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BUFFALO RIVER, TENNESSEE
WILD AND SCENIC RIVER STUDY

MESSAGE

FROM

THE PRESIDENT OF THE UNITED STATES

TRANSMITTING

A REPORT ON THE BUFFALO RIVER IN TENNESSEE, PURSUANT TO SECTION 4(a) OF THE WILD AND SCENIC RIVER ACT, AS AMENDED

OCTOBER 5, 1979.—Message and accompanying papers referred to the Committee on Interior and Insular Affairs and ordered to be printed

U.S. GOVERNMENT PRINTING OFFICE
WASHINGTON : 1979

52-150 O

TO THE CONGRESS OF THE UNITED STATES:

In my Environmental Message of August 2, 1979, I proposed legislation to add a number of rivers and trails to the National Wild and Scenic Rivers and National Trails Systems.

Enclosed are reports and draft legislation that would add the following three river segments to the National Wild and Scenic Rivers System as federally administered components:

-- Gunnison River, Colorado

-- Encampment River, Colorado

-- Priest River, Idaho

I am reaffirming my support for designation of a segment of the Illinois River in Oregon for which legislation was submitted to the Congress last year. I am also reaffirming my support for the following four river segments proposed in my last Environmental Message for inclusion in the System:

-- Bruneau River, Idaho

-- Dolores River, Colorado

-- Upper Mississippi River, Minnesota

-- Salmon River, Idaho

In addition, I am transmitting to you new study reports on eight rivers which have been found to qualify for inclusion in the National Wild and Scenic Rivers System as State-administered components. Each of the States in which the rivers are located has expressed an interest in administering these rivers as components of the national system. The rivers are:

-- Pine Creek, Pennsylvania

-- Buffalo River, Tennessee

-- Youghiogheny River, Pennsylvania-Maryland

-- Shepaug River, Connecticut

-- Kettle River, Minnesota

-- Lower Wisconsin River, Wisconsin

-- Housatonic River, Connecticut

-- Illinois River, Oklahoma

In my 1977 Environmental Message, I proposed 20 additional river segments for study as potential additions to the National Wild and Scenic Rivers System. Several of those rivers have already been designated. Except for rivers where subsequent development has affected the river's qualification for designation, I continue to support legislation authorizing the study of these rivers. Moreover, I am submitting legislation to add the North Umpqua River in Oregon to the list of those rivers to be studied.

In order to assist full congressional deliberation on the proposed Upper Mississippi Wild and Scenic River, I have directed the Secretary of the Interior to complete, with full public participation, a conceptual master plan for the river which will set forth the specific requirements for lands or interests in lands to protect the river corridor and provide public access, campgrounds and other recreational facilities. This is to be completed by April 1980.

My recent Environmental Message also contained a number of proposals relating to the National Trails System. The system is still in its fledgling stage and should be expanded to meet widespread public interest. With this objective in mind, I have directed the Federal land managing agencies to enlarge the National Recreation Trails System. In addition, I am transmitting the study report and legislation to designate the 513-mile Natchez Trace National Scenic Trail through Tennessee, Alabama and Mississippi. I am also resubmitting proposed legislation to establish the Potomac Heritage Trail through Pennsylvania, Maryland, West Virginia, Virginia and the District of Columbia. Furthermore, I am reaffirming my support for the enactment of legislation to create the North Country Trail from the State of New York to North Dakota. Legislation to create this 3,200-mile trail has already passed the House of Representatives in the form of H.R. 3757.

Finally, I am transmitting a report from the Secretary of the Interior recommending that a 13.6-mile segment of the Big Thompson River in Colorado not be added to the National Wild and Scenic Rivers System. This river segment is located entirely within the Rocky Mountain National Park and is managed and protected by the National Park Service. Further, approximately 80% of this 13.6-mile river segment is in a wilderness proposal now before the Congress. Therefore, I believe that the protection afforded by the National Wild and Scenic Rivers Act is unnecessary.

I urge that the Congress promptly act on my recommendations in order to protect these rivers and trails for the recreational and aesthetic enjoyment of all Americans.

Jimmy Carter

THE WHITE HOUSE,
October 2, 1979

United States Department of the Interior

OFFICE OF THE SECRETARY
WASHINGTON, D.C. 20240

OCT 25 1978

The President
The White House
Washington, D.C. 20500

Dear Mr. President:

We take pleasure in transmitting our report on the Buffalo River in Tennessee. The report and our recommendations are in response to the provisions of the Wild and Scenic Rivers Act, Public Law 90-542, as amended, which designated the Buffalo River for study as a potential component of the National Wild and Scenic Rivers System.

The study of the Buffalo River was conducted by a field task force composed of representatives of Federal and State agencies having programs involving the river or special interest in its values.

The study finds that 117 miles of the Buffalo River from its mouth to the Henryville Bridge qualifies for inclusion in the National Wild and Scenic Rivers System. The lower 44 miles of the qualifying segment would be classified as recreational with the upper 73 miles being classified as scenic.

In accordance with the wishes of the Governor, we recommend that the river be preserved, protected and managed by State and local action.

It is recommended that the report be transmitted to the Congress in compliance with Section 5(a) of the Wild and Scenic Rivers Act, as amended.

Sincerely,

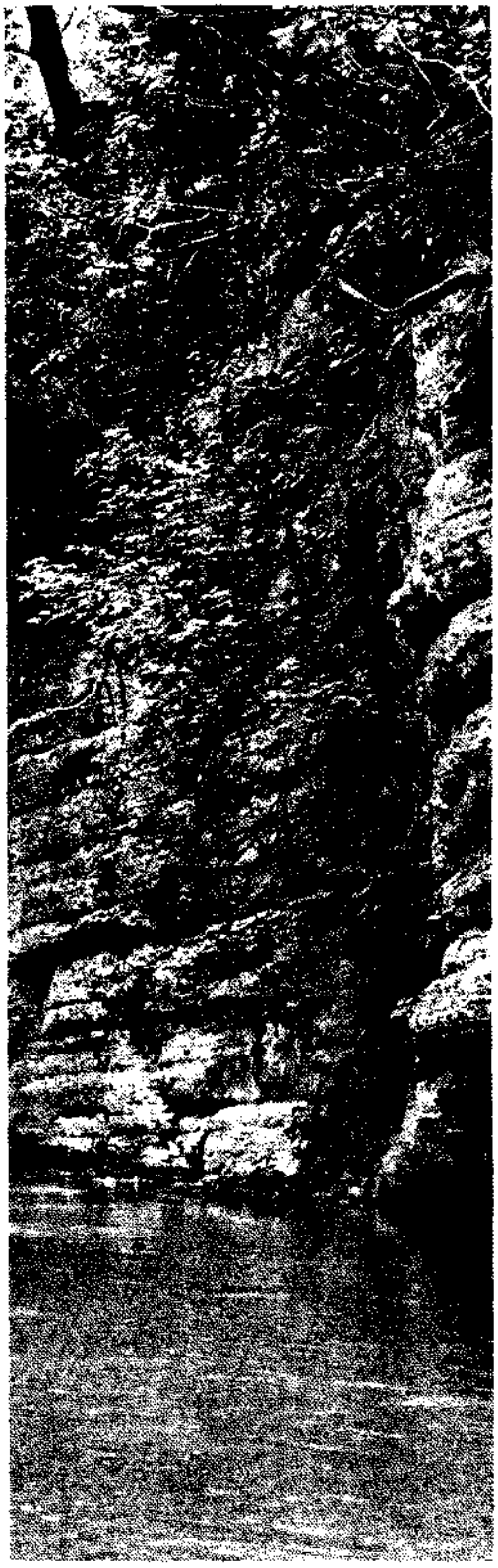
Cecil D. Andrus

SECRETARY

Enclosure

BUFFALO RIVER

WILD AND SCENIC RIVER STUDY

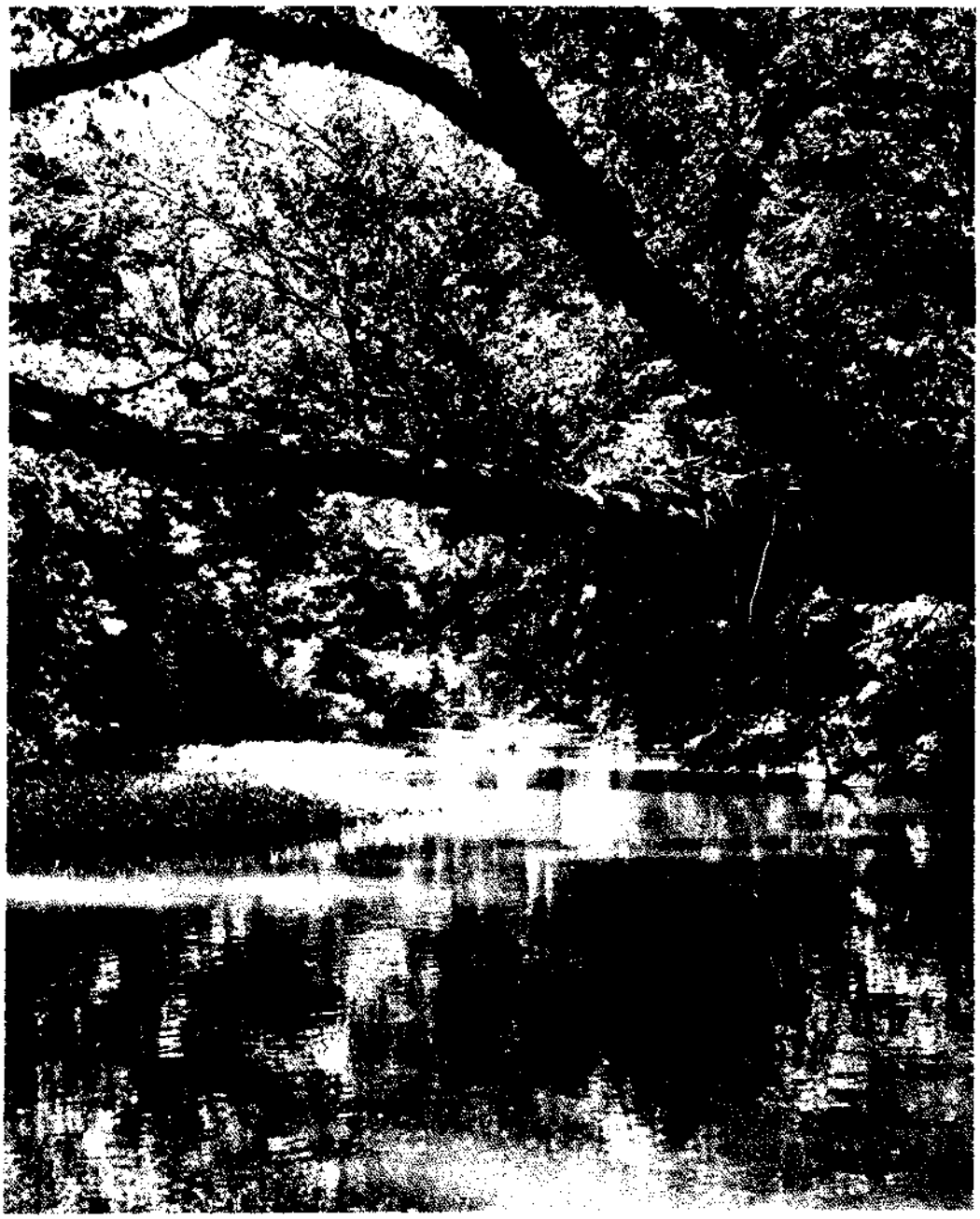


AS THE NATION'S PRINCIPAL CONSERVATION AGENCY, THE DEPARTMENT OF THE INTERIOR HAS BASIC RESPONSIBILITIES FOR WATER, FISH, WILDLIFE, MINERAL, LAND, PARK AND RECREATIONAL RESOURCES.

INDIAN AND TERRITORIAL AFFAIRS ARE OTHER MAJOR CONCERNS OF AMERICA'S "DEPARTMENT OF NATURAL RESOURCES."

THE DEPARTMENT WORKS TO ASSURE THE WISEST CHOICE IN MANAGING ALL OUR RESOURCES SO EACH WILL MAKE ITS FULL CONTRIBUTION TO A BETTER UNITED STATES NOW AND IN THE FUTURE.

DEPARTMENT OF THE INTERIOR
Cecil D. Andrus, Secretary



THE BUFFALO RIVER

Photo: Tennessee Wildlife
Resources Agency

BUFFALO RIVER, TENNESSEE
WILD AND SCENIC RIVER STUDY

prepared by
HERITAGE CONSERVATION AND RECREATION SERVICE
formerly
BUREAU OF OUTDOOR RECREATION

printed by
NATIONAL PARK SERVICE
MAY 1978

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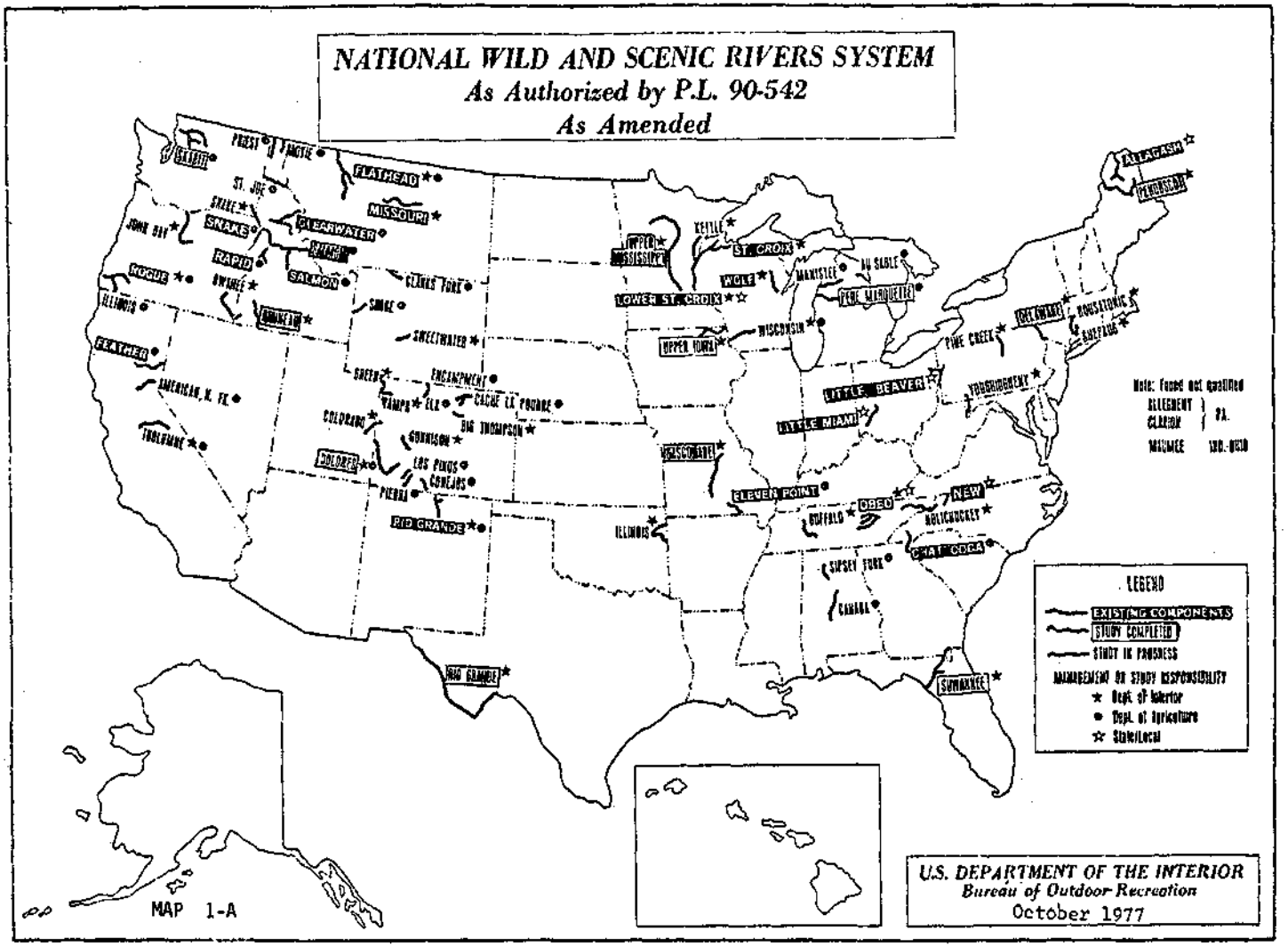
NATIONAL WILD AND SCENIC RIVERS SYSTEM
As Authorized by P.L. 90-542
As Amended
LEGEND
EXISTING COMPONENTS
STUDY COMPLETED
STUDY IN PROGRESS
MANAGEMENT OR STUDY RESPONSIBILITY
Dept. of Interior
Dept. of Agriculture
State/Local
U.S. DEPARTMENT OF THE INTERIOR
Bureau of Outdoor Recreation
October 1977
MAP 1-A

MAP I-B

BUFFALO RIVER, TENNESSEE

USDI-BOR

USDA - SCS **JULY 1974**

BUFFALO RIVER BASIN

I. INTRODUCTION

This study of the Buffalo River, Tennessee, was conducted in compliance with the provisions of Section 4(a) of the Wild and Scenic Rivers Act, Public Law 90-542 as amended. In Section 1(b) of this Act the Congress stated its purpose as follows:

> "It is hereby declared to be the policy of the United States that certain selected rivers of 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."

To carry out this policy, the Wild and Scenic Rivers Act established a National Wild and Scenic Rivers System composed of eight initial rivers and identified 27 other rivers, including the Buffalo River in Tennessee, to be studied for possible inclusion in the National System. The Act calls for a determination of the suitability of the Buffalo River for inclusion in the National System and, if it is to be included, recommendations pertaining to the administration and management of the river environment.

Background

As early as 1960, the Tennessee State Planning Office and the Game and Fish Commission became interested in developing a prospectus which would detail a possible course of action for the eventual protection of the Buffalo River. The prospectus, published in January 1961, regarded recreation as the basic

resource attributable to the Buffalo River. The State agencies concluded that a comprehensive plan should be prepared which would include in its recommendations the preservation of the Buffalo River as a State free-flowing river with emphasis on floating, fishing, and camping. Further, they recommended that a recreation development plan be prepared to include fishing and floating access, recreation area development (including parks and campsites), snag clearance to facilitate boating, trail clearing and marking, construction of a barrier dam, bluegill stocking, natural areas preservation, tributary and small watershed development, information and education, a future land-use plan for the watershed and a declaration of State policy on the Buffalo River. This group believed that any program of development for the Buffalo River should be kept separate from any program which may be developed for the Duck River by the Tennessee Valley Authority and the Duck River Development Association.

Federal interest in the Buffalo River dates from 1964 when a group of field representatives of the Departments of the Interior and Agriculture and the State of Tennessee prepared a study report on the possibility of designating the Buffalo as a wild and scenic river. This study report was given official recognition by the State of Tennessee in 1965 when the 84th General Assembly passed Senate Joint Resolution No. 24 urging the Department of the Interior and the Congress to give favorable consideration to establishing the Buffalo as a national wild and scenic river and offered State assistance in carrying out such a program.

In the fall of 1966, the Tennessee Valley Authority proposed to undertake a study which would include specific proposals for the development and administration of the Buffalo River as a scenic riverway under Tennessee Valley Authority auspices and in cooperation with the State of Tennessee.

The Tennessee Valley Authority took the position that the Buffalo River and its adjacent land constituted a unique resource that had water of exceptionally high quality and relatively constant flow, and aquatic and terrestrial plant and animal life. The concept in the subsequent September 1968 Buffalo Scenic Riverway Report called for the identification of specific reaches of the river and adjoining land in which those outstanding natural resources would be protected.

On April 3, 1968, the General Assembly of the State of Tennessee passed the Tennessee State Scenic Rivers Act. The original State

Act designated a system of 10 rivers, including the entire Buffalo River.

The Buffalo River was included in the Wild and Scenic Rivers Act (Public Law 90-542 passed in 1968), Section 5(a), for study and possible addition to the National Wild and Scenic Rivers System. Further, the Tennessee Statewide Comprehensive Outdoor Recreation Plan, 1969, named the Buffalo River as a potential national wild and scenic river, the designation of which was to be determined in a joint study conducted by the State of Tennessee and the Bureau of Outdoor Recreation.

In April 1969, action by the State legislature excluded all but a small portion of the Buffalo River, the Lawrence County portion, from the provisions of the Tennessee Scenic Rivers Act of 1968. This deletion by the Tennessee General Assembly was attributable to opposition by riparian landowners.

Conduct of Study

This wild and scenic river study was conducted in full partnership with the State of Tennessee, and with the participation or assistance of the Fish and Wildlife Service, Geological Survey, and the National Park Service, all within the Department of the Interior; the U.S. Forest Service, the Soil Conservation Service, Agricultural Stabilization and Conservation Service, and the Agricultural Extension Service in the Department of Agriculture; the Environmental Protection Agency, and the Tennessee Valley Authority.

By letter dated February 12, 1970, the State of Tennessee formally requested that a joint Federal-State study of the Buffalo be undertaken as provided by Section 5(c) of the Wild and Scenic Rivers Act. This action resulted in formation of the interagency study team on November 24, 1970, under the coleadership of the Bureau of Outdoor Recreation, Southeast Regional Office, and the Tennessee Department of Conservation. However, because of precedence given to several rivers already being studied in the Southeast Region, the Buffalo River Study was not fully implemented until December 20, 1973.

Public Meetings

To encourage maximum public awareness and input, three public information meetings were held locally in the Buffalo River basin during the early stages of the study and after its reactivation in 1973. Two series of public meetings were held locally in March and October 1974, and in April 1974 task force members met with interested local citizens to provide information and answer questions. A public information television program presented the study project and diverse views on the scenic river proposals on July 20, 1974. The purpose of these meetings was to explain the Wild and Scenic Rivers Act, inform the public of the Buffalo River Study effort, and obtain public assistance in developing study data.

The majority of persons attending these meetings held in Waverly, Linden, and Waynesboro, Tennessee, were landowners who voiced strong opposition to any action toward designation of the Buffalo River as a State or Federal wild and scenic river. The general position of the landowners was that designation of the river would result in encroachments on individual rights through governmental control and unwanted river users. The main issues raised by landowners were:

1. Fear that if the Buffalo River were given national status, uncontrolled recreation use would result causing a depreciation of existing values and an encroachment on individual rights.

2. Fear that the government would acquire productive crop and pastureland adjacent to the river for recreation purposes. In many instances revenues from this land are critical to the marginal operation of the farm unit.

3. Fear that landowners would not be adequately compensated for land purchased in fee-title or by easement.

4. Fear that when a landowner grants an easement, the right of access and property management would be completely relinquished upon the death of the owner; that these rights would be nontransferable to a new owner or from father to son.

5. Why existing laws could not be enforced to provide the management needed to keep the river as it is now.

6. Fear that existing land values located just beyond the river corridor would decline causing a loss in investment value.

7. Why local government and landowners were not involved in the planning and decisionmaking process.

8. Why the Buffalo River was being studied at all since local opposition had successfully taken the river out of the State scenic rivers system in 1969.

Acknowledgments

During the course of this study, the study team worked closely with many individuals, organizations, county and city officials having an interest or responsibilities within the Buffalo River basin. This work would not have been possible without their full cooperation and contributions of information. The extensive coordination and cooperation by agency members involved in this study is sincerely appreciated. Special thanks are given to the following:

Department of Defense -- Corps of Engineers
Department of Health, Education and Welfare
Department of Housing and Urban Development
Department of Transportation -- Federal Highway Administration
Federal Power Commission *
Mid-Cumberland Development District, Nashville, Tennessee
South-Central Tennessee Development District, Columbia, Tennessee
Local Agriculture Stabilization and Conservation Committees
Tennessee Scenic Rivers Association
Those individuals who gave of their time to attend public meetings, or write, making known their concern and wishes with respect to the Buffalo River.

* Federal Energy Regulatory Commission

II. SUMMARY OF FINDINGS AND PROPOSALS

This study has revealed that the Buffalo River possesses the values which qualify it for inclusion in the National Wild and Scenic Rivers System. The Buffalo River fulfills the requirements of the Wild and Scenic Rivers Act and meets the supplemental criteria established jointly by the Secretary of the Interior and the Secretary of Agriculture as published in "Guidelines for Evaluating Wild, Scenic, and Recreational River Areas Proposed for Inclusion in the National Wild and Scenic Rivers System Under Section 2, Public Law 90-542, February 1970."

THE STUDY TEAM FINDS THAT 117 MILES OF THE BUFFALO RIVER FROM ITS MOUTH TO HENRYVILLE BRIDGE ON COUNTY ROAD 6230 MEETS THE CRITERIA FOR INCLUSION INTO THE NATIONAL WILD AND SCENIC RIVERS SYSTEM. THE BUFFALO RIVER:

. . . is a free-flowing stream without impoundments, low dams, diversion or other works. Construction of such developments has been considered by concerned agencies and deemed economically infeasible for the foreseeable future.

. . . possesses a combination of outstanding scenic, recreational, fish and wildlife, geologic, and other values in a pastoral setting.

. . . contains water of high quality that meets the water criteria defined in the "General Water Criteria for the Definition and Control of Pollution in the Waters of Tennessee," 1971, as amended, and "Quality Criteria for Water," July 1976, published by the Environmental Protection Agency.

. . . contains sufficient volume of water during normal years to permit utilization of the river's resources during summer months including passive and intensive recreation use.

. . . has shorelines and a watershed remarkably undeveloped except for agricultural purposes and timber harvesting, with a minimim of discernible adverse manmade intrusions.

. . . is a valuable and outstanding resource which should be managed in a manner that will protect and enhance those special features which make the river worthy of protection.

THE STUDY TEAM FINDS THAT TRIBUTARY STREAMS OF THE BUFFALO RIVER DO NOT MEET THE CRITERIA FOR INCLUSION IN THE NATIONAL WILD AND SCENIC RIVERS SYSTEM. APPARENT LACK OF OUTSTANDING QUALITIES, AND SMALL STREAM SIZE WERE PRIMARY LIMITING FACTORS.

THE STUDY TEAM FINDS THAT THE BUFFALO RIVER SHOULD BE CLASSIFIED AND MANAGED AS A "SCENIC" AND "RECREATIONAL" RIVER AREA AS DEFINED IN THE WILD AND SCENIC RIVERS ACT AND IN SUPPLEMENTARY CRITERIA DEVELOPED BY THE SECRETARIES OF THE INTERIOR AND AGRICULTURE.

. . . Scenic River Area - From the Henryville Bridge crossing on County Road 6230 (river mile 117) 73 miles downstream to Bethel Bridge crossing on County Road 6174 (river mile 44).

. . . Recreational River Area - From Bethel Bridge crossing 44 miles downstream on County Road 6174 (river mile 44) to the confluence with Duck River.

Proposals

It is proposed that in accordance with the expressed wishes of the State of Tennessee as contained in the letter from Governor Ray Blanton dated March 29, 1977 (Appendix A), the Buffalo River be preserved, protected, and managed through State and local government action.

Should the State preserve the Buffalo River in accordance with the requirements of the Wild and Scenic Rivers Act, as amended, and apply for the river's inclusion in the Wild and Scenic Rivers System under the provisions of Section 2(a)(ii) of the Act, the Secretary of the Interior would consider placing the river in the National Wild and Scenic Rivers System as a State administered component.

If inclusion of the river in the National Wild and Scenic Rivers System under Section 3(a) of the Act is considered at some time in the future, the following study team proposals should be applied.

To preserve the Buffalo River as a free-flowing stream and to protect and enhance its values, it is proposed:

1. That the Buffalo River from its confluence with the Duck River upstream 117 miles to the Henryville Bridge crossing on County Road 6230 Be included in the National Wild and Scenic River System.

2. That the proposed river section be divided into "scenic" and "recreational" segments under criteria described in the Wild and Scenic Rivers Act. The two proposed river classifications are 73 miles of scenic river from the Henryville Bridge crossing downstream to Bethel Bridge and 44 miles of recreational river from Bethel Bridge downstream to the Duck River.

3. That the Buffalo River corridor contain approximately 3,250 acres of adjacent land for the protection of the river environment and public use areas. The proposed acreage represents an average of 3.4 acres per mile for fee acquisition and 24.4 acres per mile for acquisition of scenic easements. A detailed plan depicting acquisition should be prepared by the managing agency or agencies minimizing, where possible, the impact upon affected landowners.

4. That the development and management of the Buffalo River give primary emphasis to maintaining and enhancing its aesthetic, scenic, fish and wildlife, historical, archeological and scientific resources; and to protecting the individual rights of adjacent landwoners. Agricultural practices along the river are recognized as being an important aspect of the river's overall pastoral character. Proposed development includes: three major public use and river access areas, six intermediate day use and access areas, six access areas, and one overlook.

5. That the Buffalo River be managed to assure that visitor use will not exceed levels which would endanger those values which caused the river to be considered as worthy of inclusion in the National Wild and Scenic Rivers System.

It is estimated that the cost, in 1974 dollars, of implementing the national river proposal described in Chapter VII of this report would be approximately as follows:

Land Acquisition

Fee Simple -	400 acres	$ 280,000
Easements -	2,850 acres	$1,596,000
Total -	3,250 acres	$1,876,000

Development	$ 920,000
Operation and Maintenance (Annual)	$ 100,000

III. ENVIRONMENTAL IMPACTS

As required by Section 102(2)(c) of the National Environmental Policy Act of 1969, Public Law 91-190, an environmental impact statement was drafted as a separate but integral part of this report. The draft statement surveyed the significant beneficial and detrimental environmental impacts of the Federal action under consideration including those that would enhance or degrade the quality of the environment, curtail or expand the range of beneficial uses of the environment, and those that serve short-term or long-term environmental goals.

After drafting the environmental review, the Bureau of Outdoor Recreation decided not to complete a formal environmental impact statement. This decision was based on the recommendation that no action be taken by the Federal Government to include the Buffalo River in the National Wild and Scenic Rivers System.

The draft environmental statement is on file and available for inspection upon request at the Southeast Regional Office, Bureau of Outdoor Recreation, 148 International Boulevard, Atlanta, Georgia.

IV. REGIONAL SETTING

Landscape

The Buffalo River drainage area is located entirely within the south-central portion of the State of Tennessee (Map 1). The river rises from several small tributaries in Lawrence County on the Highland Rim of the Western Cumberland Plateau that come together near the community of Henryville in Lawrence County. The course of the river lies in the shape of an "L", gently meandering westward about 56 miles through southern Lewis County and northern Wayne County to Flat Woods. From Flat Woods the Buffalo turns north, flowing parallel to the Tennessee River through Perry and Humphreys Counties, to its confluence with the Duck River and the backwaters of Kentucky Lake just south of the town of Waverly, Tennessee. The Buffalo gradually descends 420 feet from an elevation of 800 feet at its beginning at Henryville to an elevation of 380 feet at its confluence with the Duck River.

The watershed of the Buffalo River covers some 764 square miles or 490,000 acres in Hickman, Humphreys, Lawrence, Lewis, Perry and Wayne Counties in south-central Tennessee. Because the river is constricted between the Tennessee and Duck Rivers at its lower extremity, much of the basin's drainage area lies in the upper portions of the watershed: a total of 707 square miles lies above river mile 17.7 at Lobelville; 516 square miles above river mile 40.9 at State Highway 100 at Linden; and 447 square miles at river mile 58.7 at Flat Woods. Below Flat Woods, major tributaries of the Buffalo River include Cane Creek, Coon Creek, Short Creek, Hurricane Creek, Rockhouse Creek, and Sinking Creek. Above Flat Woods, Green River, Forty-eight Creek, Trace Creek and the Little Buffalo River are the main tributaries.

The Highland Rim of middle Tennessee extends from the Cumberland Plateau to the western valley of the Tennessee River (Map 2). Approximately in the center of this large area (12,000 square miles) is the Central or Nashville Basin, a roughly oval physiographic province which separates the Highland rim into its eastern and western parts. The surface of the western Highland Rim in which the Buffalo River valley is situated has been intricately dissected by stream erosion. As a result, the area is hilly with high irregular flat-topped ridges with the steep slopes to narrow rather flat-lying bottom land along creek and

Photo by U.S. Forest Service

The community of Flat Woods, Tennessee. The Buffalo River turns north at this point flowing 61 miles to its confluence with the Duck River.

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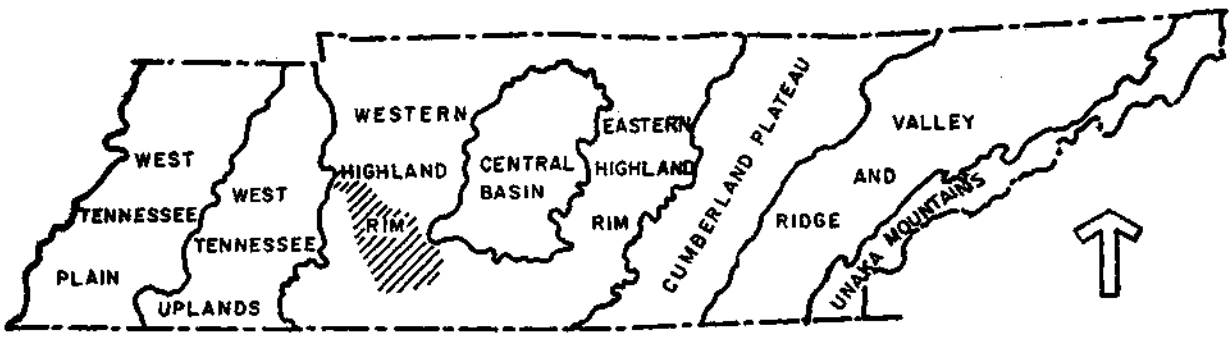
river bottoms. The crests of ridges vary from 900 to over 1,000 feet above sea level in the upper Buffalo River watershed to over 700 feet in the lower watershed. They average about 350 feet above stream bottoms. In general, the larger streams have gentle gradients and wide valleys. The smaller streams in dissected areas have relatively steep-sided valleys and steep gradients.

Natural lakes in the vicinity of the Buffalo River are rare. The principal manmade lake in this area is the 185-mile-long Kentucky Lake located just west of the Buffalo River between Perry and Henderson Counties. Kentucky Lake provides deep water navigation--linking the Tennessee River with the interconnected Inland Waterway System--flood control, hydroelectric power production, and a variety of outdoor recreation opportunities.



MAP 2 **PHYSIOGRAPHIC PROVINCES IN TENNESSEE**

Early settlers, upon their arrival to this area, found wide fertile bottom lands and adjacent hills covered with timber. Bottom lands and hillsides were cleared and the forests were cut. As these areas became badly eroded and depleted of forests, they were abandoned for new areas. Today, some industrial development has occurred along the Buffalo in Linden and Lobelville. The remainder of the area is mostly forested with farming or grazing restricted to upland and main stream bottom lands.

Population

Census data for 1970 (Table 1) shows that the number of persons within the six-county study area increased by 4,245 or less than 1 percent in the decade between 1960 and 1970. This increase is, however, a reverse trend of the population loss experienced in

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the preceding 10-year period. Only two counties, Humphreys and Lewis, experienced population growth for both the 1950-1960 and the 1960-1970 decades. Between 1950 and 1960 Hickman, Lawrence, Perry and Wayne Counties had declining populations with the most serious losses occurring in Hickman (-11.2 percent), Perry (-18.4 percent) and Wayne (-14.1 percent). Between 1960 and 1970 these same counties showed signs of greatly reduced declines in population.

TABLE 1

Historic Population Changes
Buffalo River Study Area

County	1950	1960	1950-1960 % Change	1970	1960-1970 % Change
Hickman	13,353	11,862	-11.2	12,096	+ 2.0
Humphreys	11,030	11,511	+ 4.4	13,560	+18.7
Lawrence	28,818	28,049	- 2.7	29,097	+ 3.8
Lewis	6,078	6,269	+ 3.1	6,761	+ 7.9
Perry	6,462	5,273	-18.4	5,238	- 0.7
Wayne	13,864	11,908	-14.1	12,365	+ 3.8
TOTAL	79,605	74,872	- 6.0	79,117	+ 0.6
Tennessee (millions)	3.3	3.6	+ 8.2	3.9	+10.0
Nationwide (millions)	150.7	179.3	+18.8	203.2	+10.8

Source: The University of Tennessee Center for Business and Economic Research, "Tennessee Statistical Abstract, 1971," 2nd Edition.

In comparison, the State of Tennessee grew at a much faster rate, about 8.2 percent during the 1950's and 10 percent between 1960 and 1970. For the same periods, the United States experienced an 18.8 and 10.8 percent increase.

Table 2 indicates the components of population change for the 1950-1960 and 1960-1970 decades. By comparing natural increases to outmigration for the 1950-1960 period, it can readily be seen that the number of persons moving out of the study area exceeded the number of persons moving into it by 15,621. Although during the 1960-1970 period natural population increases declined, so did outmigration to a considerable extent. The result has been a relatively stable population compared with the previous decade.

TABLE 2

Components of Change in Total Population
1950-1970
Buffalo River Study Area

	1950-1960 Change			1960-1970 Change		
County	Natural Increase[1]	Net Migration[2]	% Change	Natural Increase[1]	Net Migration[2]	% Change
Hickman	1,444	- 2,935	-11.2	884	- 650	+ 0.2
Humphreys	1,481	- 1,000	+ 4.4	959	+1,090	+17.8
Lawrence	4,524	- 5,293	- 2.7	3,437	-2,389	+ 3.7
Lewis	835	- 644	+ 3.1	573	- 81	+ 7.8
Perry	590	- 1,779	-18.4	150	- 185	- 0.7
Wayne	2,014	- 3,970	-14.1	1,220	- 763	+ 3.8
TOTAL	10,888	-15,621	- 6.0	7,223	-2,978	- 0.6
Tennessee (thousands)	547.8	-272.4	+ 8.4	345.5	- 38.4	+10.0

1/ "Natural Increase" refers to births recorded within the county.
2/ "Net Migration" indicates the balance between the number of persons who moved into and out of the county.

Source: The University of Tennessee Center for Business and Economic Research, "Tennessee Statistical Abstract, 2nd Edition.

In terms of population density, the Buffalo River drains one of the least populated sections of the State. With the population peak passing some decades ago, population in the six-county study area declined from 83,042 in 1940 to 74,872 in 1960. Since 1960, population in the area has gradually increased and is projected to reach 145,600 by year 2020 (Table 3).

TABLE 3

Historic Population (1960-1970)[1/] and Baseline Projections 1980-2020, Buffalo River Study Area[2/]

County	1960	1970	1980	1990	2000	2020
Hickman	11,862	12,096	13,300	15,700	17,300	21,700
Humphreys	11,511	13,560	15,100	18,200	20,300	26,300
Lawrence	28,049	29,097	31,300	35,600	45,000	59,300
Lewis	6,269	6,761	7,400	8,700	10,700	14,600
Perry	5,273	5,238	5,300	5,700	7,100	8,700
Wayne	11,908	12,365	12,800	13,300	13,800	15,000
	74,872	79,117	85,200	97,200	114,200	145,600

1/ United States Department of Commerce, Bureau of the Census.

2/ Tennessee Social Sciences Advisory Committee, Environmental Protection Agency, Region IV, July 1972.

Based on an urban-rural classification, the estimated 79,117 persons living in the study area are divided between 24 percent urban and 76 percent rural. The percent of total population in urban places has steadily increased over the last 2 decades. Only Perry and Wayne Counties have remained 100 percent rural. The most significant changes in rural to urban population occurred in Lewis and Hickman Counties where persons in rural places declined by greater than 10 percent. The rural-to-urban shift is indicative of trends in Tennessee and in the Nation which declined in percent of rural residences respectively from 47.7 to 41.3 and from 30.1 to 26.5 for the 1960-1970 decade.

Population outward from the study area generally reflects the more intense economic activity in the standard metropolitan statistical areas (SMSA's). Generally, the SMSA's have shown consistent population growth for the last 3-decade period. Spreading growth may be observed around and to the west of Nashville, around Huntsville, Alabama, and in Memphis. The Chattanooga, Knoxville and Atlanta SMSA's have had less influence on the study area. Population within 250 miles of each of the study area counties varies between 14 million (Lawrence, Lewis and Wayne) to 16 million (Hickman and Humphreys) people. Table 4 shows the populations within 250 miles of the approximate center of the study area.

TABLE 4

1970 Population Projections[1/] By Mile Radius[2/]
Buffalo River Study Area (1,000's)

Distance	50 Miles	100 Miles	150 Miles	250 Miles	Total
Population	217	2,050	2,856	10,245	15,373

1/ United States Department of Commerce, Bureau of Census.
2/ Measured from Linden, Perry County, to the nearest whole county.

Economy

Between 1800 and 1850 the population of Tennessee increased about tenfold from just over 100,000 in 1800 to 1 million by 1850. The early settlers to the State were hunters, trappers, herdsmen and farmers. Up to the Civil War in 1861, agriculture was the chief industry in the State and in middle Tennessee.

Because transportation was poor and slow, the early 19th Century saw much local manufacturing established to supply the needs of settlers. Gristmills, tanneries, blacksmiths, and cotton goods were the initial manufacturing endeavors.

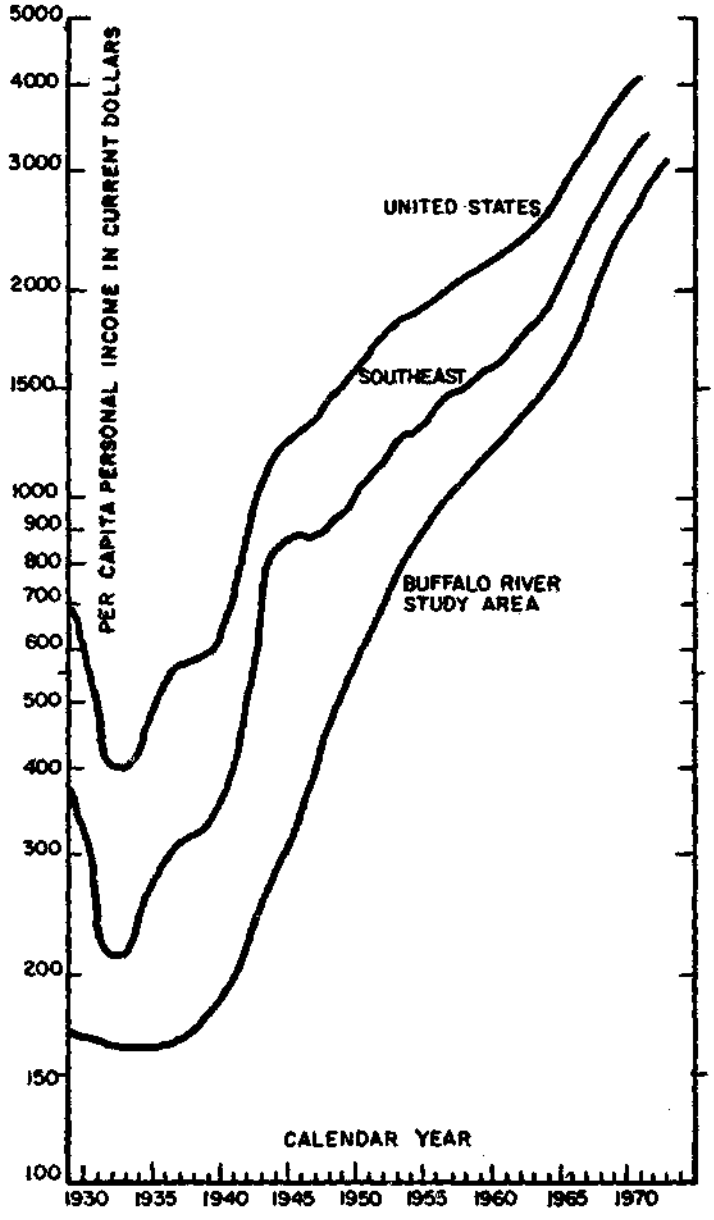
Transportation by foot and wagon was provided by "Wilderness Road" as the only land connection between east and middle Tennessee. One of the most famous early roads was the Natchez Trace which ran from Natchez, Mississippi, to Nashville. This route was frequently used by boatmen returning to the northern settlements. Water transportation was limited in the pre-1800's to the Duck and Tennessee Rivers during periods of high water. With the acquisition of New Orleans in 1803, river-oriented commerce increased to middle Tennessee.

The railroads became important in the mid-1800's when the Nashville and Chattanooga Railroad finished the line connecting the two cities. By the time the railroads opened the door between middle Tennessee and the markets at Louisville, Charleston, New Orleans and Mobile, the Civil War raged across Tennessee.

The population doubled between 1850 and 1900, and, in spite of the Civil War, the rate of increase remained fairly constant. However, the effect of the war was the enormous destruction of real and personal property and as a result a severe loss in agriculture, the State's main industry. The agricultural areas of middle Tennessee lost their economic position in the value of production. That has never been regained. Conversely, industrialization came into prominence for the established banking centers of Memphis, Nashville, Chattanooga, and Knoxville in the late 19th Century.

Between 1900 and 1950, the population of the State increased about 60 percent. With this increase came the transition from rural to urban as rural residents increasingly migrated to the cities to seek employment in manufacturing and service industries. The mechanization of agriculture and the inability of local industry to fully employ local labor only served to stimulate a manpower exodus from the region. Nashville, as well as Knoxville, Chattanooga, and Memphis, became urban centers as Tennessee entered the 20th Century.

World War I gave impetus to the move toward industrialization and the economics of mass production. The end of the war, however, saw a slow down in the industrial sector with a trend towards diversification. By 1930 the leading industries were knit wear, lumber and timber, and flour and mill products.



Source: U.S. Department of Commerce, Bureau of Economic Analysis (formerly Office of Business Economics), Personal Income, By States, Since 1929, pp. 142-143, and Survey of Current Business, August 1971, p. 31 and April 1972, p. 20.

BUFFALO RIVER, TENNESSEE

FIG. 1

PER CAPITA PERSONAL INCOME

The Great Depression dealt Tennessee a severe blow. This was, however, tempered somewhat by Congressional approval in 1933 of the Tennessee Valley Authority. To date, the Tennessee Valley Authority has invested about $2 billion in dam construction for the purposes of controlling floods, improving navigation, producing electricity, and for conservation and recreation.

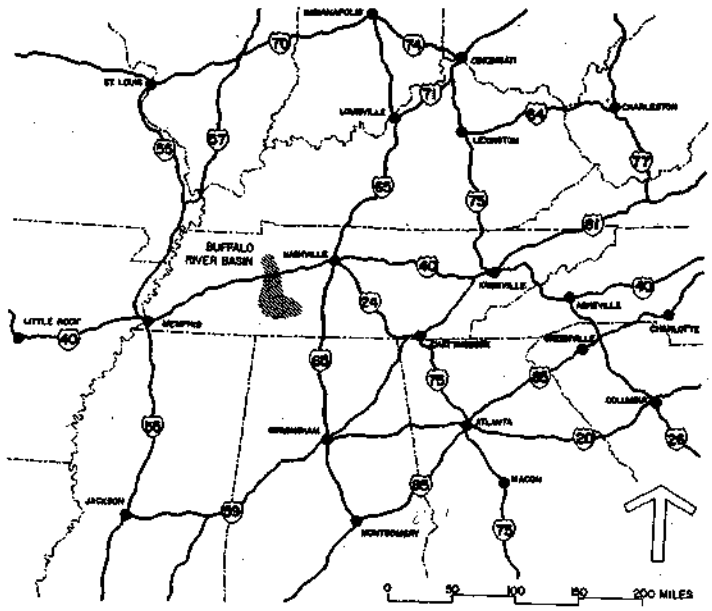
By 1940, rayon and allied products, meat packing, chemical production and apparel products were the leading growth industries. By 1950 agriculture was replaced as the leading segment of the economy in Tennessee. Nevertheless, agriculture remains important with livestock, corn, tobacco, and wheat as the chief contributors to the agricultural scene.

By 1970 manufacturing was firmly dominant in middle Tennessee with apparel, chemicals, electrical machinery, transportation equipment, food and printed matter being the largest industries. As a large part of the region is located in the relatively level Nashville basin with its rich alluvial soils, some of the more productive agricultural land in Tennessee occurs in this area. Good agricultural land also occurs in limited amounts within the study area counties of Hickman, Lewis, Perry, Wayne, and Humphreys, where it is located almost exclusively along the Buffalo and Duck River valleys. A large number of farms in the area are engaged in dairy and livestock farming. Tobacco, soybeans, and corn are the principal cash crops.

Although small farms on steep slopes and other less productive soils persist, there has been a steady decline in the use of this type of land for agricultural purposes. The trend is toward larger, more profitable commercial farms, with the less productive land being used for pasture or permitted to revert to forest cover.

In accordance with positive growth trends in other areas of Tennessee, the economy of middle Tennessee has likewise kept pace. Personal and family income has risen sharply, although considerably lower than the State averages, especially in rural counties (Figure 1).

Projected growth to 1980 predicts Huntsville as the fastest growing of the four SMSA's which could influence the Buffalo River region with Nashville a close second. Other projected changes continue to show employment in agriculture declining sharply as the agrarian influence in the region continues to diminish.



MAP 3

BUFFALO RIVER, TENNESSEE

USDI - BOR JULY 1974

INTERSTATE HIGHWAYS

Transportation

The region is well served by transportation facilities including a combination of highways, railroads, airports and waterways. The six-county study area is served by approximately 5,000 miles of road including interstate, primary arterials, and local county roads, which tie the area with major population centers of the Southeast (Map 3).

Interstate Highways 65, 24 and 40 cross in Nashville linking Memphis, Huntsville, Birmingham, and Chattanooga to the region via the east-west I-40 which crosses the northern extremity of the study area. U.S. Highway 64 and 70 cross the east-west through the area in Humphreys, Lawrence, and Wayne Counties and State Highways 13, 50, 20, 100 and 48 link to provide internal transportation.

Photo by U.S. Forest Service

Interstate 40 joins Nashville with Memphis, Tennessee, and crosses State Highway 13 near river mile 11.

Traffic flow patterns reflect high concentrations of average daily traffic flow through the study area on a north-south axis with relatively small average daily traffic flow on the east-west axis (Table 5).

Because of rough terrain, rail transportation to the region generally skirts the study area. Both Perry and Wayne Counties have no track mileage. In addition, the area is without rail passenger service. Again the north-south axis from Nashville to Birmingham predominates. The Louisville and Nashville and Gulf/ Mobile and Ohio are the principal railroads serving the region.

TABLE 5

Traffic Count - Buffalo River Area[1/]

SITE	AVERAGE DAILY COUNT
Perry County	
South of HW 40 on HW 13	1260
Beardstown	1360
South of HW 50 (to Linden)	1580
HW 50 to Centerville	220
HW 13 (Linden)	1710
HW 20	1190
HW 100 to Centerville	2120
HW 20 to Parsons	2440
HW 13 (Buffalo River near Flat Woods)	460
HW 20 to Hohenwald	1240
Humphreys County	
HW 13 (Duck River Bridge)	1200
County Road 6171 - near Buffalo River	280
Wayne County	
HW 13 - HW 48 Intersection	310
HW 48 to Hohenwald	320
HW 13 (Buffalo River)	500
HW 13 - Waynesboro	1580
HW 64 - HW 13 (to Lawrenceburg)	5790
Natchez Trace Parkway (before HW 64)	370
East on HW 64	1730
West on HW 64	1450
Lawrence County	
Natchez Trace Parkway	200
County Road 6230	2610
County Road 6230 to Henryville	370
County Road 6230 before Summetown	690
Lewis County	
Natchez Trace at HW 20	420
HW 20 - HW 99	190
HW 20 to Hohenwald	1760
HW 48 (Perry County Line)	390
HW 48 North	1860
HW 48 (Hickman-Lewis Line)	1010

1/ Source: Tennessee Department of Highways, 1973

The Tennessee River system provides excellent water transportation facilities to link the region with other major metropolitan areas of the southeastern United States. Recreation boats also may pass through the locks at main river dams (Map 4). This service is free.

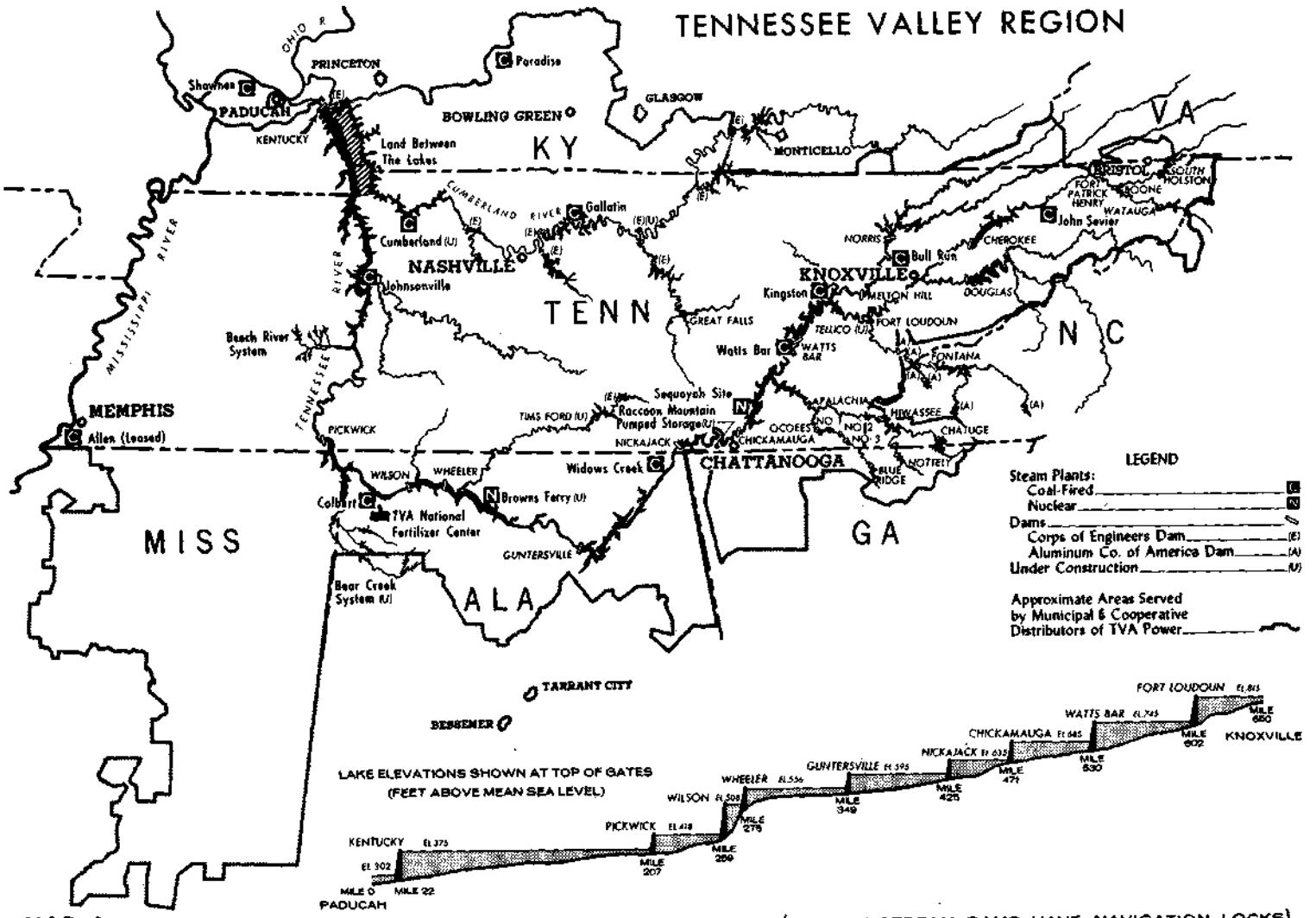
Regularly scheduled air passenger service in the region is available at Memphis, Jackson, Nashville, Chattanooga, Shelbyville-Tullahoma, and Clarksville-Hopkinsville.

Recreation Resources

The Tennessee Department of Conservation is currently implementing six of the 11 designated rivers in the State Scenic Rivers System. The master plan for the class II (pastoral river area) and class III (partially developed) Harpeth State Scenic River has been completed with master plans for the class I (natural river area) sections of the Roaring River, Spring Creek and Blackburn River nearing completion. The preparation of the master plan for the French Broad State Scenic River has just begun. The Harpeth River consisting of 6 miles of class II and 8.5 miles of class III lies within Davidson County near Nashville and within 65 miles of the Buffalo River via Interstate 40. Roaring River, Spring Creek and Blackburn Fork, totaling 8.1 miles of class I streams are located in Jackson, Overton, and Putnam Counties, some 141 miles east of the Buffalo. The French Broad, consisting of 29.3 miles of class III stream, is located in Cocke County just east of Knoxville or approximately 295 miles east of the Buffalo River.

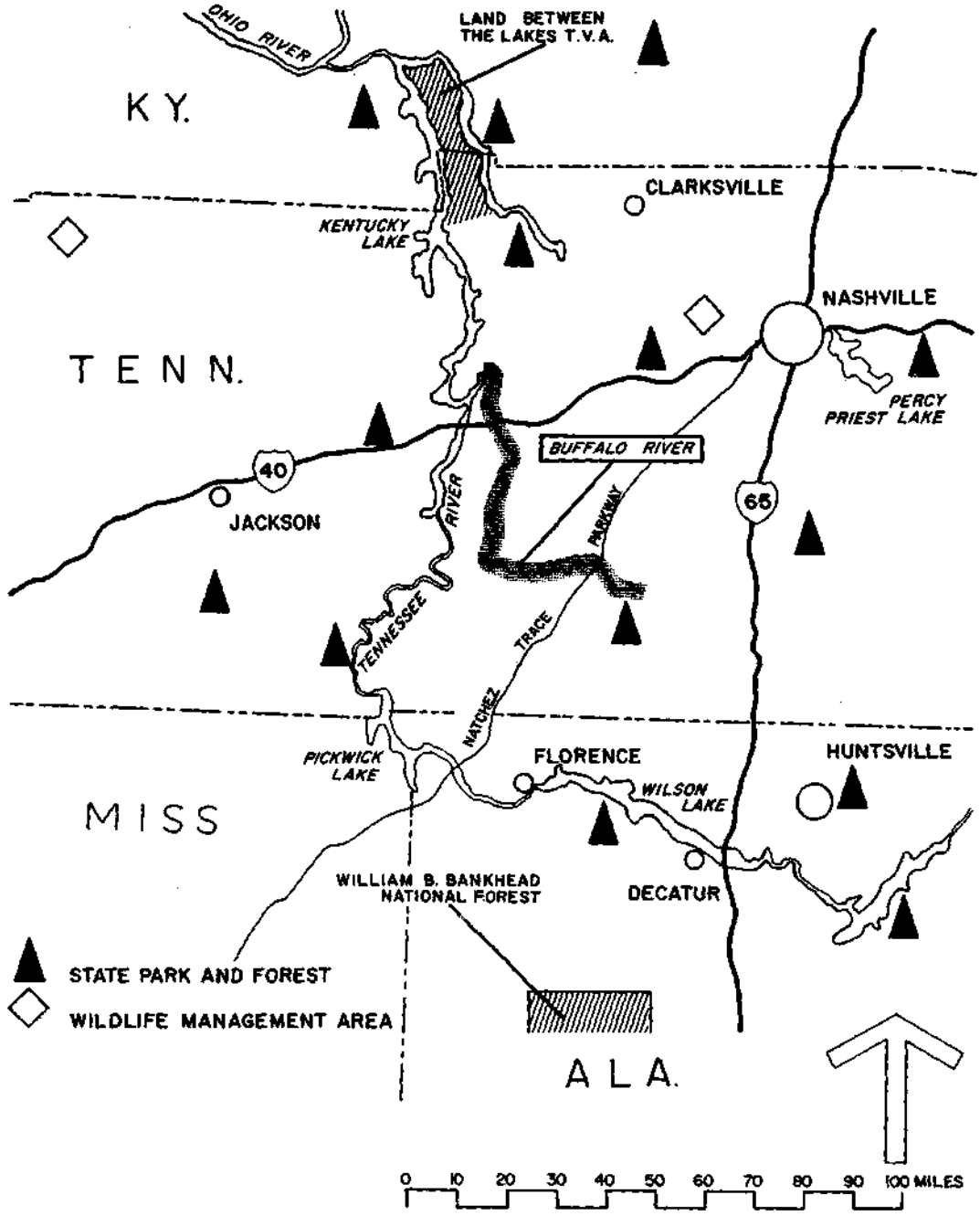
The Hiwassee State Scenic River (class III) located in southeastern Tennessee near Chattanooga is nearest to being a managed State Scenic River. Acquisition of private parcels and cooperative management agreements with the U.S. Forest Service have been completed. The administrative phase of project implementation began in the fall of 1974 and included 23.2 miles of river.

Preliminary planning and survey of the Hatchie River (class I) located about 60 miles southwest of Linden and the Collins River (class II) located near McMinnville (approximately 120 miles east of Linden) was started in the fall of 1974.



MAP 4

PROFILE OF THE TENNESSEE RIVER (ALL MAINSTREAM DAMS HAVE NAVIGATION LOCKS)



MAP 5
USDI - BOR - SERO

BUFFALO RIVER, TENNESSEE

JULY 1974 REGIONAL RECREATION RESOURCES

In addition to the Buffalo River, six other rivers in the Southeast--the Chattooga River in Georgia, North Carolina and South Carolina; Suwannee in Georgia and Florida; the Nolichucky in Tennessee and North Carolina; and the Sipsey and Cahaba in Alabama--were designated for study as potential additions to the National System in Section 5(a) of the Wild and Scenic Rivers Act, as amended through Public Law 93-621. The Chattooga, Obed and Suwannee Rivers have been studied. The Suwannee is recommended for State action (House Document 93-246). The Chattooga and approximately half of the Obed are now components of the National Wild and Scenic Rivers System. The Obed study report is undergoing final review.

The nearest existing component of the National Wild and Scenic Rivers System is the Obed River. On October 12, 1976, Congress passed Public Law 94-486, which amended the Wild and Scenic Rivers Act by designating a total of approximately 45 miles of the Obed River, Clear Creek, Daddy's Creek and the Emory River as components of the System.

The Chattooga River in North Carolina, South Carolina, and Georgia, was designated a component of the National System on May 10, 1974. A total of 50.2 miles of the Chattooga River and 7.7 miles of the West Fork of the Chattooga were designated. The component comprises some 15,000 acres. This wild and scenic river is being managed by the U.S. Forest Service.

One other river which deserves mention is the Big South Fork of the Cumberland River which has been under a joint Kentucky-Tennessee-Federal interagency study to determine various alternatives for development. Section 108 of Public Law 93-251 provided legislative authorization and direction to establish the Big South Fork National River and Recreation Area and this project is presently being implemented under the leadership of the United States Army Corps of Engineers.

Within 100 miles of the Buffalo River is a variety of Federal, State, and private recreational facilities and areas (see Map 5) in Kentucky, Tennessee, Alabama, and Mississippi. The Natchez Trace Parkway and the Shiloh National Military Park are in the immediate area of the Buffalo River. The largest single recreation area in this region is represented by the Land Between the Lakes. This area contains over 170,000 acres of land in Kentucky and Tennessee and is administered by the Tennessee Valley Authority as a demonstration in outdoor recreation and environmental education. Presently, most users of this park arrive through Kentucky from States to the north. An improvement of existing highways from the south would almost certainly increase visitation from other areas.

A number of Federal, State, local and privately operated recreation areas and facilities are associated with and available to the public on federally constructed reservoirs on the Cumberland and Tennessee Rivers system. Reservoir areas administered by the Corps of Engineers on the Cumberland include the J. Percy Priest Reservoir (14,200 acres), Old Hickory Reservoir (22,500 acres), Cheatham Reservoir (19,000 acres), and Barkley Reservoir (57,920 acres). The latter forms the east boundary for the Land Between the Lakes.

The Tennessee Valley Authority controls some 610,572 acres of surface water in Kentucky, Tennessee, Alabama, and Mississippi (Map 4). These reservoirs include Kentucky, Pickwick, Wilson, Wheeler, Tims Ford, and Great Falls Lakes. These impoundments provide recreation facilities which have been largely developed by private enterprise and in addition provide power, flood control, and navigation for the Tennessee River basin. Presently the Tennessee Valley Authority is developing four impoundments totaling 8,280 acres on Bear Creek in Alabama, and received congressional approval for the construction of the Columbia, under construction, and Normandy, completed but not completely filled, projects on the Duck River, Tennessee. These two reservoirs when completed will comprise 12,600 and 3,230 acres, respectively, and will be located 2 miles east of Columbia and 1.5 miles upstream from Normandy, respectively.

The Beech River Watershed Development Project which provides seven reservoirs for recreational use, ranging from 153 to 864 acres and exceeding a total of 3,000 acres, is an example of a cooperative venture in comprehensive resource development between the local people, the State of Tennessee, and TVA. This area lies just west of Kentucky Lake about 30 miles from Linden, Tennessee.

A total of 17 State parks comprising 86,269 acres are located within the region in all four States. The largest of these, the Natchez Trace State Park and Forest in Henderson and Carrol Counties, Tennessee, contains 42,000 acres of managed timber stands which provide excellent hunting and recreational opportunities. The area lies approximately 25 miles west of the Buffalo River on Interstate 40.

In the vicinity of the Buffalo River, proposed additions to the Tennessee Outdoor Recreation Area System include Link Farm Archeological Area in Humphreys County, Mousetail Landing Rustic

Area in Perry County and Devil's Backbone Historic Area in Lewis County.

Within the 100 miles of the Buffalo, there are 16 wildlife management areas and two National Wildlife Refuges containing about 359,000 acres. These wildlife areas, administered by the States of Tennessee and Alabama and the Fish and Wildlife Service, are totally undeveloped and in their primitive state.

Two national forests, the Bankhead in Alabama and a portion of Holly Springs in Mississippi, are within 100 miles of the Buffalo River. The Bankhead in Alabama, containing 177,153 acres, is an area of streams and lakes with Lake Lewis Smith and the Sipsey River being outstanding features within the area. A special feature of Holly Springs is the 260-acre Chewalla Lake.

The region contains a major privately owned recreational complex of national prominence. This is Opryland, U.S.A., a 369-acre facility located on the Cumberland River in east Nashville. Opryland, U.S.A. contains a recreation entertainment park on 110 developed acres and the new Grand Ole Opry. The park portrays American music in both sight and sound. Constructed at a cost of over $28 million, Opryland is expected to have a major impact upon the economy of the Nashville area. The facility is presently the subject of national advertising and promotion and drew approximately 1.2 million persons in its first year of operation. By being centrally located in Nashville, the park attracts visitors traveling to Florida and other vacation areas throughout the southeastern United States.

There are many historic sites in the region that are of both regional and national significance. Appendix F provides a list of those properties located within 100 miles of the Buffalo River (as measured from Flatwoods, Tennessee) that were included in the National Register of Historic Places as of December 2, 1975. Of those properties listed only four are in the counties through which the Buffalo River flows; they are: the John Gordon House, northwest of Williamsport, Hickman County, and 50 miles east of the Buffalo River; Link Farm Site in Humphreys County, northwest of Hurricane Mills in the Duck River watershed and some 2½ miles east of the confluence of the Buffalo with the Duck River; Cedar Creek Furnace in Perry County in the Tennessee River drainage some 9 miles southwest of Linden and 8 miles west of the Buffalo River; and the Old Natchez Trace which passes

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through Hickman, Lawrence, Lewis, and Wayne Counties. The Old Trace crosses the Buffalo River in the vicinity of Napier, in Lewis County. In the vicinity of the crossing is also located the Meriwether Lewis Monument, which marks the place where the explorer and governor of Louisiana was buried in 1809, and the old Napier Mine, Foundry, and Metal Ford, sites of early mining and iron smelting activity. These places have been proposed for inclusion in the National Register of Historic Places; they are now in public ownership under the management of the National Park Service. An inventory of historic places associated with Natchez Trace Parkway lands is being prepared by NPS at this time.

Shiloh and Ft. Donelson National Military Parks and Stones River National Battlefield within the region remain as outstanding cultural interpretation centers depicting the war between the north and the south.

The Tennessee Historical Commission, in an attempt to preserve and protect historic sites, is in the process of preparing a statewide comprehensive plan for historic preservation in Tennessee.

Historic trails within the region consist of the Cumberland Trail which connects with the Natchez Trace and traverses northeasterly along the Cumberland River and heavily forested hilly lands. A study, authorized by the National Trails System Act (Public Law 90-543, October 2, 1968), is presently underway to determine if a "national scenic trail" should be established along the route of the old Natchez Trace. In addition, the Trail of Tears enters the southeast portion of the region and connects Cedars of Lebanon, J. Percy Priest Reservoir, and Cheatham Wildlife Refuge, then meanders northwesterly to the general vicinity of the Land Between the Lakes. These trails could eventually include hiking, horse, and even biking facilities.

V. DESCRIPTION AND ANALYSIS OF RIVER

Riverscape

The Buffalo River is one of the few free-flowing streams of its length remaining in Tennessee. It remains today as one of the most outstanding examples in Tennessee of pastoral stream. For much of its 117-mile length the river meanders alternately between forests, farms, and small communities with a notable absence of many manmade structures such as cottage developments, road crossings, or other disturbances within the river corridor.

The gradient of the Buffalo River is quite uniform throughout most of its length with the exception of the reach above the community of Riverside, located at river mile 91. In this 28-mile section of river the fall is almost 5 feet per mile compared to less than 3 feet per mile in the lower reaches.

The Buffalo varies in depth from a few inches over rocky shoals to more than 12 feet in pools. Shoal areas are spaced uniformly along the river and may vary from 50 to 300 feet in length. Pools vary in length from about 100 feet to as much as 3,000 feet. During low flows, it may be necessary to "walk" a boat through shallow shoal areas. Low flows, however, have little effect on pool levels since these are controlled by shoals at the downstream end. During heavy or prolonged rains, flow in the upper reaches is frequently swift and turbulent through the numerous shoals and riffles which separate still pools.

The width of the riverbed averages from 45 feet in Lawrence County (upper reach) to 125 feet in Lewis, 100 feet in Wayne, 200 feet in Perry, and 220 feet in Humphreys County. The river flows over a varying bed that is predominantly gravel at its upper reaches to varying amounts of silt, sand, clay, etc., in the lower sections. The flood plain varies in width from a few hundred feet to about 1½ miles near its confluence with the Duck River.

The scenery along the river as seen from the water is a changing panorama of forested rolling hills, steep bluffs, pasture and cropland. Agricultural land is frequently partially or fully screened from the river by a fringe of bottomland hardwoods containing such species as sweetgum, sycamore, willow, yellow poplar, pin oak, and cottonwood. A variety of flowering shrubs,

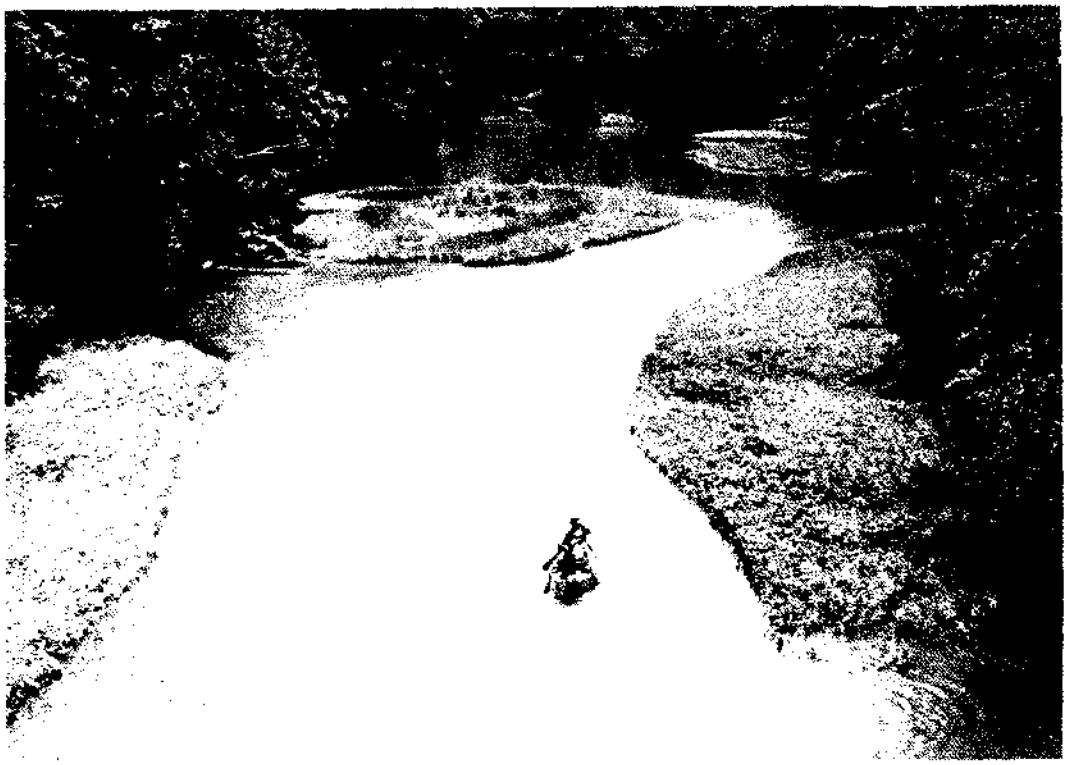

Photo by Tennessee Wildlife Resources Agency

Forested banks partially or fully screen the Buffalo River from agricultural land.

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wild flowers, and wildlife enhance the river experience. In addition, the water is notably clear and unpolluted except during periods of heavy runoff.

In many instances, streambank erosion has occurred becoming particularly severe in the lower reaches where agricultural practices have cleared all but a fringe of protective trees adjacent to the river. In some locations the banks have eroded as much as 10 to 25 feet over distances of up to 500 feet. As a result of bank erosion many uprooted trees or logging debris can be observed over the length of the river. In a few instances massive log jams have occurred. In some instances car bodies, lashed together, have been used in an attempt to check severe washing.

The following table provides a detailed description of the riverscape by size, description of water, and present use.

TABLE 6

CHARACTERISTICS OF THE BUFFALO RIVER[1/]

Lawrence County[2/]

Size	Description of Water	Present Use
14 miles in county. Width of streambed averages approximately 45 feet; varies from 20 to 100 feet. 1.5 feet average pool depth; 3 to 6 inches average riffle depth.	At minimum flow, water is continuous. Some agricultural pollution; pollution is sporadic. On 9/26/70 - pH 7.0, D.O. 8.0 ppm, hardness 85 ppm; M.O. alkalinity 85 ppm; temperature was 73°. Normal color is clear. Estimated percent stream in pools is 50%. Estimated percent pool bottom is silt 5%, sand 20%, gravel 70%, rubble 5%. Estimated percent riffle bottom is sand 5%, gravel 75%, rubble 10%, bedrock 10%. Abundance of fish food organisms is numerous. Predominant families are caddis flies, crayfish, stone flies, periwinkles. Abundance of littoral aquatic plants is average. Cover abundance is good over 50% of stream, average in 50%. Shade or canopy good over 60% of stream. Scenic values are good.	Fair fishing exists. Fishing pressure is moderate. Medium potential for improving stream fishery. Primary fish caught are smallmouth bass, rock bass, suckers. Stream used for float trips, bait collection, camping, gravel dredging. Local watershed about 40% timber, 50% pasture, 10% cultivation.

Lewis County[2/]

24 miles in county. Width of streambed averages approximately 125 feet; varies from 50 to 200 feet. 3 feet average pool depth; 8-10 inches average riffle depth.	At minimum flow, water is continuous. Minimum flow[6/] near Flat Woods during 1921-1960 was 65 C.F.S.; average flow is 721 C.F.S.; No known pollution. On 8/7/70 - pH 7.0, D.O. 10 ppm, hardness 68 ppm; M.O. alkalinity 68 ppm; temperature was 79° F. Normal color is clear. Estimated percent stream in pools is 75%. Estimated percent pool bottom is mud 25%, silt 25%, sand 20%, bedrock 10%, gravel 20%. Estimated percent riffle bottom is sand 5%, gravel 70%, rubble 20%, bedrock 5%. Abundance of fish food organisms is numerous. Predominant families are caddis flies, stone flies, may flies, periwinkles. Abundance of littoral aquatic plants is numerous. Cover abundance is good in 80% of stream, average in 20%. Shade or canopy good over 80% of stream. None of stream is channelized. Scenic values are excellent. Fertility of watershed is average.	Good fishing exists. Fishing pressure is moderate. Medium potential for improving stream fishery. Primary fish caught are smallmouth and largemouth bass, rock bass, sunfish. Access is good; 5 bridges cross stream. Stream used for float trips, bait collection, camping, vacation and weekend cottages, navigation, municipal water supply Local watershed about 60% timber, 30% pasture, 10% cultivation.

Wayne County[3/]

Size	Description of Water	Present Use
22.1 miles in county. Width of streambed averages approximately 100 feet; varies from 50 to 160 feet. Average pool depth 12 feet; average riffle depth 22 inches.	At minimum flow water is continuous. Farm and other domestic pollution is sporadic. On 5/2/68 the pH was 6.5, D.O. 6 ppm, hardness 34.2 ppm, M.O. alkalinity 34.2 ppm and temperature was 63°F. Normal color is slightly turbid. Estimated 40% of stream is in pools. Pool bottom is estimated 30% mud, 20% sand, 20% gravel, 20% rubble and 10% boulders. Riffle bottom is estimated 30% mud, 10% silt, 20% gravel and 40% rubble. Abundance of fish food organisms is numerous. Predominant families are mayflies and snails. Abundance of littoral aquatic plants is numerous. Cover abundance is good in 60% of stream; average in 30% and poor in 10%. Shade or canopy good over 90% of stream; interferes some with fly fishing. Scenic values are excellent. Fertility of watershed is average. Estimated 2% of stream is channelized.	Excellent fishing exists. Fishing pressure is moderate. Low potential for improving stream fishery. Primary fish caught are smallmouth bass and rock bass. Access is fair; four bridges cross stream. No paralleling roads. Stream used for float trips, bait collection, camping, vacation and weekend cottages, municipal water supply and waste disposal. Local watershed about 50% timber, 20% pasture and 30% cultivation. Watershed about 10% in Natchez Trace National Forest.

Perry County[4/]

43.3 miles in county. Width of streambed averages approximately 200 feet; varies from 50 to 300 feet. Average pool depth 8 feet; average riffle depth 6 inches.	At minimum flow water is continuous.[7/] Municipal and farm pollution; pollution is continuous. On 5/13/69 the pH was 6.5, D.O. 6 ppm, hardness 119.7 ppm, M.O. alkalinity 119.7 ppm and temperature was 64°F. Normal color is slightly turbid. Estimated 50% of stream is in pools. Pool bottom is estimated 10% mud, 10% silt, 30% gravel, 30% rubble and 20% bedrock. Riffle bottom is estimated 20% mud, 10% sand, 30% gravel and 40% rubble. Abundance of fish food organisms is numerous. Predominant families are mayflies and stoneflies. Abundance of littoral aquatic plants is average. Cover abundance is good in 80% of stream, average in 10% and poor in 10%. Shade or canopy good over 40% of stream; does not interfere with any type fishing. Scenic values are excellent. Fertility of watershed is rich.	Good fishing exists. Fishing pressure is moderate. No potential for improving stream fishery. Primary fish caught are smallmouth bass and rock bass. Access is good; 14 bridges cross stream. Other access by 30 miles of paralleling roads. Stream used for float trips, camping and municipal water supply. Local watershed about 40% timber, 30% pasture and 30% cultivation.

TABLE 6 (Cont'd)

CHARACTERISTICS OF THE BUFFALO RIVER[1/]

Humphreys County[5]

Size	Description of Water	Present Use
14 miles in county. Width of streambed averages approximately 20 feet; varies from 10 to 75 feet. 6 feet average pool depth; 3 inch average riffle depth.	At minimum flow, water is continuous. 8/ Farm pollution, pollution is sporadic. On 7/26/68 pH was 7.2 D.O. 8 ppm, hardness 86; M.O. alkalinity 120 ppm. Maximum temperature was 68° on 7/26/68. Normal color is clear. Estimated percent stream in pools is 30%. Estimated percent pool bottom is mud 10%, silt 10%, sand 25%, clay 12%, gravel 30%, rubble 5%, boulders 3%, bedrock 5%. Estimated percent riffle bottom is mud 5%, silt 5%, sand 15%, clay 10%, gravel 50%, rubble 10%, boulders 3%, bedrock 2%. Abundance of fish food organisms is average. Predominant families are midge, caddis flies, mayfly, crayfish. Abundance of littoral aquatic plants is average. Cover abundance is good in 70% of stream, average 20%, poor in 10%. Shade or canopy good over 80% of stream; interferes some with bank fishing. Estimated less than 1% of stream is channelized. Scenic values are excellent. Fertility of watershed is rich.	Excellent fishing exists. Fishing pressure is moderate. Medium potential for improving stream fishery. Primary fish caught are spotted bass, smallmouth, sunfish, catfish, suckers. Access is fair. Stream used for trips, camping, vacation and weekend cottages, municipal water supply, industrial water supply, gravel dredging, drainage, waste disposal, livestock and irrigation. Local watershed about 60% timber, 20% pasture and 20% cultivation. Watershed is in private lands.

1/ Based on study data collected by the Tennessee Wildlife Resources Agency and compiled by the U.S. Department of Agriculture, Soil Conservation Service, as part of an appraisal of potentials for outdoor recreation development made in cooperation with local individuals, organizations, and State agencies.
2/ Inventory date, September 1970.
3/ Inventory date, May 1968.
4/ Inventory date, July 1968.
5/ Inventory date, August 1968.

6/ Updated flow figures to a more current base of continuous flow record at the U.S.G.S. Flat Woods gage, 03604000 Buffalo River near Flat Woods, Tenn., have been published through the 1975 water year. The minimum flow recorded, 1921-75 still remains 65 cfs as listed in the report, however the average discharge has increased to 743 cfs.

Recently recorded mean velocities at the U.S.G.S. Flat Woods gage range from less than 0.5 feet per second (fps) at about 250 cfs, up to about 2.5 fps at about 20,000 cfs. At the U.S.G.S. gage 03604500 Buffalo River near Lobelville, Tenn., recently recorded mean velocities range from about 0.6 fps at 300 cfs up to 3.5 fps at 27,000 cfs.

7/ Minimum natural flow of 142 cfs and average flow of 1,139 cfs based on the period of record 1927-60 at the U.S.G.S. Lobelville gage in Perry County.

8/ Updated published flow figures for the period 1927-75 are 142 crs (unchanged) minimum, and 1,167 cfs average discharge.

Photo by Tennessee Wildlife Resources Agency
Shoal areas are spaced rather uniformly along the Buffalo River.

Flow Characteristics

Sufficient volumes of water during the recreation season when water levels are normally low is considered essential if the recreation potential generally associated with free-flowing rivers is to be realized.

Flow data on the Buffalo River is available from two stream gauging stations maintained by the U.S. Geological Survey. The gauge at river mile 58.7 near Flat Woods has been in operation since 1920 and the gauge at river mile 17.7 near Lobelville began its operation in 1927. In addition to these gauge records, a number of discharge measurements have been taken at other locations on the Buffalo River and its tributaries. Many of these measurements were secured during periods of low flow and, therefore, can be used to indicate "stream floatability" during dry periods or during the summer months.

The average discharge for 51 years at river mile 58.7 is 711 c.f.s. or 21.60 inches per year for a drainage area of 447 square miles. The stream gauge at river mile 17.7 indicates the average discharge for 44 years to be 1,112 c.f.s. or 21.36 inches per year for a drainage area of 707 square miles.

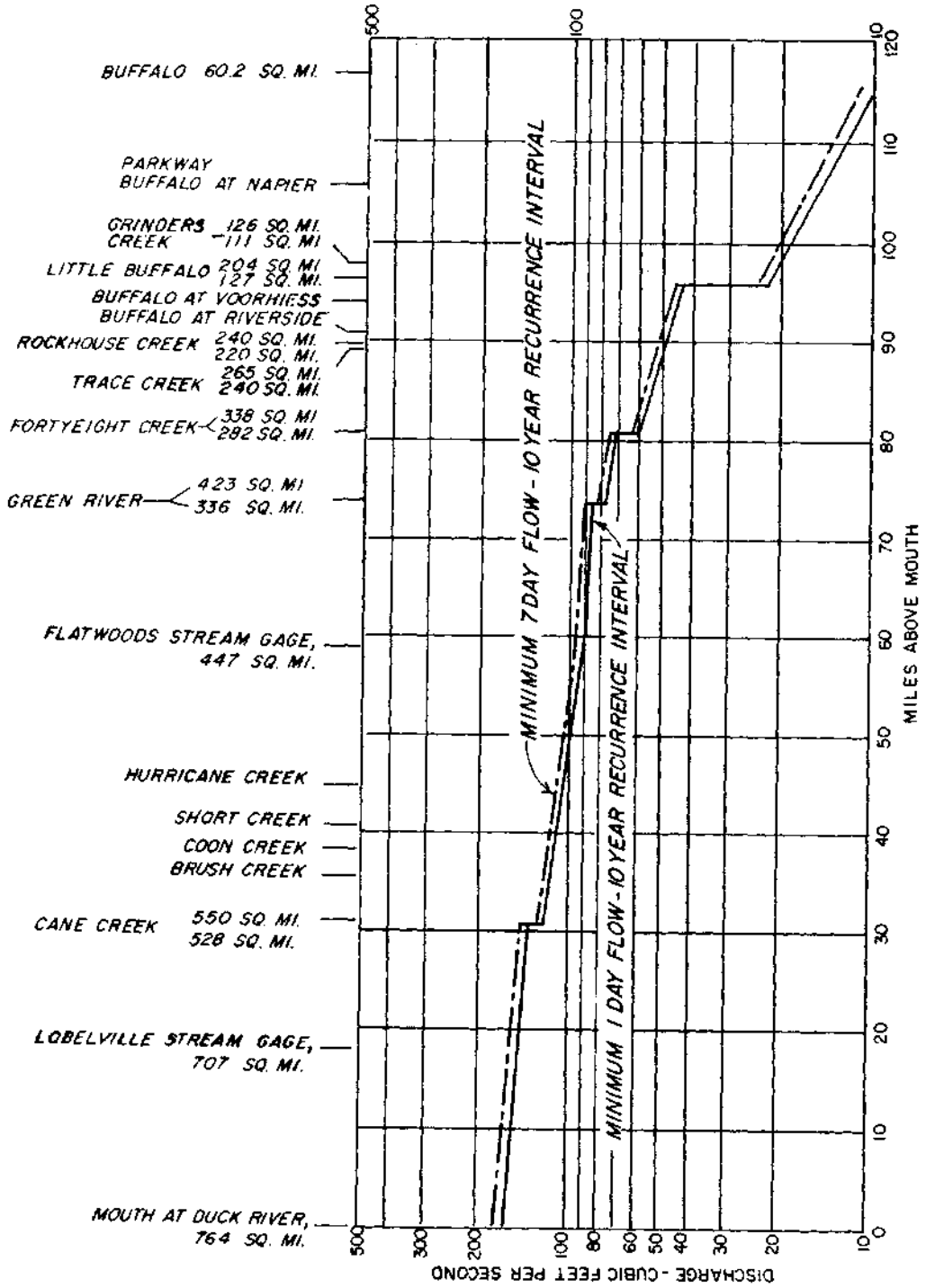
Average discharges for water years 1951 through 1965 at the Flat Woods stream gauge (Table 7) shows average minimum daily discharges to range from a high of 584 c.f.s. in March to a low of 150 c.f.s. in September. Average minimum daily flows of 200 c.f.s. or less occur during the months of July, August, September, and October.

TABLE 7
AVERAGE DISCHARGES-FLAT WOODS

Water Years 1951-65

Month	Average Maximum Daily (cfs)	Average Mean (cfs)	Average Minimum Daily (cfs)
October	376	208	170
November	1,611	465	203
December	3,903	818	276
January	5,800	1,136	333
February	7,063	1,575	520
March	8,680	1,631	584
April	5,315	1,288	508
May	2,584	671	316
June	1,401	440	245
July	675	297	200
August	403	217	163
September	441	200	150

A stream profile of the Buffalo River developed from available historic data (Figure 2) indicates the minimum flow which could be expected to occur for 1-day and 7-day periods once in every 10 years.

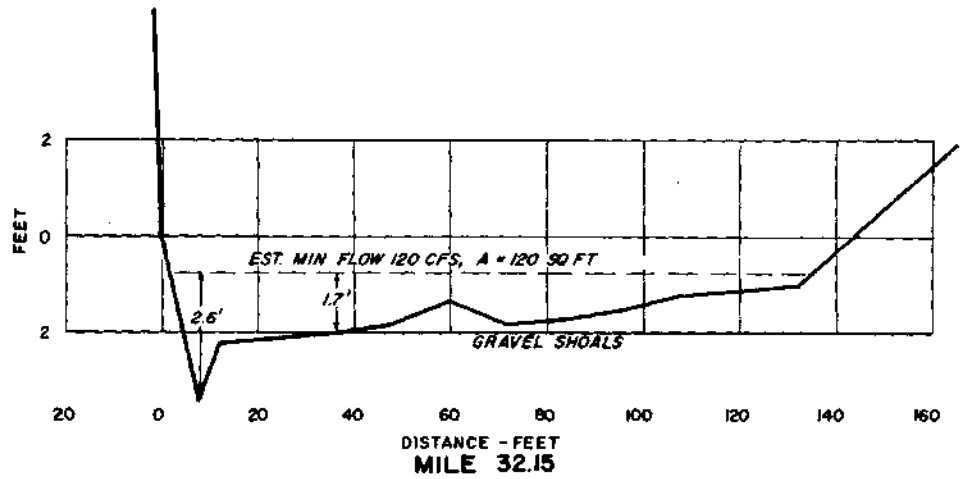


BUFFALO RIVER, TENNESSEE

STREAMFLOW PROFILES

FIG. 2

Fig. 3 Sections showing minimum flows at selected shoals on the Buffalo River, Tennessee



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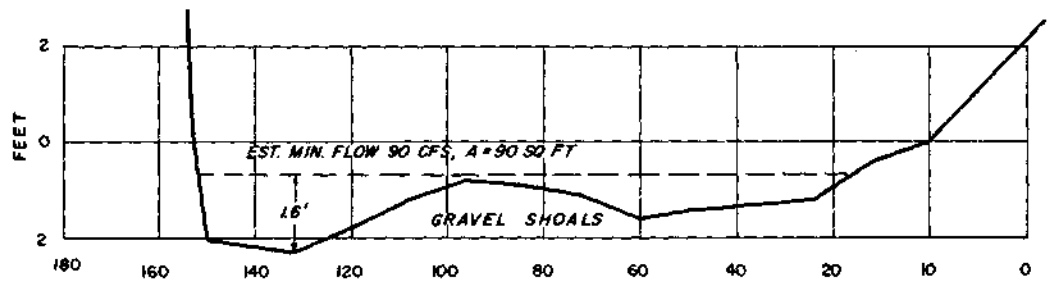

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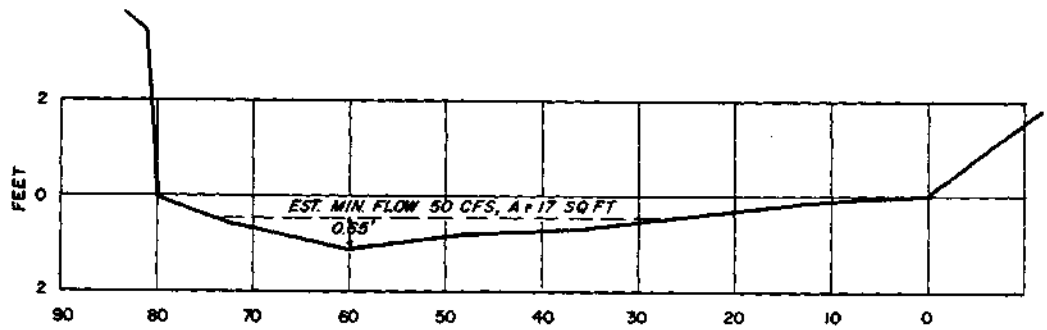
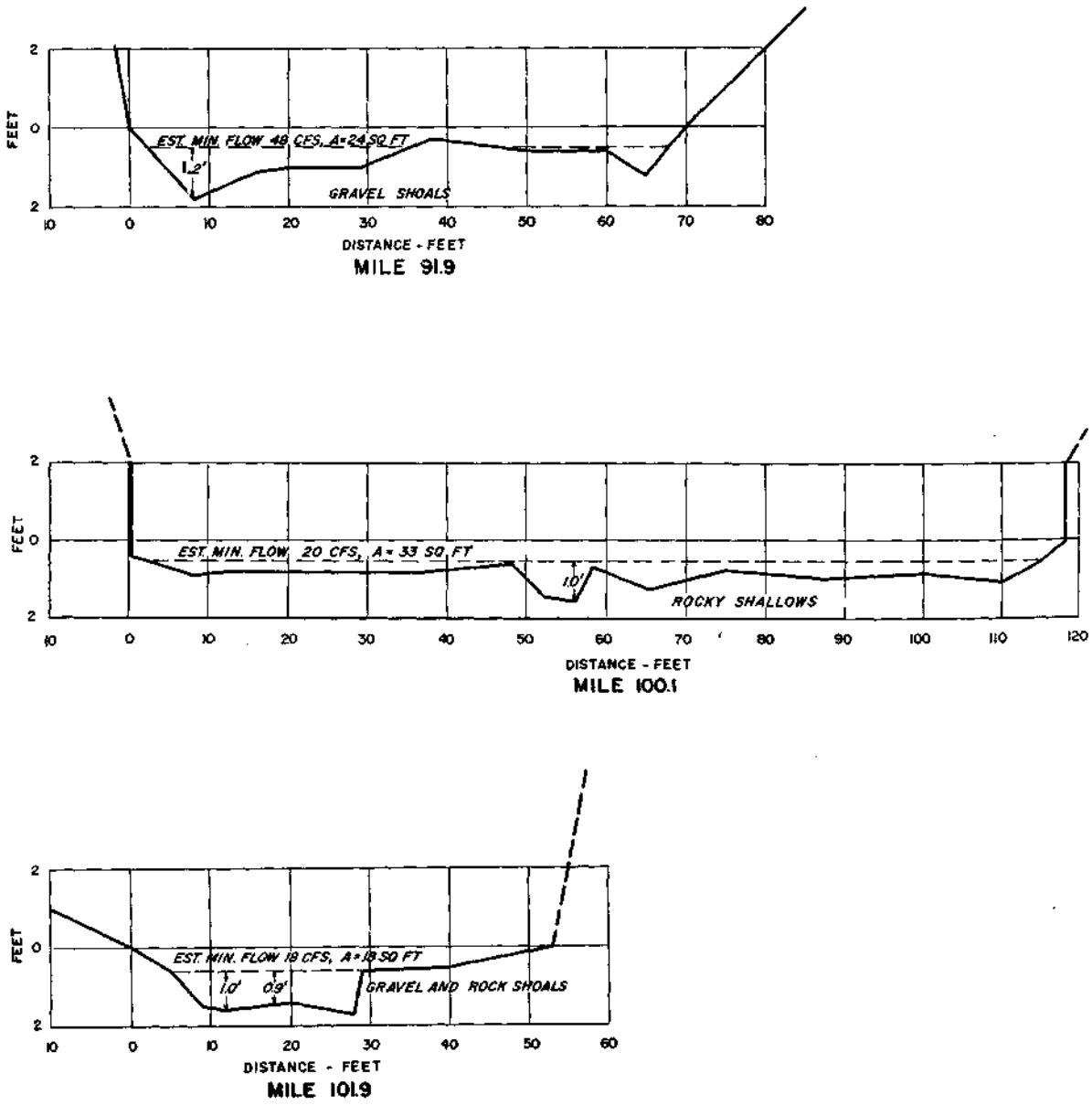


MILE 89.4

Fig. 4 Sections showing minimum flows at selected shoals on the Buffalo River, Tennessee



By using 1-day minimum low flows as shown on the streamflow profile, estimates of water depths which could be expected at typical shoal areas on the Buffalo River during the driest periods have been developed. These estimates, shown in Figures 3 and 4 and summarized in Table 8, indicate that even during periods of low flow water depth is generally adequate for shallow draft boats such as canoes, kayaks, and johnboats from Natchez Trace (river mile 104) downstream. From Henryville (river mile 117) to Natchez Trace, floating would, however, be difficult during extremely dry years when flows are less than 30 c.f.s.

TABLE 8
ESTIMATE OF LOW FLOW CONDITIONS AT TYPICAL SHOAL AREAS - BUFFALO RIVER

	Low Flow Conditions			
River Mile	Estimated Minimum Discharge (cfs)	Estimated Velocity (cfs)	Area (sq. ft.)	Maximum Depth (feet)
101.9	18	1.0	18	1.0
100.1	20	0.6	33	1.0
91.9	48	2.0	24	1.2
89.4	50	2.9	17	0.65
61.7	90	1.0	90	1.6
32.2	120	1.0	120	2.6

As shown in Figures 3 and 4, the deepest part of the channel is almost always adjacent to the shoreline and as a result is normally blocked by overhanging trees or drift. The floater is consequently forced to cross shoal areas which during periods of low flow would be difficult to negotiate. For this reason, ideal floating conditions would require flows of at least between 40 and 50 c.f.s. at Natchez Trace (river mile 104), 80-100 c.f.s. at Flat Woods (river mile 58.7) and 150 c.f.s. at Lobelville (river mile 17.7). Maximum flow which occurs frequently during the winter and spring months has little effect on the overall recreation use of the stream.

As seen from the flow duration curve (Figure 5) flows of 40 c.f.s. at Natchez Trace are exceeded or equaled about 85 percent of the time and at Flat Woods flows of 80 c.f.s. is exceeded or equaled 99.9 percent of the time. These figures reflect the suitability of the Buffalo River for recreation purposes during periods when most other streams of the region are normally too low to be used.

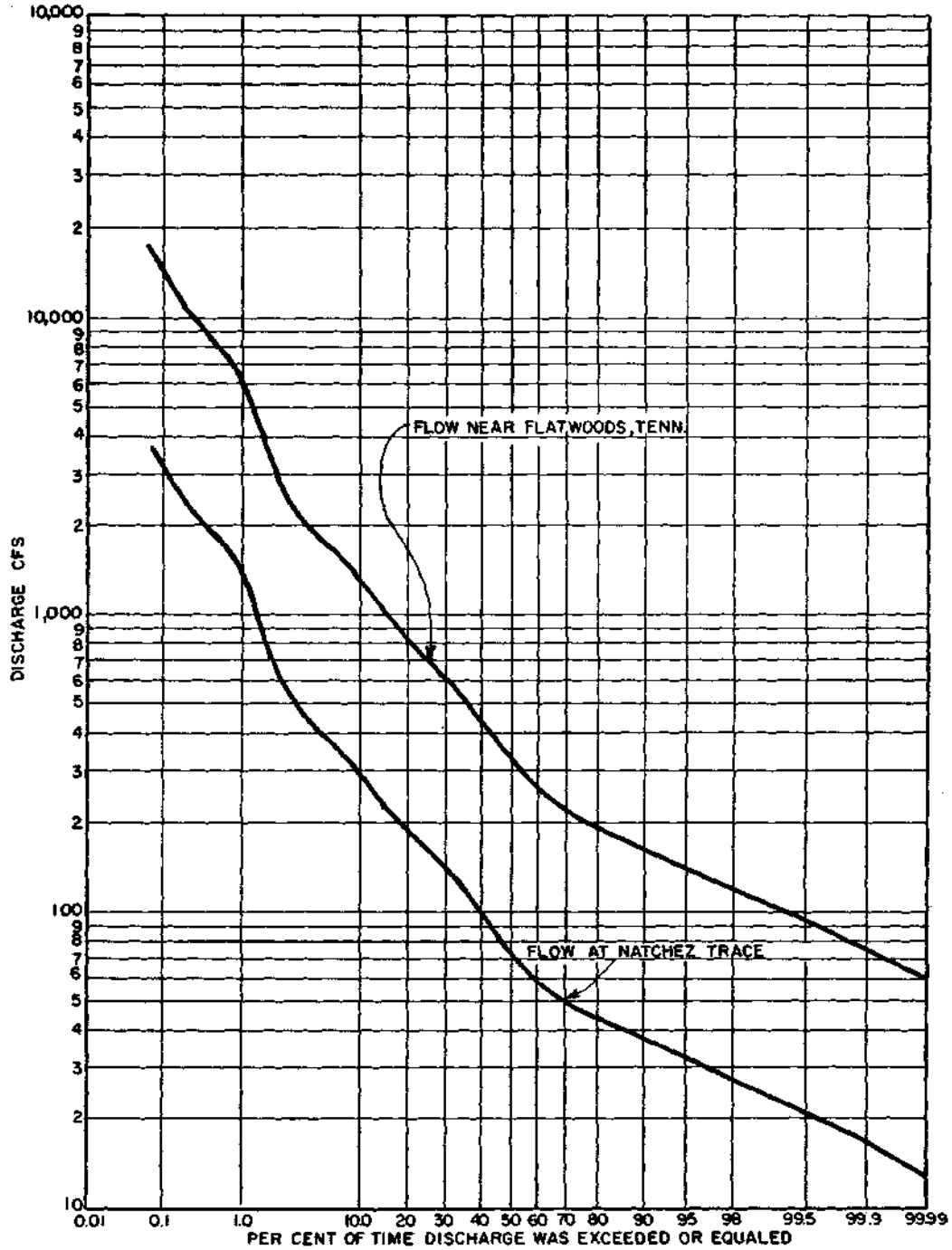
During maximum flows (Figure 6) which normally occur during the months of January through April, the river will occasionally leave the stream channel, flooding adjacent low-lying areas. Under these conditions, floating and canoeing can be particularly hazardous since many of the flooded areas are wooded. A great deal of floating debris is present.

Based on the investigation of flows and the estimate of conditions which may be expected during low flows, it is believed that low flow augmentation of the Buffalo River would not enhance existing recreational values. The river is known for its strong base flow. This is especially beneficial for water-oriented recreation activities during late summer and fall months when the supply from surface runoff is historically low.

Water Quality

The water quality criteria contained in Tennessee's "General Water Quality Criteria for the Definition and Control of Pollution in the Waters of Tennessee, and the Stream Use Classifications" adopted on October 26, 1971 and amended on December 14, 1971, and October 30, 1973 were used as a basis for determining the permissible condition of water quality in the Buffalo River with respect to its use for outdoor recreation. These federally approved water quality criteria or standards were promulgated in accordance with requirements of the Federal Water Pollution Control Act of 1970. Criteria for the various categories of use are in accord with "Quality Criteria for Water," published by the Environmental Protection Agency in July 1976.

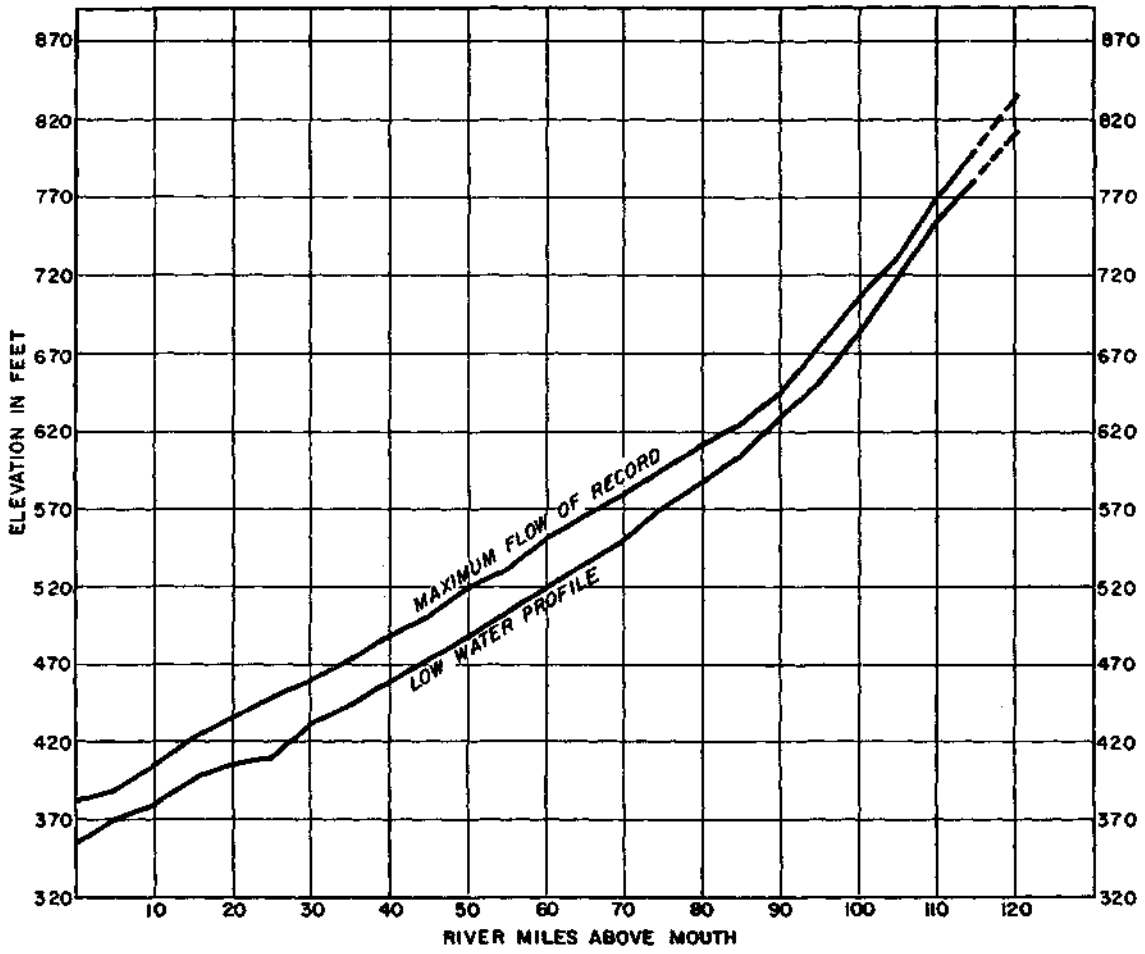
Water use classifications established by the Tennessee Water Quality Control Board for the Buffalo River are shown in Table 9.



BUFFALO RIVER, TENNESSEE

FIG. 5

FLOW DURATION



BUFFALO RIVER, TENNESSEE

FIG. 6

WATER PROFILE

TABLE 9
STREAM USE CLASSIFICATION
BUFFALO RIVER AND TRIBUTARIES

Buffalo River	Domestic Water Supply	Industrial Water Supply	Fish and Aquatic Life	Recreation	Irrigation	Livestock Watering and Wildlife	Navigation
From its mouth to river mile 27.0	X	X	X	X	X	X	--
From river mile 27.0 to river mile 29.1	--	X	X	--1/	X	X	--
From river mile 29.1 to river mile 38.0	X	X	X	X	X	X	--
From river mile 38.0 to river mile 41.2	--	X	X	--2/	X	X	--
From river mile 41.2 to headwaters	X	X	X	X	X	X	--
Green River							
From its mouth to river mile 9.0	X	X	X	X	X	X	--
From river mile 9.0 to river mile 11.7	--	X	X	--3/	X	X	--
From river mile 11.7 to headwaters	X	X	X	X	X	X	--
Rockhouse Creek							
From its mouth to river mile 6.0	X	X	X	X	X	X	--
From river mile 6.0 to river mile 9.8	--	X	X	--4/	X	X	--
From river mile 9.8 to headwaters	X	X	X	X	X	X	--

1/Lobelville sewage treatment plant discharge point river mile 26.0
2/Linden sewage treatment plant discharge point river mile 41.1
3/Waynesboro sewage treatment plant discharge point river mile 11.7
4/Hohenwald sewage treatment plant discharge point river mile 9.8

The "recreation" classification designates waters that are deemed appropriate for primary contact recreation. This requires water quality suitable for wading and dabbling by children, swimming, diving, water skiing, or surfing. The criteria specified for fish and aquatic life are stringent enough for secondary recreational uses such as boating and fishing.

The Buffalo River generally receives chemical, physical, radioactive and bacterial constituents in detectible but insignificant amounts. This general lack of pollutants makes the Buffalo River suitable for a variety of purposes, including fish and other aquatic life, wildlife, and recreation use. The only water quality limitations affecting the use of the river for recreation would be the inadvisability of engaging in primary contact recreation in those reaches immediately below the Lobelville and Linden sewage treatment plants at river mile 26.0 and 41.1, respectively. These areas are subject to contamination from human waste and should not be used for such activities as swimming.

The tributary streams of the Buffalo River are also of high quality as they enter the Buffalo River. Green River and Rockhouse Creek receive treated waste from Waynesboro and Hohenwald, respectively, but have no measurable effect on the water quality of the Buffalo River.

The major point sources of waste that have a potential for adversely affecting the water quality of the Buffalo River are discharges from the sewage treatment facilities at Linden, Lobelville, and Waynesboro. A complete inventory of wastewater discharges is presented in Table 10 and is shown on Map 6.

Linden operates a newly constructed contact stabilization secondary treatment plant designed for the equivalent of 3,000 people. The Linden sewage treatment plant discharge point is at river mile 41.1 of the Buffalo River. Lobelville has an aerated lagoon wastewater treatment facility that has a design capacity of 1,136 people. This discharge occurs at river mile 26.0 on the Buffalo River after chlorination. Waynesboro has a new contact stabilization plant that is designated for an organic load equivalent to 3,800 people. The treated waste is chlorinated and discharged at river mile 11.7 on the Green River.

Based on the antidegradation statement contained in "General Water Quality Criteria for the Definition and Control of Pollution

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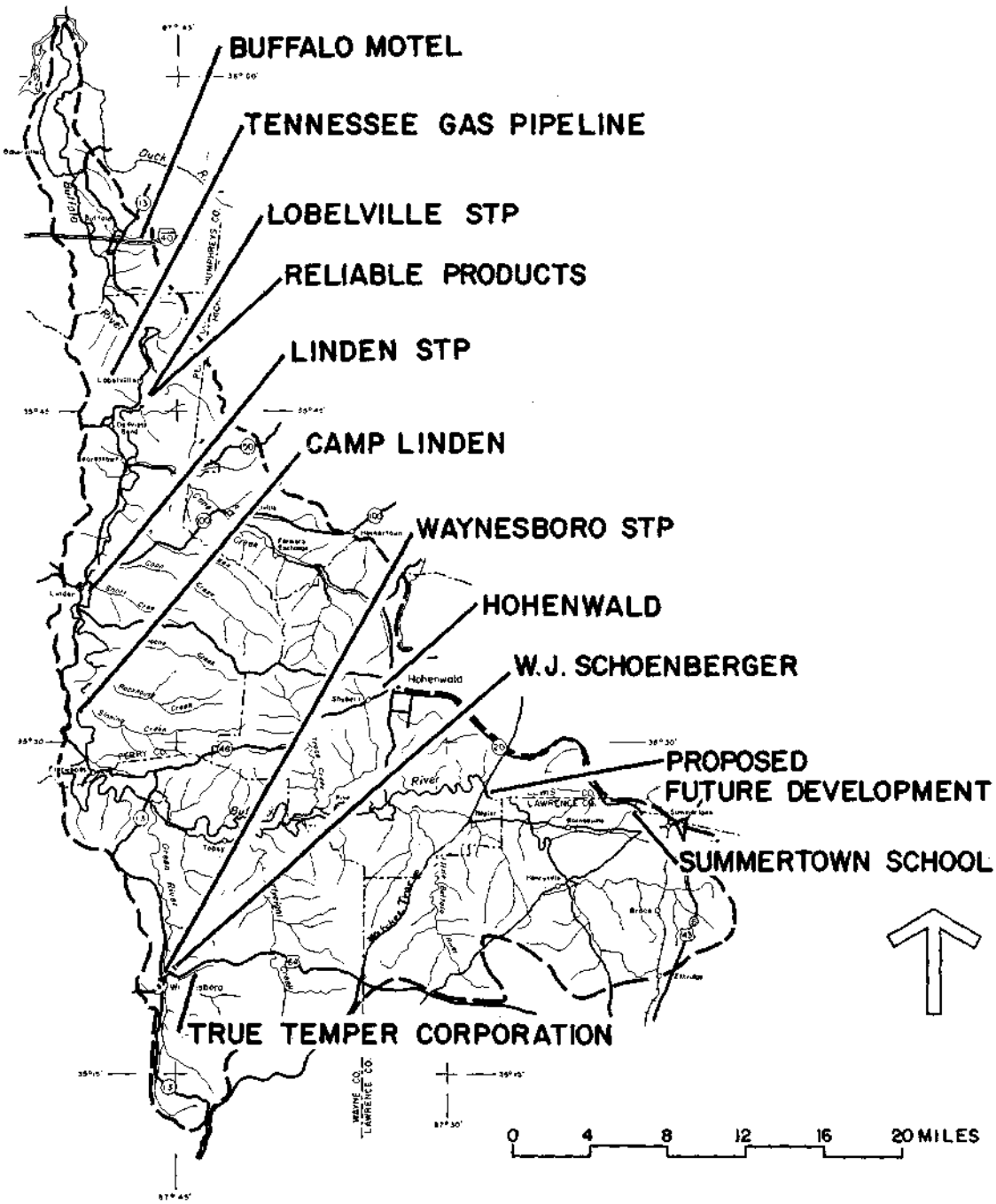
in the Waters of Tennessee," which was adopted by the Tennessee Water Quality Control Board, the Tennessee Division of Water Quality Control has formed a policy which will require a tertiary degree or equivalent treatment for all proposed discharges and major expansions of existing discharges into the Buffalo River system. This policy stands regardless of whether the Buffalo River is included in the National Wild and Scenic Rivers System.

Agricultural, forestry, and land-use activities in the basin also affect the water quality of the Buffalo River. An estimated 74 percent of watershed is in forest, 10 percent in pasture, and 15 percent in cropland. Cropland is located primarily on bottomland and level-to-gently-sloping, low-lying terrace soils bordering the river and its tributaries and on ridgetop soils (Appendix A). As would be anticipated, during heavy rainstorms, sediment pollution increases as a result of erosion. During these periods, high turbidity results. Sediment sources include streambank erosion, unstable road banks in the watershed, highway cuts and fills, crop land and pastureland. Normally, however, the sediment load on Buffalo River is low and turbidity levels are well below instream limits established for the designated stream uses.

No data on the use of chemical pesticides were found. The application of pesticides within or affecting the river corridor, including applications on forest, pasture, and cropland adjacent to the corridor, should comply with the Federal Environmental Pesticide Control Act of 1972 (P.L. 92-516). Consideration should be given to banning, in the above-named areas, the use of all pesticides classified as "restricted" under the Act. Aerial spraying of any pesticide should be minimized, restricted to allow adequate buffer zones, or prohibited.

Climate

The prevailing climate of the Buffalo River basin is temperate, with pronounced seasonal variations in both temperatures and precipitation. All seasons are marked by weather changes which come from passing weather fronts and associated centers of high and low pressure. This weather activity is least during the recreation season or from late spring through the summer months becoming more pronounced in the fall and greatest during the winter and early spring.



MAP 6

BUFFALO RIVER, TENNESSEE

WASTEWATER DISCHARGE TO BUFFALO RIVER SYSTEM

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TABLE 10
Wastewater Discharges to Buffalo River System

Discharger	County	Type of Wastewater	Quantity Gallons/Day	Type of Treatment	Discharge Point
Buffalo Motel	Humphreys	Domestic	8,000	Extended Aeration	Black Br. Mile 4.4 Buffalo R. Mile 8.3
Tennessee Gas Pipeline Co.	Perry	Industrial Cooling Water	10,000	None	Dodson Spring Br. Mile 0.2 Marrs Br. Mile 1.3 Buffalo R. Mile 25.3
Lobelville Sewage Treatment Plant	Perry	Domestic	114,000	Aerated	Buffalo R. Mile 26.0
Reliable Products	Perry	Industrial Cooling Water	150,000	Sedimentation	Buffalo R. Mile 26.2
Linden Sewage Treatment Plant	Perry	Combined Domestic and Industrial	200,000	Contact Stabilization	Buffalo R. Mile 41.1
Camp Linden	Perry	Domestic	15,000	Septic Tank and Sand Filter	Buffalo R. Mile 55.3
Waynesboro Sewage Treatment Plant	Wayne	Domestic	500,000	Contact Stabilization	Green R. Mile 11.7 Buffalo R. Mile 73.5
W.J.Schoenberger	Wayne	Industrial Cooling Water	16,000	None	Hurricane Cr. Mile 11.7 Buffalo R. Mile 73.5
True Temper Corp	Wayne	Industrial Cooling Water	266,000 (seasonal)	None	Unnamed Trib. Mile 0.1 Barlow Br. Mile 1.3 Hurricane Cr. Mile 0.9 Green R. Mile 11.7 Buffalo R. Mile 73.5
Hohenwald	Lewis	Domestic	530	Trickling Filter	Rockhouse Cr. Mile 9.8 Buffalo R. Mile 98.0
Proposed Future Development	Lewis	Domestic	100,000-500,000	To Be Determined	Buffalo R. Mile 104.5
Summertown School	Lawrence	Domestic	31,000	Extended Aeration	Unnamed Trib. Mile 0.5 N. Fork Saw Cr. Mile 0.8 Saw Cr. Mile 5.0 Buffalo R. Mile 113.7

TABLE 11
CLIMATOLOGICAL SUMMARY
WAYNESBORO, TENNESSEE

Means and Extremes For Period 1931-1965

Month	Temperature(°F) Means: Daily Maximum	Daily Minimum	Monthly	Extremes: Record Highest	Year	Record Lowest	Year	Mean Degree Days	Precipitation (inches): Mean	Greatest Daily	Year	Snow, Sleet: Mean	Maximum Monthly	Year	Greatest Daily	Year	Mean Number of Days: Precip..10 inch or more	Temperatures Max. 90° and above	32° and below	Min. 32° and below	00 and below	Month
(a)	35	35	35	35		35		30	35	35		35	35		35		35	35	35	35	35	
J	50.0	26.6	38.3	79	1943	-21	1940	794	5.92	3.67	1946	3.8	17.1	1948	15.5	1964	9	0	3	21	1	J
F	53.6	28.8	41.2	84	1963	-20	1951	664	5.76	5.32	1948	2.1	17.8	1960	6.5	1960	8	0	1	18	*	F
M	60.8	35.4	48.1	87	1935	6	1943	527	6.06	2.85	1933	1.7	9.0	1951	6.0	1934	9	0	*	14	0	M
A	71.7	44.9	58.1	94	1937	19	1940+	210	5.13	4.49	1948	T	T	1956+	T	1956+	8	*	0	4	0	A
M	79.7	52.6	66.2	96	1942	27	1944	65	4.12	3.02	1933	0	0		0		7	2	0	1	0	M
J	87.0	61.1	74.2	106	1936	38	1933+	0	4.31	5.24	1960	0	0		0		7	11	0	0	0	J
J	89.8	64.3	77.1	108	1952	41	1947	0	4.58	6.37	1938	0	0		0		7	17	0	0	0	J
A	89.9	62.9	76.4	106	1954	41	1946	0	3.73	2.88	1931	0	0		0		6	17	0	0	0	A
S	84.4	56.0	70.2	107	1954	29	1949+	45	3.10	4.78	1944	0	0		0		5	9	0	*	0	S
O	74.8	43.4	59.1	95	1954	16	1952	214	2.64	5.30	1932	T	0.1	1954	0.1	1954	4	1	0	5	0	O
N	61.3	33.6	47.5	85	1935	- 5	1950	531	4.62	5.00	1948	0.4	6.6	1950	6.6	1950	7	0	*	15	*	N
D	51.9	27.9	39.9	75	1964	- 8	1962	760	5.09	6.90	1956	1.5	11.0	1945	9.5	1963	7	0	2	21	*	D
Year	71.2	44.8	58.0	108	July 1952	-21	Jan. 1940	3,810	55.06	6.90	Dec. 1956	8.9	17.8	Feb. 1960	15.5	Jan. 1964	84	57	6	99	2	Year

(a) Average length of record, years.
T Trace, an amount too small to measure
+ Also on earlier dates, months, or years.
* Less than one half.

Source: U.S. Department of Commerce, Environmental Science Services Administration

Waynesboro weather records generally represent the local climate for this part of the Highland Rim (Table 11). Application of the Waynesboro records to surrounding terrain should, however, make allowances for influence of hills and valleys on precipitation, wind, cold air movement, snowfall, etc.

Precipitation in the basin is normally well distributed but can vary greatly during all seasons from year to year. Although most of the area's precipitation occurs during the winter and early spring, a secondary maximum of precipitation occurs in mid-summer due to shower and thunderstorm activity. The months of September and October have the least rainfall making these months especially suitable for outdoor recreation activities.

Because of its elevation within the Highland Rim of middle Tennessee, cloudiness and precipitation as compared to lower neighboring elevations is generally greater because of uplifting air currents. While the 55 inches of precipitation at Waynesboro is not the greatest for the area, it is almost 6 inches more than at lower elevations in the vicinity of the inner central basin area around Nashville. Snowfall is quite variable from year to year. Some winters have little or none with the average year having about 4 days with snow on the ground of 1 inch or more in depth. Heavy snowstorms are infrequent and snow seldom remains on the ground for more than a few days.

Flooding of the Buffalo River and its tributaries may occur anytime during the winter and early spring months between December and March when the frequent migratory storms bring general rains of high intensity. During this period, the Buffalo River may rise causing temporary widespread flooding in the wider valley bottoms of the Buffalo watershed and local flash flooding elsewhere. During the summer months, heavy rainstorms can result in local flash flooding. Flood producing rains during the fall are rare.

Temperature in this part of the State reaches 90° F. and above 57 days during the year. There are many mild periods in winter and occasional periods of cold, dry weather. Stretches of warm, humid weather can occur during the summer. Early morning averages for relative humidity range from 75 percent in March to 90 percent in August and September. In early afternoon, the range is from 48 percent in March to 65 percent in December.

Photo by Bureau of Outdoor Recreation

Steep bluffs along the Buffalo River add to the attractiveness of the river scene.

The Buffalo River basin has a favorable and moderate climate conducive to most outdoor recreation activities year-round, with many days of the year nearly ideal in temperature. On the whole, the fall season is the most pleasant time of the year--rainfall is at a minimum, sunshine at a relative maximum and temperature extremes are practically nonexistent.

Geology

Known to occur near the Buffalo River are rock phosphate, limestone, chert, iron-ore, sand and gravel, manganese, and clays. In addition, noncommercial "shows" of oil and gas were reported from a well near the river.

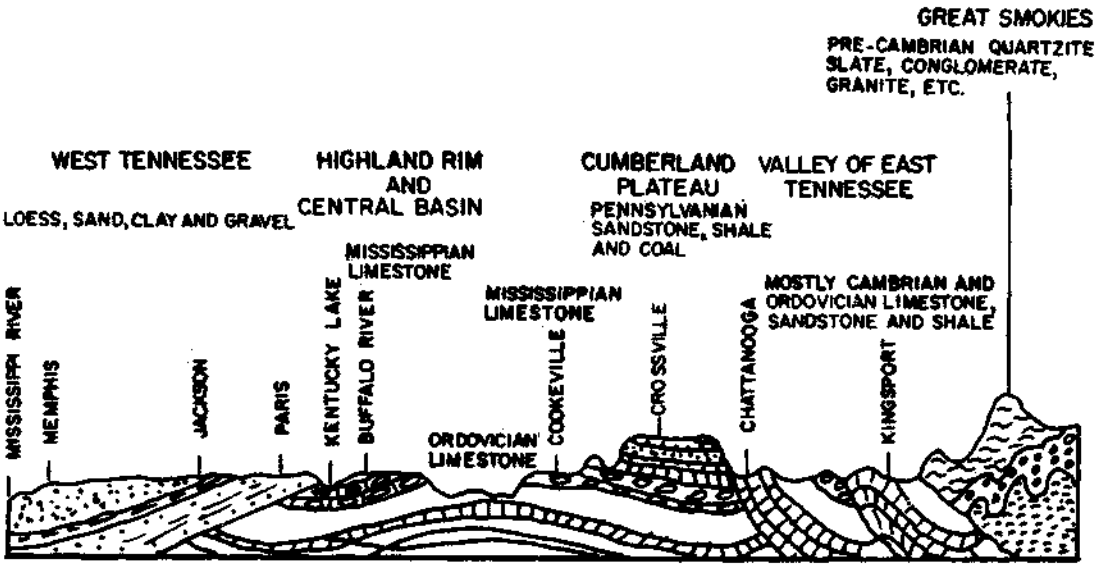


FIG. 7 **GEOLOGY**

USDA-SCS, July 1974

Cross section of main geological formations and structure, Tennessee.

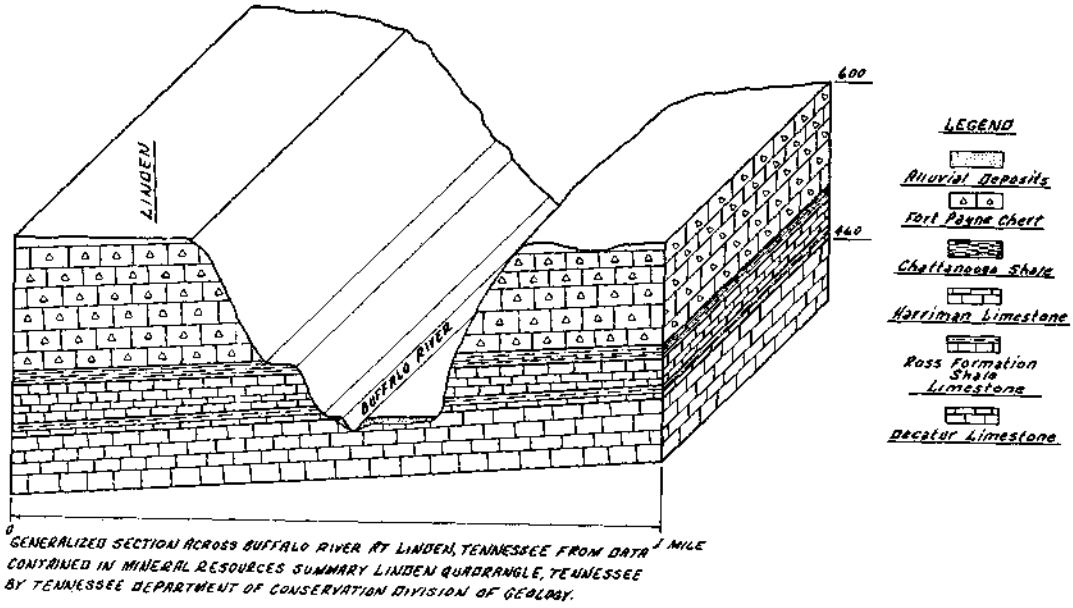
The Buffalo River lies within the Western Highland Rim physiographic province of Tennessee. The Highland Rim is underlain by limestone that weathers into a flintly soil. These rocks are nearly 350 million years old (of the Mississippian Period) and lie nearly flat (Figure 7). The same 300-foot-thick limestone deposit forms the bedrock under the rim from the foot of the Cumberland Plateau westward for more than 100 miles to Kentucky Lake. Oldest formations in Central Tennessee are limestone rocks that underlie the Central Basin. Those were mainly deposited as mud and fossils on the floor of a shallow sea that flooded all of Tennessee during the Ordovician Period nearly half a billion years ago.

The rocks that form the Western Highland Rim region are sedimentary and range in age from Ordovician to Quaternary (Figure 8). Ordovician rocks of the Mannie Shale, Fernvale and Hermitage

Photo by U.S. Forest Service
In many places, bluffs have been undercut forming numerous flutings, cavities and small caves at or near water level.

Formations are exposed in a small area in the vicinity of Trace and Rockhouse Creeks at river mile 89 on the Buffalo River. These rocks consist of bluish-gray, fossiliferous limestone and calcareous shale of various characters. The limestone is phosphatic at many horizons. These are the oldest rocks found in the Buffalo River basin.

Silurian rocks lie next above those of the Ordovician system. They occupy most of the valley floor of the Buffalo River downstream from Grinders Creek to Lobelville including all the valley floor of tributaries within this reach. The Silurian rocks consist of massive to shaley fossiliferous limestone. The lower beds are varigated, and the upper part is gray and in places contains cherts. Rocks of the Silurian Age form the lower part of the vertical bluffs found along the Buffalo. In places, these



GENERALIZED SECTION ACROSS BUFFALO RIVER AT LINDEN, TENNESSEE FROM DATA CONTAINED IN MINERAL RESOURCES SUMMARY LINDEN QUADRANGLE, TENNESSEE BY TENNESSEE DEPARTMENT OF CONSERVATION DIVISION OF GEOLOGY.

FIG. 8

BUFFALO RIVER, TENNESSEE

U.S.D.A. - SCS JULY 1974

GENERALIZED CROSS SECTION

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bluffs have been undercut from solution and abrasion to form numerous flutings, cavities and small caves at or near water level.

The Devonian rocks, which are next in succession, begin at Linden and continue downstream to approximately river mile 41 where Highway 13 bridge crosses the Buffalo River. These rocks consist of thick beds of chert, or novaculite, interbedded with thin, pure, white limestone and siliceous limestone and shale. The Birdsong Shale Member of the Ross Formation is noted for its excellent fossil collecting. Overlying this Devonian chert is a thin sandstone and above that a black shale (The Chattanooga Shale) which is of Devonian or Mississippian Age.

The two Mississippian formations mostly associated with this area are in ascending order, the Fort Payne chert, and the Warsaw

Photo by Bureau of Outdoor Recreation

Numerous springs and tributary streams maintain a uniform flow during normal low-flow periods.

Formation. Generally, at higher elevations throughout the length of the Buffalo River the more resistant cherty, siliceous bed of the Fort Payne Formation is found.

This Fort Payne Formation is the most extensively outcropping unit in the area and in most places in the uplands it is weathered to a deep residuum consisting of chert fragments in a siliceous, clayey residue. It is this cherty material which forms the gravelly alluvial channels of the streams in this region.

Acting as an excellent aquifer, this formation releases water from many springs into the Buffalo and its tributaries, maintaining a uniform and substantial flow during normal low flow periods.

The Warsaw limestone composed of massive, pure limestone and cherty limestone, and containing sandstone beds occupies mostly

Photo by Bureau of Outdoor Recreation
Standing Rock at river mile 17 is composed of Fort Payne silicastone.

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the flat higher uplands around Hohenwald and Lawrenceburg areas. In most areas, it is completely weathered to a cherty, clayey residuum. Within this Mississippian residuum are deposits of iron in the form of limonite. These deposits were worked extensively in the 19th Century and into the early part of this century. In the Buffalo River basin, the largest mining areas were in the vicinity of Napier and south of Riverside. Although no longer in demand, these ore deposits were the basis for a thriving industry during that period and constitute an important segment of the history of the Highland Rim. The old mines have changed little in the past 50 years or more and scattered iron boulders and smaller pieces of ore can still be found.

Overlying the Fort Payne and Warsaw formation are remnants of what was once a larger area of Tuscaloosa Gravel of the Cretaceous Age. The Tuscaloosa consists mostly of chert gravel in a matrix of sand and silt with lenses of clay. In Wayne County the gravel of the Tuscaloosa occurs as a mantle on the higher hills and ridges; it thins out entirely towards the north.

The Alluvian deposits of the Quaternary Age and the most recent succession, consist of gravel, sand and silt, and clay in varying proportions; it forms the many gravel bars along the river and loam on stream terraces or abandoned meander loops.

The configuration of the Buffalo River valley and that of its channel is the result of several factors. These are (1) regional structural features, (2) joints, (3) rock types, (4) the cycles of erosion, and (5) possible stream piracy. The Upper Valley, which flows almost due west, is developed on the north flank of the extension of the Cincinnati Arch, known as the Clifton Saddle, a structural axis which trends west then northwest through Clifton in western Wayne County. This axis, which extends beneath the coastal plain sediments of West Tennessee, connects with the Ozark Dome to the northwest.

The distinct L-shape of the Buffalo valley may be due to control by the Clifton Saddle in the east-west segment, and a response to regional dip in the north-south segment. Another explanation of this valley configuration is that the east-west segment of the river once flowed westward directly into the Tennessee River, and was pirated by a rapidly headward eroding stream flowing northward, and the L-shaped valley resulted.

Most of the meanders of the river, as well as its low gradient in all but the headwaters region, are a result of the mature stage of development reached in the cycle of erosion of the valley. Also characteristic of maturity is the moderately wide alluvial plain in the downstream segment. It appears that the Buffalo River has undergone a slight rejuvenation (renewed downcutting) fairly recently, as evidenced by some distinct, slightly elevated meander scars and oxbow lakes recently cut off or in the process of being abandoned. Excellent examples of these meander scar features are found in an area just south of Linden, at Bethal at De Priest Bend, and at Lobelville.

In the upstream segments, above Oak Grove, jointing in the more resistant rocks has resulted in a unique zigzag pattern, somewhat atypical of the more classical looping meanders in the less resistant limestone downstream.

An actively degrading (downcutting) stream with distinct meanders is further evidence of rejuvenation. This situation

will result in the stream "slipping off" areas on the inside of meanders, depositing a veneer of alluvium, and eroding the outside banks of the meander where the stream expends its maximum erosive power. The resulting profile is typical along most of the river, with a long, low slope opposite vertical, often high, sometimes undercut bluffs.

Unique geologic features include numerous small waterfalls, some which are visible from the river. They form on the resistant siltstone beds of the lower Fort Payne Formation, and the Hardin Sandstone Member of the Chattanooga Shale. Some of these waterfalls are 15 to 20 feet high.

One of the most notable features in the valley is Natural Bridge in Courthouse Hollow, a tributary of Forty Eight Creek. It is developed in Silurian Limestone from solution-widening of joints and bedding planes.

There are many small caves present in the valley, mostly developed in Silurian limestones. Some of these are visible from the river, but many are located in small ravines and in tributary valleys.

At Bethel, and also just above the mouth of the river are whirlpools where a portion of the river water descends into underground passages. The Bethel "whirlpool" is obvious as the rushing noise of the water in the cavern can easily be heard. The water emerges about 2 miles downstream. The water entering the "whirl," as it is called locally, reportedly comes out in the Duck River, having traveled through a large ridge to the west.

At about river mile 17 on the Buffalo River there is an interesting feature known as Standing Rock. Visible from a considerable distance, this tall pinnacle of rock is composed of Fort Payne silicastone and is the result of erosion along vertical joints present in the rocks.

Soils

The Buffalo River watershed contains three distinct landforms. These are (1) the hills and ridges which lead from the undulating and rolling Highland Rim plain down to the stream bottom and which comprise about 60 percent of the watershed, (2) the

undulating to rolling Highland Rim plain which comprises about 20 percent of the watershed, and (3) the nearly level to gently rolling bottoms and low terraces along Buffalo and its many small tributaries which comprise the remaining 20 percent.

All of the watershed is underlain by cherty limestone and soils derived from these rocks greatly dominate the area. The soils on the hillsides as well as most of those on the bottoms and terraces are cherty throughout. The soils on the Highland Rim plain are silty and free of chert in about the upper 2 feet but they are cherty below that depth.

As indicated in Table 12, the soils range from low to high in productivity and vary in their ability to support agricultural production and development. Those on the long narrow strips of bottoms and low terraces are relatively fertile and have high productivity; those on the steep upland slopes are of low fertility and productivity; and those on the smoother parts of the Highland Rim have low inherent fertility but medium productivity as they respond well to management (Map 7).

The soils of the watershed generally have severe limitations for use as homesites and septic tank filter fields. The main reasons for this limitation are susceptibility to flooding of the bottoms and low terraces, steep slopes of the cherty uplands, and slow permeability on the Highland Rim plain where the dominant soils have a fragipan. Flood risk is common on all bottom land and low terraces in the valleys (Map 8).

As depicted on Map 8, soil groups below Trace Creek at river mile 89 are predominantly of the Ennis-Humphreys-Lobelville soil association, while those above Trace Creek are of the Humphreys-Lobelville-Ennis soil association.

For the purpose of this study, soil types within 1/4 mile of each bank of the Buffalo River (a 1/2-mile corridor) for its entire length through Lewis, Wayne, Perry, Humphreys and Lawrence Counties have been typed and described according to their best use or uses. In total, six soil groups are recognized by the Soil Conservation Service as being present within their corridor and are described in detail in Appendix B. Distribution of the soil groups by county and percent are shown in Table 13.

Soil group Nos. 1 and 2 include the well-drained bottom land soils located along the Buffalo River where slopes range from

TABLE 12

General Soil Characteristics

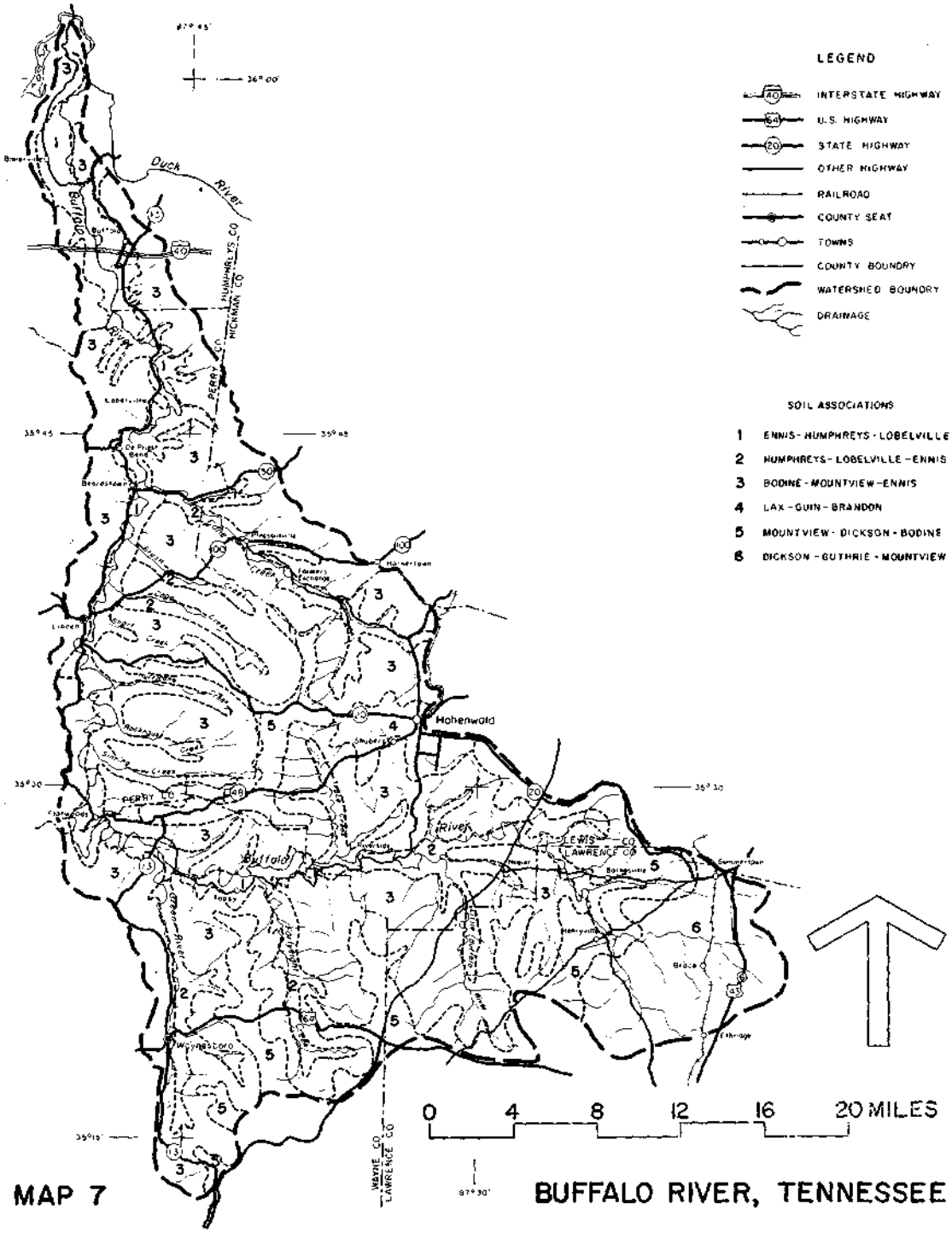
Association	Map No.[1]	Series	Percent of Association[3]	Productivity	Erosion Hazard[2]	Flood Risk	Degree and Kind of Limitations for:[2] Home Site	Septic Tank
Ennis-	1	Ennis	35	High	Slight	Yes	Severe: f	Severe: f
Humphreys-	1	Humphreys	30	High	Moderate	Yes	Severe: f, slight if no flooding	Severe: f, slight if no flooding
Lobelville	1	Lobelville	20	High	Slight	Yes	Severe: f	Severe: f
Humphreys-	2	Humphreys	35	High	Moderate	Yes	Severe: f, slight if no flooding	Severe: f, slight if no flooding
Lobelville-	2	Lobelville	30	High	Slight	Yes	Severe: f	Severe: f
Ennis	2	Ennis	20	High	Slight	Yes	Severe: f	Severe: f
Bodine-	3	Bodine	60	Low	Severe	No	Moderate: s[4]	Moderate: s[4]
Mountview-	3	Mountview	15	Medium	Moderate to severe	No	Slight	Moderate: p
Ennis	3	Ennis	10	High	Slight	Yes	Severe: f	Severe: f
Lax-	4	Lax	40	Medium	Moderate to severe	No	Moderate: p	Severe: p
Guin-	4	Guin	25	Low	Severe	No	Moderate: s[4]	Moderate: s[4]
Brandon	4	Brandon	15	Medium	Moderate	No	Slight	Slight
Mountview-	5	Mountview	35	Medium	Moderate to severe	No	Moderate: p	Moderate: p,s
Dickson-	5	Dickson	25	Medium	Moderate to severe	No	Moderate: p	Severe: p,s
Bodine	5	Bodine	20	Low	Severe	No	Moderate: s[4]	Moderate: s[4]
Dickson-	6	Dickson	30	Medium	Moderate to severe	No	Moderate: p	Severe: p,s
Guthrie-	6	Guthrie	25	Low	Slight	Yes	Severe: p,f	Severe: p,f
Mountview	6	Mountview	20	Medium	Moderate to severe	No	Moderate: p	Moderate: p,s

1/ Number refers to soil association on the General Soils Map.

2/ Based on dominant slope, erosion hazard increases with slope - Slight-Minor or no limiting soil factors. Moderate - Limitations that need to be recognized but that can be overcome. Severe - Limitations that are difficult and costly to overcome, maintenance is a continuing problem; in some cases limitations cannot be overcome. d = natural drainage f = flooding and ponding p = permeability s = slope w = watertable.

3/ The remaining percent of the association is made up of minor associated soils.

4/ Severe if over 25 percent slope.

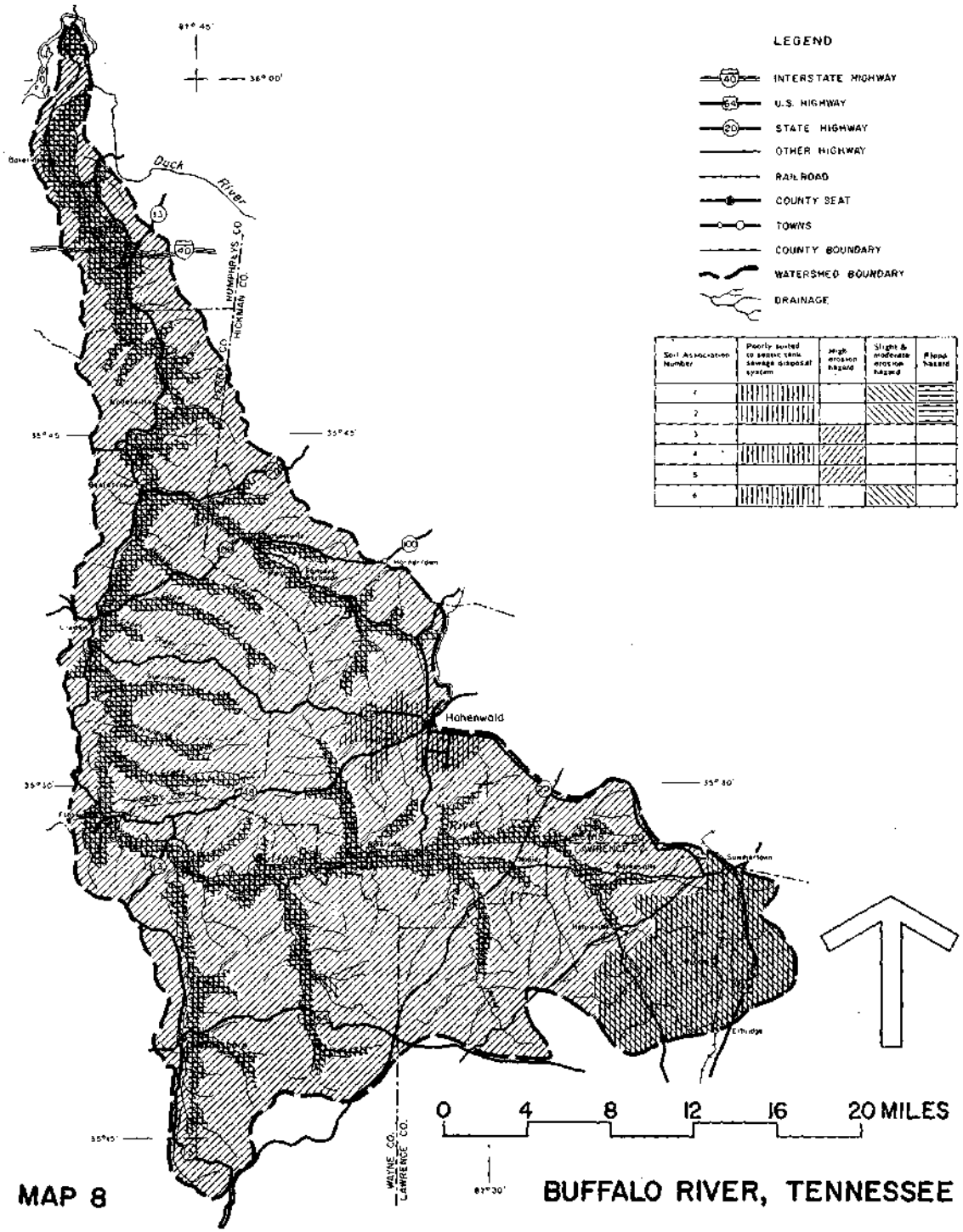


MAP 7

BUFFALO RIVER, TENNESSEE

U.S.D.I. - B.O.R.
U.S.D.A. - SCS JULY 1974

GENERAL SOIL MAP



MAP 8

BUFFALO RIVER, TENNESSEE

SOIL LIMITATIONS RELATIVE TO LAND USE

U.S.D.I.- B.O.R.
U.S.D.A. - SCS JULY 1974

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TABLE 13

Distribution of Soil Groups - % of River Corridor[2/]
Buffalo River Study

County	River Mile	Soil Group[1/] No. 1 (%)	No. 2 (%)	No. 3 (%)	No. 4 (%)	No. 5 (%)	No. 6 (%)
Lawrence	108.8-117	25	0	10	3	28	34
Lewis	109.4- 86.9	16	15	24	19	2	24
Wayne	86.9- 62.9	31	1	25	20	3	20
Perry	62.9- 15.4	38	3	19	15	1	24
Humphreys	15.4- 0	64	0	13	8	0	15
Distribution within total corridor		36	4	20	15	3	22

1/ Within ¼ mile of each bank.
2/ No. 1 -Ennis, Linside, Lobelville
No. 2 -Ennis Cherty, Linside Cherty, Lobelville Cherty
No. 3 -Humphreys, Paden, Pickwick, Mountview
No. 4 -Humphreys, Pickwick, Mountview, Paden
No. 5 -Bodine Cherty, Baxter Cherty, Mountview, Etowah Gravelly
No. 6 -Baxter Cherty, Bodine Cherty

0-2 percent. During winter months or periods of heavy rainfall, a high water table is generally within 2 feet of the surface for this group.

The cherty soils of group No. 2 are located primarily in Lewis County whereas the loamy soils of group No. 1 become more prominent with the widening of the river valley in Wayne, Perry, and Humphreys Counties (Table 13). Soil group No. 1, in total, comprises the majority of the area within the river corridor representing 36 percent. Soil Group No. 2 is relatively insignificant, occupying only 4 percent.

Soil group Nos. 1 and 2 are well suited for pasture, row crops, forest, and low intensity recreation development. The susceptibility of these areas to frequent flooding presents a severe limitation on residential development and for the more elaborate and costly recreation facility development such as

TABLE 14

Selected Uses - % Soil Group in River Corridor[1/]
Buffalo River Study

Soil Group	Degree of Limitation	Residential	Forest	Pasture	Row Crops	Recreation Facility Development (nonflooding[2/])	Recreation Facility Development (flooding[3/])	Access Roads Parking Lots Boat Ramps (nonflooding[2/])	Access Roads Parking Lots Boat Ramps (flooding[3/])
No. 1	slight	1	85	95		85	1	10	1
Ennis, Linside,	moderate	1	10	3		5	9	85	1
Lobelville	severe	98	5	2		10	98	5	98
No. 2									
Ennis cherty,	slight	1	85	95		10	1	20	1
Linside cherty,	moderate	1	10	3		80	1	70	1
Lobelville cherty	severe	98	5	2		10	98	10	98
No. 3									
Humphreys,	slight	20	80	95		90	40	20	20
Paden, Pickwick,	moderate	15	15	3		5	10	70	30
Mountview	severe	65	5	2		5	50	10	50
No. 4									
Humphreys,	slight	20	80	95		30(85)[4/]	--	30	--
Paden, Pickwick	moderate	70	15	3		60(15)	--	60	--
Mountview	severe	10	5	2		10(5)	--	10	--
No. 5									
Bodin, cherty	slight	20	20	15		20	--	20	--
Baxter, cherty	moderate	60	70	35		60	--	60	--
Mountview Etowah gravelly	severe	20	10	50		20	--	20	--
No. 6									
Baxter cherty,	slight	3	5	10		10	--	10	--
Bodine cherty,	moderate	2	25	20		20	--	20	--
	severe	95	70	70		70	--	70	--

1/ Within 1/4 mile of each bank.
2/ Does not flood during recreation season.
3/ Floods during recreation season.
4/ Low intensity recreation development such as picnic areas.

campgrounds (Table 14). Any widespread usage of these lands for other than their present use would be, in most instances, inappropriate.

Soil group Nos. 3 and 4 include the well-drained and moderately well-drained soils on the low terraces and uplands of the Buffalo River where slopes range from 0 to 5 percent and 5 to 12 percent, respectively. These soils are located mostly in the upper watershed in Lewis and Wayne Counties. In total the area occupied by these two groups represents 35 percent of the corridor area, a significant amount.

The above described soil groups can best be used as either pasture, row crops, recreation development of all types, and for timber production. Except for about one-half of group No. 3 (low terraces) which is susceptible to infrequent flooding, the soils have some limitations for residential development. Because of low bearing strength and slopes, the soils of these two groups have moderate but not serious limitations for such developments as access roads, parking areas and boat ramps.

Soil group Nos. 5 and 6 consist of deep well-drained and excessively drained soils on uplands adjacent to the Buffalo River. Slopes in soil group No. 4 range from 5 to 20 percent being mostly in the 12 to 20 percent range. In soil group No. 6, slopes are greater than 20 percent and may be as much as 50 percent. Rock outcrops are common. Soil group No. 6 is well distributed throughout the length of the river corridor to occupy about 22 percent of the total land area. Soil group No. 5 is found in lesser amounts (3 percent of the total corridor) and is mostly confined to the upper watershed in Lewis and Wayne Counties.

The steepness of slopes in both soil groups generally presents moderate to severe limitations for such uses as residential or recreational development. Such developments should not be permitted whereas slopes exceed 15 percent. A large portion of these soils has severe limitations for use of cropland, pastureland or for forest production, because of low available moisture content.

Flora

There are only a few areas along the Buffalo River which have escaped the influence of man. Except for steeply bluffed areas or inaccessible steep hillsides, the river valley has been changed through farming, timber cutting and cattle grazing. In many areas only a narrow band of trees and undergrowth separate the river from farmland.

A vegetative analysis conducted by the Tennessee Department of Conservation during January 1971 lists the tree species and understory along the Buffalo River at these and other points; this list is included in Appendix C. Principal vegetative types are listed in Figures 9, 10, and 11.

Tree species found most often along the river bottoms are a mixture of hardwoods such as gum, maple, birch, sycamore, willow, pin oak, beech and yellow-poplar. Slopes rising from the bottoms support upland hardwoods with the oak-hickory association being the most common.

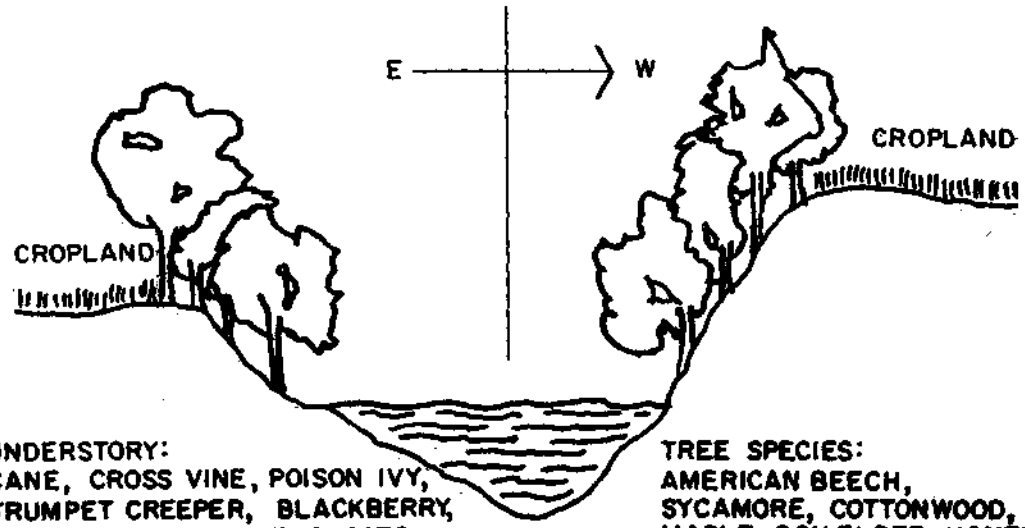

FIG. 9 VEGETATIVE PROFILE - RIVER MILE 8

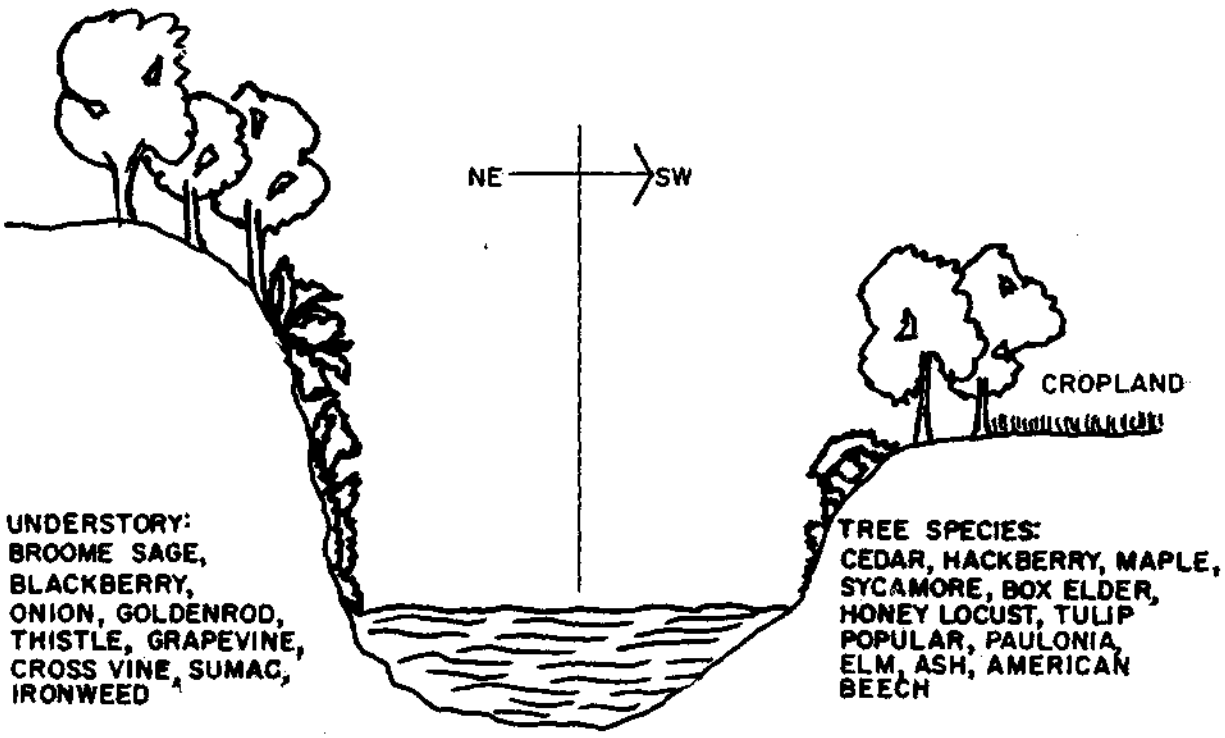

FIG. 10 VEGETATIVE PROFILE - RIVER MILE 58.2

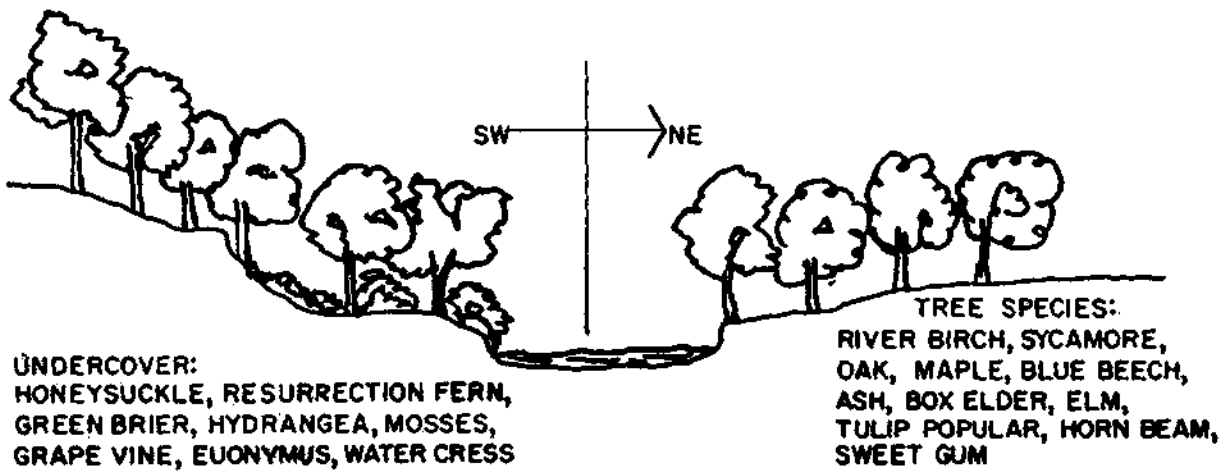

FIG. 11 VEGETATIVE PROFILE - RIVER MILE 111.6

During the spring and fall months the river is especially attractive with its vernal array of flowers and flowering shrubs and autumnal change in colors.

Fauna - Endangered and Threatened

Several species of animals which may be found in the Buffalo River basin during all or part of the year are now included in the Department of the Interior Official Lists of Endangered and Threatened Flora and Fauna, as endangered, i.e., southern bald eagle, American peregrine falcon, and Indiana bat. The golden eagle is considered a candidate for the list of threatened species.

An undescribed darter of the genus Etheostoma is known to occur in the lower portion of the Buffalo River and the Duck River. This described species appears to be restricted to the main channel of these streams. It is a candidate for the Threatened Species List. Also, the slackwater darter, Etheostoma boschungi, a species under status review for addition to the Department of the Interior's Endangered Species List, has been found in the Buffalo River tributaries.

Io geniculata, the geniculate river snail, is now extinct from the Cumberland River, the Caney Fork of the Cumberland River, and the Stones River, and will soon be extinct throughout all or most of the Duck River. In the Buffalo River, this species was found recently (1972-73) at seven sites. The species is a candidate for the Official List of Threatened Species which are likely to become Endangered.

In addition to the endangered species mentioned above, there are several species of endangered mussels which possibly are found in the Buffalo and Duck Rivers. These species include the birdwing pearly mussel, Conradilla caelata; yellow-blossom pearly mussel, Epioblasma (=Dysnomia) florentina florentina; turgid-blossom pearly mussel, Epioblasma (=Dysnomia) turgidula; and the orange-footed pimpleback, Plethobasis cooperianus.

Historically the freshwater mussel declines before the fish and snails do. This is ominous because, although the fish and snails are still doing well in the Buffalo River, the number of mussels and species of mussels in the Buffalo River has declined in the last 50 years to about one-third of its former abundance.

Fauna - Aquatic

The Buffalo River affords ideal habitat for both aquatic and terrestrial wildlife. The Buffalo River valley which is interspersed with woods and farmland offers optimum food and cover. The relative absence of industrial and agricultural development along the river influences the presence of varied wildlife habitation. The temperate climate of the area is conducive to year-round wildlife residence and is attractive to migratory birds each spring and fall. The abundant wildlife of the Buffalo River basin (see Appendix C for detailed listing) greatly supplements the recreation experience for those who float this stream.

The Buffalo River is popular for its smallmouth and rock bass fishing during the spring, summer, and fall months. Other important sport fishing species include the longear sunfish, channel catfish, and largemouth bass. White bass and crappie are also caught in the lower river sections but are not important in the catch as a whole. A creel census covering the entire Buffalo River from 1956 through 1963 by the Tennessee Wildlife Resources Agency revealed the following percentage of catch by numbers of fish caught.

Longear sunfish	- 32%	Smallmouth bass	- 6%
Channel catfish	- 19%	Largemouth bass	- 4%
Bluegill sunfish	- 11%	Suckers	- 4%
Rock bass	- 8%	Other Species (16)	- 16%

This census indicates that good fishing is available over the entire length of the Buffalo River.

During the same period, the tributary streams of the Buffalo were rated in terms of fisherman success, ranging from fair to good (Table 15).

Because of sustained volumes of spring water at low temperatures (55°-60° F.) trout fishing is also enjoyed to a limited extent in Hurricane and Sinking Creeks, tributaries of the Buffalo River. The Buffalo River itself does not remain cold enough to maintain trout.

Fishing pressure on the Buffalo River at the present time is derived principally from the local population in the five counties of the drainage basin. It is estimated that the river supported 12,000 man-days of fishing during the 1973 season; 40 percent of this pressure was exerted by the casual float fishermen. Limited access development on the stream and lack of publicity and facilities to draw and accommodate greater usage beyond the local and State level appear to be important factors in failure to realize the full potential afforded by this resource.

TABLE 15

TRIBUTARY STREAMS OF THE BUFFALO RIVER
AND FISHERMAN SUCCESS

Tributary	County Location	Length Miles	Avg. Width	Fishing Quality	Primary Fish Caught
Black Br.	SW Humphreys	4.4	20'	Fair	sunfish, suckers
Taryard Br.	SW Humphreys	2.0	30'	Good	smallmouth bass, sunfish, warmouth
Cane Cr.	NE Perry SW Hickman NW Lewis	13.8	40'	Fair to Good	black bass, sunfish, suckers, smallmouth bass
Sinking Cr.	SE Perry	8.6	15'	Fair	rainbow trout
Hurricane Cr.	SE Perry	7.7	8'	Good	rainbow trout, smallmouth bass, suckers
Forty-Eight Cr.	NE Wayne	15.5	30'	Fair	smallmouth bass, rock bass, bluegill, suckers
Green River	NC Wayne	18.2	20'	Fair	smallmouth bass, rock bass, suckers
Little Buffalo River	S Lewis NW Lawrence	15.7	55'	Fair to Good	smallmouth bass, rock bass, longer sunfish
Brush Cr.	SW Lewis NW Lawrence	8.4	30'	Fair	smallmouth bass, rock bass, longer sunfish
Chief Cr.	SC Lewis NW Lawrence	13.3	50'	Fair	smallmouth bass, rock bass, longer sunfish
Grinders Cr.	C Lewis	11.0	45'	Fair	smallmouth bass, rock bass
Pond Cr.	SC Lewis	5.5	30'	Fair	sunfish, smallmouth bass
Peter Cave Cr.	NW Lawrence	2.4	12'	Fair	smallmouth bass, rock bass, bluegill, suckers
TOTAL MILES		126.5			

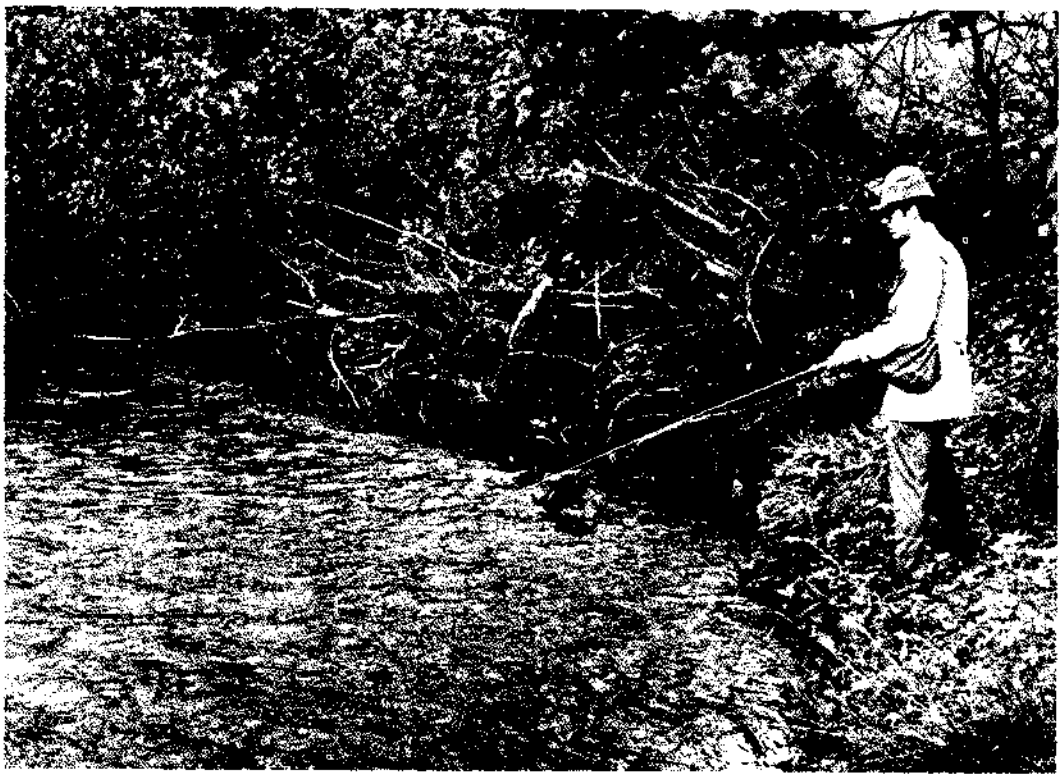

Photo by U.S. Forest Service
Trout fishing is enjoyed on tributaries of the Buffalo River.

Fauna - Wildlife

Fall is the season for hunting activities.

Bottomland hardwood, upland hardwood associations, and pasture habitat provide good hunting opportunities along the Buffalo River. The most important species of wildlife include whitetail deer, squirrel, rabbit, quail, raccoon, opossum, and fox. There is evidence that the area is also inhabitated by bobcat and beaver.

The lower reaches of the Buffalo flow through Cherry Bottoms, a flat bottomland area comprising approximately 10,000 acres largely developed for agriculture. During years of heavy rainfall, in late fall and winter, the flooded bottomland is an attractive feeding area for waterfowl and offers considerable hunting opportunity. Squirrel hunting and "jump-shooting" ducks

Photo by U.S. Forest Service
Squirrel hunting and "jump-shooting" ducks are popular sports on the Buffalo River during the fall months.

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are popular sports on the river during the fall and winter months and these activities may occur in conjunction with a fishing trip.

Small game hunting extends from September through February, deer hunting opens in October (archery only) and in late November (gun-archery), and waterfowl in November (geese only) through December (ducks and geese). In total, 6 months of hunting opportunity is available now. The Tennessee Wildlife Resources Agency plans to include turkey stocking in suitable habitat within the five counties, which, if successful, will provide spring turkey hunting.

Waterfowl hunting, which has averaged between 1,500 and 3,000 man-days annually, is generally confined to the lower portion of the Buffalo, being especially concentrated near the intersection of the Buffalo River with Duck River. This concentration is noticeable during periods of abundant rainfall when low areas are covered with shallow surface runoff water.

Waterfowl populations in the immediate and nearby area reflect these habitat conditions. The Tennessee National Waterfowl Refuge offers waterfowl management programs which provide conditions conducive to holding migratory flocks of waterfowl in the nearby area.

Recreational development potentials of the area, as determined by the Soil Conservation Service and several other resource agencies, indicate habitat suitable for waterfowl development in the upper regions of the Buffalo River drainage area is limited because of the lack of surface water retention. This restriction for development extends down river through Lawrence and Lewis Counties. Wayne and Perry Counties offer medium potential: Humphreys County is rated high for waterfowl development potential.

During past years the Tennessee Wildlife Resources Agency transplanted deer in the watershed. Recent reports indicate an increasing herd on the available habitat. With continued cooperation from people residing in the basin, proper protection, and improved land management practices, the deer population should increase to an optimum level in future years.

In 1973, deer hunting provided 700 to 800 man-days of recreational opportunity within ½ mile of the river. Most of this hunting activity took place in Lewis and Humphreys Counties (132.6 and 270.6 man-days respectively) with lesser amounts occurring in Lawrence (55.9 man-days), Wayne (50.4 man-days) and Perry (51.2 man-days).

Small game hunting is popular along the Buffalo River. Hunting for doves, quail, rabbit, squirrel and raccoon provide many hours of recreation along the river corridor. Although specific information, including man-days of use, is not available, it is anticipated that clearing and intensive crop production will result in a continued trend towards less small game habitat and as a consequence fewer opportunities for small game hunting.

For small game and big game, including forest game, recreational development potentials are presently rated high for the five counties within the study area. This rating reflects the habitat conditions in the area, including the zone within ½ mile of either side of the Buffalo River. Restricting comments to this corridor, approximately 45 percent of the land has been evaluated as small game habitat, 37 percent deer habitat, and 31

percent as forest game habitat (some overlap of these areas account for these figures adding up to 113 percent). A vegetative cover analysis indicates that 40 percent of the river corridor is woodland, 25 percent cropland, 33 percent is pasture and 2 percent is noted as "other." These varied land uses offer interspersion of cover types resulting in adequate terrestrial habitat.

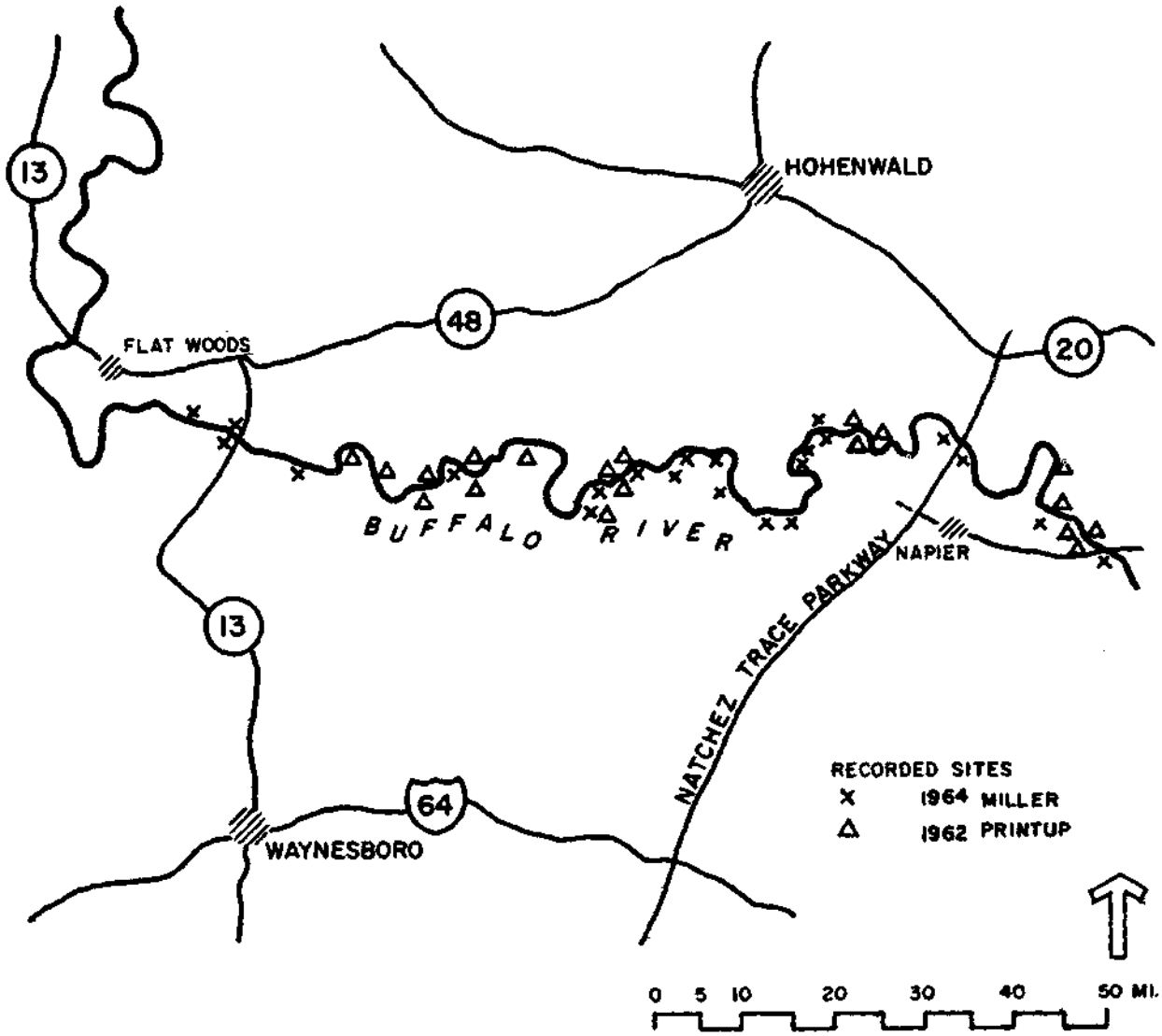
Using the above percentages, approximately 28,000 acres along the river is classified as small game habitat. Of this acreage, over 19,000 is located in Perry and Humphreys Counties, a condition reflecting a mixed cropping and vegetation cover program. Forest game habitat is highest in Wayne County, totaling almost 20,000 acres. As with small game, changing land management programs which include the removal of trees could decrease the value of the river corridor as a recreational outlet, particularly for forest game hunting.

Trapping for furbearers is practiced throughout the Buffalo River drainage area. However, a determination of how many individuals are actively trapping is difficult since the numbers of trappers reflect current fur prices. As fur prices increase, more individuals participate in the activity and conversely, as fur prices drop, trapping is usually terminated.

Archeology and History

Archeology--Outside of the main Tennessee River valley, little systematic professional archeology research has been done. The prehistoric cultural resources of tributary streams such as the Duck and Buffalo Rivers have yet to be thoroughly examined and documented by competent archeologists. The Buffalo River in particular has had little professional archeological exploration. However, two preliminary surveys have been carried out in the upper one-third of the river between the headwaters and river mile 70, approximately 2 miles below State Highway 13, near Flatwoods.

The first survey was conducted by boat by a party under the direction of Dan Printup over a 4-day period in April 1962. The results of this survey were published in 1963, "Memphis State University Buffalo River Archeological Survey Initial Report," Tennessee Archeologist, Vol. XIX, No. 2, pages 29-44, Knoxville, Tennessee. Due to time limitations ". . . a number of likely looking spots . . ." were passed up. The second



Source: 1/ Printup, Dan
1963 "Memphis State University Buffalo Archeological Survey Initial Report." Tennessee, Archeologist, Vol. XIX, No. 2, pp. 29-42, Knoxville, Tennessee.

2/ Miller, Chip and Art
1965 "A Buffalo River Survey." Tennessee, Archeologist, Vol. XXI, No. 1, pp. 1-13, Knoxville, Tennessee.

BUFFALO RIVER, TENNESSEE

FIG. 12

ARCHAEOLOGICAL SURVEY

project was carried out by Chip and Art Miller during the later part of 1964 and published in 1965, "A Buffalo River Survey," Tennessee Archeologist, Vol. XXI, No. 1, pages 1-13, Knoxville, Tennessee. The Millers limited themselves to cleared land which could be reached by automobile; thus, they concentrated on the south shore of the river. In neither survey is there any indication that attempts were made to survey the springs and streams which augment the Buffalo River.

Printup's article is an "initial report" with incomplete analysis of the artifacts and summary types of statements. Individual sites are not described either in terms of size or artifactual assemblages. The Miller's work states that they found 20 additional sites and that they were like those which Printup had found earlier. In both reports, location maps are far from accurate, and at best the site locations are only approximate (Figure 12).

On the basis of work done thus far, it can be said that the Buffalo River is rich in cultural resources. A total of 41 aboriginal sites have been identified; all are on the terraces or "second bottoms" out of reach of the normal flooding by the river. In fact, every one of these terraces checked produced some material. If any sites exist in the lowlands, they could not be identified on the surface.

The major occupation of the Buffalo River area took place during the Archaic Period from approximately 8000 B.C. to 1000 B.C. It is interesting, however, that Printup found mostly Early Archaic materials while the Millers found Middle and Late Archaic sites, seven of which also had a later Woodland component or occupation.

The archeological sites on the Buffalo River differ in a number of respects from the better known sites on larger rivers like the Tennessee River. In the Buffalo River study area, the evidence of prehistoric habitation consists exclusively of lithic materials--chips and tools. On the larger rivers, the sites usually consist of shell, animal bone, lithic materials, fire pits, and human burials; sites tend to be larger in terms of area covered and are much deeper vertically. Along the Buffalo River the Millers report a maximum depth of 12 inches at one site. Printup indicated that most of the sites found by his party were little more than surface finds. The Buffalo habitation areas appear to be more on the order of short-term campsites rather than more permanent villages on the Tennessee River.

This idea is further supported by the comment of Printup ". . . that there are considerable differences in the materials from some sites as compared with those from others."

The occurence of camps along the upper Buffalo River is not unique. In a survey recently conducted on the Duck River prior to the construction of the Columbia reservoir project, Archaic sites located there are similar to those reported in the Buffalo area: they are on the second terraces and the only materials found were flint chips and lithic artifacts. There was more extensive use of this river during later times. At the Barkley Reservoir on the Cumberland River, some of the Archaic sites contain shell in addition to the lithic materials, and again, the area was occupied after the end of the Archaic Period.

Occupation of the Buffalo River other than during Archaic times is only hinted at. Parts of two Cumberland type Paleo-Indian points have been found and could date from the very end of the Pleistocene to as late as the beginning of the Archaic Period.

Use of the river during Woodland times (from 1000 B.C. to about 1000 A.D.) has not been well established. Only three potsherds were recovered, whereas pottery is generally considered a hallmark of Woodland. In addition, Lake Archaic and Early Woodland lithic artifacts are frequently similar.

There is also indirect evidence that on the lower portions of the Buffalo, archeological remains may be somewhat different. Along the Duck River there was a Late Mississippian occupation beginning around 1200 A.D. as evidenced by the Duck River Cache found very close to the junction of the Duck and Buffalo Rivers in 1894. One of the characteristics of the Duck River Phase is that burials were frequently made in stone box graves and these were grouped into cemeteries. A map developed by W. E. Myers in 1923 for Tennessee shows a number of cemeteries along the lower two-thirds of the Buffalo though it is not known if these are aboriginal or historic. This map also shows two mounds (one located north of Lobelville and the other at the junction of the Buffalo and Rockhouse Creek) which indicate occupation of the river in either Woodland or Mississippian times.

In general, archeological studies undertaken along the Buffalo have not yet identified the relationships which may exist between the Paleo-Indian and Early Archaic occupations of the

Photo by U.S. Forest Service
The Napier iron-ore pit near Napier on the Natchez Trace Parkway

river. In addition, the relationship of the Buffalo campsites to the larger and more permanent Archaic sites of the area have not been investigated. The location and identification of Woodland or Mississippian sites along the lower two-thirds of the river have not been checked in light of the indications on Myers' map. Another gap involves the reason for so little use of the Buffalo River after Archaic times if further surveys fail to disclose any such occupation. Additional investigation would help in understanding the Indians' land-use patterns and therefore permit better interpretation of their culture.

History--The region along the Tennessee River, including the study area, was inhabited by the Cherokee, Shawnee, and the Chickasaw Indians during the period 500 A.D. to 1600 A.D. and evidence exists in the form of many relics of the presence of the earlier "Mound Builders." With the arrival of settlers from the

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older colonies to the "Territory South of the River Ohio," the Cherokees were forced to leave their homes and travel westward. By 1805 the Cherokees had moved to the western slope of the Tennessee River and settlement then began on the Middle Tennessee side of the Kentucky reservoir region. However, in 1818, the title of the Cherokees to the Western District, now called West Tennessee, was terminated and 13 new counties were established in this area.

After the Revolutionary War, the first settlers arriving in this area were mainly from Scotland and the older counties of Middle Tennessee and North and South Carolina. This movement was prompted in part by the land grants, claims, and warrants issued by North Carolina. This "Westward-Ho!" movement continued until the late 19th Century.

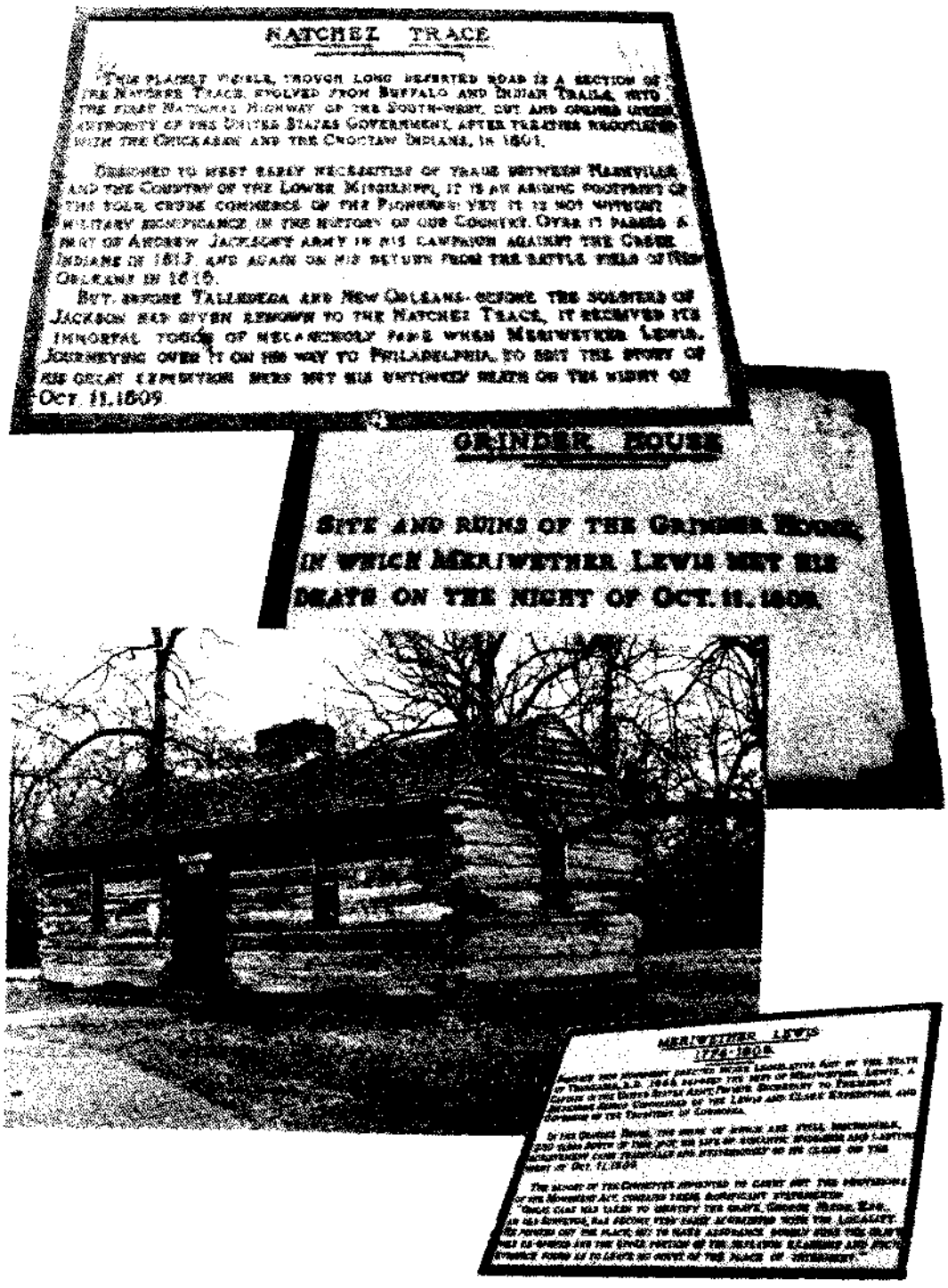
When pioneers first arrived in the region, they found unlimited game, timber with which to build their new homes, rich supplies of minerals, and virgin lands. As late as 1812, the settlers had to have patrols on the Tennessee River to prevent Indian attacks on the Middle Tennessee area. Since there were no mills or stores in the area, many pioneers traveled to New Orleans to do their trading, a trip which required 4 to 6 months.

The area at one time abounded in iron furnaces and forges, some operating as late as 1862. Eventually the better ores were depleted. The remaining ore proved to be unprofitable to mine and process at the time.

A furnace erected at the point where the Natchez Trace crossed the Buffalo River once utilized ores from Napier. The importance of nearly Napier is derived from the fact that it was one of the earliest industrial communities in Tennessee. A huge pit from which the ore was mined is located approximately ½ mile north of that small community.

Prior to the Civil War, when the question of "separation or no separation" was first voted on, the counties within the Buffalo River study area were in sympathy with the Union. But at the beginning of hostilities, only Perry County supplied troops to the Union Army. The remaining men from the area went with the Confederacy.

The major Civil War battle fought in this region was the battle of Shiloh. This battle was one of the bloodiest in the War



Photos by Bureau of Outdoor Recreation

Between the States and was significant in that the Confederate army's hold on Middle and West Tennessee was broken. Today Shiloh, located about 45 miles southwest of Waynesboro, has been established as a National Military Park to stand as a tribute and memorial to those who died, many of whom were from the region.

Many famous people of that time and of later times took part in the Civil War battles that took place in this area. Among them were U. S. Grant, who later became overall commander of Union armies and eventually President of the United States; Lew Wallace, who lost face in the Battle of Shiloh but went on to write "Ben Hur;" Nathan Bedford Forrest, who proved to be one of the greatest calvary tacticians of all times and whose field movements were studied for years; Confederate General Albert Sidney Johnston, who was killed at Shiloh.

During the last 50 years, the most notable event which brought this area into prominence was the closing of Kentucky Dam and the flooding of Kentucky Lake. This occasioned an emphasis on industry, recreation, and total resource development which is unparalleled in the region's history.

One of the most notable historic landmarks within the study area is the Natchez Trace Parkway, a modern recreational roadway that preserves a good part of the history associated with the original frontier road. When completed, the 450-mile parkway will roughly follow the route of the original Natchez Trace through the States of Mississippi, Alabama, and Tennessee, connecting the cities of Natchez, Jackson, Tupelo, and Nashville. The original wilderness road, evolving from a series of Indian trails, was improved first by the Army in 1801-1803 and again by the Postmaster General in 1806, to insure communication between Natchez, in the Mississippi Territory, and Nashville. For 2 decades the Trace played a vital part in connecting the eastern settlements and the southwestern outposts of the United States.

A museum and the grave site of Meriwether Lewis, of Lewis and Clark fame and one-time governor of Louisiana, is located in the Meriwether Lewis Park on the Trace, 7 miles east of Hohenwald and 35 miles west of Columbia on Tennessee Highway 20. The museum houses exhibits describing Meriwether Lewis and his life.

At river mile 104 on the Buffalo River south of Meriwether Lewis Park, the National Park Service has developed an exhibit just off

Photo by Bureau of Outdoor Recreation
Several low water bridges provide access to the Buffalo River. Rivercraft must be portaged around these obstructions.

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the Trace which presents the story of the earlier iron industry. Here also early Trace travelers "forded" the river. This site is called "Metal Ford" and is a favored "put-in" point by those floating the upper reaches of the Buffalo River by boat or canoe.

Access

Access to the lower study area from either Nashville or Memphis on Interstate 40 is considered excellent. Additional east-west access is provided by U.S. Highway 64 to the upper watershed area. It is a main connecting link between Chattanooga and Memphis, passing through Lawrenceburg, and Waynesboro in Lawrence and Wayne Counties. State Highways 50, 100, 20 and 48 which cross the Buffalo River at Beardstown, Linden, and Flat Woods respectively, provide secondary east-west access to middle sections of the watershed.

TABLE 16
PROPOSED HIGHWAY IMPROVEMENTS[1/]
BUFFALO RIVER STUDY

County	Route	Segment	Involvement with the Buffalo	Status
Lewis	FAS-6263 Spur	From FAS-6196 to FAS-6263. 1-3 miles long.	One new crossing downstream from existing low water bridge	Location study stage presently deferred pending outcome of Buffalo River study (agencies already contacted)
Wayne & Perry	State Route 13	From FAS-6226 in Wayne County to North of Flat Woods in Perry County	Two deficient bridges are located in the existing route	Need evaluation and initial project definition (prior to agency contact)
Perry	FAS-6389	From State Route 13 to 0.5 miles long.	One new crossing approximately ½ mile downstream from the existing bridge	Location approved by Rural Roads Engineer and plans preparation underway (agencies already contacted)

1/ Source: Tennessee Department of Transportation, February 13, 1974

Photo: U.S. Forest Service

Iron Bridge and River Access at River Mile 41.5

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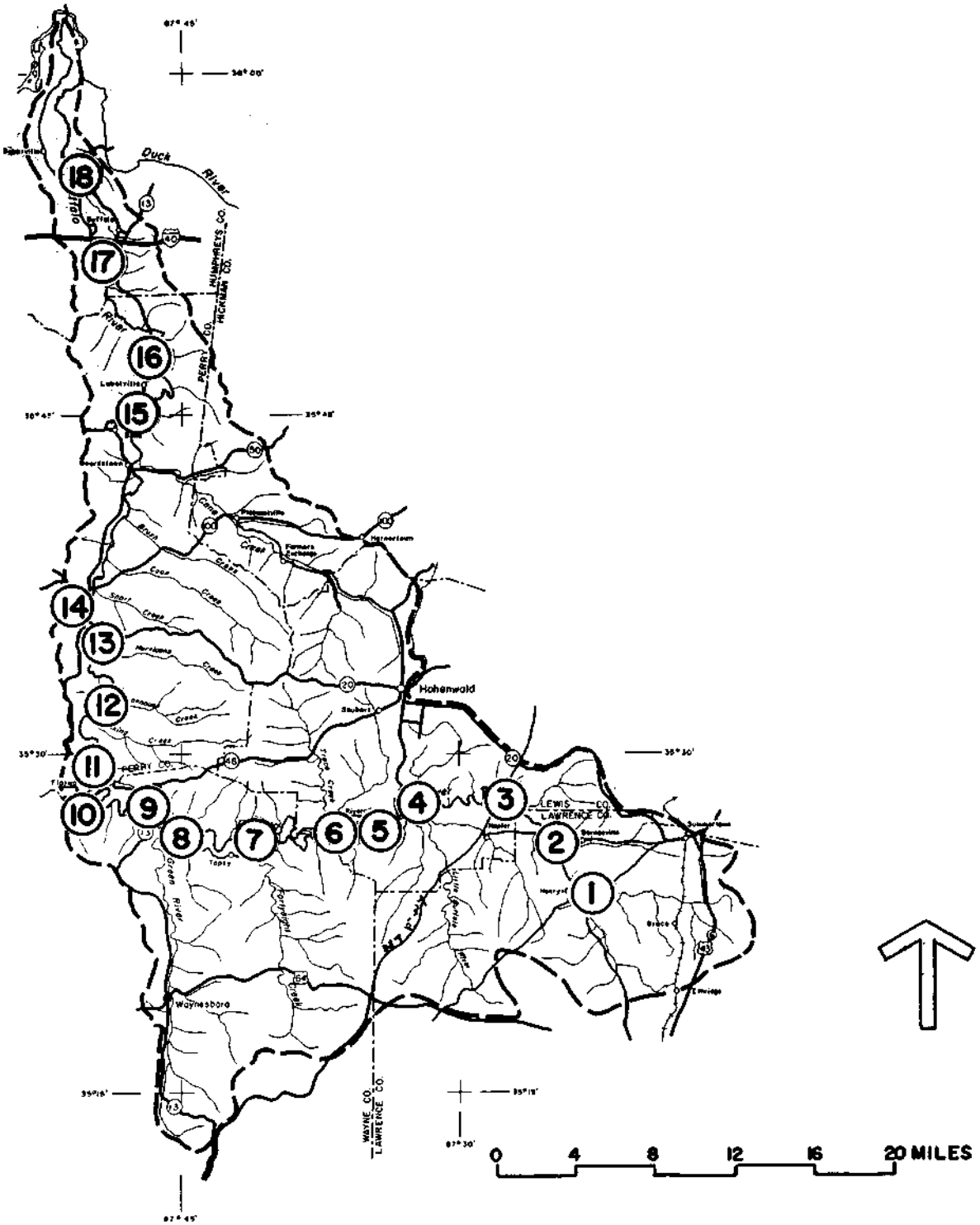


MAP 9

BUFFALO RIVER, TENNESSEE

USDI-BOR
USDA -SCS **JULY 1974**

EXISTING ACCESS SITES

North-south access is somewhat restrictive being limited to State Highway 13 which parallels the Buffalo between Interstate 40 and Flat Woods. It also serves as a connecting link between Waynesboro on U.S. Highway 64 and the tri-city area of Florence, Tuscumbia and Sheffield, Alabama. Going north, State Highway 13 first crosses the Buffalo River at Bell Bridge (river mile 73.1) and again near Lobelville (river mile 19.1).

The Natchez Trace Parkway provides access to the Buffalo River in Lewis County at Metal Ford (river mile 104).

At present, the number of public access points to the Buffalo River is considered adequate. Map 9 shows 18 unimproved access points currently in use by the public. Fifteen of these areas are located at bridge crossings and are on Tennessee Department of Transportation right-of-way. Access elsewhere, with the exception of Metal Ford at Natchez Trace, must be gained by owner permission.

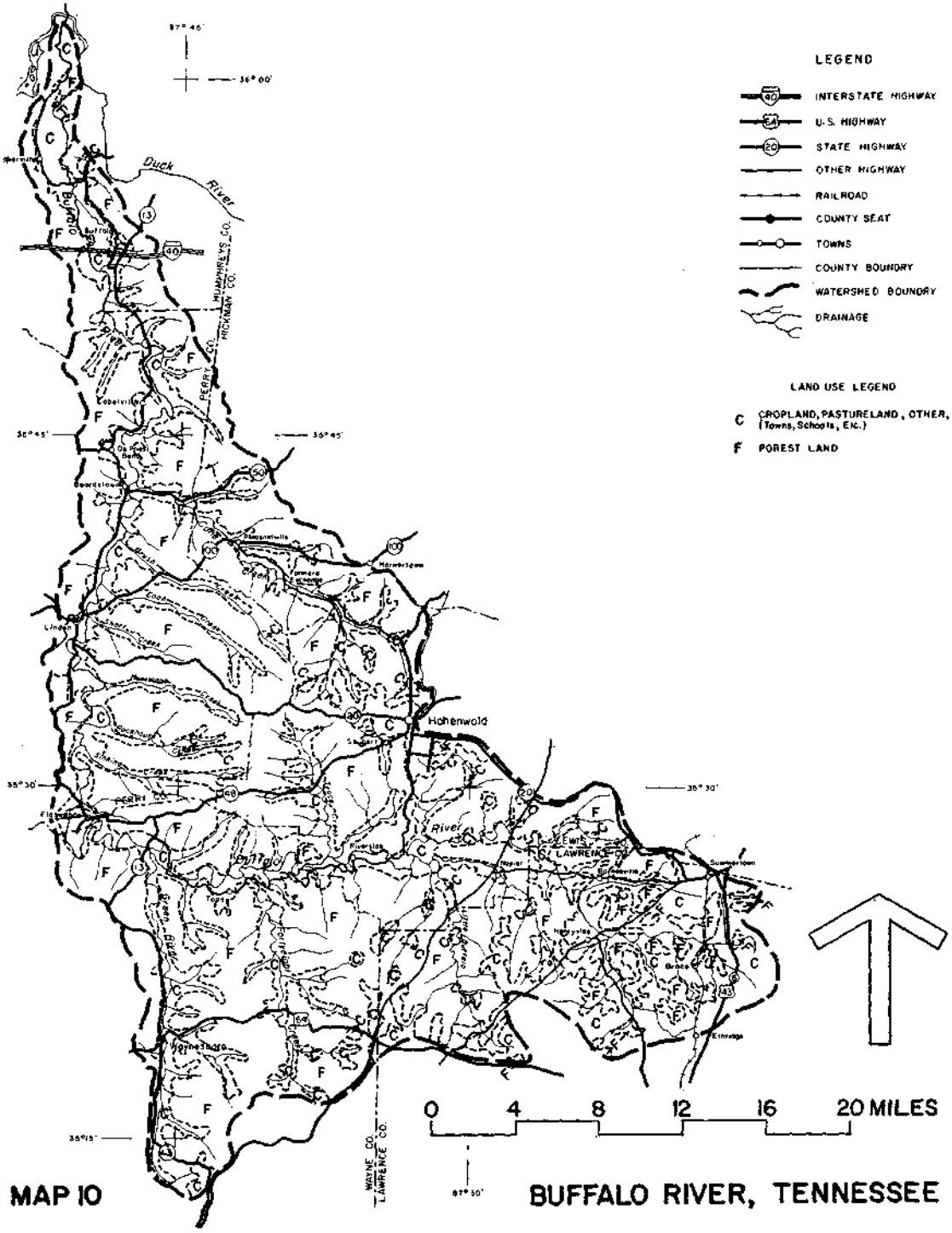
Currently the Tennessee Department of Transportation has plans to improve three road approaches and crossings to the Buffalo River. These are listed in Table 16.

The proposed road and bridge improvements would eliminate three of the remaining seven steel structured bridges which cross the Buffalo River. These old-style bridges have considerable appeal and serve to enhance the rural and pastoral setting of the river. Any major structural change or the removal of these bridges from the scene would lower the overall aesthetics of the river and any new structures could be an intrusion.

Land Use

Land-use patterns in the Buffalo River valley drainage area are typically rural, dominated by an agricultural economy in the valley bottoms, and conversely, upland hardwoods on the valley slopes and ridges. Except for urban development around the smaller communities of Linden and Lobelville and several isolated private developments, the river is largely primitive or in an overall natural setting (Map 10).

The 1969 Census of Agriculture, Department of Commerce, shows the number of farms for counties within the immediate area of the Buffalo River to have decreased slightly since 1964.



MAP 10 **BUFFALO RIVER, TENNESSEE**

U.S.D.I - B.O.R.
U.S.D.A. - SCS JULY 1974

LAND USE MAP

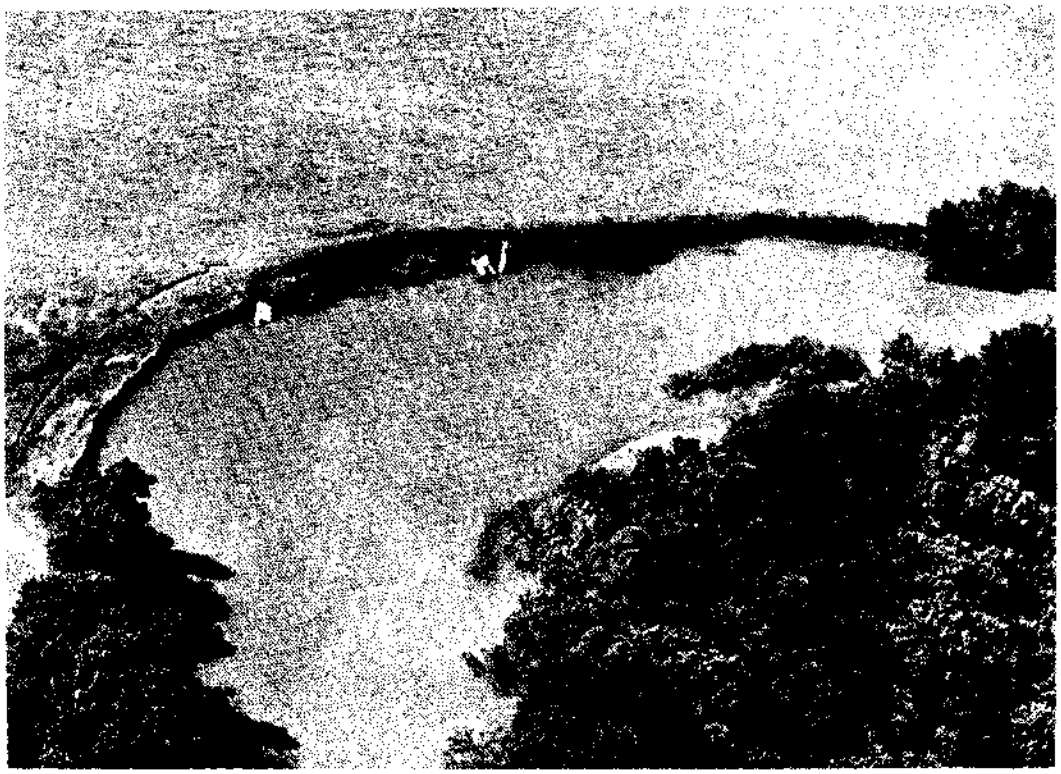


Photo by U.S. Forest Service
Land uses most common in the valley bottoms are farm-oriented. Hardwood forests remain on valley slopes and ridges.

During the same period, the size of individual farms has increased. Total land area in farms for the various counties in 1969 ranged from 29.7 percent in Lewis County to 37.1 percent for Wayne, 41.3 for Perry, 41.8 for Humphreys, and 59.5 for Lawrence County.

The trend within the five-county area has been to increase the use of cropland for pasture or grazing and to decrease the use of all other cropland and woodland including woodland pasture (Table 17). Based on market conditions, this trend could, however, be reversed.

In general, cropping and grazing have been intensified tending to increase the incidence of water pollution and streambank erosion.

No cattle feed lot operations are located within the Buffalo River basin. There appears to be only a limited potential for

TABLE 17
LAND IN FARMS ACCORDING TO USE - COUNTYWIDE
BUFFALO RIVER STUDY

Cropland used only for:	Lawrence 1969	Lawrence 1964	Lewis 1969	Lewis 1964	Hickman 1969	Hickman 1964	Wayne 1969	Wayne 1964	Perry 1969	Perry 1964	Humphreys 1969	Humphreys 1964
Pasture or grazing												
. . . farms	1,351	1,128	197	125	661	616	634	582	277	255	508	327
acres	54,195	32,750	11,500	3,587	28,010	28,811	27,271	19,528	13,210	9,023	24,412	15,791
All other cropland												
. . . farms	1,033		88		303		364		153		211	
acres	29,632	38,323	2,779	3,873	12,247	15,239	14,983	17,281	6,692	6,536	9,229	10,072
Woodland including woodland pasture												
. . . farms	1,476	1,652	205	301	687	829	675	861	289	398	542	615
acres	74,348	80,500	29,351	34,237	77,843	92,426	98,131	122,082	66,976	85,828	69,700	86,285
All other land												
. . . farms	1,545		189		657		583		257		492	
acres	36,867	37,849	5,788	8,955	23,484	19,862	21,295	14,846	12,726	11,151	23,523	20,113
Irrigated land												
. . . farms	13	8	1	2	13	2	6				3	
acres	149	45	1	3	37	2	144				36	

Existing major land-use categories for the length of the Buffalo River for Lewis, Wayne, and Humphreys Counties as represented by an area 1/2-mile-wide (1/4 mile on each side of the river) is identified below.

		Acres	Percent
Cropland	-	8,500	25
Pasture	-	11,325	33
Forest	-	13,445	40
Other	-	620	2

TABLE 18
ESTIMATED ACRES OF WOODLAND AND OPEN LAND
ALONG BUFFALO RIVER (1/4 MILE ON EACH SIDE OF RIVER)
BUFFALO RIVER STUDY

Lawrence County

Miles	Total Miles	Total Acres	Woodland Acres	Open Land Acres
117 (Henryville) to 112.0	5	1,600	800	800
112.0 to 108.8	3.2	1,024	486	538
	8.2	2,624	1,286	1,338
			49%	51%

Lewis County

(County line)				
108.8 to 98.2	10.6	3,392	2,283	1,109
98.2 to 90.7	7.5	2,400	815	1,585
90.7 to 86.9	3.7	1,183	343	840
	21.8	6,975	3,441	3,534
			51%	49%

Wayne County

(County line)				
86.9 to 82.4	4.6	1,472	607	865
82.4 to 79.4	3.0	960	316	644
79.4 to 75.1	4.3	1,375	582	793
75.1 to 73.9	1.2	385	43	342
73.9 to 72.1	1.8	576	103	473
72.1 to 66.0	6.1	1,952	772	1,180
66.0 to 62.9	3.2	1,024	442	582
	24.2	7,744	2,865	4,879
			37%	63%

TABLE 18 (Cont'd)
ESTIMATED ACRES OF WOODLAND AND OPEN LAND
ALONG BUFFALO RIVER (1/4 MILE ON EACH SIDE OF RIVER)
BUFFALO RIVER STUDY

Perry County

(In Perry on north side of river)				
67.0 to 66.0	(1.0)	160	90	70
62.9 to 59.1	3.7	1,184	810	374
59.1 to 52.2	6.9	2,210	1,305	905
52.2 to 45.5	6.7	2,145	1,340	805
45.5 to 41.4	4.1	1,310	385	925
41.4 to 31.5	9.9	3,170	750	2,420
31.5 to 22.7	8.8	2,815	815	2,000
22.7 to 15.4	7.2	2,304	624	1,680
	47.3	15,298	6,119	9,179
			40%	60%

Humphreys County

(County line)				
15.5 to 14.1	1.4	444	179	265
14.1 to 12.7	1.4	450	45	405
12.7 to 11.5	1.2	385	45	340
11.5 to 8.1	3.4	1,090	390	700
8.1 to 5.8	2.3	735	300	435
5.8 to 3.5	2.3	735	305	430
3.5 to 0	3.5	1,120	225	895
	15.5	4,959	1,489	3,470
			30%	70%
Total of all 5 counties	117.0	37,600	15,200	22,400
			40.0%	60%

1/Any narrow fringe of trees approximately 175 feet or less which bordered open land was counted as open land rather than woodland.

2/Open land includes both pasture and cropland.

cattle feed lot operations in Tennessee. Past experience of a limited number of feed lot operators in the State proved that the warmer climate along with other unidentified factors, resulted in an average daily gain of cattle being lower than in other places where feed lots are common. This difference in daily gains has presumably made feed lots an unprofitable enterprise in the State.

Approximately 2 percent of the corridor is included in "other" land use. This use includes roads, fence rows, ditches, and the narrow fringe of trees and shrubs found along many miles of the riverbank. This fringe of trees varies in width from a single row to 75 or 100 feet wide and provides shade which helps maintain cool water temperatures for the smallmouth bass and rock bass common to the river, a screen to the river, and good song bird and wildlife habitats. Retention of the fringe also tends to reduce the destruction of stabilized streambanks through erosion.

An estimate of open and woodland acres by county and river mile for a river corridor of ½ mile (¼ mile on each side of the river) is shown in Table 18. It is estimated that within the river corridor, from river mile 117 at Henryville, to river mile 0 at the confluence with the Duck River, there are 15,200 (40 percent) acres of woodland and 22,400 (60 percent) acres of open land in this corridor.

Land use along the river remains quite stable with very little additional land being cleared during the last 30 or 40 years. About 17 percent of the woodland is on bottomland soils. Most of the remaining forested areas in the corridor are generally too steep for crop production.

Cropland has been confined principally to the moderate to highly productive soils found on the bottomland, low terraces and gentle upland slopes. About half of this land is being used as rotation cropland with approximately 75 percent presently in grass. Some fields are intensively row cropped, especially on the bottom soils in the lower reaches of the Buffalo River.

In the upper half to two-thirds of the river, a field may be cultivated several years then seeded to a perennial grass and clover and used from 2 to 10 more years for hay and/or grazing. The intensity of cropping for corn, small grain and soybeans

Photo by U.S. Forest Service
A sawmill operation on State Highway 13 in Perry County

(in recent years) varies with prices, costs of machinery, available labor, and age of the landowner. During the past 10 to 15 years, the trend generally has been slightly towards more pasture and less row crops, influenced by small farms and more opportunities for off-farm work. It is estimated that 33 percent of the corridor is being used primarily for pastureland.

Within the five-county area, forested land covers about 70 percent of the land or 1,159,000 acres out of a total of 1,664,000 acres. Lawrence County is only 45 percent forested while Lewis, Wayne, Perry, and Humphreys Counties are 70 to 80 percent forested.

Tree species vary from second growth bottomland hardwoods comprised of river birch, maple, gum, sycamore, willow, pin oak, yellow-poplar, cottonwood and other bottomland trees to oak-hickory, pine-upland hardwood and pure pine in the headwaters.

The bottomland is fertile and consequently timber is healthy and vigorous. The ridge tops and slopes have poor quality soils and

are usually associated with scrubby oak species, locally called blackjack oaks. Several areas, some quite large, have been planted in pine. A large amount of Virginia pine is found on steep slopes and bluff areas above the river. Some reforestation work has taken place in all of the counties, but except for Lewis and Wayne Counties, there are no commercial stands of pine. Small amounts of cedar are found throughout the area.

The present estimated commercial saw timber volume confirms the present species classiciation with 792 million board feet in hardwoods and only 24 million board feet in softwoods. The pulpwood size trees follow the same pattern with an estimated 392 million cubic feet in hardwoods and 9 1/2 million cubic feet in softwoods. Dogwood, redbud, and other flowering trees, shrubs, and flowers are scattered along the riverbanks adding vernal variety to the scene.

Little, if any, of the forest land along the Buffalo River is under timber management. High-grading and other destructive cutting practices have generally contributed to a gradual decline in the amount of high quality timber in these woodlands. Logging debris remaining from cutting operations is usually not removed from the flood plain. As a result, when floods occur this debris is floated into the stream channel where it contributes to log jams and streambank erosion.

Present practices allow grazing of forest land, and very few landowners make any effort to exclude fire from the woodlands. Fire control is not, however, considered a serious problem anywhere along the river. Fire damage is more evident along the upper stretches of the river in Lawrence and Lewis Counties. The principal cause of fires here, as in the other three counties, is the burning of pasture and agricultural land with little regard for fire escaping to the timber land. The wildfire detection and suppression system provided by the Tennessee Division of Forestry is considered adequate in the five-county area. An informal and educational personal contact program, soon to be implemented in the area, is expected to reduce fire occurrence even further.

The greatest damage to timber along the river seems to be inflicted by cattle. Forest land which has not been protected by fencing is frequently used by livestock for access to water and for shade; therefore, the vegetation is heavily grazed, the

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Photo by U.S. Forest Service

soil compacted, and little or no regeneration of forest trees is evident.

The removal of vegetative cover from the streambank either as the result of selective logging or the conversion of forested areas into pasture or cropland has, in some instances, caused serious bank erosion.

During a field reconnaissance of the river, a total of 127 eroding bank areas were observed, having an estimated combined length of 33,400 feet of riverbank. Twelve locations show indications of having eroded as much as 10 to 25 feet into the channel bank during the past year for lengths ranging from 150 to 500 feet.

The incidence of bank erosion above Bell Bridge (river mile 73), with a few exceptions, can be considered insignificant. From

TABLE 19

CHARACTERISTICS OF LANDOWNERSHIP[1/]
BUFFALO RIVER STUDY, TENNESSEE

Ownership Category	Lawrence Co. No.	Lawrence Co. Acres	Lewis Co. No.	Lewis Co. Acres	Wayne Co. No.	Wayne Co. Acres	Perry Co. No.	Perry Co. Acres	Humphreys Co. No.	Humphreys Co. Acres	Total No.	Total Acres	% Total Acres
Individual-Separate Ownerships	30	1,971	76	5,900	54	5,476	159	12,994	66	4,613	385	30,954	100%
Public Ownership in 1973	0	0	1	37	0	0	3	17	0	0	4	54	1%
Private Resident Owners	20	1,327	59	4,900	46	4,742	121	9,248	45	3,142	291	23,359	75%
Private Non-Resident Owners	8	611	6	458	7	596	26	2,899	13	957	60	5,521	18%
Unknown Owners	2	33	10	505	1	138	9	830	8	514	30	2,020	6%
Total	30	1,971	76	5,900	54	5,476	159	12,994	66	4,613	385	30,954	100%
Percentage of Total		6.4		19.1		17.7		42.0		14.8			100%

Ownership Category	Lawrence Co. No.	Lawrence Co. Acres	Lewis Co. No.	Lewis Co. Acres	Wayne Co. No.	Wayne Co. Acres	Perry Co. No.	Perry Co. Acres	Humphreys Co. No.	Humphreys Co. Acres	Total No.	Total Acres	Total Acres
Change from resident[2/] to nonresident[3/] since 1963	3	191	3	174	0	0	21	2,187	5	452	32	3,004	10%
Change from nonresident to resident since 1963	2	100	4	169	2	127	9	1,351	1	137	18	1,884	6%
Largest ownership	1	188	1	280	1	571	1	649	1	312	1	649	
Smallest ownership	1	16	1	3	1	1	2	1	1	1	6	1	
Percentage of Total													100%

	Lawrence Co. Acres	Lewis Co. Acres	Wayne Co. Acres	Perry Co. Acres	Humphreys Co. Acres	Total Acres
Percent of River Frontage						
Resident since 1963[2/]	62.2	80.0	84.3	61.3	64.3	69.4
Nonresident since 1963[3/]	4.1	5.6	10.5	5.1	10.5	6.9
Change from resident to nonresident 1963-73	9.7	2.9	0	16.8	9.8	9.7
Change from nonresident to resident 1963-73	5.2	2.9	2.3	10.4	3.0	6.2
Unknown ownership	18.9	8.6	2.9	6.4	12.4	7.9
Total	100.0	100.0	100.0	100.0	100.0	100.0

1/Within 1/4 mile of the Buffalo River, between Natchez Trace at river mile 104 and the Duck River.

2/Residents live in the same county that their land is in.

3/Nonresidents do not live in the county their land is in.

Bell Bridge to Flat Woods Bridge (river mile 59) the frequency of disturbed areas increases; however, erosion is not considered severe. From Flat Woods Bridge to the north, severely eroded segments are numerous.

Except for about 18,000 feet of bank, it is believed that, with few exceptions, damaged banks would heal through natural means. Banks needing repair would probably require structural measures such as rip rap, flexible concrete mattresses or rockfilled gabions.

Landownership

Within 1/4 mile of each bank between river mile 117 and its confluence with the Duck River (Table 19), a total of 363 landownerships comprising 35,143 acres occurs along the Buffalo River. Sixty-two of these ownerships, comprising about 6,000 acres, are held by nonresidents living outside the county in which their land lies.

The average size of individual ownership within the river corridor is small ranging for the most part between 51 and 100 acres (Table 20). Only four tracts totaling 54 acres are in public ownership, 37 acres of this amount is administered by the National Park Service in connection with Metal Ford at Natchez Trace (Table 21).

TABLE 20

DISTRIBUTION OF OWNERSHIP BY SIZE[1/]
BUFFALO RIVER STUDY, TENNESSEE

	County					
Size of Ownership	Lawrence	Humphreys	Lewis	Perry	Wayne	Total
1-25 acres	4	15	6	51	10	86
26-50 acres	8	15	14	34	8	79
51-100 acres	12	23	22	35	8	100
101-200 acres	6	10	12	22	15	65
201-300 acres	0	3	4	16	5	28
301-500 acres	0	1	0	0	2	3
501-1,000 acres	0	0	0	1	1	2
Total	30	67	58	159	49	363

Grand Total--363

1/Within 1/4 mile of the Buffalo between Natchez Trace at river mile 104 and the Duck River.

TABLE 21

PUBLIC OWNERSHIP OF LAND[1/]
BUFFALO RIVER, TENNESSEE

Owner	Acreage
City of Lobelville	1 acre
Perry County	16 acres
Federal (Natchez Trace)	37 acres
Total	54 acres

1/Within 1/4 mile of the Buffalo River between Natchez Trace at river mile 104 and the Duck River.

Within the river corridor, most riverfront land is privately owned by residents. This occurs least in Lawrence County with 71 percent and the most in Wayne County with 97 percent. The trend in ownership along the river, however, has been towards nonresident ownership over the last 10 years. This is most pronounced in Lewis and Perry Counties. It is expected that change of ownership from resident to nonresident will increase in future years as the demand for waterfront property becomes more intense.

Water Rights

The classic definition of a legally navigable stream or river in Tennessee is "a river capable, in the ordinary state of water, of navigation ascending and descending, by sea vessels; that is, such vessels as are employed in the ordinary purposes of commerce, whether foreign or inland, and whether steam or sail vessels." Stuart V. Clarks lessee, 32 Tennessee 9, 15-16 (1852). This definition remains valid today with little variation.

The Tennessee Supreme Court has established three classes of streams with respect to navigability: (1) legally navigable waters; (2) waters or streams navigable in the ordinary sense yet not in the legal sense, which are subject to a public easement for navigational purposes; and (3) waters and streams, completely nonnavigable, which are considered to be private property.

In the first class, any body of water in Tennessee which has sufficient volume of water, either constantly or at regular recurring seasons, to be valuable to the public for the purpose of transportation, can be said to be a "legally navigable" watercourse. The effect of a river being deemed navigable is that the State holds title, in trust, for the public in the waters and on the land under the water below the ordinary low water mark. Adjoining landowners hold title only to the ordinary low water mark. On navigable streams and rivers, the public has the right to free and uninterrupted use and enjoyment of such waters for purposes of navigation, transportation, fishing, and everything of value incident to a right of soil. These "rights" exist concurrently and are taken together to express the "public proprietorship" of public waters. The United States Government would have plenary or full rights over the use of this class of stream.

In the second class, streams classified as navigable in the "ordinary sense" are yet of sufficient natural depth for rafts, flat boats, or small vessels of lighter draft than ordinary such as canoes. Title to the bed of such streams is held by adjoining landowners and the only interest the public has in such streams is a right of easement over and through their waters. The right of the public to use waters "navigable in the ordinary sense" for commerce and navigation is precisely the same as the right to make such use of "legally navigable" waters. The effect of a river being deemed "navigable in the ordinary sense" gives the riparian owner the "exclusive right" to fishing in the waters over that part of the bed. This does not, however, include the right to detaining the fish, or preventing their free movement, and only includes the right to take fish in the waters over these grants as they may be found according to their natural inclinations. Although there is a public easement on the nonnavigable stream, the county court can give a riparian owner the right to build a dam for power or other valid purposes.

Streams which do not meet the requirements of the two classifications are classified as "not navigable in any sense." A stream suited only for floating logs is an example of a nonnavigable stream. In nonnavigable waters "both the right of property and use are wholly and absolutely in the owner of the adjoining lands," and any boating use of such waters by the public would be considered trespass.

Although there has been no legal determination of the status of the Buffalo River, it has been used for navigation at least to river mile 70 near Flat Woods (House Document 328, 71st Congress, 2nd Session, Page 218, 1930) and would therefore be declared to be "legally navigable" from Flat Woods downstream to its mouth subject to Section 404 of the Water Pollution Control Act as amended (1972). The remainder of the Buffalo from river mile 117 to river mile 70 could be considered "navigable in the ordinary sense" and subject to public easement even though the riparian owner has title to the bed or channel of the stream. Tributary streams of the Buffalo, becuase of their limitation for floating, would probably be classed as "not navigable in any sense," thereby requiring acquisition of the streambed from the riparian owner before public use could be guaranteed.

In order to assure public access and public recreational use of the streams and shorelines for purposes other than boating use, rights must be acquired including easements or fee simple interests in the streambeds and shorelands.

In relation to the use of water by riparian owners, the law makes no distinction between water taken from a navigable stream and that taken from a nonnavigable stream. Rather, the requirement is a reasonable use of water by the riparian owner.

Nonrecreational Use of the Buffalo River

As part of studies made by the Corps of Engineers in preparing House Document 328, "Tennessee River and Tributaries - North Carolina, Tennessee, Alabama, and Kentucky," a damsite just downstream from the confluence of the Buffalo and Duck Rivers was identified which would back water 14 miles up the Buffalo River. In addition, three general locations at about river mile 96 on the Duck River were selected which would create possible impoundments upstream to the mouth of the Little Buffalo River. A damsite was once identified by the Tennessee Valley Authority on the Buffalo River at river mile 55.5.

The Tennessee Valley Authority has since reviewed general plans for potential reservoirs which would directly or indirectly affect the Buffalo River. To date, these projects have been found infeasible. There are some 24,000 acres of agricultural land along the Buffalo River and its tributaries downstream from the mouth of the Little Buffalo River, only a portion of which is subject to periodic

flooding. Thus, possible benefits resulting from a reduction in flooding of these lands would be quite small.

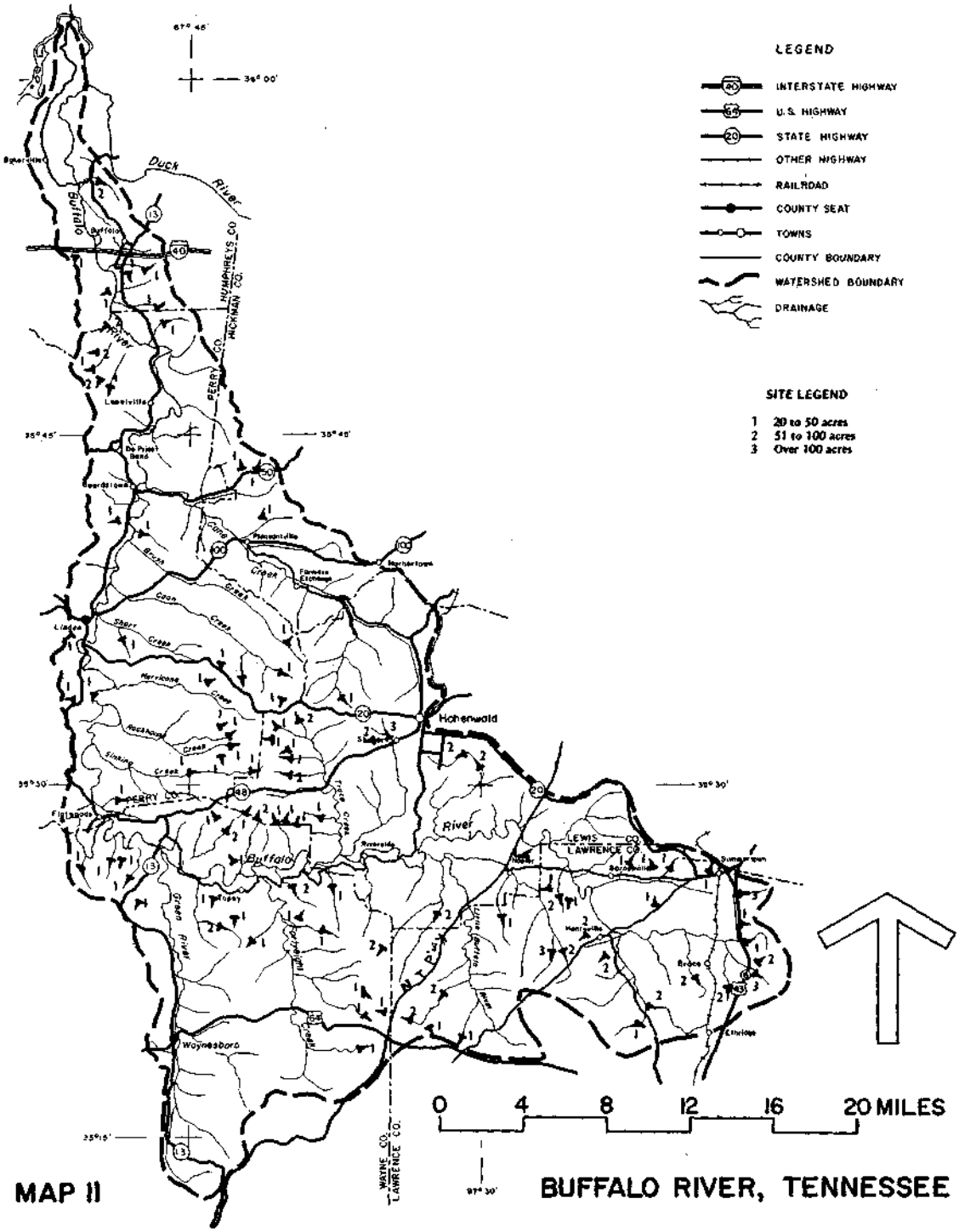
There appear to be no water supply or water quality needs in the basin; hence, no impoundments would be needed for these purposes. Likewise, recent investigations have led to the determination that there is no need for low-flow augmentation to ensure use of the river for float fishing and float recreation.

There are no existing applications for hydroelectric projects within the Buffalo River basin. Small water-power developments in operation in 1971 within the Buffalo River basin include the following. Some of these developments may have since ceased operation.

Name	Location	Remarks
Buffalo River Watershed		
Hurricane Creek	Linden, TN	6 ft. head 10 hp turbine
Buffalo River	Beardstown, TN	Perry County
Green River	Waynesboro, TN	Grist mill, Wayne County
Buffalo River	Allens Creek, TN	Grist mill, Lewis County
Buffalo River	Hohenwald, TN	Lewis County
Buffalo River	Flat Woods, TN	Wayne County
Buffalo River	Linden, TN	Perry County
Buffalo River	Beardstown, TN	Perry County
Buffalo River	Lobelville, TN	Perry County

The Watershed Protection and Prevention Act (Public Law 83-566) has stimulated some interest in the Buffalo River basin. However, the Cherry Bottom and Forty-Eight Creek Watersheds are the only applications for which planning assistance has been requested. These applications are now pending.

If properly developed, some of the tributary projects could prove to be beneficial in the enhancement of the mainstem through controlling siltation and providing low-flow augmentation during dry years. However, such development could be detrimental if stream channelization and channel clearing were included as project features. If small impoundments were to be constructed on tributary streams, provisions for multiple outlet water control should be considered. Discharge water would need to be taken from pooled strata of the impoundments to maintain ambient water temperatures of the mainstem thus preventing detrimental thermal changes in the aquatic environment.



MAP II

BUFFALO RIVER, TENNESSEE

POTENTIAL IMPOUNDMENT SITES

U.S.D.I. - B.O.R.
U.S.D.A. - SCS JULY 1974

Potential tributary impoundment sites for the Buffalo River drainage area are identified on Map 11. These reservoirs, if constructed, would add 99 new water areas capable of being utilized to some extent as outlets for water-oriented recreation activities and for fishing or other purposes (Table 22).

It is recognized that most of the small, narrow subdrainage areas of the Buffalo River would be difficult, if not impossible, to qualify as Public Law 83-566 projects. However, there are several larger tributaries such as the previously mentioned Cherry Bottoms and Forty-Eight Creeks that could qualify. The potential feasibility of any of these would, however, largely depend on the amount of flood plain, types of damages that occur, frequency of flooding, the time of flooding, and local interest in the projects.

On occasion, gravel deposits along the Buffalo River and tributary streams have been exploited for commercial purposes. Thus far, extraction operations have been primarily confined to the lower [illegible] near the perimeter of urbanized areas. Although the [illegible]emand for aggregates in the basin is small and somewhat

TABLE 22
POTENTIAL TRIBUTARY IMPROVEMENT SITES
BUFFALO RIVER WATERSHED

County	Reservoir Size (Acres) 20-50		51-100		100 +		Total	
	(#)	(acres)	(#)	(acres)	(#)	(acres)	(#)	(acres)
Lawrence	13		10		3		26	
Lewis	10		7		1		18	
Wayne	17		4		--		21	
Perry	22				--		35	
Hickman	3		--		--		3	
Humphreys	4		2		--		6	
Total	69		26		4		99	

1/ Potential impoundment sites were taken from "Inventories of Potential Impoundment Sites" prepared for use in making county "Appraisals of Potentials for Outdoor Recreational Developments," U.S.D.A., Soil Conservation Service.

sporadic, the need to construct roads, homes, industrial complexes, etc., in future years will necessarily drain available sources. Like many other natural resources, aggregates can only be extracted where nature placed the deposit. Because sand and gravel are bulky, low-cost materials, transportation plays a significant part in determining the economically accessible deposit. As a result, many operations are expected to be located near the expanding communities along the Buffalo, utilizing the Buffalo River as a source.

Since sand and gravel operations are usually found immediately adjacent to the river, the extraction process would add considerable silt load to its waters. Under a wild and scenic river designation, this use of the Buffalo River would necessarily be restricted or prohibited.

Recreation Use and Opportunity

The Buffalo River is presently well known for its qualities as a float stream both locally and statewide. As a developed scenic and recreational river, the Buffalo could supply an opportunity for recreation of a different type, setting, and character than is currently available at several more sophisticated developments that exist within easy driving distance. Public outdoor recreation attractions presently available within an hour's driving distance of the Buffalo River include the Natchez Trace Parkway, Meriwether Lewis Monument along the Parkway, Fort Donelson National Military Park, and Shiloh National Military Park, the sites of major Civil War battles. In addition, the Tennessee Outdoor Recreation Areas System provides outdoor recreation facilities and attractions at its David Crockett State Park near Lawrenceburg, Pickwick Landing State Park, Natchez Trace State Park and Forest, Nathan Bedford Forrest Memorial Park, Montgomery Bell State Park and Forest, Chickasaw State Park and Forest, and the Wayne County Natural Bridge site.

In addition to the above public developments, there are also numerous fishing and boating opportunities associated with the Tennessee Valley Authority's developments on Pickwick Lake, Wilson Lake and Wheeler Lake to the south, and Kentucky Lake to the north. North of the terminus of the Buffalo River lies the Tennessee Valley Authority project called Land Between The Lakes, a national recreation demonstration area occupying the area

between the Cumberland River and Tennessee River in southwestern Kentucky and northwestern Tennessee.

Recreation use of existing recreation facilities and areas is heavy and increasing. The general vicinity presently attracts visitors, sightseers, vacationers, and day users from a large regional area. Currently, between 14 and 16 million people reside within a 250-mile radius of the counties comprising the Buffalo River study area (see Table 4).

It appears that, if a diversity of recreation opportunity is to become a reality for the region and the local living environment improved, every effort to preserve and enhance significant natural resources such as the Buffalo should be taken. In comparison with other recreation developments in the general vicinity, which annually accommodate millions of recreation user days, the estimated visitor impact on the Buffalo River may appear slight. However, with its special experience potential and unique values, the Buffalo River denotes quality and not quantity. Its development would complement rather than compete with presently available recreation areas.

The Buffalo River has been primarily a fisherman's river. It is becoming better known throughout western Tennessee and the surrounding region as a family-type canoeing stream. Present access points are adequate in number; however, recreation facilities along the river are generally poor or nonexistent. There are sufficient points of access, but they need improvement. Recreation facility developments, appropriately spaced, would provide opportunity for the river's use as well as the associated activities such as picnicking, camping, hiking, nature study, photography, etc. Although the variety of uses on the Buffalo River is wide, it is nevertheless accummulatively light in intensity. Through increased management efforts and development programs, recreation use of the Buffalo River could be increased without detriment to the resource. It would appear that all that is needed is the opportunity and it can be provided by an energetic administrative program designed to accommodate the various needs and desires of both the local residents and the vacationing recreationists.

The Buffalo River has all of the chemical and physical requirements of a good smallmouth bass-rock bass type stream. The water quality, volume of flow, and variety of warm water fish encourage float fishing as well as bank fishing throughout its length.

Many tributary streams of the Buffalo River provide good fishing opportunities and are favored by bank and wading fishermen. These include the Little Buffalo River which has 20 miles of fishable water. Trout fishing is also enjoyed to a limited extent on several of these tributary streams which have good volume of spring flow. The preservation of these fishery resources and tributary streams are important considerations in the development of a scenic and recreational river program.

At the present time, fishing pressure on the Buffalo River comes principally from the local population in the five counties of the drainage basin. It is estimated that the river supported 12,000 man-days of fishing during 1973; 40 percent of the pressure was exerted by float fishermen. Limited access development on the stream and lack of publicity and facilities to draw and accommodate greater use beyond the local and State level appear to be important factors in limiting the full potential offered by this resource.

The bottomland hardwoods, upland pine-hardwoods and pasture areas provide good hunting opportunities along the Buffalo River and in its valley. The most important species of wildlife include white-tailed deer, squirrel, rabbit, quail, raccoon, opossum, and fox.

Many float fishermen engage in squirrel hunting during the fall months. Jump shooting of ducks is also a popular sport of the float fishermen, as well as the hunter. The meandering Buffalo River offers many opportunities for this type of wildlife harvest.

The agricultural fields which flank the Buffalo River, particularly in the lower 20 to 25 miles of the river, offer an attraction to migrating waterfowl during late fall and winter months. This is particularly true during years of heavy rainfall when the bottomlands and the grain fields are inundated.

The reservoirs mentioned above provide ample recreation opportunities in the immediate area and in close proximity to the Buffalo River. With the development of the Columbia and Normandy Reservoir projects on the Duck River, flat water recreation opportunity will be increased substantially.

VI. STUDY FINDINGS

General

General findings of the study team include the following:

. . . The Buffalo River possesses a combination of many desirable features; it is an unusually attractive stream which still retains a natural unspoiled appearance throughout most of its 117 miles. It remains today as one of the few free-flowing pastoral rivers of its length in the State.

. . . In terms of population density, the Buffalo River drains one of the least populated sections of the State. Population in the six-county study area declined from 83,000 in 1940 to 75,000 in 1960. Since 1960, population has gradually increased and is projected to reach 145,600 by year 2020. Population within 250 miles of the study area counties varies between 14 million and 16 million people.

. . . Attempts to industrialize the six-county area generally have a long history of frustration and failure. Some success is now being achieved in Lawrenceburg, Waynesboro, Hohenwald, Linden, and Lobelville.

. . . Production of livestock and timber is a strong component of the area's economy. Livestock farming appears to be increasing and affecting the character of the land, particularly in the upper Buffalo watershed, through the transition of cultivated fields to pasture.

. . . The region is well served by transportation facilities including a combination of highways, railroads, airports and waterways. Primary arterials and local county roads tie the Buffalo River with major population centers of the Southeast. Public access points to the Buffalo River are in proportion to present local and regional use although facilities are poor or nonexistent.

. . . The scenery along the Buffalo River as seen by the river user is a changing panorama of forested rolling hills,

steep bluffs, pasture and cropland. Agricultural land is frequently partially or fully screened from the river by a fringe of bottomland hardwoods. A variety of flowering shrubs, wildflowers and wildlife enhance the river experience.

. . . The Buffalo River is known for its strong base flow. This is especially beneficial for water-oriented recreation activities during the late summer and fall months when surface runoff is historically low. It is believed that low-flow augmentation would not enhance existing recreational values.

. . . The study area, due to its location in the east-central part of the United States and its elevation, provides a climate somewhat cooler than the deep south in the summertime and yet warmer in winter than the areas to the north. This climate is conducive to recreation activities on the Buffalo River.

. . . Present water quality of the Buffalo River is excellent and meets the "General Water Criteria for the Definition and Control of Pollution in Waters of Tennessee," 1971, as amended, and the National Advisory Committee on Water Quality Criteria, April 1968.

. . . The Buffalo River basin, because of its size, length, and diverse topography, provides suitable habitats for a wide variety of terrestrial and aquatic wildlife. The abundance of wildlife, both year-round residents and migratory, supplements the recreation experience for those floating the Buffalo River.

. . . Thus far, little systematic professional archeological research has been undertaken in the vicinity of the Buffalo River and much more work is needed to completely inventory undiscovered archeological sites. Historically, the Buffalo River basin has many reminders of early settlement and attempts to develop an iron-ore economy. Outside the immediate area, national military parks stand as historic landmarks of Civil War battles fought in the region.

. . . Much of the agricultural land along the Buffalo River is subject to inundation during high water. Flooding is not, however, considered a serious economic problem. Some of the flood plain lands as well as higher ground is considered suitable for wild and scenic river oriented recreational development.

. . . A total of 363 landownerships comprising 35,143 acres (in 1973) occur along the Buffalo River. Most of this land (65 percent) is held by resident owners. The trend in riverfront property has been a gradual change from resident to nonresident ownership (Table 20).

. . . The need for impounding the Buffalo River for the purposes of flood control, water supply, hydroelectric power, navigation or recreation is nonexistent.

. . . No court determination of "navigability" has been applied specifically to the Buffalo River. Within the three classes of streams defined by the Tennessee Supreme Court with respect to navigability, it would appear that the Buffalo River would be "legally navigable" from Flat Woods to its mouth and "navigable in the ordinary sense" from river mile 117 to Flat Woods. Tributary streams of the Buffalo River would probably be classed as "not navigable in any sense."

Although the Buffalo River and its surroundings have remained essentially natural and scenic in character, the study team finds several factors which presently threaten, or could threaten, the "status-quo." These are:

. . . Where the river flows through agricultural lands, there is almost always a fringe of trees separating these lands from the river. This provides a screen. However, there are several places, particularly in the lower reaches of the river, where vegetation has been removed from the riverbanks causing an unstable condition resulting in moderate to severe streambank erosion.

. . . Present recreation use of existing nearby recreation facilities and areas and use of the Buffalo River is heavy and increasing. The general vicinity presently attracts visitors, sightseers, vacationers and day users from a large regional area. If not adequately controlled, future recreation demands on the Buffalo River could result in its deterioration.

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. . . Although the water quality of the Buffalo River is considered excellent, there are short periods after heavy rainfall when the flow transports silt from cultivated fields, logged areas, and roadbanks into the river system.

. . . Mineral values along the river and its tributaries consist primarily of deposited gravel beds. Gravel extraction and associated washing operations, when active, add a silt load to the river.

. . . Private and quasi-public developments adjacent to the Buffalo River are increasing especially near major communities, travel routes, and along easily accessible river reaches. Such development could adversely impact the scenic and natural values of the area as land use is inevitably changed.

. . . Little if any of the forest land along the Buffalo River is under timber management. High-grading and other destructive cutting practices have generally contributed to a gradual decline of the resources. In addition, timber lands where accessible are used for watering and shade; therefore, the vegetation is heavily grazed, the soil compacted, and little or no regeneration of forest trees is evident.

. . . If properly developed, potential projects (Public Law 83-566) on some of the larger tributary streams might prove to be beneficial in the enhancement of the mainstem through controlling siltation and providing low-flow augmentation. However, such development, by including stream channelization or channel clearing as a project purpose could have a detrimental effect on the aquatic environment. In addition, discharge water from impoundments, if not taken from pooled strata, may raise the ambient water temperatures of the Buffalo.

Qualification for Inclusion in the National Wild and Scenic Rivers System

The Buffalo River task force study team finds that the Buffalo River possesses values which qualify it for inclusion in the National Wild and Scenic Rivers System. This finding is based on a rigorous examination by the study team to determine whether or not the Buffalo would meet the eligibility criteria for either

wild, scenic, or recreational areas as set forth in the Wild and Scenic Rivers Act and in "Guidelines for Evaluating Wild, Scenic, and Recreational River Areas Proposed for Inclusion in the National Wild and Scenic Rivers System Under Section 2, Public Law 90-542," adopted by the Secretaries of the Interior and Agriculture, February 1970.

The study team finds that the Buffalo River:

. . . is in a free-flowing natural condition without impoundments, low dams, diversions or other works. Considered construction of such developments has been deemed economically infeasible for the foreseeable future.

. . . possesses a combination of outstanding scenic and recreational values in a pastoral setting and significant fish and wildlife, historic, and geological values.

. . . contains water of high quality and meets water criteria in both the "General Water Criteria for the Definition and Control of Pollution in the Waters of Tennessee," 1971, as amended, and the Environmental Protection Agency's "Quality Criteria for Water," July 1976. The protection of the existing high water quality will be maintained unless and until it is affirmatively demonstrated to the Tennessee Water Quality Board that a change is justifiable as a result of necessary social and economic development.

. . . contains sufficient volume of water during normal years to permit utilization of the river's resources during summer months including passive and intensive recreation use.

. . . has shorelines and a watershed undeveloped except for agricultural purposes and timber harvesting, with a minimum of discernible adverse manmade intrusions.

. . . tributary streams do not meet the criteria for inclusion in the National Wild and Scenic Rivers System. The lack of outstanding natural or scenic qualities and small stream size are the primary limiting factors.

The Buffalo River in its entirety, from the Henryville Bridge at river mile 117.0 to its mouth, lies within a rural area which is

dominated almost exclusively by a combination of cropland, pasture and forest. The Buffalo River and its adjacent land within this setting is representative of a river resource not frequently found within similar land forms or land-use patterns. The Buffalo River's exceptionally high water quality, relatively high sustained summer flow, scenic attractiveness, and a variety of indigenous aquatic and terrestrial plant and animal life in combination with the agrarian influence, make it a significant resource.

Classification

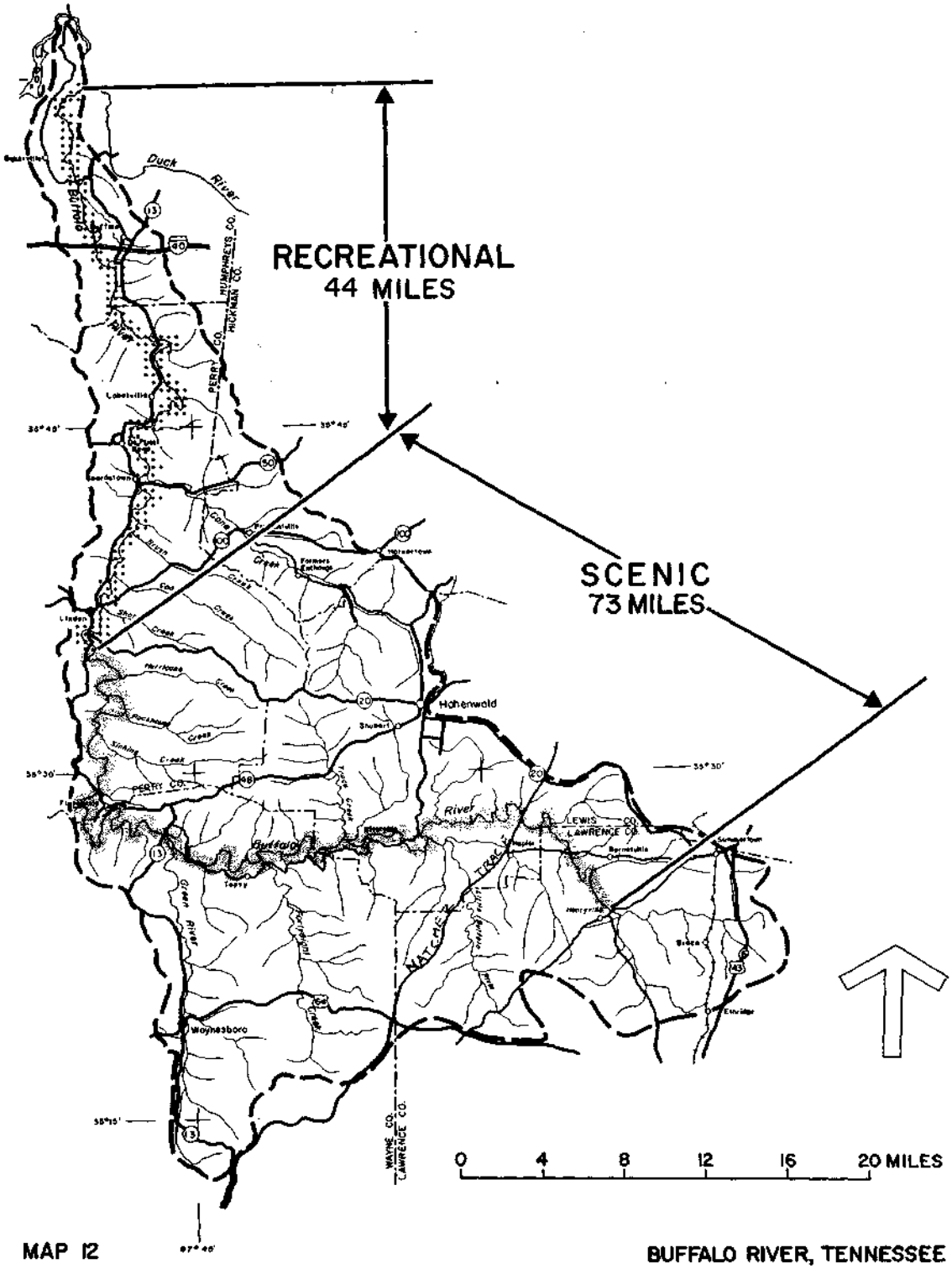
The Wild and Scenic Rivers Act identifies three river classifications--"wild," "scenic," and "recreational."

Because of its varied character, the 117-mile Buffalo River does not conform to a single classification. It is a combination of two river types, each with its own distinctive features. The steeply wooded hillsides and narrow valley of the upper river differ markedly from the wide cultivated bottomlands in the more populated lower section below the community of Linden. In addition, flow in the upper reaches is frequently swift and turbulent through numerous shoals and quiet pools while the lower river moves at a more leisurely pace with less frequent shoal areas. The Buffalo River contains two of the three classes defined in the Act, "scenic" and "recreational" (Map 12).

These two river classifications are defined as follows:

> Section 2(b)(2) Scenic River Areas - 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.
>
> Section 2(b)(3) Recreational River Areas - 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 in the past.

The 117 miles of river under study has been divided into two segments, scenic and recreational. These segments are:



MAP 12

BUFFALO RIVER, TENNESSEE

U.S.D.I. – BOR
U.S.D.A. – SCS

JULY 1974

RIVER CLASSIFICATION

. . . Scenic River Area (73 miles) - From the Henryville Bridge crossing on County Road 6230 (river mile 117) to Bethel Bridge crossing on County Road 6174 (river mile 44).

. . . Recreational River Area (44 miles) - From Bethel Bridge crossing on County Road 6174 to confluence with Duck River.

Scenic - Henryville Bridge to Bethel Bridge - This section, approximately 73 miles long, begins at the County Road 6230 crossing which lies about 1 mile east of Henryville or 4.5 miles west of Summertown. Except for limited pastureland, very little development occurs along this section of the river. The river is notable for its scenic bluffs, heavily vegetated riverbanks, its frequent change between shoal and pool areas, and its historic features exemplified by the Natchez Trace and the high wood-planked iron-frame bridge crossings. The north-south State Highway 13 is the only major road crossing this section. Other road crossings include the Natchez Trace and 11 county roads which carry only light traffic. Six of the county road crossings still retain the old iron-frame bridges. This section of river is known for its scenic and canoeing qualities and is presently the most heavily used.

Recreational - Bethel Bridge to Confluence With Duck River - This section, approximately 44 miles in length, passes the two larger Buffalo River valley communities of Linden and Lobelville. Along this portion of the river intensive farming is practiced, becoming more prominent in the wider lower reaches. Except for urbanization and light industrial development in the communities of Linden, Lobelville, and along the paralleling State Highway 13, the river and its immediate surroundings are either agricultural or wooded where steep slopes prevail. As in the upper section of the Buffalo River, sheer limestone bluffs occur in the bend of tight meanders, but less frequently.

Most farmland in this river section is well screened from the river by thin fringes of trees. In places, however, agricultural land extends to the river's edge causing moderate to severe bank erosion and a general reduction of river's scenic qualities.

VII. ALTERNATIVE COURSES OF ACTION

The National River Concept

Inclusion of the Buffalo River in the National Wild and Scenic Rivers System would serve as a method for providing protection of its intrinsic natural and scenic values and immediate surroundings. Lands so included would necessarily have to be identified by a designated managing agency or agencies in accordance with an approved management plan. Each river component named as a part of the system would consequently be administered in a manner that would:

1. Maintain its free-flowing condition and pastoral setting.

2. Protect and enhance the scenic, recreational, geologic, fish and wildlife, historic, cultural, archeological, scientific and other similar values.

3. Prevent degradation of existing water quality.

4. Provide for public access, use, and interpretation of important scenic, recreational, geologic, fish and wildlife, and similar resources, consistent with the protection and enhancement of the river's quality and its immediate environment for now and the future.

5. Provide high-quality recreational opportunities associated with a free-flowing river at a level of use that does not result in resource deterioration or cause an adverse impact on riparian landowners.

6. Provide for the use of fish and wildlife resources within the framework of appropriate Federal and State laws.

The future quality of the river would then depend on a considerable extent upon maintaining the designated river portions and associated land in a healthy state. Guidelines described herein can serve as a means of establishing a reasonable management unit within which to maintain a managed river environment.

The amount of land that would be needed to establish a suitable river corridor, whether for protection, access or recreation

facility development, would have to be identified in accordance with an approved master plan yet to be developed. This would require detailed investigation to determine the advisability and extent of control that would be needed. The estimates of land that would have to be acquired in fee title or in scenic easements should not be viewed as absolute but rather as a guide to more intensive planning.

The River Boundary

The "visual corridor" serves as the basis for determining the appropriate boundaries of the river corridor.

The visual corridor is essentially that zone of adjacent land which has a visual impact on the river user and which, therefore, should be protected from adverse use and development if the natural and scenic appeal of the riverway is to be maintained. The width of the visual corridor varies depending on the height and angle of slope of adjacent riverbnaks and bluffs and on the amount of vegetative cover near the river's edge (Figure 13). Where rock bluffs border the river, the land area subject to control would usually be to the rim. Where the river valley is broader and streamside vegetation determines the river user's perception of the corridor, a strip of land adjacent to the river would be included in the visual corridor (Figure 14).

In many instances, lands within a visual corridor are adequate for accommodation of recreation facilities. However, there are instances where expansion in nodes 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 feature near the river.

The varying degree of screening provided by shoreline vegetation is one of the primary factors in determining the width of a scenic easement that would be required to maintain the visual integrity of the river corridor.

This concept is illustrated in Figure 15 which provides an aerial 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.

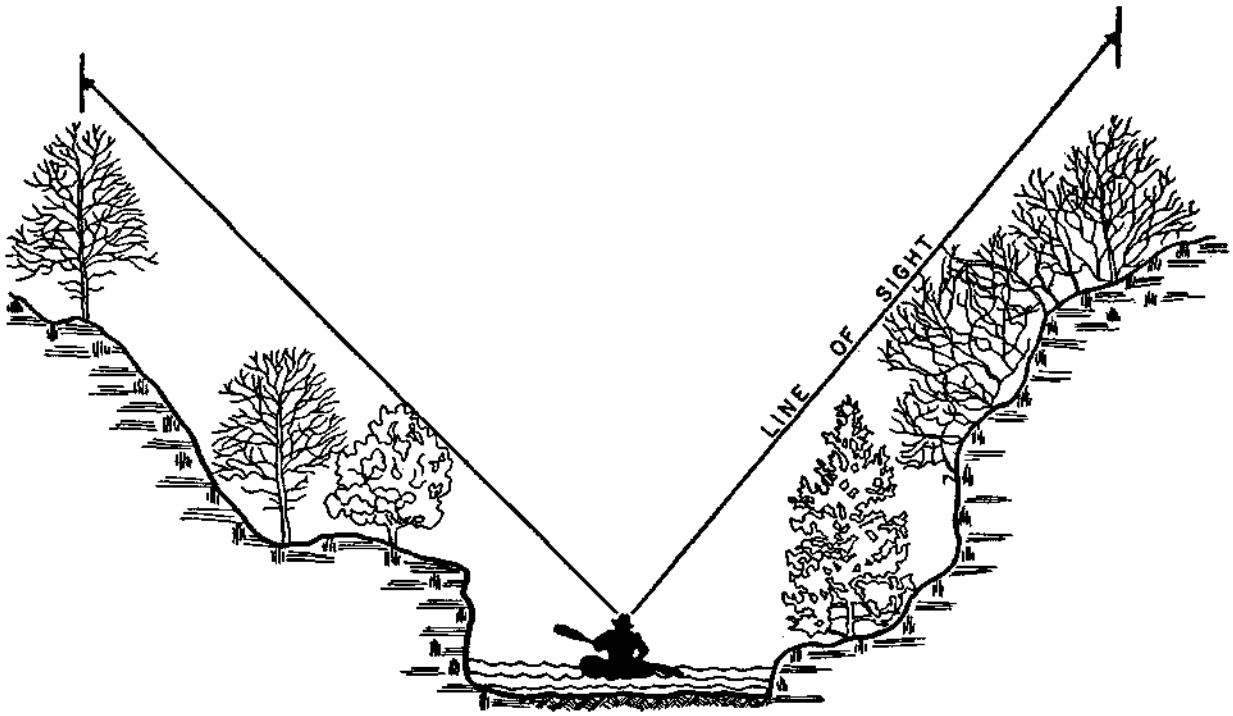


FIG. 13

VISUAL CORRIDOR WITH
UNIFORM SLOPES

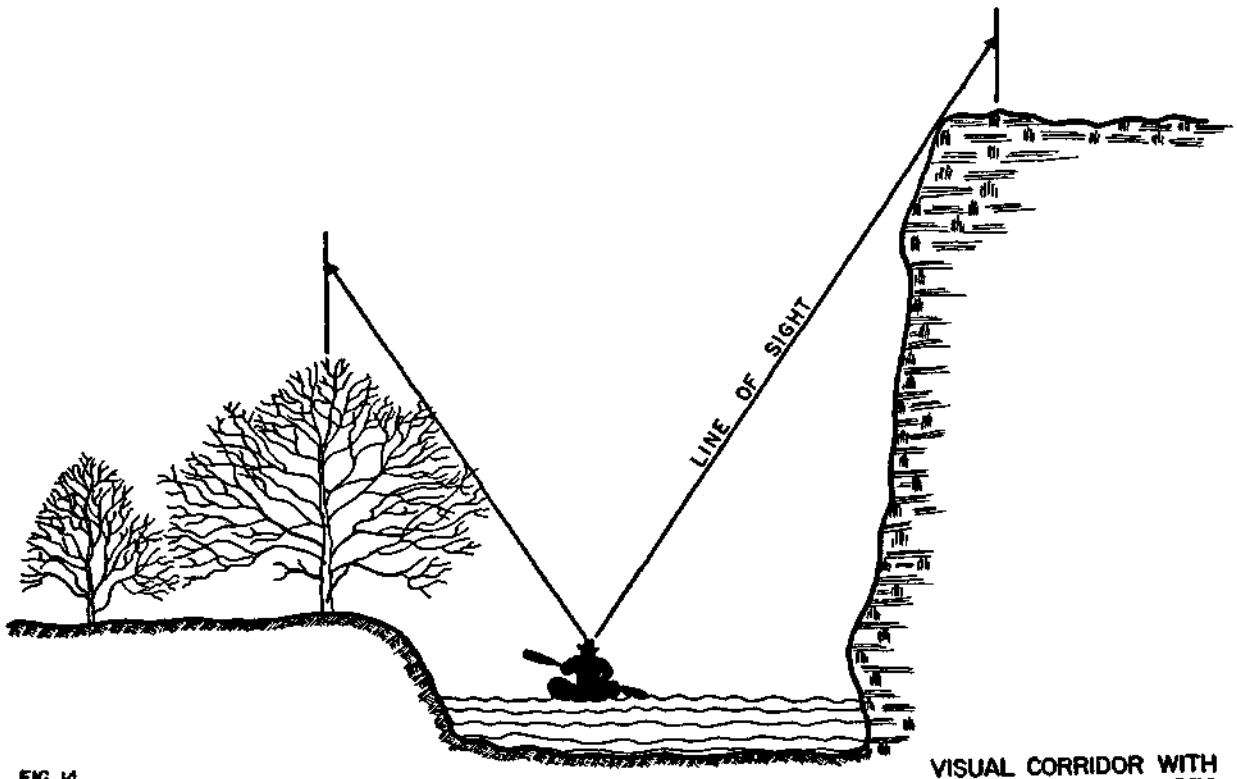
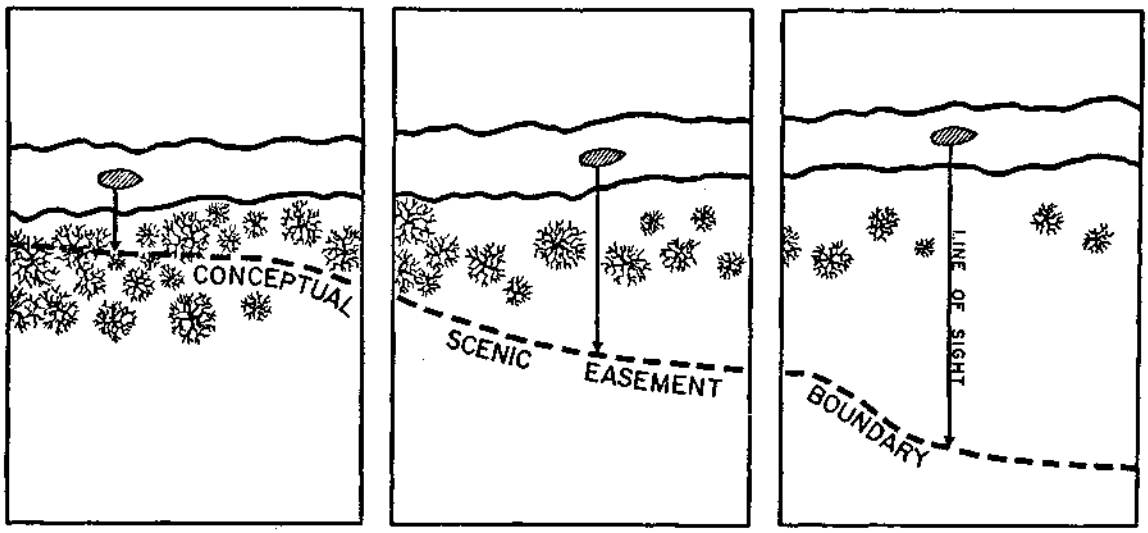


FIG. 14

VISUAL CORRIDOR WITH
BLUFFED SLOPES



BOATER'S VIEW LIMITED BY DENSE VEGETATION

BOATER'S VIEW PARTIALLY LIMITED BY VEGETATION

BOATER'S VIEW NOT LIMITED BY VEGETATION

FIG. 15

VERTICAL VIEW OF VISUAL CORRIDOR

The line-of-sight view from the river partially limited by dense vegetation may require, in some instances, a wider scenic easement. Finally, when the view from the river is unobstructed, a much wider scenic easement would normally be required - except where the reestablishment of the bankside vegetation is desired to reduce the corridor width. Conversely, it may be desirable to expand the width of a scenic easement in certain areas to protect vistas essential to maintaining the pastoral and natural character of the river.

Acquisition Alternatives

The National Wild and Scenic Rivers Act prohibits the Federal Government from acquiring more than an average of 100 acres per mile on both sides of the river in fee title for designated wild and scenic rivers. Beyond that point, the Federal Government's acquisition authority is limited to scenic easements. The Act also prohibits Federal condemnation of private property if 50 percent or more of the entire acreage within a federally administered wild, scenic or recreational area is owned by the United States, the State or States within which it lies, or by political subdivisions of those States. When less than 50 percent of the land is publicly owned, private land cannot be condemned if it is within a city or town which has a valid zoning ordinance which conforms to the purposes of the Act.

In the event that a river is added to the National System by application of a State governor to the Secretary of the Interior, the State should, as a minimum, have as much control of that river as would be required should the same area be managed as a Federal component within the system. All land purchases in this instance would be a State responsibility.

Within a recommended boundary for a wild and scenic river, all property rights are acquired to some lands in order to provide protection of the natural scene and to accommodate the existing and permissible levels of recreational use. Generally, fee acquisition would be confined to land needed to provide access and facilities to the general public and to protect the river and resource values which would otherwise be in jeopardy from less-than-fee control. The remainder of the land within the boundary could be controlled by easements and, when acceptable to the Secretary of the Interior, by adequately enforced local zoning regulations.

Fee Title Acquisition - The acquisition of all property rights, within the constraints of the National Wild and Scenic Rivers Act, provides the most effective, though not the most economical, means of protecting the natural scene and accommodating recreation use within a designated river corridor. Maximum assurances are provided against incompatible land and visitor use, thereby reducing the complexity of management inherent of less-than-fee control. All fee purchases would be made at fair market value.

Where residents, either permanent or seasonal, are presently located within the fee line, arrangements for life estate or for continued use for a specific term of years would be made if desired by the present owners. Established business enterprises which do not conflict with the objectives of the scenic and recreational river could continue to be privately operated through purchase and leaseback. This provides for public purchase of private lands which are in turn leased back to the owner with land-use restrictions. In instances where lands devoted to agricultural pursuits are acquired in fee and leased back, owners would assure the continuance of present agricultural uses which has long been traditional in the Buffalo River valley and is essential to the maintenance of the agrarian setting in which the Buffalo River lies. Present land uses may be changed to add a more pleasing perspective from the river or to stabilize and control malpractices which have been detrimental to the natural river character. Public use facilities operated as part of the Natchez Trace Parkway could continue to be administered as at present, in accord with the overall administering agency.

Scenic Easements--Scenic easements are essentially agreements between the administering agency and the landowner in which the administrator buys certain uses on selected portions of the owner's land. A scenic easement does not permit public access, rather, its purpose is to protect the scenic view from the river. Such easements would pertain to a linear corridor including lands on both sides of the river and would contain restrictions against changing any features of the natural landscape or allowing any activity not compatible with the river concept. Such easements would permit all present nonconflicting uses to be continued by the landowner, his heirs, successors or assigns. Such land under easement is still in the possession of the owner, it would remain on the tax rolls and assessed according to those rights retained. Such easements would require a detailed investigation before the

advisability and form of control contained in the easement document could be determined for individual parcels of land.

Public Use Easements--A public use easement would guarantee public access or, in instances of streambank repair, the right of ingress and egress over private lands. Such an easement would be required on all streams declared to be "navigable in the ordinary sense," since under Tennessee law the title to the bed of such streams is held by adjoining landowners. The public use easement would permit landowners to continue existing compatible land uses. For example, the present amount of agricultural use along the Buffalo River is considered as an enhancement to the riverscape and would be treated as a continuing compatible use. A public use easement would in some instances provide for the development of hiking trails along portions of private lands in lieu of fee acquisition of such lands.

Zoning--Counties and municipalities have authority under State law to enact land-use control and zoning measures (Appendix D). If properly formulated and implemented, zoning can be used effectively and economically to protect the river's environment. If improperly utilized, however, zoning can be damaging to those areas that are environmentally sensitive and easily degraded. This would be particularly true if individual counties were not coordinated and controlled by a single plan. In this instance, inconsistent and ineffective river protection and use control could result. Local initiative in establishing a coordinated county regional plan could result in the physical preservation of the river as it exists today.

Although zoning as a sole means of administering an area can be legally and politically fragile, in certain instances local zoning can be an effective and economical means of protection reducing the need for fee acquisition and easements. In addition, areas beyond the boundary of the river corridor, which are visible from the river, may be protected from encroachments that would directly or indirectly affect river quality.

No Acquisition--The Buffalo River could remain essentially as it is now, in private ownership with no land-use controls.

Under this alternative, current land uses and development within the river corridor would be allowed to continue. Presently there is strong local feeling of stewardship towards the river and in maintaining its existing values. This desire by ripariam landowners to maintain a "status-quo" condition can only be temporarily effective subject to the gradual and subtle encroachment of adverse uses, ultimately causing a degradation of the resource as competition for land for all uses becomes more intense.

It is expected that permanent housing and seasonal cottage development could very likely increase along privately owned portions of the river corridor, particularly near growing community areas and along easily accessible river stretches. The construction of additional major highway and railroad corridors is not anticipated, but some highway improvement within the region is foreseen and selected existing river crossings and approaches are scheduled for upgrading. Riverside development is often related to highway development and improvement and could adversely impact the scenic and natural values of the area as land is inevitably changed.

Recreation use is increasing in the Buffalo River basin and elsewhere in the region. Fishing, canoeing, hiking and camping are expected to increase, resulting in heavier use pressures on the Buffalo River. Without adequate controls, the scenic and recreational qualities of the Buffalo could be impaired as recreation demands on the resource increase.

It is reasonable to assume that through "no action" a gradual preemption or conversion of shorelines to other uses will inevitably occur closing options to enhance and support quality recreation experiences. Recovering this resource would become increasingly difficult and costly, if not completely impractical, as time passes.

Acquisition and Development Plan

Areas designated for river access and recreation facility development and areas of significant nonrenewing irreplaceable quality should be purchased in fee. The remaining land, or those segments that lie between nodes of fee title purchase, should be acquired by scenic easement (Map 13).

The boundary for the Buffalo River plan incorporates a total of 117 river miles from the Henryville Bridge to its confluence with

the Duck River encompassing approximately 3,250 acres. Of this total, it is estimated that about 400 acres should be acquired for public access, recreation facility development and one overlook site. The remaining 2,850 acres would be acquired by scenic easement. The figures shown below are only approximations, subject to refinements by the administrating agency or agencies designated to develop a river master plan.

	Acres Fee Title	Acres Easement	Total Acres
River access and recreation facility development	400	--	400
River corridor protection	--	2,850	2,850
TOTAL			3,250

The foregoing acreages represent on an average:

Acquisition in fee plus easements:

$$\frac{3,250 \text{ acres}}{117 \text{ miles}} = 27.8 \text{ acres per mile}$$

Acquisition in fee:

$$\frac{400 \text{ acres}}{117 \text{ miles}} = 3.4 \text{ acres per mile}$$

Acquisition in easements:

$$\frac{2,850 \text{ acres}}{117 \text{ miles}} = 24.4 \text{ acres per mile}$$

Each component of the National Wild and Scenic Rivers System is managed to protect and enhance those values which caused it to be included into the system. Preservation is not, however, intended to mean a prohibition of all types of development but rather limited development and use compatible with and in harmony with the resource.

With this constraint as a guide, development alternatives for the Buffalo River would be those which would maintain the river corridor in as natural a state as possible while providing sufficient recreation facilities for the appropriate use and enjoyment of the river. Compatible recreation uses of the Buffalo River include picnicking, camping, boating (including canoeing), hiking (including nature walks), sightseeing, and associated uses such as hunting, fishing, and nature study.

With the exception of two quasi-public developments and the river related developments associated with the Natchez Trace Parkway, the Buffalo River corridor is without any form of public recreation facility development. Privately owned canoe rental services are presently available in the vicinity of Flat Woods and Bell Bridge on State Highway 13. These services utilize the existing but undeveloped access points available at county road crossings or the access point via Metal Ford off Natchez Trace. Overnight camping and picnicking accommodations are available at the Davey Crockett State Park just west of Lawrenceburg or at two privately developed campgrounds near Flat Woods. Only minimal facilities have been developed at the latter and these might be considered "primitive." Motel accommodations are available in most of the smaller communities. To date, there has been no overall coordination or planning with respect to the distribution of accommodations and range of services that might be provided to offer the maximum number of recreational opportunities consistent with the perpetuation and enhancement of the scenic, historic, and recreational values found along the river corridor.

The conceptual development plan described herein is purposely conservative and based on the concept of maintaining the river environment in as natural a state as possible while providing only those recreation facilities needed for full visitor use and enjoyment of the river (Map 13). The objective under this plan is to be achieved with minimal disturbance of the existing pastoral setting of the Buffalo River.

Planning for development in this plan should not be completed before cultural resource preservation procedures have been met. Investigations may provide evaluations and require considerations under Section 106 of the Historic Preservation Act of 1966 that will influence conceptual development planning. Proper consultation, when required, with the State Historic Preservation Officer and Advisory Council on Historic Preservation should be conducted prior to development.

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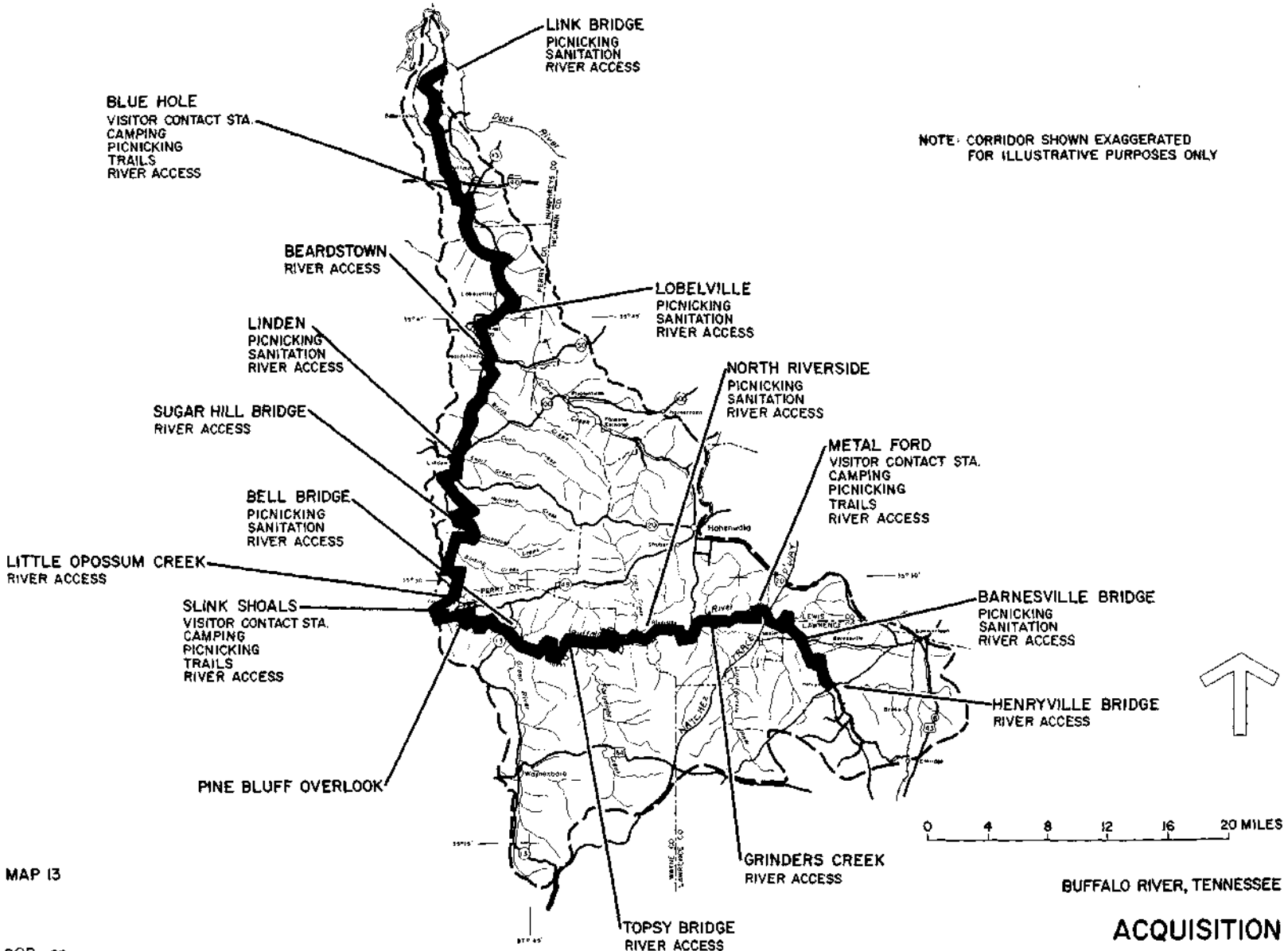

MAP 13

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BUFFALO RIVER, TENNESSEE

ACQUISITION AND DEVELOPMENT

Under this development concept, three major public use and river access areas are planned and located to disperse visitor impact and to provide for overnight camping and day-use recreational facilities. These major areas or river focal points would be supplemented by providing river access with day-use recreation facilities at six intermediate locations. In addition, six sites would be developed for river access. One overlook near State Highway 13 at river mile 67 is included to enhance the visitor's experience. River access facilities would make use of existing access points rather than augment their number where possible.

Private and quasi-public service facilities which are compatible with the management objectives established for the river would continue.

The development plan includes:

Major Public Use and River Access Areas--Three areas are planned: (1) Metal Ford (river mile 104) to be developed by the managing agency in cooperation with the National Park Service and the Natchez Trace Parkway; (2) Slink Shoals (river mile 63) in the vicinity of Flat Woods; and (3) Blue Hole Bridge (river mile 13) near I-40. It is desirable that about 50 acres in fee title at each site be acquired for facility development and river access.

Each site would serve as a visitor contact center, in addition to providing recreation development for picnicking, overnight camping, hiking, nature study, and river access. One area, the Slink Shoals site, would serve both "recreational river area" and "scenic river area" users while the Metal Ford and Blue Hole Bridge sites would be oriented "scenic" and "recreational," respectively.

Minor Public Use and River Access Areas--Six sites are planned which would accommodate day use visitors and serve as beginning or termination points for river trips lasting about 1 day. Overnight camping would not be permitted or would be primitive in character since such facilities would be provided at the three major public use areas. It is desirable that about 10 acres be acquired at each site in fee title for facility development and river access. Each site should have, as a minimum, sanitation facilities, water, picnic facilities, parking area and boat access.

Minor public use and river access areas are:

		(river mile)
1.	Barnesville Bridge	111
2.	North Riverside	90 1/2
3.	Bell Bridge	73
4.	Linden	41 1/2
5.	Lobelville	26
6.	Link Bridge	Duck River

River Access Areas--Six sites are planned which would provide river access only. These points of access would allow ingress and egress to users desiring less than a full day on the river. About 5 acres should be acquired at each site. Facility development would be minimal including parking, launching ramp, sanitation facilities, and refuse receptacles.

River access areas are:

		(river mile)
1.	Henry Bridge	117
2.	Grinders Creek	98
3.	Topsy Bridge	80 1/2
4.	Little Opossum Creek	59
5.	Sugar Hill Bridge	52
6.	Beardstown	31 1/2

Overlook--One scenic overlook is planned at Pine Bridge adjacent to State Highway 13. This bluffed area rises to an elevation of about 230 feet above the Buffalo River (river mile 67) and its flood plain providing a spectacular view. Approximately 150 acres in fee title would be needed to protect this area from encroachments and to permit a minimal level of development. Development would include parking, interpretive facilities, and associated hiking and nature trails. This site could accommodate large numbers of visitors without degrading the river resource.

Standing Rock--It is desirable to include this outstanding geologic feature (river mile 17) within the river corridor by scenic easement.

Cost of Establishing and Operating the Planned River
(1974 dollars)

Acquisition costs for the 400 acres of land in fee title and 2,850 acres in scenic easement would be approximately $280,000 and $1,596,000 respectively for a total of $1,876,000. This estimate is based upon the Tennessee Valley Authority's appraisal of land values along the Buffalo River in March 1968 and adjusted to 1974 by the U.S. Department of Agriculture index adjustment factor. Accordingly, costs per acre approximate $700 and correspond closely with similar lands purchased for the Normandy reservoir project on the Duck River in 1970-1973. The cost of easement has been estimated at 80 percent of fair market value or in this instance $560 per acre.

Closer estimates would require a field inspection of acquisitions sites and a study of local sales by a competent appraiser to ascertain fair market values.

Approximately $920,000 would be needed for facility development to support levels of recreation use on the Buffalo River consistent with preservation of the values for which the area is established. This estimate is based on the use of standards and facilities to provide high quality recreaton.

Annual operation and maintenance costs are based on the full time staff and support activities estimated to be required for the facilities. These costs are expected to be approximately $100,000 per annum.

Management Alternatives

Several alternatives including State-local, joint Federal-State, exclusive Federal control, and "no action, i.e., allowing present trends in land use and development to continue, have been considered. For each alternative explored, except for the "no action" alternative, it is assumed that the administering agency or agencies would act favorably and promptly to implement and carry out proposals which would protect and enhance present river values. For all alternatives, including "no action," the National Park Service would continue to administer those portions of the Natchez Trace affecting the Buffalo River, as it does now, in cooperation with the designated administering agency.

Protection Through State-Local Action--Within the framework of existing legislation, the State of Tennessee, in consonance with local units of governments, organizations and individuals, could implement and achieve effective protection and management of the Buffalo River and adjoining lands outside the designated river corridor. Management objectives, including the maintenance of the Buffalo River in a free-flowing condition without alteration, can be satisfied by creating a river basin authority under Tennessee law. In addition, flood plain and other protective zoning measures executed by the county courts could provide additional control throughout the river area by extending the buffer zone beyond designated river boundaries.

The State of Tennessee through the State Planning Commission has the power to create regional planning commissions and to define the boundaries of such regions (see Appendix D). These commissions by law are merely advisory. Each county is empowered to establish zones for the uses of lands within the county which lie outside of municipal corporations. Any regional zoning plan executed by counties must be approved by a regional planning commission.

Examples of how a basin authority might be created under Tennessee State law to join local and State interests in solving problems of mutual concern and benefit is exemplified by the creation of (1) the Upper Duck River Area Development Agency, (2)the Beech River Watershed Development Authority, and (3) the Chickasaw Basin Authority.

(1) Upper Duck River Development Association--In 1964, a group of citizens in the Duck River area formed the upper Duck River Development Association and sought the aid of the Tennessee Valley Authority in relation to certain water problems therein. The following year the General Assembly of Tennessee created the Tennessee Upper Duck River Development Agency (TUDRDA), Tennessee Public Acts of 1965, ch. 80; cf. T. C. A. § 13-1408, to formulate and execute programs to develop the resources of the area. One year later, the Tennessee State Planning Commission designated the directly affected four-county (Bedford, Coffee, Marshall and Maury) area as a planning region, creating the Upper Duck Regional Planning Commission as the operating branch of such developmental effort. Plans for the Duck River project were completed in September 1968 with the issuance of the Tennessee Valley Authority's project planning report No. 65-100-1

the following October. The Tennessee Valley Authority submitted its budget program for the fiscal year 1970 to the Congress in January 1969. The Congress appropriated initial funds for the project on December 11, 1969, and made further appropriations for the fiscal years 1971, 1972, 1973, and 1974. On July 1, 1971, TUDRDA entered into contracts with the appropriate agencies of cities of Columbia, Lewisburg, Manchester, Shelbyville and Tullahoma, Tennessee, to fulfill its obligations to the Tennessee Valley Authority. Monies are currently being paid into a trust fund for the Federal Government under the agreement of TUDRDA and TVA.

(2) Beech River Watershed Development Authority--The Beech River Watershed Development Authority (BRWDA) was organized under the provisions of House Bill 814 (Chapter 315, Private Acts of 1961) for the purpose of formulating and executing a plan for the comprehensive development of the resources within the Beech River Watershed in cooperation with local, State, and Federal agencies.

This bill provided that BRWDA was to be managed by a nine-member Board of Directors composed of State and local county officials, and additional members appointed by the governor from the counties involved. The BRWDA received authority to (1) make and execute contracts; (2) acquire land; (3) be exempt from taxation on the land acquired; (4) issue bonds; and (5) accept financial or other assistance from the State of Tennessee, the Tennessee Valley Authority, other Federal agencies, counties, municipalities, and private organizations. By agreement, functions and responsibilities of the parties involved and the fiscal arrangements were defined. In this instance, the State of Tennessee agreed to undertake detailed surveys to determine local opportunities for resource development, and the Tennessee Valley Authority agreed to assist in surveys, collect necessary hydrologic data, furnish technical planning assistance, and to finance land acquisition and water resource developments. The BRWDA agreed to manage, maintain and appropriately develop the land and water resources.

(3) Chickasaw Basin Authority--The Chickasaw Basin Authority organized under the provisions of Senate Bill 413 (Chapter 409, Private Acts of 1973), was created for the purposes of "reshaping" three rivers, 10 cities and the million acres of southwest Tennessee and north Mississippi land that form the valleys of

the Wolf, the Nonconnah and the Loosahatchie. Because of poor land-use practices coupled with highly erodable soils, this area has been gradually denuded of most of its topsoil and more than a hundred miles of creek and river have been clogged with sediment. The result has been yearly flooding, imperiled agriculture, and a loss of streamside recreation--recreation that is vital to a rural and expanding metropolitan population. The Chickasaw Basin Authority is a 15-member instrumentality of the State of Tennessee, with voting representation from four Tennessee counties, the city of Memphis, and the governor, capable of preparing and implementing a comprehensive plan for development of the water, land and related resources of the Chickasaw Basin area.

These three cooperative ventures, in comprehensive resource planning and development between the local people, the State of Tennessee, and the Federal Government demonstrate the capability and applicability of implementing a comprehensive development program within small watersheds in Tennessee and within the Tennessee valley region. Problems related to land and water resource management, law enforcement, and indiscriminate public use demonstrate a need for comprehensive and coordinated planning along the Buffalo River. The relatively new concepts and policies generated by land-use planning and multiple utilization of natural resources would necessitate the establishment of special organizations or agencies not typically found in an existing governmental structure.

The concern expressed by local interests, particularly riparian landowners within the Buffalo River area, dictates a detailed evaluation of a locally administered program that would ensure protection of the river resource.

There is existing legislation within Tennessee that provides guidelines for establishing locally based water resource planning agencies. The agencies are legislatively chartered and remain organizations of the State with locally defined administration and authority.

The following guidelines are suggested for incorporation in any program formulation or specific legislation intended to establish a local planning and administrative authority within the Buffalo River area:

1. Coordinated joint action between respective governmental agencies and the private citizenry in the immediate river area should be emphasized.

2. The establishment of a specific planning and administrative agency for the Buffalo River area is suggested. The agency should be instituted by the General Assembly of Tennessee and emphasize local management and administration.

3. The goal of the agency should be the establishment of a program along the Buffalo River that ensures preservation and protection of that natural resource in a manner compatible with riparian land use and management objectives.

4. The agency should coordinate all water and land-use planning, development, and administration within a specified boundary area along the Buffalo River.

5. Agency membership might include the following:

   a. The county judges from Humphreys, Perry, Wayne, Lewis and Lawrence Counties.

   b. Five (5) riparian landowners.

   c. The Chairman of the Board of the recently established "Buffalo River Preservation Association."

   d. Respective State Senator (ex officio).

   e. Respective State Representative(s) (ex officio).

   f. One (1) representative from the Tennessee Department of Conservation.

   g. One (1) representative from the Tennessee Wildlife Resources Agency.

   h. One (1) representative from the Executive Committee of the Board of Directors from the South Central Development District.

6. The agency should act only by vote or concurrence of a majority of a quorum of the membership; a quorum should not be less than 50 percent of the agency membership.

7. The agency should guide and assist local governments in making maximum use of Federal, State, and local programs that contribute to the preservation and protection of the Buffalo River.

8. The State should underwrite 100 percent of the capitol costs and operation expenses of the agency.

9. The agency should have the authority to exercise land acquisition as necessary within a specified boundary.

10. The agency should not possess the power of eminent domain.

11. The agency should have authority to enter into contracts and cooperative agreements as necessary to satisfy goals and objectives.

12. The agency should have authority to accept grants, funds, and other assistance as may apply to program needs.

13. The agency should adopt a comprehensive plan for implementation of the respective program. The plan should include, as a minimum, a procedural approach for ensuring preservation of the immediate Buffalo River area in a manner that enhances orderly growth, safety, welfare, and development of that area.

14. The agency should construct, operate, manage, lease, and maintain all facilities and projects incidental to the program.

With the enactment of State legislation in 1965, the creation of development districts by counties and cities within confines of certain planning areas designated by the governor were permitted. Counties within the State have since organized themselves on a regional basis in order to carry on general and comprehensive planning activities in a coordinated, efficient and orderly manner. Under the development district, organization counties are guided and assisted in making the maximum use of Federal, State, and local programs designed to stimulate economic development and utilization of the region's resources. Each district is governed by a Board of Directors which is composed of representatives of the counties, incorporated municipalities, and local agencies dealing with industrial development or promotion.

Two development districts could participate in preserving the natural qualities of the Buffalo River--the Mid-Cumberland Development District in Humphreys County and the South Central Tennessee Development District in Perry, Wayne, Lewis, and Lawrence Counties. Also, through the efforts of the Tennessee Wildlife Resources Agency, the Tennessee Department of Conservation, and the Tennessee Water Quality Control Board, the State has necessarily developed a close working relationship with local residents in regulating, enforcing, and conserving river related resources. These lines of communications could be strengthened to encourage local participation in a scenic rivers program thus assuring maximum local involvement and a means to exercise selfimposed control over inappropriate development and land use.

Under this alternative, the State of Tennessee could provide for the added protection of the Buffalo by requesting the Secretary of the Interior to designate the river as a part of the National System. Section 2(a)(ii) of the Wild and Scenic Rivers Act provides that State rivers which are designated as wild, scenic, or recreational river areas by or pursuant to an Act of the State legislature and which are permanently administered as such by an agency or political subdivision of the State at no cost to the United States and which meet the criteria in the Act and the guidelines may, upon application by the Governor, be included as State administered components in the National System by the Secretary of the Interior.

Protection Through Cooperative Federal-State Action--Under this alternative, two options are possible. One option would be the immediate implementation of a program by the Tennessee Valley Authority to protect and utilize the Buffalo as a river demonstration project. The second option would necessitate delayed program implementation pending the inclusion of the river in the National Wild and Scenic Rivers System by Act of Congress.

1. The Tennessee Valley Authority could implement, within the framework of its existing authority, a river demonstration project that embraces the concept presented herein. Cooperative agreements would specify the extent and willingness of the State or its political subdivisions to participate in the formulation of the river master plan, its implementation, and related project costs.

This option could, for example, provide for the immediate acquisition of the river corridor by the Tennessee Valley Authority with all development, operation, maintenance and replacement carried out by the State or its political subdivisions.

Eventual designation of the demonstration project as a wild and scenic river by an Act of Congress would provide the added protection a river receives as a result of being included in the National System. The designation would remove any conflicting options open to the Tennessee Valley Authority, such as impounding the Buffalo should this kind of development prove to be feasible in later years.

2. The Buffalo River could be jointly administered by the State of Tennessee and a Federal agency. Written cooperative agreements between the State and Federal Government could be entered into outlining the responsibilities of each party for acquisition, development and management. Under this option, the river would be included in the National Wild and Scenic Rivers System by an Act of Congress and would be administered by the State of Tennessee and the designated Federal agency.

Protection Through Federal Action--Under this alternative, the Buffalo River could be administered as a Federal component of the National Wild and Scenic Rivers System by either the National Park Service or the Tennessee Valley Authority upon its inclusion in the National System by an Act of Congress. Acquisition, development, and annual operation costs would be the responsibility of the designated managing agency with options open to the State and local agencies who may also share in management, administration, and related project costs if they so desire. The master plan for the Buffalo Wild and Scenic River would be prepared by the administering agency in cooperation with the State and affected counties.

"No Action"--One alternative is to do nothing. It is generally agreed that because of inevitable changes in the Buffalo River basin some form of concerted, uniform, and enforceable land-use standards must be created which would give appropriate recognition and treatment to those resources which comprise a quality environ-

ment, including the Buffalo River. Problems are encountered, however, when moving from general approval of an idea to quantitative specifics for implementation.

Without controls such as zoning or other regulatory measures, land along the river may be converted from its present use of cropland, pasture and woodland into summer homes, residences and other permanent structures. In addition, the exploitation of the river resources by private interests could pose a serious threat to the river's scenic beauty and water quality.

Through the cutting and the clearing of woodlands, shorelines have and are being converted to agricultural or other uses. The conversion of these lands often results in severe bank erosion and sedimentation problems, the reduction of wildlife cover and food sources, and the deterioration of quality recreation experiences. The cutting of trees that afford shade to streams may result in increased water temperatures and thereby contribute to the impairment of desirable aquatic life forms.

Management Proposal--The excellent scenic, recreational, and other qualities of the Buffalo River have been described in considerable detail in this study. These qualities are such that the study team concluded that the river (1) does qualify for inclusion in the National Wild and Scenic Rivers System by meeting the "scenic" and "recreational" criteria established by the Wild and Scenic Rivers Act, and (2) that, because of the diminishing number of rivers in this region that have these qualities, the Buffalo River should be preserved for the appreciation and enjoyment of present and future generations of Americans.

The Buffalo River is a river that can be enjoyed by many people, the picnicker, the fisherman, the beginning boater, local residents and visitors from afar. There is at the same time, a strong sense of proprietorship in the river among the residents of this area, especially among those who live and work close to the river banks. There is also a strong desire on their part to have a voice in any type of action associated with the river and its future. It is for these reasons that preservation and management of the Buffalo River through State and local action is the recommendation of this study.

As discussed in the alternative for State and local action in this chapter, the State has carried out effective river management programs in cooperation with specially established local entities in other rivers of the State and there is reason to beleive that effective cooperative management can also accomplish what is needed for the Buffalo River's management. Should national status for the river be desired in the National Wild and Scenic Rivers System, the provisions of Section 2(1)(ii) of the Wild and Scenic Rivers Act, as amended, could be applied. Furthermore, funding assistance under the Land and Water Conservation Fund program would be available should it be needed for acquisition and development costs.

Management Objectives

The management objectives for the Buffalo River should be to protect and enhance the values which caused it to be considered for inclusion in the National Wild and Scenic Rivers System, without limiting other uses that do not substantially interfere with public use and enjoyment of the river. The river should be managed to:

. . . Maintain its free-flowing condition and pastoral setting.

. . . Protect and enhance the scenic, recreational, geologic, fish and wildlife, historic, cultural, archeological, scientific, and other similar values.

. . . Prevent degradation of existing water quality.

. . . Provide for public access, use, and interpretation of important scenic, recreational, geologic, fish and wildlife, and similar resources, consistent with the protection and enhancement of the river's quality and its immediate environment for now and the future.

. . . Provide high-quality recreational opportunities associated with a free-flowing river at a level of use that does not result in resource deterioration or cause an adverse impact on adjacent landowners.

. . . Provide for the use of fish and wildlife resources within the framework of appropriate Federal and State laws.

Some specific management suggestions are:

. . . Emphasis should be placed on the development of water-oriented recreation facilities that would provide a wide range of compatible recreation activities.

. . . Efforts should be made to regulate the visitor-use of the Buffalo River to assure that visitor-use will not exceed levels which would endanger those values which caused the river to be considered as worthy of inclusion in the National System of Wild and Scenic Rivers. Because the long-term and continuing impact of human use on the river and its environment is not fully understood, existing levels of recreation use may be subject to change by either restricting or increasing them. These levels of use will depend to a large extent on the administering agency monitoring the impact and effect of measured visitation on the resource and the river experience, and making the appropriate adjustment.

. . . Any information program prepared for visitors and users of the river should stress the rights of private property owners adjacent to the river in addition to the rights and conditions for the use and enjoyment of the river.

. . . Additional areas or alternative access locations should be provided only if it is affirmatively demonstrated that such development is desirable and compatible with the established management objectives. In all instances, facility development should not detract from the quality of the river scene and should be designed to protect soils, vegetation, fish and wildlife, and to prevent conflicts with other recreation use.

. . . Interpretation of the historical and natural features of the river for the educational and recreational benefit of its users is an important management objective. The interpretive devices and signs should be kept to a minimum on the more natural stretches of the river and be relatively unobtrusive or complementary to the natural and historical scene.

. . . The use of motorized vehicles and watercraft for recreation purposes should be strictly controlled on the "scenic" portions of the river. Less stringent controls may be possible on the "recreational" river areas.

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

. . . Timber harvesting within the river corridor should be regulated in order to retain the river's visual and environmental integrity. Some selective harvesting support rather than detract from management objectives.

. . . Removal of bankside vegetation should be prevented, and where necessary, revegetation should be considered in order to maintain the natural or scenic values.

. . . Since the living communities of the river are especially susceptible to pollution, careful attention must be given to the planning and construction of development along the river and its tributaries. A program for monitoring chemical, biological, and physical water quality characteristics should be established.

. . . Efforts to reduce siltation through land conservation measures throughout the watershed should be intensified. Further investigation should be made of the feasibility and desirability of additional watershed projects which may protect the scenic and natural values of the Buffalo River.

. . . No alteration of the natural channels in the basin that significantly affect the free flow of water should be permitted unless it is clearly demonstrated that such alterations would have no adverse effect on the scenic and recreational river reaches.

. . The taking of gravel from the riverbed should be prohibited within the riverway. Gravel operations in the flood plain adjacent to the riverway should be closely monitored so that they do not adversely affect river values.

. . . A vigorous State-local cooperative program to control littering and dumping along the river should be initiated.

. . . New utilities should be located out of sight or otherwise screened from view of the river where possible. Generally, no new utility or transmission lines should cross the river. Where it is essential that they do, existing rights-of-way should be used if possible or facilities designed and located to minimize impact.

. . . Efforts should be made to encourage local units of government to apply zoning controls to lands adjacent to the river corridor, particularly in the flood plains and nearby developed areas to ensure the control of all future actions which would adversely affect the Buffalo as a wild and scenic river.

VIII. ECONOMIC IMPACT OF PROPOSAL

The characteristics of the resources of the Buffalo River are, when compared to other watershed areas in Tennessee, uniquely different insofar as social and economic potentials are concerned. As it exists today and has for several decades, the Buffalo River system is potentially a primary source of outdoor recreation opportunity in middle Tennessee. The natural, cold water stream is one of the few free-flowing rivers of its length remaining in the State. It is a scenic area to which very little industry has moved. The area is almost exclusively timber and cattle country. Except for the lower Buffalo below Lobelville, the industrial potential of the area immediately adjacent to the river has proven to be discouraging. The Buffalo drains one of the least populated sections of the State and except for Interstate 40 there are no major highways or railroads within the watershed. There is little in the way of structured improvements that could be done to the river itself or on its tributaries that would assure the greater economic development of the counties through which they pass. Unlike the neighboring Duck River, the Buffalo is of a size to discourage commercial navigation resulting in only negligible justification on the development of waterborne commerce. Electric power to enhance the growth of the region is available at the same price and in the same quantity regardless of any multiple-purpose dam construction on the Buffalo. If flood control was an important factor in the agricultural development of streamside lands, then this factor might support the argument in favor of dam construction on the Buffalo. But it is felt that none of these factors would provide the justification needed for such an expenditure of public funds. In fact, dam construction would in all probability inundate permanently those bottom lands now subject only to periodic flooding.

The Buffalo River basin, with its many "natural" characteristics, is particularly well adapted for public recreation use and development (including fish and wildlife). It is foreseeable that because of the proximity of the Buffalo River to more urbanized and industrialized areas in middle Tennessee, it would fill a vital gap in providing needed recreation opportunity not commonly found elsewhere in the State.

52-150 O - 79 - 11

The development of the Buffalo River as a scenic and recreational river would necessarily preclude the development of river shorelines for residential or commercial purposes. However, the mere presence of a wild and scenic river would tend to enhance the value of property adjacent to and in the vicinity of the river corridor boundaries. No significant amount of agricultural or timberland would be taken out of production; however, some tax loss would result to local units of government from purchases of land in fee or easement. No existing structures or plans for development of the mainstem of the river for power, flood control, water supply, or navigation would be affected by implementing this proposal.

The primary benefit to be derived from the inclusion of the Buffalo River in the National Wild and Scenic Rivers System would be the protection of a natural river environment for the use and enjoyment of present and future generations. Recreational values inherent in the river would be utilized and not lost to riverside development. In all probability, local economy would be stimulated by expenditures from those visiting the area as a result of implementing this proposal.

Recreation

In order to assess generally how the region's economy may be impacted as a direct result of recreation expenditures stimulated by project implementation, a comparative analysis was made between the Buffalo River and the Crow Wing Trail Project in Minnesota.[1/] These two rivers, although some distance apart, exhibit like characteristics and clientele (Table 23).

The Crow Wing Canoe Trail Project, initiated in the fall of 1963, serves as an example of how a lightly used scenic stream was developed and the impact of that development on local and surrounding economy. Since the resource in both instances is similar and the development concepts for both rivers parallel, the economic impact of developing the Buffalo River as a wild and scenic river should be comparable.

1/Economic Impact of the Crow Wing Canoe Trail, Wadena County, Minnesota, U.S.D.A., Economic Research Service in Cooperation With the Minnesota Agricultural Service Experiment Service, 1971.

TABLE 23
COMPARABLE PERTINENT DATA -
BUFFALO RIVER, CROW WING RIVER

Item	Crow Wing	Buffalo
Location (State)	Minnesota	Tennessee
River Length (miles)	70	117
Level of Difficulty	Beginner-Novice	Beginner-Novice
River Flow	Sustained-Rec. Season	Sustained-Rec. Season
River Setting	Pastoral	Pastoral
Recreation Season	April-August	April-August
Maximum Use Period	July-August	July-August
Number of Access Points	21 County Roads	18 County, State Roads
Recreation Facilities	14 Campsites In Conjunction With Access	None Unregulated Use
Hiking Trails	55 Miles	None
Canoe Rentals	80	50
Competing Water-Oriented Supply	Lake-Based Resort	Lake-Based Resort
Market Area of Canoe Trail	Adjacent Counties Twin-City Metro Area-- 744,380-1970 Pop., 150 Miles South	Adjacent Counties Nashville-Memphis Metro Areas-- 1,071,533-1970 Pop., 65 Miles East and 155 Miles West
Population Characteristics	Rural	Rural
Area Economy	Agriculture-Livestock	Agriculture-Livestock

Major developments on the Crow Wing River include:

(1) access points and campsites; (2) supporting services; (3) promotion of the area for its recreation opportunity. Of the 14 campsites, only three existed prior to development. Each campsite provides camping facilities and were essentially completed at the beginning of the 1965 canoeing season. In 1967, there were three private enterprises with a total of about 80 rental canoes. A 55-mile multipurpose trail was developed in 1969 to complement the canoe trail. Developed campsites now serve canoeists, horseback riders, and hikers.

As characteristic of the Buffalo, the Crow Wing Canoe Trail lies in a rural agriculture area dominated by a crop and pastureland setting. The forests along major streams consist of softwoods and hardwoods. In the vicinity of the canoe trail, wildlife is abundant and fishing on the river is considered good. Stream flow during dry periods is constantly being sutained by lakes and marshes in the watershed. Recreation facilities in the near vicinity include the traditional Minnesota pattern with lake-based resort facilities.

Crow Wing River canoeists include family groups, organized groups, childrens' camp users, and other nonfamily groupings. Visitor data shows that canoeing on the Crow Wing River begins as early as April, lasts through October, and reaches its peak in July and August. This use period is indicative of the Buffalo River. Visitor data also shows that only 20.5 percent of the users originated locally.

Use on the Crow Wing was light before development, increasing sevenfold between 1964 through 1967 after the decision was made to develop and promote the river.

As shown in Table 24, canoeists visiting the Crow Wing in 1967 spent $10.15 per person. An undetermined portion of this expenditure was made to recipients outside the immediate area in order for the participant to arrive at his destination point on the Crow Wing.

TABLE 24
ESTIMATED EXPENDITURES OF CANOEISTS PER TRIP,
CROW WING RIVER AREA, 1967

Item	Expenditures per person	Total
	Dollars	Percent
Food	$ 3.74	37
Lodging	0.20	2
Auto expenses	1.16	11
Equipment purchase	0.51	5
Equipment rental	3.93	39
Other	0.61	6
Total	$10.15	100

Source: Wadena County Park Board.

Firms deriving the most benefit from sales in 1967 were, in descending order, equipment rentals, food, and auto services. Lodging expenditures were small since most canoeists camped at designated camping areas. The "other" category of expenditures includes such items as insurance, fishing licenses, and entertainment.

The "new money" introduced in the local economy generates added income through the multiplier effect. From all indications, each dollar spent by customers generates an additional $0.50 to $1.00 into the local economy.

Other economic impacts which may have resulted from the Crow Wing Trail, but not included in the foregoing expenditure estimates, were judged to be (1) local expenditures by local picnickers because of developed facilities; (2) tourist and sightseeing traffic attracted by publicity; and (3) interest in real-estate.

Real Property

The unique qualities which make land attractive for inclusion into a recreation area also appeal to private investors and developers causing at times significant increases in land values both inside and outside proposed project boundaries. Price increases result from strong demand and competition in the market place for vacation homesites and in particular for lands associated with water such as the Buffalo River. Generally, the point at which Federal interest has the greatest effect upon land values appears to be about the time of authorization of a project.

As indicated by the experience of various Federal agencies there has been a steady upward trend in land values due to inflation and increased demand almost everywhere in the Nation at a rate of 5 percent to 10 percent per annum. Since farm real-estate is quite often the kind of land which is sought for recreation, the indices established by the Economic Research Service may be indicative of general trends in recreation land values in the Buffalo River area. The estimated average increase in land values by this index is 6 percent. Assuming that the price of land adjacent to the Buffalo River corridor follows this same general trend, it would double every 12 years at 6 percent compounded annually.

By applying the above factor to a 300-foot-wide strip contiguous to and paralleling lands proposed to be acquired both in fee and easement, net increase in land value on this basis is established at $5,957,000 for the first 12-year period.

$$\frac{\text{300-foot strip X 117 miles X 5,280}}{43,560} = 4,255 \text{ acres}$$

2(4,255) = 8,510 acres (both sides river)
Present land value @ $700 per acre X 8,510 acres
= $5,957,000

Forestry

Approximately 40 percent of the land located within 1/4 mile of the Buffalo River is classified as commercial forest. The remainder of land lying within this corridor is used for agricultural purposes.

High-grading and other destructive cutting practices have contributed to a decline in the amount of high-quality timber along the Buffalo during the past 10-15 years. As a consequence, streambank trees are predominantly noncommercial in species, size, and quantity. For the most part, timber stands have been heavily cut over and are badly in need of improvement.

It has been determined from general observation and extensive cruises in timber stands representative of the forest as a whole and from survey data[1/] that the woodlands within 1/4 mile of the Buffalo River average 2,500 board feet (Doyle Rule) per acre. Present value of timber at $50 per thousand board feet delivered at the mill is $125 per acre. It is estimated, using the referenced survey data, that the mean annual increment is 75 board feet per acre (Doyle Rule) and at $50 per thousand board feet is $3.75/acre/year ($3.55 + 5% interest and rounded off to closest $0.05). Assuming $0.75/acre/year management costs the net annual equivalent return would be $3.00/acre/year.

1/Forest Statistics for Tennessee Counties, 1971, by A. Hedlund; Southern Forest Experiment Station, U.S.D.A., U.S. Forest Service by J. M. Earle

Based on an average of 27.8 acres per mile for 117 miles of river and assuming streamside land to be 40 percent wooded, there are approximately 1,300 acres of timberland that would be affected by this proposal.

Using 1970 dollars, the values foregone over 50 years by not harvesting this timber are computed by capitalizing this $3.00/acre/year at 6-5/8 percent for 50 years. The harvest values foregone equal $67,883.03.

Agriculture

The value per acre of cropland and pasture shown below is the total net return per acre impacted to land, management, and capital and is believed to reflect the potential value of productivity from soils located within the Buffalo River corridor.

	Net Return/Acre[1/]
Corn, Grain	$125.00
Corn, Silage	125.00
Soy Beans	120.00
Hay	60.00
Pasture	10.00

SOURCE: SCS Washington, D.C., 1977

Of lands involved in the Buffalo River proposal, approximately 2,850 acres could be purchased by scenic easement. About 60 percent, or 1,710 acres of this land, is presently used for agricultural purposes and would, under this proposal, continue to be utilized as such with no loss of net returns.

Total acquisition of land in fee-title under this proposal could amount to about 400 acres of which approximately 240 acres or 60 percent is utilized for agricultural purposes. Of the 240 acres, 75 percent or about 180 acres represents pastureland with the remainder of cropland. Agricultural production from

1/ Based on 1969 cost and price levels.

these 240 acres of land would terminate. Based on these assumptions, without leaseback arrangements, annual values foregone for the next 50 years are computed by capitalizing the above net returns at 6-5/8% interest for 50 years.

180 acres pasture and hay @ $35.00/acre[1/] capitalized at 6-5/8% for 50 years = $156,006.97
60 acres cropland (including corn, soy beans)[1/] @ $122.50 capitalized at 6-5/8% for 50 years - $182,078.14

Total accumulated annual value lost to year 2020 at 5 percent compounded annually would be:

pasture = $156,066.97
cropland = $182,078.14

Compiling these values for forestry and agriculture shows:

Land Use	Acreage Affected	Acreage Annual Income (or) Net Return/ Ac/Year	Equivalent Capitalized at 6-5/8% for 50 years
Pasture & Hay	180 ac.	$35.00	$156,066.97
Cropland	60 ac.	122.50	182,078.14
Forest	1300 ac.	3.00	67,883.03
Total			411,028.14

Thus the total values foregone from changing land use from the present forestry and farming, if the proposal is followed would be $411,028.14.

Other Uses

No other commercial activities of significance are known to exist at this time in the proposed area. Potential uses of the resources other than those discussed are not foreseen. The trend for recreation in this area is well established and is expected to continue.

1/Based on average.

APPENDIX A

LETTERS OF REVIEW AND COMMENT

United States Department of the Interior

OFFICE OF THE SECRETARY
WASHINGTON, D.C. 20240

OCT 5 1976

Dear Mr. Train:

In accordance with the provisions of the Wild and Scenic Rivers Act (82 Stat. 906), copies of the Department's proposed report on the Buffalo River, Tennessee, are enclosed for your review and comment.

In accordance with Section 4(b) of the Act your views, together with our comments thereon, will accompany the report to the President. The Act further provides up to 90 days for your review. Accordingly, we would appreciate receiving your comments within 90 days of the date of this letter.

The Bureau of Outdoor Recreation's Southeast Regional Office in Atlanta is distributing this report to Federal agencies at the regional and field levels and to appropriate State agencies in Tennessee.

The Bureau of Outdoor Recreation is providing staff assistance on this proposal and can provide any further information you need to complete your review. Please contact Assistant Director, A. Heaton Underhill (Area Code 202-343-5723) if you have any questions.

Sincerely yours,

/s/ Thomas S. Kleppe

Secretary of the Interior

Honorable Russell E. Train
Administrator
Environmental Protection Agency
401 M Street, S.W.
Washington, D. C. 20460

Enclosure

IDENTICAL LETTERS SENT TO: (with two copies of the report)

Honorable Ray Blanton
Governor of Tennessee
Nashville, Tennessee 37219

Honorable Earl L. Butz
Secretary
Department of Agriculture
Washington, D. C. 20250

Honorable William T. Coleman, Jr.
Secretary
Department of Transportation
Washington, D. C. 20590

Honorable Richard L. Dunham
Chairman
Federal Power Commission
Washington, D. C. 20426

Honorable Warren D. Fairchild
Director, Water Resources Council
2120 L Street, N. W.
Suite 800
Washington, D. C. 20037

Honorable Carla A. Hills (Mrs.)
Secretary
Housing and Urban Development
Washington, D. C. 20410

Honorable Martin R. Hoffmann
Secretary
Department of the Army
Washington, D. C. 20310

Honorable Elliot Richardson
Secretary
Department of Commerce
Washington, D. C. 20230

Dr. Robert C. Seamans
Administrator
U. S. Energy Research and
Development Administration
Washington, D. C. 20545

Mr. Aubrey J. Wagner
Chairman, Board of Directors
Tennessee Valley Authority
Knoxville, Tennessee 37902

Honorable Frank G. Zarb
Administrator
Federal Energy Administration
Washington, D. C. 20461

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cc: Secretary's File
Secretary's Reading File (2)
FOR Files/Chron
RAS (2)
AS/FW
SERO

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cc: sent to the following (with one copy of report)

Mr. James Beach, FWS
Mr. J. P. Crumrine, PB
Dr. Richard Curry, NPS
Mr. Will Dare, BM
Mr. George E. Davis, BIA
Mr. Don Dworsky, OMB
Mr. Robert R. Garvey, Jr.
(Advisory Council on
Historic Preservation)
Mr. David Gudgell, BR
Mr. Milton O. Hackett, GS
Mr. Roman H. Koenings, BLM
Mr. Richard Leverty, CE
Mr. Max Ramsey, TVA
Ms. Mary Reece, EPA
Mr. Douglas Shenkyr, FS
Mr. David Watts, SOL

STATE OF TENNESSEE

RAY BLANTON
Governor

EXECUTIVE CHAMBER
Nashville 37219

March 29, 1977

The Honorable Cecil D. Andrus
Secretary of the Interior
Washington, D.C. 20240

Dear Mr. Secretary:

The Executive Office has reviewed the draft report on the Buffalo River Wild and Scenic River Study (June, 1976) as prepared by the Bureau of Outdoor Recreation.

This Office is in concurrence with the study findings that the Buffalo River qualifies for inclusion in the National Wild and Scenic River system; and that efforts to secure preservation and protection of the stream should be achieved through State and local government action.

In order to ensure effective local participation and guidance, the State insists that all project planning reflect the efforts and consideration of the Buffalo River Preservation Association (BRPA). This Association of riparian landowners is a non-profit citizen organization incorporated for the purpose of promoting local control and authority in river resource management.

In an attempt to assist the BRPA this Administration has introduced legislation before the 90th Tennessee General Assembly which, if passed, will authorize the Department of Conservation to provide technical and financial assistance to qualified corporations for the purpose of planning, developing, maintaining and/or managing recreational facilities along river corridors. This effort is consistent with the State-Local implementation alternative as discussed in the draft report.

The Honorable Cecil D. Andrus
March 29, 1977
Page 2

It is understood that the State of Tennessee may, if it deems appropriate, subsequently petition the Secretary of the Interior regarding inclusion of the Buffalo River in the National Wild and Scenic River system per Section 2(a)(ii) of PL 90-542. Such administrative action would of course require endorsement by the Tennessee General Assembly.

This Office appreciates the opportunity to examine the study report on the Buffalo River and looks forward to cooperative efforts with the Department of Interior as well as the BRPA in achieving protection of this valuable resource.

Sincerely,

Ray Blanton

RB/bg

NOTE:

Since several of these letters of comment refer to the State of Tennessee letter dated April 29, 1975, printed in the June 1976 review report, that letter is also included here for clarity and for the information of the reader.

See page A-26.

DEPARTMENT OF AGRICULTURE
OFFICE OF THE SECRETARY
WASHINGTON, D. C. 20250

February 10, 1977

Honorable Cecil D. Andrus
Secretary of the Interior

Dear Mr. Secretary:

We have reviewed your Department's proposed report for the Buffalo River, Tennessee, as requested in Mr. Kleppe's October 5 letter.

During the various stages of the river studies, agencies in this Department were asked to review and comment on draft material. Our review of this report indicates that few of our previous comments were incorporated. While the report is not expected to be used as a basis for a Federal wild and scenic river proposal, the report undoubtedly will be used for future decisionmaking. We feel the report, in its present form, is somewhat incomplete and misleading. For example, it is our opinion that should the proposal be implemented, the agricultural values and resulting income foregone, as stated on pages 151 and 152, are grossly underestimated. In our earlier comments on the report, we provided revised data to the Bureau of Outdoor Recreation which we believe are more indicative of these values and should be used in the report. It is important that those involved in implementing the proposal are aware of all the costs involved and opportunities foregone.

Another area of the report which could be strengthened with some minor addition is the section on alternatives. We realize the river study was in an advanced stage when the Water Resources Council's Principles and Standards for planning were adopted. However, we feel the report should incorporate an abbreviated display of alternatives with benefits assigned to a system of four accounts.

We agree with the study findings and conclusions that 117 miles of the Buffalo River meet the criteria for inclusion in the National Wild and Scenic Rivers System. We also concur with

your recommendation that protection and administration of the river area should be accomplished through State and local initiative. Through various cooperative programs in the Department of Agriculture, we will continue to provide assistance to State agencies in conservation planning for the river area if requested.

We appreciate the opportunity afforded us to offer our views on your proposed report.

Sincerely,

Paul A. Vander Myde

PAUL A. VANDER MYDE
Deputy Assistant Secretary

52-150 O - 79 - 12

COMMENT

Revised figures have been provided by the Southeast Region, U.S. Forest Service, and appropriate changes in the text have been made.

UNITED STATES DEPARTMENT OF COMMERCE
The Assistant Secretary for Policy
Washington, D.C. 20230

OCT 19 1978

Honorable Thomas S. Kleppe
Secretary of the Interior
Washington, D.C. 20240

Dear Mr. Secretary:

Secretary Richardson has asked me to acknowledge the receipt of the Department of the Interior's proposed Wild and Scenic River Study on the Buffalo River, Tennessee.

I will send you the Department of Commerce's comments on this study within your stated review period.

Sincerely,

Robert S. Milligan
Deputy Assistant Secretary
for Policy Development
and Coordination

UNITED STATES DEPARTMENT OF COMMERCE
The Assistant Secretary for Policy
Washington, D.C. 20230

JAN 18 1977

Honorable Thomas S. Kleppe
Secretary of the Interior
Washington, D.C. 20240

Dear Mr. Secretary:

At Secretary Richardson's request, I am sending you comments from the Department of Commerce on your Department's proposed report on the Buffalo River, Tennessee.

The Maritime Administration found that there are no ill effects on commercial navigation, water terminal operations or related transportation planning by the elements of the proposed plan to include the Buffalo River in the National Wild and Scenic River System. Other parts of Commerce had no comment, except for the Office of Regional Economic Coordination (OREC). Comments from OREC are enclosed for your consideration.

Thank you for the opportunity afforded us to review and make comments on this report.

Sincerely,

Kenneth W. Tolo
Director
Office of Policy Development
and Coordination

Enclosure

DEPARTMENT OF COMMERCE'S COMMENTS ON THE BUFFALO RIVER WILD AND SCENIC RIVER STUDY

Office of the Secretary

Office of Regional Economic Coordination

This study is somewhat perplexing to review. In the front matter there is printed "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 study team, however, recommended that the Buffalo River be "preserved, protected, and managed as a wild and scenic river through action by the State of Tennessee and the local governments involved." Whether the River ever becomes classified as a National Wild and Scenic River in the system provided for in P.L. 90-542, as amended, was left to subsequent action by the State of Tennessee and/or local governments. This appears to be a rather limp and empty conclusion against which to seek substantial comments by Federal agencies.

According to the estimates made by the study team, to establish the Buffalo River as a Wild and Scenic River would involve costs in the order of:

$ 95,980	present value of forestry and agriculture foregone
$1,876,000	land acquisition
$ 920,000	development
$2,891,980	Total

Apart from some estimates of outlays per day by canoeists, there was no attempt to quantify the benefits that might be associated with this expenditure or foregone values. Hence, even admitting the notion of preserving the River for obvious recreational or aesthetic values, there was a lack of feeling concerning the overall validity of the proposal.

DEPARTMENT OF THE ARMY
OFFICE OF THE ASSISTANT SECRETARY
WASHINGTON, D.C. 20310

15 DEC 1976

Honorable Thomas S. Kleppe
Secretary of the Interior
Washington, D. C. 20240

Dear Mr. Secretary:

We have reviewed the draft report on the Buffalo Wild and Scenic River. It is a comprehensive report, well written and thorough in its treatment of environmental values. The following comments on the draft report are offered for your use:

a. Section III Environmental Impact. The second paragraph of this section does not seem to agree with the other two paragraphs. Paragraph 2 indicates that after making the environmental review, the Bureau of Outdoor Recreation decided not to prepare an environmental statement whereas the other two paragraphs indicate the availability of an environmental statement.

b. Page 59, Unique geological features. This is a meaningful presentation. It is not often that unique physiographic features are identified for public enjoyment.

c. Appendix C should include trees and aquatic vegetation along with shrubs and vines. Identification of unique flora, if any, would round out the treatment on vegetation.

Thank you for the opportunity to review the Buffalo River Wild and Scenic River Study.

Sincerely,

Charles R. Ford
Deputy Assistant Secretary of the Army
(Civil Works)

COMMENT

a. Section III Environmental Impace has been rewritten to remove this apparent contradiction.

b. The list of tree species occurring in the Buffalo River area was inadvertently left out of the review report but is now included. A list of acuatic vegetation was not available for inclusion.

DEPARTMENT OF TRANSPORTATION
UNITED STATES COAST GUARD

MAILING ADDRESS:
U.S. COAST GUARD (G-WS/73)
WASHINGTON, D.C. 20590
PHONE: (202) 426-2262

A [illegible] 1977

Honorable Thomas S. Kleppe
Secretary
Department of the Interior
Washington, D. C. 20240

Dear Sir:

This is in response to your letter of 5 October 1976 addressed to Secretary Coleman concerning a proposed report on the Buffalo River, Wild and Scenic River Study, Lawrence, Perry and Wayne Counties, Tennessee.

The concerned operating administrations and staff of the Department of Transportation have reviewed the material submitted. We have no comments to offer nor do we have any objection to this proposed report.

The opportunity to review this report in the proposed form is appreciated.

Sincerely,

D. J. RILEY
[illegible]

THE SECRETARY OF HOUSING AND URBAN DEVELOPMENT
WASHINGTON, D. C.. 20410

October 29, 1976

Honorable Thomas S. Kleppe
Secretary of the Interior
Washington, D. C. 20240

Dear Mr. Secretary:

I have referred your letter of October 5, 1976, requesting this Department's review and comments on the proposed report on the Buffalo River in Tennessee in accordance with the provisions of the Wild and Scenic Rivers Act, to our Atlanta Regional Office for response.

Mr. M. Bruce Nestlehutt, the Acting Regional Administrator, 1371 Peachtree Street N.E., Atlanta, Georgia 30309 is cognizant of our interest in the water and land resources of this area. He will therefore review the report for substantive concerns relating to the Department's programs and will provide the Department's views which, together with your comments, will accompany the report to the President.

We appreciate the opportunity to comment on the proposed report.

Sincerely,

Carla A. Hills

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
REGIONAL OFFICE
PERSHING POINT PLAZA, 1371 PEACHTREE STREET, N.E.
ATLANTA, GEORGIA 30309

December 15, 1976

REGION IV

IN REPLY REFER TO:
4C

Honorable Thomas S. Kleppe
Secretary of the Interior
United States Department
of the Interior
Washington, D. C. 20240

Dear Mr. Secretary:

The review draft of the Department of Interior's "Buffalo River Wild and Scenic River Study" has been forwarded to my office for review by the Office of the Secretary, Department of Housing and Urban Development(HUD). In accordance with instructions, this letter will serve as the official departmental response relating to the Buffalo River study.

The principal concerns of HUD relate to housing and community development involvements in urban and urbanizing areas. Since these concerns are not relative factors in this study, our only comment is that the action will have an indirect effect on the urban dwellers whose psychological and physical well-being are strengthened by opportunities to visit and enjoy ". . . scenic, recreational, geologic, fish and wildlife, historic, cultural and other similar values . . ." provided by rivers that are preserved in their natural state.

Thank you for the opportunity to review this study. We enthusiastically support the findings of the study that the Buffalo River be included in the National Wild and Scenic River System and that the river be administered and managed for scenic and recreational purposes.

Sincerely,

M Bruce Nestlehutt

M. Bruce Nestlehutt
Acting Regional Administrator

FEDERAL ENERGY ADMINISTRATION
WASHINGTON, D.C. 20461

NOV 12 1976

OFFICE OF THE ADMINISTRATOR

Honorable Thomas S. Kleppe
U.S. Department of the Interior
Washington, D.C. 20240

Dear Mr. Secretary:

This is in response to your letter of October 5, 1976, in which you requested the Federal Energy Administration's comments on the Buffalo River Wild and Scenic River Study.

We have completed a review of the report on the Buffalo River and found that there are no major conflicts with energy development or resources. We would, therefore, support the proposed action of incorporating the Buffalo River into the Wild and Scenic River System.

Thank you for the opportunity to comment on this study.

Sincerely,

Frank G. Zarb
Administrator

UNITED STATES
ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION
WASHINGTON, D.C. 20545

DEC 20 1976

Mr. A. Heaton Underhill
Assistant Director
Bureau of Outdoor Recreation
Department of the Interior
Washington, D.C. 20240

Dear Mr. Underhill:

This letter is in reply to Mr. Kleppe's letter of October 5, 1976, to Dr. Seamans, requesting our review and comment regarding the Buffalo River Study for possible inclusion of a portion of the Buffalo River in the National Wild and Scenic Rivers System.

My staff has reviewed the Study report and discussed portions of the Study with environmental scientists at our Oak Ridge National Laboratory, and we offer the following comments.

The Buffalo River Task Force study team apparently has conducted a full and rigorous examination of the characteristics of the Buffalo River. Further, they have arranged their study findings into an easily read quality report. Hence, their conclusion that the river possesses values which qualify it for inclusion in the National Wild and Scenic Rivers System seems to be well supported. Further, their recommendation of the "no Federal action" alternative, which would allow the Buffalo River Preservation Association to manage the river area, appears to be equally well supported.

Even though the river management would not be Federal, we hope it would be adequate to achieve the goals and objectives of the National Wild and Scenic River Act. Additionally, we hope that the Bureau of Outdoor Recreation would be able to monitor the region, and, should it develop that these goals were not being realized, that the river again would be considered for inclusion in the Wild and Scenic Rivers System under Federal management.

We appreciate the opportunity to review this Study.

Sincerely,

James L. Liverman

James L. Liverman
Assistant Administrator
for Environment and Safety

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

JAN 13 1977

OFFICE OF THE ADMINISTRATOR

Honorable Thomas S. Kleppe
Secretary of the Interior
U.S. Department of the Interior
Washington, D.C. 20240

Dear Mr. Secretary:

Administrator Train has asked me to respond to your letter of October 5, 1976, requesting EPA's comments on the Bureau of Outdoor Recreation's (BOR) Wild and Scenic River study for the Buffalo River in Tennessee.

EPA has no substantive objection to the report as written. However, we do have concerns over the selection of the "no action" alternative. The report itself (p. 137) recognizes the danger of allowing exploitation of river resources by private interests and states: "It is generally agreed that because of inevitable changes in the Buffalo River basin some form of concerted, uniform, and enforceable land use standards must be created which would give appropriate recognition and treatment to those resources which comprise a quality environment." The study continues to say that "preservation and management of the Buffalo River through State and local action is the recommendation of this study." However, the State of Tennessee letter (Appendix A) indicates that due to "intense opposition" to any Federal or State program by the local landowners, the State will support the "no action alternative" and will allow the Buffalo River Preservation Association (BRPA) to manage the river with the State providing assistance only upon request.

In the absence of information on how the BRPA intends to manage the river (and with the background knowledge of opposition by the local landowners) we do not think that BOR's recommendation for State/local action will be satisfactory for the preservation of this water resource in this case. We would suggest that BOR closely monitor the State/local management of the Buffalo River to insure that the wild and scenic river values inherent in this stream are not lost through mismanagement or subjugated to private development interests with an attendent degradation in existing water quality. If it appears as if these values

are being substantially altered or lost we would strongly encourage BOR to request Congressional approval for inclusion of this 117 mile segment of the Buffalo River into the Wild and Scenic River System.

Any program or agency developed to manage the Buffalo River should insure its land and water use policies are consistent with the State and areawide water quality management policies developed pursuant to Section 208 of the Federal Water Pollution Control Act, as amended.

In addition to our concerns noted above, EPA suggests inclusion of sanitation facilities in "river access areas." As presently proposed in the development plan (p. 129) the six "river access areas" would include only a parking area, boat launching ramp, and refuse containers. To avoid pollution of ground and surface water, EPA believes that some form of sanitation facility should be provided at these sites in addition to the other facility development being proposed.

Thank you for the opportunity to comment on this report. Any questions on our comments can be addressed to Carol Dennis (755-0770) of my staff.

Sincerely yours,

Rebecca W. Hanmer

Rebecca W. Hanmer
Director
Office of Federal Activities (A-104)

COMMENT

We agree that the addition of sanitation facilities to the river access areas would be desirable if properly constructed to avoid pollution. The revised text includes these facilities.

FEDERAL POWER COMMISSION
WASHINGTON, D.C. 20426

DEC 17 1976

Honorable Thomas S. Kleppe
Secretary of the Interior
Washington, D.C. 20240

Dear Mr. Secretary:

This is in reply to your letter of October 5, 1976, transmitting for the Commission's comments, pursuant to the provisions of the Wild and Scenic Rivers Act (P.L. 90-542), your Department's proposed report on the Buffalo River, Tennessee.

The cited report finds that 117 miles of the Buffalo River from its mouth to Henryville Bridge on County Road 6230 meet the criteria for inclusion into the National Wild and Scenic Rivers System. The report finds that the upper 73 miles should be classified as a "scenic" river and the lower 44 miles should be classified as a "recreational" river. The report recommends that preservation of the river initially be implemented through action by the State and by the local governments involved, with subsequent consideration by the Secretary of the Interior of placing the river in the National system.

The Federal Power Commission staff has reviewed the cited report to determine the effects of the proposals on matters affecting the Commission's responsibilities. Such responsibilities relate to the development of hydroelectric power and assurance of the reliability and adequacy of electric service under the Federal Power Act, and the construction and operation of natural gas pipelines under the Natural Gas Act.

The Commission staff review shows there are no existing or planned electric generating plants and no known potential sites for development of hydroelectric power within the reaches

recommended for preservation. However, the river is crossed by several electric transmission lines and natural gas pipelines. Although the report recommends that no new lines be permitted to cross the river, it recognizes that future crossings could be essential. It noted that in those cases such facilities could be designed and located so as to minimize their impact.

Based on its consideration of the proposed report of your Department and the studies of its own staff, the Commission advises that it has no objection to the proposed preservation by State and local action of 117 miles of the Buffalo River.

Sincerely yours,

Richard L. Dunham
Chairman

52-150 O - 79 - 13

TENNESSEE VALLEY AUTHORITY
NORRIS, TENNESSEE 37828

February 9, 1977

Mr. A. Heaton Underhill
Assistant Director for State
Programs and Studies
Bureau of Outdoor Recreation
United States Department of the Interior
Washington, D.C. 20240

Dear ~~Heaton~~ Heat,

Following telephone conversations between members of your staff and Max Ramsey, our representative on the Interagency Study Group on Wild and Scenic Rivers, I felt it might be appropriate on our part to clarify, for the record, our stand relative to the Buffalo River in Tennessee. We continue to believe that the Buffalo River qualifies for and would make a contribution to the National Wild and Scenic Rivers System; however, we do not at this time have any comments on the recommendations regarding administration and management of the river.

We have appreciated the opportunity to work with your agency on studies relating to the Buffalo River and look forward to continuing our cooperative efforts.

Warm personal regards

Sincerely,

Tom

Thomas H. Ripley, Director
Division of Forestry, Fisheries, and
Wildlife Development

UNITED STATES WATER RESOURCES COUNCIL

SUITE 800 • 2120 L STREET, N.W. WASHINGTON, D.C. 20037

JAN 26 1977

Honorable Cecil D. Andrus
Secretary of the Interior
Washington, D. C. 20240

Dear Mr. Secretary:

I am pleased to provide you the comments of the Water Resources Council on the study report by the Bureau of Outdoor Recreation for the Buffalo River in Tennessee that was prepared in accordance with the provisions of the Wild and Scenic Rivers Act (82 Stat. 906). The Council has completed its review requested in Secretary Kleppe's letter of October 5, 1976.

The Council endorses the effort that has been made to coordinate the proposal with the programs of the Tennessee Valley Authority for the area involved. The review of the report would have been facilitated, however, if information required by the Council's Principles and Standards had been included as is now provided for in the Bureau of Outdoor Recreation's procedures. An analysis of alternative programs and the resulting rationale for the study recommendations would have been particularly useful in determining the reasonably forseeable potential uses of the land and water that would be enhanced, foreclosed or curtailed if the river were included in the national wild and scenic rivers system. This analysis is required under Section 4(a) of the Wild and Scenic Rivers Act.

Sincerely,

Gary D. Cobb
Acting Director

Tennessee Department of
Conservation Division of Planning & Development
RAY BLANTON - GOVERNOR
B.R.ALLISON - COMMISSIONER
2611 West End Ave. Nashville, Tennessee 37203 (615)741-1061
WALTER L. CRILEY - DIRECTOR

April 29, 1975

Mr. Robert Baker
Regional Director
Bureau of Outdoor Recreation
148 Cain Street
Atlanta, GA 30303

Dear Mr. Baker:

The Division of Planning and Development has reviewed the Preliminary Draft Environmental Statement and Draft Field Report for the Buffalo National Wild and Scenic River.

The study findings and recommendations have been discussed in detail with Commissioner Allison and Assistant Commissioner Estes. The Commissioner is particularly interested in programs that promote the preservation and protection of outstanding natural resources. While the Department of Conservation endorses the concept and intent of the National Wild and Scenic Rivers Act, recent experience in implementation of similar projects has demonstrated the importance of incorporating local opinions and considerations with respect to potential scenic river projects.

Intense opposition to any program as such has been expressed by the Buffalo River Preservation Association (BRPA). Further, the Association maintains that it is capable of administering and managing the river area without any federal, state, or local intervention. The Department of Conservation suggests that the BRPA be afforded the opportunity to manage the resource with assistance from the State as requested. The State will initially provide personnel to serve in an enforcement and policing capacity, since the BRPA has specifically expressed concern with respect to security and trespass problems. It is hoped that initial cooperative efforts on the part of the State will promote credibility and realize increased cooperation and coordination in the future.

The Department of Conservation will, therefore, support the "No Action" alternative as specified in the Study Report and Preliminary Draft Environmental Impact Statement. Short term negative impacts due to "No Action" may be avoidable if the State and BRPA can initiate and

maintain credible communication. Hopefully, cooperation demonstrated in the short run will extend to effective long term planning programs that achieve the goals and objectives of the National Wild and Scenic Rivers Act.

Comments on the Preliminary Draft Environmental Impact Statement include the following:

p.11 Proposed Development

Differences in degree of development of the various types of access sites is questionable; minimum development should be emphasized on all sites. It is unlikely that the number of proposed access sites can be reduced and still maintain adequate use.

p. 104 Environmental Intrusions

It should be specified which old iron bridges are not considered obtrusive. Those bridges should be deleted from Table 15.

p. 112 Recreation Use and Opportunity

State facilities should be identified as components of the Tennessee Outdoor Recreation Areas System.

The Wayne County Natural Bridge site should be mentioned.

p. 123 The report states that 60% or 1,710 acres is in agricultural use within the easement; the residual of the total effected acreage is 1,140 acres which is considered "bordering wooded areas." Page 131 states, however, that 1,300 acres of timberland would be affected by the proposal.

p. 125 Impact on Real Property

Has the present land value of $700/acre been derived by discounting at 6% over 12 years? If not, the calculation as shown does not reflect the ERS index increase of 6% annually.

p. 134 Impact on Local Economy

The impact on local land taxes should be discussed.

Specific types of economic enhancement should be mentioned such as shuttle services, canoe rentals, campgrounds, etc.

p. 141, 2 Adverse Effects Which Cannot Be Avoided

It is not likely that the "pressures" imposed upon the resource will ever be eliminated or diminish under any type of reasonable program.

Thank you for the opportunity to review the Buffalo River Study Report and Preliminary Draft Environmental Statement.

Sincerely,

Walter L. Criley

Walter L. Criley

jh

APPENDIX B

SOIL GROUPS - BUFFALO RIVER

Soil Group No. 1 - Ennis, Lindside and Lobelville Silt Loams

Description

This group includes well drained and moderately well drained soils on bottom land. These soils usually are loamy to depth of 5 feet or more. The moderately well drained soils are usually mottled at a depth of about 2 feet. Slopes range from 0-2 percent. This area is subject to flooding.

The Ennis Soils, about 80 percent of the group, are deep and well drained. Texture is usually silt loam to a depth of 5 feet or more. The LL is usually less than 30. The PI is usually less than 15 and is dominantly 5 to 10. The unified classification is dominantly ML but ranges to CL. AASHO classification is dominantly A-4 or A-6.

The Lindside and Lobelville soils, about 15 percent of this group, are deep and moderately well drained. Texture is dominantly silt loam to a depth of 5 feet or more. These soils are mottled at a depth of about 2 feet. During winter months or periods of heavy rainfall, a high water table is usually within about 2 feet of the surface. The LL is usually less than 30. The PI is usually 5-15. Unified classification is dominantly ML but ranges to CL. AASHO classification is A-4 or A-6. The remaining 5 percent of this group includes many soils, most of which are poorly drained or somewhat poorly drained.

Interpretation

Flooding presents a severe limitation for residential development and all the considered recreational activities. If flooding is not considered a limiting factor, then picnic areas and campsites would have a slight limitation. Access roads, boat ramps and parking lots would have a moderate limitation due to moderate traffic supporting capacity. Pasture, forest, and cropland uses are only slightly limited.

52-150 O - 79 - 14

Soil Group No. 2 - Ennis Lindside and Lobelville Cherry Silt Loams

Description

This group includes well drained and moderately well drained cherty loamy soils on bottom lands. These soils usually are loamy and cherty to a depth of 5 feet or more. Fragments of chert in each soil constitute from about 15 to 35 percent of the volume. The moderately well drained soils of this group mottled at a depth of about 2 feet. Slopes are dominantly 0 to 2 percent. This group of soils is subject to flooding.

The Ennis cherty soils make up about 85 percent of this group. They are deep and well drained. The texture is dominantly cherty silt loam to a depth of 5 feet or more. The LL is less than 30. The PI is dominantly less than 10. The unified classification is ML, CL, GM, or GC. The AASHO is A-4 or rarely A-2 or A-6.

The Lindside and Lobelville soils constitute about 10 percent of this group. They are moderately well drained and the texture is usually cherty silt loam to a depth of 5 feet or more. These soils are mottled at a depth of about 2 feet. A high Water table is within 2 feet of the surface during the wet seasons. The LL is usually less than 30. The PI is dominantly less than 10. Unified classification is ML, CL, GM, or GC. AASHO classification is dominantly A-4 but may range to A-6 or A-2.

The remaining 5 percent of this group includes many soils. The dominant inclusion is Humphreys cherty silt loam. These soils are deep and well drained. The subsoil is usually cherty silty clay loam.

Interpretation

Flooding presents a severe limitation for residential development and all the considered recreation activities. If flooding is not considered a limiting factor, then all the recreational uses would have a moderate limitation due to fragments of chert if used for picnic areas or campsites or due to traffic supporting capacity if used for parking lots, access roads or boat ramps. The content of fragments of chert is somewhat of a

limitation for agricultural use but does not prevent the use of most equipment. Yields would be slightly reduced if compared to yields in areas with Soil Group No. 1.

Soil Group No. 3 - Humphreys, Paden, Pickwick, Mountview

Description

This group includes well drained and moderately well drained soils on low terraces and uplands. Some are deep soils and some are moderately deep soils with fragipans. Slopes range from 0 to 5 percent. Some of these soils are subject to flooding.

The Humphreys soils, about 60 percent of this group, are deep and well drained. About 80 percent of these soils is subject to flooding. Texture of the surface soil is usually silt loam. Texture of the subsoil is dominantly silty clay loam. Some areas have a small amount of fragments of chert throughout the soil. The LL ranges from about 20 to 35. The PI ranges from about 5 to 15. Unified classification is ML or CL. AASHO classification is A-4 or A-6.

The Paden soils make up about 15 percent of this group. Some of these soils flood. They are moderately well drained with a fragipan at a depth ranging from about 2 to 3 feet. Texture about the fragipan is typically siltloam. The fragipan usually is silt loam or clay loam. Clay content increases with depth below the fragipan. The fragipan is slowly permeable. The LL above the fragipan is commonly 20 to 40 but increases below the fragipan to a range of 40-60. The PI near the surface is usually 5 to 15. Beneath the fragipan the PI increases to a range of 15 to 30. From the surface to a depth of 4 or 5 feet the unified classification is ML or CL. Beneath this it may be CL or MH. The AASHO classification is A-4, A-6, or A-7 below a depth of 4 or 5 feet.

The Pickwick soils make up about 10 percent of this group. They are deep and well drained. The surface layer is silt loam. The subsoil is silty clay loam. Near the surface the LL is usually 15 to 30 but is usually 30 to 40 at a depth of 3 feet. The PI ranges from about 5 to 15. Unified classification is ML or CL.

AASHO classification is A-4 or A-6. The Mountview soils, about 10 percent of the group, are deep and well drained. Typically the surface layer is silt loam underlain by a silty clay loam subsoil. Beneath about 3 feet the texture is generally cherty clay. The surface has an LL of 20-30 and a PI of less than 15. The layer beneath the surface has an LL of about 25 to 40 and a PI of about 10 to 20. Beneath about 3 feet the LL ranges from 40 to 60 and PI from 15 to 30. The unified classification of the top 3 feet is ML or CL. the clay sub-soil is CL or MH. Near the surface the AASHO classification is A-4, or A-6, the clay subsoil is A-7 or A-6.

The remaining 5 percent includes many soils. The dominant inclusions are Taft and Wolftever. The Taft is somewhat poorly drained. The Wolftever is moderately well drained.

Interpretation

About 50 percent of this group is subject to flooding. Another 20 percent has slow permeability. This presents a severe limitation for residential development. Most of this group has only slight limitation for agricultural uses. The flooding is a severe limitation for recreational uses for about 50 percent of these soils, otherwise the limitation is dominantly moderate because of moderate traffic support capacity.

Soil Group No. 4 - Humphreys, Mountview, Pickwick, Paden

Description

This group includes well drained and moderately well drained soils on low terraces and uplands. Some are deep soils and some are moderately deep soils with fragipans. Slopes range from 5 to 12 percent.

The Humphreys soils, about 50 percent of this group, are deep and well drained. Texture of the surface soil is usually silt loam. Texture of the subsoil is dominantly silty clay loam. Most areas have some fragments of chert throughout the soil.

The LL ranges from about 20 to 35. The PI ranges from about 5 to 15. Unified classification is ML or CL. AASHO classification is A-4 or A-6.

The Mountview soils, about 30 percent of the group, are deep and well drained. Typically the surface layer is silt loam underlain by a silty clay loam subsoil. Beneath about 3 feet the texture is generally cherty clay. Most areas have various amounts of small fragments of chert on the surface and throughout the soil material. The surface has an LL of 20-30 and a PI of less than 15. The layer beneath the surface has an LL of about 25 to 40 and a PI of about 10 to 20. Beneath about 3 feet the LL ranges from 40 to 60 and PI from 15 to 30. The unified classification of the total 3 feet is ML or CL. The clay subsoil is CL or MH. Near the surface the AASHO classification is A-4 or A-6. The clay subsoil is A-7 or A-6.

The Pickwick soils, about 10 percent of this group, are deep and well drained. The surface layer is silt loam. The subsoil is silty clay loam. Most areas have some small fragments of chert throughout the soil. Near the surface the LL is usually 15 to 30 but is usually 30 to 40 at a depth of 3 feet. The PI ranges from about 5 to 15. Unified classification is ML or CL. AASHO classification is A-4 or A-6.

The Paden soils, about 5 percent of this group, are moderately well drained with a fragipan at a depth ranging from about 20 to 30 inches. These soils are moderately deep. Texture above the fragipan is typically silt loam. The fragipan usually is silt loam or clay loam. Clay content increases below the fragipan. The fragipan is slowly permeable. The LL above the fragipan is commonly 20 to 40 but increases below the fragipan to a range of 40 to 60. The PI near the surface is usually 5 to 15. Beneath the fragipan the PI increases to a range of 15 to 30. From the surface to a depth of 4 or 5 feet the unified classification is ML or CL. Beneath this it may be CL or MH. The AASHO classification is A-4, A-6, or A-7 below a depth of 4 or 5 feet.

The remaining 5 percent includes many soils. The dominant inclusions are Ennis and Taft. The Ennis is deep, well drained and subject to flooding. The Taft is somewhat poorly drained.

Mountview soils comprise about 10 percent of the area. They are deep and well drained. Available moisture capacity is high. The subsoil is silty clay loam in the upper part and cherty clay in the lower part. Amount of chert usually increases with depth. The LL of the upper 3 feet ranges from about 20 to 40 and the PI is usually about 5 to 15. Unified classification is ML or CL and the AASHO classification is A-4 or A-6. The cherty clay subsoil has an LL of 40 to 60 and a PI of 15 to 30. The Unified classification is dominantly CL or MH and the AASHO classification is A-7 or A-6.

The Etowah gravelly soils make up about 5 percent of the group. They are deep and well drained. Typically these soils have a gravelly silt loam surface layer and a gravelly silty clay loam subsurface. Content of gravel ranges from 15 to 35 percent by volume in each layer. Available moisture capacity is about medium. The LL ranges from about 20 to 35 and the PI ranges from 5 to 15 to a depth of about 4 feet. Unified classification is ML, CL, GM or GC and the AASHO classification is usually A-4 or A-6. The remaining 10 percent includes many soils. There are several areas of rock outcrops. Other soils include the well drained and moderately well drained cherty soils along narrow drainways and in depressions.

Interpretation

Slope generally presents a moderate limitation for residential development. Moderate steep slope and moderate traffic supporting capacity present a moderate limitation for parking lots, access roads, and boat ramps. Dominantly moderately steep sloping and content of chert fragments present a moderate limitation for a large part of the group if used for picnic areas or campsites. A large portion of these soils have severe limitation for use as cropland due to moderately steep slopes, large amounts of fragments of chert and low available moisture capacity. About half of these soils have severe limitations for use as pastureland due to low available moisture, moderately steep slopes and content of chert fragments. There is a considerable percent of these soils which have only moderate limitation for this use. Forestry use is moderately limited for most of the soils due primarily to large amount of chert fragments.

Interpretation

About 10 percent of this group has slow permeability or is subject to flooding. This presents a severe limitation for residential development with septic tanks. Only about 5 percent has severe limitations with central sewage. About 90 percent has moderate limitations for residential use because of slope. Most of this group has slight limitations for agriculture, forest, pasture, and moderate to slight limitations for all the recreational activities considered.

Soil Group No. 5 - Bodine Cherty, Baxter Cherty, Mountview, and Etowah

Description

Soils in this group include deep, well drained and excessively drained soils on uplands. Slopes range from 5 to 20 percent but are dominantly 12 to 20 percent. Typically, the soils have a cherty silt loam surface layer and a cherty silty clay loam or cherty clay subsurface layer.

Volume of fragments of chert ranges from 15 percent to about 80 percent. Available moisture capacity ranges from medium to low but is generally low.

The Bodine soils comprise about 65 percent of this group. The surface layer is cherty silt loam underlain by a cherty silty clay loam subsurface. Volume of chert ranges from 35 to 80 percent. These soils are dominantly moderately steep and excessively drained. Available moisture capacity is low. The LL ranges from 20 to 35 and the PI ranges from NP to 10. The unified classification is dominantly GM, ML or GM-GC. The AASHO classification is A-2, A-1 or A-4.

The Baxter soils, about 10 percent of the group, are deep and well drained. Slopes range from 5 to 20 percent. They usually have a cherty silt loam surface soil and a cherty clay subsoil. Volume of fragments of chert range from about 15 to 35 percent. The surface soil has an LL of 20 to 30 and a PI of 5 to 10. The unified classification is ML, CL, GM or GC. The AASHO classification is A-4 or A-2. The subsoil has an LL of about 35 to 55 and a PI of about 10 to 35. The unified classification is usually CL, MH or GC and the AASHO classification is A-4, A-6 or rarely A-2.

Soil Group No. 6 - Baxter Cherty, Bodine Cherty

Description

This group consists of deep, well drained and excessively drained soils on steep uplands. Slopes are greater than 20 percent and may range to more than 50 percent. Typically the soils have a cherty silt loam surface and a cherty silty clay loam or cherty clay subsoil. Amount of chert in each layer is more than 15 percent by volume and may be as high as 80 percent. Available water capacity is generally low.

The Bodine soils make up about 80 percent of this group. The surface soil is cherty silt loam. The subsoil is cherty silty clay loam. Amount of chert in each horizon ranges from 35 to 80 percent by volume. These soils are steep and excessively rained. The LL ranges from about 20 to 35. The PI Np to 10. The unified classification is GM, ML or GM-GC. The AASHO classification is A-2, A-1, or A-4.

The Baxter soils, about 10 percent of this group, are deep and well drained. They usually have a cherty silt loam surface layer and a cherty clay subsurface. Amount of chert ranges from 15 to 35 percent by volume in each layer. The surface soil has an LL of 20 to 30 and a PI of 5 to 10. The unified classification is ML, CL, GM or GC. The AASHO classification is A-4 or A-2. The subsoil has an LL of about 35 to 55 and a PI of about 10 to 25. The Unified classification is usually CL, MH, or GC and the AASHO classification is A-4, A-6 or rarely A-2.

The remaining 10 percent includes many soils. The dominant land type is Rockland. There are numerous steep areas that have rock outcrops on more than 50 percent of the surface.

Interpretation

The steep slopes present a severe limitation for all the considered recreational uses. The steep slopes, high volume of fragments of chert and low available moisture presents a severe limitation for cropland and pasture. Due to the above reasons, forestry is severely limited for about 70 percent of the group and moderately limited on most of the remainder.

APPENDIX C

FLORA - BUFFALO RIVER

Trees Found Along the Buffalo River

Common Name	Genus, Species
Ailanthus	*Ailanthus altissima*
Ash	*Fraxinus spp.*
Basswood	*Tilia americana*
Beech	*Fagus grandifolia*
Black Cherry	*Prunus serotina*
Black Gum	*Nyssa sylvatica*
Black Locust	*Robinia pseudo-acacia*
Black Oak	*Quercus velutina*
Black Walnut	*Juglans nigra*
Blue Beech	*Carpinus caroliniana*
Box Elder	*Acer negundo*
Catalpa	*Catalpa spp.*
Cedar	*Juniperus virginiana*
Cottonwood	*Populus deltoides*
Elm	*Ulmus spp.*
Dogwood	*Cornus florida*
Gray Birch	*Betula pendula*
Hackberry	*Celtis occidentalis*
Hickory	*Carya spp.*
Honey Locust	*Gleditisia triacanthos*
Hop Hornbeam	*Ostrya virginiana*
Ironwood	*Cliftonia monophylla*
Loblolly Pine	*Pinus*
Mulberry	*Moraceae*
Northern Red Oak	*Quercus rubra*
Osage Orange	*Maclura pomifera*
Pin Oak	*Quercus palustris*
Poplar	*Populus spp.*
Redbud	*Certis canadensis*
Red Maple	*Acer rubrum*
River Birch	*Betula nigra*
Sassafras	*Sassafrass albidum*
Silver Maple	*Acer saccarhinum*
Sourwood	*Ozydendrum arboreum*
Sugar Maple	*Acer saccharum*
Sumac	*Rhus typhinia*
Sweetgum	*Liquidambar styracifula*
Sycamore	*Plantanus occidentalis*
Tulip Poplar	*Lirodendron tulipifera*
White Oak	*Quercus alba*
Willow	*Salix spp.*
Yellow Birch	*Betula allegheniensis*

Shrubs and Vines Found Along the Buffalo River

Common Name	Genus, Species
Black Berry	*Rubis allegheniensis*
Broom Sedge	*Andropogon virginicus*
Buck Bush	*Andrachne phyllathoides*
Cane	*Arundinaria gigantia*
Christmas Fern	*Polystichum acrostichoides*
Clematis	*Clematis spp.*
Cross Vine	*Bignonia capreolata*
Ebony Spleenwart	*Asplenium platynevron*
Fescue	*Festuca spp.*
Goldenrod	*Solidago spp.*
Grape Vines	*Vitis spp.*
Green Briar	*Smilax spp.*
Hedge Pivet	*Ligustrum spp.*
Honeysuckle	*Lonicera spp.*
Horse Weed	*Erigeron canadensis*
Hydrangea	*Hydrangea spp.*
Ironweed	*Vernonia spp.*
Laurel	*Lauraceae spp.*
Mexican Bamboo	*Polygonum cuspidatum*
Mint	*Mentha spp.*
Mistletoe	*Phoradenron Flavescens*
Onion	*Allium spp.*
Poison Ivy	*Rhus radicans*
Queen Anne's Lace	*Dancus Carota*
Resurrection Fern	*Polypodium polypodioides*
Spicebush	*Lindera spp.*
Thistle	*Carduus spp.*
Vetch	*Vicia spp.*
Watercress	*Nasturtium spp.*
Wild Oats	*Avena fatua*

APPENDIX D

FAUNA - BUFFALO RIVER

COMMON AND SCIENTIFIC NAMES OF FISHES FOUND IN THE BUFFALO RIVER BASIN, TENNESSEE*

Game Fish

Longear sunfish	*Lepomis megalotis*
Bluegill	*Lepomis macrochirus*
Spottted sunfish	*Lepomis punctatus*
Redear sunfish	*Lepomis microlophus*
Green sunfish	*Lepomis cyanellus*
Rock bass	*Ambloplites rupestris*
Warmouth	*Chaenobryttus gulosus*
Smallmouth bass	*Micropterus dolomieui*
Largemouth bass	*Microterus salmoides*
Spotted bass	*Micropterus punctulatus*
White crappie	*Pomxis annularis*
White bass	*Roccus chrysops*
Yellow bass	*Roccus mississippiensis*
Sauger	*Stizostedion canadense*
Chain pickerel	*Esox niger*
Grass pickerel	*Esox americanus vermiculatus*
Rainbow trout	*Salmo gairdneri*

Rough Fish

Channel catfish	*Ictalurus punctatus*
Blue catfish	*Ictalurus furcatus*
Flathead catfish	*Plylodictis olivaris*
Yellow bullhead	*Ictalurus natalis*
Carp	*Cyprinus carpio*
Carpsucker, ssp.	*Carpiodes*
Smallmouth buffalo	*Ictiobus bubalus*
Bigmouth buffalo	*Ictiobus cyprinellus*
Spotted sucker	*Minytrema melanops*
Golden redhorse	*Moxostoma erythrurum*
Shorthead redhorse	*Moxostoma macrolepidotum*
Black redhorse	*Moxostoma duquesnei*
River redhorse	*Moxostoma carinatum*
Silver redhorse	*Moxostoma anisurum*
White sucker	*Catostomus commersoni*
Northern hog sucker	*Hypentelium nigricans*
Longnose gar	*Lepisosteus osseus*
Spotted gar	*Lepisosteus oculatus*

Rough Fish, continued

Freshwater drum	Aplodinotus grunniens
American eel	Anguilla rostrata

Forage Fish

Gizzard shad	Dorosoma cepedianum
Mooneye	Hiodon tergisus
Skipjack herring	Alosa chrysochloris
Stoneroller	Campostoma anomalum
Rosyside dace	Clinostomus funduloides
Bigeye chub	Hybopsis amblops
Streamline chub	Hybopsis dissimilis
Blotched chub	Hybopsis insignis
River chub	Nocomis micropogon
Rosefin shiner	Notropis ardens
Popeye shiner	Notropis ariommus
Emerald shiner	Notropis artherinoides
Bigeye shiner	Notropis boops
Striped shiner	Notropis chrysocephalus
Whitetail shiner	Notropis galacturus
Tennessee shiner	Notropis leuciodus
Mountain shiner	Notropis lirus
Silver shiner	Notropis photogenis
Rosyface shiner	Notropis rubellus
Spotfin shiner	Notropis spilopterus
Telescope shiner	Notropis telescopus
Mimic shiner	Notropis volucellus
Stargazing minnow	Phenacobius uranops
Southern redbelly dace	Phoxinus erythrogaster
Bluntnose minnow	Pimephales notatus
Longnose dace	Rhinichthys cataractae
Creek chubsucker	Erimyzon oblongus
Slender madtom	Noturus exilis
Brindled madtom	Noturus miurus
Freckled madtom	Noturus nocturnus
Pirate perch	Aphredoderus sayanus
Northern studfish	Fundulus catenatus
Blackspotted topminnow	Fundulus olivaceus
Greenside darter	Etheostoma blennioides
Blenny darter	Etheostoma blennius
Rainbow darter	Etheostoma caeruleum

Forage Fish, continued

Ashy darter	*Etheostoma cinereum*
Blackside snubnose darter	*Etheostoma duryi*
Fantail darter	*Etheostoma flabellare*
Redline darter	*Etheostoma rufilineatum*
Tennessee snubnose darter	*Etheostoma simoterum*
Orangethroat darter	*Etheostoma spectabile*
Spottail darter	*Etheostoma squamiceps*
Speckled darter	*Etheostoma stigmaeum*
Banded darter	*Etheostoma zonale*
Undescribed darter	*Etheostoma sp. (ms)*
Blotchside Longperch	*Percina burtoni*
Logperch	*Percina caprodes*
Gilt darter	*Percina evides*
Dusky darter	*Percina sciera*
Stargazing darter	*Percina uranidea*
Banded sculpin	*Cottus carolinae*
Creek chub	*Semotilus atromaculatus*

*From Tennessee Game and Fish Commission's "Warmwater Stream Management Study, 1962," "Buffalo River Electro-Fishing Study, 1964," and "Buffalo River Creek and Gigging STudy, 1966;" from TVA's "tennessee Valley Streams: Their Fish, Bottom Fauna, and Aquatic Habitat, Buffalo River Basin, September-October, 1971."

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BIRDS LIKELY TO BE FOUND IN THE BUFFALO RIVER BASIN[1]

Common Name	Scientific Name
Common Loon	Gavia immer
Horned Grebe	Podiceps auritus
Pied-billed Grebe	Podilymbus podiceps
Double-crested Cormorant	Phalacrocorax auritus
Great Blue Heron	Ardea herodias
Green Heron	Butorides virescens
Little Blue Heron	Florida caerulea
Great Egret	Casmerodius albus
Snowy Egret	Leucophoyx t. thula
Cattle Egret	Bubulcus ibis
Black-crowned Night Heron	Nycticorax nycticorax
Yellow-crowned Night Heron	Nyctanassa violacea
Least Bittern	Ixobrychus exilis
Whistling Swan	Olor columbianus
Canada Goose	Branta canadensis
White-fronted Goose	Anser albifrons
Snow Goose	Chen hyperborea
Mallard	Anas platyrhynchos
Black Duck	A. rubripes
Gadwall	A. strepera
Pintail	A. acuta
Cinnamon Teal	A. c. cyanoptera
Green-winted Teal	A. carolinensis
Blue-winged Teal	A. discors
American Wigeon	Mareca americana
Northern Shoveler	Spatula clypeata
Wood Duck	Aix sponsa
Redhead	Aythya americana
Ring-necked Duck	A. collaris
Canvasback	A. valisineria

1/ Nomenclature according to the 32nd Supplement of the A.O.U.

Birds continued

Common Name	Scientific Name
Greater Scaup	A. marila
Lesser Scaup	A. affinis
Common Goldeneye	Bucephala clangula
Bufflehead	B. albeola
Oldsquaw	Clangula hyemalis
White-winged Scoter	Melanitta fusca deglandi
Ruddy Duck	Erismatura jamaicensis rubida
Hooded Merganser	Lophodytes cucullatus
Common Merganser	Mergus merganser americanus
Red-breasted Merganser	M. serrator
Turkey Vulture	Cathartes aura
Black Vulture	Coragyps atratus
Sharp-shinned Hawk	Accipiter striatus
Cooper's Hawk	A. cooperii
Red-tailed Hawk	Buteo jamaicensis
Red-shouldered Hawk	B. lineatus
Broad-winged Hawk	B. platypterus
Mississippi Kite	Ictinia missisippiensis
Rough-legged Hawk	Buteo lagopus
Golden Eagle	Aquila chrysaetos
Bald Eagle	Haliaeetus leucocephalus
Marsh Hawk	Circus cyaneus
Osprey	Pandion Haliaetus
Peregrine Falcon	Falco peregrinus anatum
American Kestrel	F. sparverius
Bobwhite	Colinus virginianus
Eastern Wild Turkey	Meleagris g. gallopavo
King Rail	Rallus elegans
Virginia Rail	R. limicola
Sora	Prozana carolina

Birds, continued

Common Name	Scientific Name
Purple Gallinule	Porphyrula martinica
Common Gallinule	Gallinula chloropus
American Coot	Fulica americana
Semipalmated Plover	Charadrius semipalmatus
Killdeer	C. vociferus
American Golden Plover	Pluvialis dominica
Black-bellied Plover	Squatarola scuatarola
American Woodcock	Philohela minor
Common Snipe	Capella gallinago
Upland Sandpiper	Bartramia longicauda
Spotted Sandpiper	Actitis mucularia
Solitary Sandpiper	Tringa solitaria
Greater Yellowlegs	Totanus melanoleucus
Lesser Yellowlegs	T. flavipes
Pectoral Sandpiper	Erolia melanotos
Least Sandpiper	E. minutilla
Short-billed Dowitcher	Limnodromus griseus
Stilt Sandpiper	Micropalama himantopus
Semipalmated Sandpiper	Ereunetes pusillus
Buff-breasted Sandpiper	Tryngites subruficollis
American Avocet	Recurvirostra americana
Herring Full	Larus argentatus
Ring-billed Gull	L. delawarensis
Laughing Full	L. atricillus
Franklin's Gull	L. pipixcan
Bonaparte's Gull	Larus philadelphia
Forster's Tern	Sterna forsteri
Common Tern	S. hirundo
Caspian Tern	Hydroprogne caspia
Least Tern	Sterna albifrons

Birds, continued

Common Name	Scientific Name
Black Tern	Chlidonias niger
Rock Dove	Columba livia
Mourning Dove	Zenaidura macroura
Yellow-billed Cuckoo	Coccyzus americanus
Black-billed Cuckoo	C. erythropthalmus
Barn Owl	Tyto alba
Screech Owl	Otus asio
Great Horned Owl	Bubo virginianus
Barred Owl	Strix varia
Short-eared Owl	Asio flammeus
Chuck-will's-widow	Caprimulgus carolinensis
Whip-poor-will	C. vociferus
Common Nighthawk	Chordeiles minor
Chimney Swift	Chaetura pelagica
Ruby-throated Hummingbird	Archilochus colubris
Belted Kingfisher	Megaceryle alcyon
Common Flicker	Colaptes auratus
Pileated Woodpecker	Dryocopus pileatus
Red-bellied Woodpecker	Centurus carolinus
Red-headed Woodpecker	Melanerpes erythrocephalus
Yellow-bellied Sapsucker	Sphyrapicus varius
Hairy Woodpecker	Dendrocopos villosus
Downy Woodpecker	D. pubescens
Eastern Kingbird	Tyrannus tyrannus
Great-crested Flycatcher	Myiarchus crinitus
Eastern Phoeby	Sayornis phoebe
Acadian Flycatcher	Empidonax virescens
Traill's Flycatcher	E. traillii
Least Flycatcher	E. minimus
Eastern Wood Pewee	Contopus virens
Horned Lark	Eremophila alpestris
Tree Swallow	Iridoprocne bicolor
Bank Swallow	Riparia riparia
Rought-winged Swallow	Stelgidopteryx ruficollis
Barn Swallow	Hirundo rustica

Birds, continued

Common Name	Scientific Name
Cliff Swallow	Petrochelidon pyrrhonota
Purple Martin	Progne subis
Blue Jay	Cyanocitta cristata
Common Crow	Corvus brachyrhynchos
Carolina Chickadee	Parus carolinensis
Tufted Titmouse	P. bicolor
White-breasted Nuthatch	
Red-breasted Nuthatch	Sitta canadensis
Brown Creeper	Certhia familiaris
House Wren	Troglodytes aedon
Winter Wren	T. troglodytes
Bewick's Wren	Thryomanes bewickii
Carolina Wren	Thryothorus ludovicianus
Long-billed Marsh Wren	Telmatodytes palustris
Short-billed Marsh Wren	Cistothorus platensis
Mockingbird	Mimus polyglottos
Catbird	Dumetella carolinensis
Brown Thrasher	Toxostoma rufum
Robin	Turdus migratorius
Wood Thrush	Hylocichla mustelina
Hermit Thrush	H. guttata
Swainson's Thrush	H. ustulata
Gray-checked Thrush	H. minima
Veery	H. fuscescens
Eastern Bluebird	Sialia sialis
Blue-gray Gnatcatcher	Polioptila caerulea
Golden-crowned Kinglet	Regulus satrapa
Ruby-crowned Kinglet	R. calendula
Water Pipit	Anthus spinoletta
Cedar Waxwing	Bombycilla cedrorum
Loggerhead Shrike	Lanius ludovicianus
Starling	Sturnus vulgaris

Birds, continued

Common Name	Scientific Name
White-eyed Vireo	Vireo griseus
Yellow-throated Vireo	V. flavifrons
Solitary Vireo	V. solitarius
Red-eyed Vireo	V. olivaceus
Philadelphia Vireo	V. philadelphicus
Warbling Vireo	V. gilvus
Warblers, Black-and-White	Mniotilta varia
Prothonotary	Protonotaria citrea
Worm-eating	Helmitheros vermivorus
Golden-winged	Vermivora chrysoptera
Blue-winged	V. pinus
Tennessee	V. peregrina
Orange-crowned	V. celata
Nashville	V. ruficapilla
Northern Parula	Parula americana
Yellow	Dendroica petechia
Magnolia	D. magnolia
Cape May	D. tigrina
Yellow-rumped	D. coronata
Black-throated	D. virens
Cerulean	Dendroica cerulea
Blackburnian	D. fusca
Yellow-throasted	D. dominica
Chestnut-sided	D. pensylvanica
	D. castanea
Blackpoll	D. striata
Prairie	D. discolor
Palm	D. palmarium
Pine	D. pinus
Ovenbird	Seiurus aurocapillus
Northern Waterthrush	S. noveboracensis
Louisiana Waterthrusl	S. motacilla
Kentucky	Oporornis formosus
Common Yellowthroat	Geothlypis trichas
Yellow-breasted Chat	Icteria virens

Birds, continued

Common Name	Scientific Name
Connecticut	Oporornis agilis
Mourning	O. philadelphia
Hooded	Wilsonia citrina
Wilson's	W. pusilla
Canada	W. canadensis
American Redstart	Setophaga ruticilla
House Sparrow	Passer domesticus
Bobolink	Dolichonyx oryzivorus
Eastern Meadowlark	Sturnella magna
Red-winged Blackbird	Agelaius phoeniceus
Orchard Oriole	Icterus spurius
Northern Oriole	I. galbula
Rusty Blackbird	Euphagus carolinus
Brewer's Blackbird	E. cyanocephalus
Common Grackle	Quiscalus quiscula
Brown-headed Cowbird	Molothrus ater
Scarlet Tanager	Piranga olivacea
Summer Tanager	P. rubra
Cardinal	Richmondena cardinalis
Rose-breasted Grosbeak	Pheucticus ludovicianus
Evening Grosbeak	Hesperiphona vespertina
Blue Grosbeak	Guiraca caerulea
Indigo Bunting	Passerina cyanea
Dickcissel	Spiza americana
Pine Siskin	Spinus pinus
American Goldfinch	S. tristis
Rufous-sided Towhee	Pipilo erythrophthalmus
Sparrows, Savannah	Passerculus sandwichensis
Grasshopper	Ammodramus savannarum
LeConte's	Passerherbulus caudacutus
Henslow's	Passerherbulus henslowii
Vesper	Pooecetes gramineus
Lark	Chondestes grammacus
Dark-eyed Junco	Junco hyemalis
Tree	Spizella arborea

Birds, continued

Common Name	Scientific Name
Backman's	Aimophila aestivalis
Chipping	Spizella passerina
Field	S. pusilla
White-crowned	Zonotrichia leucophrys
White-throated	Z. albicollis
Fox	Passerella iliaca
Swamp	Melospiza georgiana
Song	M. melodia

Rare or Endangered Species

Southern Bald Eagle	Haliaeetus l. leucocephalus
American Peregrine Falcon	Falco peregrinus anatum

MAMMALS FOUND IN THE BUFFALO RIVER BASIN

Common Name	Scientific Name
Virginia Opossum	*Didelphis marsupialis*
Southeastern Shrew	*Sorex longirostris*
Least Shrew	*Cryptotis parva*
Shorttail Shrew	*Blarina brevicauda*
Eastern Mole	*Scalopus aquaticus*
Little Brown Myotis	*Myotis lucifugus*
Southeastern Myotis	*Myotis austroriparius*
Gray Myotis	*Myotis griesescene*
Keen Myotis	*Myotis keeni*
Indiana Myotis	*Myotis sodalis*
Small-footed Myotis	*Myotis subulatus*
Silver-haired Bat	*Lasionycteris noctivagans*
Eastern Pipistrel	*Pipistrellus subflavus*
Big Brown Bat	*Eptesicus fuscus*
Red Bat	*Lasiurus borealis*
Hoary Bat	*Lasiurus cinereus*
Evening Bat	*Nycticeius humeralis*
Eastern Big-eared Bat	*Plecotus rafinesquel*
Raccoon	*Procyon lotor*
Longtail Weasel	*Mustela frenata*
Mink	*Mustela vision*
River Otter	*Lutra canadensis*
Spotted Skunk	*Spilogale putorius*
Striped Skunk	*Mephitis mephitis*
Eastern Chipmunk	*Tamaias striatus*
Eastern Gray Squirrel	*Sciurus carolinensis*
Eastern Fox Squirrel	*S. niger*
Southern Flying Squirrel	*Glaucomys volans*
Prairie vole	*Microtus ochrogas*
Beaver	*Castor canadensis*
Eastern Harvest Mouse	*Reithrodontomys humulis*
Deer Mouse	*Peromyscus maniculatus*
Whitefooted Mouse	*P. leucopus*
Cotton Mouse	*P. gossypinus*
Golden Mouse	*P. nuttalli*

Mammals, continued

Common Name	Scientific Name
Eastern Woodrat	Neotoma floridana
Rice Rate	Oryzomys palustris
Hispid Cotton Rate	Sigmodon hispidus
Pine Vole	Pitymys pinetorum
Muskrat	Ondatra zibethica
Norway Rat	Rattus norvegicus
Black Rate	R. rattus
House Mouse	Mus musculus
Woodchuck	Marmota monax
Meadow Jumping Mouse	Zapus hudsonius
Eastern Cottontail	Sylvilagus floridanus
Swamp Rabbit	S. aquaticus
Whitetail Deer	Odocoileus virginianus
Feral Domestic Dog	Canis familiaris
Feral Domestic Cat	Felis domestica
Red Fox	Vulpes fulva
Gray Fox	Urocyon cinereoar genteus
Bobcat	Lynx rufus

Rare or Endangered Species

Indiana Bat	Myotis sodalis

REPTILES AND AMPHIBIANS FOUND IN THE BUFFALO RIVER DRAINAGE

Common Name	Scientific Name
Amphibians	
Three-toed Amphiuma	*Amphiuma means tridactylum*
Hellbender	*Cryptobranchus a. alleganiensis*
Mudpuppy	*Necturus maculosus*
Red River Waterdog	*N. m. louisianensis*
Western Lesser Siren	*Siren intermedia nettingi*
Red-spotted Newt	*Diemictylus v. viridescens*
Central Newt	*D. v. louisianensis*
Spotted Salamander	*Ambystoma maculatum*
Small-mouthed Salamander	*A. texanum*
Marbled Salamander	*A. opacum*
Mole Salamander	*A. talpoideum*
Eastern Tiger Salamander	*A. t. tigrinum*
Northern Disky Salamander	*Desmognathus f. fuscus*
Zigzag Salamander	*Plethodon d. dorsalis*
Slimy Salamander	*P. g. glutinosus*
Northern Spring Salamander	*Gyrinophilus p. porphyriticus*
Four-toed Salamander	*Hemidactylium scutatum*
Northern Red Salamander	*Pseudotriton r. rubber*
Southern Red Salamander	*P. r. vioscai*
Midland Mud Salamander	*P. montanus diastictus*
Longtailed Salamander	*Eurycea l. longicauda*
Northern Two-lined Salamander	*E. b. bislineata*
Cave Salamander	*E. lucifuga*
Eastern Spadefoot	*Scaphiopus holbrooki*
American Toad	*Bufo americanus*
Fowler's Toad	*B. woodhousei fowleri*
Northern Spring Peeper	*Hyla c. crucifer*
Eastern Gray Treefrog	*H. c. chrysoscelis**
Western Bird-boiced Treefrog	*H. a. avivoca*
Barking Treefrog	*H. gratiosa*

Amphibians, continued

Common Name	Scientific Name
Green Treefrog	H. cinerea
Eastern Narrow-mouthed Toad	Gastrophryne carolinensis
Blanchard's Cricket Frog	Acris Crepitans blanchardi
Northern Cricket Frog	A. c. crepitans
Upland Chorus Frog	Pseudacris triseriata feriarum
Pickeral Frog	Rana palustris
Southern Leopard Frog	R. pipiens sphenocephala
Northern Leopard Frog	R. p. pipiens
Northern Crawfish Frog	R. areolata circulosa
Green Frog	R. clamitans melanota
Bullfrog	R. catesbeiana

Reptiles

Alligator Snapping Turtle	Macrochelys temmincki*
Common Snapping Turtle	Chelydra s. serpentina
Stinkpot	Sternothaerus odoratus
Stripe-necked Musk Turtle	S. minor peltifer
Eastern Mud Turtle	Kinosternon s. subrubrum
Ouachita Map Turtle	Graptemys pseudogeographica ouachitensis
Map Turtle	G. geographica
Midland Painted Turtle	Chrysemys picta marginata
Southern Painted Turtle	C. p. dorsalis
Slider	C. concinna hieroglyphica*
Missouri Slider	C. floridana hoyi*
Red-eared Turtle	C. scripta elegans*
Cumberland Turtle	C. s. troosti*
Eastern Box Turtle	Terrapene C. Carolina
Smooth Softshell	Trionyx muticus
Eastern Spiny Softshell	T. s. spinifer
Green Anole	Anolis c. carolinensis
Northern Fence Lizard	Sceloporus undulatus hyacinthinus
Ground Skink	Lygosoma Laterale
Broad-headed Skink	Eumeces laticeps

Reptiles, continued

Common Name	Scientific Name
Five-lined Skink	E. fasciatus
Southeastern Five-lined Skink	E. inexpectatus
Six-lined Racerunner	Cnemidophorus sexlineatus
Eastern Slender Glass Lizard	Ophisaurus attenuatus longicaudus
Rough Earth Snake	Virginia striatula*
Eastern Smooth Earth Snake	V. v. valeriae*
Western Smooth Earth Snake	V. v. elegans*
Northern Red-bellied Snake	Storeria o. occipitomaculata
Midland Brown Snake	S. dekayi wrightorum
Northern Water Snake	Natrix s. sipedon
Midland Water Snake	N. sipedon pleuralis
Yellow-bellied Water Snake	N. erythrogaster flavigaster
Queen Snake	Regina septemvittata*
Diamond-backed Water Snake	Natrix r. rhombifera
Green Water Snake	N. c. cyclopion
Eastern Garter Snake	Thamnophis s. sirtalis
Eastern Ribbon Snake	T. s. sauritus
Western Mud Snake	Farancia abacura reinwardti
Eastern Hognose Snake	Heterodon platyrhinos
Midwest Worm Snake	Carphophis amoenus helenae
Northern Ringneck Snake	Diadophis punctatus edwardsi
Mississippi Ringneck Snake	D. punctatus stictogenys
Northern Black Racer	Coluber c. constrictor
Rought Green Snake	Opheodrys aestivus
Northern Pine Snake	Pituophis m. melanoleucus
Black Rat Snake	Elaphe o. obsoleta
Gray Rat Snake	E. obsoleta spiloides
Scarlet Snake	Cemophora coccinea
Red Milk Snake	Lampropeltis triangulum syspila*
Eastern Milk Snake	L. t. triangulum*

Reptiles, continued

Common Name	Scientific Name
Prairie Kingsnake	*L. c. calligaster*
Black Kingsnake	*L. getulus niger*
Southeastern Crowned Snake	*Tantilla c. coronata*
Northern Copperhead	*Agkistrodon contortrix mokeson*
Southern Copperhead	*A. c. contortrix*
Western Cottonmouth	*A. piscivorus leucostoma*
Western Pigmy Rattlesnake	*Sistrurus miliarius streckeri*
Timber Rattlesnake	*Crotalus h. horridus*
Canebreak Rattlesnake	*C. horridus atricaudatus*

*Certain generic nomenclature recently revised and appears as such.

BOTTOM ORGANISMS - BUFFALO RIVER BASIN

September - October 1971
Tennessee Valley Authority - May 1973

TAXA	COMMON NAME
Platyhelminthes	
Turbellaria	
Tricladida	
Planariidae	Planarian
Annelida	
Oligochaeta	Aquatic Earthworm
Arthropoda	
Crustacea	
Isopoda	
Asellidae	
Lirceus sp.	Aquatic Sowbug
Amphipoda	Scud
Gammaridae	
Gammarus sp.	
Talitridas	
Hyalella azteca	
Decapoda	Crayfish
Insecta	
Coleoptera	
Elmidae (Larvae)	Riffle Beetle
Psephenidae	Water-Penny Beetle
Psephenus sp.	
Haliplidas	Crawling Water Beetle
Diptera	
Tendipedidae	Midge
Tipulidae	Crane Fly
Antocha sp.	
Rhagionidae	Snipe Fly
Atherix sp.	
Simuliidae	Black Fly
Simulium sp.	

Ephemeroptera
- Baetidae — Small Mayfly
  - Baetisca sp.
  - Caenis sp.
  - Baetis sp.
  - Pseudocloeon sp.
  - Isonychia sp.
  - Ameletus sp.
  - Unidentified
- Heptageniidae — Stream Mayfly
  - Heptagenia sp.
  - Stenonema sp.
- Ephemeridae — Burrowing Mayfly
  - Ephemera sp.

Odonata
- Libellulidae — Common Skimmer
  - Erythrodiplax sp.
- Coenagrionidae — Narrow-Winged Damselfly
  - Ischnura sp.
  - Unidentified
- Cordulegasteridae — Biddy Dragonfly
  - Cordulegaster sp.

Plecoptera
- Isoperlinae — Green-Winged Stonefly
  - Neophasganophora sp.
  - Neoperla sp.

Megaloptera
- Corydalidae
  - Corydalus sp. — Dobsonfly
  - Chauloides sp. — Fishfly

Trichoptera
- Hydropsychidae — Net-Spinning Caddis Fly
  - Cheumatopsyche sp.
  - Hydropsyche sp.
- Brachycentridae — Caddis Fly
  - Brachycentrus sp.

Mollusca
- Gastropoda
  - Ctenobranchiata

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Pleuroceridae _____ River Snail
Pleurocera curtum
Anculosa praerosa
Lithasia obovata
Lithasia duttoniana
Goniobasis laqueatus
Goniobasis edgariana

Pelecypoda
Cyrenidae
Corbicula leana _____ Asiatic Clam
Quadrula cylindrica _____ Rabbit's Foot Shell

APPENDIX E

ZONING

TITLE 13
PUBLIC PLANNING AND HOUSING
CHAPTER 1
STATE PLANNING COMMISSION

13-107. Planning regions.--The State planning commission is given the power to create planning regions and to define the boundaries respectively of such planning regions. Any such planning region may, in accordance with the boundary definition made by the State planning commission, be composed of the territory of a single county or of two (2) or more contiguous whole counties or of a part of a county or of contiguous parts of two (2) or more counties or of one (1) or more counties together with a part or parts of another county or other counties or any other territory as designated and defined by the State planning commission whether the boundaries thereof conform to any existing boundary or boundaries of a county or counties or other political subdivision or subdivisions or do not conform. (Acts 1935, ch. 43, § 8; C. Supp. 1950, § 3291.14 (Williams, § 552.14).)

13-108. Reports and plans advisory.--All reports, whether of judgment, opinion, recommendation or otherwise and all plans of the State planning commission and/or any regional planning commission provided for in this chapter or chapters 2 and 3 of this title shall be merely advisory and nothing herein shall make compliance therewith mandatory, provided, however, that nothing in this section shall be construed to impair the effect of any plan adopted by a municipal planning commission pursuant to § 13-207. (Acts 1935, ch. 43, § 17; C. Supp. 1950, § 3291.23 (Williams, § 552.23).)

13-109. Information from State departments.--The commissioner of the department of highways and public works and the commissioner of each and every other State administrative department shall keep the State planning commission informed on all projects, improvements and plans under contemplation or in preparation in their respective departments which relate to or are concerned with buildings, structures or uses on, upon, under, over or of any land or water within the State, and make available to the commission for its information and examination any and all data, sketches, plans and specifications relating to or concerning such

buildings, structures and uses, so that the commission may, before the location, character or extent of any such building, structure, or use comes to be decided, have an adequate opportunity for the study of and report upon the same. (Acts 1935, ch. 43, § 7; C. Supp. 1950, § 3291.13 (Williams, § 552.13).)

CHAPTER 2
REGIONAL PLANNING COMMISSIONS

13-201. Regional planning commissions--Creation and appointment --Qualifications of members-Terms--Vacancies.--The State planning commission may create and establish a regional planning commission of any planning region created and defined under the provisions of § 13-107. The members of any such regional planning commission shall be designated or appointed by the State planning commission. The number of members of any regional planning commission shall be determined by the State planning commission, but shall be not less than five (5) nor more than fifteen (15). The State planning commission may designate, as members of a regional planning commission, a person or persons who is a member or are members of a county court or of county courts or of a board or boards of aldermen or commissioners or other municipal legislative body or bodies; provided, however, that the members of the regional planning commission so designated from county courts and municipal legislative bodies shall be less in number than a majority of the regional commission and that not less than a majority of the members of the regional commission shall hold no salaried public office or position whatever excepting offices or faculty memberships of a university or other educational institution. All members of a regional planning commission shall serve as such without compensation, but they shall be allowed necessary traveling and other expenses while engaged in the work of or for the commission. The term of any member designated from a county court or municipal legislative body shall be coterminous with his then term as a member of such county court or municipal body. The terms of appointed members as distinguished from members designated from a county court of municipal legislative body shall be four (4) years, except that the terms of three (3) of the two (2) and three (3) years respectively. The State planning commission may remove a member of a regional planning commission for cause specified in writing served on the member and after hearing, of which he shall be given not less than fifteen (15) days' written notice. Any vacancy in the membership of a regional planning commission shall be filled by the State planning commission for the unexpired term, except that if such vacancy be filled by designation from a county court or municipal legislative body, the term of the member so designated shall be coterminous with his then term as member of such court or body (Acts 1935, ch. 43, § 9; mod. C. Supp. 1950, § 3291.15 (Williams, § 552.15).)

CHAPTER 4
COUNTY ZONING REGULATIONS

13-401. Grant of zoning power.--The quarterly county court of any county is empowered, in accordance with the conditions and the procedure specified in this chapter, to regulate, in the portions of such county which lie outside of municipal corporations, the location, height and size of buildings and other structures, the percentage of lot which may be occupied, the sizes of yards, courts, and other open spaces, the density and distribution of population, the uses of buildings and structures for trade, industry, residence, recreation or other purposes, and the uses of land for trade, industry, residence, recreation, agriculture, forestry, soil conservation, water supply conservation or other purposes. Special districts or zones may be established in those areas deemed subject to seasonal or periodic flooding, and such regulations may be applied therein as will minimize danger to life and property, and as will secure to the citizens of Tennessee the eligibility for flood insurance under Public Law 1016, 84th Congress or subsequent related laws or regulations promulgated thereunder. (Acts 1935, ch. 33, § 1; C. Supp. 1950, § 10268.1; Acts 1957, ch. 306, § 1.)

13-402. Regional zoning plans--Execution by quarterly county court.--From and after the time when the regional planning commission of any planning region defined and created by the State planning commission makes and certifies to the quarterly county court of any county located in whole or part in such region a zoning plan, including both the text of a zoning ordinance and the zoning maps, representing the recommendations of such planning commission for the regulation by districts or zones of the location, height and size of buildings and other structures, the percentage of lots that may be occupied, the sizes of population, the location and uses of buildings and structures for trade, industry, residence, recreation or other purposes and the use of land for trade, industry, residence, recreation, agriculture, forestry, soil conservation, water supply conservation or other purposes, then said county court may, by ordinance, exercise the powers granted in § 13-401 and, for the purpose of such exercise, may divide the territory of the county which lies within said region but outside of municipal corporations into districts of such number, shape or areas as it may determine and within such districts may regulate the erection, construction, reconstruction, alteration and uses of buildings and structures and the uses of land. All such regulations shall be uniform for each class or kind of buildings throughout any such district, but the regulations in one district may differ from those in other districts. The regional planning commission may make and certify a single plan for all the territory of the county which lies within said region but outside of municipal corporations, or may make and certify separate and successive plans for parts of such territory which it deems to be suitable for urban or nonurban development or which for other reasons it deems to be an appropriate territorial unit for a zone plan; and correspondingly any ordinance enacted by the county court may cover and include the said whole territory of the county which lies within said region but outside of municipal corporations covered and included in any such single plan or in any such separate and successive plans. No ordinance covering more or less than the entire area covered by any such certified plan shall be enacted or put into effect until or unless it be first submitted submitted to the regional planning commission and be approved by said commission or, id disapproved, receive the favorable vote of not less than two-thirds (2/3) of the entire membership of said county court. Acts 1935, ch. 33, § 2; C. Supp. 1950, § 10268.2.

13-403. Purposes of zoning regulations.--Such regulations shall be designed and enacted for the purpose of promoting the health, safety, morals, convenience, order, prosperity and welfare of the present and future inhabitants of the State and of its counties, including, among other things, lessening congestion in the roads or reducing the wastes of excessive amount of roads; securing safety from fire and other dangers; promoting adequate light and air; preventing, on the one hand, excessive concentrations of population and, on the other hand, excessive and wasteful scattering of population or settlement; promoting such distribution of population and such classification of land uses and distribution of land development and utilization as will tend to facilitate and conserve adequate provisions for transportation, water flowage, water supply, drainage, sanitation, educational opportunity, recreation, soil fertility, food supply and the protection of both urban and nonurban development. (Acts 1935, ch. 33, § 3; C. Supp. 1950, § 10268.3.)

13-404. Method of procedure after certification of plan from commission.--After the certification of a zone plan from the regional planning commission and before the enactment of any such zoning ordinance, the county court shall hold a public hearing thereon, the time and place of which at least thirty (30) days' notice shall be given by one (1) publication in a newspaper of general circulation in the county. Such notice shall state the place at which the text and maps as certified by the planning commission may be examined. No change in or departure from the text or maps as certified by the regional planning commission shall be made, unless such change or departure be first submitted to the certifying regional planning commission for its approval, disapproval or suggestion, and, if disapproved, shall receive the favorable vote of a majority of the entire membership of the county court; and said planning commission shall have thirty (30) days from and after such submission within which to send its report to the county court. Any such ordinance shall be published at least once in the official newspaper of the county or in a newspaper of general circulation in the county, and shall not be in force until it is so published. (Acts 1935, ch. 33, § 4; C. Supp. 1950, § 10268.4.)

APPENDIX F

NATIONAL REGISTER OF HISTORIC PLACES

National Register of Historic Places

The following properties located in counties adjacent to the Buffalo River have been named in the National Register of Historic Places, published in the Federal Register Volume 40, No. 24 - Tuesday, February 4, 1975, and subsequent changes through December 2, 1975.

Hickman County	- Nunnelly vicinity, Pinewood, approximately 3 miles north of Nunnelly on Pinewood Road (Route 3).
Humphreys County	- Hurricane Mills vicinity, Link Farm Site, northwest of Hurricane Mills.
Perry County	- Linden vicinity, Cedar Creek Furnace, 9 miles southwest of Linden on Furnace Creek.

Federal Register, Volume 30, No. 88--Tuesday, May 6, 1975

The following properties have been demolished and therefore removed from the National Register of Historic Places:

Hickman County	- Nunnelly vicinity, Pinewood.

Federal Register, Volume 40, No. 127--Tuesday, July 1, 1975

The following properties have been added to the National Register since June 3, 1975.

Hickman County	- Old Natchez Trace, see Davidson County.[1/]
Lawrence County	- Old Natchez Trace, see Davidson County.[1/]
Lewis County	- Old Natchez Trace, see Davidson County.[1/]
Wayne County	- Old Natchez Trace, see Davidson County.[1/]

1/ Davidson County - Old Natchez Trace, from AL/TN border to US 100 in Davidson County (also in Hickman, Lawrence, Lewis, Maury, Wayne, and Williamson counties) (5-30-75).