-Jul)	VR-R
136.	Chipping Sparrow	U-C (Apr-Jul)	Ac
137.	Field Sparrow	U-VC (Apr-Aug)	Ac-U
138.	White-crowned Sparrow	Ac	Ac-R
139.	White-throated Sparrow	Ac-VR (May-Jul)	Ac-R
140.	Swamp Sparrow	Ac-U (May-Jul)	Ac-R

KEY

Ab - Abundant	U - Uncommon
VC - Very Common	VU - Very Uncommon
C - Common	R - Rare
FC - Fairly Common	VR - Very Rare
	Ac - Accidental

-Migrant Birds-

	Common Name	Remarks
1.	Common Loon	R - C
2.	Red-throated Loon	Ac - VR
3.	Red-necked Grebe	Ac - VR
4.	Horned Grebe	R - VC
5.	White Pelican	Ac - VR
6.	Gannet	Ac - VR
7.	Double-crested Cormorant	R - U
8.	Little Blue Heron	Ac - VR
9.	Snowy Egret	Ac - VR
10.	Whistling Swan	Ac - C
11.	Brant	Ac - VR
12.	Blue Goose	U - C
13.	Snow Goose	U - C
14.	Gadwall	U - C
15.	Pintail	U - C
16.	European Widgeon	VR - R spring only
17.	Ring-necked Duck	VU - VC
18.	Canvasback	VU - VC
19.	Greater Scaup	VR - R
20.	Common Goldeneye	U - C
21.	Bufflehead	U
22.	Oldsquaw	R
23.	White-winged Scoter	VR - U
24.	Surf Scoter	VR - R
25.	Common Scoter	VR
26.	Common Merganser	R - U
27.	Red-breasted Merganser	U - VC
28.	Goshawk	Ac - VR
29.	Rough-legged Hawk	R - C
30.	Golden Eagle	Ac - VR
31.	Peregrine Falcon	VR
32.	Pigeon Hawk	R - C
33.	Sandhill Crane	Ac - VR
34.	Yellow Rail	Ac - R
35.	Purple Gallinule	Ac - VR
36.	Semipalmated Plover	U - C
37.	American Golden Plover	R - C
38.	Black-bellied Plover	VR - U
39.	Ruddy Turnstone	Ac - C in spring Ac - R in fall
40.	Whimbrel	VR

41.	Solitary Sandpiper	U - C
42.	Willet	Ac - VR
43.	Greater Yellowlegs	U - C
44.	Lesser Yellowlegs	U - C
45.	Knot	Ac - U
46.	Pectoral Sandpiper	C - VC
47.	White-rumped Sandpiper	Ac - U
48.	Baird's Sandpiper	Ac - U
49.	Least Sandpiper	U - C
50.	Dunlin	R - C
51.	Short-billed Dowitcher	Ac - C
52.	Long-billed Dowitcher	Ac - C
53.	Stilt Sandpiper	Ac - C in fall migration
54.	Semipalmated Sandpiper	R - C
55.	Hudsonian Godwit	Ac - R
56.	Sanderling	VR
57.	Northern Phalarope	VR
58.	Bonaparte's Gull	VR
59.	Forster's Tern	VR
60.	Common Tern	VR - C
61.	Caspian Tern	VR
62.	Black Tern	VR
63.	Snowy Owl	VR
64.	Yellow-bellied Flycatcher	R - U
65.	House Wren	U - C
66.	Saw-whet Owl	Ac - U
67.	Swainson's Thrush	U - VC
68.	Gray-cheeked Thrush	R - C
69.	Ruby-crowned Kinglet	U
70.	Water Pipit	R - U
71.	Philadelphia Vireo	VR - U
72.	Tennessee Warbler	U - C
73.	Orange-crowned Warbler	Ac - R
74.	Cape May Warbler	U - C
75.	Myrtle Warbler	U - C
76.	Bay-breasted Warbler	U - VC
77.	Blackpoll Warbler	U - VC
78.	Palm Warbler	R - U
79.	Connecticut Warbler	R - U
80.	Wilson's Warbler	R - C
81.	Canada Warbler	R - U
82.	Western Meadowlark	Ac - U
83.	Rusty Blackbird	R - C
84.	Evening Grosbeak	Ac - U
85.	Pine Grosbeak	Ac - VR

86.	Common Redpoll	Ac - U
87.	Sharp-tailed Sparrow	Ac - R
88.	Lark Sparrow	Ac - R
89.	Oregon Junco	Ac - U
90.	Tree Sparrow	Ac - VR
91.	Harris's Sparrow	Ac - VR
92.	Fox Sparrow	R - C
93.	Lincoln's Sparrow	VR - C
94.	Lapland Longspur	Ac - VC
95.	Smith's Longspur	Ac - VR
96.	Snow Bunting	Ac - C

KEY

Ab - Abundant
VC - Very Common
C - Common
FC - Fairly Common
U - Uncommon
VU - Very Uncommon
R - Rare
VR - Very Rare
Ac - Accidental

APPENDIX VI

Photograph Credits

Photograph Location	Source
Cover	Ohio DNR
Frontispiece	Unknown
Page 31	Ohio DNR
Page 33	
Upper left, Upper right and center	BOR
Lower right	Ohio DNR
Page 34	
All photographs	BOR
Page 35	
Upper left	BOR
Upper right	BOR
Center	BOR
Lower left	Ohio DNR
Lower right	Ohio DNR
Page 36	
All photographs	Ohio DNR
Page 37	
Upper right	Ohio DNR
All others	BOR
Page 38	
Upper left	Ohio DNR
Upper right	Ohio DNR
Center	Ohio DNR
Lower left	BOR
Lower right	BOR
Page 41	
All photographs	BOR
Page 42	
Upper left	BOR
All others	Ohio DNR
Page 43	
Upper photograph	BOR
Center photograph	Ohio DNR
Lower photograph	Ohio DNR
Page 48	
Both photographs	BOR
Page 49	
Both photographs	BOR
Page 56	
Both photographs	BOR
Page 62	
Both photographs	Ohio DNR
Page 63	
Both photographs	Ohio DNR

Page 66	BOR
Page 67	Ohio DNR
Page 69	
Both photographs	Ohio DNR
Page 75	F.B. Shattuck
Page 76	BOR
Page 77	BOR
Page 78	
Both photographs	BOR
Page 79	F.B. Shattuck
Page 83	BOR
Page 87	BOR
Page 98	
Upper photograph	BOR
Lower photograph	Ohio DNR
Page 100	Ohio DNR
Page 104	
Both photographs	BOR
Page 121	BOR
Page 122	Ohio DNR
Page 126	
Both photographs	BOR