VOLUME I

ALABAMA RIVER BASIN COOPERATIVE STUDY

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
ECONOMIC RESEARCH SERVICE
FOREST SERVICE

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CHAPTERS: 1. Introduction, 2. Natural Resources, 3. Human and Economic Resources, 4. Projections, Problems and Needs, 5. Component Needs

ALABAMA RIVER BASIN

COOPERATIVE STUDY

WITHIN ALABAMA

VOLUME I

Prepared by

UNITED STATES DEPARTMENT OF AGRICULTURE
Soil Conservation Service
Economic Research Service
Forest Service

In cooperation with the

ALABAMA DEVELOPMENT OFFICE

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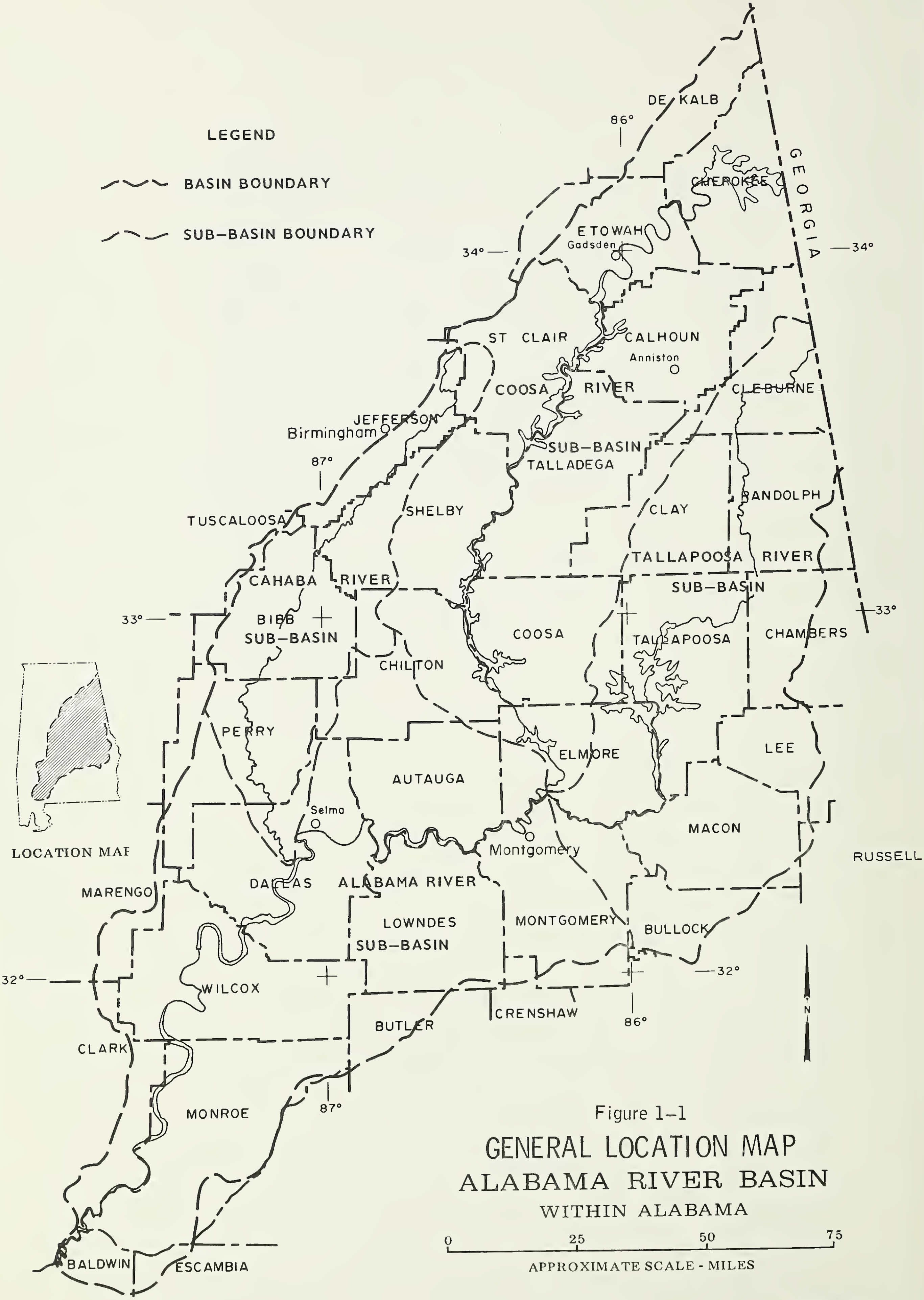

Figure 1–1

GENERAL LOCATION MAP
ALABAMA RIVER BASIN
WITHIN ALABAMA

0 25 50 75

APPROXIMATE SCALE - MILES

SOURCE: Data Compiled by SCS River Basin Study Staff.

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CHAPTER 1

INTRODUCTION

NATURE & SCOPE OF THE STUDY

The State of Alabama is intensely interested in the conservation, development, and utilization of all resources within the State, including those within the Alabama River Basin. In order to determine the availability of land and water resources and the demands on these resources both present and future, the State requested the Secretary of Agriculture to cooperate in a study of the basin. The study area encompasses the entire drainage area of the Alabama River within the State (see figure 1-1).

Participation in this Cooperative River Basin Study by the U. S. Department of Agriculture is under authority of Section 6, Public Law 83-566 as amended. The principal participants within the Department of Agriculture were the Economic Research Service, Forest Service, and Soil Conservation Service. The study was conducted under the direction of the USDA Field Advisory Committee, chaired by the State Conservationist, Soil Conservation Service. The Field Advisory Committee was responsible for coordinating the Department's survey activities; arranging for input by other agencies and reviews of draft reports; preparing schedules; and for maintaining overall coordination with other cooperating federal and state agencies.

The Alabama Development Office was the study sponsor and the coordinating agency for the State of Alabama. Many federal and state agencies, local governments, other organizations and individuals have contributed data, technical assistance and otherwise participated in this study. Their contributions are acknowledged throughout the report.

This report contains the inventory of resources in the basin and the present and projected needs for the basin's natural, human, and economic resources.

Data and projections presented herein establish a basis for selection and evaluation of alternative plans for natural resource use and development. The formulation and analysis of these alternative plans and a suggested plan for land and water resource development is presented in Volume II.

The broad purposes of this study were (1) to inventory land and water resources, (2) to project future resource needs, (3) to provide basic data for planning and development, (4) to identify resource development alternatives, and (5) to identify problems and development opportunities for detailed study. To achieve these purposes, the study was conducted:

1. To provide input for the Alabama Development Office planning process and to assist other state and local agencies engaged in resource planning;

2. To provide alternatives to be considered in formulating a sound resource use plan for the basin that will result in: the conservation and development of land and water resources to meet current and foreseeable needs; economic growth and development; and protection and enhancement of the natural environment;

3. To identify specific resource problems and needs that can be met through existing local, state, and federal programs;

4. To identify those problems and needs requiring action which cannot be implemented under existing programs and suggest methods and techniques for their solution.

The Alabama River Basin study was conducted in accordance with the multiple-objective planning concepts developed by the Water Resources Council which became effective October 25, 1973. This study was guided by the Principles and Standards for Water and Related Land Resource Planning of the Water Resource Council, and the USDA Procedures for Planning Water and Related Land Resources, March 1974. The overall planning effort in this basin was directed toward improvement in the quality of life through contributions to two major objectives:

1. National Economic Development (NED) - to enhance national economic development by increasing the value of the Nation's output of goods and services and improving national economic efficiency.

2. Environmental Quality (EQ) - to enhance environmental quality by the management, conservation, preservation, creation, restoration, or improvement of the quality of certain natural and cultural resources and ecological systems.

The two major planning objectives, components of these objectives, and specific components developed by the USDA agencies engaged in this study and the Alabama Development Office are listed on the following page. The scope of some phases of the study was limited as indicated by the footnotes to the specific components.

MAJOR OBJECTIVE	COMPONENTS OF OBJECTIVE	SPECIFIC COMPONENTS
National Economic Development (NED)	1. The value to the nation of increased goods and services resulting from a project. 2. External economies (externalities) - gains to individuals or groups other than direct users of project outputs. a. Technological externalities - external ficiency of firms economically related to direct and indirect users of project outputs. b. Pecuniary externalities - external economies reflected in increased income of firms economically related to direct and indirect users of project outputs.	1. Increased or more efficient output of food and fiber. a. Improved efficiency of production and resulting agricultural income. 1/ b. Increased forest production and utilization 2. Urban flood damage reduction. 2/ 3. Increased and more efficient production of agricultural, municipal, and domestic water supply. 4. Increased output of outdoor recreational opportunities.
Environmental Quality (EQ)	1. Management, protection, enhancement or creation of areas of natural beauty. 2. Management, preservation or enhancement of especially valuable biological resources and ecosystems. 3. Management, preservation or enhancement of especially valuable geological, archeological and historical resources. 4. Enhancement of quality aspects of land, water and air. 5. Avoiding irreversible or irretrievable commitment of resources.	1. Improved quality aspects of water, land, and air. a. Improved waste disposal. 3/ b. Improved stream water quality. 3/ c. Reduction in sedimentation. d. Reduction in point source erosion. 2. Improvement, protection and/or preservation of areas of natural beauty for man's enjoyment. a. Protection of and increased access to scenic areas. 2/ 3. Enhancement or preservation of biological resources. a. Improved quality and increased quantity of fish and wildlife habitat. b. Protection of rare and endangered species of flora and fauna. 2/ 4. Preservation of archeological and historical resources. 2/

1/ The evaluation of agricultural flood damages in the basin and the potential for reducing these damages is included. Main stem flooding damages were evaluated along with tributary damages, however, the evaluation of the potential for reducing agricultural flood damages through structural measures installed on the major rivers of the basin was considered to be outside the scope of this study.

2/ The scope of the study was limited to the identification of needs and generalized approaches to meeting these needs.

3/ The inclusion of information relating to municipal and industrial waste discharges and animal waste disposal was in response to a request from the Alabama Water Improvement Commission. The identification of plan elements relating to water quality was limited in scope and included reduction in sediment and the potential for increasing low flow in the basin's streams in selected locations.

RELATIONSHIP BETWEEN STUDY OBJECTIVES AND STATE GOALS

The major objectives of this study and specific components of these objectives are closely related to the State's goals for three functional areas of state government as presented in Goals for Alabama, 1975. The development of goals for state government was initiated by the Alabama Development Office in 1972 under authority granted this agency by Legislative Act 657 of 1969. The State's preliminary goals were developed with input from local and state government agencies, regional planners, special interest groups, various organizations and private citizens. Following further review and refinement, the goals were finalized in April 1975.

The State's goals for ten functional areas of state government are presented below in the order of importance as ranked by private citizens:

1. Strengthen the educational system in order to provide a quality education for all citizens including general, vocations, and technical-oriented programs; adult education; and pre-school programs.

2. Provide the means and opportunity for all citizens to meet their health needs through the expansion and the improvement of the quality and quantity of health services.

3. Encourage economic development in Alabama at greater than the national average, but at the same time protect and conserve natural and human resources to the best extent possible.

4. Provide for adequate shelter and living environments for all the citizens of Alabama, including an increase in quantity and quality of housing through the cooperation of government and private enterprise.

5. Develop a natural resources program which will enhance and protect the natural environment for the social and economic betterment of the entire State.

6. Develop an improved public safety and consumer protection system within the State.

7. Examine and reorganize State government to assure greater coordination and consolidation of governmental activities toward improving the quality of life in Alabama and insuring more efficient use of tax dollars.

8. Improve and extend social services to all citizens through increased government participation.

9. Promote the development of an improved, balanced transportation system (air, water, land) which emphasizes the use of existing facilities. Increase the quality and quantity of communications and utilities facilities within Alabama.

10. Design and implement comprehensive recreational and cultural programs that provide indoor and outdoor recreational and leisure-time opportunities.

The data developed during the basin study and the proposals included in the alternative plans and suggested plan will contribute most to the goals for three functional areas; Economic Development, Natural Resources and Conservation, and Recreation and Culture. These goals and subgoals are:

1. Economic Development

Goal: Encourage economic development in Alabama at greater than the national average, but at the same time protect and conserve natural and human resources to the best extent possible.

Subgoals:

A. Upgrade the quality of the labor force through manpower development.
B. Develop and enforce adequate controls on development to preserve economically productive lands and to prevent haphazard developments in unincorporated areas.
C. Place major emphasis on the attracting of higher-wage in-ustries which will diversify the industrial base of the economy.
D. Develop State policy which will provide for the orderly and expanded economic growth of the State.
E. Expand public financial support of economic planning and development activities.

2. Natural Resources and Conservation

Goal: Develop natural resources programs which will enhance and protect the natural environment for the social and economic betterment of the entire State.

Subgoals:

A. Encourage the efficient use of existing resources and the protection of the natural, scenic environment.
B. Develop plans for the reclamation of salvageable and recycleable materials from solid waste.
C. Promote the wide use of environmental resources to meet the energy needs of the State, utilizing interstate cooperation and environmental education.
D. Promote environmental quality through the adoption and enforcement of State standards to ensure proper land use and pollution control.
E. Encourage public purchase of open space and beaches to preserve and ensure the best use of these resources for the public good.
F. Initiate programs to evaluate and review the environmental impact of existing and proposed development within the State.
G. Formulate and adopt differential tax structure legislation which will stimulate the development of energy resources while encouraging the efficient use of existing resources.

3. Recreation and Culture

Goal: Design and implement comprehensive recreational and cultural programs that provide indoor and outdoor recreational and leisure-time opportunities.

Subgoals:

A. Promote the improvement and development of parks and recreation centers.
B. Promote a system of complimentary recreational and cultural facilities and programs with emphasis on public library development.
C. Promote the development of varied, quality, outdoor recreation facilities.
D. Promote and advertise the scenic, recreational, and cultural facilities of Alabama.

The relationship between the subgoals for these three functional areas of State Government and the specific components of the two major objectives of this basin planning effort are indicated in the matrix on the following page.

TABLE 1-1 — INTER-RELATIONSHIP BETWEEN SPECIFIC COMPONENTS OF MAJOR OBJECTIVES AND THE STATE'S PRELIMINARY SUBGOALS IN THREE FUNCTIONAL AREAS OF STATE GOVERNMENT

STATE GOALS AND SUB GOALS

1. ECONOMIC DEVELOPMENT

   GOAL: ENCOURAGE ECONOMIC DEVELOPMENT IN ALABAMA AT GREATER THAN THE NATIONAL AVERAGE, BUT AT THE SAME TIME PROTECT AND CONSERVE NATURAL AND HUMAN RESOURCES TO THE BEST EXTENT POSSIBLE.

   SUBGOALS:
   - A. UPGRADE THE QUALITY OF THE LABOR FORCE THROUGH MANPOWER DEVELOPMENT.
   - B. DEVELOP AND ENFORCE ADEQUATE CONTROLS ON DEVELOPMENT TO PRESERVE ECONOMICALLY PRODUCTIVE LANDS AND TO PREVENT HAPHAZARD DEVELOPMENTS IN UNINCORPORATED AREAS.
   - C. PLACE MAJOR EMPHASIS ON THE ATTRACTING OF HIGH-WAGE INDUSTRIES WHICH WILL DIVERSIFY THE INDUSTRIAL BASE OF THE ECONOMY.
   - D. DEVELOP STATE POLICY WHICH WILL PROVIDE FOR THE ORDERLY AND EXPANDED ECONOMIC GROWTH OF THE STATE.
   - E. EXPAND PUBLIC FINANCIAL SUPPORT OF ECONOMIC PLANNING AND DEVELOPMENT ACTIVITIES.

2. NATURAL RESOURCES AND CONSERVATION

   GOAL: DEVELOPMENT NATURAL RESOURCES PROGRAMS WHICH WILL ENHANCE AND PROTECT THE NATURAL ENVIRONMENT FOR THE SOCIAL AND ECONOMIC BETTERMENT OF THE ENTIRE STATE.

   SUBGOALS:
   - A. ENCOURAGE THE EFFICIENT USE OF EXISTING RESOURCES AND THE PROTECTION OF THE NATURAL, SCENIC ENVIRONMENT.
   - B. DEVELOP PLANS FOR THE RECLAMATION OF SALVAGEABLE AND RECYCLEABLE MATERIALS FROM SOLID WASTE.
   - C. PROMOTE THE WIDE USE OF ENVIRONMENTAL RESOURCES TO MEET THE ENERGY NEEDS OF THE STATE, UTILIZING INTERSTATE COOPERATION AND ENVIRONMENTAL EDUCATION.
   - D. PROMOTE ENVIRONMENTAL QUALITY THROUGH THE ADOPTION AND ENFORCEMENT OF STATE STANDARDS TO ENSURE PROPER LAND USE AND POLLUTION CONTROL.
   - E. ENCOURAGE PUBLIC PURCHASE OF OPEN SPACE AND BEACHES TO PRESERVE AND ENSURE THE BEST USE OF THESE RESOURCES FOR THE PUBLIC GOOD.
   - F. INITIATE PROGRAMS TO EVALUATE AND REVIEW THE ENVIRONMENTAL IMPACT OF EXISTING AND PROPOSED DEVELOPMENT WITHIN THE STATE.
   - G. FORMULATE AND ADOPT DIFFERENTIAL TAX STRUCTURE LEGISLATION WHICH WILL STIMULATE THE DEVELOPMENT OF ENERGY RESOURCES WHILE ENCOURAGING THE EFFICIENT USE OF EXISTING RESOURCES.

3. RECREATION AND CULTURE

   GOAL: DESIGN AND IMPLEMENT COMPREHENSIVE RECREATIONAL AND CULTURAL PROGRAMS THAT PROVIDE INDOOR AND OUTDOOR RECREATIONAL AND LEISURE-TIME OPPORTUNITIES.

   SUBGOALS:
   - A. PROMOTE THE IMPROVEMENT AND DEVELOPMENT OF PARKS AND RECREATION CENTERS.
   - B. PROMOTE A SYSTEM OF COMPLIMENTARY RECREATIONAL AND CULTURAL FACILITIES AND PROGRAMS WITH EMPHASIS ON PUBLIC LIBRARY DEVELOPMENT.
   - C. PROMOTE THE DEVELOPMENT OF VARIED, QUALITY, OUTDOOR RECREATION FACILITIES.
   - D. PROMOTE AND ADVERTISE THE SCENIC, RECREATIONAL, AND CULTURAL FACILITIES OF ALABAMA.

MAJOR OBJECTIVE	COMPONENTS OF OBJECTIVE	1.A	1.B	1.C	1.D	1.E	2.A	2.B	2.C	2.D	2.E	2.F	2.G	3.A	3.B	3.C	3.D
NATIONAL ECONOMIC DEVELOPMENT (NED)	1. INCREASED OR MORE EFFICIENT OUTPUT OF FOOD AND FIBER.																
	A. IMPROVED EFFICIENCY OF PRODUCTION AND RESULTING AGRICULTURAL INCOME.		●		●		●										
	B. INCREASED FOREST PRODUCTION AND UTILIZATION.		●		●		●				●			●		●	●
	2. URBAN FLOOD DAMAGE REDUCTION.		●		●		●			●							
	3. INCREASED AND MORE EFFICIENT PRODUCTION OF AGRICULTURAL, MUNICIPAL, AND DOMESTIC WATER SUPPLY.		●	●			●										
	4. INCREASED OUTPUT OF OUTDOOR RECREATIONAL OPPORTUNITIES.		●		●		●				●			●		●	●
ENVIRONMENTAL QUALITY (EQ)	1. IMPROVED QUALITY ASPECTS OF WATER, LAND AND AIR.																
	A. IMPROVED WASTE DISPOSAL.						●	●									
	B. IMPROVED STREAM WATER QUALITY.						●										
	C. REDUCTION IN SEDIMENTATION.						●			●							
	D. REDUCTION POINT SOURCE EROSION.						●			●							
	2. IMPROVEMENT, PROTECTION AND/OR PRESERVATION OF AREAS OF NATURAL BEAUTY FOR MAN'S ENJOYMENT.																
	A. PROTECTION OF AND INCREASED ACCESS TO SCENIC AREAS.						●				●			●		●	●
	3. ENHANCEMENT OF PRESERVATION OF BIOLOGICAL RESOURCES.																
	A. IMPROVED QUALITY AND INCREASED QUANTITY OF FISH AND WILDLIFE HABITAT.						●										
	B. PROTECTION OF RARE AND ENDANGERED SPECIES OF FLORA AND FAUNA.						●										
	4. PRESERVATION OF ARCHAEOLOGICAL AND HISTORICAL RESOURCES.						●				●			●		●	●

CHAPTER 2

NATURAL RESOURCES

DESCRIPTION OF THE BASIN

The Alabama River Basin comprises approximately 22,750 square miles extending from East Tennessee and Northwest Georgia diagonally across Alabama in a southwesterly direction to the confluence of the Alabama River with the Tombigbee River approximately 45 miles north of Mobile. There has been considerable development of the land and water resources in the upstream portion of the basin in Tennessee and Georgia through ongoing programs and this portion of the basin is not included in the study. However, the effects of waterflow from this portion of the basin have been considered.

The basin is located primarily in the Southern Piedmont, Southern Coastal Plains, and the Alabama-Mississippi Blackland Prairies Land Resource Areas. The headwaters of the basin extend into the Southern Appalachian Ridges and Valleys and Sand Mountain Land Resource Areas. The principal cities within the basin are Gadsden, Anniston, Montgomery, and Selma. The greater Birmingham area, the largest urban area within the state, with a population of approximately 900,000 is partially within the basin. The 1966-67 Conservation Needs Inventory indicates that approximately 68 percent of the land area is forest land and 24 percent is distributed equally between cropland and pasture. Slightly more than 8 percent of the basin land area is being used for non-agricultural purposes. The drainage area of the Alabama Subbasin is 5,919 square miles, the Cahaba is 1,872 square miles and the Alabama portions of the Coosa and Tallapoosa subbasins are 5,461 square miles and 3,959 square miles respectively. The Alabama portion of the basin totals 17,211 square miles (11,015,000 acres) and the drainage area in East Tennessee and Northwest Georgia is 5,539 square miles. Hereafter, reference to "the basin" applies only to the Alabama portion.

Climate

The climate is influenced by frontal systems moving from northwest to southeast and temperatures change rapidly from warm to cool due to inflow of northern air. The average annual temperature is 64 degrees Fahrenheit, ranging from 60 degrees in the north to 68 degrees in the southern portion of the basin (see figure 2-1). The average daily temperature varies from 80 degrees Fahrenheit in July to 47 degrees Fahrenheit in December.

Summer temperatures usually reach 90 degrees or higher about 70 days per year but temperatures above 100 degrees are relatively rare. Freezing temperatures are common but are usually of short duration. During the winter, extreme lows of 32 degrees or less occur about 65 times. The frost-free season varies from 201 days in the extreme north portion to about 261 days in the southern portion of the basin. Snowfall is rare and averages only about 1 inch per year in the northern portion.

Figure 2-1 -- Average annual temperature, 1931-1960.

Precipitation

Average annual rainfall is about 54 inches and varies from 52 inches in the northern portion to 60 inches in the southern portion of the basin. The nearness of the Gulf of Mexico is a major reason for plentiful rainfall in the basin. Climatic forces change with seasons but the direction and velocity of the winds do not vary greatly during the year. The more intense rains usually occur during the warmer months.

The normal rainfall pattern is shown in figure 2-2. Flood-producing storms over the Alabama River Basin are usually of the frontal type. They usually occur in the winter and spring and last from 2 to 4 days. Normally 5 to 6 inches of intense or general rainfall will cause widespread

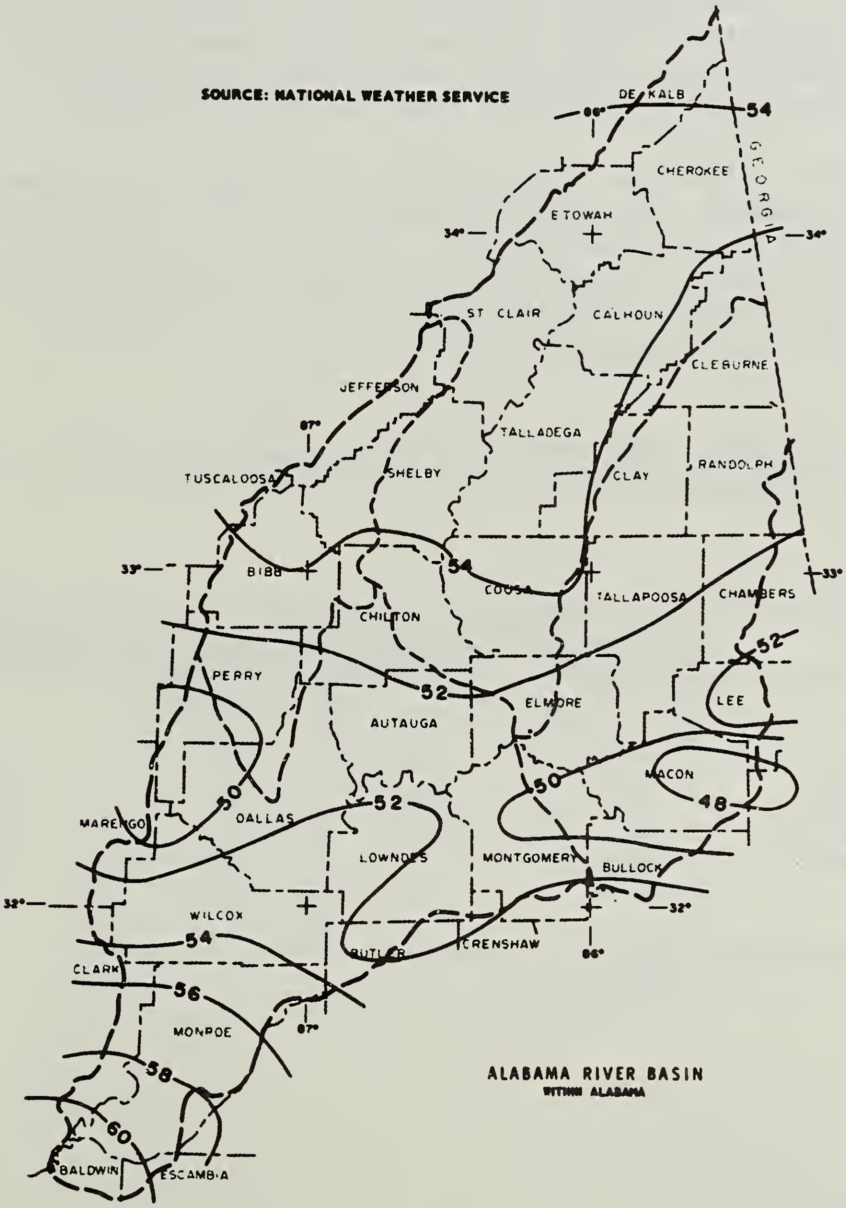

Figure 2-2 -- Normal annual precipitation (inches), 1931-1960.

flooding, but on many smaller streams, 3 to 4 inches of rainfall are sufficient to produce significant flooding. During the last 37 years, 80 percent of the flood-producing storms occurred during winter and spring months, and 25-30 percent of these storms occurred in March. March is generally the wettest month with an average rainfall of over 6 inches. Occasionally several wet years or dry years occur in series. However, annual rainfall records indicate no pattern. The greatest probability of drought is in May and October. Severe droughts are uncommon.

Wind

Wind in the basin is normally less than 10 miles per hour. During the passage of cyclonic disturbances over and to the north of the basin, there have been destructive local windstorms with some developing into tornadoes. The southern portion of the basin occasionally experiences high winds when hurricanes move inland from the Gulf of Mexico.

Structures oriented to the wind are rare and windbreaks are uncommon. However, resource planners may want to know prevailing and maximum recorded wind direction and velocity (see table 2-1). Wind records are available from the National Oceanic and Atmospheric Administration (formerly U. S. Weather Bureau) stations in Atlanta, Birmingham, Chattanooga, Mobile, and Montgomery.

Table 2-1--Average annual and maximum recorded wind velocities, Alabama River Basin.

STATION	PREVAILING		MAXIMUM		
	VELOCITY (m.p.h.)	DIRECTION	VELOCITY 1/ (m.p.h.)	DIRECTION	DATE
Atlanta, Georgia	9.6	NW	70	NE	1/53
Birmingham, Alabama	7.9	S	65	SW	3/55
Chattanooga, Tennessee	6.3	S	82	W	3/47
Montgomery, Alabama	6.8	S	60	SW	3/52
Mobile, Alabama	9.2	N	98	E	7/16

1/ Excludes tornado force winds

Geology and Topography

The Alabama River Basin is an area of strong topographical contrasts. There are five major land resource areas within the basin. Each of these areas is characterized by similar topography, soils, land use, and climate (see figure 2-3). These characteristics are interrelated with the geology and weather patterns of the area and have produced a distinct, recognizable land form with advantages and disadvantages as well as corridors for and barriers to development.

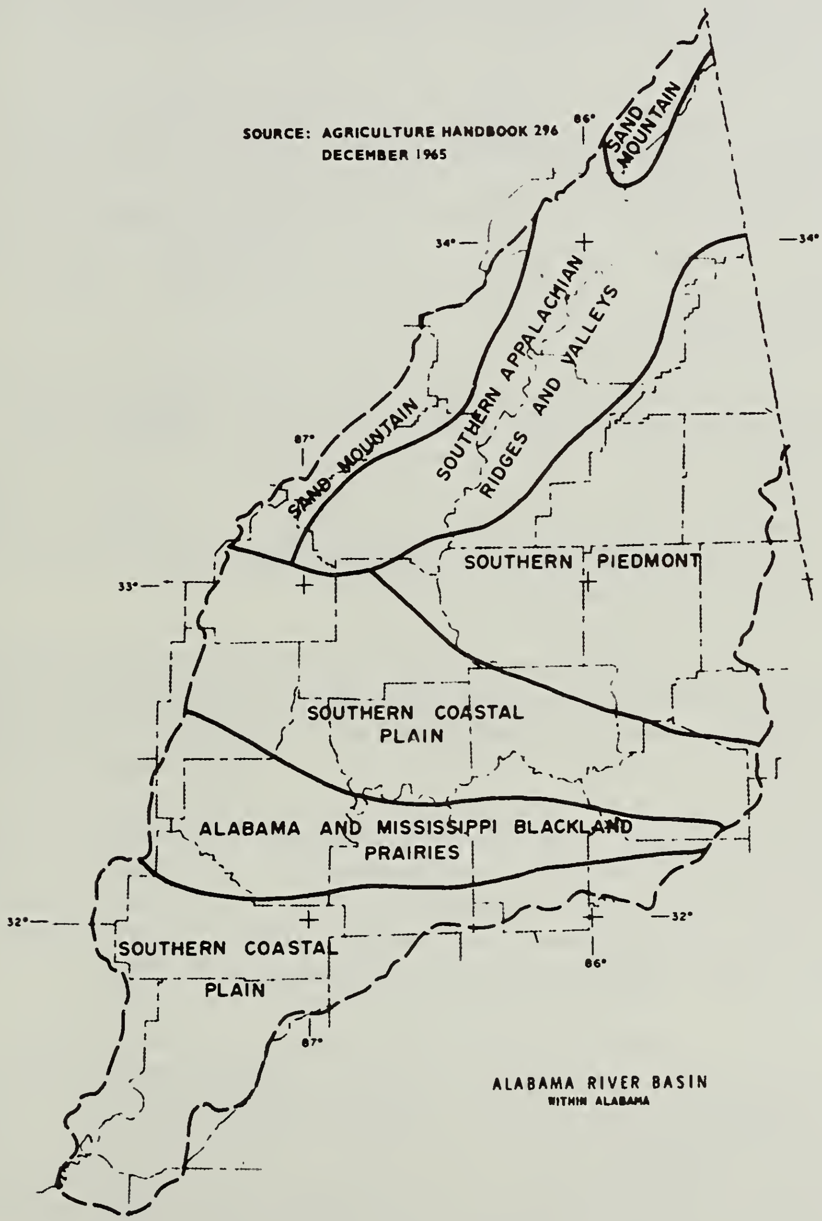

Figure 2-3 -- Major land resource areas.

Sand Mountain Land Resource Area is a series of plateaus underlain by rocks belonging to the Pottsville Group of Pennsylvanian Age. These rocks are a thick sequence of shales and sandstones; mostly flat lying and undeformed with a strong sandstone near the base of the sequence. The basal sandstone forms prominent cliffs overlooking the valleys so that the plateau margins stand out sharply to the observer. The Sequatchie and Wills Creek anticlines form valleys that divide the area into three main parts: Lookout Mountain, Sand Mountain, and the plateau west and south of Sand Mountain. The long straight Wills Creek and Sequatchie Valleys are developed on limestones that are folded and broken by thrust faulting similar to the valleys in the adjacent Ridge and Valley area; and stand in strong contrast to the main portions of the plateaus with their massive sandstone rims. Elevations generally range from 700 to 1,500 feet mean sea level (msl).

The Southern Appalachian Ridges and Valleys Land Resource Area is also called the Coosa Valley or the Limestone Valleys. The area is a series of wide, gently rolling valleys and steep, rough ridges all trending northeast-southwest. Long, straight valleys and ridges influence transportation, agriculture, streams, and roads. Elevation in the valleys range from 500 to 700 feet msl, and elevations on the higher ridges from 1,500 to 2,000 feet above mean sea level.

The Ridge and Valley area is known geologically as the Folded Appalachians. The northeast-southwest trend is caused by the parallel folding and faulting of the underlying rocks. In the humid climate of the region, limestone is generally weathered most rapidly, with shale being a little more resistant and sandstone being the most resistant. Selective weathering has formed sandstone and shale ridges and limestone and shale valleys parallel to the structure of the underlying rocks.

The Southern Piedmont Land Resource Area comprises about 25 to 30 percent of the basin. The area is mostly a moderately rolling upland developed on deeply weathered, crystalline, metamorphic rocks. Schists and gneisses predominate with quartzites, slates, and phyllites forming lesser areas. Elevations in the Piedmont area of Alabama generally range from 700 to 1,000 feet above mean sea level. The state's highest elevation, Cheaha Mountain at 2,407 feet msl, is located in this area. The Piedmont area was once general farmland used primarily for cotton production. During the past 30 years, because of erosion and economic factors, the area has become a land of pine timber, mixed farming, and manufacturing.

The Southern Coastal Plains Land Resource Area comprises most of the southern half of the basin and is divided in two portions by the Black Belt. The northern portion of the Coastal Plain is mostly rough, rolling land, generally called the Upper Coastal Plain. South of the Black Belt the countryside varies from rough and rolling to smooth and gently rolling. Topography and soils of the Coastal Plains favor the development of timber and general agriculture. Elevations in the Upper Coastal Plain vary from 300 to 600 feet msl and in the Lower Coastal Plain from 100 to 500 feet above mean sea level.

The Upper Coastal Plain is developed on sands, clays, and gravels of the Tuscaloosa Group and the Eutaw Formation of Upper Cretaceous Age. The Lower Coastal Plain is underlain by sands, clays, shales, and limestone of Cretaceous through Recent Age. The area is belted with topographic belts trending east and west in the basin. This belting is caused by weathering of formations of differing resistance. The geologic structure is monoclinal and the formations all slope very gently southward at 10 to 45 feet per mile.

The Alabama and Mississippi Blackland Prairies Land Resource Area is more commonly called the Black Belt. In the basin, the Black Belt trends east and west and is generally an area of gently undulating topography developed on soft, limy, sedimentary rocks. The name, Black Belt, is derived from the fertile, black soils. The area was originally grassland with hardwood timber and brush. The topography and soils led first to development of a cotton plantation culture; later a cattle industry developed, and now the area is diversifying with mixed agriculture, cattle, and crops. Elevations generally range from 100 to 300 feet above mean sea level.

The Black Belt geologically belongs within the Coastal Plains but is such a distinct belt and covers such a large area that it is set out as a major land resource area. The same structure that is present in the Coastal Plain prevails with the same gentle southerly slope of the formations.

INVENTORIES OF RESOURCES

Inventory data has been developed from numerous published sources such as the 1967 Conservation Needs Inventory, the 1969 Agricultural Census, and the 1970 U. S. Census. Information from many technical publications has also been used.

In addition to data from secondary sources, the river basin staff conducted an extensive field examination of the entire basin area. Data was collected and organized within groups of designated Conservation Needs Inventory watersheds. This field examination was oriented toward the identification of existing and projected problems and needs and the location of resources with development potential. Attention was directed toward the problems and needs identified in the Work Outline and those encompassed by the specific components of the two planning objectives. The areas of interest expressed by the Alabama Development Office was also considered. District Conservationists of the Soil Conservation Service participated in this field examination and furnished valuable information concerning problems and needs within their district. After the field examination was completed, additional data was collected through SCS

District Conservationists, from other state agencies, from university personnel, and regional planning commissions. The need for displaying combinations of resource inventory data and identifying conflicting uses of resources was recognized early in the inventory process. For these reasons, much of the resource data collected has been prepared for storage in a map oriented computer data storage system known as MIADS (Map Information Assembly and Display System). This system is used to store, combine, and display some of the basic data.

Inventoried resource data stored in MIADS and maintained in the files of participating USDA agencies are available on request.

WATER

Generally, the basin has a plentiful supply of good quality water for municipal, industrial, domestic and livestock purposes. In most areas of the basin an adequate supply of surface water exists, or could be impounded.

Water supply sources of the basin are generally adequate at the present time except in local areas during extreme dry periods. In the future, additional supplies will be needed in all areas of the basin. A large part of the future needs can be supplied through development of surface reservoir storage.

Surface Water

Only two county studies and eight county maps of surface water resources in the river basin have been published by the U. S. Geological Survey/Geological Survey of Alabama (see appendix 10). Rainfall (54-inch average) in the basin amounts to about 49.5 million acre-feet per year. Most of this rainfall is returned to the hydrologic cycle by evaporation and transpiration, a small amount infiltrates to ground water reservoirs, and the remainder becomes streamflow (approximately 19 inches). The geographic distribution of surface runoff is illustrated by appendix table 1. Average annual runoff represents the normal surface water resource or the normal recoverable surface water supply. This totals about 23.7 million acre-feet per year or approximately 21.2 billion gallons per day. The streamflow is equivalent to an average runoff of 19.59 inches from the entire basin area including the area outside Alabama (see figure 2-4).

Impoundments -- The impoundments of the basin range in surface area from a fraction of an acre up to 40,000 acres. There are about 14,745 impoundments, including natural impoundments, containing a combined

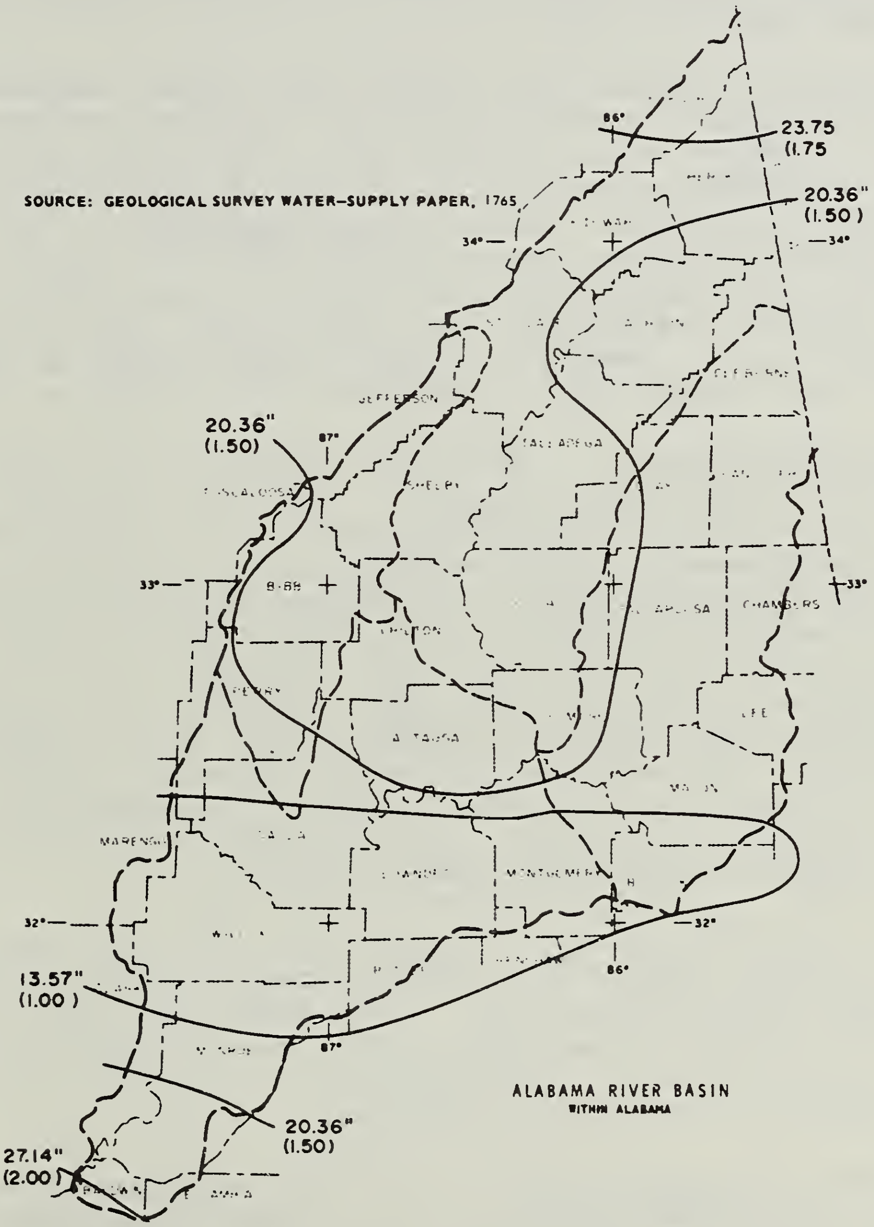

Figure 2-4 -- Annual runoff in inches (cubic feet per second - per square mile in parenthesis).

surface areas area of 245,620 acres. Included in natural impoundments are beaver ponds, river oxbows, wet borrow pits, and Grady ponds (natural, swampy, rounded ponds or "bays" in the Coastal Plains Area).

There are 95 impoundments with a surface area larger than 40 acres and whose combined surface area would be 177,910 acres. This represents only 0.6 percent of the impoundments but 72.4 percent of the total surface area. Martin Lake is the largest impoundment in the basin and has a surface area of 40,000 acres and a storage capacity of 1,630,000 acre-feet at normal operating level.

The U. S. Corps of Engineers and Alabama Power Company impoundments statistics are shown in appendix table 2B. Locations are shown in figure 4-17. Statistics for single purpose and multiple-purpose structures installed under authority of PL-566 and the RC&D Programs are shown in appendix table 2C. Statistics for impoundments, other than those mentioned above, are shown in appendix table 2D. Shown in this table are the total number and surface acres of impoundments larger than 40 acres, between 5 and 40 acres, less than 5 acres, and natural impoundments. Figure 2-5 is a summary of appendix tables 2C and 2D showing the number and total surface area of impoundments by county and subbasin.

Surface Water Quality -- The surface waters of the Alabama Basin are generally of good chemical quality. With minor treatment, most waters of the basin are suitable for industrial or domestic uses. A summary of plant managers' opinions of water quality conditions and treatment facilities that exist in the Alabama River Basin indicates that water treatment for industry is a serious concern in only 3 percent of industries that treat their own water supplies. Specific individual qualities may be of great importance when the water is to be used in some manufacturing processes (see appendix table 3A for common water use characteristics). If water of specific qualifications is not available, the available supply can usually be tailored to fit industrial needs by chemical treatment. Few, if any, industries have failed to locate in the basin because of water quality deficiencies.

The chemical quality of water in streams varies with the stage and at low flow is closely related to the mineral characteristic of the geologic units through which the water flows. The Alabama River and its tributaries are higher in calcium and magnesium content than in sodium and potassium at both high and low stage. As flow decreases, the bicarbonate content increases and the sulfate content decreases.

Stream temperatures vary from 36° to 48° F in January and February to 63° to 86° F in July and August. Major streams furnish an abundant year long supply of water at temperatures suitable for most industrial purposes.

Water use is based on volume of flow, depth of channel, rate of flow temperature, natural characteristics, geographic location, and the nature of the stream and its major uses.

In determining the precautionary measures to be taken to reduce the effect of wastes upon water quality, it is necessary to study the nature of the natural waters and how they are affected by wastes discharges. The effects of organic loadings are most evident during the warm summer months when high stream temperatures and low flow coincide. Water quality parameters measured in the Alabama River Basin are listed by agencies in appendix table 3B. Locations are shown on figure 2-6.

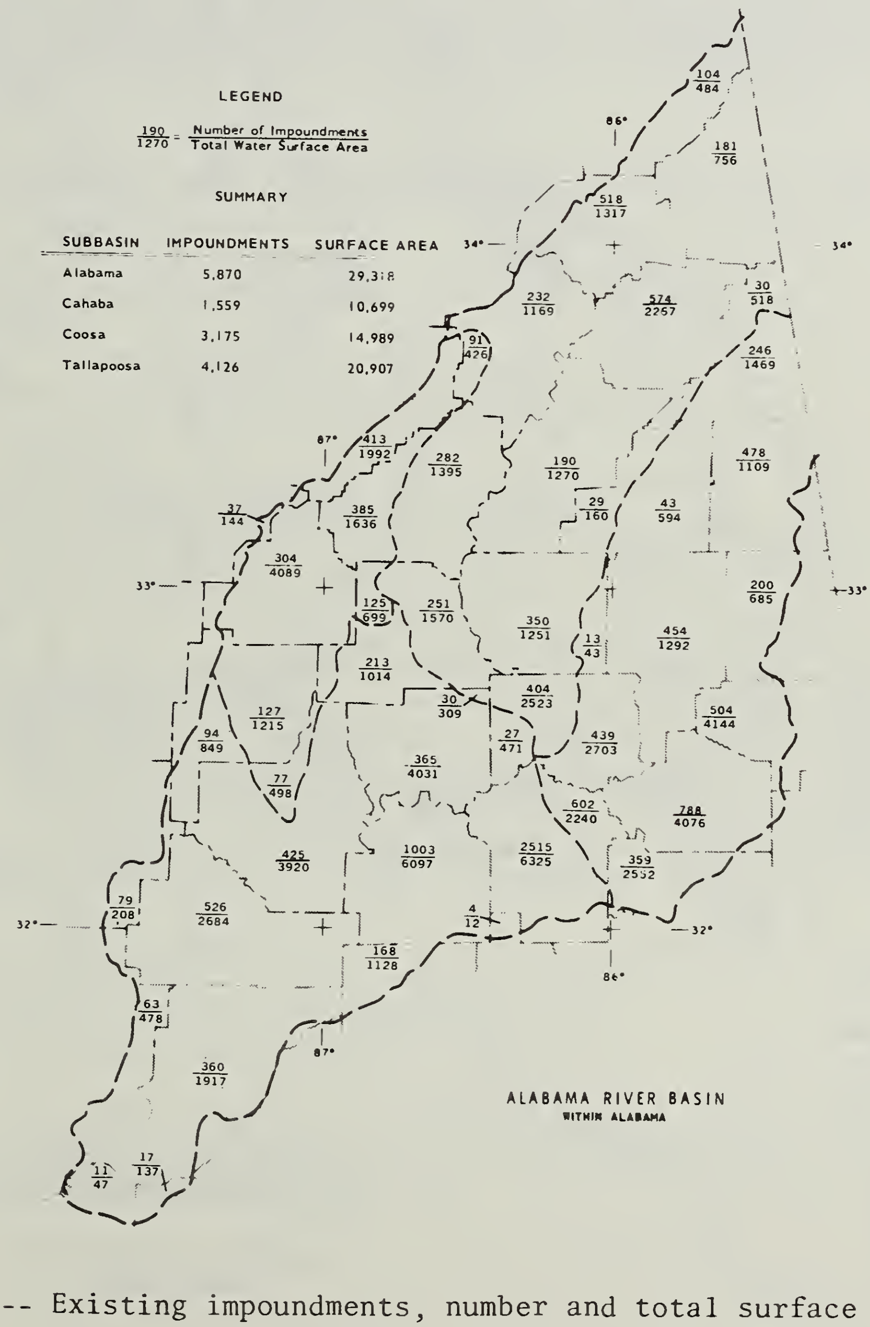

Figure 2-5 -- Existing impoundments, number and total surface area. (Data for impoundments larger than 40 acres or stream drainage more than 250,000 acres are not included in this figure.)

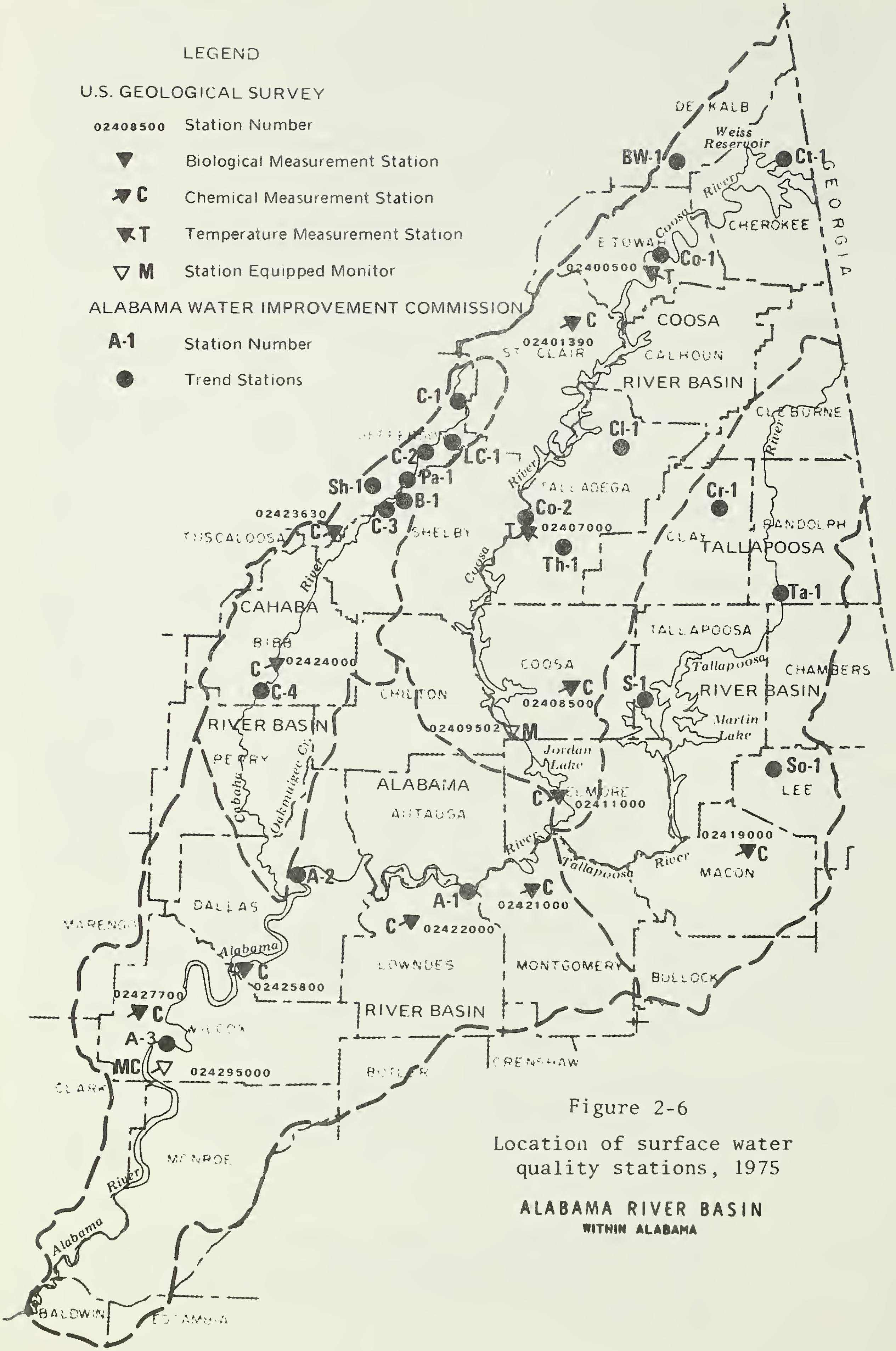

Figure 2-6

Location of surface water quality stations, 1975

ALABAMA RIVER BASIN
WITHIN ALABAMA

Sewage Treatment -- Private industry and municipalities have invested large sums in recent years for sewage treatment facilities in the basin. In 1972, residents and industry in the Alabama River Basin generated 847,900 population equivalents of waste which receive varying degrees of treatment (see table 2-2). Municipalities are listed in appendix table 4A by type of waste disposal facility. In 1972, there were still untreated wastes being discharged into the streams of the basin. Fourteen towns with a total population of 68,000 or more had inadequate facilities, however, the Alabama Water Improvement Commission reports that one of these had new facilities presently under construction while six others had corrective plans in the advanced stage. Ten industrial treatment facilities were listed as inadequate with plans scheduled to meet required standards. Appendix table 4B lists waste water treatment by industries in the study area.

Table 2-2 -- Population served by sanitary sewage facilities, 1972.

Alabama Subbasin	187,685
Coosa Subbasin	188,543
Tallapoosa Subbasin	92,249
Cahaba Subbasin	379,451
TOTAL	847,928

Stream Use Classification -- The Alabama Water Improvement Commission adopted water use classifications in 1967. The establishment and maintenance of stream classification standards is primarily a state function, but a federal influence is exerted through the Environmental Protection Agency (EPA). The classification of water uses in streams in the Alabama River Basin was completed in 1972, the Cahaba River Subbasin being the last. The classifications, as revised in September 1973, are:

1. Public Water Supply
2. Swimming
3. Fish and Wildlife
4. Fish and Wildlife as a Goal

The use classification of streams in the Alabama River Basin are presented in figure 2-7. Use classification, for all streams classified (1975), is shown by reaches in appendix table 5B.

The State of Alabama is developing a Water Quality Management Plan for each of the 14 river basins within the state. In certain urban-industrial areas of the state, the Regional Planning and Development Commissions will be responsible for developing area-wide waste treatment management plans. Stream mileage data is compiled by free-flowing and impounded stream miles. Most of the mainstream of the Alabama and Coosa Rivers is impounded. With installation of the proposed Crooked Creek impoundment on the Tallapoosa River, about 50 percent of this stream will be impounded. None of the Cahaba River is impounded and a section is being considered for designation as a scenic river. The 1963-1964 annual report of the Alabama Water Improvement Commission indicated there are about 978 river miles in the basin; approximately 500 miles are impounded as of 1975.

There are about 13,600 miles of streams in the Alabama River Basin with drainage areas one square mile or larger (see table 2-3). Estimated total mileage of streams in Alabama is 41,150 miles. These estimates were determined by measuring the thread of the stream on a selected group of 7½ minute quadrangle maps to determine the ratio of stream mileage to drainage area (see appendix 6 for additional procedural details).

Table 2-3 -- Estimated mileage of streams having drainage areas exceeding one square mile.

RIVER SUBBASINS	DRAINAGE AREA SQUARE MILES 1/	MILES OF STREAMS 2/
Alabama	5,919	4,840
Coosa	5,461	4,240
Cahaba	1,872	1,410
Tallapoosa	3,959	3,110
TOTAL	17,211	13,600

1/ Alabama Conservation Needs Inventory, 1967.
2/ Expanded from a sample on 7½-minute quadrangle map.

"Streamflow" classification is presented in appendix 6 by type of flow. Selected streams were inventoried by the following flow classifications:

1. Perennial
2. Intermittent
3. Ephemeral
4. Ponded

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EXPLANATORY NOTES CONCERNING WATER USE CLASSIFICATIONS

1. On September 17, 1973, the Alabama Water Improvement Commission adopted a classification of "Fish and Wildlife as a Goal" for certain waters of the State. The Environmental Protection Agency disallowed this classification and in November of 1974 promulgated federal water quality standards for the waters of the State of Alabama which reclassified as "Fish and Wildlife" all stream segments classified by the Alabama Water Improvement Commission as "Fish and Wildlife as a Goal" within the Alabama River Basin. This action by the Environmental Protection Agency is being challenged in court and has not been resolved as of July 1, 1976

Figure 2-7

WATER USE CLASSIFICATIONS FOR STATE AND INTERSTATE WATERS OF THE ALABAMA RIVER BASIN

(AS AMMENDED SEPTEMBER 17, 1973)

WITHIN ALABAMA

0 10 20 30 40 50

APPROXIMATE SCALE MILES

Base Compiled from 1:500,000 USGS State Base Map, Lambert Conformal Projection.

REVISED JUNE 1976 4-R-34882

SOURCE: Data from the Alabama Water Improvement Commission, 1973.

REVISED MAY 1976 4-R-28941-A

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The flow classification is grouped by watershed, river basins, and percentages in each land resource area. Stream classification by the above factors provides the water resource planner with valuable information for evaluating the quality of streams.

Reservoir Sites--An inventory of available reservoir sites in the Alabama River Basin has been completed and certain parameters of each site examined. It was not intended to locate every available site, but to select the better sites within an area. The inventory is designed to give planners a starting point in locating reservoir sites for meeting recreational, municipal and industrial, fish and wildlife, irrigation, and flood detention needs. The site parameters can be used in making preliminary estimates of effects and cost (for methodology see appendix 7A).

The major rivers of the basin are largely committed to navigation and hydroelectric power and therefore, additional development of the rivers beyond that already existing or planned is limited. Consequently, the evaluation of available reservoir sites was focused on tributaries and minor streams. Drainage areas range in sizes from 2 to 30 square miles with a few going up to 125 square miles. The available storage volumes range from 450 to 50,000 acre feet. Surface areas range from 45 to 2,600 acres. Figure 2-8 shows the location of potential reservoir sites. Data, such as location, drainage area size, reservoir size, and embankment volume can be found in appendix table 7B.

The topography of the Sand Mountain, Southern Appalachian Ridges and Valleys, and Southern Piedmont land resource areas is well suited for impoundments. However, the potential for reservoir development is often limited by factors such as roads, railroads, pipelines, transmission lines, houses, other fixed improvements, or geologic conditions. These items have a more immediate effect on the selection of large impoundments. Sites for small private ponds for recreation, irrigation, fire control, fish production, and other purposes are relatively unlimited throughout the area.

The soil and foundation characteristics in the above areas are favorable for constructing earthfill structures for both large and small reservoirs. Borrow material is readily available within close proximity of the site. Some locations may have a limited supply of impermeable soil for use as core material. Seepage through the abutments and foundations may be a problem with the greater water storage depths within the Sand Mountain area and the Appalachian areas.

Due to the stage-storage relationship, large reservoirs for purposes such as municipal use, industrial use, fish and wildlife, recreation or low-flow augmentation will require high dams. It is not difficult to locate embankments in areas with flood plains ranging from 50 to 400 feet in width. This results in rather short dams compared to their height.

The extent of site availability is limited in the Talladega Mountain area from Sylacauga to the Alabama-Georgia state line because this area has a high concentration of water resource developments. There are presently 69 floodwater retarding structures with drainage areas ranging from 1.1 to 38.1 square miles located in this area. Eight of these are multiple-purpose structures. Approximately 23 sites are planned but not constructed; some are multiple-purpose sites.

The lower reaches of the Piedmont, Upper Coastal Plain and Blackland Prairies areas are not as well suited for impoundments as is the area discussed above. Low, rolling topography characterizes these areas with broad valleys and gently sloping uplands. These conditions cause inundation of large land areas with relatively shallow depths. This impoundment characteristic is suitable for recreational purposes but these sites are less desirable if storage volume is a prime consideration. The topography lends itself to low embankments up to 3,500 feet in length. Suitable borrow material is readily available within close proximity of the structure. Critical sediment source areas above these sites may require treatment to control the accumulation of sediment in the reservoirs.

The Lower Coastal Plain is not well suited for impoundments. The topography is relatively flat, resulting in shallow reservoirs, and the sandy soils provide limited amounts of impermeable material.

Few potential sites exist on large creeks in the basin that have not been preempted by other interests. The removal or relocation of these fixed improvements renders the use of the sites as reservoirs prohibitively expensive.

In general, a site is available within reasonable distance of any need. However, man-made improvements will increase with time resulting in an increase in land rights cost; therefore, dedication of potential sites for beneficial water storage should be made as soon as possible.

The type of sites located are for on-stream reservoirs with ungated emergency spillways. These sites were studied primarily as single-purpose sites, however, water could be stored for multiple use. Some sites could include water storage for flood control, fire protection, irrigation, fish and wildlife, recreation, and other uses.

Topographic quadrangle maps were the primary tool used to locate potential reservoir sites and on-site investigations were conducted for relatively

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LEGEND

(18) —— POTENTIAL RESERVOIR SITES

NOTE: Number of each site corresponds to site numbers in Table 7B of the Appendix of the Alabama River Basin Study Report, which lists data for each site.

Selection of Potential Reservoir Sites was based on Topographic Map Study. No detailed survey or on-site investigations were made to determine economic or technical feasibility.

Figure 2-8

LOCATION MAP

POTENTIAL RESERVOIR SITES

ALABAMA RIVER BASIN

WITHIN ALABAMA

0 10 20 30 40 50

APPROXIMATE SCALE - MILES

Base Compiled from 1:500,000 USGS State Base Map, Lambert Conformal Projection.

SOURCE: Data Compiled by SCS, Alabama River Basin Study Staff.

REVISED JUNE 1976 4 - R - 34885

USDA-SCS-FORT WORTH, TEXAS 1976

REVISED MAY 1976 4-R-28941-A

few sites. Some unknown features such as sinks, faults, roads, power lines, building, etc., could exist in any reservoir site.

Ground Water

Ground Water Availability -- The Ground Water Availability map and legend is intended to portray, in very general terms, ground water conditions including range of depth, yield, and quality (see figure 2-9). The information is for area wide planning and not for specific well locations. More detailed information is available in appendix 8A which was developed for this report by combining data from three area-wide reports and other sources. The map was generalized from the 1926 Geologic Map of Alabama. Several geologic units (formations) were combined on the map where rock types and water bearing characteristics are similar. The map was developed expressly for this study and is an attempt to show the correlation of ground water occurrence within similar rock types.

Exceptions to the ranges shown in the figure 2-9 may be found in all areas. Planning based on this report should therefore be done conservatively. Planners should approach with caution proposals which expect maximum yields within a yield range or the minimum depth to obtain a given supply of ground water.

Ground water occurs in the space between soil particles and in cracks and crevices in the rocks of the earth. Extremes can occur on either side of the usual range for a rock type because of unusual fracturing or because of rock that is less permeable than usual. The specific location and development of large capacity wells should only be done with the advice of Geological Survey personnel or other competent professionals who have knowledge of ground water conditions of the given local area.

More detailed information on the availability of ground water is available at the Geological Survey of Alabama and/or from the district office of the Water Resources Division, U. S. Geological Survey in Tuscaloosa, Alabama. Water studies have been completed in most counties of the basin, though all are not published. These published reports and some unpublished information can be consulted at the offices of the agencies mentioned above. Appendix figures 10C and 10D indicate the status of water availability maps and geologic mapping.

Ground water availability and quality in the Appalachian Ridges and Valley Physiographic area is quite variable. The area consists of a series of narrow northeast to southwest trending ridges and valleys. Some of the largest springs in the state are found in this area issuing from highly fractured rock along faults. These highly fractured zones may be tapped for high yielding wells but the location of these non-typical areas is outside the scope of the present study.

The probability of high yielding wells in Piedmont Physiographic area is the poorest in the basin. Water quality is generally good for all purposes except for local areas where high iron content exists. The rocks of the area are crystalline (metamorphic and igneous) rocks and most are of low permeability. Ground water occurrence is controlled by the size and pattern of cracks and crevices and the depth of weathered rock (saprolite).

Large quantities of ground water are available throughout most of the Coastal Plains Physiographic area. Occurrence of water is controlled by the porosity of the material. The Coastal Plain consists of alternating beds of clay, marl, sand, gravel, and limestone. Aquifers, the porous formations or beds that store and transmit water, are usually sand, gravel or limestone. Silts, clays, or marls are so impermeable that they yield very little water to a well.

Generally the water in these coastal plain aquifers is fresh to depths of 1,000 to 2,000 feet and salt water occurs in these formations at greater depths. Because of the high yield capacity of the major aquifers and the overlapping of aquifers it is common for cities and industries of the area to use wells that tap one or more major aquifers and yield a half million gallons per day (350 gallons per minute) per well. Many wells in the area are capable of producing more than a million gallons per day (mgd) on a sustained basis.

Ground Water Quality -- The quality of ground water in the basin is generally good and requires little or no treatment for most uses. Some municipal and industrial supplies are treated for the removal of iron and carbon dioxide by aeration and rapid sand filtration. The addition of chlorine to kill harmful bacteria is a common practice. All treatment should be in accordance with standards set by public health departments and pollution control boards. Appendix table 9A shows use limitations of water quality parameters.

The amount and kinds of minerals dissolved in ground water may vary greatly from place to place, depending on the types of minerals in the soil or rocks over or through which the water moves, the content of carbon dioxide in the water, the temperature of the water, and the length of time the water has been in contact with the rocks. Common mineral constituents in ground water are iron, calcium, magnesium, bicarbonate, sulfate, chloride, fluoride, nitrate, sodium, potassium manganese, and silica.

Determination of the chemical quality of ground water in any given part of the basin can be made only on the basis of chemical analyses. Appendix table 9B shows results of chemical analysis at selected locations.

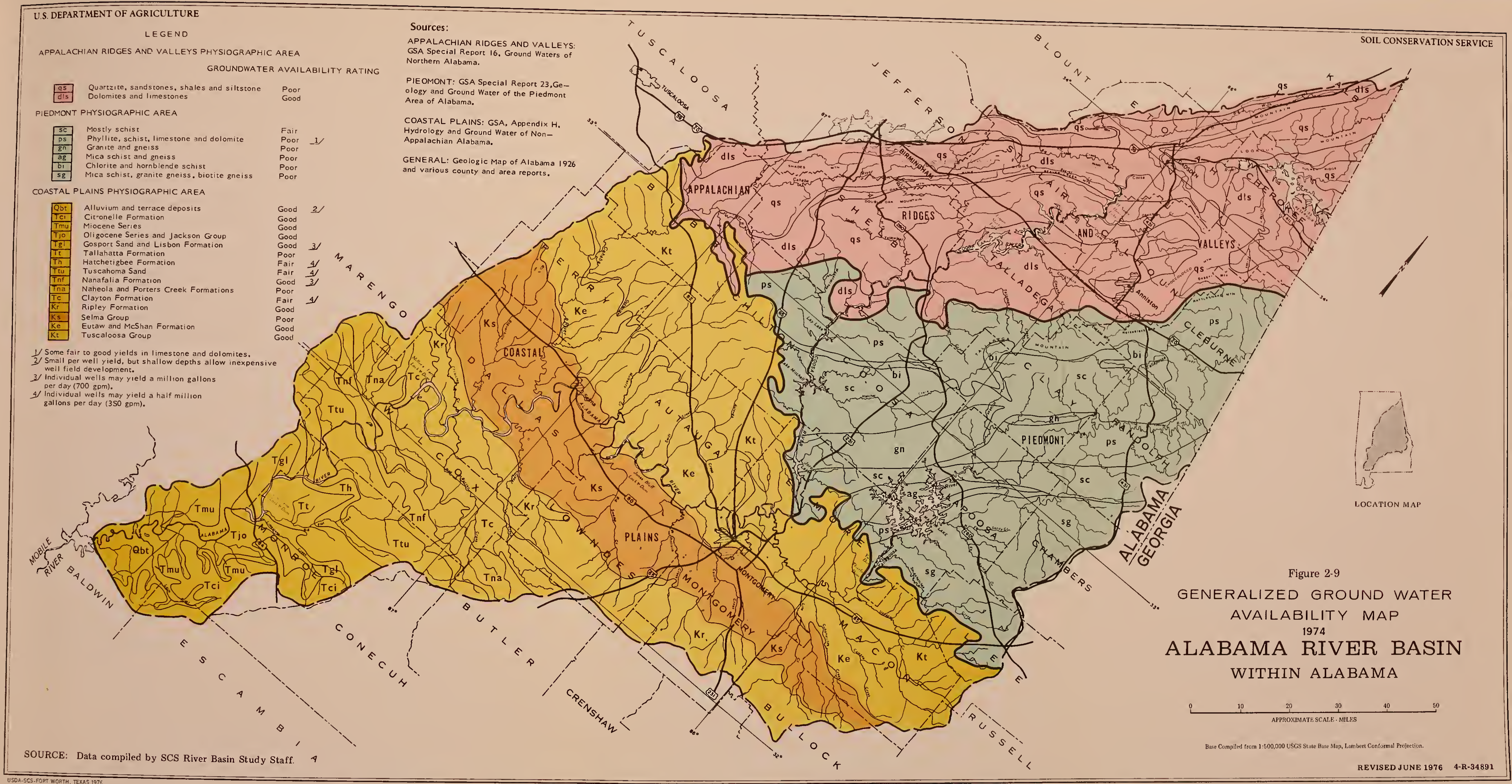


Figure 2-9
GENERALIZED GROUND WATER AVAILABILITY MAP
1974
ALABAMA RIVER BASIN
WITHIN ALABAMA

USDA-SCS-FORT WORTH, TEXAS 1976

JUNE 1976 BASE 4-R-28941-B

Appendix figure 9C shows the location of ground water quality tests typical of the Alabama River Basin. More detailed information on the chemical quality of ground water in specific areas may be obtained from the district office of the Water Resources Division, U. S. Geological Survey, Tuscaloosa, Alabama. Appendix table 3A gives the water quality characteristics and their effects.

MINERALS

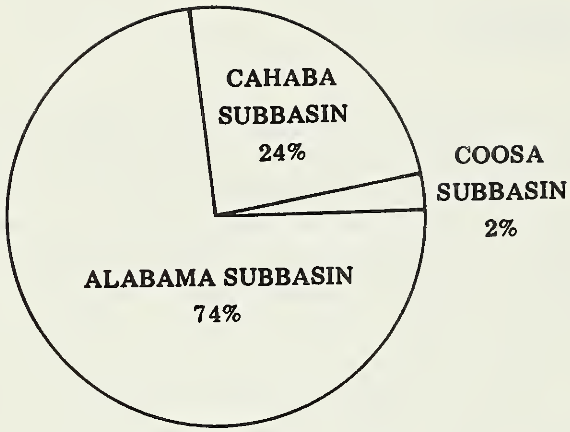
The Alabama River Basin is rich in mineral resources and supports a valuable mineral industry. Most minerals found in the basin are disemenated deposits and either are not mined at present or mined in very small areas which are usually not restrictive to area-wide land and water resource development. Urban encroachment or other preemptive land use may make even the most abundant mineral commodities, such as sand, gravel, and stone, unavailable in the local area of need. Sound land use planning should consider the best available data regarding the location of mineral commodities. It is suggested that resource planners consult the Geological Survey of Alabama concerning plans for any large land or water resource development. Quantitative estimates of most mineral resources and the projection of future mineral resource needs and the resultant effect on land and water resources are outside the scope of this study.

Events of recent years point up the need for development of energy reserves, particularly near-surface deposits of coal and lignite (low-rank bituminous coal). Figure 2-10 shows a comparison of reserves of coal in the state and basin and the approximate area potentially minable.

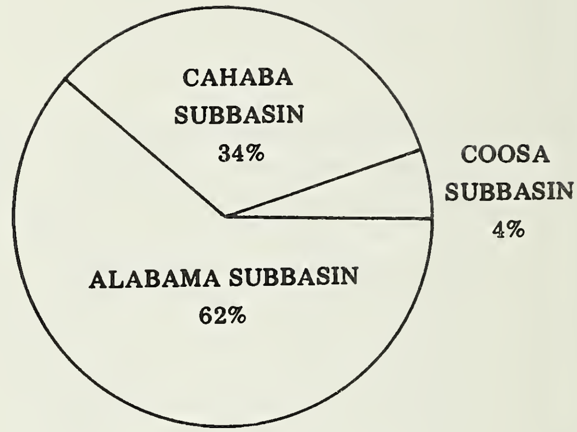
Figure 2-11 shows the approximate area in which coal, lignite, and petroleum (fossil fuels) are found in the basin. Petroleum reserves (proven) within the basin are small and were not estimated. Coal and lignite strip mining are potentially the largest "land users" of the mineral resources in the basin. Iron ore has been strip mined in local areas but surface mining is not active at the present and is not considered to be potentially a large land user in the future.

Of the strip mining in the basin, coal and lignite will potentially require the largest land area. This affected area represents 1 percent of the basin (see appendix table 11E and 11F).

More detailed information is available from publications of the Geological Survey of Alabama. Appendix figure 11A shows status of mineral resource mapping. The general area where other minerals may be found in the Alabama River Basin is shown in appendix figures 11B, 11C, and 11D.



ALABAMA BASIN RESERVES [1/]
of Strippable Coal and Lignite
(920 Million Tons)



AREA POTENTIALLY MINABLE

(126,000 Acres)

AREA	MILLIONS OF TONS AVAILABLE	ACRES POTENTIALLY AFFECTED
Alabama	3,883	643,000
Basin	920	126,000
Alabama Subbasin	679	77,500
Cahaba Subbasin	223	43,300
Coosa Subbasin	18	5,200
Tallapoosa Subbasin	0	0

Figure 2-10 -- Reserves of Strippable Coal and Lignite[1/], Alabama and the Alabama River Basin.

1/ Source - Geological Survey of Alabama, 1974 (see appendix Table 11E)

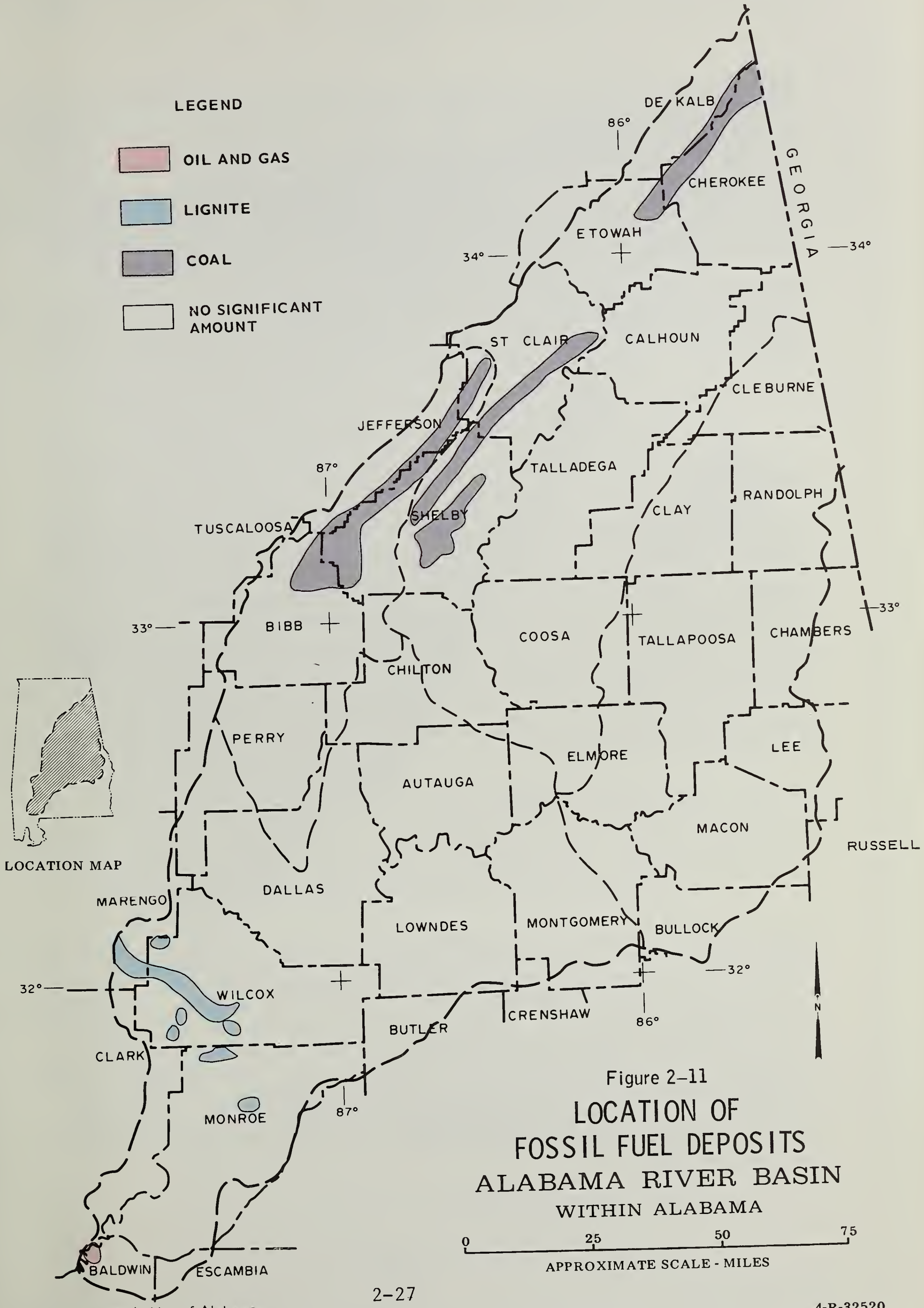


Figure 2–11

LOCATION OF FOSSIL FUEL DEPOSITS ALABAMA RIVER BASIN WITHIN ALABAMA

SOURCE: Minerals Map of Alabama, Geological Survey of Alabama, 1973.

NOVEMBER 1972
NOVEMBER 1972

4-R-32520
BASE 4-R-32344

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SOILS

The general soils map (see figure 2-12) shows the distribution of soil associations. (See appendix table 12A for association descriptions and interpretive information.) Each soil association is a broad landscape that has a repeating pattern of soils and is named according to the one or more most extensive soil series. Each area also includes other soils which are less extensive and may or may not have characteristics similar to those of the dominant soils. The scale of this map prohibits use of this information in detailed or operational planning.

Information on smaller areas or tracts for planning can be obtained from detailed soil maps at local Soil Conservation Service field offices. Status of the publication of detailed soil surveys is shown in appendix figure 12C.

LAND

Land Use

The basin area totals 11,015,000 acres. Approximately 68 percent of the land within the Alabama River Basin is forested. Cropland and pasture each comprise 12 percent of the land area. The remaining 8 percent is used for other miscellaneous and urban purposes. This land use distribution varies only slightly except in the Cahaba subbasin where 73 percent of the area is in forest, 6 percent in cropland, 6 percent pasture, and 12 percent in urban and other uses. The Alabama subbasin has about 62 percent in forest use which is slightly less than the basin average, and 14 percent and 17 percent cropland and pasture respectively, both of which are slightly greater than the basin average. More detailed information on land use is presented in appendix table 14B.

In 1967, there were 1,364,000 acres of urban and built-up area in the state. This represents an increase of 34 percent since 1958. A total of 420,000 acres in the Alabama River Basin were allocated to this use. From 1958 to 1967, urban acreage in the basin increased by 40 percent, shifting about 38,600 acres from rural to urban uses annually.

The basin land use map (see figure 2-13) is the result of a 1972 reconnaissance survey by field personnel of the Soil Conservation Service. Land use was mapped on aerial photo index sheets and county road maps and the data compiled and tabulated by MIADS (Map Information Assembly and Display System). The survey shows the pattern of land use and is not intended for operational planning. Land use categories and percentages of the basin are shown in figure 2-14. The categories mapped as plowed land and grass consist of more than two-thirds cultivated cropland or pastureland respectively; the category mixed grass and plowed consists of more than one-third of each (cultivated cropland and pastureland).

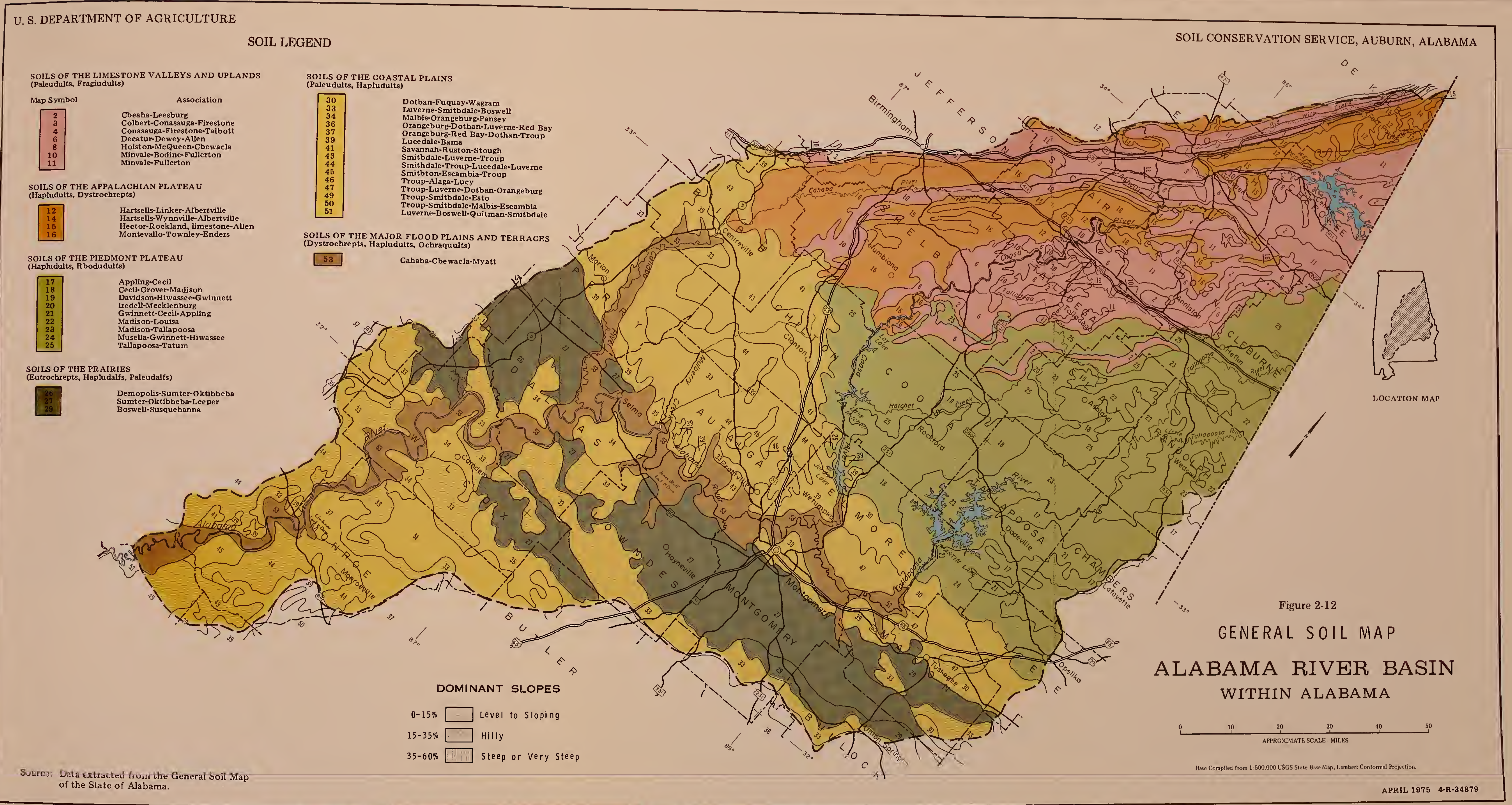


Figure 2-12
GENERAL SOIL MAP
ALABAMA RIVER BASIN
WITHIN ALABAMA


U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
LEGEND
Water
Woods
Orchard
Grass
Plowed
Strip Mines - Quarries
Urban
Mixed Grass and Plowed
TUSCALOOSA
JEFFERSON
BLOUNT
DE KALB
MARENGO
CLARK
MOBILE RIVER
BALDWIN
ESCAMBIA
CONECUH
BUTLER
CRENSHAW
MONTGOMERY
RUSSELL
CLEBURNE
ALABAMA
GEORGIA
LOCATION MAP
Figure 2–13
LAND USE MAP
of
ALABAMA RIVER BASIN
WITHIN ALABAMA
1972
0 10 20 30 40 50
APPROXIMATE SCALE - MILES
Base Compiled from 1:500,000 USGS State Base Map, Lambert Conformal Projection.
SOURCE: Data compiled by SCS River Basin Study Staff.
REVISED JUNE 1976
4-R-32217

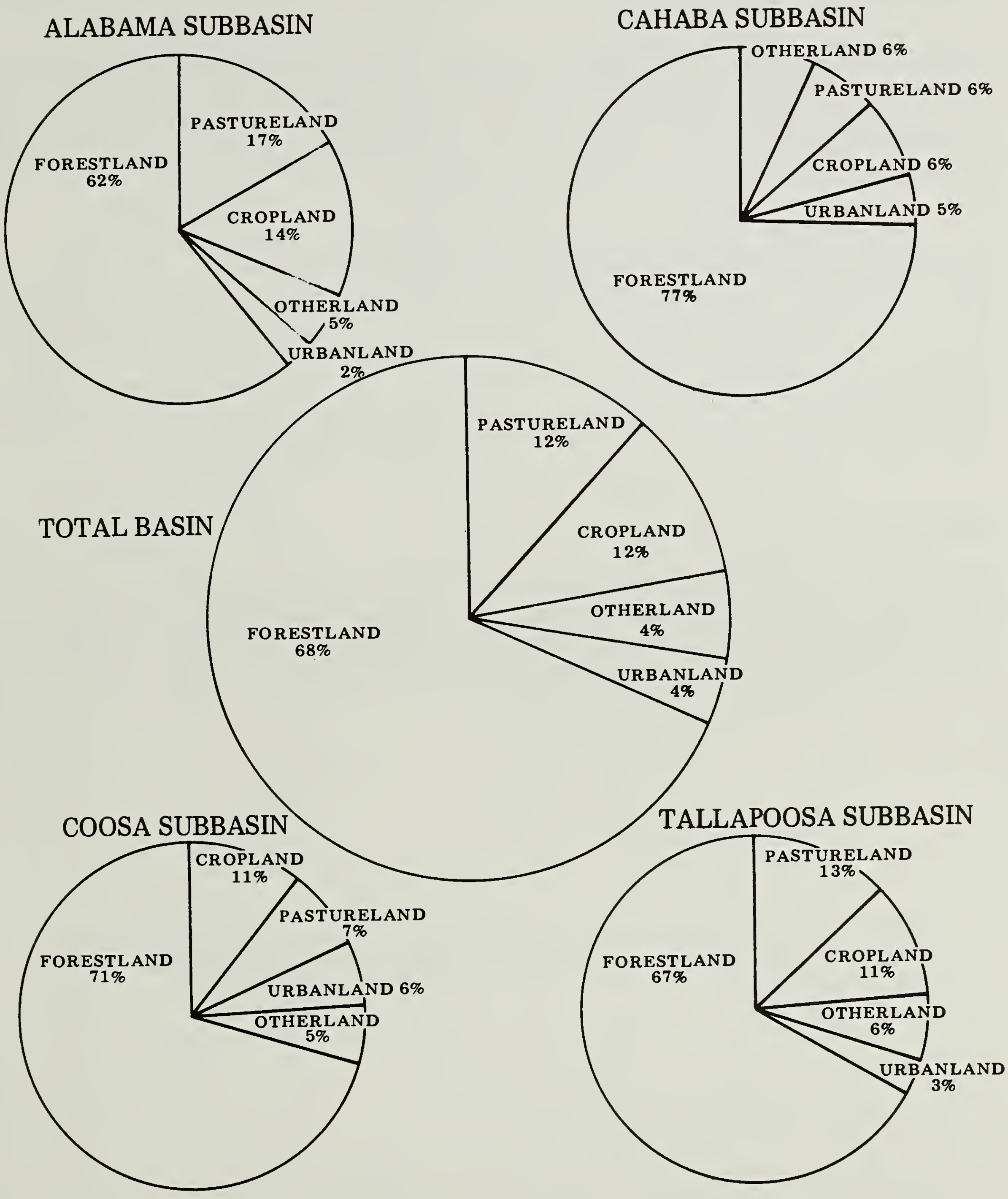


Figure 2-14 - Land use distribution, Alabama River Basin and subbasins, 1970.

Land Capability Classification -- Capability classification is a grouping of soils to show their suitability for various agricultural uses. It is a practical classification based on the degree and kind of permanent soil limitations. The degree of limitation is designated by Roman Numerals I through VIII; the numerals indicating progressively greater limitations and narrower choices for practical use (see appendix table 14A for description).

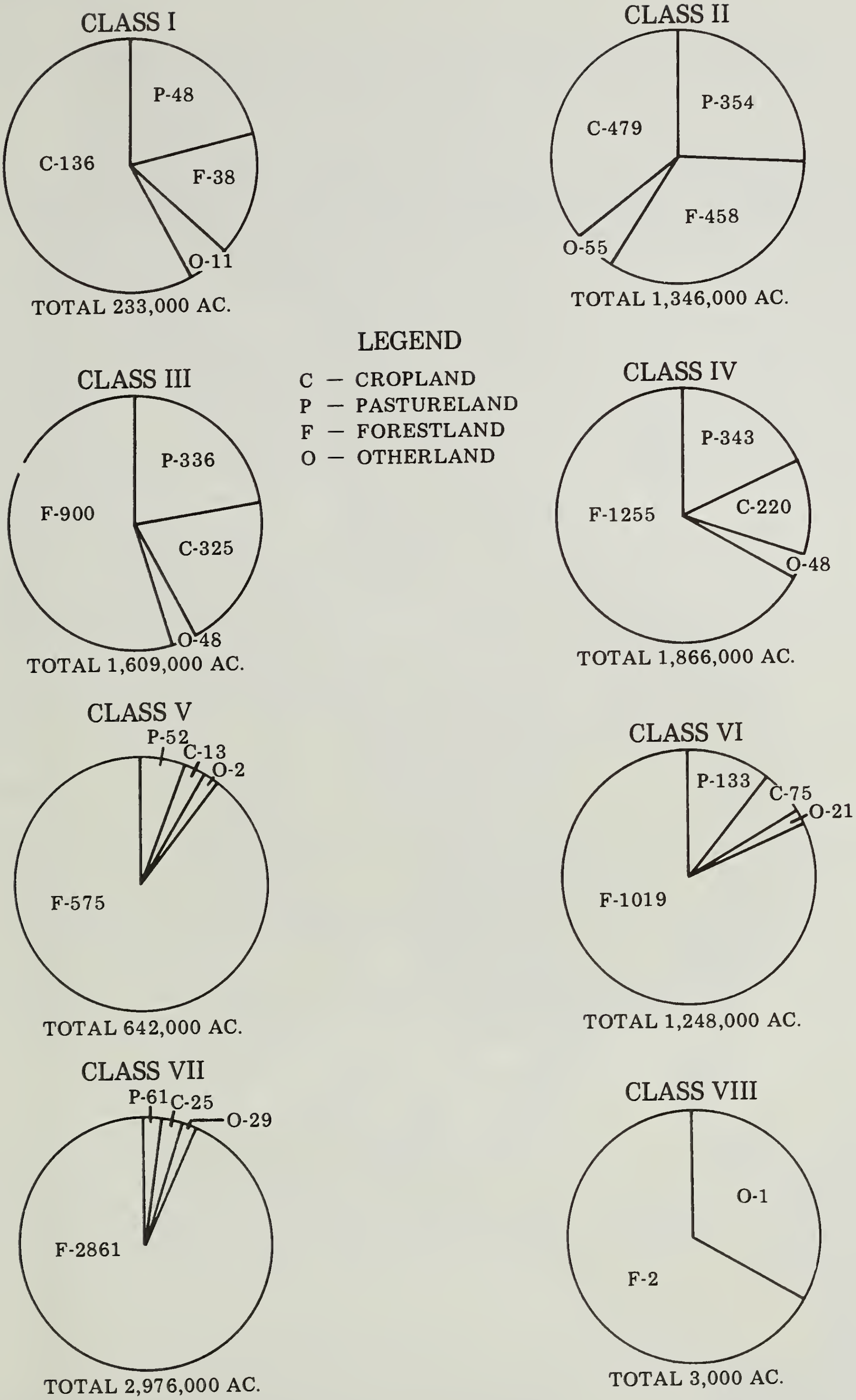
Class I lands have few limitations that restrict their use while Class VIII lands have limitations that preclude their use for commercial plant production and restrict their use to recreation, wildlife, water supply, or aesthetic purposes. Figure 2-15 shows land capabilities for stated uses and land reported as unclassified.

Forest Land Site Potential -- Forest land site potential (or "roundwood production potential") is based on a grouping of soils to show their suitability for forest in terms of site index.* Forest land site potentials are shown in figure 2-16. The most productive sites are south, in the Coastal Plains. A few very productive sites are known to exist in the northern half of the basin. The steep mountainous area is included as fair site class, because many coves on north-facing slopes have high site indices for producing quality upland hardwoods.

Agricultural Land Use

The 1967 Conservation Needs Inventory (CNI) included classification of 9,923,000 acres in the study area (see table 2-4). Federal lands, urban, built-up and water areas not included in this total comprise the remaining 1,092,000 acres in the basin (see appendix table 14B).

* Site index is the height in feet that trees of a given species will reach in a stated number of years, usually 50 years for most species.



NOTE: Figures in pie charts are thousands of acres

Figure 2-15 - Land capability distribution by land use in the Alabama River Basin

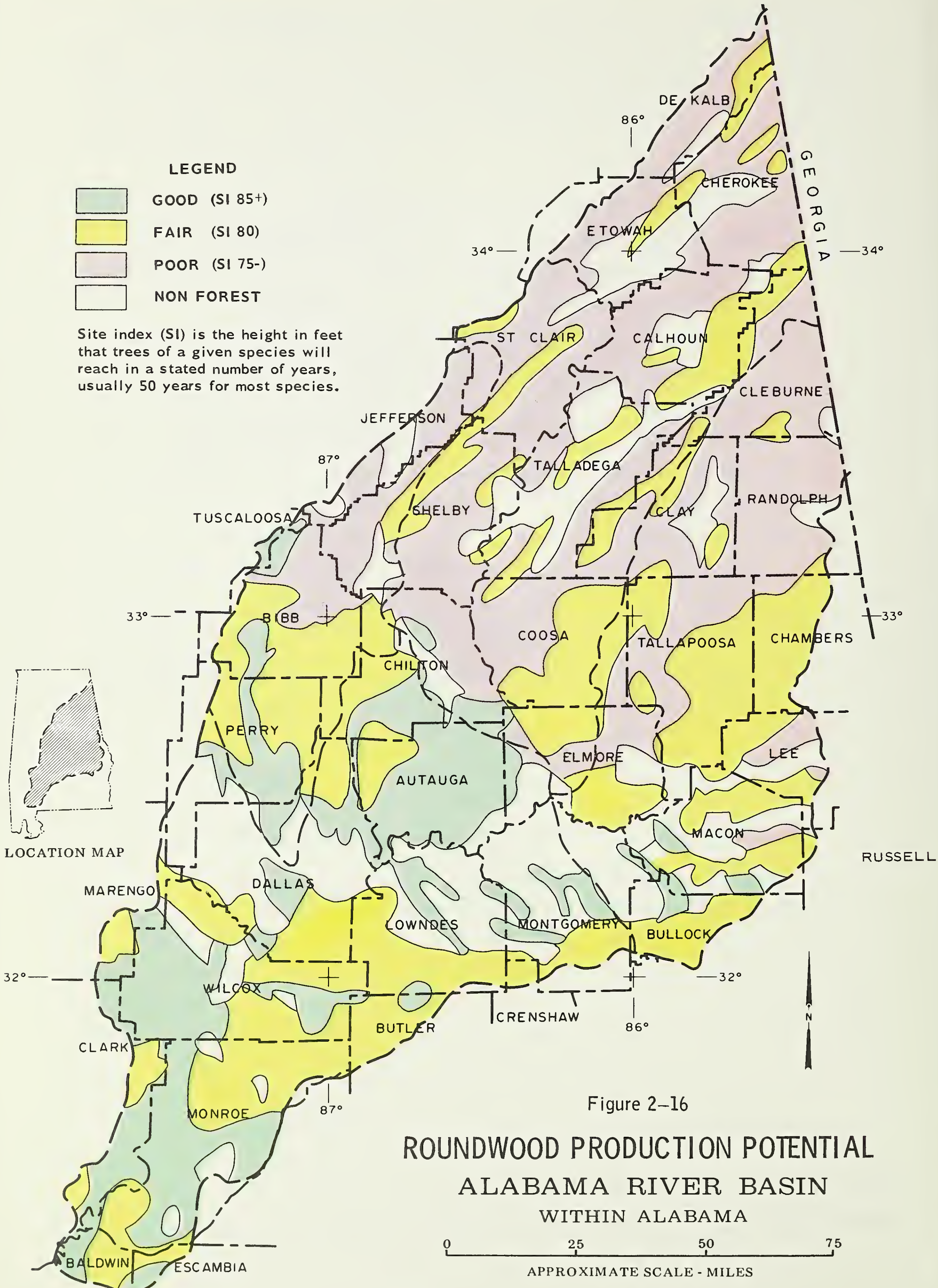


Figure 2–16

ROUNDWOOD PRODUCTION POTENTIAL

ALABAMA RIVER BASIN

WITHIN ALABAMA

0 25 50 75

APPROXIMATE SCALE - MILES

SOURCE: Data Compiled by U.S. Forest Service

USDA-SCS-FORT WORTH, TEXAS 1976

REVISED JUNE 1976
NOVEMBER 1972

4-R-34940
BASE 4-R-32344

Table 2-4 -- Distribution of agricultural land use by subbasin, Alabama River Basin, 1967. 1/

LAND USE	TOTAL STUDY AREA	SUBBASINS ALABAMA	CAHABA	COOSA	TALLAPOOSA
	Thousand Acres				
Cropland.............	1,273	542	72	382	277
Row crops	601	267	28	195	111
Close grown	95	39	9	26	21
Rot. hay & pasture	25	7	2/	10	8
Hayland	101	56	9	19	17
Orchards, vineyards	23	12	2/	5	6
Conservation use	206	90	9	41	66
Idle and other	222	71	17	86	48
Pasture...............	1,327	658	78	259	332
Improved	531	263	31	104	133
Forest................	7,108	2,381	819	2,245	1,663
Grazed	524	422	20	21	61
Other land...........	215	76	17	74	48
Total land inventory..	9,923 3/	3,657	986	2,960	2,320

1/ Alabama Conservation Needs Inventory (CNI), 1967.

2/ Less than 500 acres.
3/ Total is inventoried land only; non-inventoried land includes urban, military, water, etc.

Basin farmland is undergoing change faster than in other parts of the state. Much of the transition has been in marginal cropland. From 1939 through 1969, cropland losses averaged over 50,000 acres annually (see table 2-5). During this period, one-third of the basin's farmland went to other uses, compared to a 29 percent drop statewide.

Table 2-5 -- Trend in agricultural land use, Alabama River Basin, 1939-1969.

ITEM	1939	1949	1959	1969
	Thousand Acres			
Land in Farms	6,509	7,102	5,643	4,543
Cropland, total.......	3,328	2,790	1,803	1,626
Harvested	2,205	1,610	969	678
Irrigated	0	0	8	2
Pastured	688	935	556	747
Idle	435	245	278	261
Forest land, total...	2,450	3,410	2,687	1,868
Pastured	NA	1,448	1,272	NA
Not pastured	NA	1,962	1,415	NA
Pasture..............	NA	716	996	NA
Other land.........	NA	186	157	989*

Census of Agriculture, 1939, 1949, 1959, 1969
*Includes pasture other than cropland or forest land pasture.

Cropland harvested declined steadily between 1939 and 1969 as a result of sharp reductions in corn and cotton acreage. Since 1972, however, harvested acreage has increased in response to export demands. An estimated 823,000 acres were harvested from basin farms in 1975.

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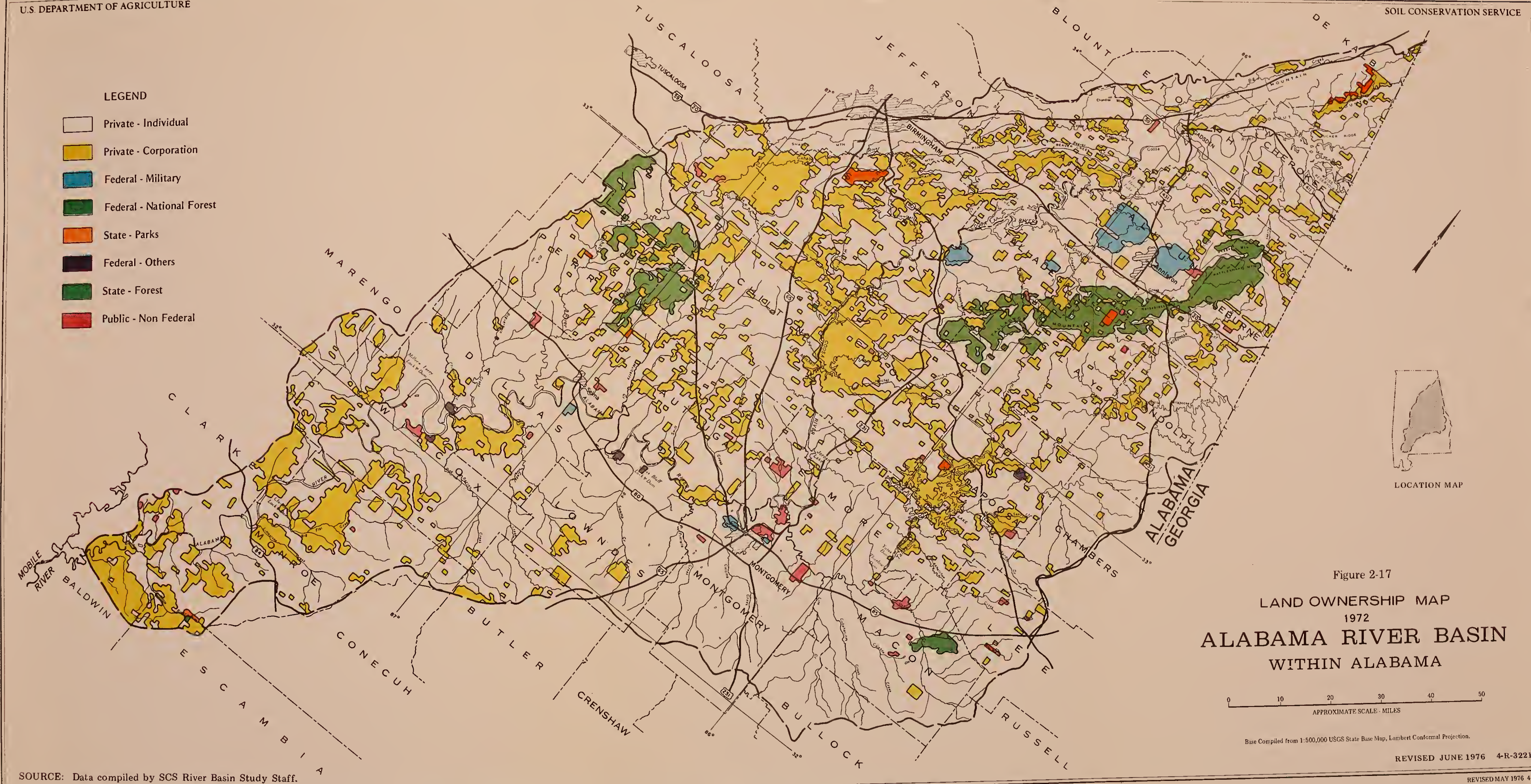


Figure 2-17

LAND OWNERSHIP MAP 1972

ALABAMA RIVER BASIN WITHIN ALABAMA

0 10 20 30 40 50

APPROXIMATE SCALE - MILES

Base Compiled from 1:500,000 USGS State Base Map, Lambert Conformal Projection.

REVISED JUNE 1976 4-R-32216

SOURCE: Data compiled by SCS River Basin Study Staff.

REVISED MAY 1976 4-R-28941-A

USDA-SCS-FORT WORTH, TEXAS 1976

Land Ownership

The inventory of land ownership within the basin was based on information obtained from local sources within each county. Ownership was divided between private, federal, and state holdings. The results of this study shows that approximately 10,486,000 acres privately owned. Remaining are 455,000 acres held by the federal government and 74,000 acres owned by the State of Alabama. Included in all categories of ownership are about 245,000 acres of water and 10,770,000 acres of land. The land ownership map (see figure 2-17) shows the general location of holdings of private individuals and private corporations as well as a breakdown of lands owned by the state and federal government. Figure 2-18 shows percent ownership by categories.

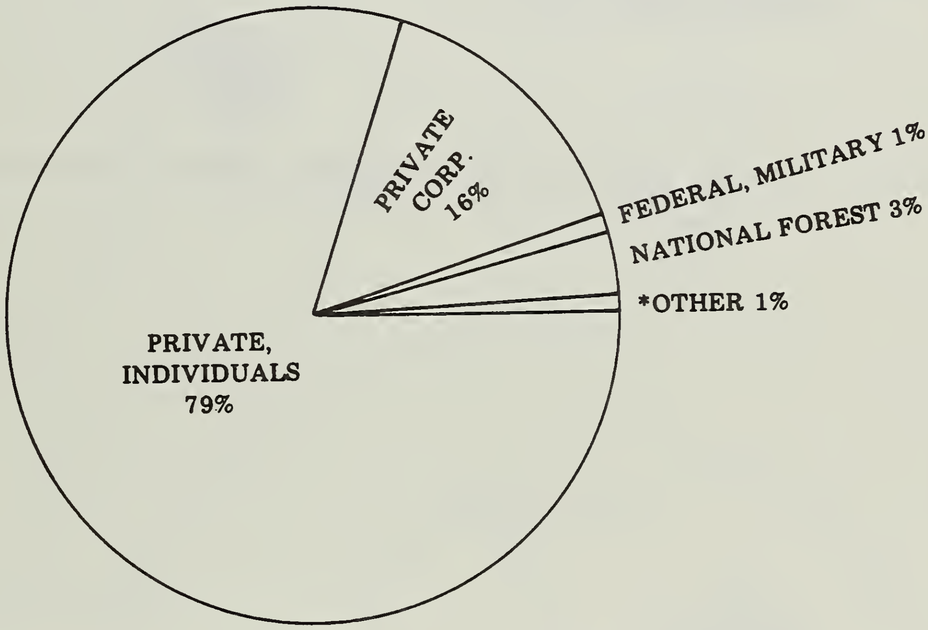
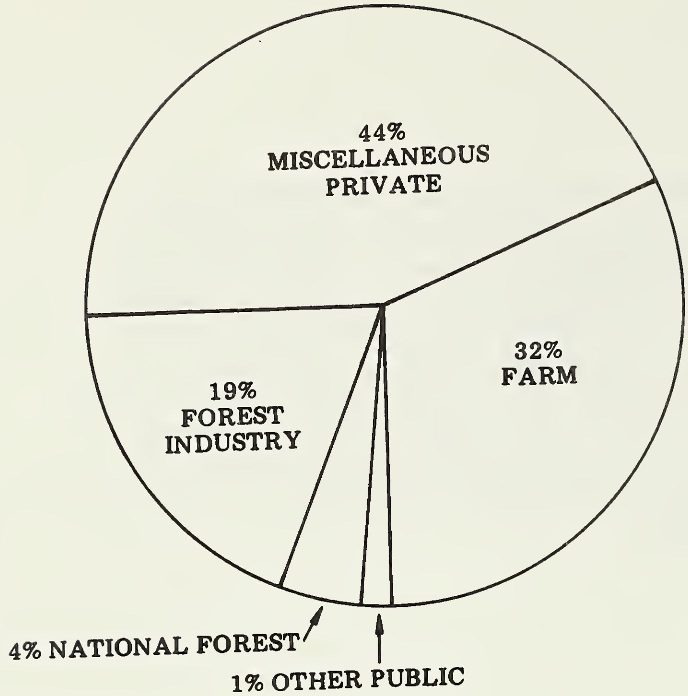


Figure 2-18 -- Land ownership distribution, Alabama River Basin, 1972.

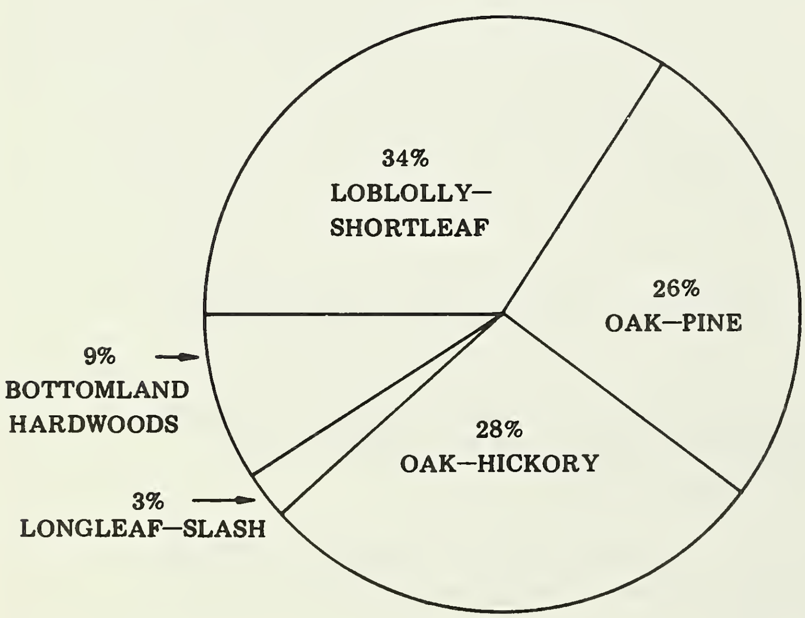
The forest land ownership is largely private in small tracts, although forest industry does control 19 percent; mostly in the central and southern portion of the basin (see figure 2-19).

The U. S. Forest Service administers 310,200 acres in the basin, which is about 4 percent of the total forest land. National Forest locations and acreages are shown in figure 2-21.



OWNERSHIP	ACREAGE
MISCELLANEOUS PRIVATE	3,299,000
FARM FORESTS	2,380,900
FOREST INDUSTRY	1,419,600
NATIONAL FORESTS	310,200
OTHER PUBLIC	61,900
TOTAL	7,471,600

Figure 2-19 -- Forest ownership distribution, Alabama River Basin, 1970.



FOREST TYPE	ACREAGE
LOBLOLLY—SHORTLEAF	2,540,400
OAK—HICKORY	2,092,000
OAK—PINE	1,942,600
BOTTOMLAND HARDWOODS	672,500
LONGLEAF—SLASH	224,100
TOTAL	7,471,600

Figure 2-20 -- Acreage distribution of forest types, Alabama River Basin, 1972.

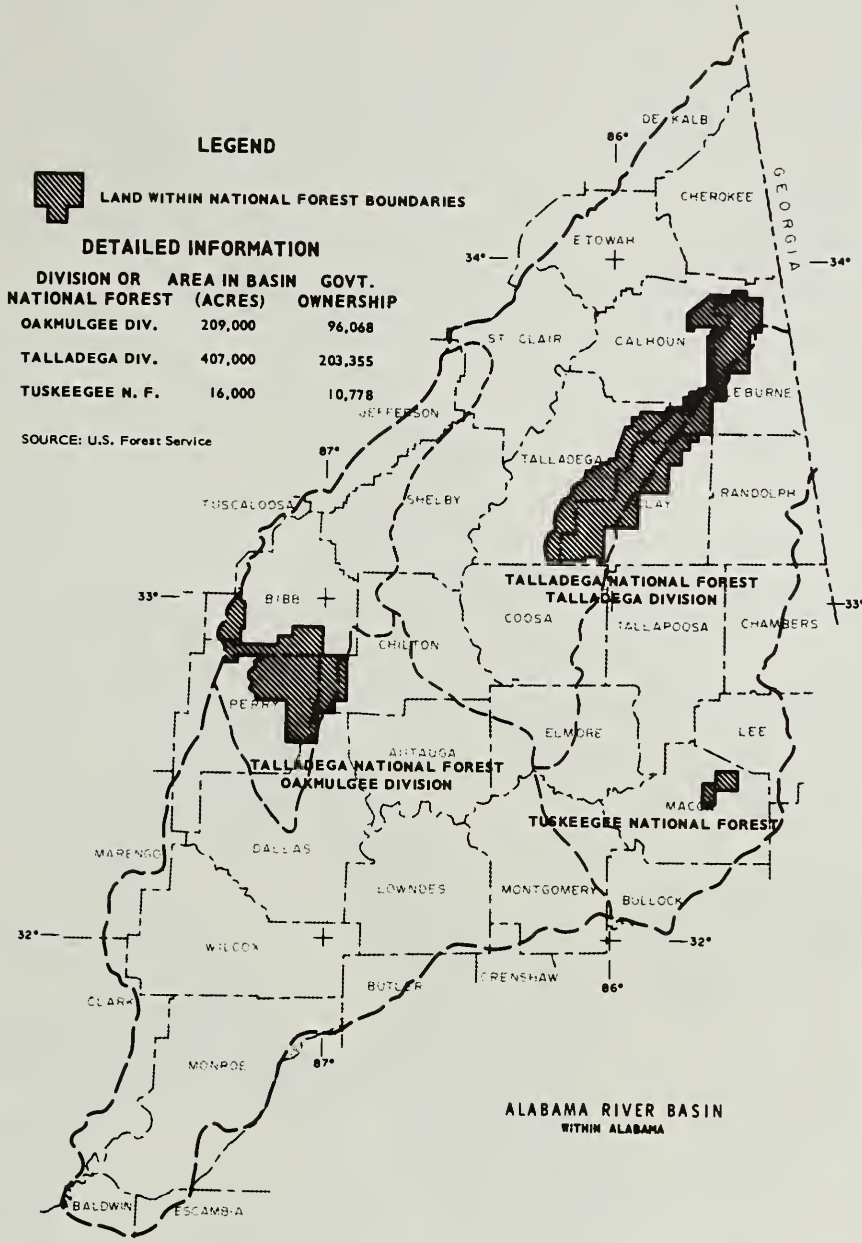


Figure 2-21 -- Location of National Forests, Alabama River Basin, 1975.

Forest Resources

Loblolly-shortleaf forest type (34 percent) dominates the forest land of the basin. Oak-hickory and oak-pine types cover another 54 percent. The remaining 12 percent of the forest land contains bottom land hardwoods, (9 percent) and longleaf-slash pine, (3 percent). Figure 2-20 lists acreages by forest types within the basin and figure 2-22 shows forest types.

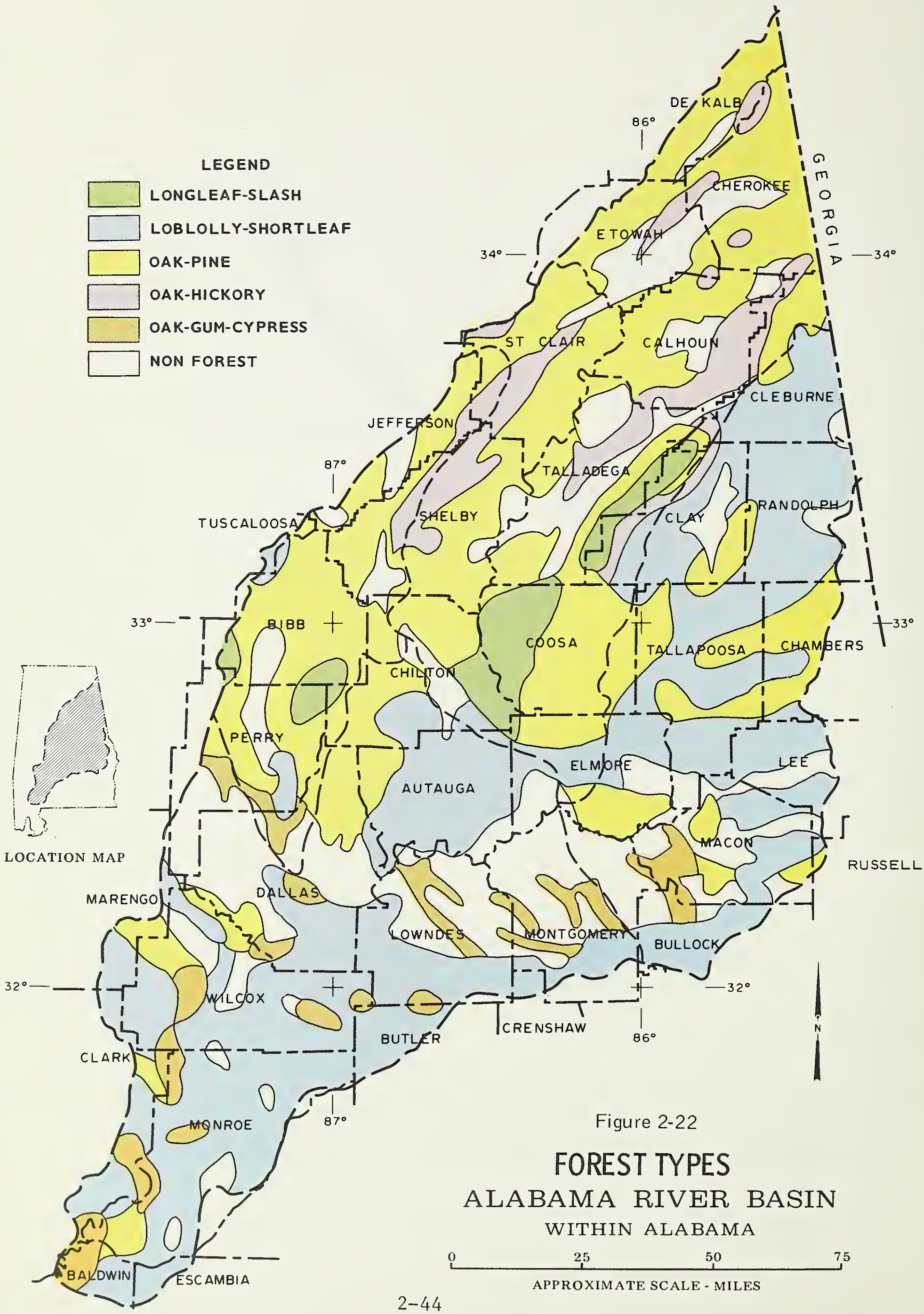


Figure 2-22

FOREST TYPES
ALABAMA RIVER BASIN
WITHIN ALABAMA

SOURCE: Data compiled by US Forest Service.

USDA-SCS-FORT WORTH, TEXAS 1976

REVISED JUNE 1976
NOVEMBER 1972

4-R-34939
BASE 4-R-32344

Area Condition -- Area condition is a classification of commercial forest land based upon stocking by desirable trees and other conditions affecting current and prospective timber growth. These conditions are illustrated in figure 2-23. Only 8 percent, or 597,600 acres of forest land, is fully stocked with desirable trees. Another 80 percent, or 5,977,400 acres, contains fair stocking. The remaining 12 percent, or 896,600 acres, is poorly stocked.

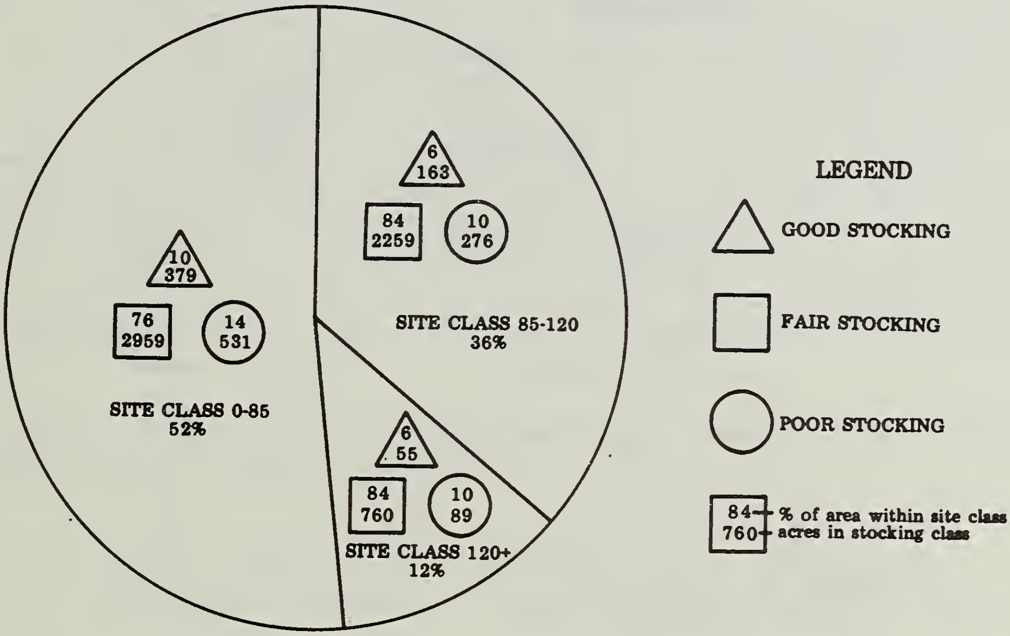


Figure 2-23 -- Forest land acreage (thousands of acres) by area condition, Alabama River Basin, 1974.

Fish and Wildlife

Fish -- The most common species of sport fishes in the freshwaters of the basin are largemouth bass, smallmouth bass, striped bass, spotted bass, crappies, various catfishes, bluegill, and redear sunfish.

The supply of freshwater fishing available for public use in the basin is presented in figure 2-24 (for detailed information in subbasins see table 15B in the appendix). About 188,000 acres of fishing waters are available in the basin with a capacity of 8,911,000 activity occasions. Almost 50 percent of the fish habitat is in the Coosa Subbasin.

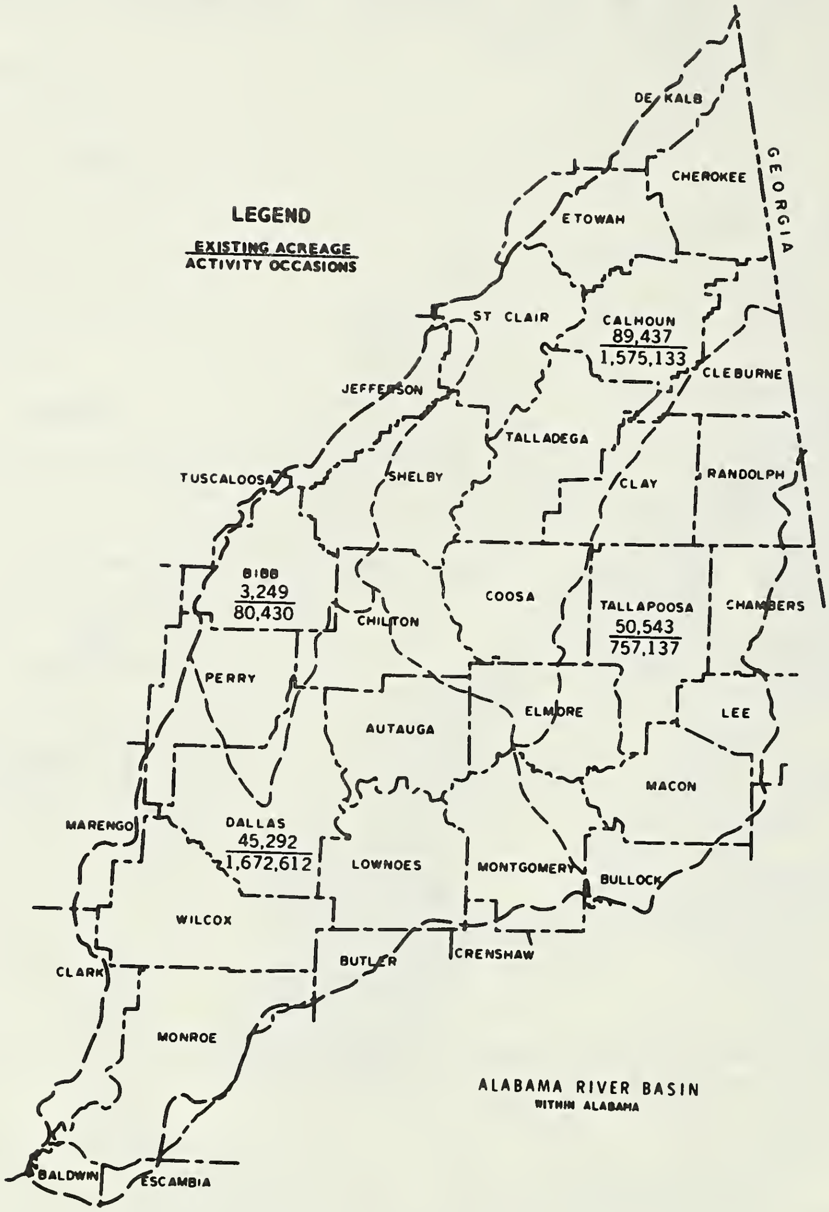


Figure 2-24 -- Freshwater fish habitat available for public use, Alabama River Basin, 1971.

About 500 miles of free-flowing rivers remain in the basin. Many of these rivers are polluted to the extent that use for fishing is very limited (see figure 2-7). Pollution has also decreased use of many small streams that were an important source of fishing during the 1930's and 1940's. However, many productive streams are not now receiving the normal fishing activity because of inaccessibility and other reasons. The more important fishing streams are shown in figure 2-25. These streams were selected on the basis of productivity, water quality, use, and esthetic value.

The most productive fish habitat in the basin is found in small impoundments. In small ponds and lakes, many factors affecting productivity can be controlled. There are about 44,000 acres in privately-owned, small impoundments, 475 acres in state-owned lakes, and 40 acres in lakes owned by the federal government that are managed primarily for fish production (see table 2-6). There is an additional 325 acres of public fishing in small multiple-purpose impoundments owned by either cities or counties. The state and federal hatcheries have provided fish for the initial stocking of about 51,200 surface acres in more than 13,500 small impoundments in 30 basin counties. (See appendix table 15C for details).

State-operated lakes, as of 1975, are shown in figure 2-26; additional data can be found in appendix table 16.

Table 2-6 -- Total acreage, use, and ownership of impoundments stocked for fishing, Alabama River Basin, 1971. 1/

SUBBASIN	ALL IMPOUNDMENTS	PUBLIC OWNERSHIP 2/	PRIVATE OWNERSHIP		
			TOTAL	OPEN TO PUBLIC	USED FOR COMMERCIAL PRODUCTION
	Acres				
Alabama	19,310	194	19,116	2,891	624
Cahaba	2,733	189	2,544	352	62
Coosa	11,725	281	11,444	2,677	216
Tallapoosa	11,163	176	10,987	2,337	85
TOTAL	44,931	840	44,091	8,257	987

1/ Less than 500 acres, more than 0.25 acres.
2/ Includes some PL-566 structures.

STREAM	MILES OF FISHING	TYPES OF FISHING 1/
1. CHOCCOLOCCO	28	B W F
2. CANOE	20	B W F
3. EMUCKFAW	12	B W
4. HATCHETT	35	B W F
5. HILLABEE	12	B W
6. KELLEY	14	B W
7. SHOAL	16	B W
8. TALLADEGA	35	B W F
9. WEDOWEE	15	B W
10. YELLOWLEAF	25	B W

1/ B - BANK W - WADE F - FLOAT

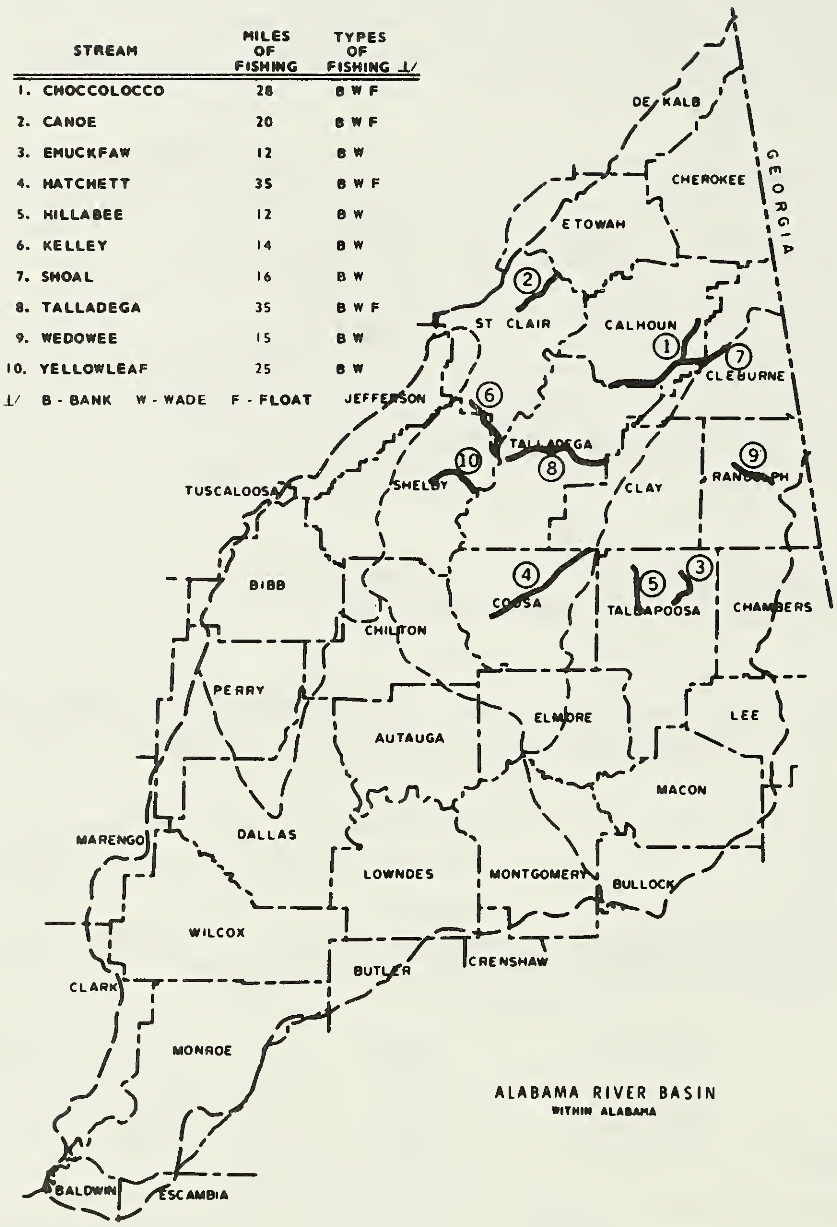


Figure 2-25 -- Important fishing streams, Alabama River Basin.

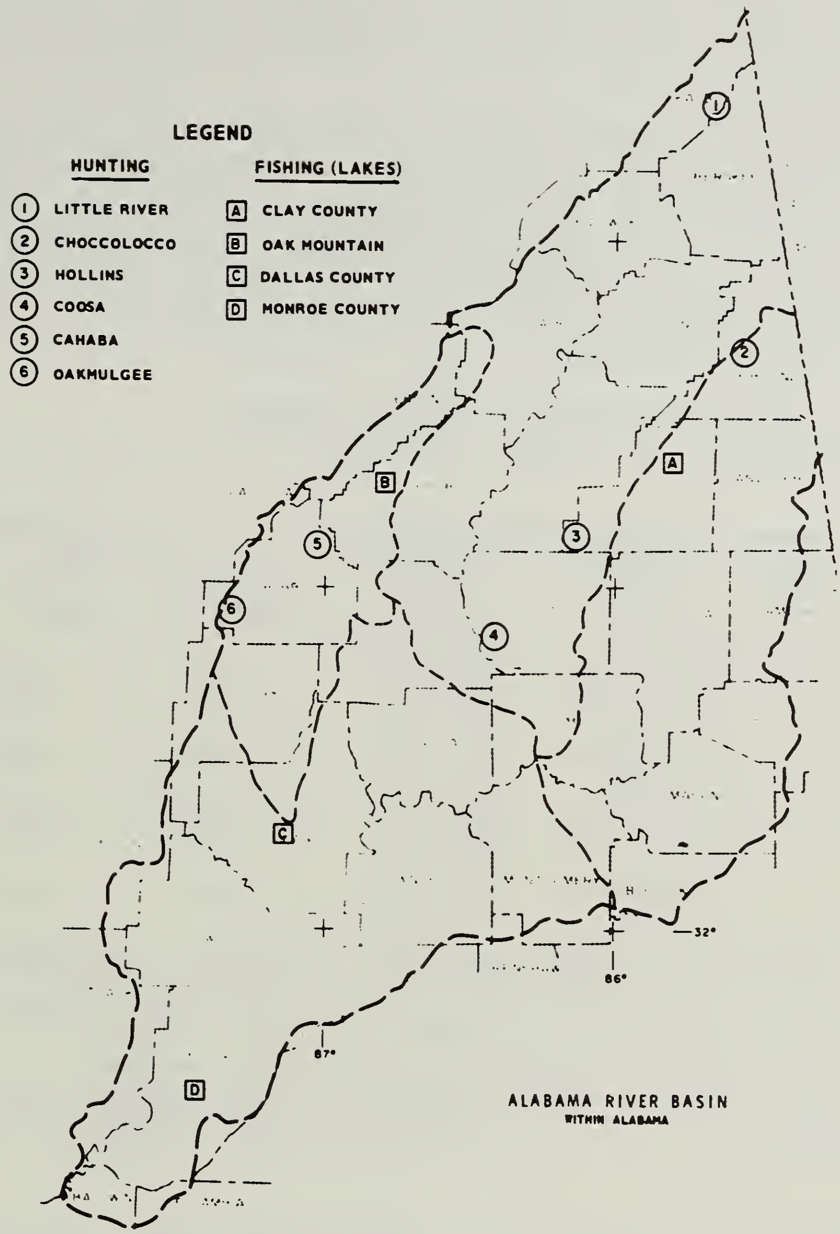


Figure 2-26 -- State-operated public hunting and fishing areas, Alabama River Basin, 1975.

Wildlife-Hunting -- The wildlife resource in Alabama is as varied and abundant as that of any other state in the Southeast. The most frequently hunted forest game animals in Alabama are white-tailed deer, turkey, and squirrels. Open land species include quail, rabbits, and dove. The primary responsibility for administering wildlife resources, except the federally protected migratory birds, is vested in the Alabama Department of Conservation and Natural Resources.

A detailed field survey revealed about 3,244,000 acres available for some form of public hunting in the basin. Of this total, 631,800 acres are leased by hunting clubs and 7,620 acres are in shooting preserves. These acreages were not assumed to be open to all hunters because of either restricted or limited memberships (see table 2-7). Less than 15 percent of the acreage open to public hunting is managed by either the state or the federal government.

Table 2-7 -- Acreage available for public hunting, Alabama River Basin, 1971. 1/

SUBBASIN	STATE MGT. AREAS	COMPANY-OWNED LANDS	PRIVATELY-OWNED LANDS	NATIONAL FOREST	CLUB-LEASED LANDS	SHOOTING PRESERVES
Alabama	15,000	377,000	158,700	5,000	279,000	-
Cahaba	50,500	109,700	28,200	33,900	1,300	-
Coosa	102,700	571,000	369,500	107,000	174,000	6,620
Tallapoosa	30,000	217,000	223,700	47,800	177,500	1,000
TOTAL 2/	198,200	1,272,700	780,100	193,700	631,800	7,620

1/ Data obtained from selected state and federal agencies in each county. Duplication of recorded acreage was avoided.
2/ An additional 160,000 acres of water in miscellaneous ownerships was inventoried as being available for public waterfowl hunting.

In 1971, more than 50 percent of the land available for public hunting was either owned or managed by large companies, primarily paper companies. However, privately-owned lands that were unavailable for public use, supported more than 60 percent of the hunting demand.

The estimated hunting effort in the basin during the 1974-1975 season was more than 2.2 million man-days (see table 2-8). Estimated harvest for selected species was taken from the game kill survey of the Alabama Department of Conservation and Natural Resources and from field biologists and technicians.

Since 1972, deer hunting has been the most popular sport hunting activity in the basin and in the state. In 1974-75, about 196,406 Alabama deer hunters harvested 120,727 deer during 2,006,080 man-days of deer hunting. According to the annual Game-Kill Survey conducted by the Department of Conservation and Natural Resources, squirrels, dove, quail and rabbits are the most popular small game in Alabama. Traditionally, squirrel hunting attracted more people than any other type of hunting. However, the trend has recently been changing toward increased deer and dove hunting. Further reduction of mature hardwood forest should continue to reduce the percent of hunters who primarily hunt squirrels. Other game animals that provide hunting opportunity in the basin include racoon, opossum, fox, bobcat, snipe and woodcock. About 292,600 man-days of hunting for these species was expended in the basin during 1974-75.

Table 2-8 -- Harvest and hunting effort for selected game species, State and Alabama River Basin, 1974-75. 1/

	ESTIMATED KILL		MAN-DAYS EFFORT		MAN-DAYS
SPECIES	STATE	BASIN	STATE	BASIN	PER KILL
Deer	120,727	40,240	2,006,080	668,700	16.62
Turkey	26,299	10,500	291,609	116,600	11.08
Quail	2,310,190	77,100	807,784	244,500	.35
Dove	3,996,080	1,332,000	824,192	269,300	.21
Squirrel	2,082,590	693,500	1,191,380	397,100	.57
Rabbit	946,549	315,500	727,554	242,500	.77
Duck	158,974	15,900	120,942	12,100	.76
Others 2/	-	-	895,430	292,600	-
TOTAL			6,864,971	2,243,400	

1/ Data Source: Alabama Department of Conservation and Natural Resources.
2/ Includes fox, bobcat, opossum, raccoon, geese, woodcock and snipe.

The deer population in the river basin is about 300,000 compared to a state population of more than one million (see figure 2-27). Every county in the basin had an open season on deer in 1974-1975. Figure 2-28 shows the deer population by counties based on a relative density expressed as high medium or low. Density ratings were calculated by dividing the land area in each county, excluding urban and built-up areas by the estimated deer population. With the exception of Cleburne County, the highest deer populations and deer concentrations are located in the southwestern portion of the river basin.

The eastern wild turkey, perhaps the most magnificent of all game birds, is native to the Southeast. Through a dedicated program of trapping, relocation, and protection, Alabama has become one of the leading states in the production of wild turkeys. The state population (Fall, 1975) was estimated to be about 275,000 with approximately 106,000 in the Alabama River Basin.

Turkeys are found throughout the basin. The highest populations are in the southwestern portion, primarily in Dallas, Lowndes, Wilcox, Monroe, and Clark Counties (see figure 2-29). In 1974-75, there was an open season

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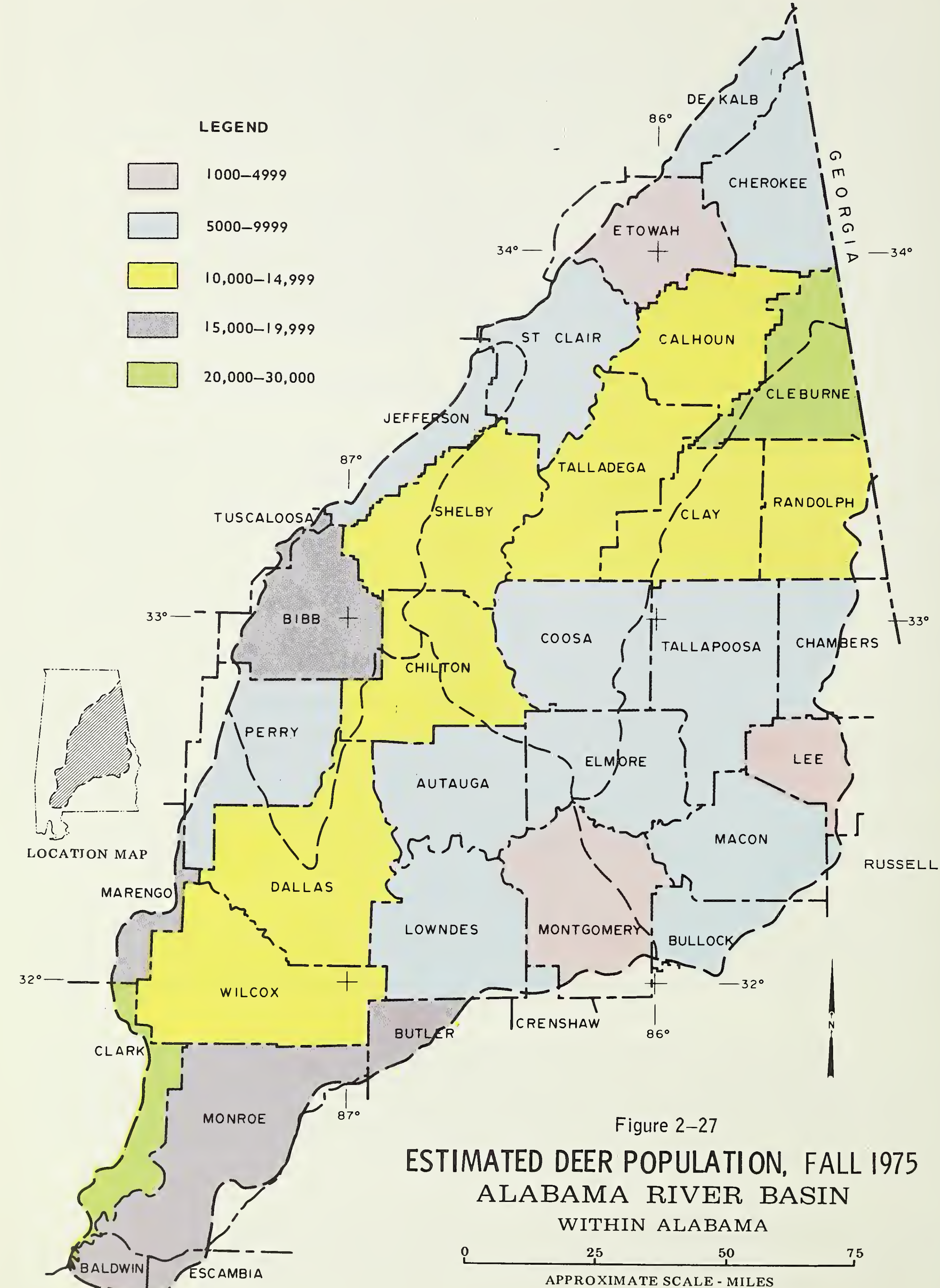

Figure 2–27

ESTIMATED DEER POPULATION, FALL 1975
ALABAMA RIVER BASIN
WITHIN ALABAMA

SOURCE: Data Compiled by SCS River Basin Study Staff

USDA-SCS-FORT WORTH, TEXAS 1976

REVISED JUNE 1976
NOVEMBER 1972

4-R-32508
BASE 4-R-32344

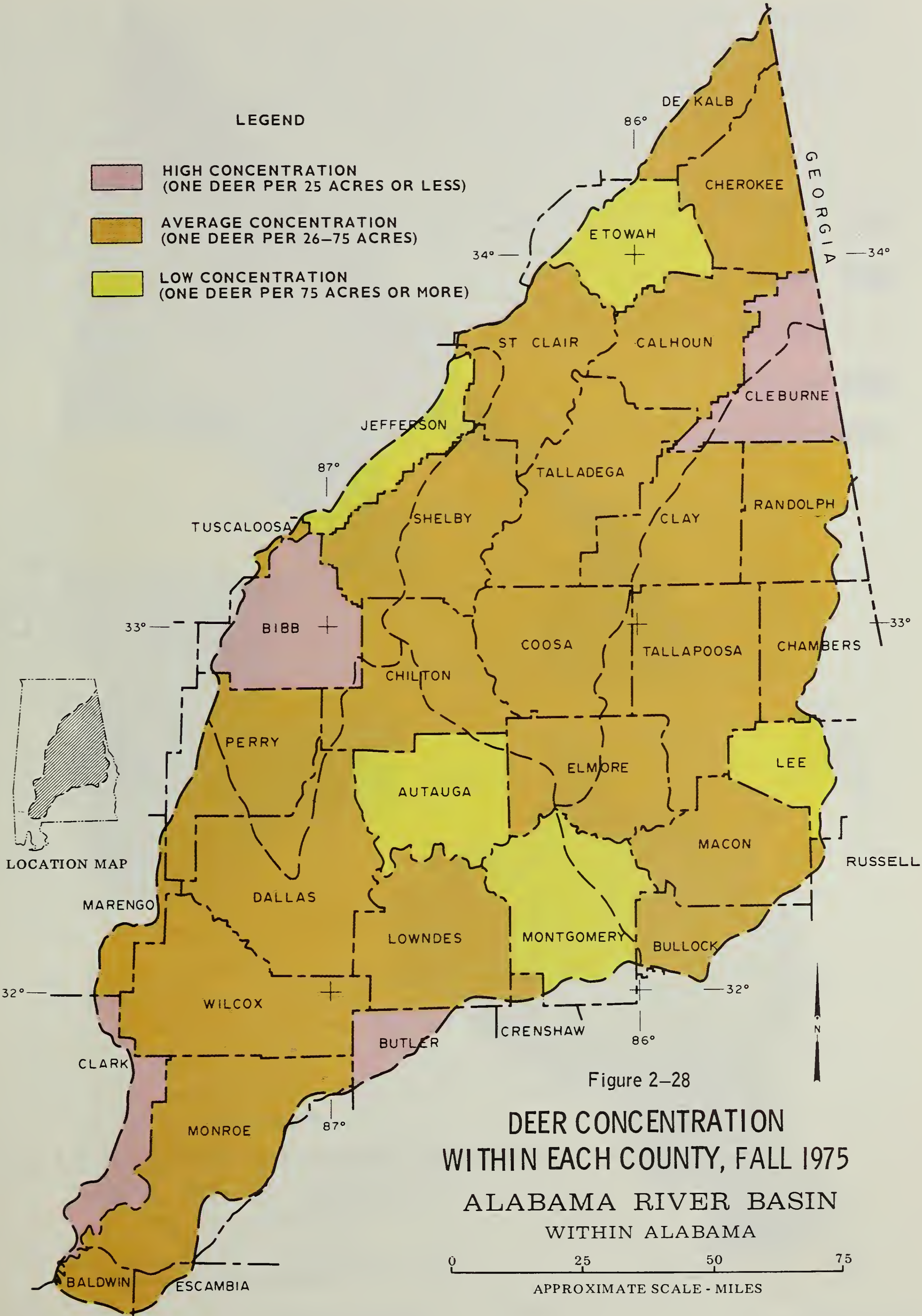

Figure 2–28

DEER CONCENTRATION WITHIN EACH COUNTY, FALL 1975

ALABAMA RIVER BASIN

WITHIN ALABAMA

SOURCE: Data Compiled by SCS River Basin Study Staff

REVISED JUNE 1976
NOVEMBER 1972

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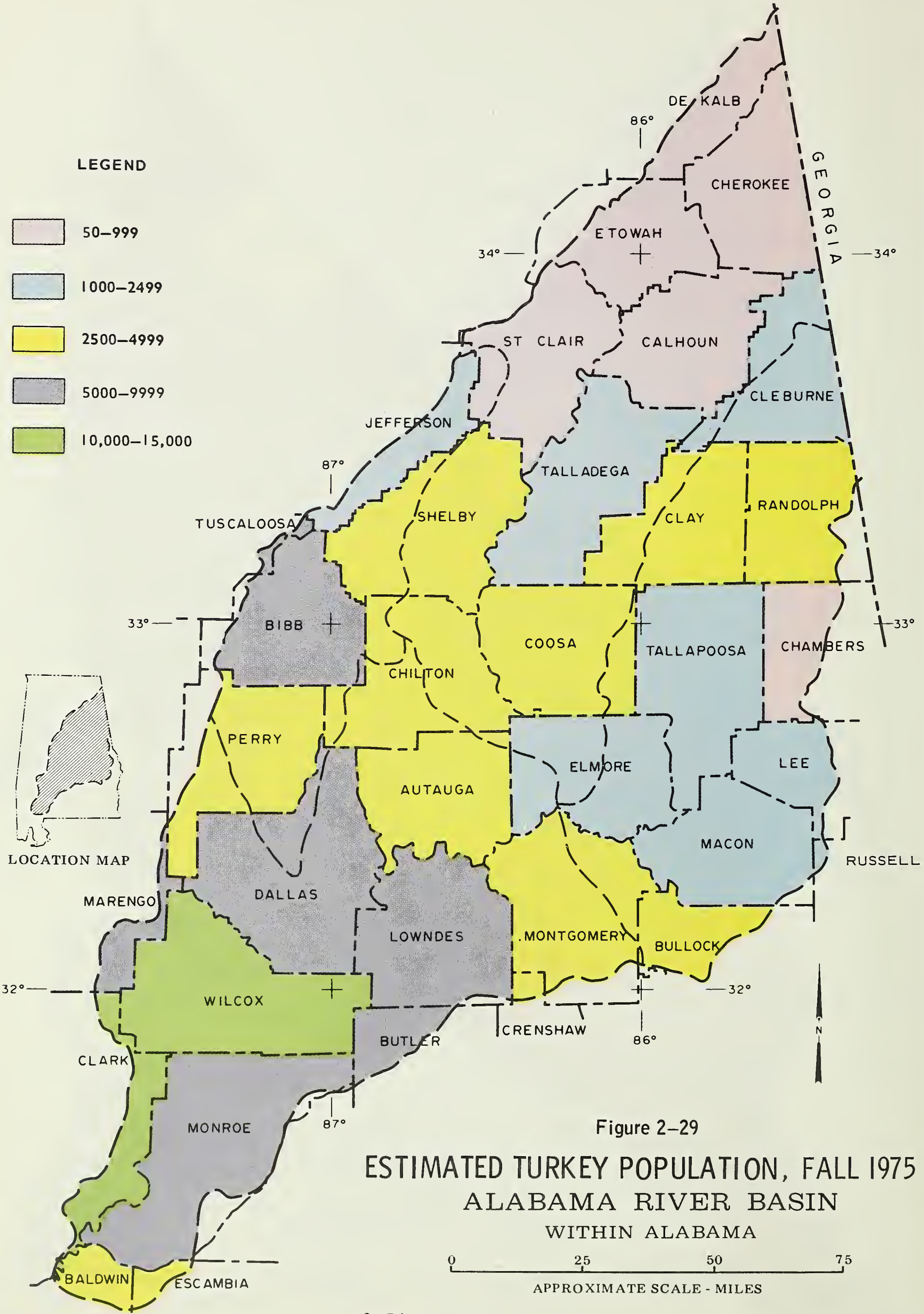


Figure 2–29

ESTIMATED TURKEY POPULATION, FALL 1975
ALABAMA RIVER BASIN
WITHIN ALABAMA

Data Compiled by
SCS River Basin Study Staff
USDA-SCS-FORT WORTH, TEXAS 1976

REVISED JUNE 1976
NOVEMBER 1972

4-R-32509
BASE 4-R-32344

for turkey hunting in all counties of the basin except in DeKalb, Cherokee, and Etowah. Figure 2-30 shows the relative concentration of turkeys within each county of the basin. Turkey populations normally fluctuate from year to year with changing environmental conditions. However, where large tracts of diversified tree cover are cleared for monocultural practices wild turkey populations will be adversely affected.

Twenty-six species of wild ducks and four species of wild geese are found in Alabama and in coastal waters of the state. Only one species--the wood duck--normally breeds in appreciable numbers in the state. To some extent, ducks use nearly all ponds, lakes, reservoirs and other water areas in Alabama. However, a recent study in North Alabama indicates that 80 to 90 percent of the young wood ducks are produced in beaver ponds and natural ponds. During the 1974-1975 season, about 13,000 ducks and geese were harvested in the river basin.

Wildlife--Non-Harvest Values -- Many positive values can be realized from wildlife without actually harvesting the animals or removing them from their natural surroundings.

Every year more and more people are becoming interested in wildlife; yet the proportion of hunters in the total population is decreasing. For example, more people are visiting wildlife refuges than ever before; but the sale of duck stamps is below the levels reached two or three decades ago. People are becoming more and more interested in watching, hearing, seeing, photographing, and otherwise enjoying wildlife without harvesting it. This is somewhat of a departure from tradition, of course. It is an interest that must be recognized in managing wildlife not only for the present, but also for future generations.

More than eight million people participated in bird watching in 1965 and more than three million people age 12 and over took nature walks during that year. By comparison, the same study revealed that slightly fewer than 17 million people age 11 and over participated in hunting in 1965. The most striking aspect of these figures is the change from a similar study in 1960. About 1.5 million more people took nature walks in 1965 than in 1960, but 100,000 fewer people participated in hunting. Other published reports reveal the same general pattern--an increased interest in non-harvest, or non-consumptive, uses of wildlife.

In all probability, the increase in demand for wildlife and wildlife-oriented recreational activities within the basin will continue at an accelerated pace. It appears, therefore, that a desirable wildlife management objective should be to provide the greatest satisfaction from wildlife for all the people. This would include effective habitat preservation and management for all wildlife not only for hunting but also for non-consumptive uses.

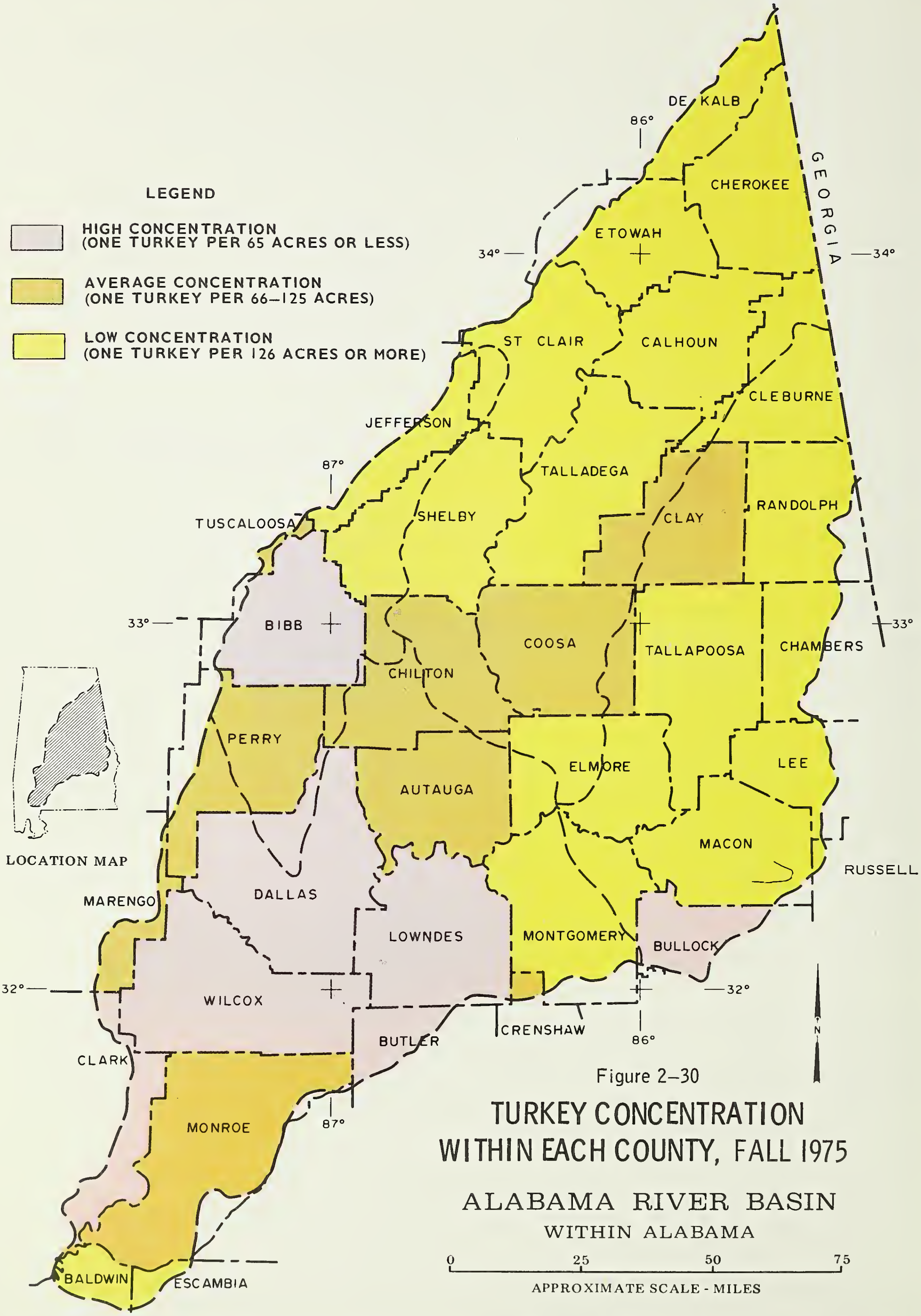


Figure 2–30

TURKEY CONCENTRATION WITHIN EACH COUNTY, FALL 1975

ALABAMA RIVER BASIN
WITHIN ALABAMA

SOURCE: Data Compiled by SCS River Basin Study Staff

USDA-SCS-FORT WORTH, TEXAS 1976

REVISED JUNE 1976
NOVEMBER 1972

4-R-32510
BASE 4-R-32344

Birdwatching is most often a group activity with many members of a group or club wandering the same woods. An element of competition is present. The number of either birdwatchers or nature photographers, or both, who can occupy the same area is limited largely by their ability to keep quiet.

Flora and Fauna

The Alabama River Basin, is indeed, rich in diversity of native flora and fauna. Biologically, unique areas such as the Black Belt Swamps, lying on the Selma chalk, Little River Canyon, Cheaha Mountain Area, and large granite outcroppings near Wadley, Alabama, support unique plant and animal life.

This section is devoted primarily to the rare and endangered plant and animal species in the basin. A current listing of these organisms can be found in appendix tables 17 and 18.

Information regarding the status of the plant and animal species listed in the tables was compiled by authorities at Auburn University and from results of a Threatened and Endangered Plants and Animals Symposium held at the University of Alabama in March 1975.

Few species of plants or animals have been sufficiently studied that we can state with certainty their place in the biological complex, their relationship with other organisms, or ultimately their influence on man's welfare. Every living species of organism is a complex of genetic material not duplicated by any other organism. Extermination of a species cannot be corrected or reversed. From a strictly commercial standpoint, the extermination of a species could very easily result in depriving mankind of a product that might be of considerable value.

Obviously, rare and endangered organisms should be given careful consideration in future planning efforts. More comprehensive listings and detailed location maps are available in publications from appropriate agencies and universities.

Wetlands

Natural wetlands such as marshes, swamps, and overflow lands have many inherent values and a variety of uses. These wetlands are valuable in storage of ground water, retention of surface water, stabilization of runoff, reduction of runoff, production of timber, creation of firebreaks, and the production of game as well as non-game organisms.

During the past half century, there has been a continual decrease in the acreage of wetlands in the basin. Furthermore, as human populations continue to expand, wetland is drained, and reservoirs are developed the total wetland acreages will become smaller, and the job of preserving and developing wetlands for wildlife and other uses will become correspondingly bigger and more expensive. The inventory of existing wetlands in the basin is expected to facilitate total resource planning in the future (figure 2-31). The wetlands were classified by types as defined in USDI, Circular 39.

Table 2-9 presents total flood plain acres by subbasin. Almost all of the wetlands are within flood plains; however, a large portion of the flood plains delineated are Type 1 (annually flooded). Type 5 wetlands were primarily deep lakes and reservoirs and were not shown in figure 2-31 since the permanent waters of streams, reservoirs, and deep lakes are not included in the definition.

Less than 1 percent (36,900 acres) of the Alabama River Basin is classified as Wetlands Type 2, 3, 4, 6, and 7 (see table 2-10 and appendix table 19B). About 95 percent (34,500 acres) of these wetlands were tabulated as Type 6 or Type 7. Several hundred acres of mudflats are exposed each fall in power company reservoirs. These areas were not tabulated although they have a potential for waterfowl development. Usually the power company impoundments are managed primarily for generation of electricity and summertime, water-based recreational activities. The inventory (figure 2-31) pointed out an obvious lack of natural wetlands in the Alabama River Basin. Seasonally flooded bottom lands and beaver impoundments represent most of the wetlands area of the basin.

Table 2-9 -- Potential acreage of Type 1 wetland by subbasin, Alabama River Basin, 1975.

SUBBASIN	FLOOD PLAIN 1/ (Type 1 Wetland)
	-----Acres-----
Alabama	375,300
Cahaba	118,300
Coosa	188,200
Tallapoosa	179,600
TOTAL	861,400

Table 2-10 -- Acreage of wetland by type in the Alabama River Basin, 1974.

BASIN	TYPE 2	3	4	5	6	7	TOTAL
	-----Acres-----						
Alabama River	200	1,000	300	1/	6,900	28,500	36,900

1/ Type 5 wetland is primarily impoundments and was not included in this inventory.

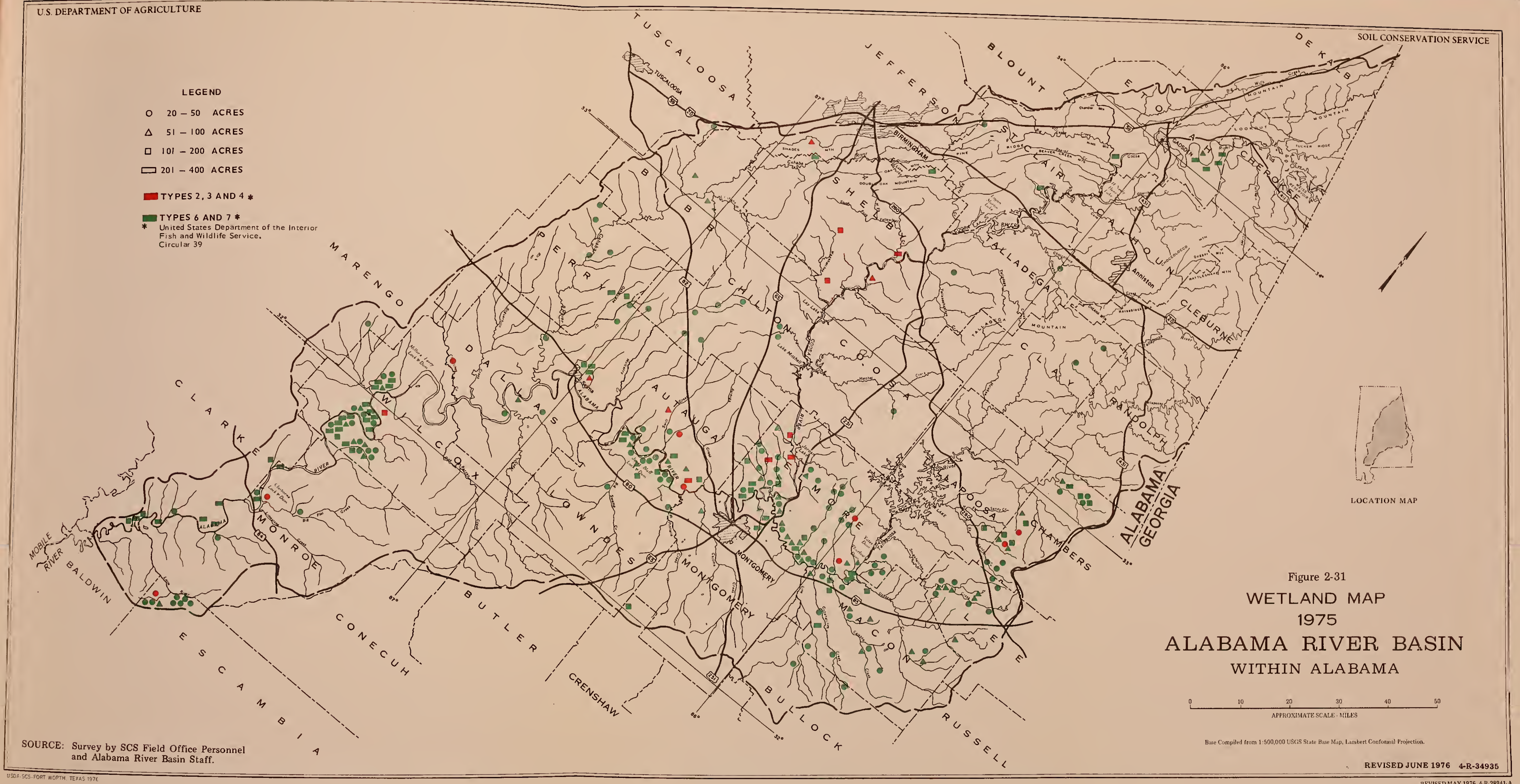


Figure 2-31
WETLAND MAP
1975
ALABAMA RIVER BASIN
WITHIN ALABAMA

REVISED MAY 1976 4-R-28941-A

Places of Historical, Archaeological and Scenic Value 1/

The National Historic Preservation Act of 1966 (80 Stat. 915) provides for the preservation of certain properties including historic districts, sites, buildings, structures, and objects that are significant in American history, architecture, archaeology, and culture. Section 106 of the act requires that all federal agencies must take into account the effect of any work undertaken on sites that appear on the National Register of Historic Places.

Basic data was collected from the Federal Register, Alabama Historical Commission, the Regional Planning and Development Commissions in the basin, and the Appraisal of Potentials for Outdoor Recreation Development for each county in the river basin. These sources can be consulted for a more comprehensive listing.

In this study, an attempt was made to identify those sites that are most likely to be affected by water and related land resource development projects (see appendix table 20). In general, homes, stores, churches, graveyards, museums, and monuments were not included. Types of sites listed are: (a) all sites listed on the National Register of Historic Places as of April 1975, (b) battle sites, or Indian villages that played a significant role in the early settlement of the state, (c) covered bridges, (d) undeveloped natural and scenic areas of unusual aesthetic or scientific value. Agencies, organizations, and individuals planning resource development projects that could result in the unintentional destruction of historical, archaeological, and scenic sites should consult the information sources listed in the preceeding paragraph.

One extensive area of historical interest in the basin is Bartram's Trail, in the eastern part of the basin and along the southeastern boundary (see figure 2-32). This is the route followed by the noted naturalist, William Bartram, in 1775. Records of his travels contain much valuable information about plants, birds, insects, reptiles, mammals, and fish found in the basin during this period. For more information pertaining to Bartram's travels see appendix 21.

1/ The identification of fossil sites was considered to be outside the scope of this study. There are several important fossil sites in the basin, particularly along the chalk bluffs adjacent to the Alabama river. Information concerning these sites can be obtained from the Geological Survey of Alabama.

Figure 2-32 -- Approximate route of Bartram's travels, Alabama River Basin, 1775-1776.

The Alabama River Basin has a varied landscape.

Typical scenes are . . .

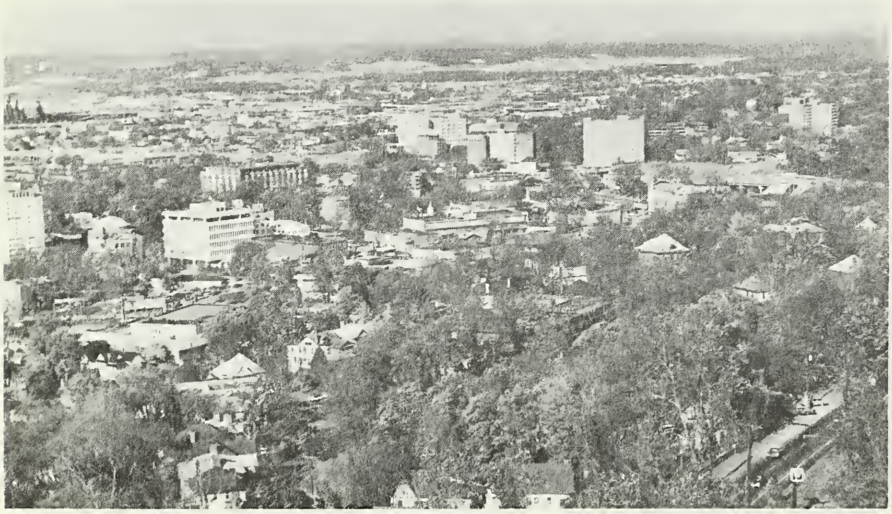
forest land,

pastureland,

and cropland.

The Alabama River Basin has many . . .

scenic areas,



urban & built-up areas,

and wetlands.

CHAPTER 3

HUMAN AND ECONOMIC RESOURCES

General

This chapter presents a brief examination of economics, agriculture and forestry. More detailed analyses and projections are available in a separate report, An Economic Base Study of the Alabama River Basin Area, authored by the Economic Research Service and Forest Service in May 1973. Information herein updates and summarizes selected items from the more extensive base report.

Population and Urban Growth

Historically, basin population growth has been slower than that of the state. From 1950 to 1973 population of the study area increased by only 9 percent compared to Alabama's 16 percent. Total population reached 1,039,000 in 1973, about 29 percent of the state's inhabitants. This percentage has been fairly constant in recent years (see table 3-1). Eight basin counties declined in population between 1960 and 1973. The national growth rate during the 13 year period was about 1.01 percent annually, roughly double that of the basin study area.

In the Alabama Basin, urbanization has occurred steadily and uniformly in all subbasins as illustrated in figure 3-1 (see appendix table 22A for details). One-half of the basin population was listed as urban in 1950, two-thirds in 1970, and projections indicate about three-fourths of the population will be urban by 1990.

Migration generally measures the desirability of an area. People will go where job opportunity exists. Other factors, however, can weigh just as heavily in a person's decision to migrate. Marion Clawson addressed this point during a series of meetings on balanced growth for the Nation. 1/ Speaking on migration, Clawson noted, "By and large, the non-metropolitan areas are deficient in many of the important social services. Schools are generally poorer, medical care is poorer--or nonexistent...Libraries, sports, and cultural activities generally are less available. It is often the poverty of social life as well as the deficiency in job opportunities which drives the young people to leave the smaller towns and rural areas." Apparently, this is the case in the Study Area. Between 1950 and 1960, the migration rate for 20-29 year-olds exceeded 60 percent in five counties, 50 percent in another five, and 40 percent in ten other counties.

Table 3-1 -- Population trends, Alabama River study area, Alabama, southeastern states and the United States, selected years, 1950-1973.

AREA	UNIT	1950	1960	1970	1973 1/
United States	Thous.	151,323	179,323	204,766	211,000
Southeastern U. S. 2/	Thous.	19,551	23,326	27,413	N. A.
Alabama	Thous.	3,062	3,267	3,444	3,539
Alabama Basin	Thous.	949	967	998	1,039
Alabama Subbasin	Thous.	298	312	308	329
Cahaba Subbasin	Thous.	96	99	102	103
Coosa Subbasin	Thous.	366	381	393	408
Tallapoosa Subbasin	Thous.	189	184	195	199
Alabama / U. S.	Pct.	2.0	1.8	1.7	1.7
Alabama Basin / Alabama	Pct.	30.9	29.9	29.0	29.4

1/ Preliminary
2/ Includes Alabama, Florida, Georgia, Louisiana, Mississippi, South Carolina, and Tennessee.
U. S. Bureau of the Census, Census of Population, and Bureau of Business Research, University of Alabama.

Even though out-migration slowed somewhat between 1960 and 1970, six basin counties experienced net inmigration while 28 sustained out-migration. This loss of such a large share of the childbearing population must be reversed if healthy economic growth is to occur.

Income

Personal income growth in both the study area and Alabama kept pace with national growth during the 1959 to 1972 period. Table 3-2 indicates income in each of the three areas increased by about 57 percent through 1969; however, in recent years, Alabama's income growth has begun to accelerate as a result of the state's emphasis on vocational training and industrialization.

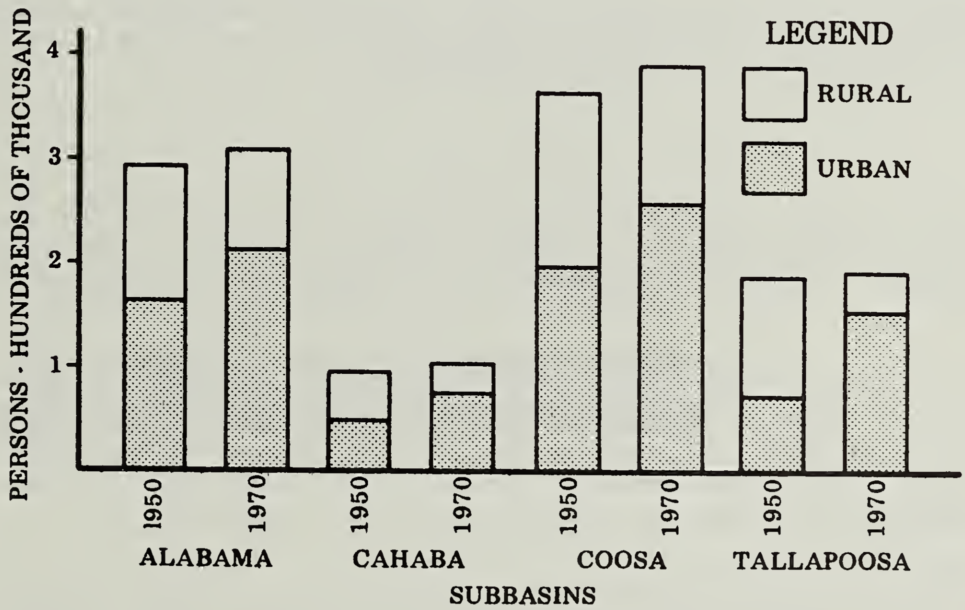


Figure 3-1 -- Urban-rural composition of the population, 1950 and 1970, Alabama River Basin and Subbasins.

Table 3-2 -- Total personal and per capita income, United States, Alabama and the Alabama River Basin, 1959, 1969, and 1972. 1/

INCOME	UNIT (Dollars)	1959	1969	1972
Total personal				
U. S.	Bil.	437	690	756
Alabama	Mil.	5,373	8,444	9,699
Basin	Mil.	1,514	2,380	2,764
Per Capita				
U. S.		2,441	3,416	3,620
Alabama		1,685	2,460	2,757
Basin		1,557	2,392	2,696

1/ 1967 dollars.

Economic Report of the President, 1973; Center for Business Research, University of Alabama, and OBERS projections developed jointly by the U. S. Departments of Commerce and Agriculture.

Between 1969 and 1972, personal income within the basin rose by 16 percent while Alabama's total climbed 15 percent and the U. S. average only 10 percent. Ninety-five percent of all basin earnings were from non-farm sources.

Only Jefferson County reported a 1972 per capita income above the United States average, figure 3-2. Most basin counties were well below the national mean; in fact, 11 reported per capita incomes below $2,200, less than one-half the United States figure. In 1969, 17 counties were in this category, thus the picture is seen to be improving.

In addition, all but two of the basin's 28 primary counties increased their per capita income relative to the U. S. between 1969 and 1972 (see figure 3-2).

Employment

Substantial employment gains were registered in the basin between 1960 and 1970. The most notable were in service and manufacturing employment,

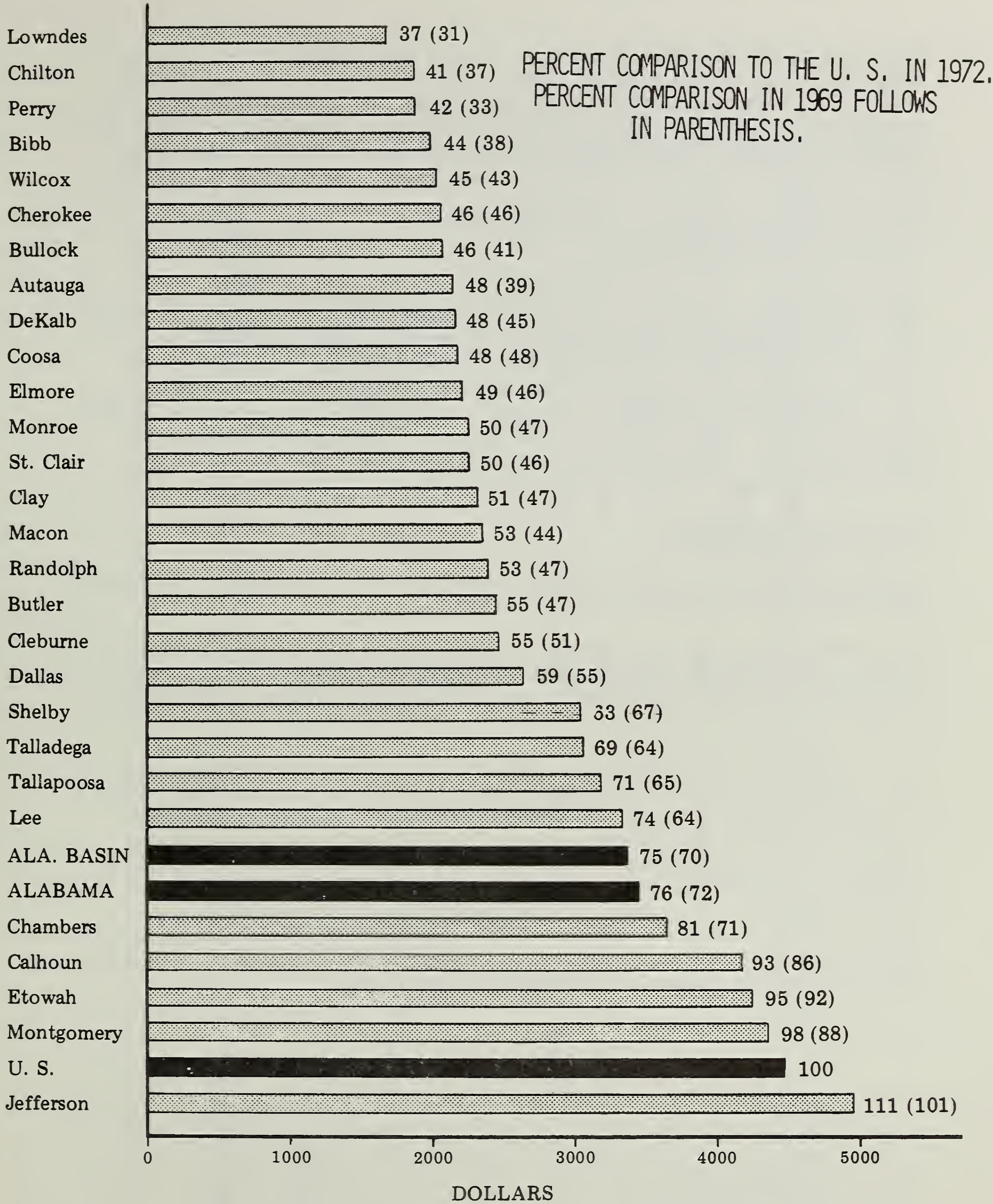


Figure 3-2 - Per capita income in Alabama River Basin counties compared to the United States, 1972 dollars.

the two largest sectors, table 3-3. These data account for civilian employment only and represent a work force of persons 14 years old and over. Total employment increased 25 percent, while population was increasing by only 2 percent during this period. Most of the employment growth in the basin paralleled the national growth rate, rather than increasing as a result of attractive employment conditions in the area.

Agricultural employment is declining rapidly. In 1970, less than one job in 20 was agricultural.

Unemployment in the basin reached 7 percent in January 1975, the highest rate since 1960 as shown in table 3-4 (county details in appendix table 22C). The figure was still below the average for the remainder of the southeast and the U. S., 8.2 percent. More than one-third (370,000 persons) of the basin's population reside in areas of high unemployment, i.e., unemployment exceeding 8 percent. Unemployment appears to be most critical in the Coosa Subbasin with Etowah, Talladega, Calhoun and Dekalb counties all reporting from 9 to 12 percent of the work force unemployed during the first quarter of 1975.

Industrial Development

Alabama finished last among eight southern states in expanding industrial employment in the last half of the 1960's.

The problem is not going unnoticed. The Alabama Development Office is placing top priority on attracting industry. In 1972, a record 193 new industries located in the state, up substantially from the 128 reported in 1969.

Basin industrial development is compared to statewide growth in table 3-5. Overall, the study area has been attracting a proportionate share of the new plants locating in Alabama; however, the average capital investment for new or expanded plants has been well below the state average. This is changing. In 1974, $294 million of the $843 million invested in new plants went to basin industries; a much higher share than in the past. The total of new industrial jobs dropped from a record 14,738 in 1972 to 3,864 in 1974. Employment statistics fluctuate widely from year to year, however, the Basin normally accounts for about 30 percent of the states' new industrial positions.

Table 3-3 -- Employment by major categories, Alabama River Basin Study Area, 1940 to 1970.

EMPLOYMENT CATEGORIES	1940	1950	1960	1970
	-----	-----Number-----	-----	-----
Agricultural	121,037	77,373	32,276	19,360
Mining	5,664	3,439	1,881	1,200
Contract construction	8,732	17,023	20,765	24,079
Manufacturing	54,817	80,910	87,274	111,748
Transportation, comm., and utilities	10,101	16,105	16,721	17,445
Wholesale & ret. trade	26,692	45,580	52,118	64,280
Finance, ins., & real estate	3,557	6,397	9,099	10,948
Services	49,388	61,096	76,830	120,858
Government	10,163	19,968	31,867	43,044
TOTAL	290,151	327,891	328,381	412,962

U. S. Department of Commerce, Census of Population, 1940, 1950, 1960, and Department of Industrial Relations, State of Alabama, 1970.

Table 3-4 -- Unemployment rates, Alabama River Basin, March 1973 to January 1975.

ITEM	PERCENT OF WORK FORCE UNEMPLOYED MAR. 1973	DEC. 1974	JAN. 1975
Alabama Basin	3.6	5.8	7.0
Alabama	3.8	5.7	7.2
Southeastern states	----Not Available---		8.2
U.S.	4.8	6.7	8.2

Center for Business and Economic Research, University of Alabama

Table 3-5 -- Industrial Development, Alabama River Basin, 1968-1974.

ITEM	UNITS	1968	1969	1972	1974
New industries					
Plants	No.	33	31	46	21
Capital investment	$1,000	13,266	18,718	68,306	293,652 1/
New jobs created	No.	3,762	3,075	5,563	1,768
Avg. investment	$1,000	402	604	1,485	13,983
Avg. no. jobs	No.	114	99	121	84
Expanded industries					
Plants	No.	75	60	105	164
Capital investment	$1,000	36,225	33,600	96,550	202,182
New jobs created	No.	6,900	2,340	9,175	2,096
Avg. investment	$1,000	483	560	919	1,233
Avg. no. jobs	No.	92	39	88	13
Basin as a percent of the States					
New industries:					
Plants	Percent	28	24	24	24
Capital investment	Percent	9	11	23	35
New jobs	Percent	38	17	27	20
Expanded industries:					
Plants	Percent	34	35	21	29
Capital investment	Percent	12	10	18	17
New jobs	Percent	46	24	41	23

Alabama Development Office, Industrial Development Report, 1968, 1969, 1972, and 1974.

1/ Figure includes a $250 million chemical refinery announced for Macon County. This one plant accounts for 85 percent of the new capital planned for investment in the Basin in 1974, and distorts the average investment per plant. Excluding the Macon County plant results in an average investment of $2,183,000 per plant, rather than $13,983,000.

Other Social and Cultural Factors

The 1970 Census of Population reported that 41 percent of the basin's residents over 25 had completed high school compared to only 27 percent in 1960. The State average in 1970 was also 41 percent. Median grade completed was 10.6 years compared to 10.8 years statewide. The pupil-teacher ratio of 27:1 is slightly higher than the national average of 22:1.

During the 1968-1969 school year, there were 3,555 dropouts from among the 253,000 school children, or 14 dropouts per 1,000 children, compared to 38 per 1,000 in the age 5 to 17 population nationwide.

There are definite problems in both the quantity and quality of medical aid, particularly in rural areas of the Alabama River Basin. Lowndes County, for example, with a 1970 population of 12,897, had no doctors, hospitals, or nursing homes in the county. Coosa County had only one doctor and no hospital facilities. The shortage of doctors appears to be most critical in the Coosa Subbasin where there were 200 physicians for a population of almost 400,000 or one doctor per 2,000 persons. The 1970 state average was one per 1,370 persons while the national figure was one per 1,200. In 1970, 43 of Alabama's 140 hospitals were located in the Study Area. Combined they offer approximately 4,000 beds, or one per 250 persons. This ratio is indicative of the severe shortage of hospital beds. In 1968, the American Hospital Association reported one bed for each 120 persons in the U. S.

The importance of good schools and hospitals, skilled physicians, adequate recreational areas, and other social and cultural opportunities is often overlooked. Existing conditons must be improved if the area is to significantly increase its desirability and growth potential.

Agricultural Economy

During the decade of 1959-1969, farm numbers in the study area decreased by 40 percent, dropping from 35,120 farms to 20,795 (see table 3-6). This rate of reduction was much greater than the national decline of around one-third of all farms during the same period. Farmland values in Alabama are increasing rapidly. Between 1970 and 1971, Alabama and Delaware led the U. S. in the amount of increase in average value of farmland. More recently, Alabama's average value per acre of farmland rose 25 percent between 1973 and 1974. This is placing additional pressure on the small operator, making it difficult to obtain good agricultural land, while creating a lucrative opportunity for him to enter other types of employment. Of the 20,795 farms, only 7,913 were classified as commercial, i.e., with sales of $50 or more. Almost two-thirds of the basin's farms were operated on a part-time or part-retirement basis.

Table 3-6 -- Farm characteristics, Alabama River Basin, and Alabama, 1954-1969.

ITEM	1954	1959	1964	1969
Number of farms				
Study area	56,620	35,120	29,044	20,795
Alabama	176,956	115,788	92,530	72,491
Commercial				
Study area	26,628	16,350	14,925	7,913
Alabama	95,101	57,840	51,912	29,639
Average size, acres				
Study area	127	161	181	218
Alabama	118	143	164	188

U. S. Bureau of the Census, Census of Agriculture, Alabama, selected years.

The trend as reflected by table 3-7 shows that poultry is firmly established as the most important enterprise in the basin, accounting for 40 percent of the increase in agricultural sales during the 1964-1973 period. Soybeans have emerged as a leading money crop and will undoubtedly replace cotton as the top money making crop in the basin in 1975.

Basin agricultural sales reached $331 million in 1973, an average of about $19,000 per farm (see table 3-7). The average basin farmer netted $6,230 for his 1973 operations. This compared favorably with the $6,370 average for all Alabama farms, but remained well below the U. S. net return of about $10,000 per farm.

Table 3-7 -- Cash receipts from farm sales, Alabama River Basin, 1964 and 1973.

ITEM	1964	1973	BASIN'S SHARE OF STATE SALES 1964	BASIN'S SHARE OF STATE SALES 1973
	(Thousand Dollars)		(Percent)	
Total receipts 1/	157,300	331,000	26	25
Livestock receipts	95,600	248,700	28	28
Poultry	47,300	114,900	25	24
Cattle and calves	29,100	86,900	41	35
Dairy	14,000	25,300	35	38
Hogs	5,200	21,600	16	21
Crop receipts	61,700	82,300	23	22
Cotton	47,100	32,400	31	33
Soybeans	1,000	20,500	9	21
Vegetables & potatoes	3,000	11,200	16	26
All other crops	10,600	18,200	21	13

1/ Current dollars.

U. S. Bureau of the Census, Census of Agriculture, Alabama, 1964, and Alabama Agricultural Statistics, 1973, Alabama Crop and Livestock Reporting Service.

Crop Production

Crops are no longer the major source of agricultural income in Alabama. In 1973, only one of every four dollars received from farming resulted from crop sales.

The rapid decline of cropland harvested in both the state and basin is shown graphically in Figure 3-3. Alabama's acreage dropped from 7.2 million harvested in 1935 to a record low 2.7 million in 1970, then climbed slightly to 3.4 million in 1975. Basin figures follow the same pattern.

In spite of this reduction in cropland used, output continued to increase as productivity per acre of major crops increased 225 percent, better than 5 percent a year (see table 3-8). This increased productivity was achieved through adoption of more efficient farm organization, greater use of chemicals and fertilizers, improved crop varieties, and shifts to more productive land.

Table 3-8 -- Average Yield of Major Crops, Alabama Basin, 1930 to 1975.

		Average Yield Per Acre					% Increase
Crop	Unit	1930-1939	1940-1949	1950-1959	1960-1969	1970-1975	Mid 30's to Mid 70's
Corn	Bu.	12	16	22	33	43	258
Cotton	Lbs.	215	274	336	409	455	112
Soybeans	Bu.	5.7	13.2	19.5	22.7	23.0	304

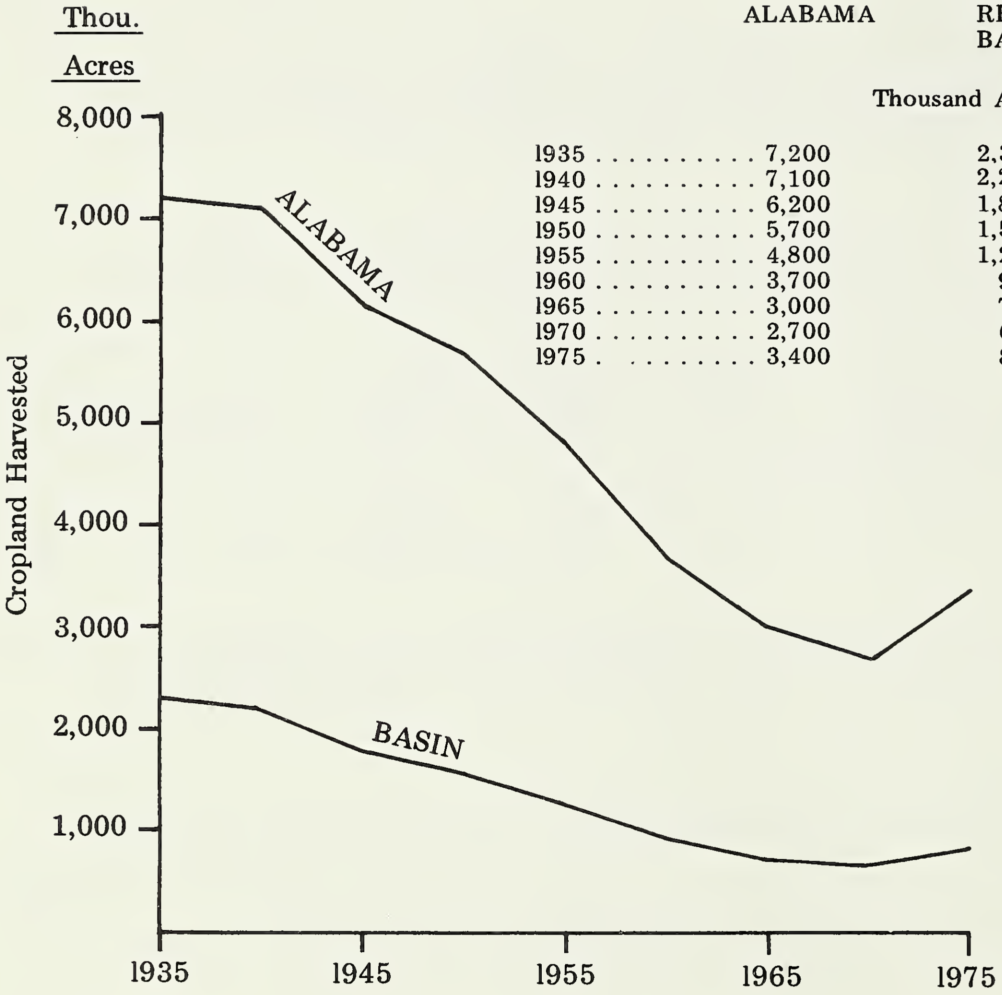
Recent production of basin crops is shown in table 3-9. Acreage harvested dropped steadily between 1964 and 1970, however, strong consumer demand and record prices for farm products pushed acreage harvested to 823,000 acres in 1975.

Feed crops now account for 48 percent of the basins harvested acreage, followed by oil and fiber crops (47 percent) and food crops (5 percent).

In 1959, 576,000 acres of corn were harvested from basin farms; this figure fell to a record low of 114,000 acres in 1973, then rose to 123,400 acres in 1975. Yields reached 54 bushels per acre in 1975.

During the past ten years, basin farmers have consistently produced 35 to 40 percent of the states' hay. In 1975, 443,000 tons were grown on 243,600 acres, yielding 1.9 tons per acre. Oats and grain sorghum remain of minor importance.

Trends in cotton production are similar to those of corn. Acreage has declined, yields are erratic, and production is trending downward over the long run. More than 3 million acres of cotton were grown in Alabama as late as 1933. In 1975, the state harvested only 370,000 acres of



CROPLAND HARVESTED

	ALABAMA	ALABAMA RIVER BASIN	% OF ALABAMA
	Thousand Acres		
1935	7,200	2,300	31
1940	7,100	2,200	30
1945	6,200	1,800	29
1950	5,700	1,560	27
1955	4,800	1,250	26
1960	3,700	920	25
1965	3,000	725	24
1970	2,700	660	24
1975	3,400	823	24

Figure 3-3 -- Trend in Cropland Harvested, Alabama and the Study Area, 1939 to 1975.

Table 3-9 -- Principal crops: Acres harvested and production, Alabama River Basin 1964, 1970, and 1975.

	UNIT OF PRODUCTION	1964 ACRES	1964 PRODUCTION	1970 ACRES	1970 PRODUCTION	1975 ACRES	1975 PRODUCTION
Feed crops							
Hay	Tons	195,700	294,000	207,500	316,000	246,300	467,970
Corn	Bushels	262,257	8,526,000	133,135	2,905,000	123,400	6,663,600
Oats	Bushels	13,210	538,000	9,415	357,700	9,900	336,600
Grain sorghum	Bushels	2,087	50,666	8,075	258,000	13,600	435,200
Oil and fiber							
Cotton	Bales	217,870	277,328	152,971	156,143	110,600	93,320
Soybeans	Bushels	14,704	407,400	140,962	3,177,000	275,000	6,600,000
Peanuts	Pounds	3,159	2,290,000	2,288	2,157,000	2,880	7,488,000
Food crops							
Wheat	Bushels	5,914	164,400	15,133	430,000	30,000	744,000
Vegetables	Cwt	10,134	608,000	9,500	669,000	11,000	737,000
Potatoes	Cwt	886	83,600	1,200	152,650	750	108,750
Total acres		725,921		677,779		823,430	

Census of Agriculture, Alabama, 1964, and Alabama Crop and Livestock Reporting Service estimates for 1970 and 1975.

which 110,600 were in the Basin. Yields average slightly less than one bale per harvested acre. Cotton acreage continues to shift from south to north Alabama, particularly into the Tennessee Valley area. Future prospects for an acreage increase will depend largely on government programs and acceptance of synthetic fibers.

Soybean production is booming in all parts of the south and the study area is no exception. Basin production is up from 407,000 bushels in 1964 to a record 6,600,600 bushels in 1975. Acreage is eighteen times the 1964 level with an increased share of the state's soybeans being grown on basin farms. Basin farmers produced 21 percent of Alabama's crop, compared to 9 percent in 1964. Production within the basin is concentrated in the Alabama Subbasin.

Livestock and Livestock Products

Poultry is the single most important basin farm enterprise with sales of $115 million in 1973. Broiler production alone contributed greater income than all crops combined, about $88 million. More than 100 million broilers were marketed from basin farms in 1973 (see table 3-10). Egg sales produced $26 million in 1973 to rank third behind broilers and cattle in value of sales.

The number of hogs and pigs on farms has fluctuated widely over the past 20 years, ranging from a high of 260,000 in 1959 to a low of 141,000 in 1964. There were 201,000 on basin farms in 1973 with sales of 269,000 hogs and pigs during the year. Sales grossed $21.6 million.

Milk production in the study area has been increasing slowly while the number of dairy cows has actually declined. Average production per cow remains about two-thirds the national average. In 1973, there were 43,500 milk cows reported averaging 7,195 pounds for a total production of 313 million pounds of whole milk.

Cattle and calf sales have increased slowly since 1959, with the basin's share of state sales flucuating between 35 and 40 percent. Sale of 288,770 animals in 1973 yielded $86.9 million. Over half of the sales occurred in the Alabama Subbasin, primarily in the Montgomery market area.

In 1973, 638 million pounds of beef and veal were produced in Alabama; 223 million pounds were from basin cattle. A breakdown of the source of production shows that 10 percent of the gain was from feedlot operations, 10 percent was from hay and other wintering rations, while the balance of gain, 80 percent, was from grazing of some type. Growing of improved pastures yielded almost 100 million pounds of beef. Roughly, one-fourth of the basin's beef output comes from woodland grazing.

Woodland grazing is concentrated in the Alabama Subbasin, and the Coosa Subbasin. Most grazing in forests is on bottom lands adjacent to pastureland.

Forest types (pine) with 100 percent grass cover produce about 2,500 pounds of oven-dried forage per acre.

The grass density was estimated at 30 percent in 1972. This indicates the grazing resource is one-third of its' potential and producing 725 pounds of forage per acre per year. This will support 1,741,000 AUM's (animal unit months) of moderate grazing on favorable forest types (see table 3-11). The need for woodland grazing of cattle, however, is expected to decline sharply by 1990 with the acceleration of improved pasture and forage production.

Table 3-10-- Livestock and livestock products sold, Alabama River Basin, 1964, 1970, and 1973.

LIVESTOCK AND LIVESTOCK PRODUCTS	UNITS	QUANTITY SOLD 1964	1970	1973
Livestock				
Cattle and calves	Number	270,900	303,600	288,770
Hogs and pigs	Number	165,000	230,000	269,200
Broilers	Thousand	59,045	97,500	103,500
Turkeys	Number	273,050	8,900	1/
Sheep and lambs	Number	2,053	935	1/
Livestock products				
Whole milk	Thousand lbs.	292,500	304,400	313,740
Cream	Thousand lbs.	10,003	11,870	12,800
Chicken eggs	Million	632	843	557

1/ Insignificant amount.

Census of Agriculture, Alabama, 1959 and 1964, and Alabama Crop and Livestock Reporting Service estimates for 1970.

Table 3-11 -- Forest range resource, Alabama River Basin, 1972.

FOREST TYPE	ACRES	FORAGE	ANIMAL UNIT MONTHS
	Thousand	Pounds/Acre	Thousand
Pine	2,765	825	1,014
Oak-Pine	1,943	625	540
Bottom land hardwood	673	625	187
TOTAL	5,381		1,741

Forest Products

The volume of growing stock (roundwood) in 1972 was 6.7 billion cubic feet, or 902.3 cubic feet per acre, which is about average for southeastern United States. Fifty-seven percent of the growth volume was softwood, while forty-three percent was hardwood. One-half of the volume was sawtimber-size trees* (see table 3-12).

Table 3-12 -- Roundwood volumes 1/ by size classes, Alabama River Basin, 1972.

TYPE	SAWTIMBER	POLETIMBER	SEEDLINGS & SAPLINGS	TOTAL
	----------Million Cubic Feet----------			
Softwood	1,921.3	1,383.4	538.0	3,842.7
Hardwood	1,449.5	1,072.6	376.8	2,898.9
TOTAL	3,370.8	2,456.0	914.8	6,741.6

1/ Roundwood volumes includes forest products from sawtimber and pulpwood; measured in cubic feet.

Diameter size class shows the bulk of the volume is in smaller diameter growth, mainly 6 to 13 inches diameter breast height, as shown in figure 3-4.

* A sawtimber tree is described as a live tree containing at least a 12-foot saw log meeting grade specification. Softwoods are at least 9 inches diameter breast height, and hardwoods are at least 11 inches in diameter.

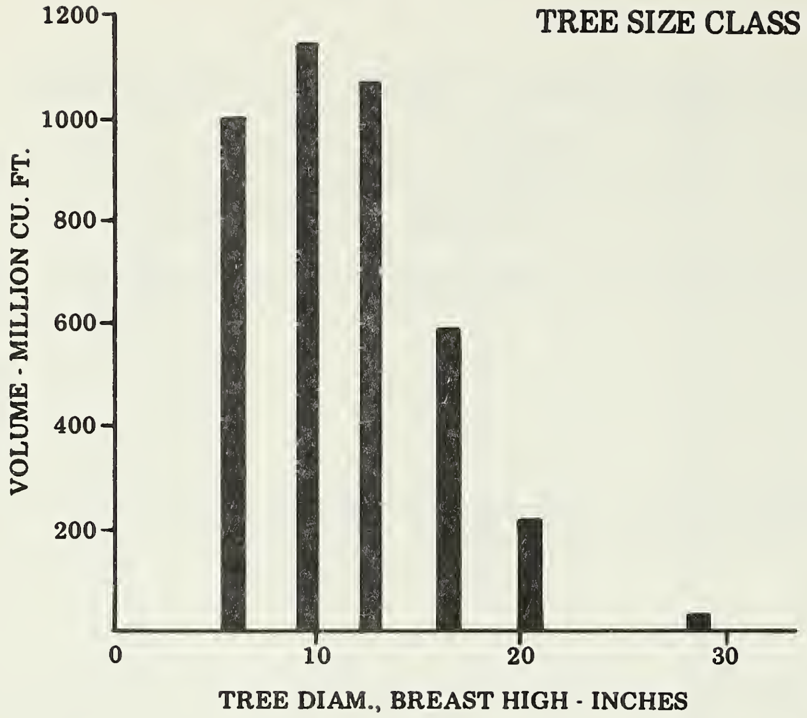


Figure 3-4 -- Roundwood volumes by tree size classes, Alabama River Basin, 1972.

An analysis of forest stands managed by landowners reveals that most stands are age classes 30 to 40 years as shown in figure 3-5. Ages of the most abundant dominant and codominant trees are used to determine stand age class.

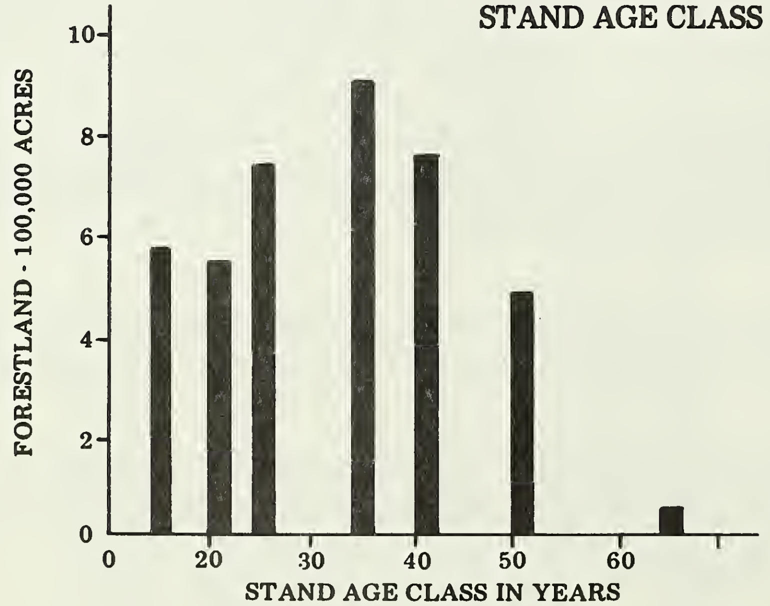


Figure 3-5 -- Forest land acres by the average age of the stands featured in management, Alabama River Basin, 1972.

Average net annual growth increased from 39.3 cubic feet per acre in 1962 to 56.1 cubic feet per acre in 1972. Net annual growth by counties is compared to removal in figure 3-6. Growth by subbasins is shown in table 3-13.

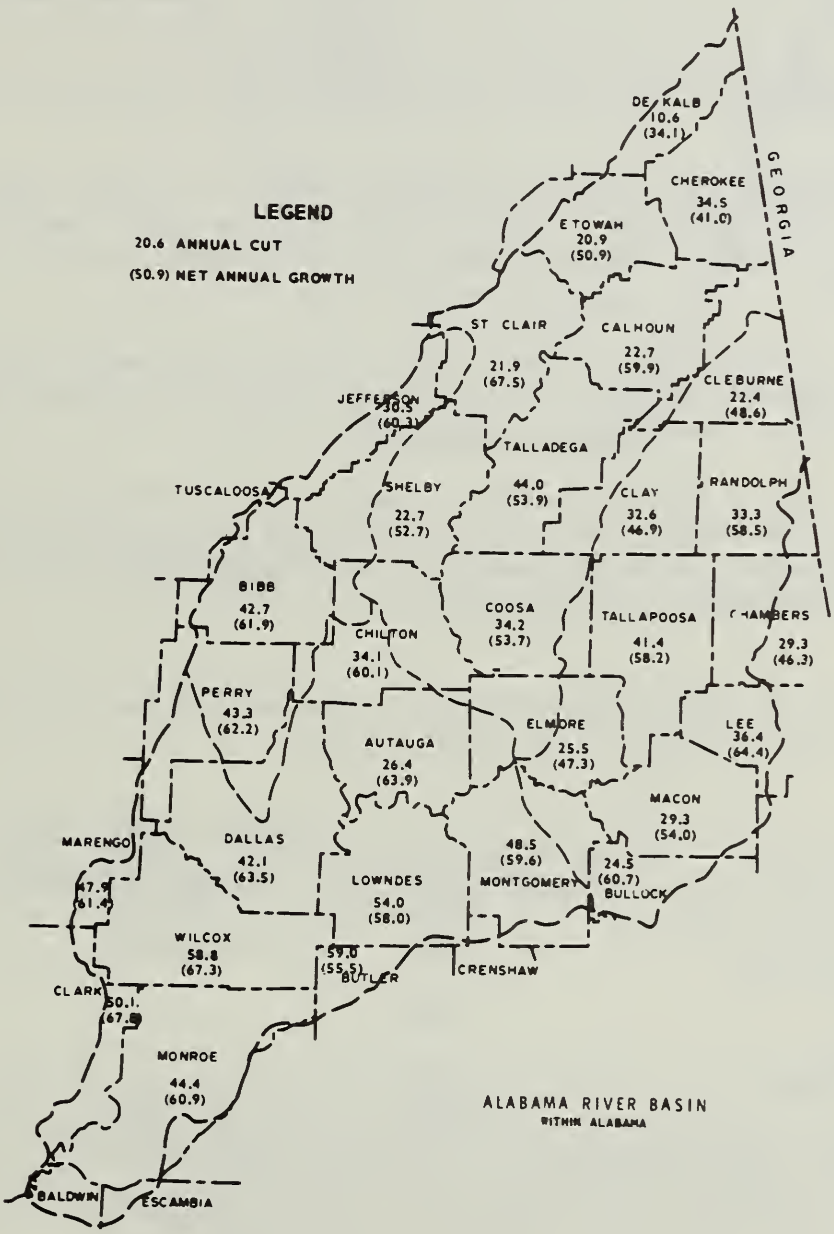


Figure 3-6 -- Annual roundwood removal and growth by counties, 1972.

Table 3-13 -- Average net annual roundwood growth, Alabama River Basin, 1972.

SUBBASIN	AVERAGE NET ANNUAL GROWTH CUBIC FT./AC.
Alabama	61.6
Cahaba	60.6
Coosa	51.6
Tallapoosa	54.0
Weighted average	56.1

Timber removals between 1962 and 1972 increased from 27.7 cubic feet per acre to 34.1 cubic feet per acre. The 1971 cut for the basin was 255 million cubic feet. Timber removal volumes and net annual growth are shown in figure 3-6.

Increased capital investments in forest industry since the early 1960's have resulted in increased primary production as well as increased value added through secondary manufacturing (see figure 3-7).

Three paper mills, with a 24-hour pulping capacity of 2,850 tons, have been constructed in the basin since 1964. Locations of forest industries are shown in figure 3-8. Number of employees and wages for forest based industries for 1970 are shown in table 3-14.

Table 3-14 -- Number of employees and annual wages attributed to forest industry, Alabama River Basin, 1970.

TYPE OF ACTIVITY	NO. EMPLOYEES 1/	TOTAL ANNUAL WAGES (1,000 DOLLARS)
Management & harvesting 2/	1300	4,643.6
Primary industry	7900	52,706.8
Secondary manufacturing processes	2400	11,751.8
Associated industry & supporting activity	400	2,445.1
TOTAL	12,000	71,547.3

1/ Much of the part-time employment in forestry services and on-farm labor in timber harvesting is not shown here.

2/ An additional 22,000 part-time employees are estimated to be associated with the forest industry of the basin. At $1,500 per part-time employee, this amounts to an additional $33 million dollars in wages.

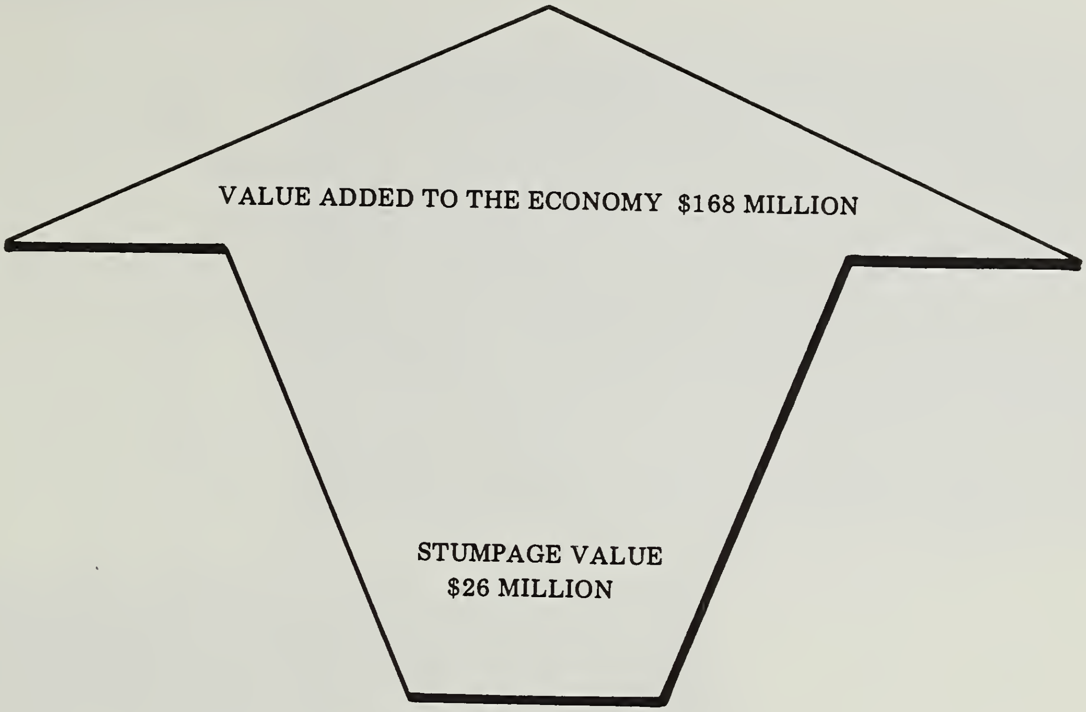


Figure 3-7 -- Stumpage values and value added to the economy by roundwood processing in the Alabama River Basin, 1970.

After the World War II building boom subsided in the late 1940's and early 1950's, profits declined for many producers in forest industry. Rising labor costs caused old plants and relatively inefficient operations to become unprofitable. Many sawmills and other manufacturers ceased operations.

New increments of forest industry are expected in the next 10 to 15 years, but not at the scale generated by the major installations of the pulp and paper industry since 1964. Increased mechanization and improved labor efficiency is the current trend in wood harvesting. Refinement in machinery in the manufacturing and harvesting process is expected in the future.

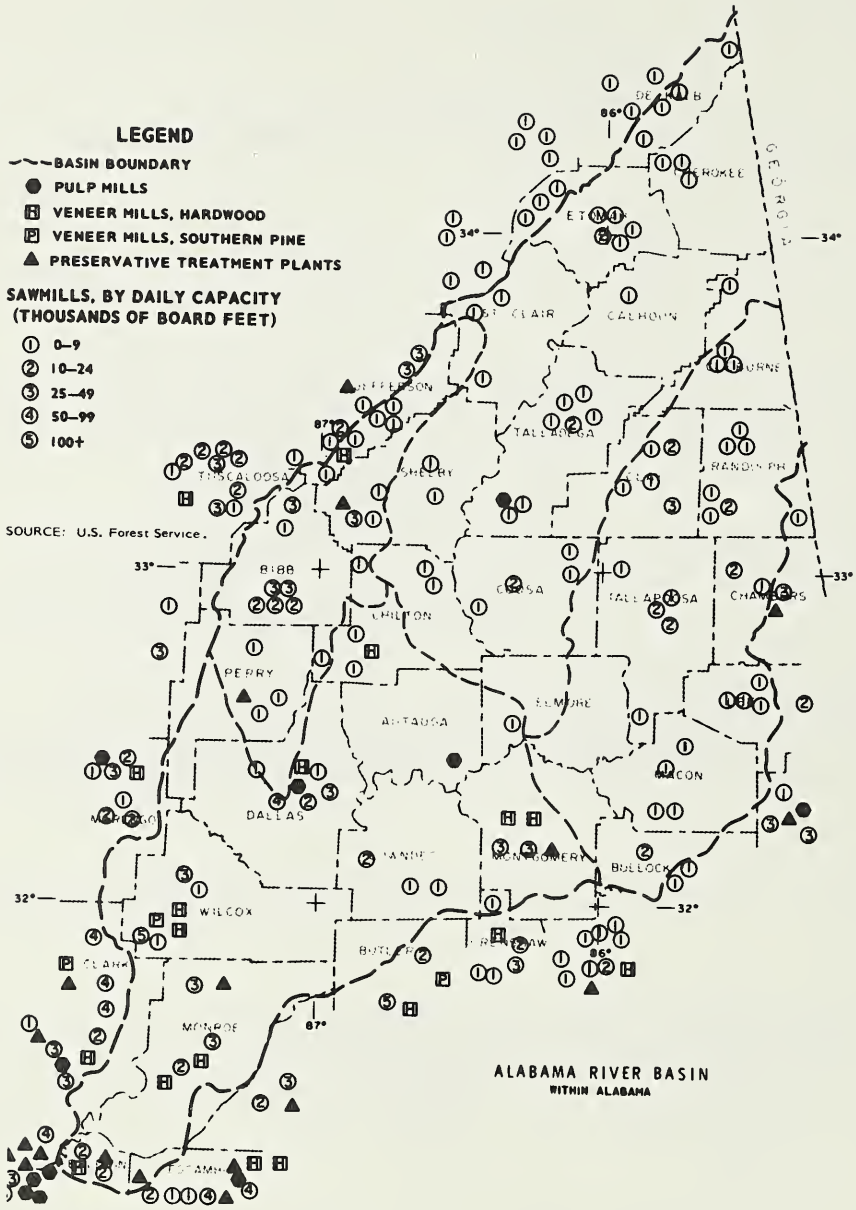


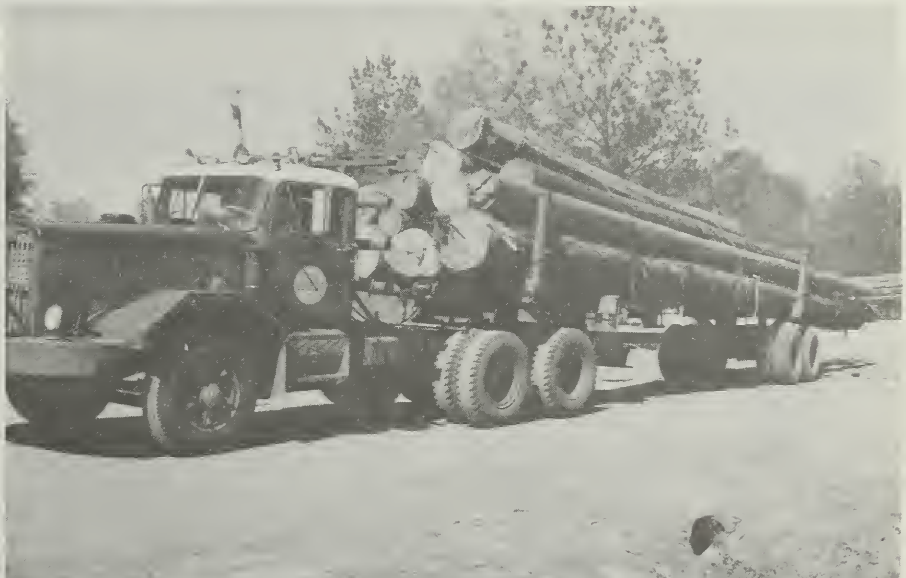
Figure 3-8 -- Primary forest industries, Alabama River Basin and adjacent counties, 1972.

Harvest from the land may be as diverse as . . .

hay,

beef,

or timber.



Income and employment is offered in industries such as . . .

forest management,

produce shipping,

and poultry packing.

CHAPTER 4

PROJECTIONS, PROBLEMS AND NEEDS

GENERAL PROJECTIONS

Population

Population projections for the study area counties and the state are based on estimates for Water Resource Subregions in Alabama prepared by the U. S. Departments of Commerce and Agriculture, for use in river basin planning. These estimates, commonly termed OBERS projections, assume Census of Population Series C growth rates which result in a doubling of U. S. population between 1968 and 2020. Alabama's population is projected to reach 5.8 million by 2020, with about 1.6 million residents in the Alabama River Basin (see figure 4-1). Autauga and Montgomery counties should continue to be the fastest growing basin counties, followed closely by Lee and Shelby.

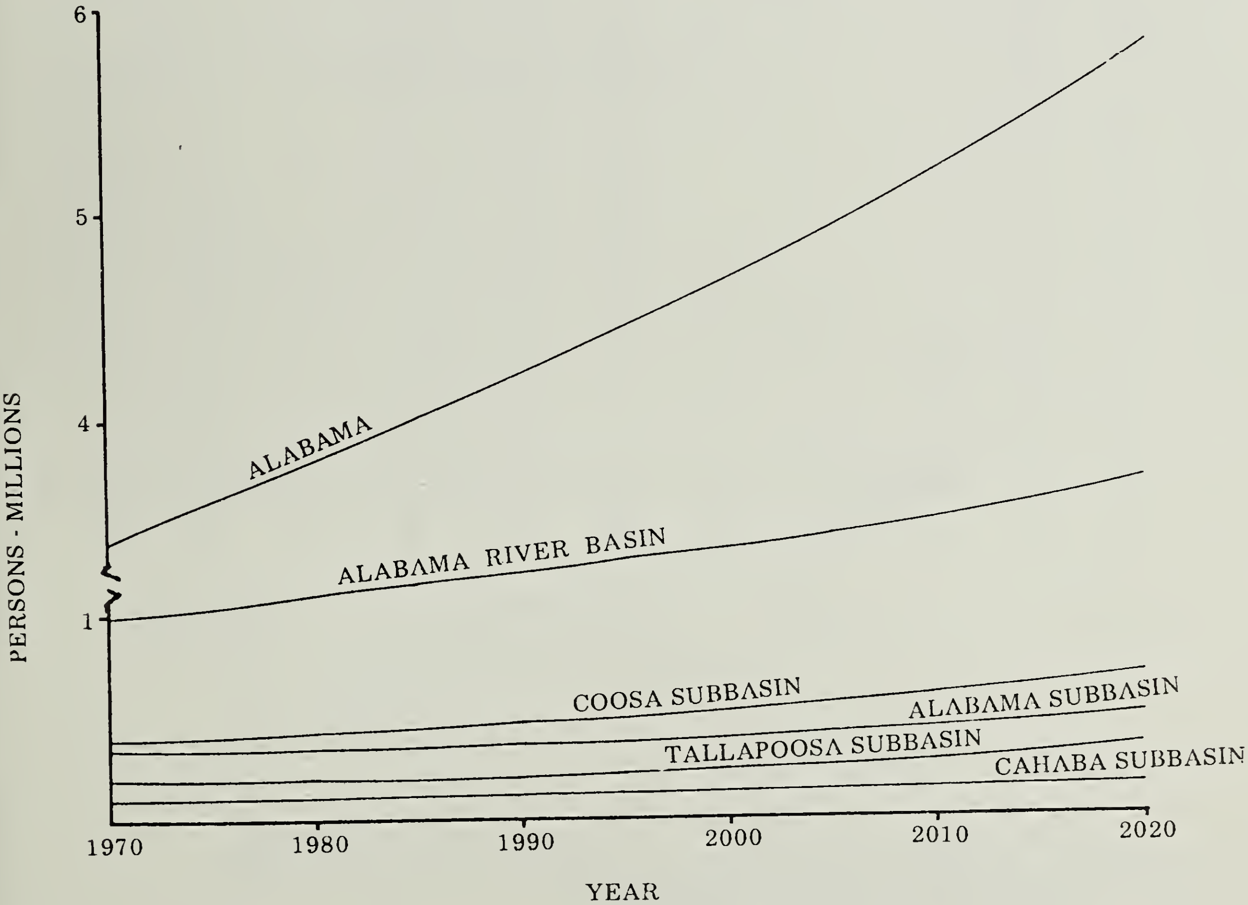


Figure 4-1 -- Population for Alabama, the Alabama River Basin, and subbasins, 1970-2020.

In the Alabama Basin, urbanization has occurred steadily and uniformly in all subbasins. One-half of the basin population was listed as urban in 1950, two-thirds in 1970, and projections indicate about three-fourths of the population will be urban by 1990 (see figure 4-2 or appendix table 22B).

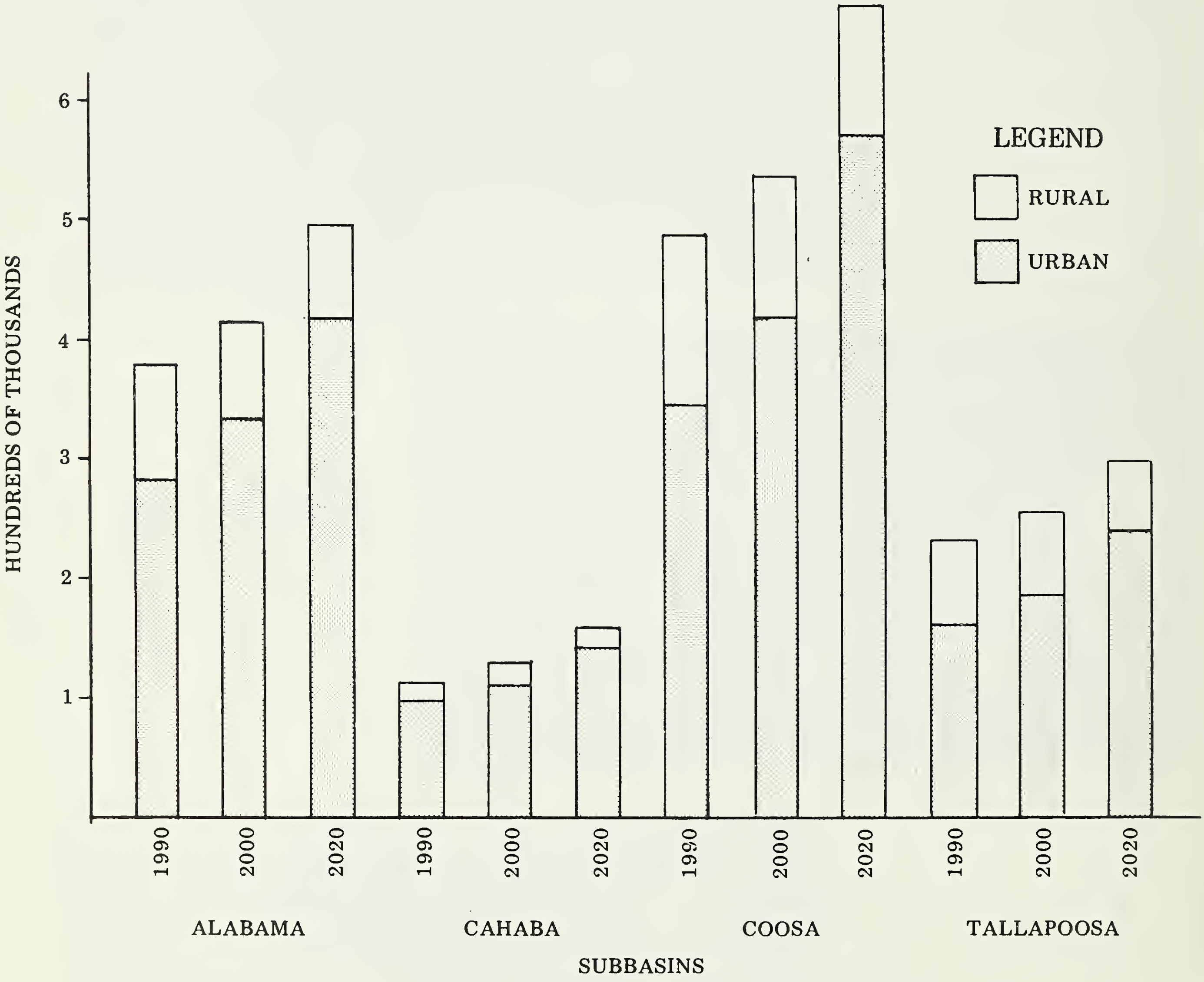


Figure 4-2 -- Urban-rural composition of population, by subbasins, Alabama River Basin, 1990-2020.

Income

In both 1959 and 1969, basin counties accounted for 28 percent of the state's total income. This share is projected to remain constant through 1990, reaching $5.7 billion by that time (see table 4-1). This is a 4.3 percent annual increase in total personal income within the study area, equivalent to the expected national rate of growth.

Per capita basin income is expected to double by 1990, reaching almost $4,800 (see figure 4-3). The yearly increase of 3.4 percent is slightly higher than the projected national increase of 3.0 percent annually.

Table 4-1 -- Total personal income, United States, Alabama, and the Alabama River Basin, 1990, 2000, 2020.

INCOME	UNITS 1/	PROJECTED 1990	2000	2020
Total personal				
United States	Bil. Dols.	1,663	2,540	5,690 2/
Alabama	Mil. Dols.	20,400	31,200	70,400
Basin	Mil. Dols.	5,745	8,370	18,100

1/ 1967 dollars.
2/ Projections developed from U. S. Department of Commerce estimates of U. S. economic growth to 2020.

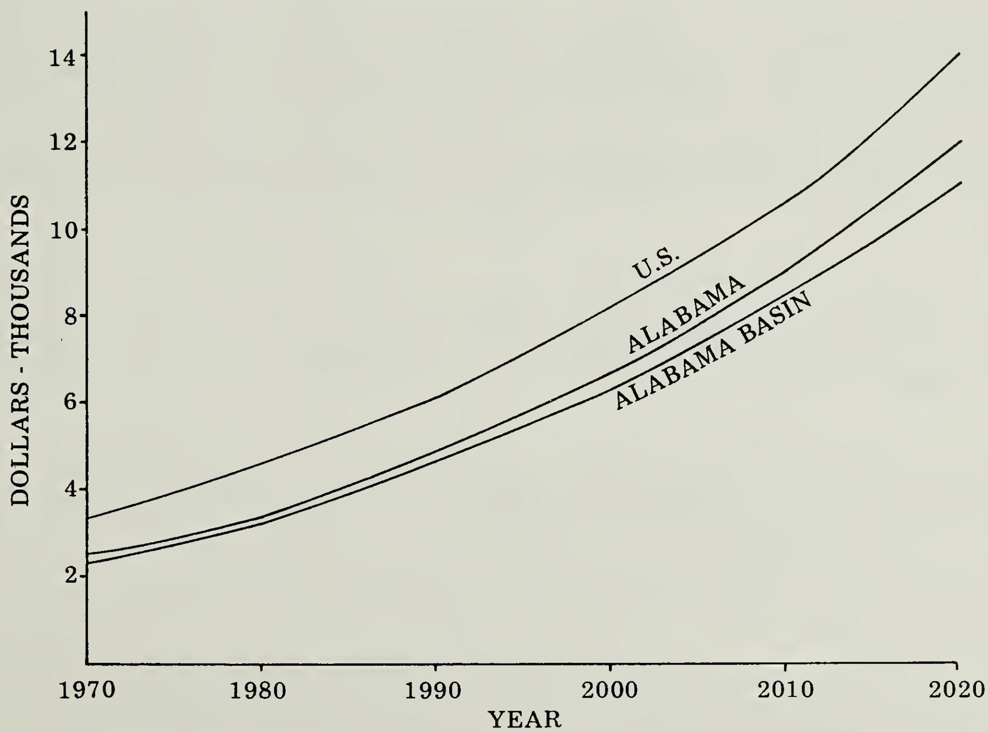


Figure 4-3 - Per capita income, U.S., Alabama, and the Alabama River Basin, 1970-2020.

Employment

The employment projections shown in table 4-2 are OBERS baseline estimates which are consistent with a projected national framework.

Employment projections should not be considered to be an optimum or idealized level of activity. They are simply conditional forecasts of the future based on an extension of past relationships.

As indicated in table 4-2, total employment in the study area should reach 487,000 by 1990, an increase of 18 percent over 1970. Most rapid gains are forecast in finance, insurance, and real estate, followed by services and trade employment.

Agricultural employment will continue to decline. By 1990, agricultural employment is expected to represent only 2 percent of total employment.

Table 4-2 -- Employment by major categories, Alabama River Basin, 1990, 2000, and 2020.

EMPLOYMENT CATEGORIES	PROJECTED 1990	2000	2020
	------Number------		
Agricultural	9,040	7,600	7,200
Mining	1/	1/	1/
Contract construction	28,500	31,200	36,500
Manufacturing	129,500	140,700	164,100
Transportation, comm., & utilities	21,200	23,800	28,900
Wholesale & ret. trade	78,100	87,100	105,100
Finance, ins., & real estate	14,400	16,500	20,900
Services	154,200	174,900	221,600
Government	52,200	57,500	68,400
TOTAL	487,100	539,300	652,700

1/ Less than 500.

Source: Projections developed from U. S. Department of Commerce estimates of U. S. economic growth to 2020.

Food and Fiber Output

State Production--A basic concept of river basin planning is that plans for resource development be related to the projected needs of the Nation as well as to regional needs. These needs, normally expressed in quantities of agricultural products expected from the river basin, are considered baseline estimates of future production rather than optimum levels of output. Baseline production estimates are used to pinpoint problems which may arise in the future. The estimates of future production are based on historical production relationships between the state and nation. They are in no way a goal or a constraint on the state or basin's economic activity. Neither are they a constraint in considering alternative levels of growth.

State estimates were prepared using two techniques. One was to allocate a part of the national food and fiber requirements to Alabama based on historical state-national production relationships. The other method was based on linear extension of historical production trends.

Production has been quite erratic in recent years making long term projections extremely difficult. The uncertainty of long run export demands and future energy supplies further clouds the picture. To estimate a single projected acreage or production level subject to these conditions seems very risky. For this reason, a range of future production levels was considered (see table 4-3).

Level A projections assume a continued moderate increase in the production of most commodities. Corn would continue to decline; soybean, peanut, wheat and hay output would increase though not as rapidly as in the past; beef production would expand about 2 percent annually, equivalent to the current rate of growth. Level A estimates for Alabama are related to OBERS Series C agricultural requirements.

Recent events, particularly the emphasis on increased exports of oil and grain crops, forced the consideration of an alternative higher production level, Level B, within the state. These estimates assume accelerated production of soybeans, corn, peanuts and beef. Level B figures for the state are related to OBERS E' needs.

Basin and Subbasin Analyses--Once the range of state estimates was determined, the anlysis shifted to probable developments within the Alabama River Basin. The study area was examined through the use of a state agricultural model encompassing the nine major river basins within the state.

A statewide approach was used to permit an analysis of probable production shifts in all areas of the state, rather than the Alabama River Basin alone. Least cost linear programming techniques were used to estimate land requirements, land use shifts, and cost and returns for 1990 and 2020. The cost

Table 4-3 -- Agricultural production, historical and projected, Alabama.

		PRODUCTION OVER PAST 50 YEARS						PROJECTED PRODUCTION			
								1990		2020	
ITEM	UNIT	1925	1935	1945	1955	1965	1975	LEVEL A 1/	LEVEL B 2/	LEVEL A	LEVEL B
	Thou.										
Major Crops											
Corn	Bu.	35,200	48,400	43,400	59,900	37,500	35,000	10,000	33,000	10,000	50,000
Peanuts	Lbs.	85,250	203,000	340,900	209,600	258,020	535,600	424,000	530,000	600,000	650,000
Soybeans	Bu.	21	60	348	2,068	5,016	31,440	29,360	38,500	43,750	61,000
Cotton	Bales	1,352	1,059	931	1,045	853	312	480	290	540	170
Other Crops											
Wheat	Bu.	66	70	310	1,007	1,348	3,240	4,400	4,400	7,400	6,500
Oats	Bu.	1,870	1,746	6,292	3,848	1,400	1,120	865	760	915	420
Hay	Tons	349	575	742	869	824	1,134	920	770	1,150	870
Grain Sorghum	Bu.	NA	NA	NA	874	270	1,280	1,975	50	2,750	0
Vegetables	Lbs.	NA	NA	60,000	209,400	216,000	230,300	310,000	278,000	450,000	270,000
Potatoes	Lbs.	80,600	168,300	292,600	90,100	234,900	137,800	240,000	278,000	250,000	275,000
Beef & Veal		92,025	141,760	214,550	431,080	535,215	650,000	885,000	1,050,000	1,365,000	1,540,000
From Impr. pastures	Lbs.	NA	NA	NA	NA	170,000	282,000	540,000	640,000	1,000,000	1,125,000

Source: Alabama Agricultural Statistics, 1965 and 1975, and 100 years of Alabama Crop, Livestock, and Income Data, Agricultural Experiment Station, Auburn University.

1/ Assumes a continuation of the present level of foreign export demands. Related to OBERS Series C U.S. needs.
2/ Assumes a substantial increase in agricultural exports. Related to OBERS Series E' requirements.

minimization approach was selected on the assumption that in the long run farmers will tend to produce food and fiber efficiently. This is not always the case due to personal preferences, resource limitations, and/or legal arrangements, consequently, restraints on land use shifts were built into the model to keep projections realistic.

Throughout the study, programmed results were viewed as a starting point from which subjective changes were made as necessary. Consequently, projections in this report are not mechanical estimates. They have been tempered with the reasoning and knowledge of soil scientists, economists, and production specialists in both the USDA and the Agricultural Experiment Station of Auburn University.

Program Requirements and Assumptions - To project land use without accelerated resource development, the model required information on six items: (1) the acreage of openland available for agriculture in each subbasin in each time period; (2) current land use on each soil resource group (SRG) 1/; (3) yields on each soil resource group in each time period for each enterprise considered (see appendix 24F); (4) costs of production for each enterprise on each soil group; (5) projected state production of each commodity in each time period; and (6) rotation practices, or the percent of time each soil group can be used for row crops.

In each subbasin and within soil groups the acreage of cropland and pasture that could be used to grow specific crops served as a restraint for the model. Since land use is generally slow to change, the amount of change that could take place over time was limited. For each crop, up to one-half of the acreage on each soil group within a subbasin in 1967 was permitted to shift to other uses by 1990. For example, if a particular SRG in the Alabama Subbasin produced 20,000 acres of cotton in 1967 the model would require at least 10,000 acres of cotton in the Alabama Subbasin in 1990 grown on the same SRG as in the base year. The remaining cotton production could be grown anywhere in the state subject to the objective function of minimizing production costs.

Corn and oats were the only crops permitted to decline more than 50 percent by 1990. This change was allowed because acreage had declined rapidly in recent years. A requirement of only 15 percent of the base average of corn and 25 percent for oats was placed on each subbasin.

Projected Alabama agricultural production in 1990 and 2020 was the final control. Two levels of production were presented in Table 4-3. Each was examined separately.

1/ A soil resource group is a group of soils with similar productivity and limitations for agricultural use. These groups are described in detail in appendix 24E.

In addition to the assumptions already discussed, the following was assumed:

1. Governmental farm programs will not restrict the location of agricultural production.
2. Capital and labor are available in sufficient quantities.
3. Management will continue to improve resulting in a more efficient allocation of resources for crop and pasture production.

For a more detailed discussion of assumptions and methodology, see appendix 24D.

Land Use--The category urban and other land encompasses all urban and built up areas including rural non-farm residences, roads, feed lots, marshes, and miscellaneous land uses. The most rapid urbanization will continue to be around Montgomery. Three of every ten acres expected to shift to urban uses in the basin by 1990 will be in the Montgomery SMSA (see appendix 24C for projection methodology).

Cropland in production should decline slightly from the 1970 level of 653,000 acres to around 614,000 acres by 1990 and 591,000 by 2020 (see table 4-4). Improved pasture will continue to climb, exceeding a million acres by 1990, and approaching 1.5 million by 2020.

Table 4-4 -- Land use projections and needs, Alabama River Basin, 1970-2020.

LAND USE	1970	PROJECTED 1990	2020
	Thousands of Acres		
Urban and other land	682	774	963
Cropland harvested, fallow, or in water disposal	653	614	591
Other cropland	620	625	650
Improved pastureland	531	1,025	1,473
Unimproved pastureland	796	542	160
Forest land	7,471	7,155	6,862
Impounded water	245	263	300
Rivers and streams	17	17	16
TOTAL AREA	11,015	11,015	11,015

Forest land acreage has declined in the past and will continue to decline in the future if its present poorly competitive economic position cannot be changed. Projections indicate an 8 percent decline from 7,471,000 acres in 1970 to 6,862,000 acres in the year 2020.

Impounded water (lakes and ponds) should increase from 245,000 acres in 1967 to 300,000 acres by 2020. Acreage of free-flowing streams will decrease from 17,000 acres in 1970 to 16,000 acres by 2020.

Agricultural Land Use--Projected agricultural land use for both the state and basin is shown in Table 4-5. Statewide, level B output would require about 20 percent more acreage for crops and pasture than level A in both time periods, an additional 900,000 acres in 1990, and 1.2 million extra acres by 2020. A substantial increase in corn acreage and improved pastures for beef cattle are the major factors causing the increase. Level B production would maintain state agricultural land requirements at current levels through 1990, with a gradual increase in land needs through 2020. Idle openland would drop from 3.1 million acres in 1975 to 1.6 million acres by 2020.

Within the basin, a shift from level A to level B production would require an additional 231,000 acres to be in production by 1990, bringing the total to 614,000 acres. This is well below the 823,000 acres utilized in 1975, but in line with the long run trend to fewer acres harvested.

The land use projections and associated data in tables 4-3, 4-5, and 4-6 are the result of the state agricultural model which was designed to meet the projected Alabama agricultural production without accelerated resource development. The model was based on minimization of production costs. The following crop and livestock discussions are based on these projections.

Crop Production--In 1975, basin farmers harvested 24 percent of the State's cropland. Baseline projections indicate that by 1990 this share will have reached 27 percent, on 614,000 of 2,247,000 acres utilized statewide (table 4-5). Subbasin detail is shown in appendix table 24A and figure 4-4.

Basin corn production in 1975 totaled 6.7 million bushels from 123,000 acres resulting in a record 54 bushels per acre average yield. By 1990 yields should approach 70 bushels with output from 146,000 acres totaling 10.1 million bushels (table 4-6). An increasing share of the state's corn crop will come from basin farms with production spread uniformly across the study area.

Table 4-5 -- Agricultural land use, current and projected for Alabama and the Alabama River Basin.

ITEM	1975	1990 LEVEL A	1990 LEVEL B	2020 LEVEL A	2020 LEVEL B
	-----------------Thousand acres-----------------				
ALABAMA					
Cropland in production 1/	3,420	1,920	2,247	1,715	2,215
Feed Crops	1,363	383	698	309	628
Oil & Fiber Crops	1,886	1,363	1,373	1,205	1,422
Food Crops	171	174	176	201	165
Improved pasture	1,900	2,490	3,059	3,520	4,239
TOTAL Land used	5,320	4,410	5,306	5,235	6,454
Available open land	8,430	8,280	8,280	8,050	8,050
Idle cropland & pasture	3,110	3,870	2,974	2,815	1,596
ALABAMA RIVER BASIN					
Cropland in production 1/	823	383	614	565	591
Feed crops	393	144	236	142	214
Oil & Fiber Crops	388	210	286	332	343
Food Crops	42	29	92	91	34
Improved pasture	700	927	1,024	988	1,473
TOTAL Land used	1,523	1,310	1,634	1,553	2,062
Available open land	2,600	2,560	2,560	2,513	2,513
Idle cropland & pasture	1,077	1,250	926	960	451

1/ Harvested, conservation land used for water disposal, and fallow land in rotation supporting production.

Table 4-6 -- Agricultural production, current and projected, Alabama River Basin.

COMMODITY GROUP	UNIT	1975	LEVEL B SELECTED BASELINE 1990	LEVEL B SELECTED BASELINE 2020	LEVEL A 1990	LEVEL A 2020
Crops	Thou.					
Corn	Bu.	6,664	10,100	13,900	2,300	4,600
Cotton	Bales	93	54	22	95	250
Peanuts	Lbs.	7,488	4,500	23,000	9,680	30,000
Soybeans	Bu.	6,600	10,100	17,600	4,880	12,000
Wheat	Bu.	744	2,900	490	450	2,600
Oats	Bu.	337	195	285	275	560
Grain Sorghum	Bu.	435	0	0	1,740	20
Vegetables	Lbs.	73,700	123,000	203,000	111,000	380,000
Potatoes	Lbs.	10,875	18,000	156,000	18,000	130,000
Hay	Tons	468	470	670	320	780
Livestock products	Mil.					
Beef & Veal	Lbs.	240	345	530	330	375
Pork	Lbs.	52	49	65	57	85
Poultry	Lbs.	435	615	830	665	1,050
Eggs	Doz.	90	116	150	128	203
Milk	Lbs.	260	150	75	150	95

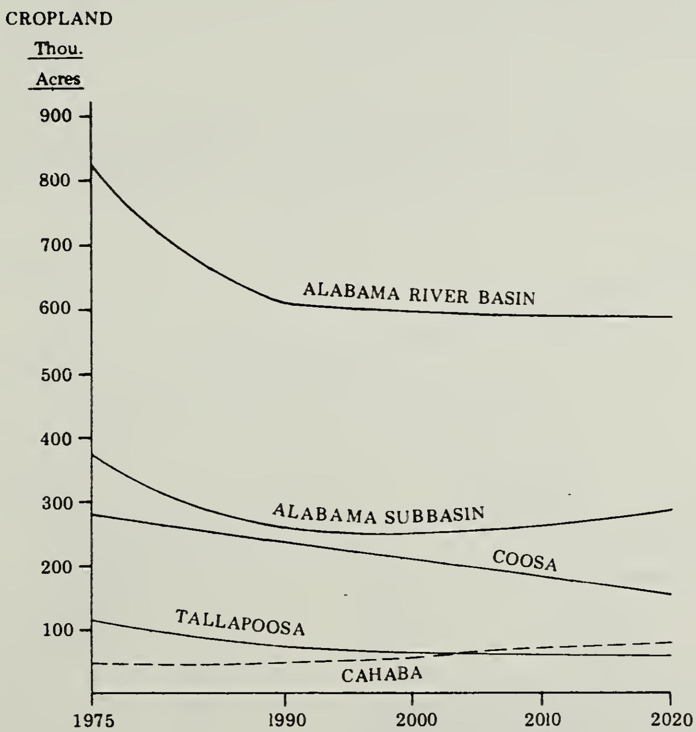


Figure 4-4 -- Cropland in Production, Current and Projected Without Accelerated Resource Development Alabama River Basin and Subbasins.

Cotton production should continue to decline. Production dropped 40 percent between 1970 and 1975 (156,000 bales to 93,000 bales) and another 40 percent cut is projected by 1990. Production of 54,000 bales - about one bale in five statewide - will be supplied from the basin, with production centered in the Coosa Subbasin.

Soybean activity should follow much the same pattern as corn, with production increasing about 50 percent during the next 15 years. Two factors contribute to this: Alabama is producing an increasing share of the U. S. soybean crop, and a larger share of the state's output will come from basin farms (26 percent by 1990 compared to 21 percent in 1975). The Alabama Subbasin will continue to account for a majority of the study area's soybean acreage.

Together, corn, cotton and soybeans will account for 70 percent of the cropland harvested in 1990, and 80 percent by 2020. The only other crops expected to be of significance are wheat and hay with 76,000 acres and 87,000 acres harvested respectively by 1990. Wheat production will be concentrated in the Coosa Subbasin, while three-fourths of all hay will come from the Alabama Subbasin.

Livestock Production--Growth of the livestock industry should continue as in the past with substantial gains in the quantity of eggs, poultry, and beef leading the way (see table 4-6). More than one-half of the basin's beef currently comes from the Alabama Subbasin and this relationship should continue throughout the projection period. Improved pasture acreage in the Alabama Subbasin is projected to go from 350,000 acres in 1975 to 525,000 acres by 1990 and 700,000 acres by 2020 (see figure 4-5). The basin should continue to produce about one-third of the state's beef and veal.

Only small gains are forecast for the dairy industry as a result of the expected decline in per capita utilization. Annual milk use per individual is expected to drop from 627 pounds to around 460 pounds by 1990.

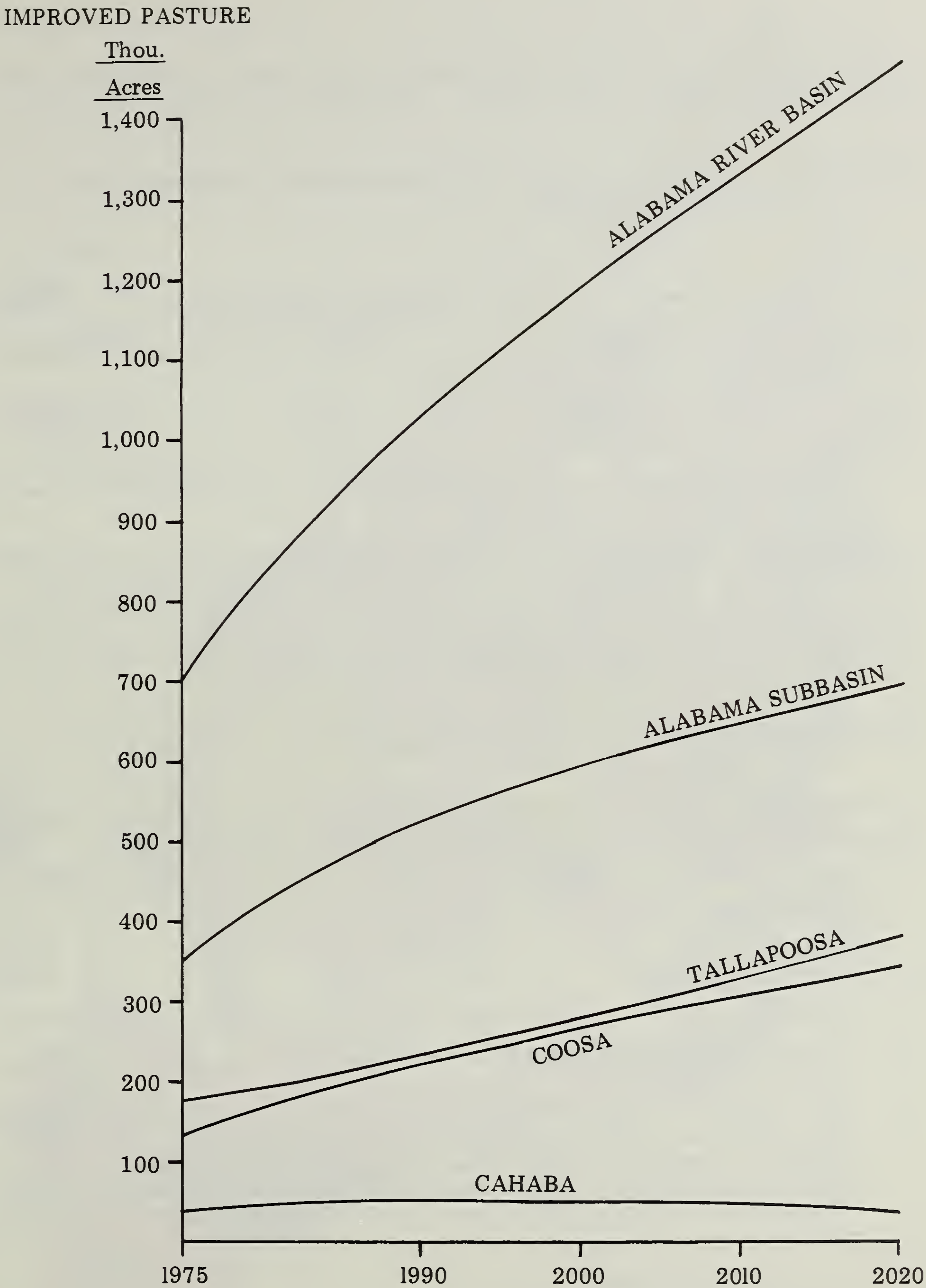


Figure 4-5 -- Improved pasture, current and projected without accelerated resource development, Alabama River Basin and Subbasins.

A portion of the basin's grazing demands can be met on favorable soil and vegetative types in the forest. Potentials are shown in table 4-7.

Table 4-7 -- Acreages by forest grazing potential, Alabama River Basin, 1970-2020.

YEAR	RATING (1,000 Acres)		
	GOOD	FAIR	TOTAL
1970	1,434.7	1,906.8	3,341.5
1990	1,377.3	1,830.5	3,207.8
2020	1,319.9	1,754.3	3,074.2

Forest grazing occurs mostly on bottom land hardwood sites in and near the Black Belt, and in the Coosa Valley. Most bottom land hardwood sites in the Black Belt which are suitable for improved pasture have already been cleared. Figure 4-6 shows areas of forest land that have the highest potential for development of forest grazing. Table 4-8 lists grazing production potential on forest lands.

Table 4-8 -- Projected forest-grazing production, Alabama River Basin, 1970-2020.

YEAR	BEEF FROM FOREST GRAZING (MIL. LBS.)	ESTIMATED NUMBER OF ANIMALS (1,000)	ESTIMATED 1/ AUM's (1,000)	ESTIMATED ACREAGE NEED (1,000)
1970 2/	59.3	194.5	1,556.0	3,112.0
1990	30.6	101.3	802.6	2,400.0
2020	25.6	83.9	671.5	2,000.0

1/ An AUM (Animal Unit Month) is described as a cow and calf grazing for one month.

2/ 1970 figured as heavy grazing, with 2000 pounds of forage per AUM. Years 1990 and 2020 are figured at moderate grazing, using 3000 pounds of forage per AUM to improve vegetation quality and lessen wildlife conflicts. Only a portion of the 3,000 pounds of forage is utilized (1,200 pounds) thus leaving a grass cover and reducing impacts.

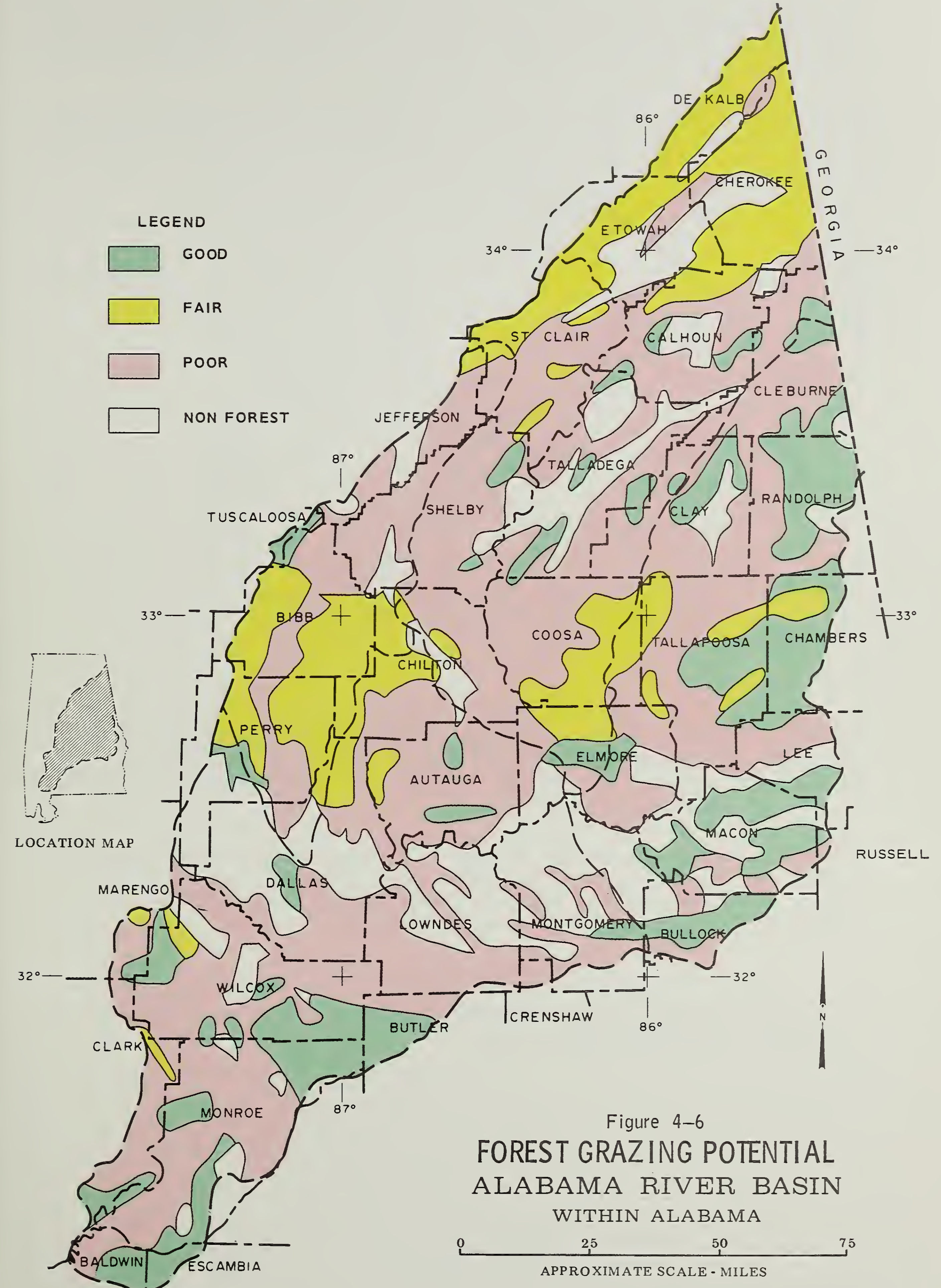


Figure 4–6

FOREST GRAZING POTENTIAL
ALABAMA RIVER BASIN
WITHIN ALABAMA

SOURCE: Data compiled by US Forest Service.

USDA-SCS-FORT WORTH, TEXAS 1976

REVISED JUNE 1976
NOVEMBER 1972

4-R-34928
BASE 4-R-32344

Timber Production--Forest roundwood* projections indicate an increase in demand from 255 million cubic feet (34 cubic feet/acre) in 1970 to 600 million cubic feet (87 cubic feet/acre) by 2020 (see figure 4-7).

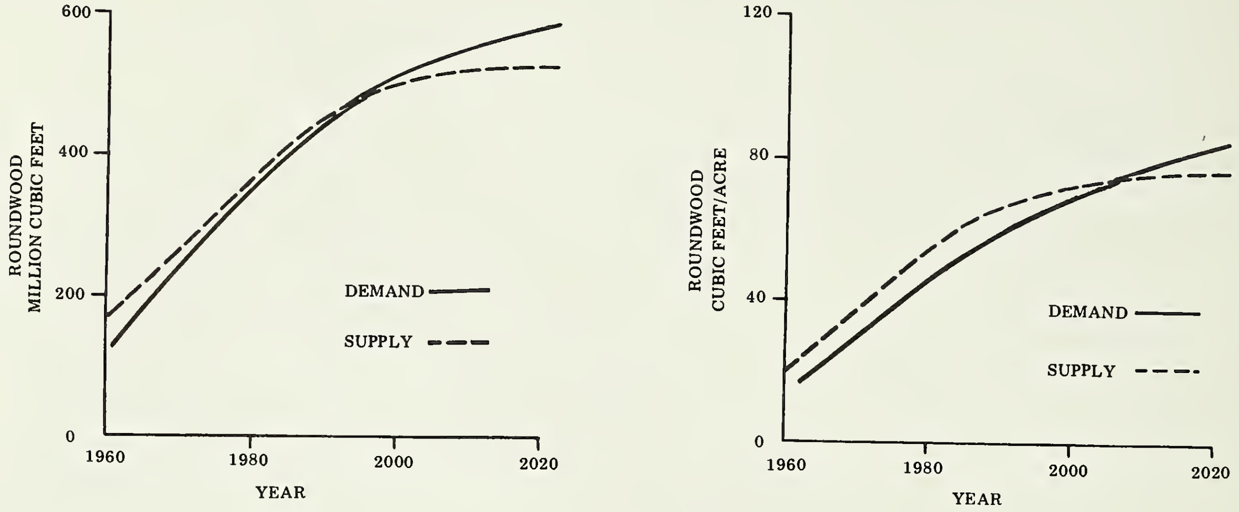


Figure 4-7 -- Roundwood supply and demand projections, Alabama River Basin, 1960-2020.

By 2020, demand will exceed supply. At the present management level, the trend indicates a demand-supply deficiency of 82 million cubic feet (12 cubic feet/acre) by 2020 (see figure 4-7). This deficit is critical to the future economy of the basin.

A balanced mixture of forest products is essential to provide needed lumber for construction, and pulp for paper products. Figure 4-8 compares sawtimber versus pulpwood needs through 2020. The greatest demand during this period will be for pulpwood.

*Roundwood includes volumes of forest products including sawtimber and pulpwood; measured in cubic feet.

The size class distribution of hardwoods within the state will be of concern in the future. Prospective cut projections indicate demand will reduce the hardwood inventory in every diameter class over 12 inches, thus developing a shortage of hardwood sawtimber by the year 2010.

Projected demands are equivalent to 87 cubic feet per acre annually, and the basin is capable of producing 88 cubic feet per acre (see table 4-9).

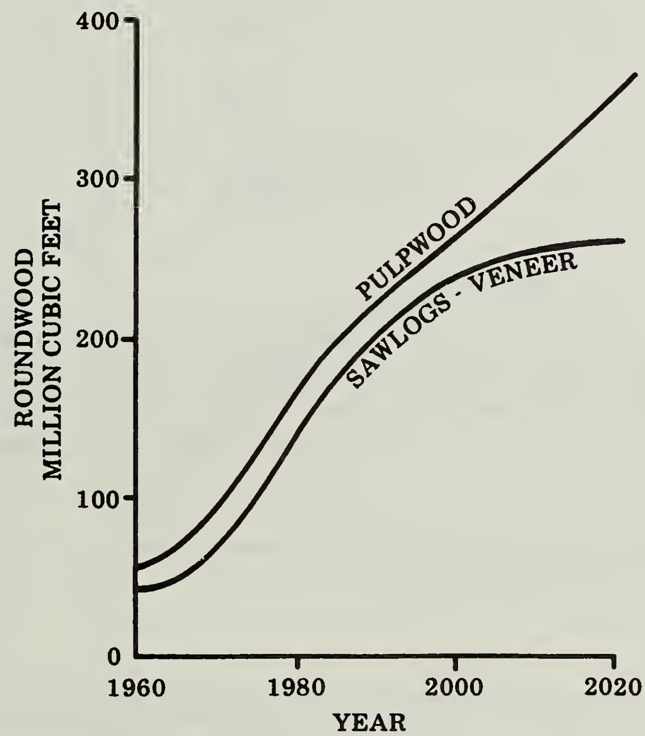


Figure 4-8 -- Roundwood demand by forest products Alabama River Basin, 1960-2020.

Table 4-9 -- Average roundwood growth potential by subbasins (cubic feet/acre), Alabama River Basin, 1972.

SUBBASIN	AVERAGE GROWTH POTENTIAL PER ACRE (Cu. Ft.)
Alabama	97.3
Cahaba	90.3
Coosa	80.8
Tallapoosa	84.6
Weighted average	88.0

Most opportunities for increased roundwood production rest with the private landowner. Individual private landowners and forest industry not only own the largest portion of forest land in the basin (95 percent), but also occupy the sites with the best growth potential (see table 4-10).

Table 4-10 -- Roundwood growth potential by ownership, Alabama River Basin, 1972.

OWNERSHIP	GROWTH POTENTIAL PER ACRE (Cu. Ft.)
Miscellaneous private	90
Farmer	90
Forest industry	89
National forest	73
Other public	78

Under present management trends, the growth is projected to increase from 56 cubic feet per acre in 1972 to 76 cubic feet per acre by 2020. This will leave a deficit of 82,000,000 cubic feet by 2020 (see figure 4-9). The maximum average growth potential for the basin is 88 cubic feet per acre annually. To meet the projected 2020 demands at 100 percent growth potential will require 6,861,400 acres, the projected forest land base. This means that to meet the 2020 demand, every acre of forest land will have to be producing to its' maximum growth potential under present levels of management; an unlikely probability.

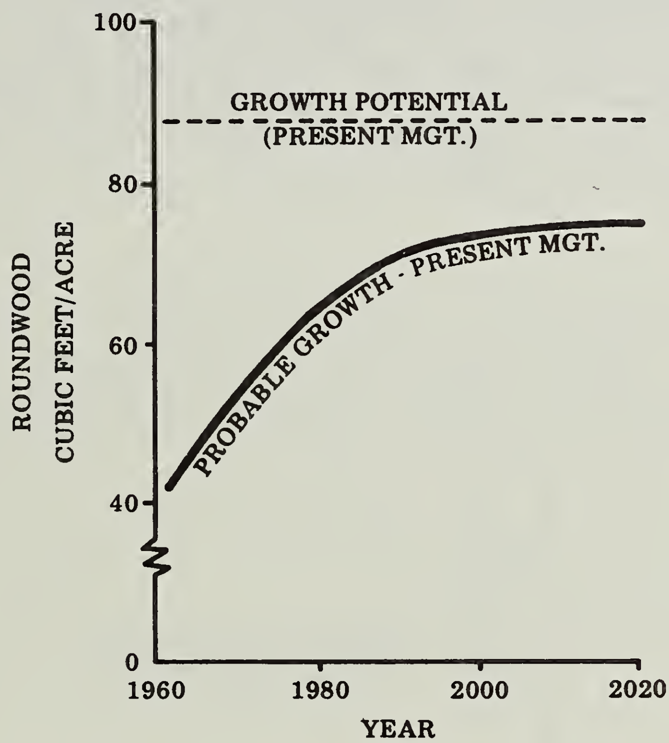


Figure 4-9 -- Projected and potential roundwood growth, and yield, Alabama River Basin, 1960-2020.

The supply of roundwood not meeting the projected demand is due primarily to the anticipated forest management. Only 8 percent of the stands have good stocking; the remaining stands are ~~not adequately~~ stocked to meet future demands (see figure 4-10). Improved forest management could provide more roundwood.

An immediate program is necessary to meet demands because the production of pulpwood and sawtimber products requires a minimum of 20 to 40 years respectively. This means that if a program is initiated in 1976, yields would not be realized until 1995 for pulpwood, and 2020 for sawtimber. Factors effecting an accelerated forest management program are quite varied, but the three most critical deterrents are capital expenditure, high risk, and lack of annual income to the landowners. In an area such as Alabama, where per capita income in many counties is less than 50 percent of the national average, adequate investment money often is not available. Many counties with per capita income less than 50 percent of the U. S. average have large acreages of low-productivity soils.

The area condition indicates an existing need for tree planting on 896,000 acres and interplanting and timber stand improvement on 6,000,000 acres on fair and poorly-stocked areas. These are mainly upland hardwood and oak-pine sites, which require more effort to increase production and provide lower rates of return for the dollar invested. Since per capita income is lower in these areas, an aggressive stimulus must be applied if the wood fiber demand is to be met.

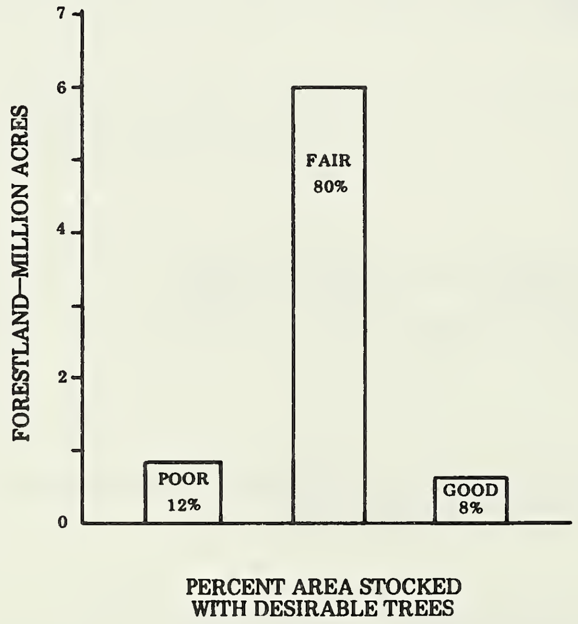


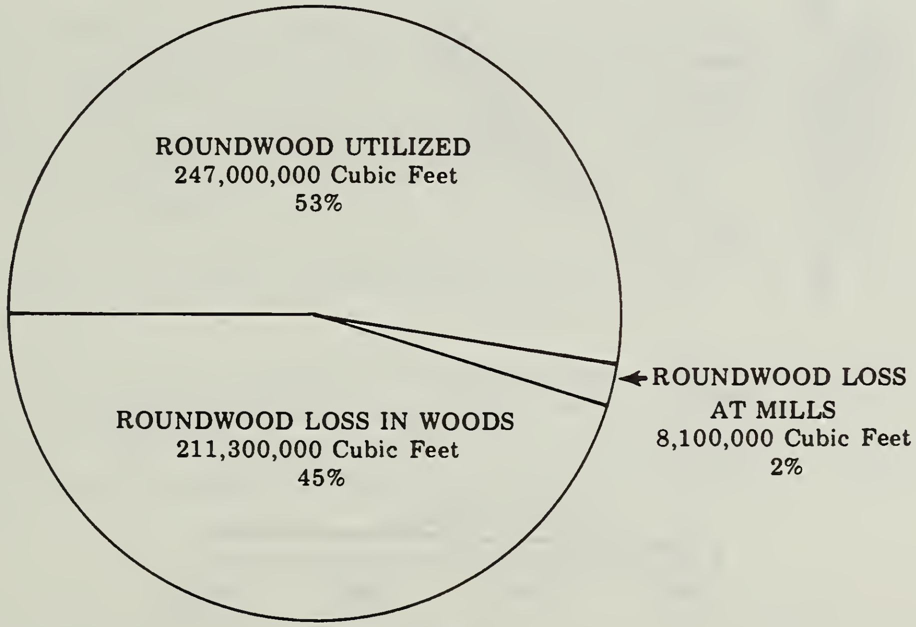
Figure 4-10 -- Forest land stocking, Alabama River Basin, 1972.

Factors such as high capital investment for reforestation, long-term investment, high risk, limited localized markets, and land and/or timber taxes have gradually caused landowners to favor land uses other than forest. Under going federal and state programs, this trend toward land uses other than forest is expected to continue. These factors relate to the demand-supply deficit in loss of forest acreage to other land uses such as urban, mineral development, cropland, or improved pasture. Need for recreation lands for camping, natural areas and modified timber harvest practices to improve the visual quality of the landscape will also hasten the deficit. Encroachment on forest land from urban areas will continue, particularly in Jefferson and Shelby counties. Most public lands such as National Forests and state-owned areas will receive increased recreation pressures.

Strippable minerals will be removed in the future thus reducing the forest base. Areas primarily affected in the basin will be in Tuscaloosa, Bibb, Shelby, and Wilcox Counties. Strip-mined areas will cause loss of forest acreage and wood volumes unless they are immediately rehabilitated.

Poor utilization is a factor contributing to the roundwood demand-supply deficit. This includes incomplete utilization of trees in the forest and at the mills.

A total of 211.3 million cubic feet, or 28.3 cubic feet per acre annually of the raw material is left in the woods after harvest. This volume is in stumps, tops, unused sections, and residual trees. Presently, a limited market exists for these products, but future demand should make it profitable to utilize these sections. Utilization losses are shown in figure 4-11.



Roundwood loss in the woods includes losses in small stems, stumps, etc. that are not included in growing stock volume estimates in Alabama Forests: Trends and Prospects.

Figure 4-11 -- Annual utilization and waste of roundwood, Alabama River Basin, 1972.

Less waste occurs once the products reach the mill. This amounts to approximately 8.1 million cubic feet, or 1.1 cubic feet per acre. About 97 percent of the coarse residues (slabs, edgings, cull pieces) are utilized versus only 70 percent of the fines (sawdust). Most of the material used is converted to chips for pulping.

Increased utilization of the wood in the forest would contribute to the supply and could meet the national demand. Proper training of woods workers and efficient use of existing equipment could increase the supply. Increased utilization is problematical requiring a high investment for research and technological development, plus heavy capital expenditure and training. Use of large machines to increase utilization is also complicated by steep terrain on the northern portion of the basin.

Utilization projections indicate that as much as 445 million cubic feet will be left in the woods and 17 million cubic feet lost at mills by 2020 (see figure 4-12).

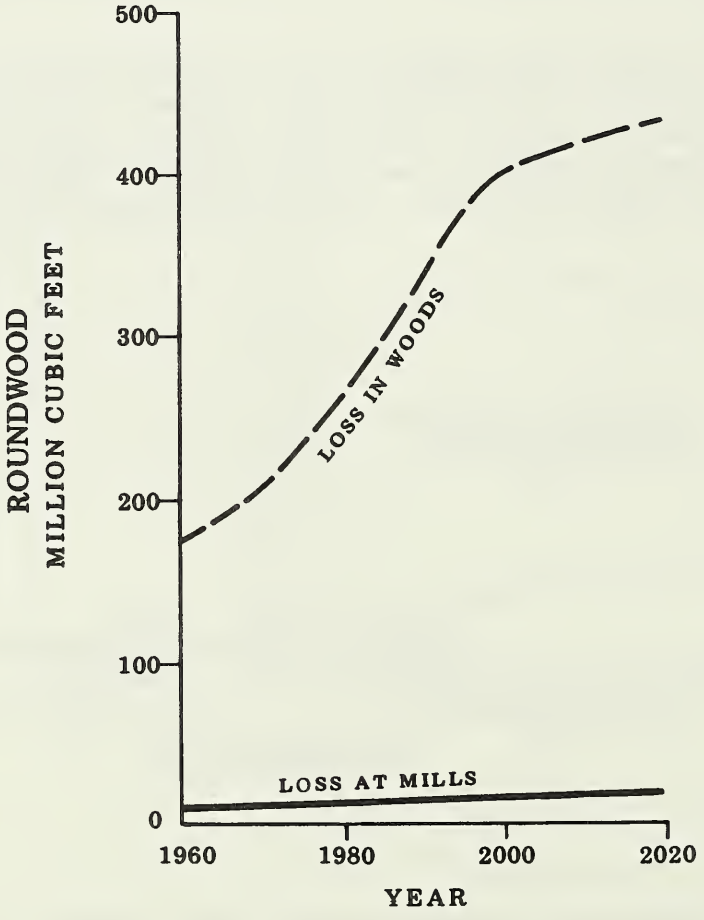


Figure 4-12 -- Projected losses of roundwood from woods and mill operations, Alabama River Basin, 1960-2020.

Factors such as fire, insects, and diseases reduce growth or cause mortality. Southern Pine Beetle damage was extensive during 1972, and 1973. Damages were common over large areas of Alabama and adjacent states; the damaged area covered the entire Alabama River Basin. This infestation decreased slightly during 1974 and 1975. Roundwood losses due to various causes are shown in table 4-11.

Table 4-11 -- Annual loss of forest volumes from insects, disease, and other causes, Alabama River Basin, 1972.

FACTORS	LOSS MILLION CUBIC FEET	CUBIC FEET PER ACRE
Fire	0.9	0.12
Insects	2.2	0.29
Disease	1.6	0.22
Other 1/	5.5	0.74
Unknown	26.2	3.50
TOTAL	35.5	4.75

1/ Other damages include crown defects such as forked trees, broken, spike, or flat top crowns.

About 63,500 acres of forest land burn annually in the basin. Figure 4-13 displays a 5-year average fire occurrence by counties. Most fires are kept under 20 acres due to the increased emphasis on detection and efficiency of fire crews and equipment. The average annual forest land burn is 0.8 percent. The state planning goal is to reduce the annual burn to 0.25 percent.

Fires within the basin destroy 900,000 cubic feet of timber growing stock per year.

Fires north of the Alabama and Mississippi Blackland Prairies are mostly in Oak-pine forest types, thus reducing the hardwood species in the stand. The fires south of this area are largely in pine types causing little damage except during high fire danger conditions.

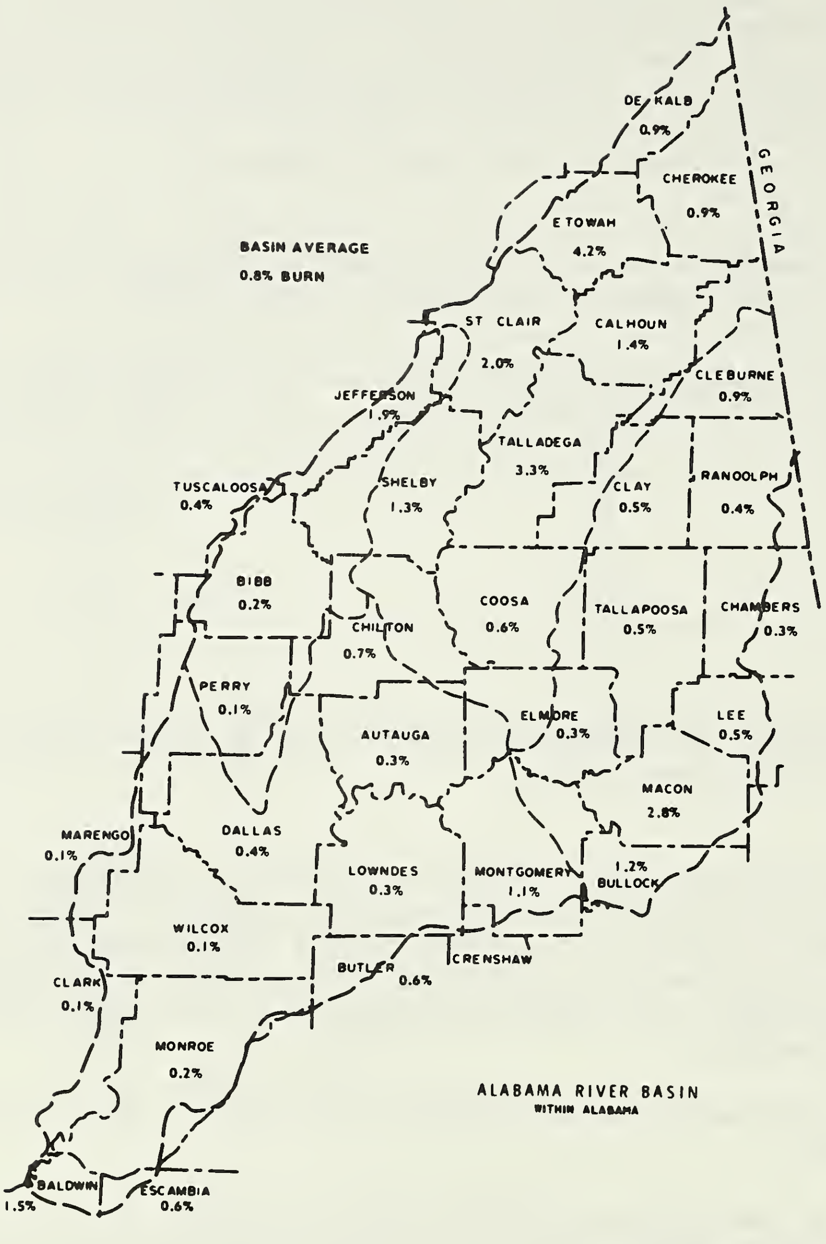


Figure 4-13 -- Fire occurrence (wild fires) showing the percent of forest land area burned annually by county, Alabama River Basin, 1967-1971.

Railroad traffic in the southern portion of the basin causes a considerable number of fires, but the main cause is still the arsonist, who willfully starts fires. Figure 4-14 lists the causes of fire within the basin.

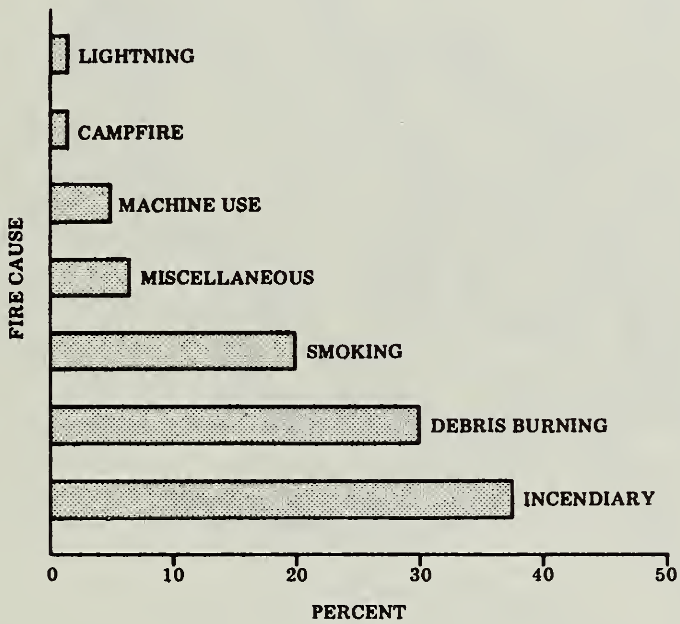


Figure 4-14 -- Causes of forest fire, by percent, Alabama, 1968-1970.

The Alabama Forestry Commission developed a fuel model map displaying hazardous fire conditions based on vegetation (see figure 4-15). This indicates the fire hazard potential by fuel conditions, and is used to locate state forestry manpower and personnel where they are most effective.

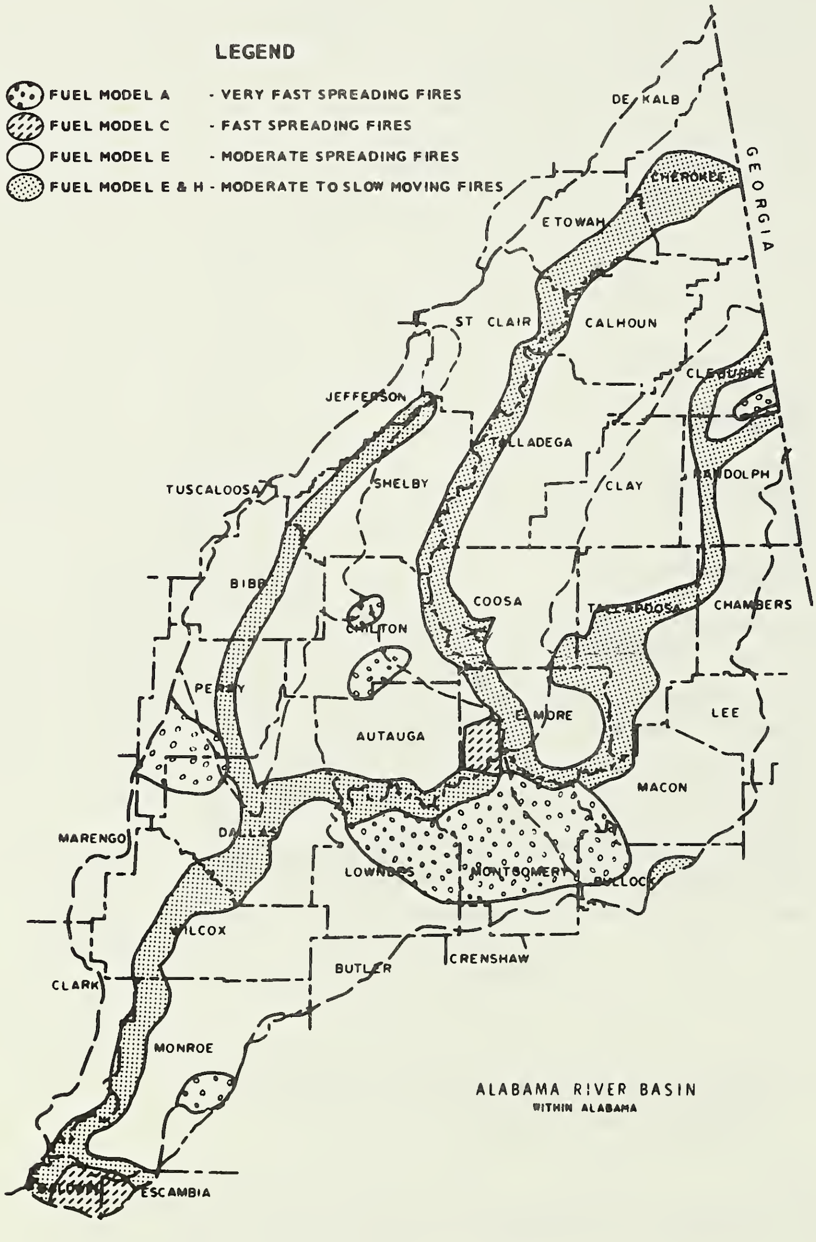


Figure 4-15 -- Fire fuel map for the Alabama River Basin, 1973.

Controlled burning is an important forest management tool. Nearly 45,000 acres are burned annually according to prescription. The control-burned acreage is projected to increase by the year 2020 in pine types. Most burns are used to reduce undergrowth for timber marking, site preparation, improved wildlife habitat, improved forage for cattle, elimination of disease in longleaf stands, or fuel reduction. Prescribed burning is conducted mainly in the Southern Coastal Plain and Southern Piedmont land resource areas.

Location of manpower and equipment needed for fire control are provided in figure 4-16. Manpower and equipment needs in figure 4-16 refer to one tractor plow unit plus one man at each designated location. There are 39 existing units and an additional need for 31 units.

SUBBASIN	PRESENT UNITS	ADDITIONAL UNITS NEEDED
Alabama	10	14
Cahaba	5	1
Coosa	15	7
Tallapoosa	9	9
TOTAL	39	31

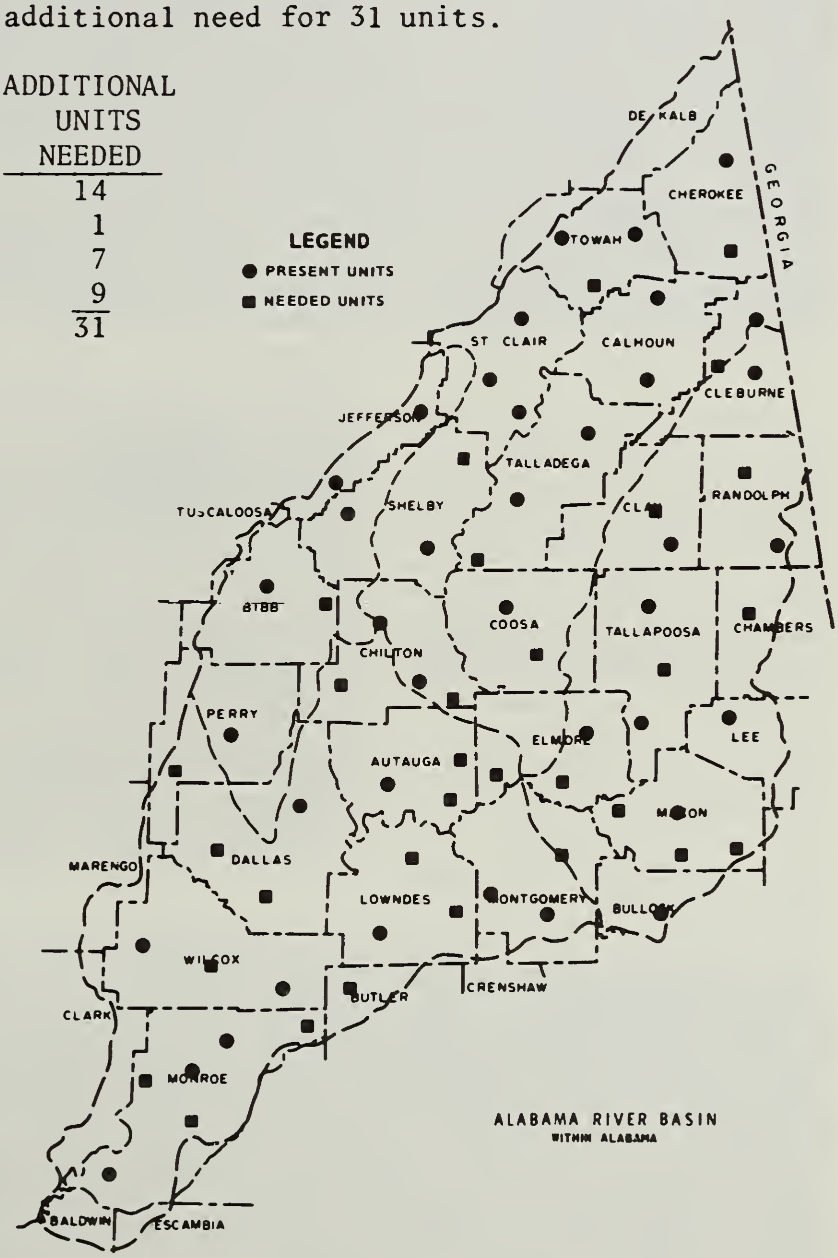


Figure 4-16 -- State manpower and equipment needs for fire control. Alabama River Basin, 1973.

PROBLEMS AND NEEDS

Flood Prevention

Information from U. S. Geological Survey and U. S. Corps of Engineers river stage records indicate that flood stages are exceeded about 1.5 times annually on major rivers in the Alabama River Basin. During the spring months, particularly in March, high winds of cyclonic origin come into the area from the west and often produce intense local storms with heavy rainfall. A pre-record flood of March-April 1886, the greatest known in the basin, resulted from a general storm which centered over the Coosa River at Centre, Alabama. This storm produced the highest known stages along most of the principal streams with the exception of the lower Alabama River. Flooding was especially severe along the Coosa and Upper Alabama Rivers. It is estimated that the peak discharge for this flood was 322,000 c.f.s. at Montgomery on the Alabama River. The flood of April 1938 resulted in equally heavy agricultural damage because it occurred during the early part of the planting season. This flood produced the highest flow ever recorded in the basin, 298,000 c.f.s. at the Coosa River station just below Jordan Dam and was also critical along the lower Alabama River where near-record stages occurred. Damaging overflows were recorded at practically all stations in the basin.

Flood problems along the middle and lower reaches of the major streams are largely caused by comparatively infrequent general rains which cover large areas for prolonged periods of time. When such flood producing storms occur, they cause considerable urban and industrial damages as well as damages to agriculture. A list of urban places or communities within the basin having flood problems is included in appendix table 25. There are about 80 communities in the basin with an urban flood problem. While the number of communities experiencing flooding can be expected to increase, many communities are presently developing flood plain management programs. This effort is expected to accelerate. The rate of development within urban flood plains is therefore expected to decrease; however, urban development in the future is expected to increase the number of communities experiencing flooding to 90 in 1990 and 110 in 2020. These estimates are based on the HUD-FIA Type 21 Flood Insurance Study, July 1973 and similar data from other sources.

Flood plain acreage, land use along the major rivers of the basin is shown in table 4-12, (see appendix 25B for details). The total acres subject to flooding along these major rivers is estimated to be 398,200 acres. This area of flood plain is included in the flood plain of watersheds shown in Tables 4-14 and 4-15. Average annual damage to agricultural crops, urban properties, and roads, and railroads is included in table 4-13 (appendix table 25C). The total damage along the major rivers is estimated to be $1,316,000 annually.

Flooding in the Alabama River Basin damages . . .

roads and bridges,

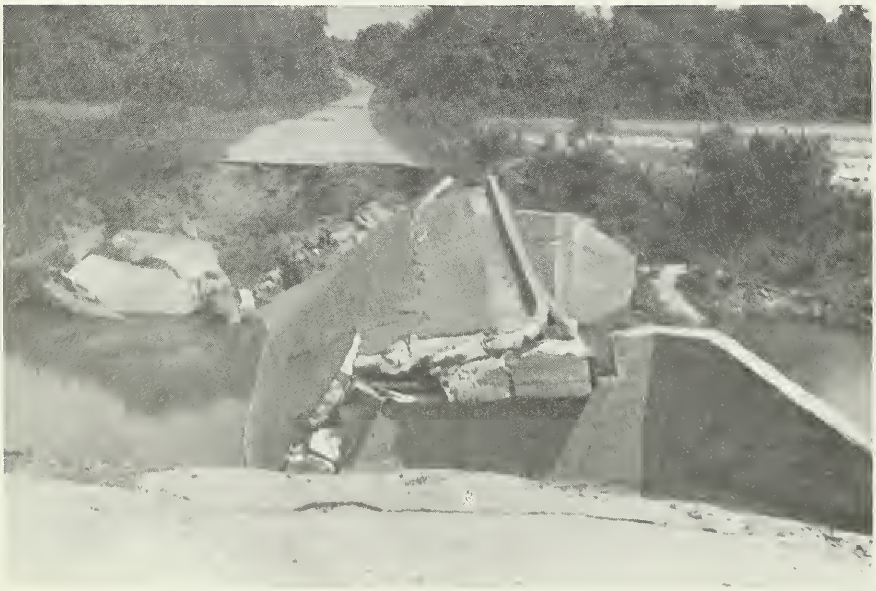
pastures and forests,

and crops.

Flooding results in . . .

damage to
fixed improvements,

hazard to life
and property,



and disruption
of commerce.

Violent local storms, of both frontal and convective types, in the tributary areas create flash floods, the force of which is dissipated before the flood flows progress very far downstream. However, those floods often cause severe land damages to streambanks and channels and to adjoining bottom lands. Also, prolonged periods of rainfall in the Piedmont Plateau area cause overflow of longer duration on tributary streams. These tributary flows are often absorbed by the impoundments on the main streams without appreciable rises in stage.

On the tributaries, an average of about three to four floods occur annually. Damages due to inundation occur on all the Southern Appalachian and Piedmont tributaries and on many Coastal Plain tributaries. Flood damages which may be alleviated by land treatment, structural measures and nonstructural measures are predominantly on those tributary streams located in the upper reaches of the Cahaba and Tallapoosa subbasins.

Flood plain land use and flood damage estimates for the small watersheds (250,000 acres or less) in each subbasin have been summarized in tables 4-14 and 4-15. Without project action, land use is expected to remain mostly unchanged. The dollar value of flood damages would normally increase consistent with the rate of inflation. For information concerning individual watersheds (CNI), see appendix table 25D. The primary purpose for including this information is to indicate the general magnitude of the flood problem. The total area subject to flooding in the basin is estimated to be 861,000 acres. Flood damage on this area currently amounts to about $3,836,000 annually (see tables 4-14 and 4-15). There are some small watersheds within the basin that have flood prevention and water resource plans already developed. The area that can be protected by these projects amounts to about 129,900 acres. Additional information concerning these water resource developments is shown in table 4-15 and figure 4-17.

Table 4-12 -- Flood plain areas along principal streams, Alabama River Basin, 1972. 1/

STREAM	STREAM MILE 2/ FROM	TO	FLOOD PLAIN AREA IN ACRES CLEARED	RURAL WOODS	TOTAL	URBAN	TOTAL 3/
Coosa River Subbasin	569.6	314.4	27,000	25,500	52,500	3,100	55,600
Alabama River Subbasin	314.4	0.0	94,700	130,800	225,500	7,700	233,200
Tallapoosa River Subbasin	137.7	0.0	30,000	26,000	56,000	---	56,000
Cahaba River Subbasin	88.8	8.2	27,800	25,600	53,400	---	53,400
TOTAL FOR BASIN			179,500	207,900	387,400	10,800	398,200

1/ Adapted from Corps of Engineers Data, Mobile District; area based on approximately the 100-year storm.

2/ Miles shown are from the mouth of each respective river except that miles for Coosa River are from mouth of Alabama River.

3/ This flood plain is included in small watersheds shown in Tables 4-14 and 4-15.

Table 4-13 -- Estimated average annual damage along the principal streams, Alabama River Basin, 1972. 1/

STREAM	STREAM MILE 2/ FROM	TO	AGRICULTURAL DAMAGE CROPS	OTHER THAN CROPS	SUBTOTAL	ROADS AND RAILROADS	URBAN	TOTAL
			---Dollar---					
Coosa River	569.6	314.4	95,000	104,000	199,000	26,000	48,000	273,000
Alabama River	314.4	0.0	270,300	65,700	336,000	20,000	379,000	735,000
Tallapoosa River	137.7	0.0	143,800	39,200	183,000	8,000	-	191,000
Cahaba River	88.8	8.2	67,000	37,000	104,000	13,000	-	117,000
TOTAL BASIN			576,100	245,900	822,000	67,000	427,000	1,316,000

1/ Adapted from Corps of Engineers Data, Mobile District.

2/ Miles shown are from the mouth of each river; Coosa River mileage is from mouth of Alabama River.

Table 4-14 -- Estimated flood plain land use and flood damage within small watersheds by subbasins, Alabama River Basin, 1972.

SUBBASIN	FLOOD PLAIN LAND USE DISTRIBUTION: FLOOD PLAIN 1/	CROPLAND	PASTURE	FOREST	MISC.	AVERAGE ANNUAL FLOOD DAMAGE: CROP AND PASTURE	OTHER AND INDIRECT	TOTAL
	Acres					Dollar		
Coosa River Subbasin	132,600	7,100	26,300	95,400	3,800	268,200	100,500	368,700
Alabama River Subbasin	331,300	21,000	67,300	237,100	5,900	706,000	264,400	970,400
Tallapoosa River Subbasin	149,300	14,400	31,900	100,400	2,600	370,500	139,000	509,500
Cahaba River Subbasin	118,300	4,500	11,900	100,300	1,600	131,700	49,300	181,000
TOTAL BASIN	731,500	47,000	137,400	533,200	13,900	1,476,400	533,200	2,029,600

1/ In some watersheds, the flood plain of major rivers (joint flood plain) is included with the flood plain of small streams.

Table 4-15 -- Estimated flood plain land use and flood damage within P. L. 566 Watersheds and RC&D Project Measures, by subbasins, Alabama River Basin, 1972.

SUBBASIN	FLOOD PLAIN LAND USE DISTRIBUTION					AVERAGE ANNUAL FLOOD DAMAGE		
	FLOOD PLAIN 1/	CROPLAND	PASTURE	FOREST	MISC.	CROP AND PASTURE	OTHER AND INDIRECT	TOTAL
	Acres					Dollar		
Coosa River Subbasin	55,600	14,200	24,200	16,000	1,200	510,000	350,500	860,500
Alabama River Subbasin	44,000	3,700	15,700	24,100	500	409,000	165,300	574,300
Tallapoosa River Subbasin	30,300	4,200	13,900	11,700	500	255,200	116,400	371,600
Cahaba River Subbasin	No Flood Control Plans --			--	--	--	--	--
TOTAL BASIN	129,900	22,100	53,800	51,800	2,200	1,174,200	632,200	1,806,400

Note: Flood protection has been or is expected to be provided for only 86,000 acres out of the total 129,000 acres. The remaining watersheds are in various stages of planning and development.

1/ In some watersheds, the flood plain of major rivers (joint flood plain) is included with the flood plain of small streams.

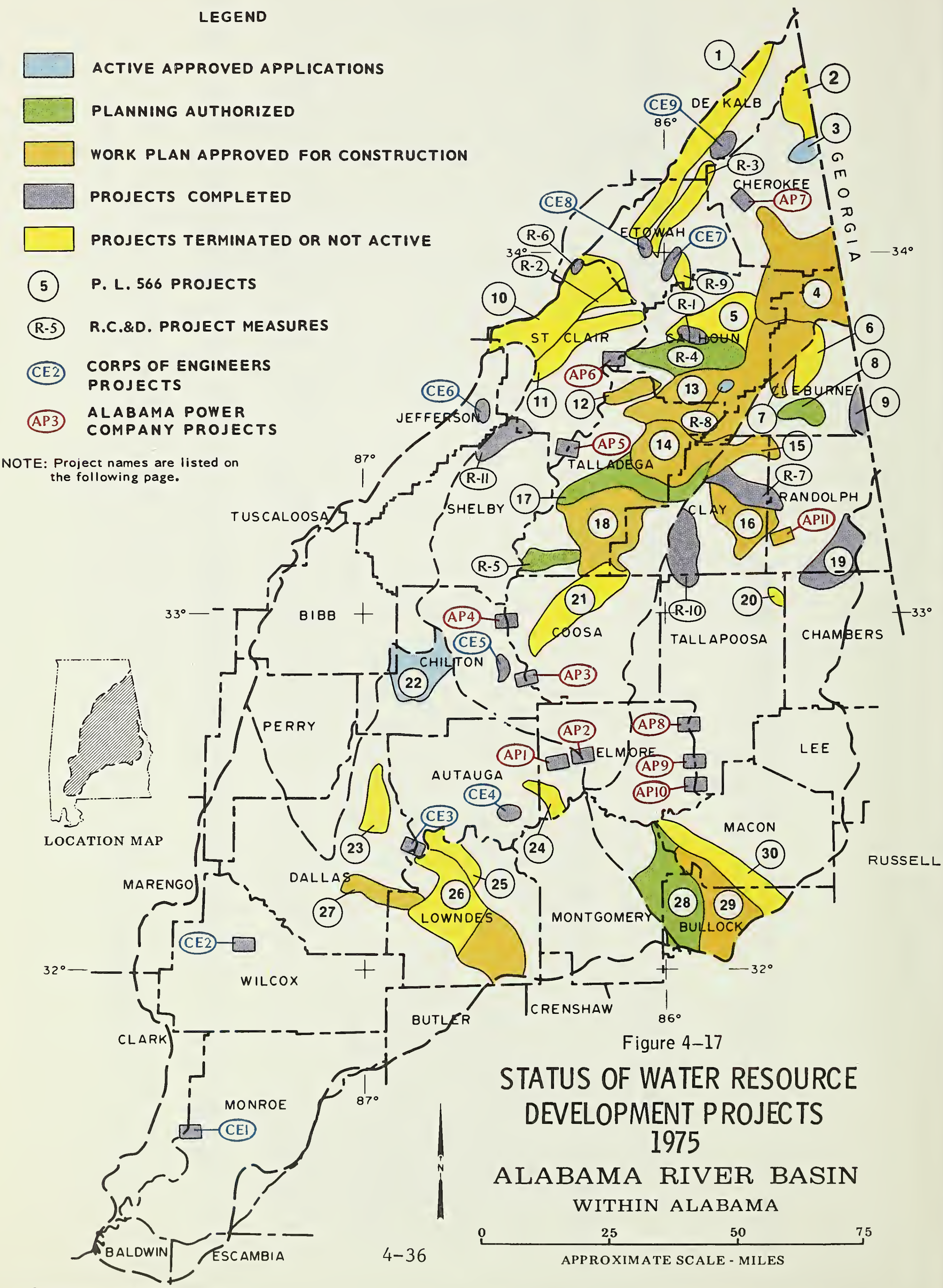


Figure 4–17

STATUS OF WATER RESOURCE DEVELOPMENT PROJECTS 1975

ALABAMA RIVER BASIN

WITHIN ALABAMA

SOURCE: Data Compiled by SCS River Basin Study Staff.

REVISED JUNE 1976
NOVEMBER 1972

4-R-32507
BASE 4-R-32344

USDA-SCS-FORT WORTH TEXAS 1976

List of water resource development projects shown in figure 4-17

COOSA VALLEY RC&D PROJECTS

R-1 - Alexandria
R-2 - Ashville
R-3 - Black Creek
R-4 - Cane Creek
R-5 - Cedar Creek
R-6 - Chandler Mountain Lake
R-7 - Fox Creek
R-8 - Friendship Community Drainage
R-9 - Glencoe Creek
R-10 - Little Hillabee Creek
R-11 - Shoals Creek

P. L. 566 PROJECTS

1 - Big Wills Creek
2 - Mills Creek
3 - Chatooga River
4 - Terrapin Creek
5 - Tallahatchee Creek
6 - Cane Creek Creek
7 - Cahulga Creek
8 - Dynne Creek
9 - Lost Creek
10 - Canoe Creek
11 - Beaver-Shoals Creek
12 - Blue Eye Creek
13 - Choccolocco Creek
14 - Cheaha Creek
15 - Ketchepedrakee Creek
16 - Crooked Creek
17 - Talladega Creek
18 - Tallaseehatchie Creek
19 - High Pine Creek
20 - Mill Creek
21 - Weogufka Creek
22 - Mulberry Creek
23 - Blue Girth-Beech Creek
24 - Mill Creek
25 - Lowndes-Cypress Creek
26 - Big Swamp Creek
27 - Mush Creek
28 - Line Creek
29 - Old Town Creek
30 - Cubahatchee Creek

CORPS OF ENGINEERS PROJECTS

1 - Claiborne Lock & Dam
2 - Miller Ferry Lock & Dam
3 - Jones Bluff Lock & Dam
4 - Prattville Levee & Clearing & Snagging
5 - Clanton Clearing & Snagging
6 - Trussville Clearing & Snagging
7 - Glencoe Clearing & Snagging
8 - Black Creek Clearing & Snagging
9 - Collinsville Levee & Clearing & Snagging

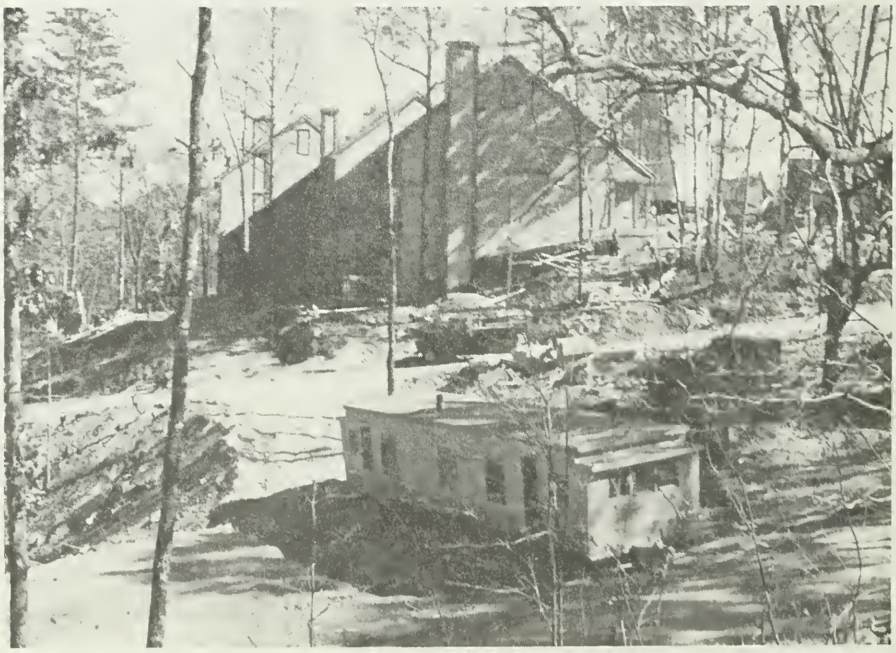
ALABAMA POWER COMPANY PROJECTS

1 - Bouldin Dam
2 - Jordan Lake
3 - Mitchell Lake
4 - Lay Lake
5 - Logan-Martin Lake
6 - H. Neely Henry Lake
7 - Weiss Lake
8 - Martin Lake
9 - Yates Dam
10 - Thurlow Dam
11 - Crooked Creek Dam (R. L. Harris Reservoir)

Sheet and gully erosion damages the land and causes-

damaging sedimentation on lands and in the waters of the Basin.

Erosion is a problem on construction sites,



public lands,

unprotected
rights-of-way,

and strip mines.

Erosion and Sedimentation

Table 4-16 summarizes acreage needing erosion reduction. The inventory of present needs on agricultural land was taken from the Alabama Conservation Needs Inventory, 1970 (CNI).

Future erosion reduction needs were projected based on capability class (erodibility) of the land, projected land use, and projected rate of application of erosion reduction measures. The future erosion reduction acreage needs are the needs which will not be met through ongoing programs.

Table 4-16 -- Land needing erosion reduction measures, Alabama River Basin, 1970 through 2020.

LAND USE	ALABAMA RIVER BASIN 1970	1990	2020
	----------Thousand Acres--------------		
Harvested Cropland and Conservation Acres	483	396	392
Other Cropland	527	481	506
Improved Pasture	430	735	1,056
Unimproved Pasture	732	441	119
Forest	60	74	114
Total	2,232	2,127	2,187

Erosion computations indicate that 65.1 million tons of soil are eroded annually from Alabama River Basin lands (Table 4-17). Serious erosion is occurring on 1.9 million acres or 17 percent of the basin including about 151,000 acres of gullies, roadsides and other critically eroding areas. The remaining land is eroding, but at rates which are tolerable in the sense that excessive sediment is not produced and the long-term productive capacity of the land remains high. Table 4-17 and figure 4-18 show erosion distribution by land uses.

An apparent contradiction exists between the projection of cropland needing erosion protection, which decreases as ongoing programs continue to operate, and gross erosion on cropland which is projected to increase. It should be noted that the major increase in erosion is on "Other Cropland", which consists of marginal land mostly too steep to efficiently crop. This abused land is not only the most erosive but is the most difficult to reach with voluntary treatment programs since the areas are generally small acreages not returning enough to the landowner to encourage investment in soil conservation practices.

Table 4-17 -- Average annual gross erosion, Alabama River Basin, 1970-2020.

LAND USE	1970	PROJECTED 1990	2020
	----------------Thousands of Tons	----------------	
Sheet & Rill Erosion			
Cropland			
Harvested cropland	6,204	4,666	4,433
Other cropland	8,308	7,125	10,660
Pastureland			
Improved pasture	1,805	2,870	5,008
Unimproved pasture	3,264	2,818	928
Forest			
Slight to undisturbed	6,583	5,798	4,103
Disturbed	20,546	26,400	32,952
Urban & Other land	3,615	3,850	4,622
Critical Erosion 1/	14,847	14,937	15,337
TOTAL	65,172	68,484	78,043

1/ Critical erosion includes badly eroding roadsides, streambanks, mined land and gullies.

Average annual erosion rates by major land uses are shown in table 4-18.

Table 4-18 -- Erosion rates by land use, Alabama River Basin. 1970-2020.

LAND USE	1970	PROJECTED 1990	2020
	------------Tons per acre per year	--------------------	
Cropland			
Harvested Cropland	9.5	7.6	7.5
Other Cropland	13.4	11.4	16.4
Pastureland			
Improved Pasture	3.4	2.8	3.4
Unimproved Pasture	4.1	5.2	5.8
Forest			
Slight to undisturbed	0.9	0.9	0.7
Disturbed	33.6	33.0	33.0
Urban & Other Land	5.3	5.0	4.8

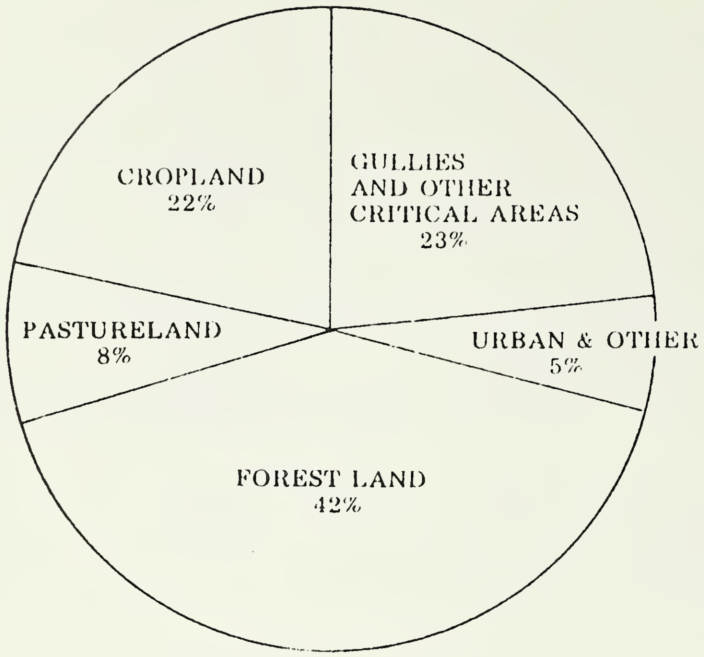


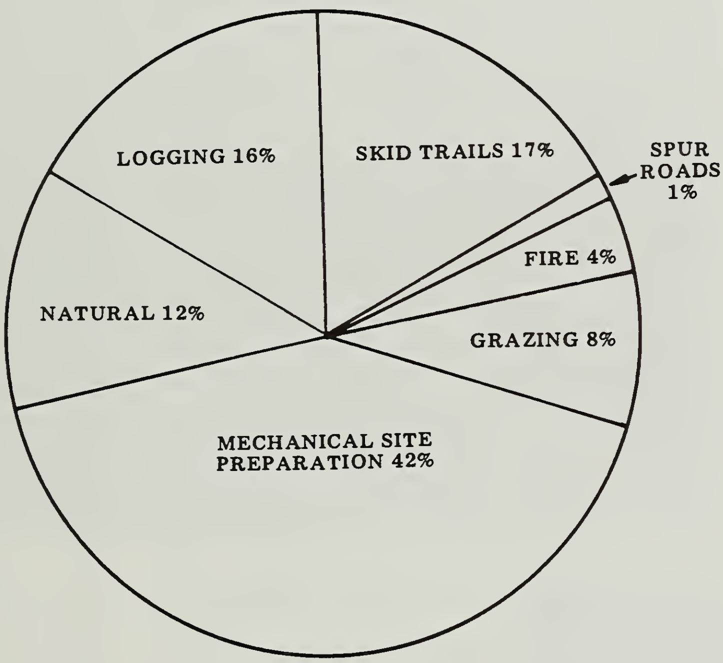
Figure 4-18 -- Distribution of annual erosion by major land use categories, Alabama River Basin, 1970.

Forest land, covering 68 percent of the basin, is experiencing 27.1 million tons of on-site erosion per year, or 42 percent of the total on-site erosion. The causes of on-site erosion by forest disturbances are listed in figure 4-19, see appendix table 26B for details.

The erosion rate for "disturbed" forest is higher than other land uses because the data includes four disturbances with high erosion rates. Two of these disturbances, skidding trails and mechanical preparation, occur on only three percent of the forest acreage yet are the source of 60 percent of the gross erosion. "Disturbed" forest is eroding at rates that are critical and are treated similarly (see table 5-1).

Major erosion problems result from improperly applied forest practices, leaving limited ground cover on steep slopes with little or no vegetative filter strips to absorb the soil movement.

CAUSE OF EROSION BY DISTURBANCES	THOUSAND ACRES	EROSION RATE TONS/ACRE/YEAR	EROSION TONS/YEAR
Natural	7,471.6	0.5	3,428,000
Logging 1/	358.6	12.0	4,325,000
Skid trails	109.9	41.0	4,524,000
Spur roads	25.4	13.5	343,000
Fire	186.8	5.5	1,041,000
Grazing	254.0	8.0	2,102,000
Mechanical site preparation 2/	117.6	96.5	11,366,000
TOTAL	7,471.6	-	27,129,000



TOTAL FOREST LAND EROSION
27,129,000 Tons/Yr.
or 3.63 Tons/Ac./Yr.

1/ Includes general logging on clearcut areas with no mechanical site preparation.

2/ Mechanical site preparation on private lands, mainly on straight-bladed, disced and KG-bladed areas.

Figure 4-19 -- On-site erosion by disturbances on forest land, Alabama River Basin, 1970.

Exploitation may result in scenes such as . . .

forest land after abusive logging operations,

or excessive site preparation for tree planting.

Poor land and water management may result in streambank erosion.

Figure 4-20 displays the degree of erosion hazard on basin lands. These ratings are based on natural erodibility and slope. Land use practices which expose the soil on severe and moderately hazardous sites should include conservation treatment measures to lessen or prevent erosion and sediment damage.

Critical area erosion is defined as erosion that is damaging to offsite or downstream areas. These are usually bare areas that not only produce extremely large amounts of sediment but large quantities of runoff as well. Table 4-19 shows the projected extent of critical areas. These critical areas are eroding at estimated average rates of about 100 tons per acre per year; a total of 14.8 million tons of soil loss annually.

Table 4-19 -- Critically eroding areas, Alabama River Basin, 1970-2020.

	ALABAMA RIVER BASIN		
CATEGORY	1970	1990	2020
	Acres		
Gullies and associated areas	115,000	113,000	117,000
Roadsides	2,800	2,300	2,300
Streambanks	21,000 1/	21,000	21,000
Mined Land	12,700	15,300	15,300
TOTAL	151,500	151,600	155,600

1/ 1,763 miles of eroding streambanks, National Assessment of Streambank Erosion, 1970.

Roadside erosion and other critical erosion areas assume an importance out of proportion to their land area because of their degradation of the aesthetic quality of the landscape, the destruction of costly road structures and their sediment production potential. Mileage of roads in the basin and acreage of eroded roadsides is shown in table 4-20.

There are about 2,800 acres of eroding roadsides in the basin that produce an estimated 552,000 tons of eroded material per year. These roadsides are eroding at an average annual rate of about 200 tons per acre per year. Unlike most other forms of erosion, almost all of this eroded material becomes damaging sediment. About 80 percent of the material eroded from roadsides enters a stream whereas only 50 percent or less of the material eroded from fields, and 23 percent from forests enter streams and becomes damaging sediment.

Acreage of eroding roadside is projected to decrease in the future. Highway departments now routinely require vegetative treatment on all new road construction and RC&D project measures are expected to rehabilitate 500 acres of existing roadside by 1990.

Table 4-20--Roadside erosion, total mileage of roads by categories and acreage of eroded roadbanks, Alabama River Basin, 1973.

SUBBASIN	ALL ROADS		UNPAVED		COUNTY PAVED		STATE HIGHWAYS		FEDERAL & INTERSTATE	
	MILES OF ROADS	ACRES OF ERODED BANKS	MILES OF ROADS	ACRES OF ERODED BANKS	MILES OF ROADS	ACRES OF ERODED BANKS	MILES OF ROADS	ACRES OF ERODED BANKS	MILES OF ROADS	ACRES OF ERODED BANKS
Alabama	5,213	695	3,001	431	1,289	225	586	28	337	11
Cahaba	1,570	241	991	189	397	43	125	5	57	4
Coosa	6,125	1,047	3,241	500	2,114	492	389	28	381	27
Tallapoosa	4,490	778	3,325	604	668	98	309	16	188	60
TOTAL BASIN	17,398	2,761	10,558	1,724	4,468	858	1,409	77	963	102

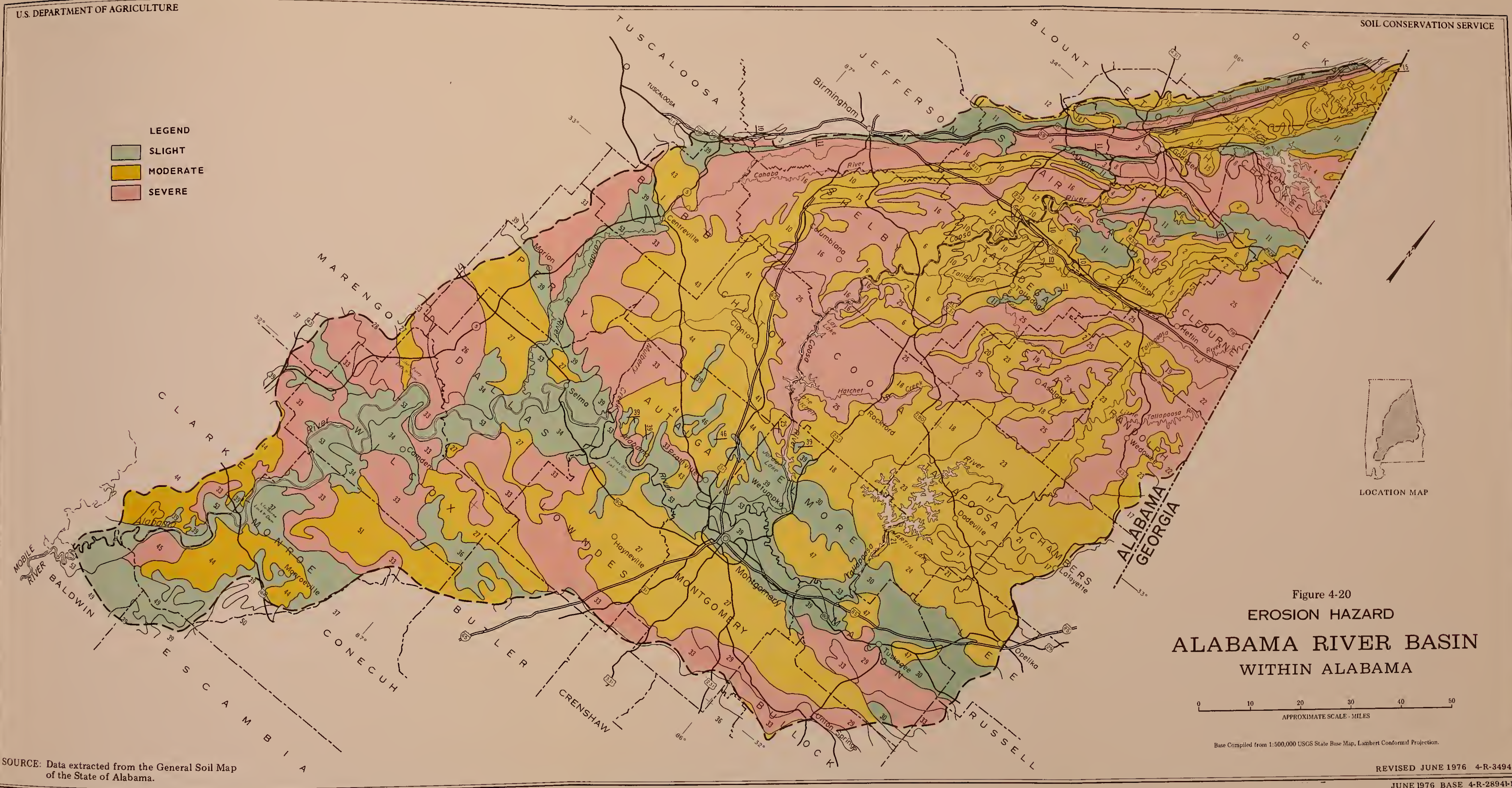


Figure 4-20
EROSION HAZARD
ALABAMA RIVER BASIN
WITHIN ALABAMA

Streambank erosion destroys land and clogs waterways with sediment and though the number of acres involved is small the damage to aesthetics and environmental quality is great. The Alabama River Basin has an estimated 1,763 miles of streambanks along small streams damaged by erosion with estimated annual damages of $121,000, according to the National Assessment of Streambank Erosion made in 1970. Streambank erosion is expected to continue to damage about the same mileage annually in the future.

Erosion resulting from urban construction is a problem in developing areas of the basin such as in Shelby County and other areas. Erodibility of soils under poor construction practices varies from about 3 tons per acre per year on 1 percent slopes to as much as 3,000 tons per acre per year on 65 percent slopes. Urban developers often seek to use the steepest land for housing because of its scenic value. This is, overall, wise land use; preserving the better land for agriculture or other uses. However, careless or callous construction practices can, in a short time, create permanent problems downstream with clogged waterways and filled reservoirs and ponds. Construction erosion, included as a part of "urban and other" land erosion (Table 4-17 and 4-18), is projected to decrease due to new programs and practices. At the same time, "urban and other land" erosion will increase in the future as fairly large acreages are shifted from some other land use.

Strip mining and poor reclamation practices have left 12,700 acres of basin land in an eroding, bare condition. This land is eroding at estimated average rates of 150 tons per acre per year. Surface mining is annually active upon about 1,400 acres per year in the basin, but the rate could accelerate rapidly because of the energy shortage. Most of the land mined each year is reclaimed after a year or two but some is illegally abandoned and becomes "orphaned" with no one willing to accept responsibility for reclamation (for details see appendix Table 29). Acreage of mined land needing erosion control in the future was based on an estimated 20 percent increase in surface mining activity by 1990 with annual reclamation approximately equal to annual mining disturbance (Table 4-21).

"Orphan" mined land, which includes abandoned mines and some unreclaimable area (quarries, etc.), is projected to increase slightly in the future since there is presently no effective program for these lands (see Table 4-21). Mined lands are often serious erosion problems since they are usually steep, rough, and chemically or biologically inhospitable to plant growth.

Table 4-21 -- Surface-mined land needing erosion reduction, Alabama River Basin, 1974-2020.

CATEGORY	ALABAMA RIVER BASIN 1974	1990	2020
	----------Thousands of Acres----------		
Area needing reclamation			
"Orphan"	12	14	15
Active	1	2	2
Area reclaimed	40	60	108
TOTAL	53	76	125

Sediment is the product of erosion and is directly proportional to the amount of erosion in a watershed. Total sediment load is reduced by reduction in erosion; and also, stream sediment load may be reduced by trapping sediment with vegetative strips or with reservoirs.

Most of the sediment load of streams is caused by sheet and rill erosion on upland areas; however, only 50 percent or less of the eroded material usually reaches a stream system. Sediment transit losses are continuous and the larger a drainage area is, the lower the ratio of sediment yield to erosion. Topography, shape of the watershed and many other factors affect the percentage of eroded material that is carried as sediment load by a stream. Sediment production in the basin (see table 4-22) is the amount of sediment after transit losses in tributaries of the basin. Sediment is trapped in the slackwater portion of each reservoir on a stream.

Table 4-22 -- Annual sediment production, Alabama River Basin, 1970-2020

SOURCE OF SEDIMENT	1970	PROJECTED 1990	2020
	----------Thousands of Tons----------		
General erosion 1/	12,734	13,384	14,782
Critically eroding areas	8,714	8,631	8,871
TOTAL	21,448	22,015	23,653

1/ Includes "disturbed" forest lands which are eroding at "critical" rates.

Most sediment in streams is carried by runoff from a few large storms. In some streams nearly 100 percent of the total sediment yield may be carried by storm runoff and almost none moved by low flows. The proportion of sediment carried by storms and low flows varies according to the kind of erosion in the watershed, cover conditions, pattern of water flow, degree of bank caving, and other factors. Sediment concentration in a stream varies even more than water flow in the same stream since sediment transport peaks during a storm and declines to a nominal amount during low flow.

Heavy flushes of sediment in a stream are harmful to downstream reservoirs and spawning areas; however, the short periods of muddy flow are somewhat mitigated by long periods of clear, low flow. In contrast, a stream receiving sediment pollution from gravel washing or dredging may stay "muddy" through low flows as well as storms. This chronic sedimentation, by sheer preponderance of time, may be quite harmful to water quality, fisheries, and aesthetics and may be as objectionable as the heavy sediment load carried by storm runoff.

Suspended sediment is a critical measurement of water quality and is expressed in parts per million (ppm) or milligrams per liter (mg/l). Water quality records in the basin are inadequate for estimating sediment concentrations; therefore, sediment concentrations were extrapolated from erosion data by using a delivery ratio, or percentage of erosion. Suspended sediment concentration of waters in the Alabama River Basin averages 290 ppm (average annual concentration). Figure 4-21 shows the estimated distribution by source of suspended sediment in the basin.

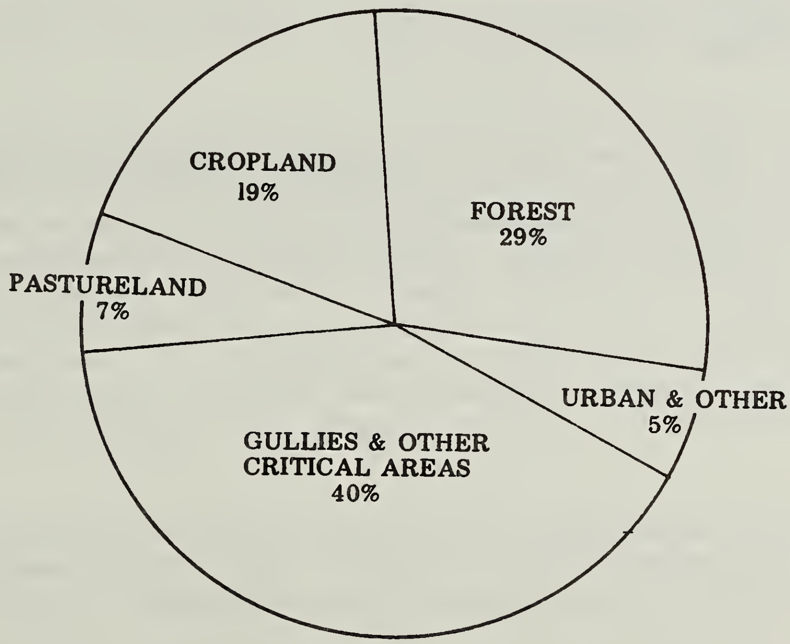


Figure 4-21 -- Average annual sediment contribution distributed by land use (erosion source), Alabama River Basin, 1970.

The suspended sediment concentration from forest land totals 84 ppm or 29 percent of the total suspended sediment production in the basin. The sediment is attributed to the disturbances shown in figure 4-22.

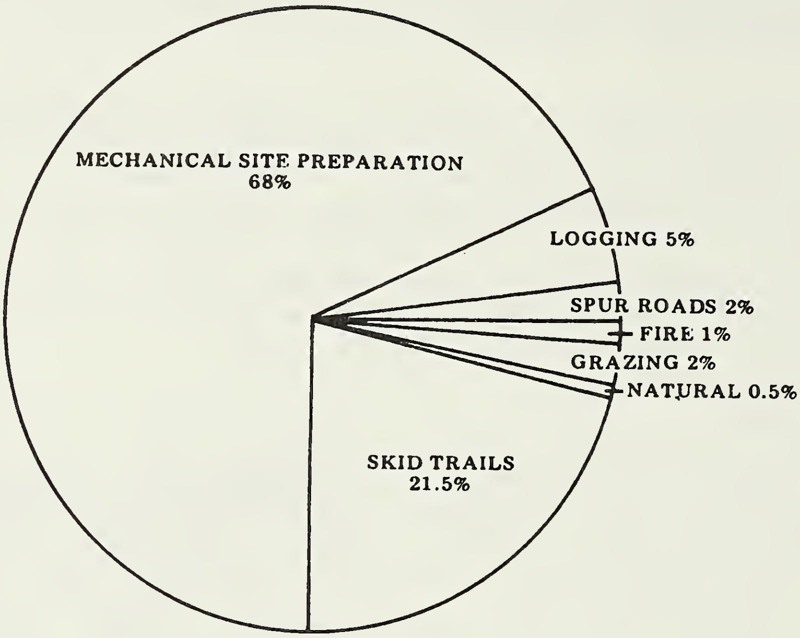


Figure 4-22 -- Annual sediment production by disturbances on forest land, Alabama River Basin, 1972.

The Environmental Protection Agency's Proposed Criteria for Water Quality (Vol. 1, October 1973) states that a good fishery cannot be established or maintained where the waters normally contain more than 80 milligrams per liter (mg/l) suspended solids. This "normal" suspended sediment concentration cannot be directly compared to average annual suspended sediment concentration since the average annual figure includes runoff from large storms and will usually be much higher than the "normal" concentration. For examples of downstream sediment yields and suspended sediment concentrations for selected streams, see appendix table 27B.

The goal set by the amendments to the Federal Water Pollution Control Act requires the clean-up of all streams by 1985. Forest management practices will strive for 80 ppm; the maximum allowable for good fisheries.

The Alabama Water Improvement Commission's goal is to develop Water Quality Management Plans for the four subbasins by 1977 and present proposals to the Environmental Protection Agency (EPA) for erosion control on forestry practices. The State Forester has appointed a Committee to develop alternatives relative to the desirability of a forest practices act, with the intent of making recommendations for legislative action concerning erosion and sediment control on forest lands. All these actions must conform to the standards set by the EPA.

Primary erosion and sediment problems related to forestry practices in the basin are:

1. Mechanical Site Preparation - This practice on private lands, particularly straight blading with a bulldozer, produces an average erosion rate of 97 tons per acre per year for a 4-year period. The practice produces about 57 ppm in suspended sediment from forest land which is 68 percent of the total sediment produced by all forest practices.

2. Skid Trails - Trails made by skidding trees to landings cause ditches or gullies which concentrate water runoff. If skidding is up and downhill, the erosion hazard is increased. These trails produce an average erosion rate of 41 tons per acre per year for a 3-year period. They account for 21 percent of the total sediment load from forest lands, and contribute 17 ppm in suspended sediment to the rivers and streams.

3. Logging - Generally, logging practices (primarily clearcutting) produce an average erosion rate of 12 tons per acre per year for a 3-year period after logging. The areas produce 4 ppm in suspended sediment from forest land which is 5 percent of the total suspended sediment load.

These three major forestry activities contribute 80 ppm of the total 84 ppm suspended sediment for forests, consequently they must be modified if the 80 ppm water quality standard is to be met. This will require erosion control planning, implementation, and maintenance of those plans, which in turn, will increase timber production costs, and will be reflected in wood and fiber prices at the consumer level.

Urban and Industrial Water Use and Needs

An expanding population and an increase in industry will necessitate the development and protection of safe, adequate water supplies. Hydrologic data shows that the basin has an adequate supply of good quality water from surface and ground water sources to meet present and prospective needs. Table 4-23 gives withdrawal use of water by source, and principal use by subbasins. Total water withdrawal in 1970 was about 1.5 billion gallons per day. About 94 percent was surface water drawn from streams or reservoirs, while about 6 percent was ground water drawn from wells or springs. If distributed equally among the basin residents, this withdrawal rate would provide every person with nearly 1,500 gallons of water each day. Figure 4-23 presents water use in Alabama from 1955 to 1970 which is comparable to water use in the basin.

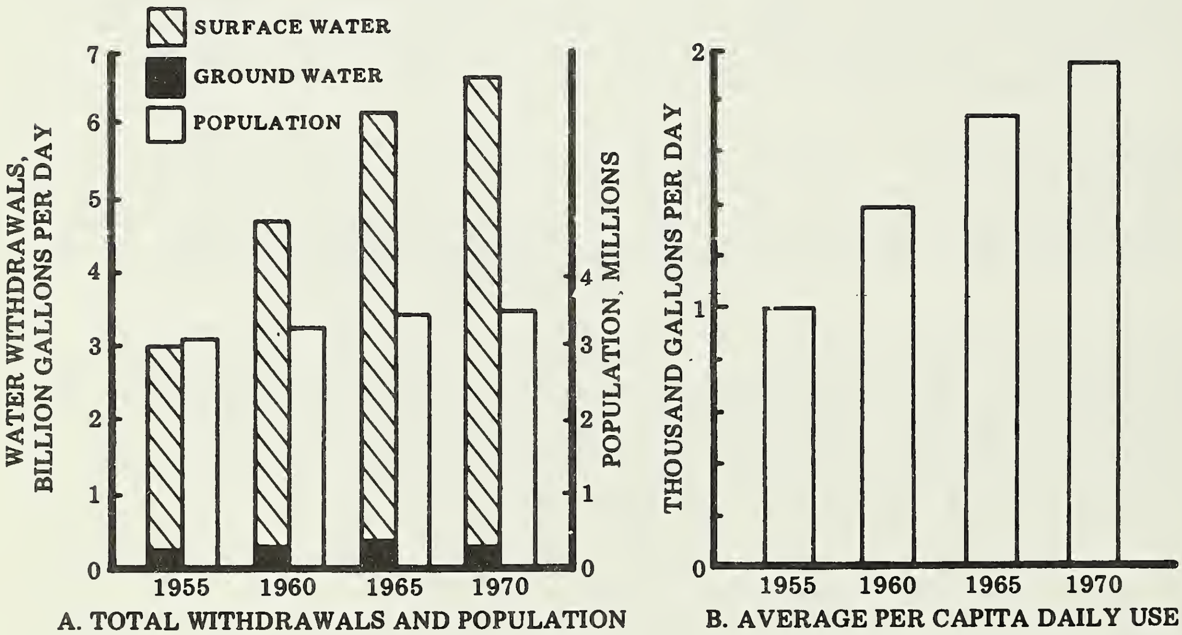


Figure 4-23 -- Trends in total water withdrawal, population, and per capita daily use, 1955-1970, State of Alabama.

Table 4-23 -- Withdrawal use of water (million gallons per day) by source and principal use by subbasin in the Alabama River Basin, 1970.

SUBBASIN	PUBLIC SUPPLY		RURAL USE							SELF-SUPPLIED INDUSTRY		THERMOELECTRIC POWER PLANTS		SUBTOTAL		GRAND TOTAL
			DOMESTIC	LIVESTOCK		IRRIGATION		CATFISH FARMING								
	GROUND WATER	SURFACE WATER	GROUND WATER	GROUND WATER	SURFACE WATER	GROUND WATER	SURFACE WATER	GROUND WATER	SURFACE WATER	GROUND WATER	SURFACE WATER	GROUND WATER	SURFACE WATER	GROUND WATER	SURFACE WATER	
Alabama	6.61	0	5.69	1.45	2.42	0.34	0.73	1.23	0.69	4.02	51.35	0	0	19.35	55.19	74.54
Cahaba	2.16	54.00	1.51	0.29	0.38	0.03	0.03	0.11	0.02	2.44	2.17	0	0	6.54	56.60	63.14
Coosa	21.58	13.52	8.38	1.22	1.16	0.65	1.32	0.56	0.26	15.56	213.02	0	1,008.40	47.95	1,237.68	1,285.63
Tallapoosa	12.53	17.54	4.32	0.96	1.12	1.63	1.57	0.31	0.70	0.86	3.21	0	0	19.61	24.14	43.75
Total By Source	42.88	85.06	19.90	3.92	5.08	1.65	3.65	2.22	1.67	22.88	269.75	0	1,008.40	93.45	1,373.61	1,467.06
Total By Sub-Category			19.90	9.00		5.30		3.89								
Total By Category	127.94		38.09							292.63		1,008.40				1,467.06

Source: Use of Water in Alabama, 1970, Geological Survey of Alabama.

1/ Montgomery uses some surface water but withdrawal is from the Tallapoosa River.

Public water systems furnished water to over 60 percent of the basin's 998,000 people and 30 percent of the water utilized by industry. Seventy-two percent of the projected population is expected to use public water systems by 2020. Table 4-24 shows present and projected public water supply needs by subbasin. Public water supply, present and projected uses) are shown in figure 4-24 (for detail information see appendix table 30). On the average about 10 percent of the water withdrawal is consumed through public water systems and about 6 percent through industrial water systems.

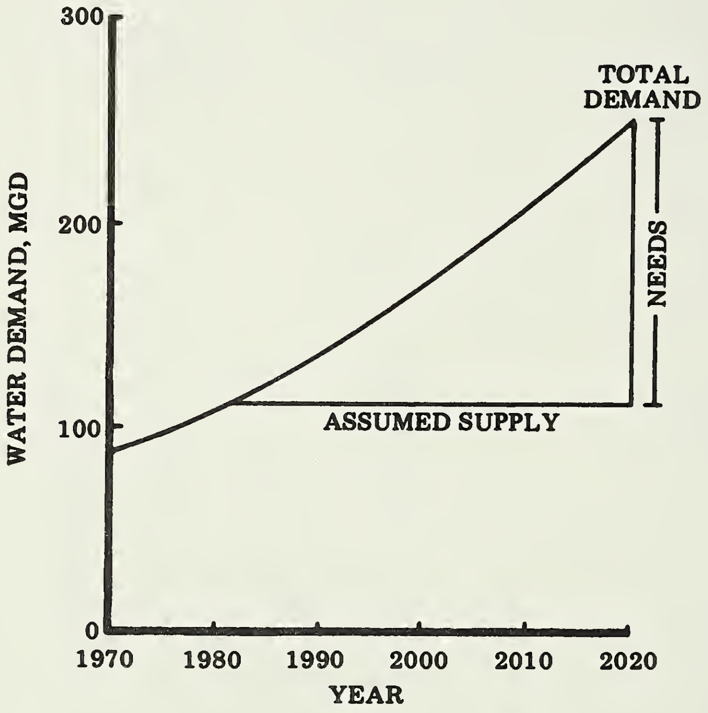


Figure 4-24--Projected public water supply needs, Alabama River Basin.

Total water withdrawal excluding hydro- and thermoelectric use, is projected to increase over five times from 1970 to 2020. This trend is shown in table 4-25. Estimated water use by hydroelectric and thermoelectric plants is shown in table 4-26. Water use in table 4-23 shows 1,373, MGD withdrawn from surface water including 1,008 MGD used by thermoelectric plants. The remaining 365 MGD is used by industrial, municipal, and rural water systems. A 10 percent consumptive use for public, industrial, and rural systems gives a maximum consumption of 37 MGD for the entire basin. A summary of surface water supply and use in 1970 is as follows:

Total Water Use	1,373	MGD
Thermoelectric Plant Use	1,008	MGD
Industrial, Municipal, and Rural Use	365	MGD
10 Percent Maximum Consumptive Use	37	MGD
Gross Potential Water Supply (Average Outflow at Claiborne, AL)	21,200	MGD

Based on the above data the net reduction in surface water is small. With regard to quantity, there is no general limitation on water within the basin; and with good management of surface water, none should occur except in isolated areas.

Table 4-24 -- Present and projected public water supply needs by subbasins, Alabama River Basin.

SUBBASIN	YEAR	POP. SERVED THOUSANDS	RESIDENTIAL NEEDS PER CAPITA gpd	RESIDENTIAL NEEDS TOTAL mgd	TOTAL NEEDS 1/ PER CAPITA gpd	TOTAL NEEDS 1/ TOTAL mgd
Alabama	1970	194.1	81 2/	15.7	136 2/	26.4
	1990	257.9	101	26.0	156	40.2
	2020	379.1	140	53.1	195	73.1
Coosa	1970	219.7	78	17.1	160	35.1
	1990	294.7	99	29.2	172	50.7
	2020	491.1	138	67.8	220	108.0
Tallapoosa	1970	74.7	81 2/	6.0	136 2/	10.1
	1990	105.1	101	10.6	156	16.4
	2020	156.7	140	21.9	195	30.6
Cahaba	1970	72.4	116 3/	8.4	238 3/	17.2
	1990	96.9	141	13.7	263	25.5
	2020	138.9	175	24.3	297	41.3
TOTAL	1970	560.9	84	47.2	158	88.8
	1990	759.6	105	79.5	175	132.8
	2020	1168.9	143	167.1	194	253.0

1/ Total includes industrial and commercial from public supply. Per capita use extended at present rate.
2/ For Alabama and Tallapoosa subbasins combined.
3/ Average use in Black Warrior and Cahaba subbasins.

Table 4-25 -- Present and projected withdrawal of water for residential, industrial, commercial, and rural use by subbasin, Alabama River Basin. 1/

SUBBASIN	1970	WATER WITHDRAWAL 1990	2020
		(Million gallons per day)	
Alabama	75	150	381
Cahaba	63	128	324
Coosa	277	560	1,424
Tallapoosa	44	89	225
TOTAL	459	927	2,354

Source: Use of Water in Alabama 1970 by Geological Survey of Alabama. Water use by hydroelectric and thermoelectric not included.

Table 4-26 -- Estimated water use by hydroelectric and thermoelectric plants by subbasins, Alabama River Basin, 1970.

SUBBASINS HYDROELECTRIC PLANTS	OWNER 1/	GROSS POWER NEED	AVERAGE ANNUAL GENERATION	AVERAGE WATER USE
		(ft.)	(1,000 mwh)	(mgd)
Coosa River				
Weiss	APC	56	216	4,200
H. Neely Henry	APC	43	202	5,100
Logan Martin	APC	69	400	6,270
Lay	APC	83	639	8,300
Mitchell	APC	67	351	5,680
Jordan	APC	103	212	2,260
Walter Bouldin	APC	127	691	5,880
Tallapoosa River				
Martin	APC	146	321	2,390
Yates	APC	55	133	2,650
Thurlow	APC	96	253	2,840
Alabama River				
Jones Bluff	C of E	-	329	-
Millers Ferry	C of E	-	434	-
Subbasins Thermoelectric Plants				
Coosa				
Gadsden	APC			144.4
E. C. Gaston	SEGCO		—	864.0
TOTAL				1,008.4

1/ APC-Alabama Power Company, C of E-Corps of Engineers, SEGCO-Southern Electric Generating Company.

Source: Use of water in Alabama, 1970 by Geological Survey of Alabama.

Rural and Agricultural Water Use and Needs

Agricultural water requirements along with rural domestic needs are presented in figure 4-25 for the period 1970 through 2020. Projected water requirements for agriculture show an increase of 58 percent by 1990 or a total demand of 63.4 MGD by that time; a reflection of the growing needs of agriculture.

The rural domestic water demand of 31.4 MGD in 1990 is expected to be 44 percent greater than in 1970. The increase can be attributed almost entirely to increased per capita consumption. Population living on farms and rural areas not serviced by public water utilities in 1970 was estimated at 437,000 and anticipated to increase to 443,000 by 1990 and to 455,000 by 2020.

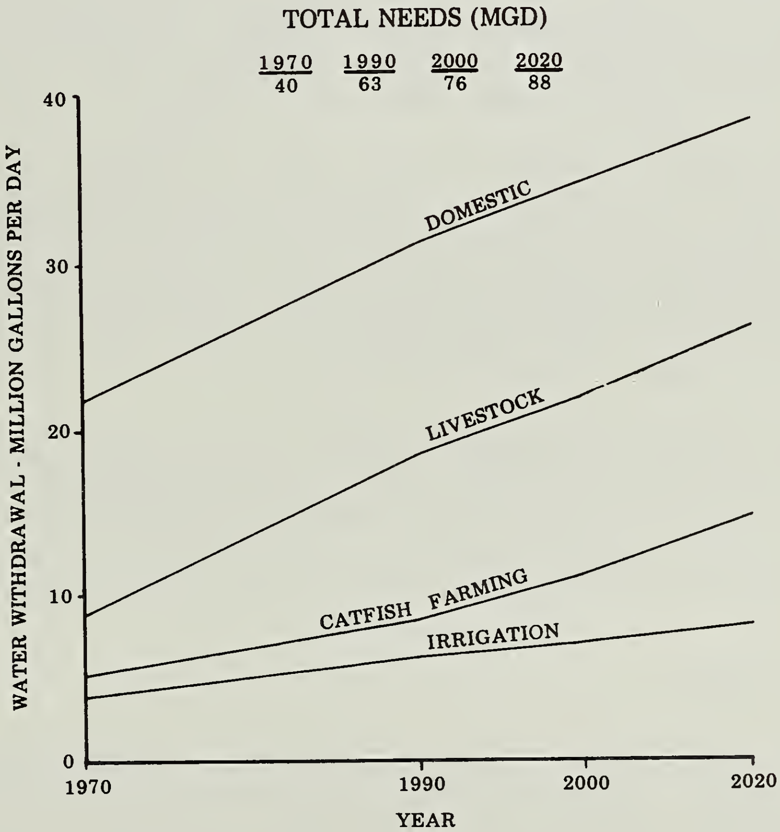


Figure 4-25 -- Rural withdrawal use of water, 1970-2020.

Total water use for irrigation should increase from about 5.3 MGD in 1970 to about 6.1 MGD by 1990. Demand will continue to be strongest in the Tallapoosa and Coosa Subbasins. If the basin continues to develop as in the past, irrigated land will increase from 10,500 acres in 1970 to 12,200 acres by 1990. As agricultural technology and better management methods are developed, soil moisture deficiency is likely to become a more generally limiting factor in crop yields.

Livestock water requirements should double in the next two decades, reaching 18.1 MGD by 1990. Other rural uses such as catfish farming are expected to require around 7.8 MGD.

Supplemental moisture (irrigation) is needed for maximum plant growth in most years though the increase in quality and yield cannot normally justify the capital expenditure necessary to develop and operate irrigation systems on general crops or pastures in the basin.

There are no serious shortages of water for livestock and rural domestic purposes in the basin. The source of water for livestock is generally streams and farm ponds and only during an extended drought period is the water supply limited. Wells are the normal source of water for rural domestic use and few cases of water shortages occur. These are generally caused by faulty pumping equipment or wells that are too shallow.

The average annual rainfall for the study area is 54 inches. This rainfall is not distributed uniformly throughout the growing season. Lack of sufficient soil moisture during parts of the growing season reduces yields and sometimes causes crop failures. Appendix table 31 gives, at different levels of probability, the number of drought days each month from April through October for soils with different available soil moisture capacities for each subbasin.

The vertical distance between available moisture and potential evapotranspiration curve in figure 4-26 is an indication of irrigation needs for the respective months for maximum plant growth. For the months of June, July, August, and September, three to four inches of water is needed to sustain maximum plant growth and to maintain the original soil moisture base.

Impaired Drainage

Drainage of excess water in the basin is not a major problem. Local areas exist where excess water is a problem to agricultural production and urban development. These areas are small and the wetness problem can normally be solved by ditches, drains, diversions or a combination of practices.

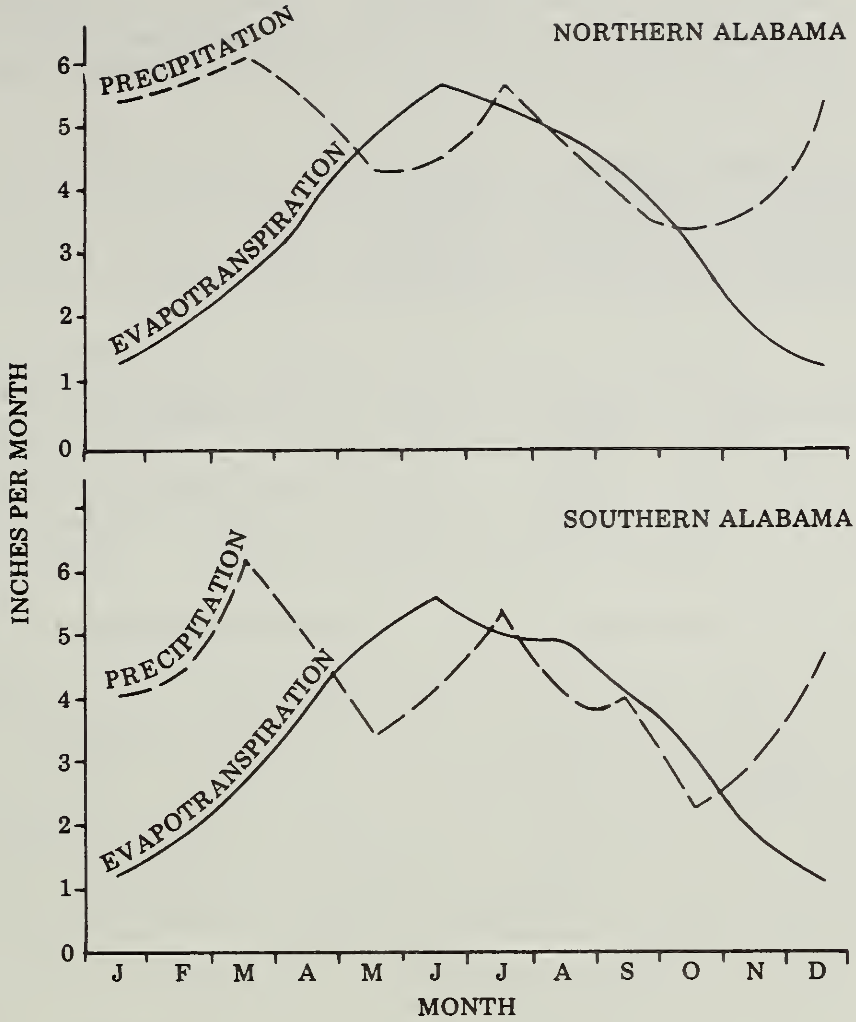


Figure 4-26 - Average monthly precipitation and evapotranspiration for Alabama in a typical year.

On-farm drainage systems are needed to provide for the orderly removal of excess water from the land. Open ditches are the most common measure used to remove surface water while subsurface drains are used for removal of internal water. Dikes, diversions, levees and land smoothing are sometimes needed to complete the collection system. An adequate outlet is a must for the system to be effective. If suitable outlets are not available, this development usually requires group or project-type action.

There are 2,141,000 of the 11,015,000 acres in the basin that have excess water as the dominant hazard or limitation. There are 229,000 acres of cropland and 410,000 acres of pastureland with this characteristic. Drainage is needed on 32,000 acres of cropland and 137,000 acres of pastureland for a total of 169,000 acres.

A large portion of this area is located in the flood plain of rivers and streams and has a combined problem of drainage and flooding. A solution to the drainage problem only solves part of the excess water problem. Additional measures would be required to reduce the flood potential.

The installation of drainage measures on wetlands should presently be limited to those acres of cropland where the efficiency of crop production can be improved. Pastureland and forest land in land capability classes II and III, with drainage, could be converted to cropland if crop production from these areas is needed to supply the demands for food and fiber or to improve production efficiency.

Surface Storage for Flow-Augmentation, Recreation and Municipal Water

Certain specific water needs were recognized during the early phase of the basin study that might be met most efficiently through surface storage. The Alabama Water Improvement Commission identified 20 areas along streams and tributaries which have or will have a pollution problem during periods of low streamflow. The Economic Research Service has projected a demand for water-based recreation in the Cahaba River Subbasin. There will exist a need for additional municipal water throughout the river basin. A portion of these needs will have to be met through the use of surface storage.

Low-flow agumentation for pollution abatement is generally considered to be a last resort solution to water quality problems. After all practical levels of waste treatment have been achieved in a drainage basin, low flow augmentation could be used as a supplemental method of maintaining desired water quality requirements during periods of low flow. There are 10 of the 20 identified problem areas (Alabama Water Improvement Commission, 1975) where a reservoir site is available that could be used to alleviate the pollution problem (see table 4-27). These sites are located upstream from the problem area to utilize gravity flow. Ten of the identified problem areas have existing or potential pollution problems that cannot be solved by flow augmentation from a reservoir. These problems are physically located so that no upstream reservoir site exists, or the required minimum flow is greater than the dependable yield from the drainage area.

Table 4-27 -- Location of existing and potential water pollution problems, status of impoundment possibility for flow augmentation, and minimum flow requirements, Alabama River Basin, 1975.

LOCATION 1/	MINIMUM FLOW REQUIRED CFS 2/	RESERVOIR SITE AVAILABLE 3/	DEPENDABLE YIELD FROM DRAINAGE AREA AND RESERVOIR CFS 4/
Alabama River Subbasin			
Wilcox County			
Pursley Creek at Camden	2	Yes	3.97 & 3.75 5/
Chilton County			
Middle Fork of Mulberry Creek at Thorsby		No	
Cahaba River Subbasin			
Shelby County			
Buck Creek--vicinity of Siluria & Alabaster		No	
Jefferson County			
Cahaba River-vicinity of U. S. Highway 280	-	Yes	9.51, 8.52, 7.85 3.06 6/
Coosa River Subbasin			
Coosa County			
Baker Creek at Goodwater	1.5	Yes	2.19
DeKalb County			
Big Wills Creek at Fort Payne	150	Yes 7/	-
Shelby County			
Buxahatchee Creek at Calera		No	
Calhoun County			
Cane Creek at Anniston-Fort McClellan		No	
Talladega County			
Shirtee Creek at Sylacauga		No	
Calhoun County			
Tallahatchee Creek at Jacksonville	8	No	
Talladega County			
Tallaseehatchie Creek at Sylacauga	31.5	Yes	17.32 & 4.22 5/
Chilton County			
Walnut Creek at Clanton		No	
Shelby County			
Waxahatchee Creek at Columbiana	4.5	Yes	6.16

Table 4-27 (Cont'd)

LOCATION 1/	MINIMUM FLOW REQUIRED CFS 2/	RESERVOIR SITE AVAILABLE 3/	DEPENDABLE YIELD FROM DRAINAGE AREA AND RESERVOIR CFS 4/
Tallapoosa River Subbasin			
Cleburne County			
Cahulga Creek--vicinity of Heflin		No	
Macon County			
Calebee Creek--vicinity of Tuskegee	2.5	Yes	1.05
Clay County			
Horsetrough Creek--vicinity of Ashland	8	Yes	1.29
Bullock County			
Old Town Creek--vicinity of Union Springs		No	
Lee County			
Parkerson Mill Creek--vicinity of Auburn		No	
Lee County			
Sougahatchee Creek--vicinity of Auburn-Opelika	23	Yes	3.22
Randolph County			
Wedowee Creek--vicinity of Wedowee	0.5	Yes	9.26

1/ Location of problem areas were identified by Alabama Water Improvement Commission.
2/ Flow required to maintain 5 ppm dissolved oxygen in stream. Furnished by Alabama Water Improvement Commission.
3/ For detail location and reservoir statistics see appendix table 7B.
4/ Estimated as being 50 percent of the average annual runoff.
5/ Two sites available.
6/ Four sites available.
7/ Several sites are available above problem area, however, these sites will not meet the flow requirements. Each site would involve an acquisition of extensive land rights.

Four sites have been located in the Cahaba River Subbasin which could provide surface area for water-based recreation. A potential site located on Shades Creek in Bibb and Jefferson Counties will require considerable clean-up of the water draining into the reservoir before this reservoir could be used for water contact sports. These and other potential retarding structures which are planned under the small watershed program should be utilized as multiple-purpose structures whenever possible.

Needs for municipal water have been projected for all public supply systems. Eight area or county-wide studies have been made which included identification of the needs for municipal water and analyzed the potential for surface storage. Reservoirs which could satisfy these needs were located during these studies.

Appendix table 7B lists these sites as well as other potential reservoir sites which could meet a wide range of surface area or storage needs.

Recreation and Related Needs

Introduction -- Alabamians now spend more hours engaging in recreation activities outdoors than ever before, and the demand for leisure-time facilities is soaring. Actually, the demand for outdoor recreation in the Alabama River Basin is increasing much faster than the population (figure 4-27). Participation in recreation is often measured in terms of "activity occasions", i.e., participation in a recreation activity for at least 30 minutes a day. In 1974, residents of the Alabama River Basin and tourists recreating within the basin participated in over 32 million activity occasions. By 1990, the number of occasions is expected to double, and by the year 2020, the number of recreationists is expected to be over three times greater than in 1974 (see table 4-28).

Water is vital to most outdoor recreation activity. In 1974, more than 60 percent of all basin recreation activity was water based. Water also enhances land based recreation such as camping and picnicking. Consequently, the recreational use of water must not be overlooked in planning.

Several state agencies are concerned with preserving and improving the recreational environment of Alabama. Chief among these is the Alabama Department of Conservation and Natural Resources, Division of Outdoor Recreation. In 1975, Auburn University completed an extensive Comprehensive Outdoor Recreation Plan for Alabama under contract with the Alabama Department of Conservation and Natural Resources. Since the planning regions in the state study did not coincide with the hydrologic boundaries of the basin, and because of unexpected changes in the level of projected population, it became necessary to develop a separate recreational analysis for the basin study area. The methodology and assumptions utilized in the analysis, as well as the detailed subbasin projections are presented in appendix 32.

Table 4-28 -- Projected demand for outdoor recreation by residents and tourists in the Alabama River Basin, 1974, 1990, and 2020.

ACTIVITY	DEMAND--ACTIVITY OCCASIONS 1974	1990	2020
	----------------	1,000	----------------
Swimming	10,004	19,860	37,020
Picnicking	6,292	9,930	14,100
Boating	2,755	6,280	12,930
Hunting	2,159	2,788	3,666
Fishing	6,615	9,913	13,368
Camping	1,520	3,910	8,330
Golfing	1,326	2,934	5,868
Water skiing	944	2,845	5,525
Hiking	511	1,080	1,810
Total	32,126	59,540	102,617

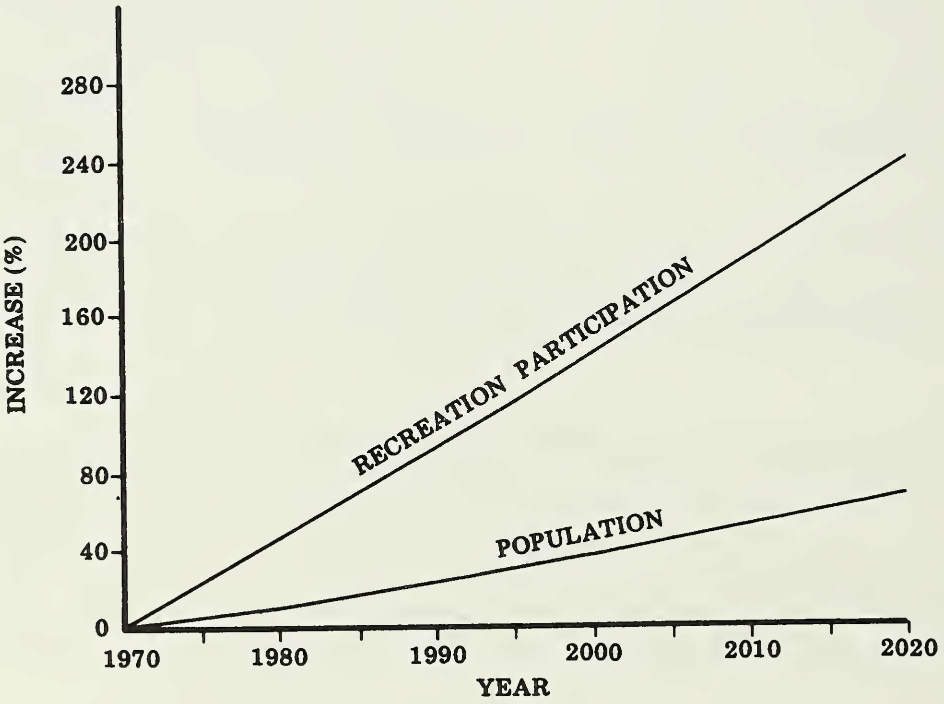


Figure 4-27 -- Projected outdoor recreation participation and population growth, Alabama River Basin, 1970-2020.

Recreation may be . . .

swimming,

camping,

skiing,

hunting of small game,

large game,

or fishing.

Demand, Supply and Facility Needs -- Nine land and water based activities were selected for analysis. They are fishing, hunting, boating, swimming, water skiing, camping, hiking, picnicking, and golfing. These are the primary recreation activities in the area and are those that would potentially be affected by land and water development activities. Each will be discussed separately. It is realized that much of the land and water area required can be used to satisfy several needs, either concurrently or at different seasons of the year. There is no general rule regarding how much of an area can serve dual purposes. This depends on the nature of the particular area.

Boating -- Boating demand is projected to increase from 2,755,000 activity occasions in 1974 to 6.3 million by 1990 and 12.9 million occasions by 2020 (see figure 4-28). Boating thus ranks third behind water skiing and camping in the rate of increase anticipated during the next 50 years. Currently, no need exists for additional boating waters as almost 200,000 acres are available for public use. One-half of this acreage is in the Coosa Subbasin, consequently, this area has the largest surplus of acreage. The basin can presently satisfy 11.6 million activity occasions of boating and no serious shortage of boating waters is expected by the year 2020. If boating demand is to be satisfied in the local area, a minor need exists for 2,800 acres in the Cahaba Subbasin within the next 20 years. As has been pointed out, however, this demand could easily be satisfied on one of the many reservoirs in the Coosa Subbasin.

Swimming -- Pressure for swimming areas should about double by the year 2020 (see figure 4-29). To satisfy the increased demand with lake, pond or river swimming would require the development of an additional 500 acres of beaches to supplement the 126 acres reported in 1974. These beaches together with public pools provide the opportunity for about 8 million activity occasions of swimming annually. Present demand of 10.0 million occasions already exceeds capacity. Most of the new beaches required during the next two decades will be needed in the Alabama Subbasin. Currently, this area can supply only 2,300,000 activity occasions of swimming, while demand is for 3.2 million activity occasions. At present, 40 acres of beach would be required to meet unsatisfied demand. The need in the Alabama Subbasin is expected to increase to 146 acres by 1990. With a metropolitan population approaching 200,000 in the Montgomery area, there is increasing pressure on the recreational resources of this area. Few beach areas were reported in either Montgomery or Autauga Counties in 1974 hence a real need exists in these counties.

Water Skiing -- This activity is expected to have the greatest relative increase in demand throughout the planning period; however, the percentage of the population participating will remain low (see figure 4-30). In 1974, only five persons in 100 participated in water skiing.

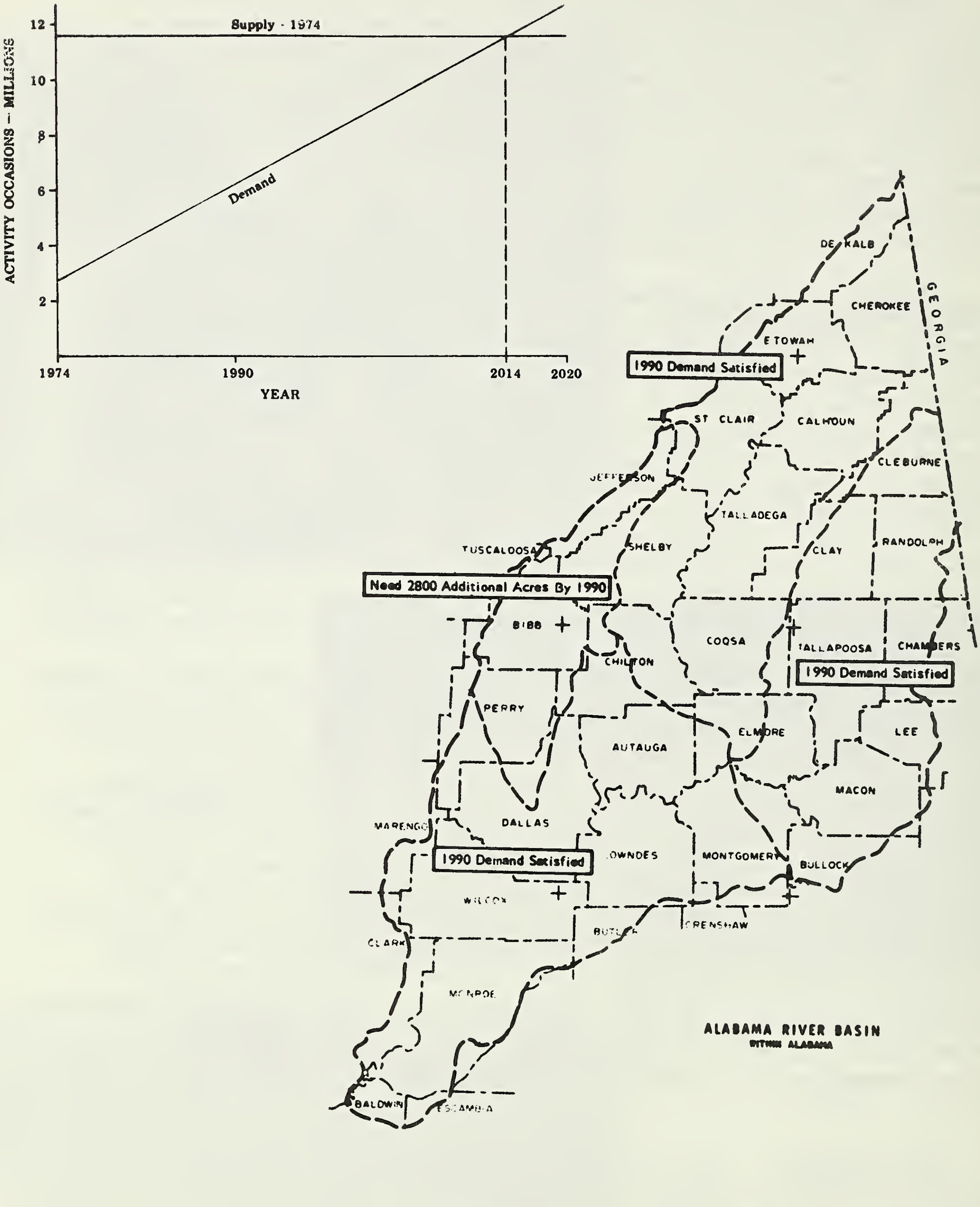


Figure 4-28 -- Water development needed for boating, 1974 to 1990.

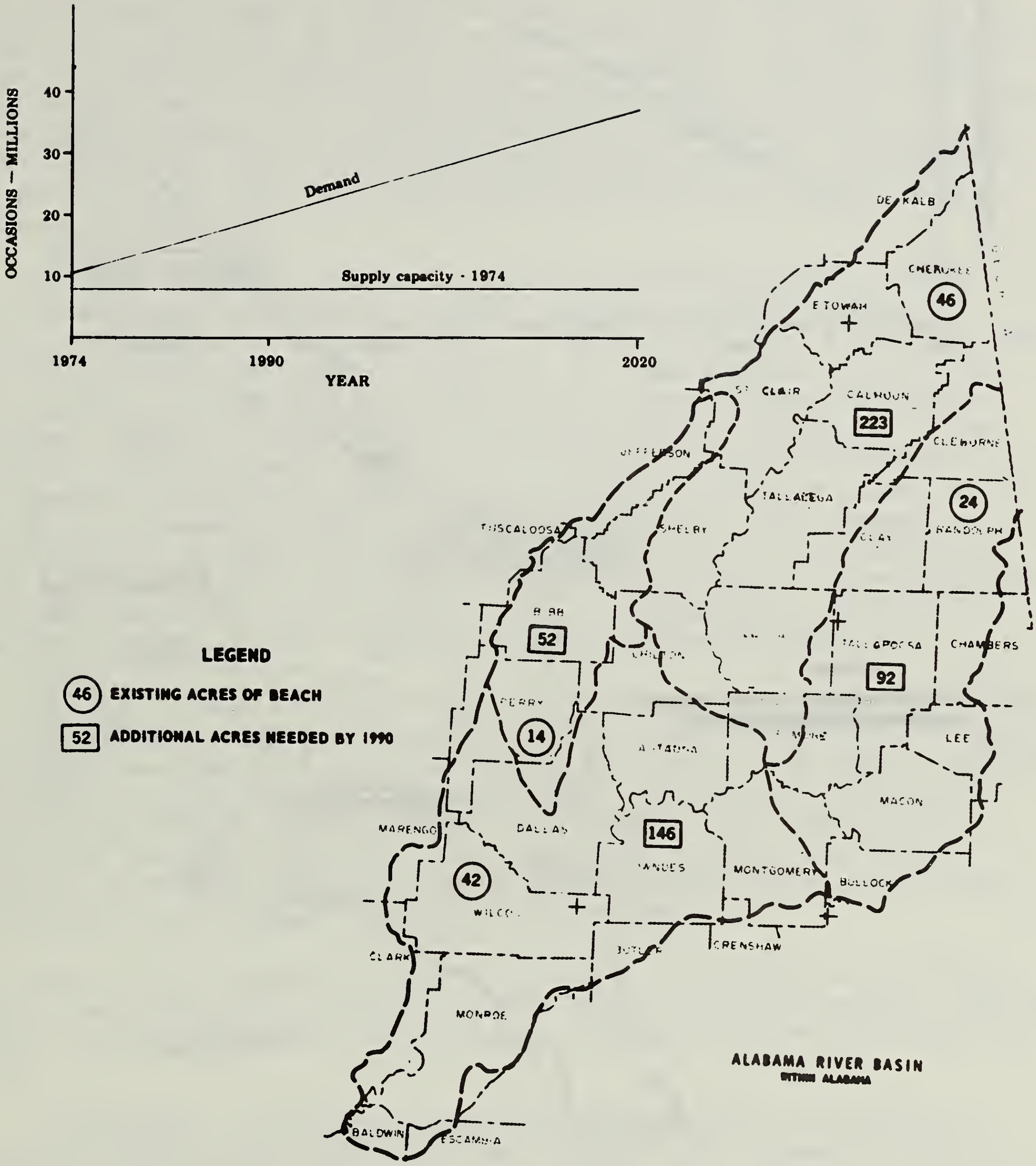


Figure 4-29 -- Beach acreage needed, 1974 to 1990.

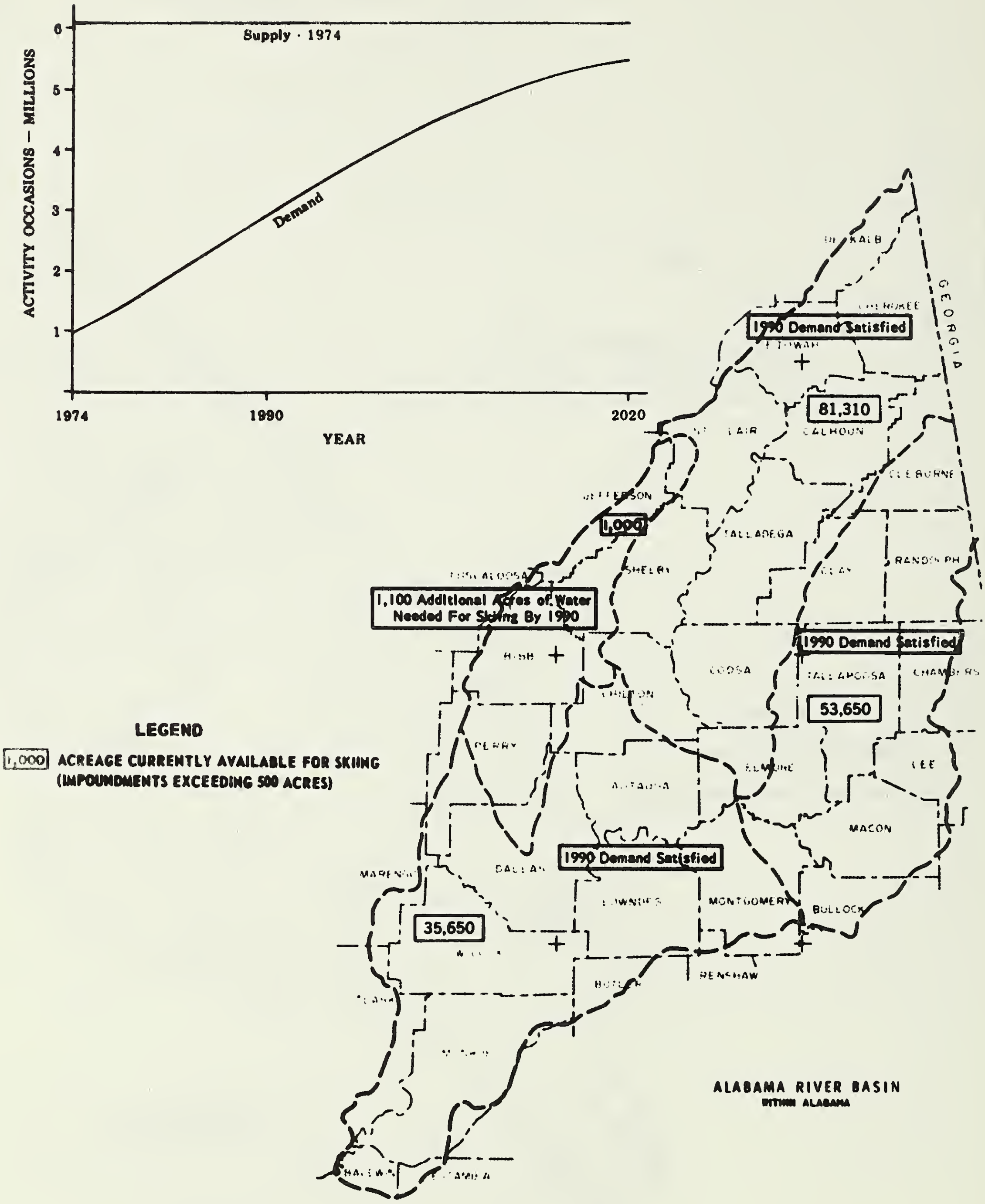


Figure 4-30 -- Water needed for skiing, 1974 to 1990.

By 1990, the estimate is for eight persons per 100 to participate. Demand is expected to climb from 944,000 occasions in 1974 to 2.8 million by 1990 and 5.5 million by 2020. Public large water impoundments can currently satisfy skiing demands in each of the four subbasins, but by 1990, 1,100 acres will be needed in the Cahaba area. A large surplus of water for skiing is available in the Coosa Subbasin. As with boating, unsatisfied demand in the Cahaba region could easily be met in the Coosa Subbasin if residents were willing to travel 100 miles or more to ski. In the past, most have not been willing or able to do so; consequently, a need will soon exist for skiing waters particularly in the populous Jefferson County area.

Camping -- Camping demand is usually satisfied in one of three ways -- through tent camping, trailer camping, or group camping in cabins or lodges (see figure 4-31). In 1974, there were 1,256 individual sites in the basin developed especially for tent camping, 6,284 sites for trailer/tent camping, and 4,873 beds in group camping facilities. Combined they had a capacity of 3.2 million activity occasions. More than one-half of these facilities are located in the Coosa Subbasin. The demand for camping facilities is expected to increase second only to water skiing among the nine activities considered. Total demand is expected to rise from 1.5 million occasions in 1974 to 3.9 million by 1990 and 8.3 million by the end of the planning period. As pointed out, the need can be satisfied in several ways; consequently, figure 4-31 specifies facility needs in terms of both acreages and beds.

Hiking -- Public hiking trails in the basin satisfy about 90 percent of the current demand (see figure 4-32). A total of 341 miles of trail exist, while another 78 miles are needed at present. By 1990 an additional 430 miles will be required to meet demands. The bulk of the current deficit is centered in the Alabama Subbasin where only 60 miles of developed trails are reported. The area has a present need for an additional 54 miles of trails. Both the Coosa and Cahaba basins have sufficient trail mileage to satisfy current demands.

No other activity appears to be so lacking in facilities as is hiking. With demand expected to double by 1990, there is a real need for additional public trails throughout the basin particularly near the more populated areas.

Picnicking -- Picnicking demand is not expected to increase as rapidly as most other activities (see figure 4-33). Demand by 1990 should be about 9.9 million occasions, 60 percent greater than in 1974. Presently, there are about 1,435 acres developed for picnicking in the basin. Approximately 4,500 tables are available; 1,900 are in the Coosa Subbasin. The Alabama Subbasin contains only 1,340 tables for a population

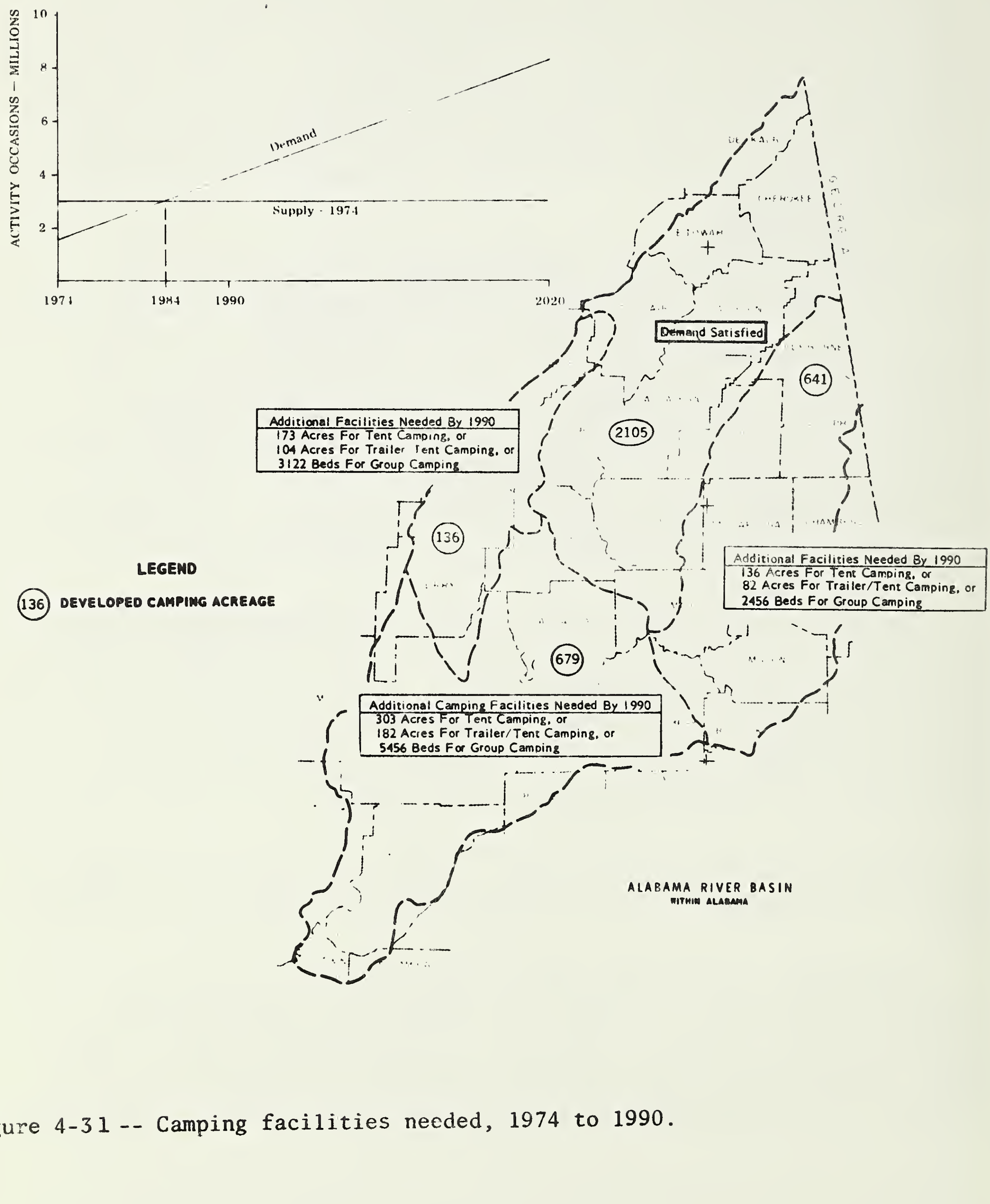


Figure 4-31 -- Camping facilities needed, 1974 to 1990.

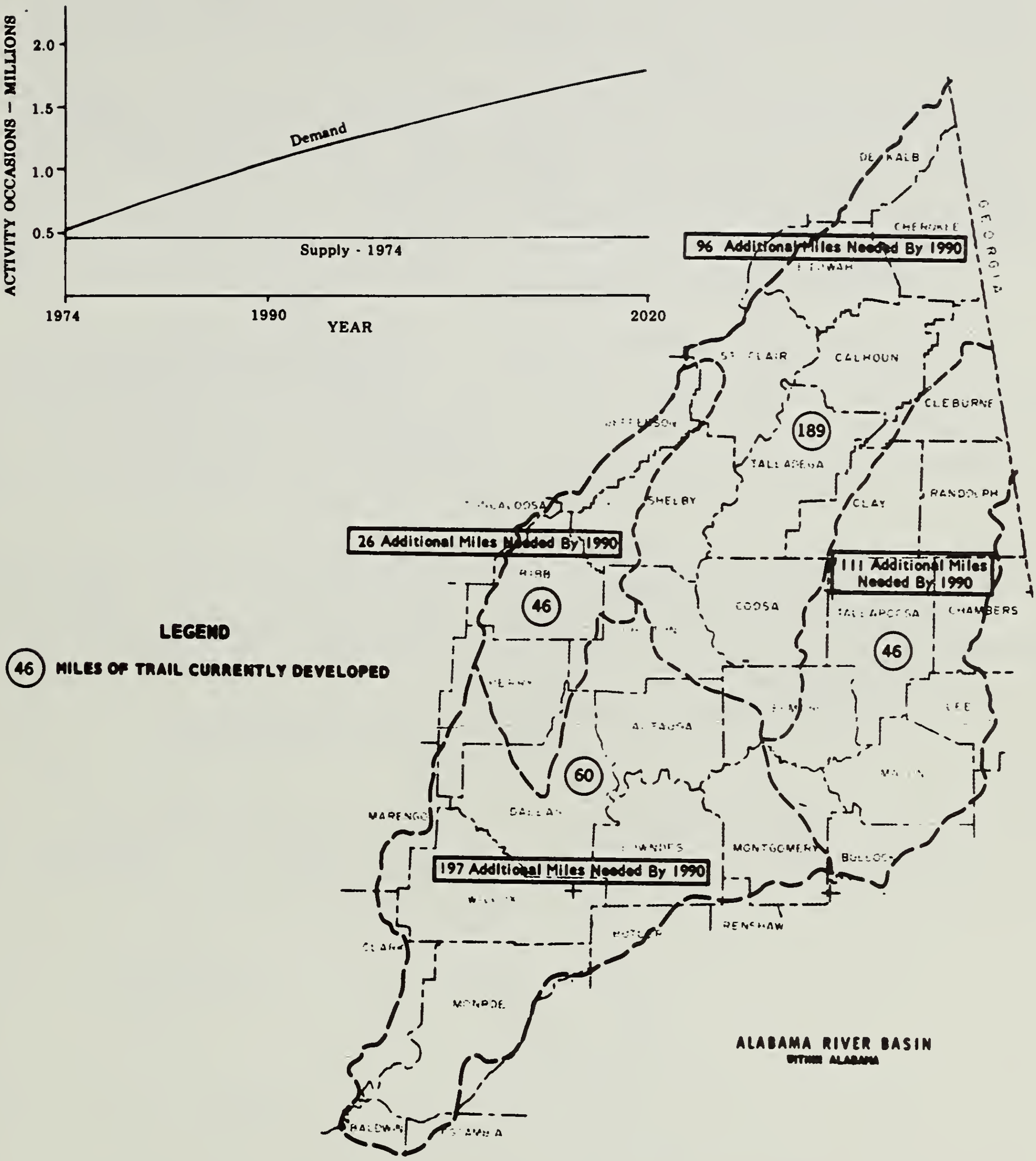


Figure 4-32 -- Hiking trails, 1974 to 1990.

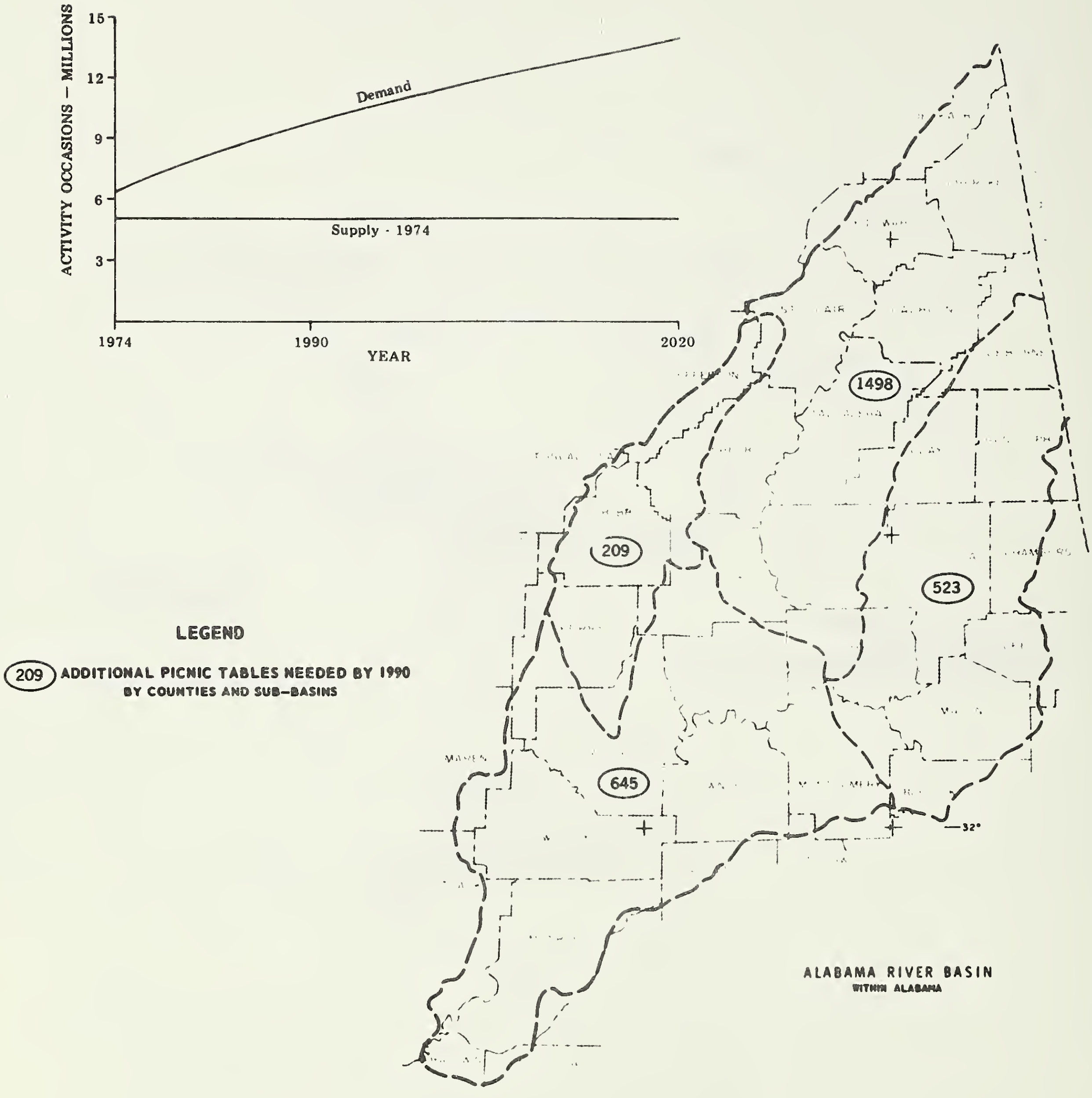


Figure 4-33 -- Location and extent of picnic table needs, 1974 to 1990.

of 321,000; consequently, the immediate need is greater here than in other subbasins. By 1990, however, needs of the Coosa area will surpass those in the Alabama Subbasin because of the heavy tourist activity in the Coosa area. During the next 15 years, an additional 2,900 tables will be needed within the basin -- 1,500 of these in the Coosa Subbasin.

Golfing -- The current capacity of the 74 golf courses in the basin is 2.2 million activity occasions, while demand is for 1.3 million occasions (see figure 4-34). With demand increasing to 2.9 million occasions by 1990 and 5.9 million by 2020, the need for numerous new or expanded courses is quite evident. Currently, no additional courses are needed. By 1990, however, demand is expected to change dramatically as 32 additional 18-hole courses will be needed to satisfy demands.

Forest Related Recreation -- Camping, hiking, and picnicking are usually forest related activities. Forested areas with the best recreation potential are located along rivers, lakes and in the mountainous area. Basic criteria for determining areas for potential development include soil suitability, vegetation, population, and travel distance. Water is also a basic criterion for intensive development.

These favorable areas indicate general possibilities for recreation development. More detailed surveys are necessary to determine specific site locations within these areas. Ownership of forest land with recreation potential is shown in table 4-29.

Table 4-29 -- Ownership of forest land with recreation potential, Alabama River Basin, 1972.

	SITE RATING	
TYPE OWNERSHIP	GOOD (% OF AC.)	FAIR (% OF AC.)
Private individual	80.7	84.3
Private corporation	14.7	13.6
Federal military	2.7	1.7
National Forest System	0.9	0.2
Public non-federal	0.6	0.1
State park	0.4	0.1
	100.0	100.0
Acreage with recreation potential	462,750	1,136,550

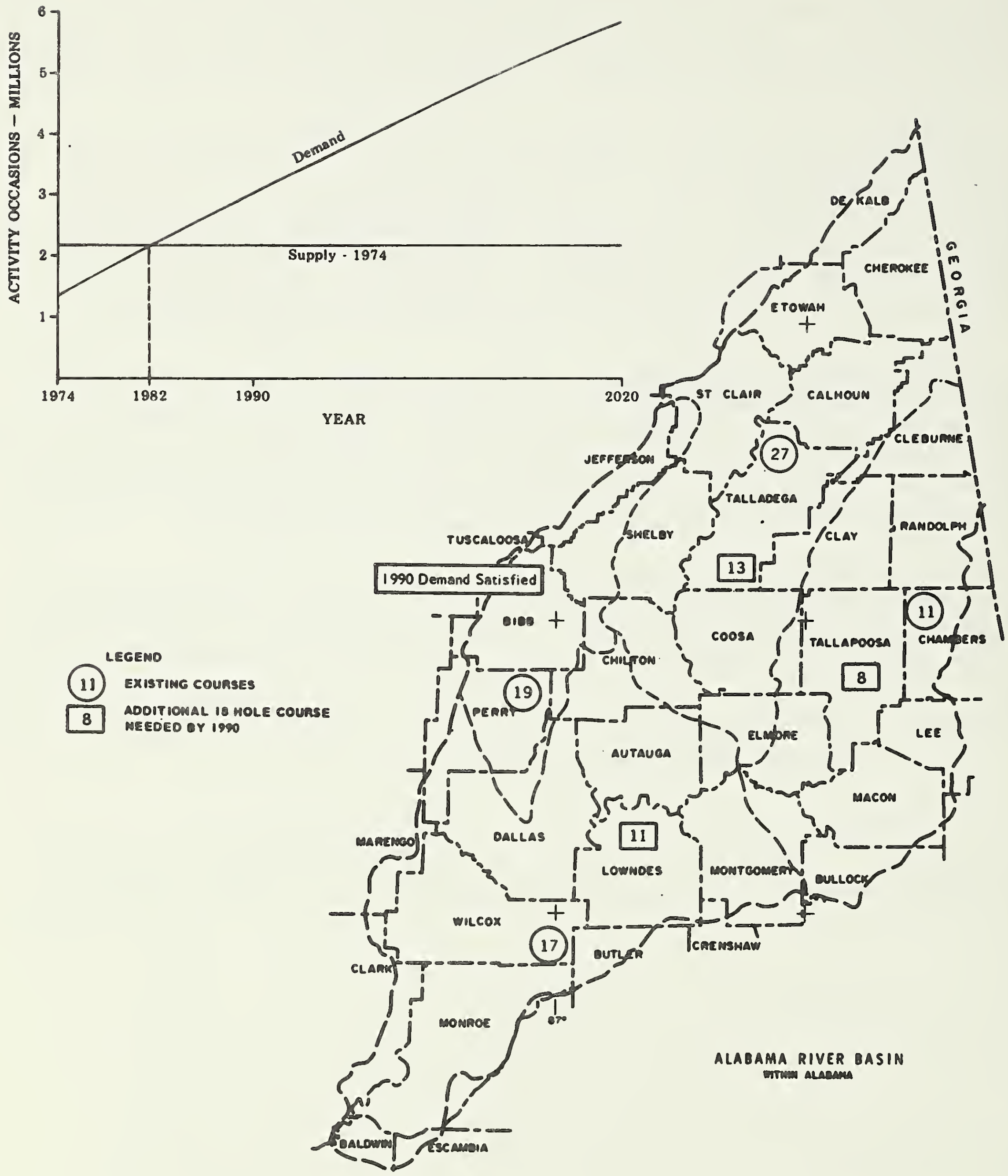


Figure 4-34 -- Golf course requirements, 1974 to 1990.

Wildlife Management Needs

Fishing -- Fishing demand has been estimated for four categories of water -- lakes and reservoirs, rivers and streams, small impoundments, and put-grow-and-take ponds. Brackish and salt water fishing is not available in the basin. This classification into separate types of fishing demand follows the method set forth in the State Recreation Plan and is consistent with other research on fishing being conducted as a part of the basin study.

Eighty-five percent of the basin's fishing waters are classified as large impoundments, i.e., lakes and reservoirs exceeding 500 acres. Almost 50 percent of the acreage is concentrated in the Coosa Subbasin (see table 15 in the appendix). For the purposes of this study, a man-day of fishing is assumed to equal one activity occasion. Each reservoir, lake, river and stream in the basin was analyzed separately regarding man-days of fishing and sustained harvestable production of fish per acre. The potential capacity of all public fishing areas in 1974 was almost nine million activity occasions compared to a demand of 6.6 million occasions (see figure 4-35).

The demand for fishing is expected to equal the supply by 1990. The basin is projected to support 9,942,000 fishing occasions by 1990 to satisfy a projected demand of 9,913,000 occasions (see appendix 32N). After 1990, the demand for fishing is projected to exceed the supply.

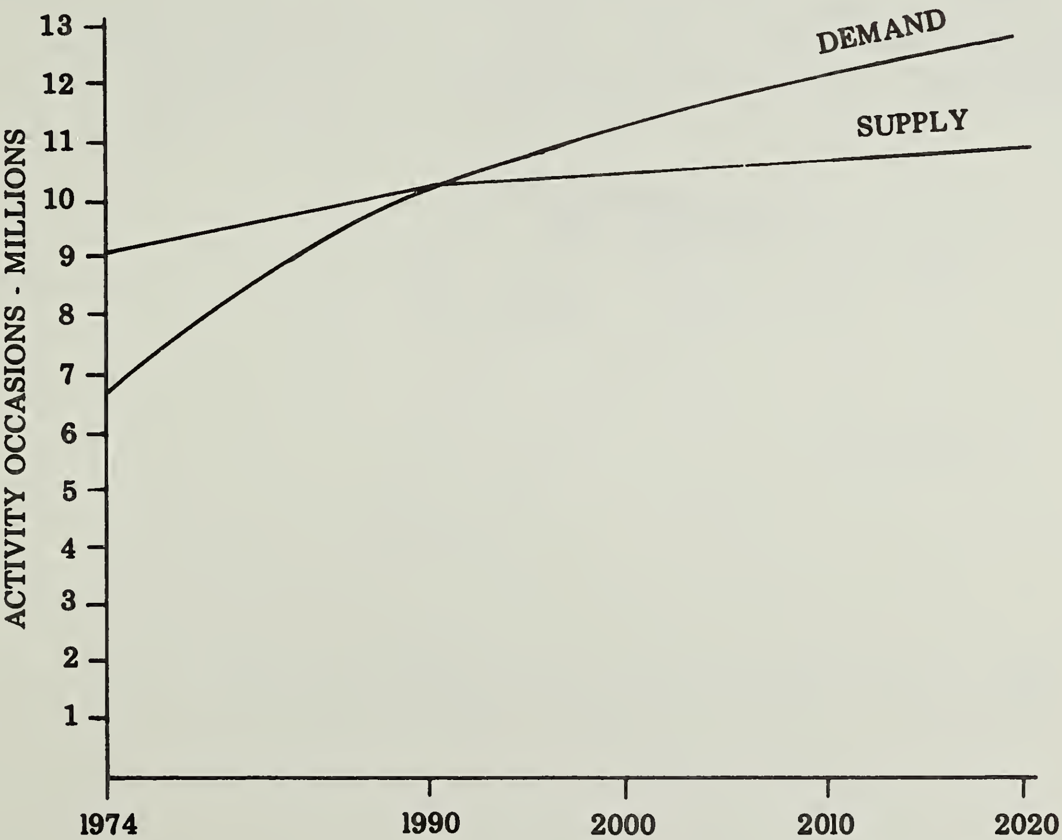


Figure 4-35 -- Supply and demand for fishing, 1974 to 2020.

Hunting -- Three types of hunting demand are considered in this study -- big game, small game, and waterfowl (see figure 4-36). The supply of land assumed to be available for hunting includes state wildlife management areas, National Forests, and all company and privately owned land open to public hunting. Shooting preserves and club-leased lands are not included in the acreage open to public hunting. In all, 2.4 million acres are available for public hunting in the basin. Almost one-half or 1.1 million acres are in the Coosa Subbasin.

Hunting demand is strongest in the Alabama and Tallapoosa Subbasins. A hunter in these two areas normally participates in about 29 hunting occasions per year, whereas in other parts of the basin the rate is only 15 occasions. Current demand in the basin is for about 2.2 million hunting trips each year. Seventy percent of the demand is for small game. The capacity of public hunting lands in the basin is 6.1 million hunting trips each year, hence there is no serious shortage. There are however, a few problems in satisfying two particular types of hunting. All areas are deficient in waterfowl hunting. Currently, 388,000 acres are available for waterfowl hunting, but an additional 8,000 acres are needed to satisfy the 1974 demand. By 1990, the acreaged need for waterfowl hunting is expected to increase by 24,000 acres. The other need is for additional big game hunting in the Alabama Subbasin.

The Wildlife Habitat Evaluation Program (WHEP) developed by the U.S. Forest Service was used in preparing the maps and numerical ratings of habitat potential for the four major game species on forest lands. This analysis indicates the most favorable conditions for forest game species based on existing habitat. These values are expressed in potential populations and potential hunting trips. Gray squirrel and deer hunting supply-demand data is most critical and is examined in this section as well as appendix 34. Quail and turkey habitat are also covered in appendix 34.

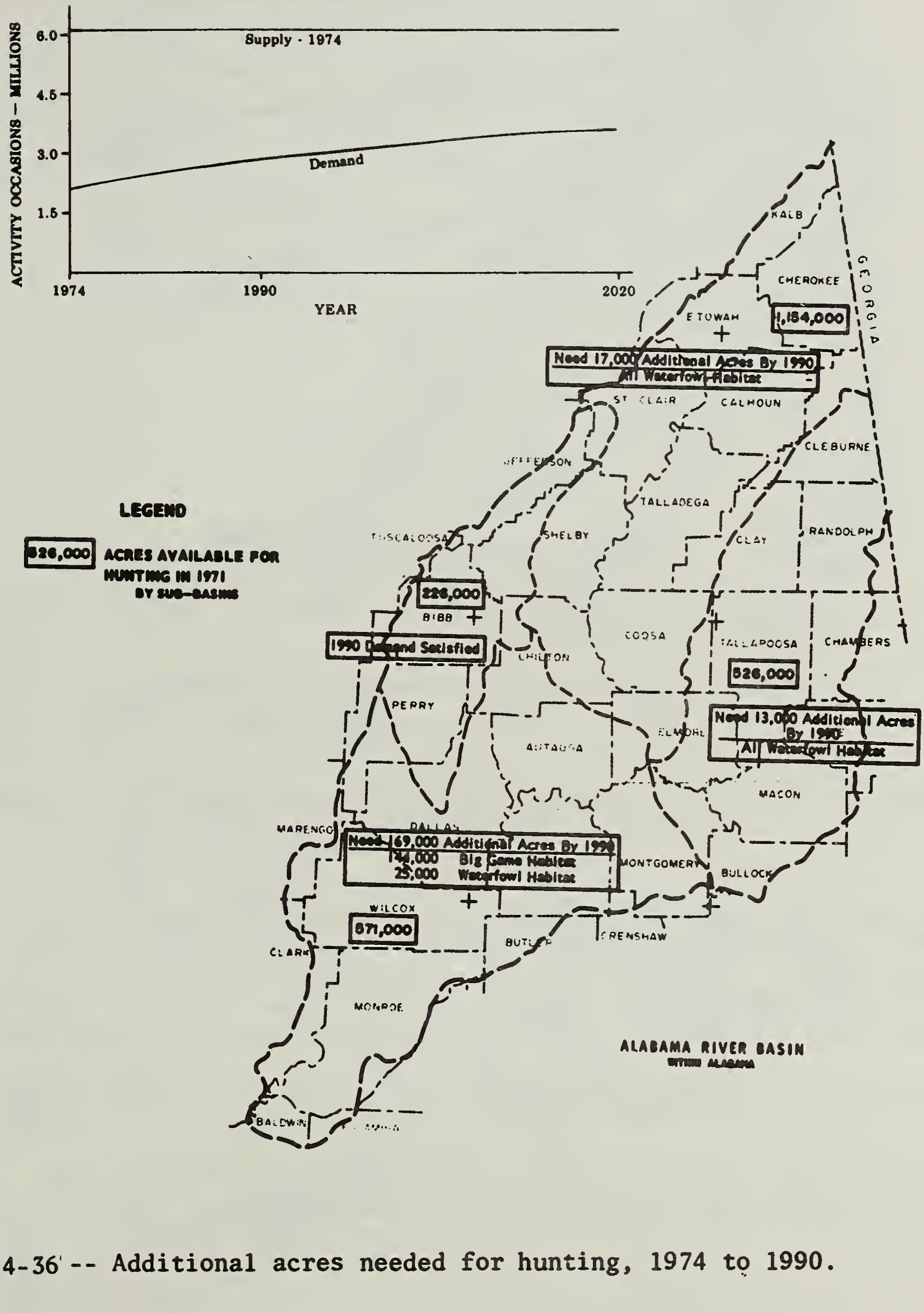


Figure 4-36 -- Additional acres needed for hunting, 1974 to 1990.

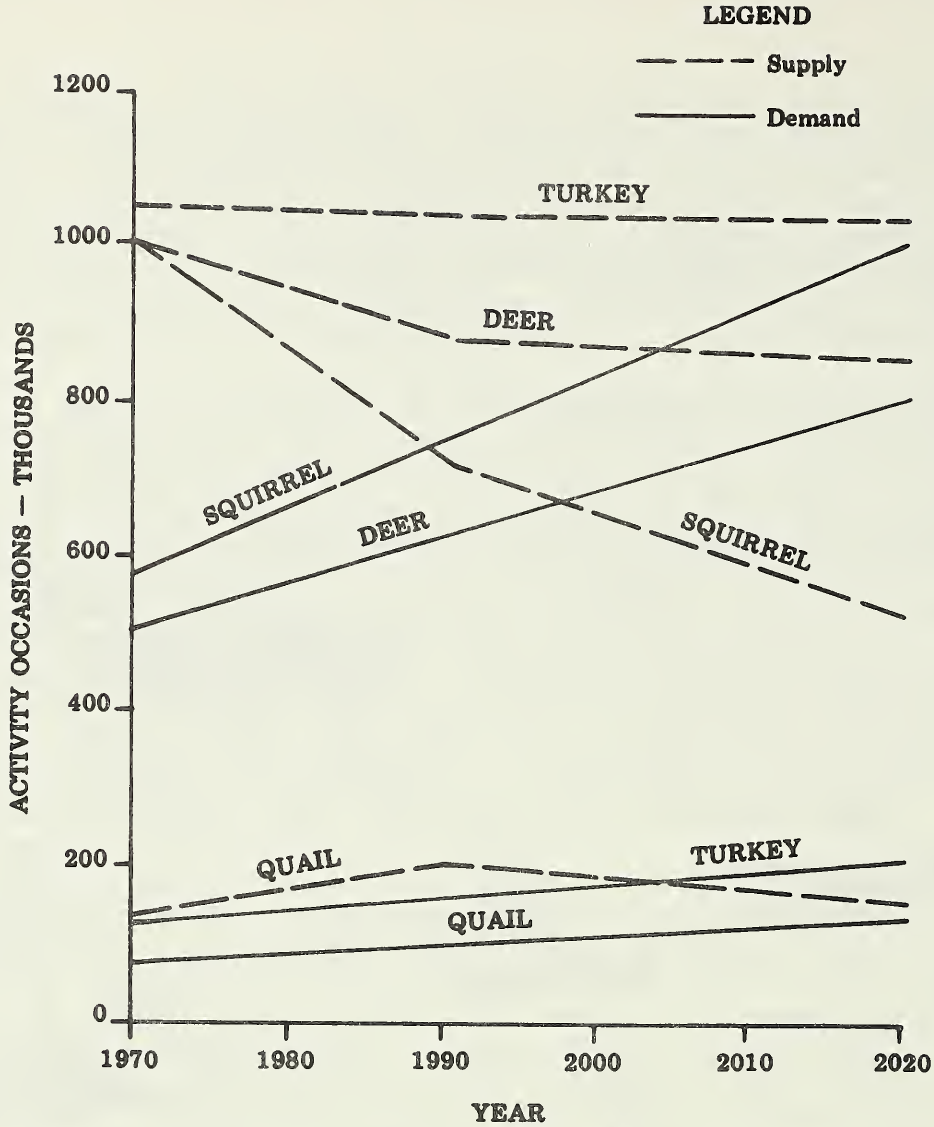


Figure 4-37 -- Supply and demand for hunting on forest lands, Alabama River Basin, 1970 to 2020.

The potential diversity of habitat for white-tailed deer is reflected by WHEP. Almost all forest types had either good or fair deer habitat (see figure 4-38). The oak-hickory and bottom land hardwood sites rate highest. Most of the oak-pine and loblolly-shortleaf types rate fair. Longleaf-slash types are poor deer habitat, probably because of insufficient data.

Gray squirrel habitat (see figure 4-39) is best in the bottom lands and in the oak-hickory forest type. It is fair in some oak-pine stands.

Hardwood sites provide the best turkey habitat (see figure 4-40). It is best on bottom land hardwoods and on upland oak sites. Oak-pine and longleaf-slash pine stands are fair to good turkey habitat.

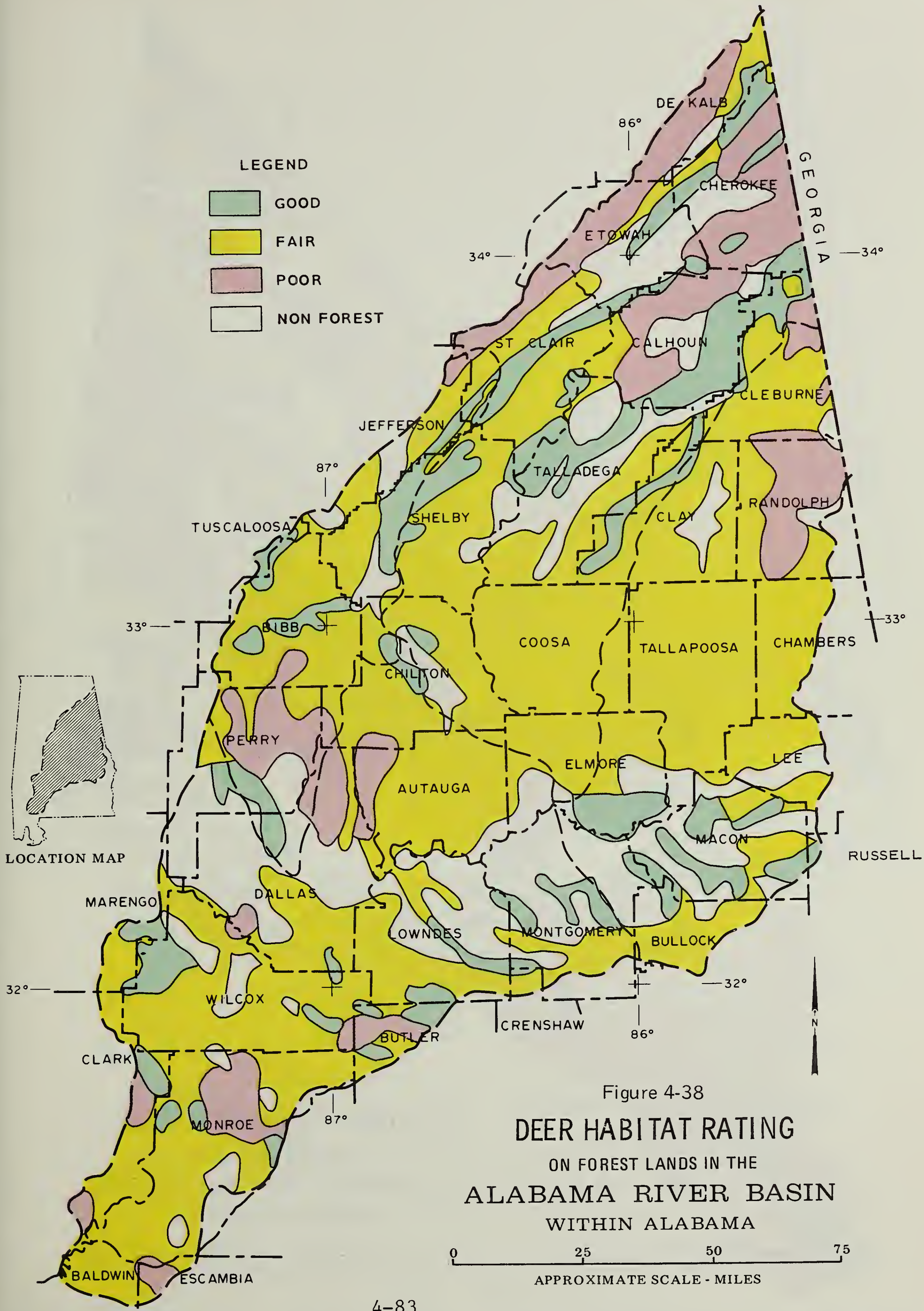


Figure 4-38

DEER HABITAT RATING
ON FOREST LANDS IN THE
ALABAMA RIVER BASIN
WITHIN ALABAMA

0 25 50 75
APPROXIMATE SCALE - MILES

SOURCE: Data compiled by U.S. Forest Service

REVISED JUNE 1976
NOVEMBER 1972

4-R-34980
BASE 4-R-32344

USDA-SCS-FORT WORTH, TEXAS 1976

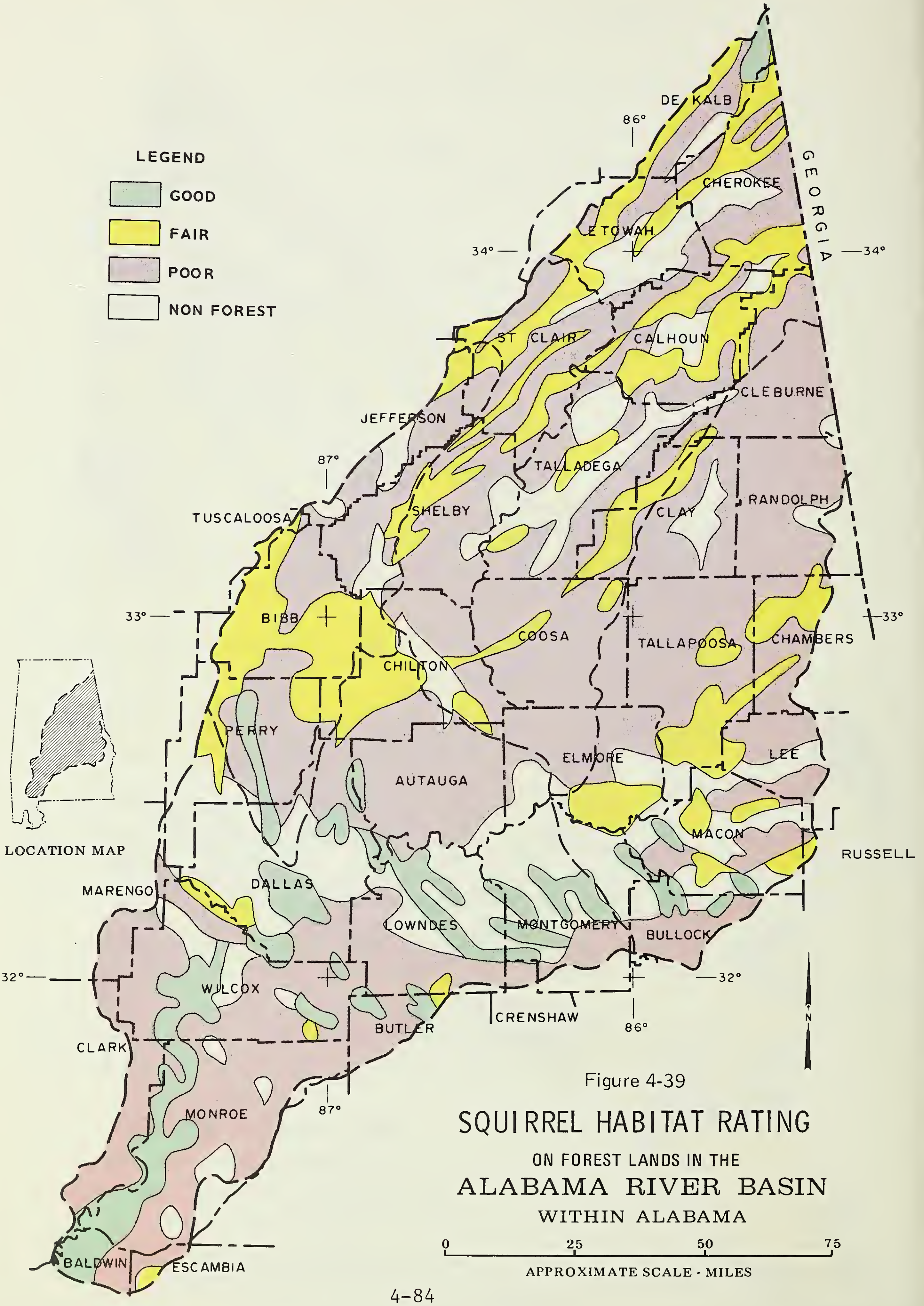


Figure 4-39

SQUIRREL HABITAT RATING

ON FOREST LANDS IN THE

ALABAMA RIVER BASIN

WITHIN ALABAMA

SOURCE: Data Compiled by U.S. Forest Service.
USDA-SCS-FORT WORTH, TEXAS 1976

REVISED JUNE 1976
NOVEMBER 1972

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BASE 4-R-32344

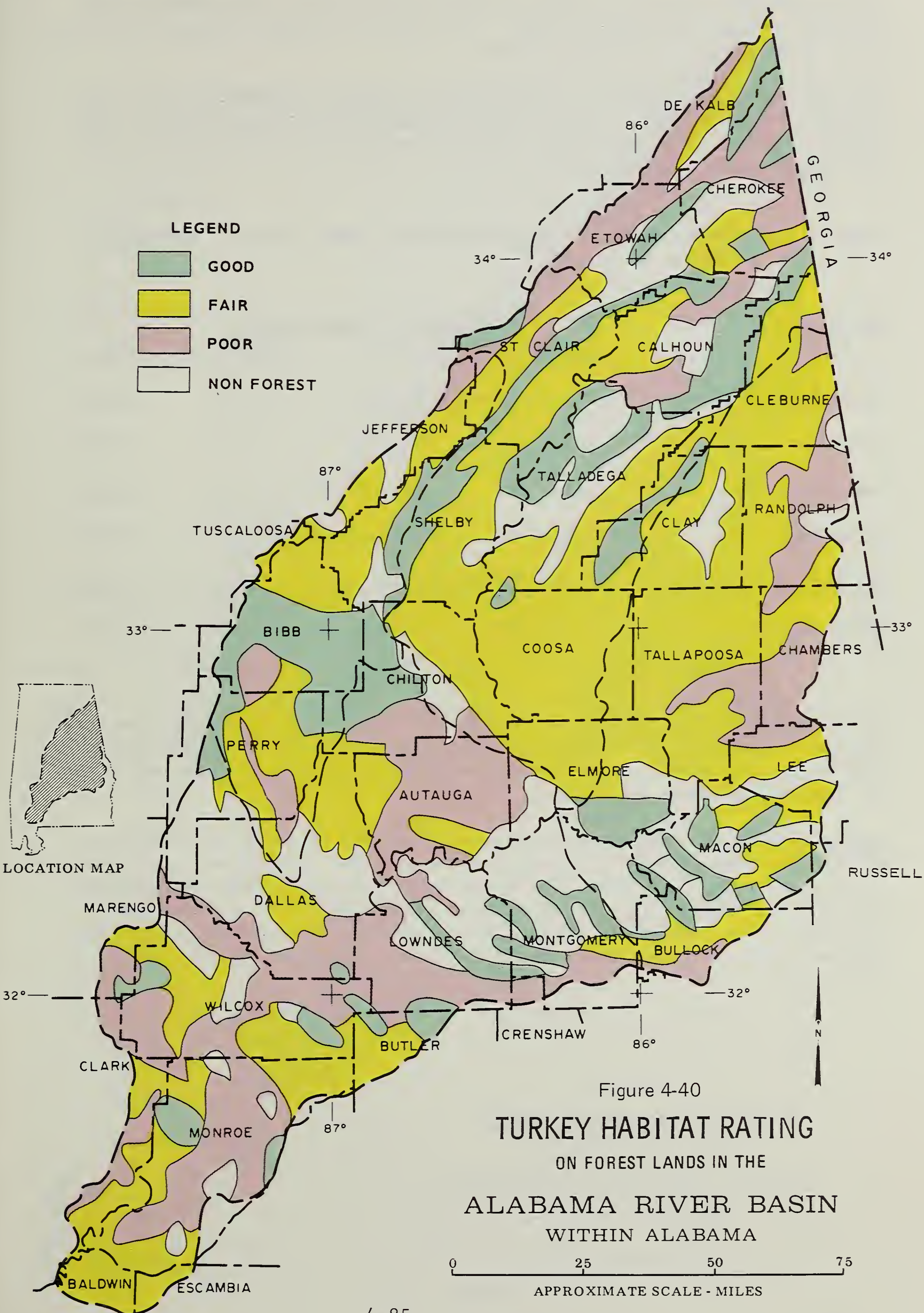

Figure 4-40

TURKEY HABITAT RATING

ON FOREST LANDS IN THE

ALABAMA RIVER BASIN

WITHIN ALABAMA

SOURCE: Data compiled by U.S. Forest Service

USDA-SCS-FORT WORTH, TEXAS 1976

REVISED JUNE 1976
NOVEMBER 1972

4-R-35021
BASE 4-R-32344

Quail habitat is best in areas of the Coastal Plain and Piedmont land resource areas (see figure 4-41). It is fair in areas adjacent to crop and pastureland in the Coosa Valley.

The population potential, as indicated by habitat evaluation, does not account for management factors such as poaching, hunting activity, and harvest. Table 4-30 lists the potential populations within the basin (see appendix 33 for details).

Table 4-30 -- Population potential of forest game species, Alabama River Basin, 1975.

MAJOR FOREST TYPES	NUMBER OF GAME ANIMALS			
	SQUIRREL	QUAIL	TURKEY	DEER
Loblolly-Shortleaf	Not Featured	351,000	26,000	50,000
Longleaf-Slash	Not Featured	50,000	3,000	3,000
Oak-Pine	246,000	121,000	22,000	41,000
Oak-Hickory	563,000	Not Featured	27,000	72,000
Bottomland Hardwood	1,463,000	Not Featured	12,000	41,000
TOTAL ANIMALS	2,272,000	522,000	90,000	207,000

Table 4-31 reflects the hunter-trips that could be supported by the population potentials. The basin could support heavy deer and turkey hunting. Additional quail and squirrel hunting would also be available if these populations existed.

Numerous problems affect the management and use of wildlife resources within the basin. More and more privately owned land is being closed to public hunting. Reasons for this closure include increased hunting activity and realization by landowners that wildlife is a valuable resource. Deer and a few other species are heavily hunted, still other species such as the opossum, woodcock, and snipe, are hunted relatively little.

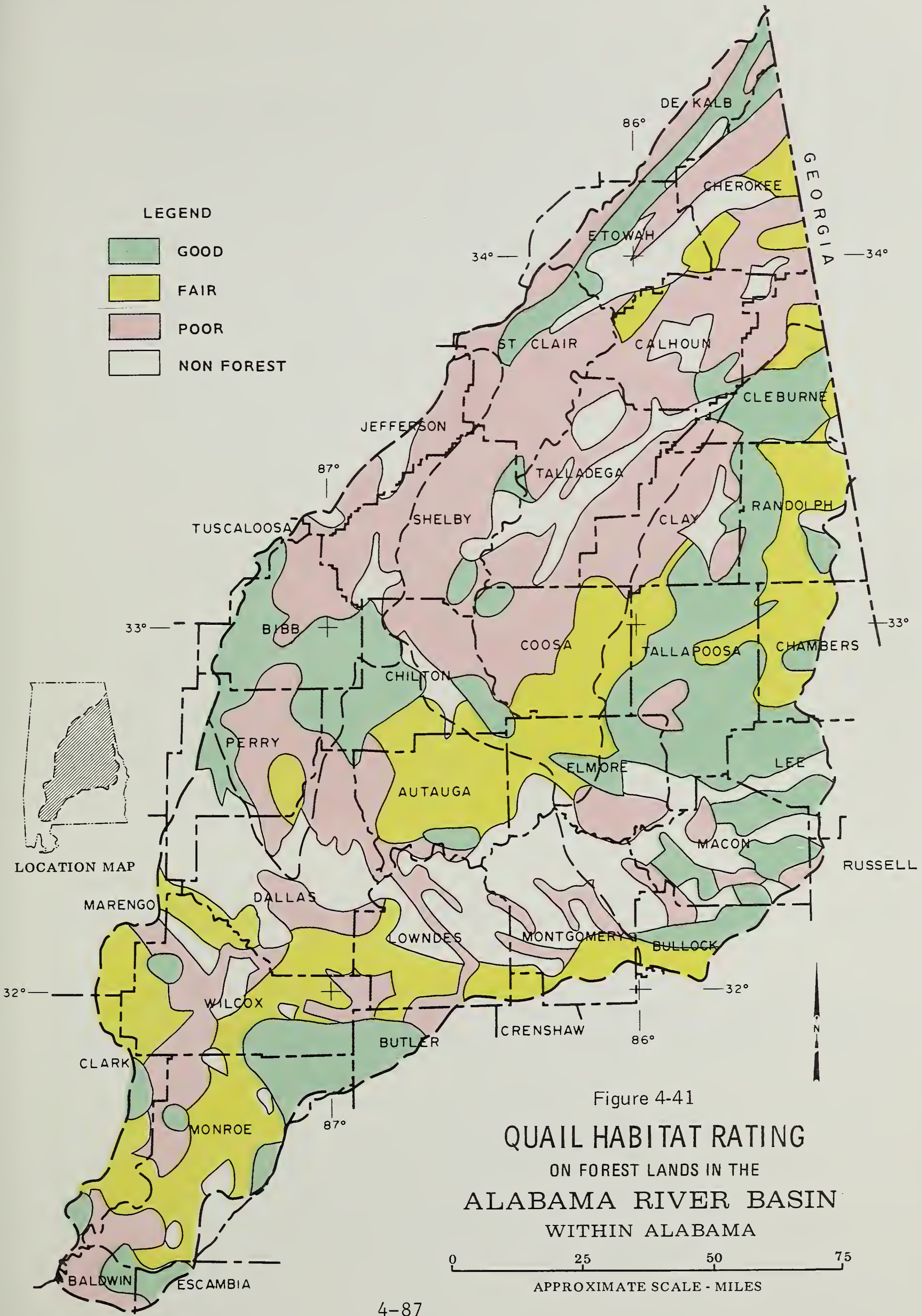

Figure 4-41

QUAIL HABITAT RATING
ON FOREST LANDS IN THE
ALABAMA RIVER BASIN
WITHIN ALABAMA

0 25 50 75
APPROXIMATE SCALE - MILES

SOURCE: Data compiled by U.S. Forest Service

REVISED JUNE 1976
NOVEMBER 1972

4-R-34979
BASE 4-R-32344

USDA-SCS-FORT WORTH, TEXAS 1976

Table 4-31 -- Potential hunting trips for forest game, Alabama River Basin, 1972.

MAJOR FOREST TYPES	HUNTING TRIPS			
	SQUIRREL	QUAIL	TURKEY	DEER
Loblolly-Shortleaf	Not Featured	84,000	412,000	249,000
Longleaf-Slash	Not Featured	16,800	44,000	13,500
Oak-Pine	122,000	38,400	344,000	204,000
Oak-Hickory	252,000	Not Featured	436,000	363,000
Bottomland Hdws.	656,000	Not Featured	184,000	202,500
TOTAL	1,020,000	139,200	1,420,000	1,032,000

Obviously, the problem is to stimulate public interest in the sporting qualities of some of the less important species.

Illegal hunting and poaching are problems in many counties. Illegal hunting appears to be the limiting factor on big-game populations in several areas.

Although Alabama is not in a direct migration route, thousands of waterfowl pass through the state each year from both the Atlantic and the Mississippi flyways. In the basin, are many acres of streams, lakes, reservoirs, and beaver ponds with some waterfowl potential. The basin contains neither a waterfowl refuge nor a waterfowl management area; and most of the wetland habitat receives little, if any, management from private, state, or federal sources. The location of a potential waterfowl management area in the Alabama Subbasin is discussed in Volume II (Alternative Plans).

Figure 4-42 summarizes the potential in each county for developing hunting areas as recreational enterprises. generally, the basin has a high potential for developing hunting areas for both big game and small game. It has a low potential for developing hunting areas for waterfowl.

Beaver control seems to be the most prevalent wildlife problem in the river basin. There is no doubt that the beaver population needs close regulation even where beaver ponds are managed for either waterfowl or fish

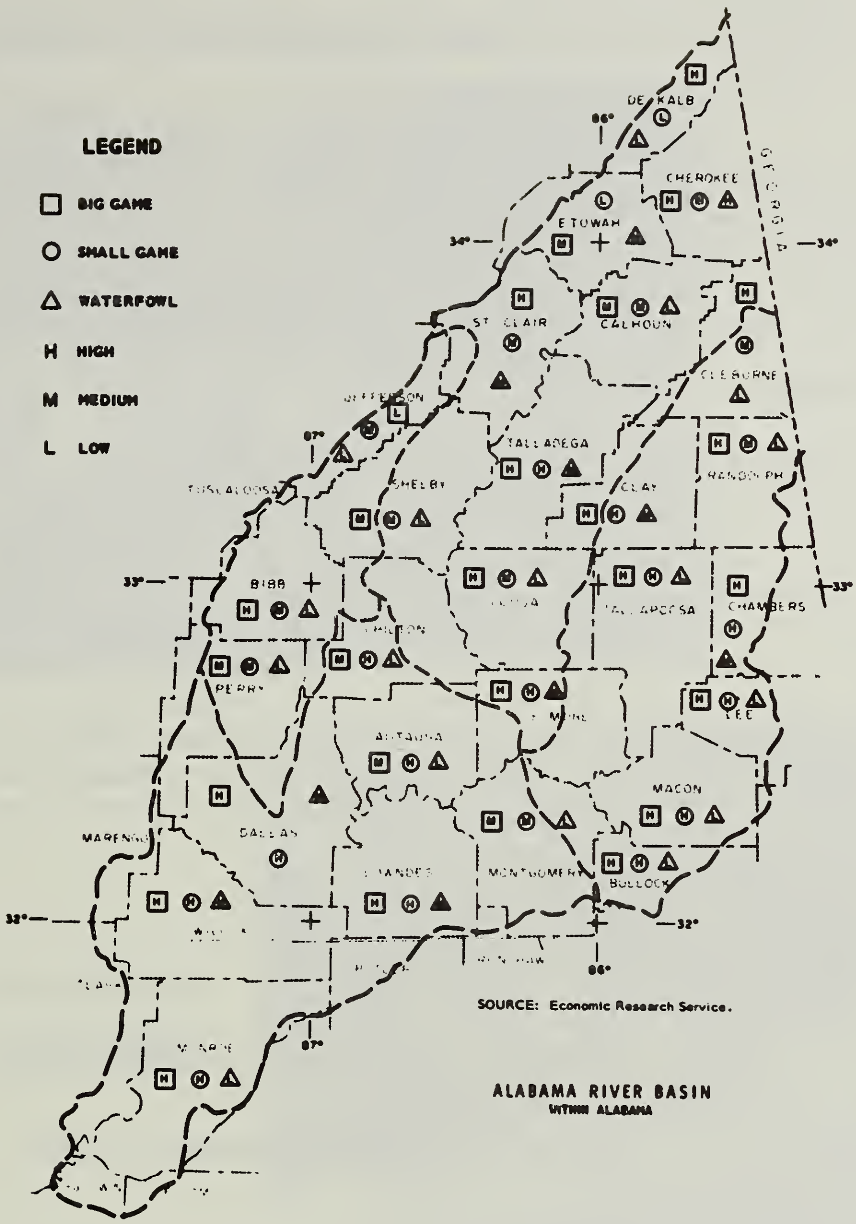

Figure 4-42 -- Potential for developing hunting areas, Alabama River Basin.

however, authorities agree that beaver eradication must be avoided. Although most beaver damage occurs on areas with inferior, second-growth hardwood of rather low value, substantial losses of raw materials are occurring on the estimated 40,000 acres of forest lands that are flooded by beaver ponds.

Table 35 in the Appendix shows the results of an aerial survey that was conducted of beaver ponds in 1967. Nine counties were chosen at random, beaver ponds were counted on all waterways, and the data were expanded for all counties in the State.

Trapping appears to be the most reliable and least costly method of beaver control, although chemical control is being tested at some research stations. According to information collected during the 1973-1974 trapping season, 16 trappers caught 1,792 beaver in 560 trapping days. The value of the catch, including fur and beaver carcasses, averaged about $1,500 per trapper. There are approximately 600 trappers in the State.

Waste Disposal Problems

Confined Livestock Operations -- A potential land use or environmental quality problem is pointed out by the 1972 inventory of confined livestock operations and their waste handling facilities. Figure 4-43 summarizes the results of the confined livestock inventory for the total basin and each subbasin. According to the survey, 301 operators had approximately 75,890 hogs, dairy cattle, and beef cattle confined. This varied from about 6,000 animals in the Cahaba Subbasin to 40,000 animals in the Alabama Subbasin. The percentage of operations with some type of waste treatment facility ranged from 50 percent in the Alabama Subbasin to 86 percent in the Cahaba Subbasin. An evaluation of the adequacy of the facilities or the efficiency of the treatment was not a part of this inventory.

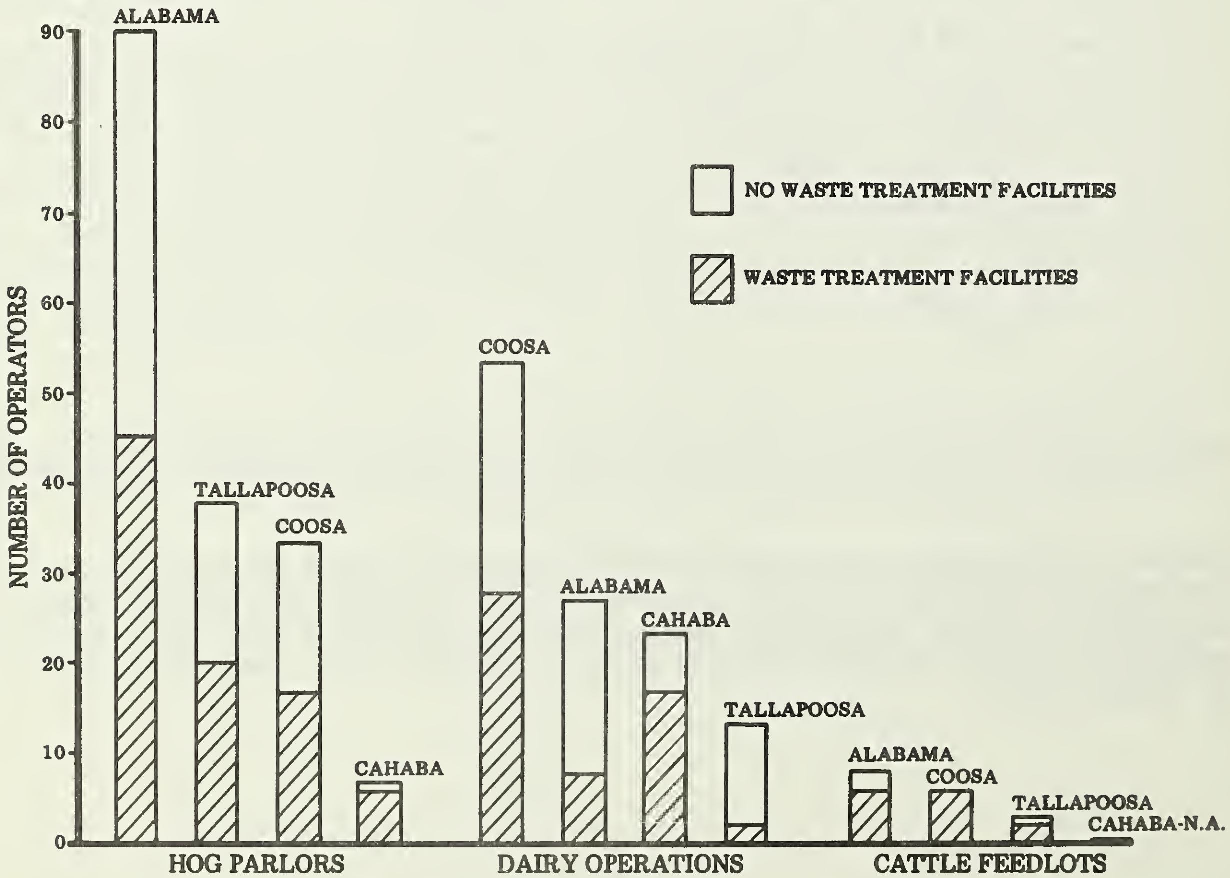

Figure 4-43 - Confined livestock operations by type and subbasin, Alabama River Basin, 1972.

Waste disposal problems vary from . . .

open dumps,

to sanitary land fills,

and livestock waste lagoons.

Information gathered concerning confined livestock includes pertinent data on (1) all beef cattle feedlots where 100 animals or more are kept in continuous confinement, (2) all hog parlors, (3) all dairy operations where cows are kept in continuous confinement, (4) and all dairy operations milking more than 100 cows.

Large concentrations of animals have greatly magnified the problems of handling wastes, including health hazards and aesthetic nuisances. Economic studies indicate that the costs of handling manures make them no longer competitive in price with chemical fertilizers.

Approximately 168 hog parlor operators were housing 51,330 hogs in the Alabama River Basin.

Seventeen beef cattle feedlots were inventoried in the basin, 8 were in the Alabama Subbasin, 6 in the Coosa Subbasin and 3 in the Tallapoosa Subbasin. Only 3 of 17 beef cattle feedlots inventoried did not have waste facilities. For more detail information see appendix table 36.

As shown in table 4-32, the total solid waste production of the confined animals was estimated as exceeding 280,000 tons annually. More than half of the solid waste is generated by dairy cows. Using an average population equivalent factor from several sources, the 75,890 confined animals inventoried in this report would produce wastes equivalent to a human population of approximately 500,000.

Table 4-32 -- Production of wastes by confined livestock, Alabama River Basin, 1972.

LIVESTOCK	POPULATION	TOTAL PRODUCTION OF SOLID WASTE 1/	TOTAL PRODUCTION OF LIQUID WASTE 1/
	Thousands	---------Thousands tons/year------------	
Beef cattle	8	75.2	29.1
Hogs	51	55.1	32.7
Dairy cattle	16	150.4	58.4
TOTAL	75	280.7	120.2

1/ Source: "Wastes in Relation to Agriculture and Forestry", USDA, Miscellaneous Publication No. 1065.

In April 1975, an inventory of animal waste treatment facilities permitted in the Alabama River Basin by the Alabama Water Improvement

Commission was examined. A field check of these facilities was made to establish the actual number of the facilities that had been constructed. The results of this study are presented in table 4-33 below and in appendix table 36A.

Table 4-33 -- Animal waste stabilization basins, by subbasins, Alabama River Basin, April 1975.

SUBBASIN	PERMITTED AND CONSTRUCTED 1/ NO. OF FACILITIES-NO. OF ANIMALS			PERMITTED 2/ NO. OF FACILITIES-NO. OF ANIMALS		
	Hogs	Cows	Layers 3/	Hogs	Cows	Layers 3/
Alabama	27- 9,950	8-2,580	-	8-1,520	4- 425	-
Cahaba	4- 1,323	2- 350	-	2- 268	1- 150	-
Coosa	40-10,730	1-1,290	11-273,350	22-3,906	3- 240	14-264,000
Tallapoosa	10- 3,022	6-1,105	3- 93,000	8- 431	5-2,200	1- 95,000
TOTAL	88-25,025	25-5,325	14-366,350	40-6,125	13-3,015	15-359,000

1/ Number of facilities having a permit from the Alabama Water Improvement Commission (AWIC) and constructed before April 1975. Field check by Soil Conservation Service.
2/ Number of locations permitted by AWIC but not constructed by April 1975.
3/ Laying hens in egg producing operations.

Solid Waste Disposal Systems--A survey of the status of solid waste disposal systems (collected by the Soil Conservation Service in November 1972) indicated that 64 percent of the counties within the basin meet the requirements for the collection and disposal of solid wastes set forth by the Division of Solid Waste, State Department of Public Health. Considerable improvement has been made in the past three years.

According to data provided by the Division of Solid Waste in May 1975, the primary solid waste disposal problem areas in the basin were Wilcox, Monroe, Chambers, Randolph, and Dallas Counties and progress was being made by local officials in each of these counties. Wilcox County had an approved sanitary land fill site but no collection system. Monroe County had an approved disposal site, dumpster containers, and a truck on order. Chambers, Randolph, and Dallas Counties did not have organized collection systems that serve the entire county.

There is an abundance of suitable land in the basin to meet future requirements for commercial and residential solid waste disposal. The primary problem is a need for public industrial solid waste disposal sites. Three sites, each ranging in size from 50 to 100 acres would meet the current and immediate future needs of the entire state. The most suitable area for these sites is in the Blackland Prairies Land Resource area in central Alabama. Much of this area is within the basin. State legislation regulating the disposal of hazardous industrial wastes and authorizing studies in the area of solid waste reclamation are also needed.

The rating of existing solid waste disposal areas as of May 1975 is shown in figure 4-44. This rating is conducted periodically and it reflects current conditions; therefore, the rating could be temporary. A rating system which measures various factors relating to the collection and disposal of solid waste is used as the basic criteria for determining the approval of a waste disposal system. However, the minimum state standards for a land disposal site require that; (1) no burning of refuse be permitted, (2) refuse be compacted and covered daily as used, (3) no pollution of ground or surface water occurs, (4) all hazardous waste such as pesticide containers be properly managed.

Other information concerning solid waste collection and disposal systems is contained in table 4-34. This information represents the status of each county system as of May 1975, and was developed from information provided by the Division of Solid Waste, State Department of Public Health. The acceptability of disposal area operation is temporary in nature and unacceptable disposal areas can often be brought up to standards with a minimum of effort. Detailed information on the requirements of an approved county-wide solid waste system may be obtained from the State Department of Public Health--Division of Solid Waste.

Visual Resource

The visual resource is defined as the scenic quality of the landscape. The visual resource of the basin varies from piney flatwoods of the Southern Coastal Plain to mountains of the Southern Appalachian Ridges and Valleys. Critical visual resource areas that should be preserved or enhanced are shown in figure 4-45.

The visual aspects of vegetation manipulation within these areas warrant particular attention. They are viewed by the recreating and traveling public and often provide their only impression of the region. Areas that are adjacent to water and in mountainous terrain also have favorable potential for dispersed recreation development such as hiking trails, nature study, etc. Acreages within these zones are shown in table 4-35.

Table 4-34--Status of rural solid waste collection and disposal systems, Alabama River Basin, May 1975. 1/

	TYPE OF COLLECTION			COLLECTION SYSTEM OPERATED BY			LAND FILL STATUS MAY 1975		DISPOSAL SYSTEM MGMT.			COMMENTS
	Container	Mailbox	Bag System	County	Private	Franchised	Acceptable	Substandard	County	City	Private	
Autauga	X			X			1			X		
Baldwin		X				X	3		1	1	1	
Bibb		X		X				1	X			
Blount		X				X	1		X			
Butler		X				X	2		X			Basin residents use Greenville area
Calhoun	X					X	3		2		1	Collection by contract
Chambers		X					1		X			Collection being organized 5/75
Cherokee	X			X			2		1	1		
Chilton	X			X			1		X			
Clarke		X		X			1	1	1	1		Thomasville sub-standard 5/75
Clay	X			X			1		X			
Cleburne	X			X			1		X			
Coosa	X			X			1		X			
Crenshaw		X				X	1		X			
Dallas		X					3	1	3	1		No organized collection 5/75
Dekalb		X				X	2	1		2	1	
Elmore	X			X			1	2	2	1		
Escambia		X				X	2		X			
Etowah	X	X				X	3		1	1	1	County containers phasing out 5/75
Jefferson		X				X	12	4	7	8	1	All County areas acceptable 5/75
Lee	X	X				X	2		1	1		
Lowndes		X		X			1		X			
Macon	X			X			1		X			
Marengo			X	X	X			1	X			
Monroe							1		X			Collection not underway 5/75
Montgomery		X				X	3		1	2		
Perry	X			X				1	X			
Randolph		X			X		1	1	1	1		Collection needs upgrading 5/75
Russell		X		X			1				X	
St. Clair		X				X	1				X	
Shelby		X				X	3		X			
Talladega		X		X			2	2	3	1		Munford & Odena sites unacceptable 5/75
Tallapoosa	X			X			3		2	1		
Tuscaloosa	X			X			1		X			
Wilcox												No collection, landfill being implemented 5/75

1/ Source: Solid Waste Division of the Alabama Department of Public Health.

The visual impacts of forest management and other vegetative manipulation, particularly along waterways and travel corridors are often negative. Mountainous areas should be given special attention since the height permits the landscape to be seen from longer distances. This, once again, will cause increased costs for wood and fiber production.

Table 4-35 -- Estimated acreage requiring visual resource management considerations, Alabama River Basin, 1972.

TYPE AREA	ACREAGE
Travel corridor	18,500
Water corridor	18,500
Terrain features	151,000
TOTAL ACRES	188,000

Potential scenic rivers and streams are shown in figure 4-46. Little River is designated a state scenic river under Act No. 465 (Regular Session, 1969). The Cahaba River is now under consideration for possible designation as a national scenic river. Others are proposed for state wild and scenic river status in the Statewide Comprehensive Outdoor Recreation Plan.

Preservation of Historical, Archaeological, and Scenic Sites

There is increased public interest in Alabama and the basin in the preservation of historical, archaeological and scenic sites, much of which can be attributed to the efforts of local historical and archaelogical societies and the Alabama Historical Commission. Identification of those sites by this agency, other state agencies, and the Regional Planning and Development Commissions has resulted in more public awareness on the part of state and basin citizens.

As mentioned in Chapter 2, a list of sites of interest that should be considered for preservation is contained in appendix table 20. A more comprehensive list can be obtained from the Alabama Historical Commission, 725 Monroe Street, Montgomery, Alabama 36104. Persons or organizations interested in site acquisition for preservation purposes should examine

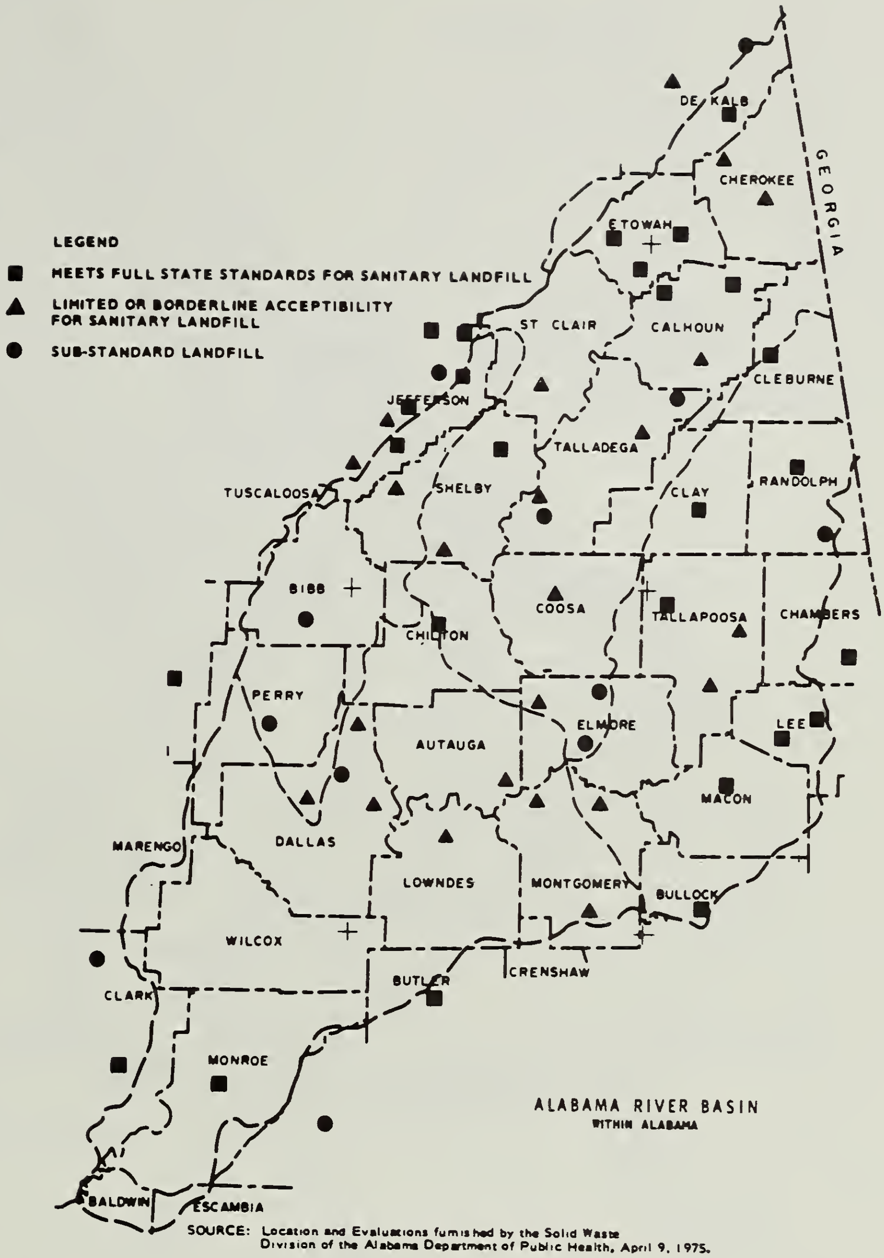

Figure 4-44 -- Location and evaluation of solid waste disposal areas, Alabama River Basin, 1975.

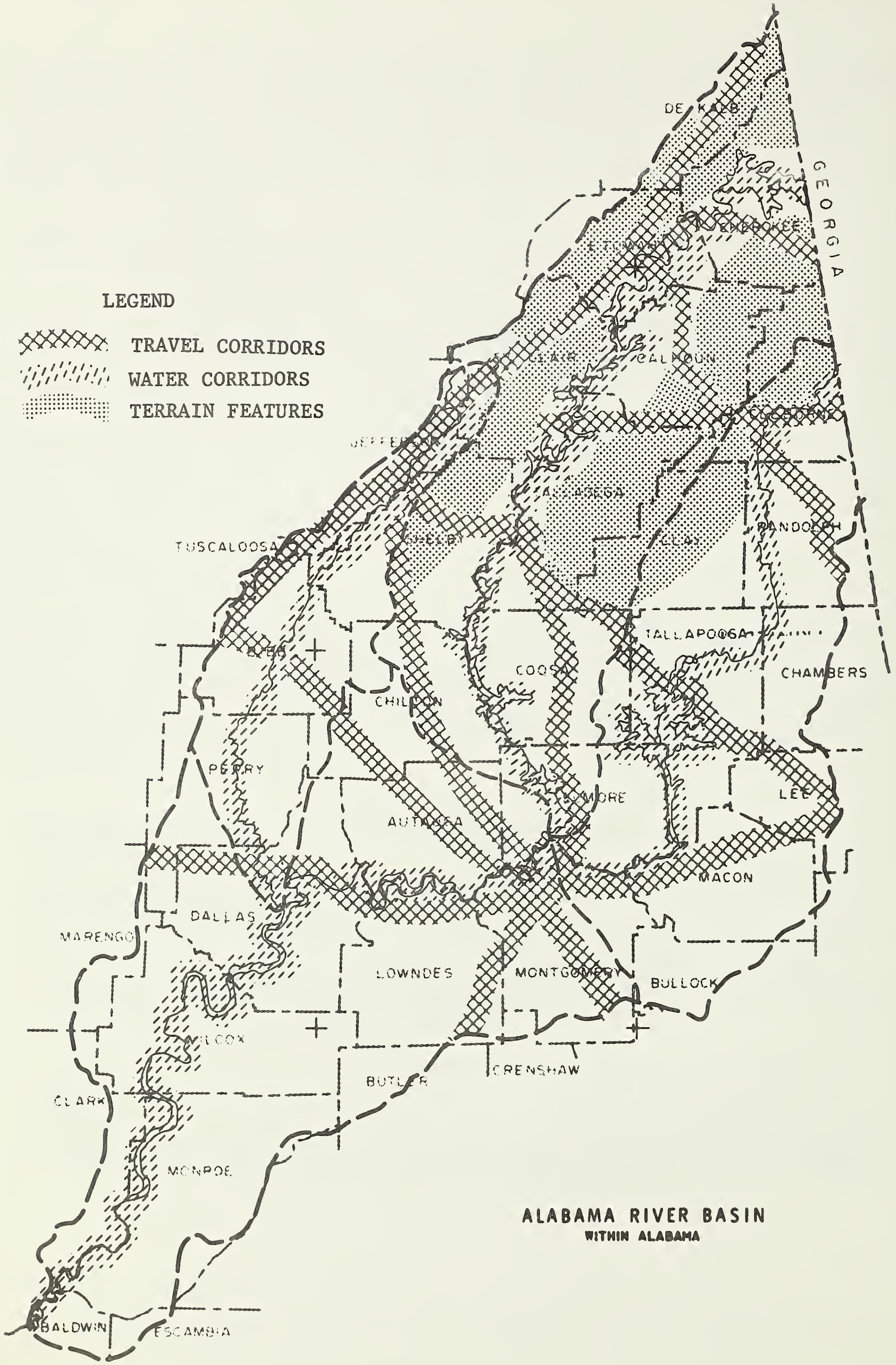

Figure 4-45 -- Critical visual resource areas in the Alabama River Basin, 1972.

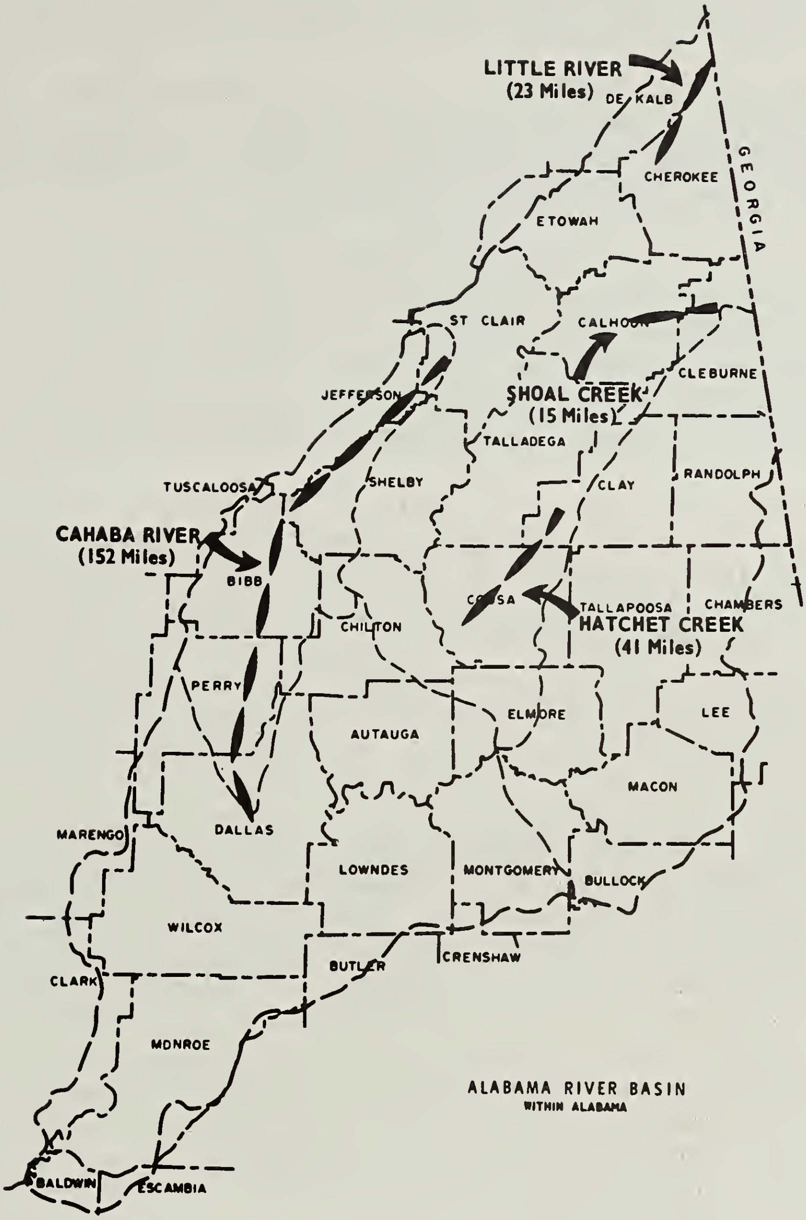

Figure 4-46 -- Potential wild and scenic rivers, 1/ Alabama River Basin 1971.

1/ Alabama Statewide Comprehensive Outdoor Recreation Plan all possible sources of financial assistance as funds are available through various local, state and federal agencies and programs.

Two recent examples of co-operative efforts to preserve the rich heritage of the basin are the re-creation of Fort Toulouse in Elmore County and the effort being directed toward the designation of the Bartram Trail as an official trail under the National Trails Act.

Fort Toulouse, built in 1714, at the junction of the Coosa and Tallapoosa Rivers, is one of the most significant sites in the basin. It was at this site that William Weatherford, the Red Eagle, surrendered to General Andrew Jackson to end the Creek War. The fort is being re-created in authenic fashion under direction of the Alabama Historical Commission and with the expert assistance of competent archaeologists.

The effort to obtain official recognition of the Bartram Trail is a six-state effort and is being actively supported by numerous organizations. Interest in designation of the route travelled by Bartram, as a National Scenic and Historic Trail, approximately 215 miles in the state, has gained momentum since the passage of the National Scenic and Historic Trails Act of 1968, (see appendix 21). State and Federal legislation has been introduced on several occasions to further this cause. Federal legislation, H. R. 1524, was introduced in the U. S. House of Representatives, 94th Congress, 1st Session, on January 16, 1975 to provide for a feasibility study by the Secretary of the Interior. The effort to obtain official designation of this historic trail has accelerated since more than 90 trail enthusiasts from eight states convened in Montgomery on November 3-4, 1975 for the Bartram Trail Southeastern Conference, and mapped strategy for development of the route as a National Scenic Trail for Hiking. A detailed course of action is in the process of being formulated by leaders within each state, however, the majority of those attending the workshop agreed that legislation should be sought for a federally-funded Regional Bartram Trail Commission to conduct a feasibility study of the proposed trail. If such a trail were deemed practical, an amendment to the National Trails Act would make possible development of the Bartram Trail within the National Scenic Trails System.

Recent developments in this trail recognition effort include the dedication on April 24, 1976, of the one-mile stretch through the Tuskegee National Forest and the dedication of the Bartram State Canoe Trail on March 6, 1976. The canoe trail is the State's first officially recognized trail and the only official canoe trail in the Southeast to pinpoint the route of 18th Century naturalist-artist William Bartram.

The Alabama Historical Commission owns a 5-acre site at Ft. Mims on the Alabama River at the extreme lower end of the basin and an additional 25 acres is needed prior to initiation of a restoration effort. Research is in progress at this site.

The Historical Commission owns a portion of the area known as Old Cahaba (the location of the first state capitol) at the mouth of the Cahaba River. This is considered a prime historical site in the basin but plans for restoration have not been developed.

Other current projects include the John Morgan House in Selma, the Scott-Yarbrough House in Auburn, the William Knox House in Montgomery, the First Presbyterian Church in Lownesboro, the Wilcox Female Seminary in Camden, the Francis Museum in Jacksonville, the Union Railway Station in Montgomery, and the Confederate Memorial Cemetery at Mountain Creek in Chilton County.

The future acquisition of additional historic or archaeological sites by the Alabama Historical Commission will be limited by the availability of funds. The degree of protection provided the abundance of sites in the basin will depend largely on the interest and resources of local units of government, citizens groups, and individuals. The above projects can be expected to ignite interest on the part of other organizations and individuals in the preservation of other significant sites in the basin.

Acquisition, operation and maintenance expenditures for historic and archaeological sites will increase tremendously as public use and awareness of the cultural resource broadens. The resultant wear and tear will necessitate higher expenditures especially considering that many of the materials and skills necessary for preserving older structures are already scarce and will become more so.

According to the Alabama Historical Commission, by 1990 the protection and preservation of archaeological and historic sites statewide will require 250 employees, $20,000,000 annually in capital outlay expenditures and $15,000,000 annually for maintenance expenditures. Admission fees will be charged at some sites such as Fort Mims and Fort Toulouse to offset total costs.

CHAPTER 5

COMPONENT NEEDS

SUMMARY OF COMPONENT NEEDS

The study results indicate projected increases in demand for food, feed and fiber from agricultural land can be met without accelerated resource development. The 1975 cropland base will not decline substantially in the future. Based on the assumptions used in this study and the potential yields utilized in the model, agricultural production is expected to equal or exceed projected demand and not provide significant component needs for increased food and fiber production. Component needs for improving use and management efficiencies of land and water resources, where problems have been identified, serve as the basis for alternative plan formulation.

Based on the comprehensive water and related land resources inventory of the basin presented in Chapter 2 and the problems and needs identified in Chapter 4, component needs were developed as shown in table 5-1.

Those component needs most likely to be applicable in achieving the national economic development objective have been identified as primarily NED and shown in table 5-1. Likewise, other component needs identified as being primarily EQ in table 5-1 are basic to achieving the environmental quality objective.

Agricultural Flood Damage Reduction

The need for flood damage reduction was determined by a reconnaissance study of all watersheds within the basin. Basic data on the extent of flood problems and conditions was obtained through interviews with watershed landowners and Soil Conservation Service field office personnel, and from published reports. Detailed information on the extent of the flooding problem can be found in Appendix tables 25D and 25E. The study revealed a flood problem on 861,000 acres of flood plain. Public Law 566 and Resource Conservation and Development projects (RC&D) for flood control in place or expected to be installed by 1990 would provide protection on about 86,000 acres which were therefore deducted from the total. In addition, there are 572,000 acres of forest in the flood plain where flood damages are insignificant. 1/ This area was also deducted leaving a net of 203,000 acres (49,000 acres of cropland and 154,000 acres of pastureland) needing flood damage reduction by 1990.

1/ Minor flood problems may exist on small areas of forest in the flood plain.

Table 5-1 -- Specific components of major objectives and component needs, present and projected, Alabama River Basin, 1975

SPECIFIC COMPONENTS	COMPONENT NEEDS	UNITS	QUANTITY PRESENT	1990	2020
PRIMARILY NED					
1. Increased or more efficient output of food and fiber.					
a. Improved efficiency of production and resulting agricultural income	Flood reduction--agricultural land	Thous. acres	239	203	203
	Erosion damage reduction				
	Cropland and pastureland	Thous. acres	2,172	2,053	2,073
		Thous. tons	9,198	6,255	9,533
	Increased drainage - on farm	Thous. acres	169	170	202
	Improved production efficiency				
	Cropland	Thous. acres	738	614	591
	Pastureland	Thous. acres	603	1,024	1,473
b. Increased forest production and utilization	Increased forest production	Mil.cu.ft./yr.	0	0	82.0
	Reduction of fire losses	Ac./yr.	7,429	7,429	6,845
	Increased forest grazing	Mil.lbs./yr.	47.0	19.2	15.7
2. Urban flood damage reduction	Urban damage reduction	No. of comm.	80	90	110
3. Increased and more efficient production of agricultural, municipal, and domestic water supply	Create additional surface water supply	MGD	6	25	71

Table 5-1 -- cont'd

SPECIFIC COMPONENTS	COMPONENT NEEDS	UNITS	QUANTITY PRESENT	1990	2020
4. Increased output of outdoor recreation opportunities.	Increased recreation activities				
	Boating	Thou. ac. of water	0	2.8	38
	Water skiing	Thou. ac. of water	0	1.1	4
	Fishing	Thou. ac. of water	25	36	69
	Hunting	Thou. ac. of water	58	176	457
	Swimming	Mil. act. occas./yr.	2.0	11.9	29.0
	Camping	Mil. act. occas./yr	0.4	0.7	5.2
	Hiking	Miles of trails	78	400	950
	Picnicking	No. of tables	285	2,900	6,000
	Golfing	Thou. ac. of land	0	4.8	17.4
		No. of 18-hole courses	0	32	116
PRIMARILY EQ					
5. Improved quality aspects of water, land and air					
a. Improved waste disposal	Solid waste disposal improvement	Industrial waste disposal (ac.)	100	200	400
b. Improved stream water quality	Low quality streams improvement	Flow (cfs)	231.5	231.5	231.5
c. Reduction in sedimentation	Reduction in total sediment	Mil. tons/yr.	14.1	14.7	16.4
d. Reduction in point source erosion	Critical erosion reduction				
	Streambanks	Thous. acres	21.0	21.0	21.0
		Thous. tons	777	777	777
	Roadside erosion	Thous. acres	2.0	2.3	2.3
		Thous. tons	390	449	449
	Critical areas	Thous. acres	115.0	113.0	117.0
		Thous. tons	10,225	10,735	11,115
	Strip mine reclamation	Thous. acres	12.7	15.3	15.3
		Thous. tons	1,842	2,219	2,219
e. Reduction in "disturbed" forest erosion	"Disturbed" forest erosion reduction	Thous. acres	60	74	114
		Thous. tons	12,187	17,888	23,331

Table 5-1 -- cont'd

SPECIFIC COMPONENTS	COMPONENT NEEDS	UNITS	QUANTITY PRESENT	1990	2020
6. Improvement, protection and/or preservation of areas of natural beauty for man's enjoyment.					
a. Protection of and increased access to scenic areas	Scenic streams	Miles	420	300	350
	Natural scenic sites	Numbers	130	90	75
7. Enhancement or preservation of biological resources					
a. Improved quality and increased quantity of fish and wildlife habitat	Fish & wildlife habitat improvement				
	Upland habitat	Thous. acres	100	150	220
	Wetland habitat	Thous. acres	18	25	40
	Improved management	Thous. acres	7	8	10
	Stream improvement	Thous. acres	4	3	5
b. Protection of rare and endangered species of flora and fauna	Protection of flora & fauna				
	Flora	No. of species	26	40	50
	Fauna	No. of species	40	50	62
8. Preservation of archaeological and historical resources	Protection of archaeological and historical sites				
	Archaeological sites	No. of sites 1/	120	110	100
	Historical sites	No. of sites 1/	255	200	180

1/ Based on recognized sites.

No flood control projects were identified for installation under future without accelerated resource development after 1990 therefore the 2020 needs would remain at 203,000 acres.

Erosion Reduction

Needs for cropland and pastureland were projected for the years 1990 and 2020. These projections assumed a continuing trend toward efficient agricultural land use allocation throughout the state. In 1970, 2,600,000 acres of the basin were devoted to cropland or pastureland uses. Total projected acreage of these uses is estimated to be 2,806,000 in 1990 and 2,874,000 in 2020 (see table 4-4).

Present erosion is estimated to be 65.2 million tons per year; 19.6 million tons from sheet erosion of crop and pasture lands; 27.1 million tons from forest land and 18.5 million tons from other sources (see also Reduction in Critical Erosion and Reduction in "Disturbed" Forest Land Erosion).

Treatment accomplishments to reduce erosion to the standard set by (SCS) Technical Guides for Alabama show going programs and planned projects can provide adequate treatment on 753,000 acres by 1990. This acreage was deducted from 2,806,000 to obtain a net treatment need of 2,053,000 acres for 1990. Net needs for 2020 were determined in a similar manner.

Erosion damage reduction needs may be expressed in number of acres that are eroding at excessive rates or in tons of excessive erosion. Either expression is based on the concept that each soil has a tolerance ("T") for some erosion and erosion in excess of that tolerance will be mining the resource base.* Areas that are eroding at rates of "T" or less can sustain crop yields and, conversely, areas that are eroding at rates in excess of "T" should be used differently or treated for erosion control in order to restore or maintain the resource base. Cropland and pastureland soil in the basin have "T" values averaging 4 tons per acre per year.

Erosion reduction needs were quantified by expressing the amount of total erosion in excess of the tolerance of the land use base. Net erosion reduction needs were determined by comparing "T" erosion with the projected erosion; the excess being the reduction need.

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* Soil loss tolerance ("T") is the estimated maximum average soil loss that can be tolerated and still achieve the degree of conservation needed for sustained, economical production in the foreseeable future. These rates are expressed in tons of soil loss per acre per year. Rates of 1 through 5 tons are used in Alabama, depending upon soil properties, soil depth, and prior erosion.

Erosion projections for 1990 indicate that 2,806,000 acres of cropland and pastureland can tolerate 11 million tons of erosion annually, but will be losing 17.5 million tons; 2,874,000 acres can tolerate 11.5 million tons but will be losing 21.0 million tons by 2020.

Agricultural Drainage

Drainage is needed on 32,000 acres of cropland and 137,000 acres of pastureland to provide orderly removal of excess water and improve production efficiency if the full agricultural potential is to be realized. This land is characterized by being periodically submerged or by having a constant or occasional high water table. Provisions for adequate drainage must be made before other needed conservation practices can be applied successfully.

An analysis of existing programs indicated they are adequate to satisfy the recurring needs. After considering the land use projections, the drainage needs for cropland and pastureland will be 36,000 and 134,000 acres respectively by 1990 and 33,000 and 169,000 acres by 2020 respectively.

Production Efficiency

All evidence points to a continuation of improvements in crop and pasture yields, as well as continued emphasis on improving production technology. Land Grant Institutions and commercial agricultural interests are strengthening their efforts toward this goal. This study assumes a continuation of these efforts.

Projections indicate that even without accelerated water resource development, the state and study area should have little problem in producing at the levels projected for 1990 and 2020 (see table 4-3). Studies indicate a continuation of the trend to less cropland harvested. In short, land and water resource scarcities for agricultural production are not anticipated through 2020.

In this light, it would first appear that there is little need for additional USDA action to accelerate crop production efficiency. This is probably true if the goal is simply to assure that the area can produce the output presently anticipated in future planning periods. However, this could be a costly approach. There is always a need to produce food and fiber at less cost (i.e., increase production efficiency). Demands change, and in time, the State could be called upon to greatly expand its output to satisfy increased domestic or export needs. If this occurs, even marginal agricultural land could become quite valuable. Improvements in production efficiency will release land for other productive uses and increase net income.

Table 5-1 indicates a need to improve efficiency on 1.6 million acres of crop and pastureland by 1990. This is the amount of land projected to be in production without accelerated resource development, and as such, represents a maximum acreage on which efficiency could conceivably be improved. Theoretically, the aim should be to improve efficiency on all productive land, in this case, 1.6 million acres. Realistically, however, there is little chance of this. Even so, efforts should be focused in this direction.

Increased Forest Production

Projections of timber supply and demand in the basin indicate an increase in demand from 225 million cubic feet in 1970 to 600 million cubic feet in 2020 while forest acreage is projected to decline from 7,471,000 acres to 6,862,000. By 2020, demand will exceed supply at an annual rate of 82 million cubic feet per year assuming a continuation of present trends in management. This deficit is critical to the economy of the basin.

Fortunately, supplying the deficit is within the capability of the resource, for the basin's forests growth potential is 88 cubic feet per acre per year.

Reduction of Fire Losses

Protection of the forest resource from the destructive effects of fire is an essential part of the forest land treatment program. If the watershed goal of attaining a 0.25 percent fire loss index* is to be reached by 2020, then prevention, detection, and suppression facilities, personnel, and efforts need to be strengthened throughout the basin. Currently, 7,429,000 acres of forest land need fire protection. By 1990, this need will decrease to 7,129,000 acres, and by 2020, to 6,845,000 acres as forest land acreage declines.

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* Fire loss index is the numerical expression of the percentage of acres burned in relation to total acres protected.

Increased Forest Grazing

As a result of the continuing shift of beef production from unimproved pastures and forest lands to improved pasture and feedlots, future demands allocated to forest lands will drop sharply from 59.3 million pounds of beef in 1970, to 30.6 million in 1990 and 25.6 million in 2020. As increased demands for timber rise, beef production from forest grazing will decline from 12.3 million pounds of beef in 1970 to 11.4 million in 1990, and 9.19 million by 2020.

Urban Flood Damage Reduction

The study identified 80 urban communities with existing flood problems. While the number of communities experiencing flooding can be expected to increase, many communities are presently developing flood plain management programs. This effort is expected to accelerate. The rate of development within urban flood plains is therefore expected to decrease; however, urban development in the future is expected to increase the number of communities experiencing flooding to 90 in 1990 and 110 in 2020. The extent of this problem will be influenced by increased runoff from urban development on uplands. These estimates are based on the HUD-FIA Type 21 Flood Insurance Study, July 1973 and similar data from other sources.

Water Supply

The projected water use shown in appendix table 30 uses the 1970 water use rate as a base coupled with basin population projections. The residential per capita use rate is assumed to increase 1.25 percent per year. Increased water-use efficiencies and reuse should result in very little change in industrial and commercial per capita use patterns.

Future sources of supply were estimated in cooperation with the Alabama Public Water Supply Division, Alabama Department of Public Health. The supply from impoundments, streams, wells, and purchase arrangements was considered. The areas identified as not being able to meet future needs from present sources of supply were reviewed with local community officials and planning agencies. Those areas with limited supply and available water storage sites were studied for feasibility.

Many communities will develop available wells and streams through ongoing programs to supply projected needs except where surface storage would provide the best source of additional water supply. Potential impoundment sites were studied with local representatives of the communities listed below. A total of 13 communities needing 25 MGD were identified for 1990; by 2020, 20 communities will need 71 MGD.

Table 5-2 -- Communities needing additional supply of municipal and industrial water by time frames - Alabama River Basin

Need Additional Supply By 1990	Will Need Additional Supply Between 1990-2020
Piedmont	Sterrett-Vandiver
Jacksonville	Westover
Calera	Wilsonville
Columbiana	Ashville
Margaret	Springville
Moody	Steele
Odenville	Auburn
Wedowee	
Woodland	
Ranburne	
Fruithurst	
Opelika	
Lookout Mountain (Gadsden)	

Increased Recreation

Outdoor recreational needs were quantified using methodology similar to that employed in the Statewide Comprehensive Outdoor Recreation Plan (SCORP). Primary data developed for the SCORP served as the foundation for estimation of demand (see Appendix 32). Demand determination involved resident population, preferences and participation rates for major outdoor recreation activities, and probable tourist activities within the basin.

Projected 1990 and 2020 demands were estimated for nine major outdoor recreation activities: fishing, hunting, boating, swimming, water skiing, camping, hiking, picnicking, and golfing. Current demand is for 32 million activity occasions; demand is expected to double by 1990. Demands were converted to facility needs using standards developed for the SCORP. Needs are expressed in terms of miles of trail, camp sites, beach area, etc., necessary to satisfy the anticipated demand.

An extensive survey of Alabama's recreational facilities in 1974 pinpointed the location and size of existing facilities.

All recreation projects funded for construction were also assumed to be in place. The total of existing and funded facilities were deducted from anticipated needs, leaving a complement of facilities needed for development by 1990 and 2020 (see figures 4-28 to 4-34). These needs are presented in table 5-1.

Solid Waste Disposal

As discussed on page 4-93, the development of adequate collection systems and disposal sites for residential and commercial solid wastes will be a continuous process; however, this need can be met through ongoing programs. There is a need at present and in the foreseeable future for the development and operation of cooperative waste disposal sites for hazardous solid industrial wastes. Two sites, approximately 100 acres each, will be needed within the basin by 1990 while a total of 400 acres will be needed for this purpose by 2020.

Low Quality Stream Improvement

The Alabama Water Improvement Commission has identified a number of areas along streams which have now or will have a pollution problem during periods of low streamflow. The majority of these pollution problems are a result of insufficient streamflow to transport effluent from municipal and industrial waste treatment facilities. These problem points are shown in table 4-27. Total flow in these streams should be increased approximately 230 cubic feet per second to maintain the allowable dissolved oxygen content of 5 parts per million.

Reduction in Sedimentation

The need for reduction in sedimentation is difficult to quantify. Concern is expressed over improvement of general water quality, aesthetic quality, and fish habitat. Other efforts are aimed at reduced silting of streams and reservoirs, and reduced deposition on flood plains. The goal would, therefore, seem to be zero stream sediment load. This is an unreachable goal since geologic erosion takes place even under wilderness conditions.

One goal for sediment reduction in streams is the Environmental Protection Agency (EPA) fisheries goal stating that freshwater streams, where there is a fish population, should have no more than 80 milligrams per liter (mg/l) suspended solids. There is insufficient data available to determine whether the streams of the Alabama Basin are within the limit during periods of average flow. However, the important fishing streams in the basin were identified by fisheries biologists who judged the streams on apparent water quality, productivity, and aesthetic quality (see figure 2-25). If these more important streams are in fact good fishery streams and within the 80 mg/l standard, a correlation might exist between the erosion estimates in appendix table 27C and the fisheries goal. These "good" fishery streams have average erosion rates from their watersheds approximately equal to that erosion which will permit sustained yield from the land without mining the resource base. The "sediment goal" was, therefore, set at that amount of sediment that would be produced if erosion could be reduced to "T" erosion basinwide. The sediment reduction need is the difference between "projected sediment yield without a plan" and the "sediment goal". The sediment goal is about 8.5 million tons annually for 1990 and 2020.

Projected annual sediment yield without a plan is expected to be about 22 million tons by 1990 and 23.7 million tons by 2020; consequently, the need is to reduce sediment yield 14.7 million tons by 1990 and 16.4 million tons by 2020.

Reduction of Critical Erosion

Reconnaissance surveys by SCS field personnel and figures presented in the 1969 National Assessment of Streambank Erosion indicate there are 151,500 acres of critically eroding land in the basin. These critical areas are active gullies or other seriously eroding lands which are sources of sediment contributing to downstream damages. They are small areas that contribute sediment directly into a channel and are therefore sometimes termed "point sources" of sediment in contrast to sheet erosion on fields and forests which are dispersed sources of sediment. Erosion from one percent of the land in the basin amounts to 23 percent of the total erosion and accounts for 40 percent of the sediment produced in the basin.

Existing Public Law 566 watershed projects, RC&D projects and other conservation efforts are expected to keep pace with the development of new gullies and critical areas. Mine operators will reclaim most land strip mined annually, but unreclaimed mined land is expected to increase from 12,700 acres to 15,300 acres by 1990. Future needs for point source erosion control were obtained by projecting the rate of development and subtracting out reclamation through ongoing programs. The remainder is the projected need; 151,600 acres by 1990, and 155,600 acres by 2020.

Erosion reduction needs can also be expressed as the amount of erosion that could be prevented by rehabilitation of existing critical areas. Erosion can be reduced to about 5 tons per acre per year on areas that have high present erosion rates such as gullies at 100 tons per acre, critically eroding roadside at 200 tons per acre, eroding streambanks at 42 tons per acre, and unreclaimed mine land at 150 tons per acre. Net needs are derived by subtracting the erosion that will remain after treatment from the projected erosion in the untreated condition.

In 1990 gullies and associated areas will lose about 11.3 million tons of soil material which could be reduced to 565,000 tons by treatment, a net reduction need of 10.7 million tons. Needs for other categories and time periods were derived in the same manner (see table 5-1).

Reduction of Erosion on "Disturbed" Forest Lands

Reduction in "disturbed" forest land erosion is needed on 60,000 acres to bring the average forest erosion down to the level at which sediment goals expressed on page 4-52 may be reached. Erosion control practices and standards that will reduce erosion to an overall average of 2 tons per acre per year on forest lands will provide the needed reduction.

Net erosion reduction needs were determined by comparing the projected erosion with the erosion that the system can tolerate. Forest lands totalling 7,155,000 acres can tolerate annual erosion totalling 14.3 million tons and will be sustaining 32.2 million tons by 1990; 6,862,000 acres can tolerate 13.7 million tons erosion by 2020 and will be losing 37.0 million tons. Net reduction needs are 17.9 million tons and 23.3 million tons in the two projected time frames. Reduction is needed on 74,000 acres by 1990 and 114,000 acres by 2020.

Protection of Scenic Rivers and Streams

A list of rivers and streams having potential scenic qualities and needing protection was compiled primarily from the Natural Scenic Rivers Study, and suggestions from the fish and wildlife work group. Presently, 416 miles of scenic streams including all or portions of the Cahaba River, Tallapoosa River, Little River, Shoal Creek and Hatchett Creek need protection from unregulated development and special-interest exploitation.

Needs by future planning time frames were determined by assessing proposed and potential programs of private, county, state, and federal agencies that might influence the status of a scenic stream. For example, about 16 miles of the Tallapoosa River will be inundated by a proposed impoundment. This impoundment will create about 10,600 acres of flat lake-type habitat for fish and waterfowl. The total recreational value of this stretch of river will be greatly increased by providing boating, swimming, water skiing, and other related activities. On the other hand, the R. L. Harris Reservoir will eliminate most of the float fishing opportunities now offered by the Tallapoosa River. It was assumed that the current mileage of scenic streams needing protection will be reduced about 25 percent by 1990 because 16 miles will be impounded and about 100 miles will be protected through current private, state or federal programs, leaving 300 miles to be protected. A projected 350 miles of stream will need protection by 2020 to preserve an ample supply of this resource for the increased population.

Natural Scenic Sites

A list of 130 natural scenic sites that need protection to preserve and maintain their unique or aesthetic qualities was developed from the Alabama SCORP, Volume 18 and the County Appraisals of Potential for Outdoor Recreation (see Appendix 20). Sites presently protected by law, managed on a commercial basis, or committed to other uses were not included.

A projection was made that by 1990 about 10 sites would be destroyed, commercialized, or otherwise be unavailable for public use. An additional 30 sites will receive adequate protection through ongoing state, federal, and privately funded programs, leaving a net of 90 sites that would need protection in 1990. By 2020, it was projected that an additional 15 sites would be eliminated for various reasons indicated above, leaving 75 sites to be protected.

Improve the Quality and Quantity of Fish and Wildlife Habitat

A field examination was made in each basin county on various soil associations by members of the planning staff to establish the existing supply and condition of fish and wildlife habitat available for public use. Also, areas were inventoried that could satisfy public recreation demand by improving the quality of existing habitat.

The demand for public use of fish and wildlife resources based on population projections and the capacity of the current supply was developed jointly with the ERS economist using standards developed by Auburn University. Needs shown in table 5-1 were developed by subtracting demand from supply for present and projected time frames.

By 1990 the demand/supply relationships for both deer and squirrel will be critical. While the deer hunting relationship can be improved, the future for squirrel hunting is bleak. Unless large acreages of longer rotation hardwoods are developed (at a great loss of timber production) the capability to meet even the present level of demands by 1995 will be inadequate.

Protection of Endangered Species of Flora and Fauna

A list of endangered plants and animals that occur in Alabama and are believed to occur in the basin was compiled from current state and federal listings (see Appendix 17). Presently about 66 plants and animals are classified as "endangered" on a state or federal list. This number is expected to increase to 90 by 1990 and 112 by 2020. These organisms were assumed to be in need of protection even though an Endangered Species Act was passed by Congress in 1973 to conserve endangered and threatened organisms. The projected needs shown in table 5-1 for 1990 and 2020 reflect an increase from 35 to 70 percent, based on a general concensus from the basin biology work group and consultation with other recognized authorities.

Protection of Archaeological and Historical Sites

Known archaeological and historical sites in the basin that should be considered for preservation during future land and water resource development planning are listed in Appendix table 20. The Alabama Historical Commission has inventoried about 6,800 structures, sites, and objects statewide. Presently, there are approximately 120 recognized archaeological sites needing preliminary investigation and/or protection in the basin. Many sites will receive protection through ongoing programs, both federal and state. A few sites will be lost through various resource development efforts, both public and private. The number of known archaeological sites needing preservation by 1990 has been estimated at 110, and at 100 by 2020. The present estimate of 255 historical sites needing preservation can be expected to decline to 200 by 1990 and 180 by 2020. The primary need in assuring protection of these sites is thorough documentation of the location and value of these sites followed by an appropriate public awareness effort.

Expenditures to operate, improve and maintain sites will naturally increase as more and more sites are brought under protection and as more places are preserved. It is anticipated that a tremendous increase in employees and maintenance expenditures will be necessary to operate a state program to perpetuate this cultural heritage. Capital expenditures for site acquisition are expected to increase gradually as more funds become available.

According to the Alabama Historical Commission, by 1990 the protection and preservation of archaeological and historic sites statewide will require 250 employees, $20,000,000 annually in capital outlay expenditures and $15,000,000 annually for maintenance expenditures. Admission fees will be charged at some sites, generating revenues to offset total costs.

APPENDIX TO VOLUME I

ALABAMA RIVER BASIN COOPERATIVE STUDY

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
ECONOMIC RESEARCH SERVICE
FOREST SERVICE

APRIL 1977

ALABAMA RIVER BASIN

COOPERATIVE STUDY

WITHIN ALABAMA

APPENDIX

Prepared by

UNITED STATES DEPARTMENT OF AGRICULTURE
Soil Conservation Service
Economic Research Service
Forest Service

In cooperation with the

ALABAMA DEVELOPMENT OFFICE

Auburn, Alabama

April 1977

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Appendix Table 1 -- Maximum, minimum and average runoff rates for selected gaging stations, Alabama River Basin.

Gaging Station	Period of Record	Drainage Area Sq. Mi.	Watershed Average In./Yr.	Watershed Average C.F.S.	Watershed Maximum C.F.S.	Watershed Minimum C.F.S.	Square Mile Average C.F.S.	Square Mile Maximum C.F.S.	Square Mile Minimum C.F.S.
Alabama River Subbasin									
02429500 Claiborne, Alabama	44 years 1930-74	22,000	19.86	32,170	267,000	2,850	1.5	12.1	0.130
02423000 Selma, Alabama	55 years 1900-13 1928-70	17,100	20.78	26,170	284,000	2,600	1.5	16.6	0.156
02420000 Montgomery, Alabama	44 years 1899-1903 1927-71	15,100	20.95	23,290	283,000	2,180	1.5	18.7	0.144
02425500 Minter, Alabama	18 years	217	13.77	220	90,000	0.1	1.0	414.7	0.000
02421000 Catoma Creek Montgomery, Alabama	19 years 1952-71	298	15.27	345	48,600	0	1.2	163.1	0.000
Cahaba River Subbasin									
02425000 Marion Jct., Ala.	22 years 1938-54 1968-70	1,768	21.17	2,757	83,400 1/	224	1.6	47.2	0.127
02424000 Centreville, Ala.	47 years 1901-07 1929-31 1935-74	1,029	20.71	1,569	83,600	90	1.5	81.2	0.087
02423630 Shades Creek Greenwood, Ala.	8 years 1965 1967-73	72.4	24.95	133	7,220	11	1.8	99.7	0.152
02423800 Little Cahaba Brierfield, Ala.	13 years 1957-70	148	17.89	195	10,000	36	1.3	67.6	0.243
Coosa River Subbasin									
02411000 Wetumpka, Ala.	46 years 1912-14 1956-74	10,200	21.54	16,180	298,000	54	1.6	29.2	0.005
02407000 Childersburg, Ala.	57 years 1913-70	8,390	22.03	13,610	146,000	440	1.6	17.4	0.052
02400500 Gadsden, Ala.	44 years 1926-70	5,800	21.66	9,253	76,900	100	1.6	13.3	0.017
02408500 Hatchett Creek Rockford, Ala.	30 years 1944-74	244	20.87	375	22,800	7	1.5	93.4	0.029
02405800 Talladega Creek Talladega, Ala.	11 years 1959-70	67.3	21.39	106	6,550	8.5	1.6	97.3	0.126
02404000 Choccolocco Creek Jenifer, Ala.	41 years 1903-08 1929-32 1935-70	281	19.53	404	22,500	30	1.4	80.1	0.107
02401000 Big Wills Creek Crudup, Ala.	27 years 1943-70	185	22.32	304	14,800	21	1.6	80.0	0.114

Appendix Table 1 -- Maximum, minimum and average runoff rates for selected gaging stations, Alabama River Basin (CONT'D).

GAGING STATION	PERIOD OF RECORD	DRAINAGE AREA SQ. MI.	WATERSHED				SQUARE MILE		
			AVERAGE IN./YR.	AVERAGE C.F.S.	MAXIMUM C.F.S.	MINIMUM C.F.S.	AVERAGE C.F.S.	MAXIMUM C.F.S.	MINIMUM C.F.S.
Tallapoosa River. Subbasin									
02418500 Tallasee, Ala.	46 years 1928-74	3,320	19.49	4,765	128,000 2/	10	1.4	38.6	0.003
02414500 Wadley, Ala.	51 years 1923-74	1,660	20.34	2,487	52,800	45	1.5	31.8	0.027
02412000 Heflin, Ala.	22 years 1952-74	444	20.38	666	19,300	13	1.5	43.5	0.029
02415000 Hillabee Creek Hackneyville, Ala.	18 years 1952-70	196	20.86	301	15,600	8	1.5	79.6	0.041
02419000 Uphapee Creek Tuskegee, Ala.	31 years 1939-70	330	17.58	427	32,200	0.8	1.3	97.6	0.002

1/ Flood of February 24, 1961 reached a stage 43.80 feet present datum, from flood marks (discharge not determined). Maximum discharge August 16, 1939 (gage height 42.95 feet).

2/ Flood of March 15, 1929 maximum gage height, 51.35 feet (discharge not determined). Maximum discharge February 25, 1961 (gage height, 50.4 feet).

Source: Water Resources Data for Alabama, 1970, Part 1, Surface Water Records; United States Department of the Interior, Geological Survey.

APPENDIX 2 -- STATISTICS OF IMPOUNDMENTS

Appendix 2A -- Methodology and source of data for impoundments in the Alabama River Basin, 1975.

Data in table 2B was obtained from other published material. Status of the Crooked Creek reservoir was obtained from Alabama Power Company.

Data in table 2C was prepared from information on file in the design section of the Soil Conservation Service, Auburn, Alabama.

Data in table 2D was obtained through several sources. A questionnaire was solicated from each SCS District Conservationist, in the basin. Data provided name, location, use, surface area and height of all impoundments larger than 40 acres in the county. An estimate of the total number and total surface acres for three groups of impoundment; 5 to 40 acres; less than 5 acres; and natural impoundments was also provided. Natural impoundments include beaver ponds, river oxbows, wet borrow pits and Grady ponds (natural, swampy, rounded ponds or "bays" in the Coastal Plains Area).

The number of beaver ponds reported on the questionnaire was adjusted to parallel the results of an aerial beaver pond survey as published in Proceedings of the First Alabama Beaver Symposium, 1967.

Information on state owned public fishing lakes was furnished by the Alabama Development Office.

Appendix Table 2B -- Statistics of impoundments on major streams, Alabama River Basin, 1975.

SUBBASIN AND IMPOUNDMENTS	ABOVE MOUTH (MILES)	DRAINAGE AREA (SQ. MILES)	PURPOSE 1/	POWER POOL ELEV. 2/	SURFACE AREA (ACRES)	STORAGE (1,000) (AC. FT.)	SHORE LINE (MILES)	DEPTH AT DAM (FEET)
			Corps of Engineers					
Alabama River								
Claiborne	81.1	21,520	N-R-F&W	35	5,930	96.4	160	33
William F. Dannelly	142.3	20,700	N-P-R-F&W	80	17,200	331.8	516	56
Jones Bluff	245.4	16,300	N-P-R-F&W	125	12,300	247.0	368	61
			Alabama Power Company					
Coosa River								
Bouldin 3/	4/	3/	P-R-F&W	252.0	3/	3/	3/	52
Jordan 3/	18.8	10,165	P-R-F&W	252.0	6,800	233.5	118	110
Mitchell	37.3	9,827	P-R-F&W	311.9	5,850	177.0	147	90
Lay	51.3	9,087	P-R-R&W	396.0	12,000	241.5	289	88
Logan-Martin	98.4	7,700	FC-P-R-F&W	465.0	15,263	518.6	275	69
H. Neely Henry	148.0	6,600	P-R-F&W	508.0	11,200	121.9	339	53
Weiss	225.7	5,273	FC-P-R-F&W	564.0	30,200 5/	703.4	447	62
Tallapoosa River								
Crooked Creek 6/	138.0	1,453	FC-P-R-F&W	793.0	10,660	431.0	7/	118
Martin	60.6	3,000	P-R-F&W	490.0	40,000	1630.0	700	155
Yates	52.7	3,250	P-r-F&W	344.0	2,000	54.0	40	46.5
Thurlow	49.7	3,300	P-R-F&W	288.8	574	18.4	6	54

1/ Purposes - FC-Flood Control, P-Power, N-Navigation, R-General Recreation, F&W-Fish & Wildlife.
2/ Normal operating pool level or summer pool level.
3/ Jordan and Bouldin share the same reservoir.
4/ Bouldin about 15 miles off stream from Jordan Dam.
5/ Small acreage in Georgia.
6/ Crooked Creek Reservoir as currently proposed.
7/ Not available.

Appendix Table 2C -- Statistics of impoundments, P.L. 566 and RC&D floodwater retarding structures, single- and multiple-purpose, Alabama River Basin, 1975.

Location	Site No.	Purpose 1/	Drainage Area (Sq.Mi.)	Normal Pool Elevation (MSL)	Normal Pool Area (Ac.)	100-Yr. Sediment Volume (Ac.Ft.)	Multiple Purpose Volume (Ac.Ft.)	Detention Volume (Ac.Ft.)	Maximum 2/ Area Flooded (Ac.)	Height of Dam (Ft.)
				Coosa River Subbasin						
Blue Eye Creek W/S Talladega & Calhoun County	1	FP	5.29	555.5	15	42 3/		588	95	42
	2	FP	3.23	545.0	10.5	46 3/		748	80	34
Cheaha Creek W/S Talladega & Clay Co.	2	FP	3.57	599.0	25	65 3/		815	790	22
	3	FP	2.40	685.0	7.7	33 3/		628	599	41
	4	FP	5.82	699.2	10	56 3/		2,109	72	68
	5	FP	11.56	590.5	19	111 3/		3,940	1,675	76
	6	FP	27.22	587.1	38	190 3/		9,520	353	83
Choccolocco Creek W/S Calhoun, Cleburne, Talladega & Clay Co.	2	FP	21.35	772.0	31	324		4,987	249	72
	3	FP	2.76	765.3	6	62		818	38	47
	6	FP-WS	38.1	751.7	265	207	6,893	4,460	358	91.0
	7	FP-R	13.98	1027.1	58	224	326	6,060	234	72
	9	FP	1.50	729.3	7.6	42		376	28	37
	11	FP-WS	16.00	647.0	182	303	2,887	4,693	317	72
	14	FP	1.09	664.5	4.8	31		259	25	32
	15	FP	1.95	666.3	7.1	49		525	49	40
	17	FP	1.87	629.0	3.5	48		473	34	57
	24	FP	12.87	870.9	17.7	227		6,926	286	86
Tallaseehatchie Creek W/S Talladega & Clay Co.	2	FP	3.9	612.3	19	141		1,332	96	55.8
	3	FP	5.6	578.3	23	200		2,060	118	64.1
	6	FP	2.7	636.0	16	97		923	69	39.5
	7	FP	2.05	600.5	11	85		657	42	52
Terrapin Creek W/S Cherokee, Cleburne & Calhoun Co.	6	FP	4.50	654.8	16.6	79		1,035	105	32
	8	FP	20.80	645.5	77.3	390 3/		4,940	393	33
	9	FP	2.30	700.8	9.8	64		603	45	41
	14	FP	3.00	811.0	9	40 3/		710	56	39
	15	FP	2.70	858.5	7.2	37 3/		891	47	47
	17	FP	5.10	846.2	23	72 3/		862	120	25
	21	FP	17.50	932.3	28	225 3/		3,900	325	55
	22	FP	21.60	901.5	25	264 3/		4,808	154	100
	31	FP	29.01	747.1	49	290 3/		7,790	345	72
	33	FP	15.90	814.5	38	226 3/		3,052	213	51

Appendix Table 2C -- Statistics of impoundments, P.L. 566 and RC&D floodwater retarding structures, single- and multiple-purpose, Alabama River Basin, 1975 (CONT'D).

LOCATION	SITE NO.	PURPOSE 1/	DRAINAGE AREA (SQ.MI.)	NORMAL POOL ELEVATION (MSL)	NORMAL POOL AREA (AC.)	100-YR. SEDIMENT VOLUME (AC.FT.)	MULTIPLE PURPOSE VOLUME (AC.FT.)	DETENTION VOLUME (AC.FT.)	MAXIMUM 2/ AREA FLOODED (AC.)	HEIGHT OF DAM (FT.)
				TALLAPOOSA RIVER SUBBASIN						
Cahulga Creek W/S										
Cleburne Co.	1	FP-WS	6.54	887.7	84.2	111	526	3,036	177	41
Crooked Creek W/S										
Clay & Randolph Co.	2	FP-WS	3.34	1,030.2	82.5	66	1,250	2,106	101	47
	3	FP-WS	3.82	1,041.9	53	85	750	1,808	100	51
	4A	FP	3.0	992.5	22	88		744	74	30.0
	5	FP	1.1	1,037.7	9	40		247	33	24.2
	16	FP	8.51	779.8	16	123		2,097	93	53
Fox Creek W/S										
Clay & Randolph Co.	2	FP	1.35	1,034.8	6.3	27 3/		259	26	30
High Pine Creek W/S										
Randolph & Chambers Co.	1	FP	2.60	860.0	9.8	73 3/		554	25	52
	2	FP	6.95	741.5	54	186 3/		1,808	150	39
	3	FP	3.28	783.9	15	102 3/		700	67	32
	4	FP	2.70	928.4	13	87 3/		575	53	37
	5	FP	1.80	939.5	11	63 3/		384	35	36
	6	FP-WS	3.18	848.7	48.3	99 3/	500	813	84	56
	10	FP	2.70	755.7	18.5	87 3/		575	102	30
	11	FP	2.90	719.3	35	123 3/		775	102	24
	12	FP	1.32	771.7	12.4	47 3/		282	53	22
Ketchepedrakee Creek W/S										
Clay & Randolph Co.	1	FP	2.26	970.5	9	19 3/		630	69	26
	9	FP	3.09	996.8	14	61 3/		899	78	31
	10	FP	1.92	1,017.7	5	24		455	50	30
	11	FP	1.12	1,008.4	2	9		190	14	41
Little Hillabee Creek W/S										
Clay & Tallapoosa Co.	1	FP	3.22	906.0	6.5	70		752	51	55
	2	FP	2.85	921.0	11	64		508	34	37
	3	FP	1.99	870.7	11.5	43		292	30	22
	4	FP	3.09	838.0	14.1	69		499	51	26
	6	FP	1.42	826.0	5.2	14		223	27	25
Lost Creek W/S										
Cleburne Co.	1	FP	8.52	584.3	30	170		1,630	130	38
	2	FP	1.96	600.0	14	121		351	34	38
	3	FP	1.66	571.0	12	78		337	32	31
	4	FP	1.48	551.7	13	81		261	30	28

Appendix Table 2C -- Statistics of impoundments, P.L. 566 and RC&D floodwater retarding structures, single- and multiple-purpose, Alabama River Basin, 1975 (cont'd).

LOCATION	SITE NO.	PURPOSE 1/	DRAINAGE AREA (SQ.MI.)	NORMAL POOL ELEVATION (MSL)	NORMAL POOL AREA (AC.)	100-YR. SEDIMENT VOLUME (AC.FT.)	MULTIPLE PURPOSE VOLUME (AC.FT.)	DETENTION VOLUME (AC.FT.)	MAXIMUM 2/ AREA FLOODED (AC.)	HEIGHT OF DAM (FT.)
				TALLAPOOSA RIVER SUBBASIN						
Old Town Creek W/S										
Bullock & Macon Co.	22	FP	6.0	302.5	95	507		1,968	364	21.0
	24	FP	5.50	372.7	73	500		1,044	218	27
	25	FP	4.18	387.7	62	346		1,269	178	26
	26	FP	5.50	384.7	95	494		1,702	208	29
	28	FP-I	7.3	316.8	188	152	300	2,856	454	21.3
	29	FP	6.3	320.6 4/	143 4/	496		2,034	367	19.8
	31	FP	3.06	295.3	83	217		1,182	229	18
	32	FP	5.65 5/	334.1	91	971		3,080	285	29
	37	FP	2.91	342.4	61	217		1,073	184	19

1/ FP - flood prevention, R - recreation, WS - water supply, I - irrigation.
2/ Area flooded at depth of flow in emergency spillway for the design storm.
3/ 50-year sediment volume.
4/ 100-year sediment pool, not inundated.
5/ Equivalent drainage area (5.65 sq. mi.) 100 percent of 2.46 sq. mi. plus 24 percent of 15.43 sq. mi.

Appendix Table 2D -- Statistics of impoundments on tributaries, by subbasins and by counties, Alabama River Basin, 1972.

COUNTY	LARGE IMPOUNDMENTS 1/ NAME	LOCATION	USE 5/	SURFACE ACRES	HEIGHT OF DAM (feet)	MEDIUM IMPOUNDMENTS 2/ NO.	MEDIUM SURFACE ACRES	SMALL IMPOUNDMENTS 3/ NO.	SMALL SURFACE ACRES	NATURAL IMPOUNDMENTS 4/ NO.	NATURAL SURFACE ACRES
				Alabama Subbasin							
Autauga	Bridge Cr. Fishing Club	6 mi. N--Prattville	F	50	12	30	500	230	560	104	2,921
Baldwin						2	14	7	11	2	22
Butler						20	200	130	500	18	428
Chilton						3	45	180	225	30	744
Clarke						2	16	20	40	41	422
Crenshaw						-	-	4	12	-	-
Dallas	Dallas Co. Public Lake	11 mi. S--Selma	F	100	20	60	700	200	750	163	2,310
	Valley Creek Park	15 mi. N--Selma	F,R	60	15						
Elmore						4	32	15	45	8	394
Escambia	Little River State Lake	Off Hwy 21, State Park	F,R	75	-			2	3	14	59
Lowndes	Bell Lake	3 mi. SW--Burkeville	F,L	43	15	71	650	840	2,854	90	2,510
	Lake Berry	1 mi. S--Burkeville	I,F,L	40	21						
Marengo	Spencer Lake	Near Gallion	R	50	-	5	29	73	129	-	-
Monroe	Monroe Co. Public Lake	3 mi. W--Beatrice	R	94	21	13	124	215	470	131	1,229
Montgomery	Suggs Lake	2 mi. SW--Hope Hull	R,L	80	12	130	1,050	2,225	2,955	155	2,040
	Davis Lake	2 mi. N--Fleta	R	50	15						
	Davis Lake	2 mi. N--Fleta	R	50	15						
	Davis Lake	1½ mi. N--Robinsons Crds.	R,L	60	16						
	Davis Lake	1½ mi. N--Robinsons Crds.	R,L	40	16						
Perry						32	432	42	129	20	288
Wilcox	Bain Henderson Lake	1½ mi. W--Millers Ferry	R,L	52	20	15	122	391	787	119	1,723
Subtotal	14			794		387	3,914	4,574	9,470	895	15,090
				Cahaba Subbasin							
Bibb	Chase Lake	8 mi. SW--Blocton	F	50	25	14	190	100	250	188	3,549
	Shady Grove Lake	6 mi. N--Centreville	F	50	30						
Chilton						5	83	50	60	70	556
Dallas						8	100	50	150	19	248
Jefferson	Emerald Valley Lake	2 mi. E--Palmerdale		170	-	46	457	178	271	184	301
	Lake Purdy	6 mi. SW--Leeds	F,R,M	653	65						
	Norman Fountain	S--Interstate 59--Bucksville Exit	F	47	23						
	Reese Murray	NE corner of Co. off Co. Hwy 30	F	50	35						
	Zamora Lake	2 mi. E--Palmerdale		43	-						
Perry						8	84	48	144	71	987
Shelby	Lake Purdy	On Little Cahaba River	F,R	400	60	24	325	175	350	183	392
	Oak Mtn. Public Lake	Oak Mtn. State Park	F,R	84	40						
	Oak Mtn. Public Lake	Oak Mtn. State Park	F,R	85	30						
St. Clair	Frank Trucks Lake	3½ mi. S--Springville	F,R	42	15	3	69	60	130	25	75
	Margaret Lake	Just N--Margaret	F	50	15						
	Sportsman Lake	2 mi. N--Odenville	F,R	60	30						
Tuscaloosa						2	16	21	47	14	81
Subtotal	13			1,784		110	1,324	682	1,402	754	6,189
				Coosa Subbasin							
Autauga						-	-	15	30	15	279
Calhoun	Harold Fink	5 mi. N--Anniston	F,R	78	13	125	1,000	400	500	41	109
	Lee Bros. Lake	4 mi. NW--Reads Mill	F,R	48	25						
	Nesbitt Lake	3 mi. NW--Jacksonville	F	40	20						

Appendix Table 2D -- Cont'd

COUNTY	LARGE IMPOUNDMENTS 1/ NAME	LOCATION	USE 5/	SURFACE ACRES	HEIGHT OF DAM (feet)	MEDIUM IMPOUNDMENTS 2/ NO.	MEDIUM IMPOUNDMENTS 2/ SURFACE ACRES	SMALL IMPOUNDMENTS 3/ NO.	SMALL IMPOUNDMENTS 3/ SURFACE ACRES	NATURAL IMPOUNDMENTS 4/ NO.	NATURAL IMPOUNDMENTS 4/ SURFACE ACRES
Cherokee	Coley Bros.	5 mi. S--Centre	L,R	100	26	4	6	146	450	27	83
Chilton						11	130	190	200	50	1,240
Clay						13	101	3	10	13	49
Cleburne						10	241	2	7	9	28
Coosa	Ann Jordan	2.3 mi. SW--Kellyton	Private	135	20	38	288	270	680	41	148
DeKalb	Camp Corner Lake	2½ mi. S--Valley Head	R	75	20	9	111	70	140	23	68
	Fort Payne City Lake	NE side--Ft. Payne	M	90	50						
Elmore	Speigner Lake	Draper Prison Farm	F,I	500	32	6	52	352	722	45	1,249
Etowah	Meadow Lake	Eastern Etowah Co.	R	45	12	20	200	475	1,000	22	72
Shelby	Smyer's Lake #1	3 mi. SW--Dunavant	F,R	80	-	32	359	225	450	20	99
	Smyer's Lake #2	3 mi. SW--Dunavant	F,R	100	30						
	Lake Wehapa	1 mi. SW--Dunavant	F,R	200	25						
	Woodmere Lake	6 mi. W--Columbiana,AL 70	F,R	67	40						
	Yielding Lake	2 mi. W-Vandiver	F,R	40	20						
St. Clair	Chandler Mtn. Lake	Atop Chandler Mtn.	F,I	145	27	32	282	150	300	45	171
	Lake Joyce	4 mi. NE--Moody	F	46	12						
	Pinedale Shores	3 mi. W--Ashville	F,R	125	16						
	Springville Lakes Est.	3½ mi. NW--Springville	F,R	40	25						
	Sumatanga	2 mi. S--Gallant	F	60	25						
Talladega	Caudle Lake	1½ mi. N--Fayetteville	F,R	65	22	21	278	105	210	45	185
	Lake Elliott	2 mi. E--Talladega	F,R	40	23						
	Lake Howard	4 mi. NE--Sylacauga	M	200	75						
	Mump Creek Reservoir	1 mi. E--Waldo	M	42	40						
	Lake Socapatoy	½ mi. S--Waldo	F,R	40	25						
Subtotal	24			2,401		321	3,048	2,403	4,699	396	3,780
			Tallapoosa Subbasin								
Bullock						23	160	289	435	38	1,066
Chambers	J.W. Grady Lake	.5 mi. SW--Stroud	F	40	20	15	126	133	225	48	167
	LaFayette Reservoir	3 mi. W--LaFayette	M	80	30						
Clay	Lake Gerald	½ mi. E--Delta	R	120	30	1	10	10	35	15	59
	State Lakes (3)	½ mi. W--Delta	R	103	-						
Cleburne	Lake Edmond	1½ mi. W-Chulafinnee	R	165	35	37	444	181	579	21	65
	Cleburne Co. Boy Scout Lake	2 mi. W- Hollis Cross Roads	R	63	40						
Coosa						2	12	5	10	6	21
Elmore	Seller Pond	S of Wetumpka	R	40	10	8	190	380	1,085	50	1,388
Lee	C.E. Lee Lake	4 mi. S- Opelika Hwy 37	F	60	20	100	1,150	364	1,110	36	1,004
	Ogletree #1--Auburn City Lake	3 mi. SE--Auburn	F,M	200	50						
	Opelika City Lake	3 mi. N--Opelika	F,M	560	40						
	Willow Run Lake	Beauregard	F	60	15						
Macon	Tuskegee Public Lake	Adjacent-Tuskegee	R	100	30	50	600	640	580	98	2,896
Montgomery						70	350	500	1,100	32	790
Randolph						20	200	415	600	36	139
Tallapoosa	Russell Lake	4 mi. S--Alexander City	F	60	-	10	70	400	1,000	43	162
Subtotal	13			1,651		336	3,312	3,317	6,759	423	7,757
GRAND TOTAL	64			6,630		1,154	11,598	10,976	22,330	2,468	32,816

Note: The classification of impoundments has no relation to any other size grouping in this report.

1/ Surface area of normal pool is greater than 40 acres.

2/ Surface area of normal pool is between 5 and 40 acres.

3/ Surface area of normal pool is less than 5 acres.

4/ This includes such impoundments as old river oxbows, beaver ponds, Grady ponds, inundated borrow pits, etc.

5/ F-fishing, R-water-based recreation, L-livestock watering, I-irrigation, M-municipal water storage.

APPENDIX 3 -- WATER QUALITY

Appendix Table 3A -- Water quality characteristics and their effects.

CONSTITUENT	SOURCE OR CAUSE	EFFECTS
Silica (SiO_2)	Most abundant element in igneous rocks, resistant to solution.	Causes scale in boiler and deposits on turbine blades.
Iron (Fe)	Very abundant in igneous rocks, readily precipitates as hydroxide.	Stains laundry and porcelain, bad taste.
Manganese (Mn)	Less abundant than iron, present in sedimentary and metamorphic rocks.	Stains laundry and porcelain, bad taste.
Calcium (Ca)	Dissolved from most rock, especially limestone and dolomite.	Causes hardness, forms boiler scale, helps maintain good soil structure and permeability.
Sodium (Na)	Dissolved from feldspars and other common rocks, industrial wastes.	Injurious to soils and crops, and certain physiological conditions in man.
Potassium (K)	Abundant in many rocks and soils, but not very soluble.	Causes foaming in boilers, stimulates plankton growth.
Bicarbonate (HCO_2) Carbonate (CO_3)	Abundant and soluble from limestone, dolomite, and soils.	Causes foaming in builers, and embrittlement of builer steel.
Sulfate (SO_4)	Sedimentary rocks, mine water, and industrial wastes.	Cathartic, unpleasant taste.
Chloride (Cl)	Most rocks, soils, industrial wastes and sewage, and sea water.	Unpleasant taste, increases corrosiveness.
Silica Fluoride (F)	Not very abundant, sparingly soluble, fluorite most common source, seldom found in industrial wastes except as spillage, some sewage.	Over 1.5 ppm causes mottling of children's teeth, 0.88 to 1.5 ppm aids in preventing tooth decay.
Nitrate (NO_3)	Spoil, sewage, industrial waste, decomposition of plants and animals, bacteria.	High content in water indicates pollution, causes methemoglobinemia in infants.
Hardness as $CaCO_3$		Excessive soap consumption, scale in pipes interferes in industrial processes. Up to 60 ppm - soft 61 to 120 ppm - moderately hard 121 to 180 ppm - hard over 180 ppm - very hard

Appendix Table 3B -- Water quality parameters measured in the Alabama River Basin.

	USGS-GSA Partial	USGS-GSA Standard	USGS-EPA Field Analysis	Ala. Water Improvement Commission	Ala. Dept. of Public Health
	(1)	(2)	(3)	(4)	(5)
Time	X	X	X	X	
Discharge	X	X	X	X	
Silica		X			
Dissolved Iron		X		X	X
Dissolved Manganese		X			X
Calcium		X			
Magnesium		X			X
Sodium		X			X
Arsenic					X
Barium					X
Cadmium					X
Chromium					X
Cyanide					X
Lead					X
Mercury					X
Selinium					X
Silver					X
Potassium		X			
Zinc				X	
Copper				X	
Chromium				X	
Bicarbonate	X	X	X	X	
Carbonate	X	X	X		
Sulfate		X			
Chloride	X	X		X	X
Flouride		X			X
Cyanide				X	
Nitrate		X			X
Dissolved Solids (@ 180^{o} C)		X		X	X
Dissolved Solids (sum of constituents)		X			
Dissolved Solids (tons/acre-feet)		X			
Total Solids				X	
Hardness	X	X		X	X
Non-Carbonate Hardness	X	X			
Specific Conductance	X	X	X		
pH	X	X	X	X	X
Dissolved Oxygen			X	X	X
Temperature	X	X	X	X	
Nitrate				X	
Phosphate				X	
Biochemical Oxygen Demand				X	
Coliform				X	
Turbidity				X	
Color				X	
Alkalinity (Total)				X	X
Alkalinity (Phenolphalein)					X
Acidity					X
CO_2					X

Appendix Table 4A -- Municipal waste disposal facilities in the Alabama River Basin, by subbasins, October 1974.

Municipality	Population 1970 Census	Waste Disposal Facility	Receiving Stream	Remarks
		ALABAMA RIVER SUBBASIN		
Camden	1,742			
West Plant		Single-Cell Lagoon	Reed Creek	
South Plant		Single-Cell Lagoon	Town Branch, Pursley Cr.	
North Plant		Single-Cell Lagoon	Rockwest Creek	
Frisco City	1,286	Imhoff Tank	Bear Creek	1/
Marion	4,289	Imhoff Tank	Boguechitto Creek	
Monroeville	4,846			
Broughton St. Plant		High-Rate Filter	Limestone Creek	
Hudson Branch Plant		Aerated Lagoon	Hudson Branch	
Montgomery	133,386			
Catoma Plant		Bioactivation Process w/Cl_2	Catoma Creek	
Econchate Plant		Standard-Rate Filters w/Cl_2	Alabama River	
Towassa Plant		Standard-Rate Filters w/Cl_2	Alabama River	
Pine Hill	697	One-Cell Lagoon	Cub Creek	
Prattville	13,116	High-Rate Filter w/Cl_2	Autauga Creek	
Selma	27,379	High-Rate Filter w/Cl_2	Alabama River	
Thorsby	944	Primary Imhoff Tank	Charlotte Creek	1/
		CAHABA RIVER SUBBASIN		
Alabaster	2,642	Imhoff Tank	Buck Creek	1/
Birmingham	300,910	(See Jefferson County)		
Brent	2,093	Single-Cell Lagoon	Cahaba River	
Centreville	2,233	Single-Cell Lagoon (Only partially sewered)	Cahaba River	
Homewood	21,245	(See Jefferson County--Shades Valley)		
Hoover	1,393	(See Jefferson County--Patton Creek)		
Irondale	3,166	(see Jefferson County--Shades Valley)		
Jefferson Co. Sanitary District				
Cahaba River		Activated Sludge w/Cl_2	Cahaba River	
Chateau Orleans		STO Pkg. Plant	Little Shades Creek	
Shades Valley		Activated Sludge w/Cl_2	Shades Creek	
Leeds Plant		Standard-Rate Filter w/Cl_2	Little Cahaba River	
Neely		STO Pkg. Plant	Little Shades Creek	
Trussville Plant		Standard-Rate Filter w/Cl_2	Cahaba River	
Patton Creek		Standard-Rate Filter w/Cl_2	Patton Creek	
Leeds	6,991	(See Jefferson Co.--Leeds)		
Marion	4,289			
Ames		One-Cell Lagoon	Rice Creek	
MHP		One Cell Lagoon	Rice Creek	
Montevallo	3,719	Extended Aeration w/Cl_2	Shoal Creek	
Mountain Brook	19,474	(See Jefferson County--Shades Valley)		
Trussville	2,985	(See Jefferson County--Trussville)		
Vestavia Hills	8,311	(See Jefferson County--Patton Creek)		

Appendix Table 4A -- Municipal waste disposal facilities in the Alabama River Basin, by subbasins, October 1974 (cont'd).

MUNICIPALITY	POPULATION 1970 CENSUS	WASTE DISPOSAL FACILITY	RECEIVING STREAM	REMARKS
		TALLAPOOSA RIVER SUBBASIN		
Alexander City	12,358			
Christian Creek Plant		Modified Act. Sludge w/Chorination	Christian Creek	
Coley Creek Plant		Modified Act. Sludge w/Chlorination	Coley Creek	
Dobbs Plant		Modified Act. Sludge w/Chlorination	Hillabee Creek	
Spring Hill Plant		Standard-Rate Filter w/Chlorination	Elkahatchee Creek	
Sugar Creek Plant		Aerated Lagoon/Mech. Clarifier w/Cl_2	Sugar Creek	
Young Plant		STD Pkg. Plant	Sugar Creek	
Ashland	1,921			
Eastside		High-Rate Filter	Horsetrough Creek	2/
Westside		Septic Tank	Enitachope Creek	1/
Auburn	22,767			
Northside		High-Rate Filter w/Cl_2	Sougahatchee Creek	
Southside		Stage Filters w/Cl_2	Parkerson's Mill Creek	2/
Camp Hill	1,554	Single-Cell Lagoon	So. Sandy Creek	
Dadeville	2,847			
Outfall		No Treatment	Chattashofka Creek	1/
Plant No. 1		Single-Cell Lagoon	Buck Creek	
Heflin	2,872	Single-Cell Lagoon	Cahulga Creek	
LaFayette	3,530	Aerated Lagoon w/Cl_2	Chatahospee Creek	1/
Lineville	1,984	Septic Tanks		
Notasulga	833	Septic Tank	Red Creek	1/
Opelika	19,027			
Plant No. 2		Two-Cell Lagoon	Sougahatchee Creek	
Plant No. 3		One-Cell Lagoon	Pepperell Branch	
Plant No. 4		Activated Sludge	Chewacla Creek	3/
Roanoke	5,251			
Plant No. 1		One-Cell Lagoon	High Pine Creek	
Plant No. 2		One-Cell Lagoon	High Pine Creek	
Tallassee	4,809	Two-Cell Lagoon in Series	Tallapoosa River	
Tuskegee	11,028			
Plant No. 1		One-Cell Lagoon	Uphapee Creek	
Plant No. 2		Two-Cell Lagoon in Parallel	Uphapee Creek	
Plant No. 3		One-Cell Lagoon	Calabee Creek	
Plant No. 4		One-Cell Lagoon	Calabee Creek	
Plant No. 5		Two-Cell Lagoon in Parallel	Calabee Creek	
Union Springs	4,324	High-Rate Filter	Town Creek	
Wadley	626	One-Cell Lagoon	Hutton Creek	
Wedowee	842	One-Cell Lagoon	Wedowee Creek	

APPENDIX TABLE 4A -- MUNICIPAL WASTE DISPOSAL FACILITIES IN THE ALABAMA RIVER BASIN, BY SUBBASINS, OCTOBER 1974 (CONT'D).

MUNICIPALITY	POPULATION 1970 CENSUS	WASTE DISPOSAL FACILITY	RECEIVING STREAM	REMARKS
		COOSA RIVER SUBBASIN		
Anniston	31,533	Activated Sludge w/Cl_2	Choccolocco Creek	
Ashville	986	Septic Tank	Canoe Creek	1/
Attalla	7,510	Single-Cell Lagoon	Big Wills Creek	
Blue Mountain	466	Standard-Rate Filter	Cane Creek	
Bon Air	214	Sentic Tank	Griffin Branch (Tallaseehatchee Creek)	1/
Calera	1,655	Extended Aeration (Air)	Buxaahatchee Creek	
Cedar Bluff	956	Three-Cell Lagoon	Chattooga River (Coosa River)	
Centre	2,418	Single-Cell Lagoon	Terrapin Creek (Coosa River)	
Childersburg	4,831			
West Plant		Two-Cell Lagoon in Parallel	Coosa River	
Northeast Plant		One-Cell Lagoon	Talladega Creek	
Clanton	5,868	Standard-Rate Filter	Walnut Creek	
Collinsville	1,300	Single-Cell Lagoon	Little Wills Creek	
Columbiana	2,248	One-Cell Lagoon	Waxahatchee Creek	
Fort Payne	8,435	Aerated Lagoon w/Cl_2	Big Wills Creek	
Gadsden	53,928			
West Side Plant		High-Rate Filter w/Cl_2	Big Wills Creek	
East Side Plant		High-Rate Filter w/Cl_2	Coosa River	
Glencoe	2,901	Single-Cell Lagoon	Coosa River	
Goodwater	2,172	Single-Cell Lagoon	Baker Creek	
Jacksonville	7,715	High-Rate Filter w/Cl_2	Tallahatchee Creek	
Oxford	4,361	City of Anniston Plant		
Pell City	5,381			
Plant No. 1		Primary w/Digestion	Dye Creek	1/
Plant No. 2		Extended Aeration	Wolf Creek	
Piedmont	5,063	One-Cell Lagoon	Nances Creek	
Rainbow City	3,107	One-Cell Lagoon	Big Wills Creek	
Springville	1,153	Primary--Septic Tank	Spring Creek	1/
Sylacauga	12,255			
Five Points STP		High-Rate Filter w/Cl_2	Shirtee Creek	
Fairmont STP		Extended Aeration	Tallaseehatchee Creek	
Oldfield STP		Activated Sludge	Crooked Creek	
Talladega	17,662			
Plant No. 1		High-Rate Filters w/Cl_2	Talladega Creek	
Brecon System		High-Rate Filter	Kelly Creek	
Bemiston Plant		High-Rate Filter	Talladega Creek	
Wetumpka	3,786			
East Lagoon		Two-Cell Lagoon in Parallel	Coosa River	
West Lagoon		Two-Cell Lagoon in Parallel	Coosa River	
Wilsonville	659	Extended Aeration	Bullets Creek	

1/ Inadequate
2/ Overloaded
3/ Inoperable-waste to lagon

Source: Alabama Water Improvement Commission, Municipal Inventory-October 1974.

Appendix Table 4B — Industrial waste disposal facilities in the Alabama River Basin, by subbasins, 1974.

Name of Industry and Location	Sewage Disposal Facilities	Industrial Treatment Facilities	Receiving Stream	Remarks
		ALABAMA RIVER SUBBASIN		
Vanity Fair Mills, Monroeville, Monroe County	Monroeville sewerage system	Pre-treatment screening Monroeville sewerage system: aerated lagoon and a mechanical clarifier.	Hudson Branch	Intrastate waters. Adequate
MacMillan Bloedel United, Inc., Pine Hills, Wilcox Co.	Treated with industrial wastes	Mechnical clarifier, 90-day oxidation--storage lagoon, diffusion in river.	Alabama River	Interstate waters. Adequate
All Lock Company, Selma, Dallas County	Selma Municipal STP	Sludge Lagoon or Drying Bed	Valley Creek	Intrastate waters. Adequate
Bush Hog MFG. Selma, Dallas County	Selma Municipal Valley Creek STP	No-or-pre-treatment	Valley Creek	Intrastate waters.
Cloverleaf Dairy, Selma, Dallas County	Septic Tank	No-or-pre-treatment	Valley Creek	Intrastate waters.
Dan River Mills, Benton, Dallas County	---	Stabilization Basin	Old Town Creek	Intrastate waters. Inadequate
General Battery, Selma, Dallas County	---	No-or-pre-treatment	Tributary Ala. River	Intrastate waters. Inadequate
Hammermill Paper Co., Selma, Dallas County	Treated with industrial wastes	Mechanical clarifier, 5-day retention basin and 60-day oxidation storage lagoon, diffusion in River	Alabama River	Interstate waters. Inadequate
Helena Chemical Company, Dallas County	---	---	Tributary Ala. River	
Selma Stop & Go Car Wash, Selma, Dallas County	Selma Municipal Valley Creek STP	No-or-pre-treatment	Valley Creek	Intrastate waters.
Southland Mower, Selma, Dallas County	Septic Tank	Equalization	Alabama River	Interstate waters. Inadequate
Ala. Rendering, Montgomery, Montgomery County	Montgomery Municipal Econchate STP	Sedimentation, segregation, and collection and collection	Tributary Ala.	Intrastate waters. Inadequate
American Oil Company Montgomery, Montgomery Co.	Septic Tank	Separators and Traps	Tri. Catoma Creek	Intrastate waters.
Brockway Glass, Montgomery, Montgomery County	---	No-or-pre-treatment	Tributary Ala. River	Intrastate waters. Adequate
Gunter AFS, Montgomery, Montgomery County	Montgomery Municipal Econchate STP	---	Tributary Ala. River	Intrastate waters. Adequate
Illinois Central Gulf RR, Montgomery, Montgomery Co.	---	No-or-pre-treatment	Alabama River	Interstate waters. Inadequate

Appendix Table 4B -- Industrial waste disposal facilities in the Alabama River Basin, by subbasins, 1974 (CONT'D).

NAME OF INDUSTRY AND LOCATION	SEWAGE DISPOSAL FACILITIES	INDUSTRIAL TREATMENT FACILITIES	RECEIVING STREAM	REMARKS
Koppers Company, Montgomery Montgomery County	Montgomery Municipal Econchate STP	Segregation and collection	Tributary Ala. River	Intrastate waters. Adequate
Maxwell AFB, Montgomery, Montgomery County	Towassa STP		Alabama River	Interstate waters. Adequate
Pennault Corp, Montgomery, Montgomery County	Montgomery Municipal Econchate STP	No-or-pre-treatment	Tributary Ala. River	Intrastate waters.
Shell Oil Company, Montgomery, Montgomery Co.	Septic Tank	Separators and traps	Catoma Creek	Intrastate waters.
Stevens J. P. Montgomery, Montgomery Co.	Montgomery Municipal Econchate STP	No-or-pre-treatment	Alabama River	Interstate waters.
Whitfield Pickle Co. Montgomery, Montgomery Co.	Montgomery Municipal STP	Municipal system consists of a high rate trickling filter plant with chlorination.	Ala. River via Treatment Plant	Interstate waters. Adequate - Process Waste Inadequate
R. L. Ziegler, Inc. Selma, Dallas Co.	Selma Municipal STP	Selma sewerage system; high rate trickling filter with chlorination	Ala. River via Selma Plant	Interstate waters. Adequate - Process and Sanitation Inadequate
King Pharr Canning Company Uniontown, Perry County	Uniontown Municipal STP	Screening		Intrastate waters. Inadequate
Transcontinential Gas Billingsley, Chilton Co.	Septic Tanks	Recycle or reuse of water.	Day Light Creek	Adequate
Fox Lumber Company Plantersville, Autauga Co.	Septic Tank	No-or-Pre-treatment	Mulberry River	Intrastate waters.
Gurney Mfg. Company Prattville, Autauga Co.	Prattville Municipal STP	No-or-Pre-Treatment	Autauga Creek	Intrastate waters. Inadequate
Ring Around Products Prattville, Autauga Co.		No-or-Pre-Treatment	Tributary Ala. River	Intrastate waters. Inadequate
Union-Camp Corp. Prattville, Autauga Co.	Treated with industrial wastes	Settling basin, 1,500 acres (2,260 MG capacity) of oxidation--storage lagoons, diffusion in river.	Alabama River	Interstate waters. Adequate

Appendix Table 4B -- Industrial waste disposal facilities in the Alabama River Basin, by subbasins, 1974 (cont'd).

Name of Industry and Location	Sewage Disposal Facilities	Industrial Treatment Facilities	Receiving Stream	Remarks
		COOSA RIVER SUBBASIN		
Keystone Metal Mould, Clanton, Chilton Co.	Segregation and collection	Sludge lagoon or drying beds	Walnut Creek	Intrastate waters. Adequate
Avondale Mills, Rockford, Coosa Co.	--- ---	Standard pkg. plant w/aerobic digest unit	Tributary of Davidston Creek	
Dixie Craft Mfg. Co., Goodwater, Coosa Co.	Hatchett Creek Lagoon	Segregation and collection	Hatchett Creek	Intrastate waters. Sanitary waste Adequate
Abex Corp., Calera, Shelby Co.	Calera Municipal STP	No-or-pre-treatment	Buxahatchee Creek	Intrastate waters. Sanitary waste Adequate
Alabama Plating Co. Vincent, Shelby Co.	Septic tank and absorption field	Chemical treatment facilities for metal plating wastes and a blending basin.	Tributary of Spring Creek	Intrastate waters. Inadequate
Alabama Power Wilsonville PL - Wilsonville, Shelby Co.	---	Sludge digestor	Coosa River	Interstate waters.
Catalytic Inc., Wilsonville, Shelby Co.	---	---	Bullets Creek	Intrastate waters. Adequate
Hackney Corporation, Columbiana, Shelby Co.	Columbiana Municipal STP	Chemical treatment facilities for metal plating wastes including sedimentation and storage basins.	Tributary of Waxahatchee Creek	Intrastate waters. Adequate. Sanitary Process waste Inadequate
Avondale Mills-Pell City, Pell City, St. Clair Co.	Pell City #1	---	Dye Creek	Intrastate waters. Sanitary waste Adequate
Custon Pack Poultry, Pell City, St. Clair Co.	---	Stabilization Basin	Wolf Creek	Intrastate waters. Adequate
Pell City Meat Process, Pell city, St. Clair Co.	---	Separators and traps. Stabilization basin and lagoon.	Tributary of Coosa River	Intrastate waters. Inadequate
Kimberly-Clark Corp., Talladega Co., Coosa Pines	Primary treatment. Imhoff tank.	Mechanical clarifier, 268-acre (960 MG capacity) oxidation-storate basin, diffusion in river.	Coosa River	Interstate waters. Inadequate
Alabama Industries, Sylacauga, Talladega Co.	Sylacauga Municipal STP	Sludge lagoon or drying bed.	Tributary of Shirtee Creek	Intrastate waters. Sanitary waste Adequate. Process waste. Inadequate

Appendix Table 4B -- Industrial waste disposal facilities in the Alabama River Basin, by subbasins, 1974 (CONT'D).

Name of Industry and Location	Sewage Disposal Facilities	Industrial Treatment Facilities	Receiving Stream	Remarks
		COOSA RIVER SUBBASIN		
Avondale Mills-Sylacauga Sylacauga, Talladega Co.	Sylacauga Municipal STP	Sludge lagoon or drying bed.	Tributary of Shirtee Creek	Intrastate waters. Sanitary waste Adequate. Process waste Inadequate.
Avondale Mills-Sycamore, Sycamore, Talladega Co.	---	Screening	Tributary of Emawhee Creek	Intrastate waters. Sanitary waste Inadequate. Cooling water Adequate.
Crown Textiles, Talladega, Talladega Co.	Talladega Municipal STP	Pre-treatment facilities consisting of blending and aeration basins.	Talladega Creek via Talladega Creek STP.	Intrastate waters. Adequate.
Bemis Co., Inc., Talladega, Talladega Co.	Talladega, Bemiston STP	Discharge to secondary municipal plant	Talladega Creek via Municipal Plant	Intrastate waters.
Wehadkee Yarn Mills, Talladega, Talladega Co.	Talladega municipal STP	No-or-pre-treatment.	Talladega Creek via Talladega treatment plant	Intrastate waters. Sanitary waste Adequate
Ga. Pacific Corp. Talladega Talladega Co.	Septic tank	---	Kelly Creek	Intrastate waters. Adequate
Alabama Department of Conservation, Eastaboga, Talladega County	---	---	Eastaboga Creek	Intrastate waters.
Clow Corp., Lincoln, Talladega Co.	Septic tank	---	Blue Eye Creek	Intrastate waters. Sanitary waste Adequate
Bannister Slaughter, Munford, Talladega Co.	---	Local separators and traps; Stabilization basin and lagoon.	Choccolocco Creek	Intrastate waters.
Anniston Army Ordnance Bynum, Calhoun Co.	Imhoff tank STP under construction.	Separators and traps	Dry Creek Eastaboga Creek	Intrastate waters. Inadequate. Federal installation.
Adelaide Mills, Anniston, Calhoun Co.	Anniston Municipal STP	---	Snow Creek	Intrastate waters.

APPENDIX TABLE 4B -- INDUSTRIAL WASTE DISPOSAL FACILITIES IN THE ALABAMA RIVER BASIN, BY SUBBASINS, 1974 (CONT'D).

NAME OF INDUSTRY AND LOCATION	SEWAGE DISPOSAL FACILITIES	INDUSTRIAL TREATMENT FACILITIES	RECEIVING STREAM	REMARKS
		COOSA RIVER SUBBASIN		
Boyles Galvanizing Co., Anniston, Calhoun Co.	Anniston Municipal STP	No-or-pre-treatment	Snow Creek	Intrastate waters. Inadequate.
Chicopee MFG, Anniston, Calhoun Co.	Anniston Municipal STP	---	Snow Creek	Intrastate waters.
Classe Ribbon Co., Anniston, Calhoun Co.	Anniston Municipal STP	---	Snow Creek	Intrastate waters.
Indian Head Yarn & Thread Co., Blue Mtn., Calhoun Co.	Anniston Municipal STP	Sedimentation and equalization	Tributary of Cane Creek	Intrastate waters.
Industrial Plating, Anniston, Calhoun Co.	---	Segregation and collection	Tributary of Snow Creek	Intrastate waters. Inadequate.
Kilby Steel, Anniston, Calhoun Co.	---	---	Snow Creek	Intrastate waters. Inadequate
Lee Bros. Corp. Anniston, Calhoun Co.	Septic tank	No-or-pre-treatment	Tributary of Choccolocco Creek	Intrastate waters. Inadequate.
Mead Standard Foundry Anniston, Calhoun Co.	---	No-or-pre-treatment	Tributary of Snow Creek	Intrastate waters. Inadequate.
Mead Union Foundary, Anniston, Calhoun Co.	---	Sedimentation and skimmer.	Tributary of Snow Creek	Intrastate waters. Inadequate.
Mead Water Pipe Plant Anniston, Calhoun Co.	---	No-or-pre-treatment	Snow Creek	Intrastate waters. Inadequate
Monsanto, Anniston, Calhoun Co.	Anniston Municipal STP	---	Snow Creek	Intrastate waters. Sanitary waste Adequate. Process waste Inadequate.
National Gypsum Co. Anniston, Calhoun Co.	Anniston Municipal STP	Screening, sedimentation lagoon	Coldwater Creek	Intrastate waters. Adequate.
Southern Natural Gas Dearmanville, Calhoun Co.	---	No-or-pre-treatment.	Tributary of Choccolocco Creek	Intrastate waters.
Southern Plating and Mach. Anniston, Calhoun Co.	Anniston Municipal STP	Sludge lagoon or drying bed.	Choccolocco Creek	Intrastate waters. Adequate
Southern Tool & Mach. Oxford, Calhoun Co.	Anniston Municipal STP	No-or-pre-treatment	Choccolocco Creek	Intrastate waters. Sanitary waste

Appendix Table 4B -- Industrial waste disposal facilities in the Alabama River Basin, by subbasins, 1974 (CONT'D).

Name of Industry and Location	Sewage Disposal Facilities	Industrial Treatment Facilities	Receiving Stream	Remarks
		COOSA RIVER SUBBASIN		
Tape Craft Corp, Anniston, Calhoun Co.	Anniston Municipal STP	---	Choccolocco Creek	Intrastate waters.
Triangle Refineries Oxford, Calhoun Co.	Septic tank	No-or-pre-treatment	Choccolocco Creek	Intrastate waters. Adequate
Tull Chemical Co. Oxford, Calhoun Co.	---	No-or-pre-treatment	Snow Creek	Intrastate waters. Inadequate
Turner Dairies Inc. Oxford, Calhoun Co.	Septic tank	---	Tributary of Choccolocco Creek	Intrastate waters. Process waste Inadequate
U. S. Pipe & Foundry Co. Anniston, Calhoun Co.	Anniston Municipal STP	---	Snow Creek	Intrastate waters. Sanitary waste Adequate. Process waste Inadequate.
Alabama Power Co. Gadsden, Etowah Co.	Septic tank and absorption field	Ash settling ponds.	Coosa River	Interstate waters. Adequate.
Allis Chalmers Gadsden, Etowah Co.	Gadsden Municipal Eastside STP	---	Tributary of Coosa River	Intrastate waters. Sanitary waste Adequate. Process waste Inadequate.
Alpine Mills Atlanta, Etowah Co.	Attalla Municipal Lagoon	Segregation and collection screening		Adequate
Norris Cole Slaughter Gadsden, Etowah Co.	Local separators and traps	Stabilization basin and lagoon	Tributary of Coosa River	Intrastate waters.
Craft Plating and Finishing Attalla, Etowah Co.	Attalla Municipal lagoon	Sludge lagoon or drying bed		Inadequate
Attalla MFG Gadsden, Etowah Co.	Rainbow City Municipal Lagoon	Segregation and collection, sedimentation		Sanitary waste Adequate. Process waste Inadequate.
Goodyear Tire and Rubber Co., Gadsden, Etowah Co.	Gadsden Municipal Gadsden Eastside STP	Oil and solids removal equipment for the waste stream which is composed principally of cooling water and surface drainage. Facilities include an oil separation equipped with mechanical equipment for removal of oil and solids and a polishing basin.	Coosa River	Interstate waters. Adequate.
Health-Tex Gadsden, Etowah Co.	Attalla Municipal Lagoon.			

Appendix Table 4B -- Industrial waste disposal facilities in the Alabama River Basin, by subbasins, 1974 (CONT'D).

Name of Industry and Location	Sewage Disposal Facilities	Industrial Treatment Facilities	Receiving Stream	Remarks
		COOSA RIVER SUBBASIN		
Owens Plating Co. Gadsden, Etowah Co.	Rainbow City Municipal Lagoon	---		
Republic Steel Corp. Gadsden, Etowah Co.	Gadsden Municipal Gadsden West STP	In-plant control, 2.5 acre sedimentation, blending, and oil removal basin.	Black Creek	Intrastate waters. Adequate.
Spring Valley Farms Gadsden, Etowah Co.		Local separators and traps; and sedimentation lagoon	Coosa River	Interstate waters. Adequate.
Texaco-Gadsden Gadsden, Etowah Co.			Coosa River	Interstate waters.
Big Wills Poultry, Inc. Collinsville, DeKalb Co.	Treated with industrial wastes	Screening, grease and solids removal, an anaerobic lagoon having a water surface area of 7.0 acres.	Big Wills Creek	Intrastate waters.
Manufacturers Inc. Collinsville, DeKalb Co.	---	---	---	---
Bailey Knit Copr. Ft. Payne, Dekalb Co.	Ft. Payne Municipal Big Wills STP	No-or-pre-treatment	Big Wills Creek	Intrastate waters. Inadequate.
Cooper Hosiery Mills I Ft. Payne, Dekalb Co.	Ft. Payne Municipal Big Willls STP	No-or-pre-treatment	Big Wills Creek	Intrastate waters. Inadequate.
Davis W. B. Hosiery Mills, Inc., Ft. Payne	Ft. Payne Municipal Big Wills STP	Screening to municipal system	Big Wills Creek	Intrastate waters. Inadequate.
Demuth Steel Ft. Payne, DeKalb Co.	Ft. Payne Municipal Big Wills STP	Segregation and collection, sedimentation	Big Wills Creek	Intrastate waters. Inadequate.
Desotocho Inc. Ft. Payne, DeKalb Co.	Ft. Payne Municipal Big Wills STP	No-or-pre-treatment	Big Wills Creek	Intrastate waters. Adequate.
Ft. Payne DeKalb Hosier, Ft. Payne, DeKalb Co.	Ft. Payne Municipal Big Wills, STP	Screening	Big Wills Creek	Intrastate waters. Inadequate.
Heil Corp. Fort Payne DeKalb Co.	Ft. Payne Municipal Big Wills STP		Big Wills Creek	Intrastate waters. Adequate.
Merico Inc. Ft. Payne, DeKalb Co.	Ft. Payne Municipal Big Wills STP	Local separators and traps.	Big Wills Creek	Intrastate waters. Inadequate.
Prewett VI & Son Ft. Payne, DeKalb Co.	Ft. Payne Municipal Big Wills STP	Screening	Big Wills Creek	Intrastate waters. Adequate

Appendix Table 4B -- Industrial waste disposal facilities in the Alabama River Basin, by subbasins, 1974 (CONT'D).

Name of Industry and Location	Sewage Disposal Facilities	Industrial Treatment Facilities	Receiving Stream	Remarks
COOSA RIVER SUBBASIN				
Serv-I-Soft Ft. Payne, KeKalb Co.	Ft. Payne Municipal Big Wills STP	No-or-pre-treatment	Tributary of Dye Branch	Intrastate waters. Sanitary waste Adequate. Process waste Inadequate.
Shugart, W. Y. & Sons Ft. Payne, DeKalb Co.	Ft. Payne Municipal Big Wills STP	Screening	Big Wills Creek	Intrastate waters. Adequate.
Texaco-Ft. Payne Ft. Payne, DeKalb Co.			Big Wills Creek	Intrastate waters.
Vulcraft Div. Nucor Ft. Payne, DeKalb Co.	Septic tanks			Adequate
Ellis Brothers Centre, Cherokee Co.			Lagoon	Inadequate
Texaco-Centre Centre, Cherokee Co.			Coosa River	Interstate waters.

Appendix Table 4B -- Industrial waste disposal facilities in the Alabama River Basin, by subbasins, 1974 (CONT'D).

Name of Industry and Location	Sewage Disposal Facilities	Industrial Treatment Facilities	Receiving Stream	Remarks
		CAHABA RIVER SUBBASIN		
Marion Fish Hatchery Marion, Perry Co.				
Deason Slaughterhouse Centerville, Bibb Co.		Local separators and traps lagoon	Haysor Creek	Intrastate waters.
Canton Textile Mills Alabaster, Shelby Co.	Alabaster Municipal STP	(Zero discharge)	Buck Creek	Intrastate waters. Sanitary wastes Adequate. Process wastes Inadequate.
Dunn Construction Co. Helena, Shelby Co.	Septic tank	Segregation and collection	Rock Creek Roy Branch	Intrastate waters.
Anderson Electric Co. Leeds, Jefferson Co.	Leeds Municipal STP	Nutralization, sludge lagoon, and drying beds.	Tri. of Little Cahaba River	Intrastate waters. Adequate
Birmingham Sal.& Steel Drum, Irondale, Jefferson Co.			Tributary of Shades Creek	Intrastate waters.
Mann Brothers Plating Co. Trussville, Jefferson Co.	Trussville Municipal STP	Pre-treatment consisting of chemical treatment of metal plating wastes. Municipal facilities consist of a slow rate trickling filter and chlorination.	Cahaba River via Trussville Treatment Plant	Intrastate waters. Process waste Inadequate.
Lumber Jack Meats, Leeds, Jefferson Co.	Leeds Municipal STP	Local separators and traps	Tributary of Cahaba River	Intrastate waters.
Mirro Metal Plating Lovick, Jefferson Co.	Septic tank	No-or-pre-treatment	Tributary of Cahaba River	Intrastate waters.
Ralston Purina Co. Trussville, Jefferson Co.	Lagoon	Screening-sedimentation	Cahaba River	Intrastate waters. Inadequate.
Rock Wool MFG Leeds, Jefferson Co.	Septic tank	No-or-pre-treatment	Tri. of Little Cahaba River	Intrastate waters. In process of upgrading.
Southern Railway Irondale, Jefferson Co.	Septic field	Sludge lagoon or drying bed.	Shades Creek	Intrastate waters. Adequate.
U.S. Steel University Atlas, Leeds, Jefferson Co.	Leeds Municipal STP	No-or-pre-treatment.	Moores Creek	Intrastate waters. Sanitary waste Adequate.

Appendix Table 4B -- Industrial waste disposal facilities in the Alabama River Basin, by subbasins, 1974 (cont'd).

Name of Industry and Location	Sewage Disposal Facilities	Industrial Treatment Facilities	Receiving Stream	Remarks
		TALLAPOOSA RIVER SUBBASIN		
Neptune Meter Co. Tallassee, Tallapoosa Co.	Tallassee Municipal STP	No-or-pre-treatment		
Southern Car Service Waugh, Macon Co.			Line Creek	
Welsh Co. Union Springs, Bullock Co.	Union Springs Municipal STP	Pre-treatment chemical flocculating and filter press. Municipal facilities consists of neutralization and sedimentation.	Old Town Creek	Intrastate waters. Adequate.
Ampex Corporation, Opelika Lee Co.	Opelika Municipal STP	Neutralization and pH control equipment-sedimentation	Pepperell Branch	Intrastate waters. Adequate.
Uniroyal, Inc. Opelika Lee Co.	Opelika Municipal STP	Two separate systems; system No. 1 consists of a 0.5 acre settling basin and system No. 2 consists of a 0.7 acre basin.	Chewacla Creek	Intrastate waters. Adequate.
West Point Pepperell, Opelika, Lee Co.	Opelika Municipal STP	In plant facilities including a caustic recovery system, an aerated lagoon having a retention of 2.9 days, a trickling filter 39 feet in diameter and 28 feet deep, an aerated lagoon having a retention of 2.6 days and a 15 acre polishing lagoon.	Pepperell Branch	Intrastate waters. Adequate.
Auburn University Fisheries Auburn, Lee Co.			Saugahatchee Creek	Intrastate waters. Adequate
Avondale Mills, Alexander City, Tallapoosa Co.	Alexander City sewerage system	Municipal facilities consist of an activated sludge type treatment plant with chlorination.	Coley Creek via municipal sewage system.	Intrastate waters. Adequate.
Russell Mfg. Co., Alexander City, Tallapoosa Co.	Alexander City Municipal STP	Aerated lagoon system including aerobic digester, mechanical clarifiers and chlorination.	Sugar Creek via municipal sewage system.	Intrastate waters. Adequate.
Avondale Mills LaFayette, Chambers Co.			Mill Creek	Intrastate waters.
C. F. Clegg Poultry Proc. Ashland, Clay Co.	Ashland Municipal East STP	Separation and traps, screening	Horsetrough Creek	Intrastate waters.
Matthews Meat Market Lineville, Clay Co.		Local separators and traps, Lagoon	Fox Creek	Intrastate waters.
C. F. Clegg Poultry Proc. Heflin, Cleburne County	Lagoon	Sludge lagoon or drying bed.	Tallapoosa River	Interstate waters. Adequate.

APPENDIX 5 -- USE CLASSIFICATION OF STREAMS, ALABAMA RIVER BASIN.

5A -- Methodology and classification notes.

EXPLANATION REGARDING FISH AND WILDLIFE CLASSIFICATION

On September 17, 1973, the Alabama Water Improvement Commission adopted a Fish and Wildlife Goal for certain waters of the State. These waters were previously classified as something less than Fish and Wildlife and the Commission, through its action, established, as an objective, the attainment of water quality in these areas compatible with the criteria applicable to such classification. Waters included in this category are listed under the classification "Fish and Wildlife as a Goal".

Since these segments of water were previously classified as something other than Fish and Wildlife, and have had this classification assigned as an objective, the criteria applicable to such classification are not descriptive of current conditions. Information on current water quality may be obtained by contacting the Commission's office (State Office Building, Montgomery, AL 36130, 269-7971).

SEGMENTS OF WATER NOT LISTED IN CLASSIFICATIONS

On September 17, 1973, the Alabama Water Improvement Commission adopted, as a goal, a classification of Fish and Wildlife for all waters of the State which were unclassified at the time. Most of the major water segments are shown on this classification map; however, for any segments which are not shown, a goal of water quality commensurate with the criteria applicable to a Fish and Wildlife classification is appropriate.

Appendix Table 5B -- Use classification of streams, Alabama River Basin.

Stream	From	To	Public Water Supply	Swimming	Fish and Wildlife	Fish and Wildlife as a goal
INTERSTATE WATERS OF THE ALABAMA RIVER SUBBASIN ADOPTED BY THE WATER IMPROVEMENT COMMISSION ON MAY 5, 1967						
ALABAMA RIVER	MOBILE RIVER	Claiborne Lock & Dam			X	
ALABAMA RIVER	Claiborne Lock & Dam	Frisco Railroad Crossing		X	X	
ALABAMA RIVER 1/	Frisco Railroad Crossing	River Mile 131	X		X	
ALABAMA RIVER 1/	River Mile 131	Miller's Ferry Lock & Dam			X	
ALABAMA RIVER	Miller's Ferry Lock & Dam	Blackwell Bend (Six Mile Ck.)		X	X	
ALABAMA RIVER	Blackwell Bend (Six Mi. Ck.)	Jones Bluff Lock & Dam			X	
ALABAMA RIVER	Jones Bluff Lock & Dam	Pintlalla Creek		X	X	
ALABAMA RIVER	Pintlalla Creek	Its source			X	
INTRASTATE WATERS OF THE ALABAMA RIVER SUBBASIN ADOPTED BY THE WATER IMPROVEMENT COMMISSION ON JUNE 19, 1967						
Little River	ALABAMA RIVER	Its source		X	X	
Randons Creek	ALABAMA RIVER	Its source			X	
Limestone Creek	ALABAMA RIVER	Its source			X	
Big Flat Creek	ALABAMA RIVER	Its source		X	X	
Pursley Creek	ALABAMA RIVER	Its source			X	
Turkey Creek	ALABAMA RIVER	Its source			X	
Pine Barren Creek	ALABAMA RIVER	Its source		X	X	
Chilatchee Creek	ALABAMA RIVER	Its source		X	X	
Boguechitto Creek	ALABAMA RIVER	Its source			X	
Sand Creek	Boguechitto Creek	Its source			X	
Unnamed Branch	Sand Creek	Marion Sewage Treatment Plant				X
Big Cedar Creek	ALABAMA RIVER	Its source		X	X	
Valley Creek	ALABAMA RIVER	Selma-Summerfield Rd.			X	
Valley Creek	Selma-Summerfield Rd.	Its source		X	X	
Mulberry Creek	ALABAMA RIVER	Plantersville		X	X	
Mulberry Creek	Plantersville	Its source			X	
Big Swamp Creek	ALABAMA RIVER	Its source		X	X	
Swift Creek	ALABAMA RIVER	Its source		X	X	
Pintalla Creek	ALABAMA RIVER	Its source		X	X	
Autauga Creek	ALABAMA RIVER	Western boundary of Prattville			X	
Autauga Creek	Western boundary of Prattville	Its source		X	X	
Catoma Creek	ALABAMA RIVER	Catoma Creek Sewage Treatment Plant, Montgomery				X
Catoma Creek	Catoma Creek Sewage Treatment Plant, Montgomery	Its source			X	
Mortar Creek	ALABAMA RIVER	Its source			X	
Valley Creek Lake	Within Valley Creek State Park			X	X	
Little River Lake	Within Valley Creek State Park			X	X	

Appendix Table 5B -- Use classification of streams, Alabama River Basin. (CONT'D)

INTRASTATE WATERS OF THE CAHABA RIVER SUBBASIN ADOPTED BY THE WATER IMPROVEMENT COMMISSION ON OCTOBER 16, 1972

Stream	From	To	Public Water Supply	Swimming	Fish and Wildlife	Fish and Wildlife as a goal
Cahaba River	Alabama River	Junction of Lower Little 2/ Cahaba River		X		
Cahaba River	Junction of Lower Little 2/ Cahaba River	Dam near U.S. Hwy 280			X	
Cahaba River	Dam near U.S. Hwy 280	Grant's Mill Road	X			
Cahaba River	Grant's Mill Road	U.S. Hwy 11			X	
Cahaba River	U.S. Hwy 11	Its Source			X	
Childers Creek	Cahaba River	Its Source			X	
Oakmulgee Creek	Cahaba River	Its Source		X 2/		
Little Oakmulgee	Oakmulgee Creek	Its Source		X 2/		
Rice Creek	Cahaba River	Its Source				X
Waters Creek	Cahaba River	Its Source		X 2/		
Old Town Creek	Cahaba River	Its Source		X 2/		
Blue Outtee Creek	Cahaba River	Its Source		X 2/		
Affonee Creek	Cahaba River	Its Source		X 2/		
Haysop Creek	Cahaba River	Its Source			X	
Schultz Creek	Cahaba River	Its Source		X 2/		
Little Cahaba River (Bibb County)	Cahaba River	Its Source junction of Mahan and Shoal Creeks)			X	
Six Mile Creek	Little Cahaba River	Its Source		X 2/		
Mahan Creek	Little Cahaba River	Its Source			X	
Shoal Creek	Little Cahaba River	Its Source			X	
Caffee Creek	Cahaba River	Its Source			X	
Shades Creek 3/	Cahaba River	Jefferson County Line			X	
Shades Creek 3/	Jefferson County Line	Shades Creek Sewage Treatment Plant				X
Shades Creek 3/	Shades Creek Sewage Treatment Plant	Its Source			X	
Rocky Brook	Shades Creek	Its Source				X
Buck Creek	Cahaba River	Cahaba Valley Creek			X	
Buck Creek	Cahaba Valley Creek	Its Source				X
Cahaba Valley Ck.	Buck Creek	Its Source			X	
Peavine Creek	Buck Creek	Its Source			X	
Oak Mtn. State Pk.Lakes				X		
Patton Creek	Cahaba River	Its Source				X
Little Shades Ck.	Cahaba River	Its Source				X
Little Cahaba River (Jefferson-Shelby Counties)	Cahaba River	Head of Lake Purdy	X			
Little Cahaba River (Jefferson County)	Head of Lake Purdy	Corporate Limits, City of Leeds				X 4/
Little Cahaba River (Jefferson County)	Corporate Limits, City of Leeds	Its Source				X
Pinchgut Creek	Cahaba River	Its Source				X

Appendix Table 5B -- Use classification of streams, Alabama River Basin. (CONT'D)

INTERSTATE WATERS OF THE COOSA RIVER SUBBASIN ADOPTED BY THE WATER IMPROVEMENT COMMISSION ON May 5, 1967

Stream	From	To	Public Water Supply	Swimming	Fish and Wildlife	Fish and Wildlife as a goal
COOSA RIVER	Its junction with the TALLAPOOSA RIVER	Alabama Hwy 14 bridge at Wetumpka			X	
COOSA RIVER	Alabama Hwy 14 bridge at Wetumpka	Jordan Dam	X		X	
COOSA RIVER Lake Jordan	Jordan Dam	Mitchell Dam		X	X	
COOSA RIVER Lake Mitchell	Mitchell Dam	Lay Dam	X	X	X	
COOSA RIVER Lay Lake	Lay Dam	Southern RR Bridge (1-1/3 miles above Yellowleaf Ck.)	X	X	X	
COOSA RIVER Lay Lake	Southern RR Bridge (1-1/3 miles above Yellowleaf Ck.)	River Mile 89 (1-½ miles above Talladega Creek)				X
COOSA RIVER Lay Lake	River Mile 89 (1-½ miles above Talladega Creek)	Logan Martin Dam	X		X	
COOSA RIVER Logan Martin Lake Lake Henry	Logan Martin Dam	McCardney's Ferry		X	X	
COOSA RIVER Lake Henry	McCardney's Ferry	City of Gadsden's water supply intake			X	
COOSA RIVER Lake Henry	City of Gadsden's water supply intake	Weiss Dam powerhouse	X		X	
COOSA RIVER	Weiss Dam powerhouse	Weiss Dam			X	
COOSA RIVER Weiss Lake	Weiss Dam and Weiss Dam powerhouse	Spring Creek	X	X	X	
COOSA RIVER Weiss Lake	Spring Creek	Alabama-Georgia state line		X	X	
Terrapin Creek	COOSA RIVER	Alabama Hwy 9	X		X	
Terrapin Creek	Alabama Hwy 9	U.S. Hwy 278			X	
Terrapin Creek	U.S. Hwy 278	Borden Springs	X		X	
Terrapin Creek	Borden Springs	Alabama-Georgia state line			X	
Little River	COOSA RIVER (Weiss Lake)	Alabama-Georgia state line	X	X	X	
West Fork of Little River	Little River	Alabama-Georgia state line	X	X	X	
Chattooga River	COOSA RIVER (Weiss Lake)	Gaylesville		X	X	
Chattooga River	Gaylesville	Alabama-Georgia state line			X	
Spring Creek	COOSA RIVER (Weiss Lake)	Alabama-Georgia state line			X	

Appendix Table 5B -- Use classification of streams, Alabama River Basin. (CONT'D)

INTRASTATE WATERS OF THE COOSA RIVER SUBBASIN ADOPTED BY THE WATER IMPROVEMENT COMMISSION ON JUNE 19, 1957

Stream	From	To	Public Water Supply	Swimming	Fish and Wildlife	Fish and Wildlife as a goal
Weoka Creek	COOSA RIVER (Lake Jordan)	Its source		X	X	
Chestnut Creek	COOSA RIVER (Lake Jordan)	Its source			X	
Hatchet Creek	COOSA RIVER (Lake Mitchell)	Socapatoy Creek			X	
Hatchet Creek	Socapatoy Creek	Central of Georgia RR		X	X	
Hatchet Creek	Central of Georgia RR	Its source	X	X	X	
Socapatoy	Hatchet Creek	Its source			X	
Weogufka Creek	Hatchet Creek (Lake Mitchell)	Its source		X	X	
Walnut Creek	COOSA RIVER (Lake Mitchell)	Interstate Hwy 65			X	
Walnut Creek	Interstate Hwy 65	Its source				X
Waxahatchee Creek	COOSA RIVER (Lake Mitchell)	Its source			X	
Buxahatchee Creek	Waxahatchee Creek	Its source			X	
Yellowleaf Creek	COOSA RIVER (Lay Lake)	Its source		X	X	
Tallaseehatchie Creek	COOSA RIVER (Lay Lake)	City of Sylacauga's water supply reservoir dam			X	
Tallaseehatchie Creek	City of Sylacuaga's water supply reservoir dam	Its source	X		X	
Shirtee Creek	Tallaseehatchie Creek	Its source				X
Talladega Creek	COOSA RIVER (Lay Lake)	Its source			X	
Mump Creek	Talladega Creek	City of Talladega's water supply reservoir dam			X	
Mump Creek	City of Talladega's water supply reservoir dam	Its source	X		X	
Kelly Creek	COOSA RIVER (Lay Lake)	Its source		X	X	
Choccolocco Creek	COOSA RIVER (Logan Martin Lake)	Its source			X	
Eastaboga Creek	Choccolocco Creek	Its source			X	
Cheaha Creek	Choccolocco Creek	Lake Chinnabee		X	X	
Lake Chinnabee	Within Talladega National Forest			X	X	
Coldwater Creek	Choccolocco Creek	Its source			X	
Snow Creek	Choccolocco Creek	Its source				X
Dye Creek	COOSA RIVER (Logan Martin Lake)	County road one mile east of Pell City			X	
Dye Creek	County road one mile east of Pell City	Pell City sewage treatment plant				X
Cane Creek	COOSA RIVER (Logan Martin Lake)	Southern RR Bridge			X	
Cane Creek	Southern RR Bridge	Ft. McClellan Reservation				X
Cave Creek	Cane Creek	Ft. McClellan Reservation			X	
Ohatchee Creek	COOSA RIVER (Logan Martin Lake)	Its source		X	X	
Canoe Creek	COOSA RIVER (Lake Henry)	Its source			X	
Big Wills Creek	COOSA RIVER (Lake Henry)	Mouth of Little Wills Creek near Alabama Hwy 35			X	
Big Wills Creek	Mouth of Little Wills Creek near Alabama Hwy 35	Its source	X		X	
Black Creek	Big Wills Creek (Lake Henry)	U.S. Hwy 431				X
Black Creek	U.S. Highway 431	Its source			X	

APPENDIX TABLE 5B -- USE CLASSIFICATION OF STREAMS, ALABAMA RIVER BASIN. (CONT'D)

Stream	From	To	Public Water Supply	Swimming	Fish and Wildlife	Fish and Wildlife as a goal
INTRASTATE WATERS OF THE COOSA RIVER SUBBASIN ADOPTED BY THE WATER IMPROVEMENT COMMISSION ON JUNE 19, 1967						
Coleman Lake	Within Talladega National Forest			X	X	
Sweetwater Lake	Within Talladega National Forest		X	X	X	
High Rock Lake	Within Talladega National Forest			X	X	
Hillabee Lake	Within Talladega National Forest		X	X	X	
Salt Creek Lake	Within Talladega National Forest			X	X	
Shoal Creek	Choccolocco Creek	Sweetwater Lake		X	X	
INTERSTATE WATERS OF THE TALLAPOOSA RIVER SUBBASIN ADOPTED BY THE WATER IMPROVEMENT COMMISSION ON MAY 5, 1967						
TALLAPOOSA RIVER	ALABAMA RIVER	U.S. Hwy			X	
TALLAPOOSA RIVER	U.S. Hwy 231	Macon-Tallapoosa County Line	X		X	
TALLAPOOSA RIVER	Macon-Tallapoosa County Line	Thurlow Dam			X	
TALLAPOOSA RIVER	Thurlow Dam	Yates Dam	X	X	X	
TALLAPOOSA RIVER	Yates Dam	Martin Dam	X	X	X	
TALLAPOOSA RIVER (Lake Martin)	Martin Dam	Hillabee Creek		X	X	
TALLAPOOSA RIVER	Hillabee Creek	Alabama-Georgia State Line			X	
LITTLE TALLAPOOSA RIVER	TALLAPOOSA RIVER	Alabama-Georgia State Line			X	
INTRASTATE WATERS OF THE TALLAPOOSA RIVER SUBBASIN ADOPTED BY THE WATER IMPROVEMENT COMMISSION ON JUNE 19, 1967						
Oakfuskee Creek (Line Creek)	TALLAPOOSA RIVER	Its source			X	
Old Town Creek	Oakfuskee Creek (Line Creek)	Two miles downstream from U.S. Hwy 29			X	
Old Town Creek	Two miles downstream from U.S. Hwy 29	Its source				X
Cubahatchee Ck.	TALLAPOOSA RIVER	Its source		X	X	
Calebee Creek	TALLAPOOSA RIVER	Its source			X	
Uphapee Creek	TALLAPOOSA RIVER	City of Tuskeegee water supply intake			X	
Uphapee Creek	City of Tuskeegee water supply intake	Opintlocco Creek	X		X	
Uphapee Creek	Opintlocco Creek	Its source			X	
Chinquapin Creek	Uphapee Creek	Its source	X		X	
Chewacla Creek	Uphapee Creek	Mahone	X	X	X	
Chewacla Creek	Mahone Creek	Its source		X	X	
Chewochleehatchee Creek	Uphapee Creek	Chewacla State Park Lake			X	
Chewochleehatchee Creek	Chewacla State Park Lake	Its source	X		X	

Appendix Table 5B -- Use classification of streams, Alabama River Basin. (CONT'D)

INTRASTATE WATERS OF THE TALLAPOOSA RIVER SUBBASIN ADOPTED BY THE WATER IMPROVEMENT COMMISSION ON JUNE 19, 1967

Stream	From	To	Public Water Supply	Swimming	Fish and Wildlife	Fish and Wildlife as a goal
Moore's Mill Ck.	Chewochleehatchee Creek	Its source	X		X	
Sougahatchee Creek	TALLAPOOSA RIVER	County road two miles north of Loachopoka			X	
Sougahatchee Creek	County road two miles north of Loachopoka	Its junction with Pepperell Branch				X
Sougahatchee Creek	Its junction with Pepperell Branch	Opelika water supply reservoir			X	
Sougahatchee Creek	Opelika water supply reservoir	Its source	X		X	
Pepperell Branch	Sougahatchee Creek	Its source				X
	TALLAPOOSA RIVER (Lake Martin)	Alabama Hwy 49	X		X	
Sandy Creek	Alabama Hwy 49	Its source			X	
North Fork of Sandy Creek	Sandy Creek	Its source			X	
South Fork of Sandy Creek	Sandy Creek	Its source			X	
Little Sandy Ck.	South Fork of Sandy Creek	Central of Georgia RR			X	
Little Sandy Ck.	Central of Georgia RR	Its source	X		X	
Elkahatchee Creek	TALLAPOOSA RIVE (Lake Martin)	Alabama Hwy 63			X	
Elkahatchee Creek	Alabama Hwy 63	Alabama Hwy 22	X		X	
Elkahatchee Creek	Alabama Hwy 22	Its source			X	
Sugar Creek	Elkahatchee Creek	Its source				X
Hillabee Creek	TALLAPOOSA RIVER	Sandy Creek			X	
Hillabee Creek	Sandy Creek	County road bridge 3 miles east of Hackneyville	X		X	
Hillabee Creek	County road bridge 3 miles east of Hackneyville	Its source			X	
Hackney Creek	Hillabee Creek	Its source	X		X	
Chatahospee Creek	TALLAPOOSA RIVER	Its source			X	
Finley Creek	Chatahospee Creek	Its source	X		X	
High Pine Creek	TALLAPOOSA RIVER	Alabama Hwy 22			X	
High Pine Creek	Alabama Hwy 22	Its source	X		X	
Crooked Creek	TALLAPOOSA RIVER	Alabama Hwy 9			X	
Crooked Creek	Alabama Hwy 9	Its source	X		X	
Horsetrough Creek	Crooked Creek	Alabama Hwy 9			X	
Horsetrough Creek	Alabama Hwy 9	Its source				X
Wedowee Creek	LITTLE TALLAPOOSA RIVER	Its source			X	
Cahulga Creek	TALLAPOOSA RIVER	U.S. Hwy 78			X	
Cahulga Creek	U.S. Hwy 78	Its source	X		X	

1/ Amended in accordance with public hearing held April 1, 1970.
2/ Amended on June 18, 1973, in accordance with a public hearing conducted on May 3, 1973.
3/ Amended on October 16, 1972, in accordance with a public hearing conducted September 18, 1972.
4/ Fish and Wildlife classification is an objective to be attained when the Jefferson County Commission completes its program under which the Leeds sewage discharge will be abandoned. This discharge will go to the Cahaba River interceptor sewer upon its completion.

APPENDIX 6 -- STREAMFLOW CLASSIFICATION, ALABAMA RIVER BASIN, 1975.

6A -- Methodology

Studies have been made by the Soil Conservation Service on the number of miles of streams per square mile of drainage area. The estimated total mileage for the state is 41,153.

This is based on random samples taken from USGS 7½' quadrangle maps. The studies have categories of land resource areas, river basin and stream classes. The U.S. Corps of Engineers has mileage tables of major streams in Alabama.

Table 6B shows the class of sample streams in each subbasin. The streams studied are mostly developed watersheds and the mileage of natural streams is low. Most of the channels have been improved many years ago. The studies show considerable variance among the ratios and no systematic relationship between the ratio and river basins or physiographic resource areas.

Methodology: Classification is made by four categories of flow:

A. Perennial: Flow at all times except during extreme drought.
B. Intermittent: Continuous flow during some seasons of the year but little or no flow during other seasons.
C. Ephemeral: Flow only during periods of surface runoff, otherwise dry.
D. Ponded: No noticeable flow, caused by lack of outlet or high ground water table.

Step One: Streams were selected to represent drainage patterns, river subbasins and land resource areas. Fifteen streams were selected throughout the Alabama River Basin.

Step Two: Maps of each stream were studied by field office personnel of the Soil Conservation Service. Classification was determined for each segment of stream.

Step Three: The thread of each stream was coded and measured on watershed maps. Measurement was made on streams with one square mile of drainage area or larger. The length was determined by a standard map measure (wheel) and converted to miles. Each flow class was tabulated.

Step Four: The ratio of length of miles of stream per square mile drainage area in square miles is "stream density" and is usually written as miles per square mile.

The density of streams can be used to evaluate the quality of streams, amount of streams by class as resource use and availability, and erosion and pollution problems.

Appendix Table 6B -- Streamflow classification by type for selected streams, Alabama River Basin, 1975.

	DRAINAGE AREA	TYPE OF FLOW										% D/A BY LRA	
		PERENNIAL		INTERMITTENT		EPHEMERAL		PONDED		TOTAL			
WATERSHED	SQ. MI.	MI.	MI./SQ.MI.	MI.	MI./SQ.MI.	MI.	MI./SQ.MI.	MI.	MI./SQ.MI.	MI.	MI./SQ.MI.		
Alabama River Subbasin													
Turkey Creek	29.5	22.2	0.75							22.2	0.75	C-100	
Big Swamp Creek	411.6	70.2	0.17	146.5	0.36					216.7	0.53	B-100	
Cahaba River Subbasin													
Buck Creek	58.1	49.5	0.85					1.4	0.02	50.9	0.88	S-100	
Mahan Creek	66.8	23.9	0.36	6.9	0.10					30.8	0.46	C-100	
Coosa River Subbasin													
Blue Eye Creek	22.1	8.5	0.38	7.2	0.33	1.1	0.05	0.5	0.02	17.3	0.78	R-100	
Cheaha Creek	114.0	72.8	0.64	23.5	1.06	1.4	0.01	1.3	0.06	99.0	0.87	P-50	R-50
Talladega Creek	200.4	110.9	0.55	37.8	0.19			3.8	0.02	152.5	0.76	P-50	R-50
Big Canoe Creek	256.6	150.2	0.59	26.4	0.10	2.0	0.01	16.0	0.06	194.6	0.76	R-80	S-20
Terrapin Creek	308.0	152.6	0.50	55.0	0.18	6.5	0.02	8.1	0.03	222.2	0.72	P-30	R-70
Choccolocco Creek	379.0	214.6	0.57	50.0	0.13	8.9	0.02	10.6	0.03	284.2	0.75	P-65	R-35
Tallapoosa River Subbasin													
Cahulga Creek	27.5	13.5	0.49					2.2	0.08	27.5	0.57	P-100	
Ketchepedrakee Creek	54.9	51.6	0.94					1.2	0.02	52.8	0.96	P-100	
High Pine Creek	76.7	81.8	1.07					4.4	0.06	86.2	1.12	P-100	
Crooked Creek	98.2	97.0	0.99					2.8	0.03	99.8	1.02	P-100	
Old Town Creek	163.4	7.8	0.05	129.2	0.79			3.5	0.02	140.6	0.86	C-10	B-90

C - Coastal Plain
B - Black Belt
P - Piedmont
R - Ridge & Valley
S - Sand Mountain

APPENDIX 7 -- RESERVOIR SITE AVAILABILITY STUDY, ALABAMA RIVER BASIN.

7A -- Methodology of potential reservoir site study.

This study is an inventory of available reservoir sites in the Alabama River Basin and presents certain perameters of each site. It is not the intent of the study to locate every possible available site, but to select the better sites within an area.

Topographic quadrangle maps were the primary tool used to locate potential reservoir sites. Very few of the sites were visited by the study group during the inventory and none were surveyed. Therefore, some unknown features such as sinks, faults, roads, power lines, building, etc., could exist in the reservoir site. It is hoped that this will be at a minimum.

Consideration to topography, land use, fixed improvements, known geographical features, and location was given during site selection. Location as to a particular need was not a consideration. A stage versus storage and area flooded was developed for each site. A storage pool elevation was selected based on a study of the quadrangle coverage. The top of dam elevation was selected based on drainage area size and Land Resource Area. Storage volume and surface area were read from the stage versus storage and area curves. Embankment volume was computed using the formula H/162 (TW + 2TL + 2BW + BL), were H=height of embankment; W=flood plain width; L=top length of embankment; B=base width of embankment in the flood plain; and T=top width of embankment. A volume was added for cutoff and old channel bankfill. The embankment volume and the storage pool area can be used in estimating structural cost. Storage volume and surface area can be used to determine how well a given need could be met.

Complete coverage of the study area is available in topographic maps of the Army Map Service (AMS) at a scale of 1:250,000 (50 ft. and 100 ft. contour intervals). In addition partial coverage is available in topographic maps of the U.S. Geological Survey (USGS), either in the 7½ minute quadrangle series (1:24,000 scale, 10-ft. or 20-ft. contour interval) or the earlier 15 minute quadrangle series 1:62,500 scale, 10-ft. or 20-ft. contour interval).

The upper third of the Cahaba Subbasin is covered by 7½ minute quadrangles. The center and lower quarters of the subbasin are covered by minute quadrangles. The lower portion of Bibb County and the upper portion of Perry County have no coverage other than the AMS series.

The upper two-thirds of the Coosa Subbasin has the best coverage in the river basin. This area has solid coverage of 7½ minute and 15 minute quadrangles. The lowermost point in the subbasin and a strip through Shelby, Talladega, Chilton, and Coosa Counties is covered by 15 minute quadrangles.

Most of the Tallapoosa Subbasin is covered with 7½ minute quadrangles. A portion of Elmore and Montgomery Counties is covered by 15 minute quadrangles. Only AMS coverage is available for a portion of Macon and Bullock Counties.

About one-third of the Alabama Subbasin in the Chilton, Dallas, Autauga, and Montgomery County area is covered by 15 minute quadrangles. A few 7½ minute quadrangles are available in the Selma, Montgomery, and Monroeville areas. The remainder of the subbasin is covered by the AMS series.

Scattered areas in the river basin are covered with 30 minute quadrangles. These are mostly repetitious of 7½ minute and 15 minute quadrangle coverage and are of early edition.

The reliability of the reservoir data depends upon the scale and contour interval of the maps used. In spite of this weakness, information derived from these maps is not without value. As more detailed maps become available the reservoir data developed from the existing maps can be revised.

The general location of sites studied is shown on page 2-19, figure 2-8 of Volume I.

Appendix Table 7B - Statistics of potential reservoir sites, by subbasins, by counties, Alabama River Basin, 1975.

Site Location (Site No.) (Creek; Township; Range; Section)	Quandrangle Sheet Used (name and size) 1/	Contour Inter- (ft.)	D. A. (sq.mi.)	STORAGE POOL Elev. (msl)	STORAGE POOL Surface Area (ac.)	STORAGE POOL Total Storage (ac.ft.)	TOP OF DAM Elev. (msl)	TOP OF DAM Surface Area (ac.)	Height (ft.)	Emb. Volume (cu.yds.)
ALABAMA SUBBASIN										
Autauga County										
1 2/ Autauga; T 19 N; R 15 E; Sect. 8 & 9	Billingsley (15')	20	19.6	440.0	405	7,242	446.0	500	44	405,900
2 Bridge; T 19 N; R 15 E; Sect. 36	Billingsley (15')	20	10.9	370.0	450	9,600	375.0	505	57	482,000
3 Buck; T 19 N; R 12 E; Sect. 22	Plantersville (15')	20	21.0	300.0	405	7,042	306.0	568	38	144,500
4 Ivy; T 17 N; R 13 E; Sect. 29	Benton (15')	20	19.6	180.0	162	3,405	186.0	200	56	181,400
5 Turnpike Br.; T 19 N; R 14 E; Sect. 2 & 3	Billingsley (15')	20	9.1	390.0	208	4,300	395.0	247	54	246,300
Bibb County										
6 Elam; T 22 N; R 12 E; Sect. 20 & 21	Maplesville West (7½)	20	8.0	434.0	184	2,760	438.0	206	41	220,000
Butler County										
7 Cedar; T 11 N; R 13 E; Sect. 22	Andalusia (AMS)	50	23.0	305.0	1090	25,000	315.0	1450	65	1,094,000
8 Mussel; T 11 N; R 13 E; Sect. 10	Fort Dale (7½)	20	46.0	280.0	1076	11,120	288.0	1925	38	197,900
9 Wolf; T 11 N; R 12 E; Sect. 17	Adnalusia (AMS)	50	30.7	280.0	-	12,300	288.0	-	45	273,800
Chilton County										
10 Middle Fork; T 22 N; R 13 E; Sect. 20	Montgomery (AMS)	50	21.0	457.2	450	11,350	461.0	485	54	413,100
11 Trib. of Middle Fork; T 22 N; R 13 E; Sect. 30	Montgomery (AMS)	50	2.7	418.6	125	1,008	422.0	137	21	51,000
12 East Fork; T 22 N; R 13 E; Sect. 27	Montgomery (AMS)	50	5.3	460.0	44	445	470.0	105	31	64,000
13 Trib. of East Fork; T 22 N; R 13 E; Sect. 34	Montgomery (AMS)	50	5.2	466.0	62	500	456.0	120	27	65,000
14 Trib. of East Fork; T 21 N; R 13 E; Sect. 16	Montgomery (AMS)	50	6.4	433.0	100	1,150	440.0	135	40	60,000
15 Trib. of Middle Fork; T 21 N; R 13 E; Sect. 7	Montgomery (AMS)	50	3.0	385.0	63	550	390.0	90	32	60,000
16 Trib. of Mulberry; T 22 N; R 12 E; Sect. 34	Montgomery (AMS)	50	4.7	411.0	152	1,790	416.0	190	36	112,000
Dallas County										
17 Bear; T 16 N; R 7 E; Sect. 16 & 20	Centeral Mills (7½')	10	12.3	178.8	1050	5,220	183.0	1300	23	231,000
18 Boguechitto; T 17 N; R 7 E; Sect. 1	Browns (7½')	20	96.8	164.0	1330	16,400	170.0	1850	23	334,500
19 Trib. of Cedar Cr.; T 13 N; T 11 E; Sect. 35	Braggs (15')	20	3.9	179.0	170	1,560	183.0	225	23	55,000
20 Chaney; T 17 N; R 8 E; Sect. 3 & 4	Browns (7½')	20	5.6	185.9	432	2,450	189.0	564	16	79,000
21 Mud; T 17 N; R 7 E; Sect. 7 & 8	Uniontown E (7½')	20	16.8	180.2	870	7,100	185.0	1180	23	195,000
22 Rogers; T 15 N; R 6 E; Sect. 2	Central Mills (7½')	10	10.4	200.0	567	5,575	205.0	722	35	250,100
Elmore County										
23 Kenner; T 18 N; R 17 E; Sect. 7	Elmore (15')	20	11.3	340.0	350	8,470	345.0	400	65	491,200
Lowndes County										
24 Green Br.; T 13 N; R 12 E; Sect. 14	Braggs (15')	20	6.1	220.0	573	8,710	225.0	720	45	154,000
25 Middle; T 12 N; R 12 E; Sect. 1	Braggs (15')	20	5.2	245.0	334	3,380	250.0	450	30	42,400
26 Mussel; T 12 N; R 14 E; Sect. 31	Braggs (15')	20	32.5	325.0	1500	24,000	335.0	1930	50	572,000
27 Big Swamp; T 12 N; R 15 E; Sect. 13	Montgomery (AMS)	50	6.1	300.7	299	2,950	305.0	371	25	94,900
28 Cherry; T 12 N; R 16 E; Sect. 5	Montgomery (AMS)	50	5.3	273.0	254	2,490	276.0	337	24	112,200
29 Ballards; T 12 N; R 15 E; Sect. 15	Montgomery (AMS)	50	5.6	307.0	247	2,610	309.0	285	27	91,600
30 Possum; T 13 N; R 15 E; Sect. 16	Montgomery (AMS)	50	4.0	234.0	240	2,110	237.0	281	22	80,000
31 Fort Deposit; T 12 N; R 15 E; Sect. 8	Montgomery (AMS)	50	3.6	295.2	177	1,880	298.0	202	28	82,700
32 Trib. of Lake Cr.; T 13 N; R 14 E; Sect. 27	Montgomery (AMS)	50	4.8	253.6	296	2,380	256.0	361	20	96,800
33 Lake; T 13 N; T 14 N; Sect. 35 & 36	Montgomery (AMS)	50	3.9	261.3	192	1,730	264.5	227	22	83,200
34 Trib. of Big Swamp; T 14 N; R 15 E; Sect. 18	Montgomery (AMS)	50	3.2	193.7	195	1,564	196.0	225	20	65,800
35 Trib. of Big Swamp; T 15 N; R 14 E; Sect. 35	Montgomery (AMS)	50	4.0	206.9	241	1,970	210.0	289	22	86,300
36 Trib. of Big Swamp; T 14 N; R 14 E; Sect. 1&2	Montgomery (AMS)	50	4.3	194.5	248	2,120	197.0	299	22	93,000
37 Trib. of Halls Br.; T 13 N; R 14 E; Sect. 6	Montgomery (AMS)	50	2.9	225.4	178	1,490	228.0	205	20	91,500
38 Halls Br.; T 14 N; R 13 E; Sect. 33	Montgomery (AMS)	50	3.5	239.6	229	1,760	243.0	276	21	90,500

Appendix Table 7B -- Cont'd

Site Location (Site No.) (Creek; Township; Range; Section)	Quandrangle Sheet Used (name and size) 1/	Contour Inter- (ft.)	D. A. (sq.mi.)	STORAGE POOL Elev. (msl)	STORAGE POOL Surface Area (ac.)	STORAGE POOL Total Storage (ac.ft.)	TOP OF DAM Elev. (msl)	TOP OF DAM Surface Area (ac.)	Height (ft.)	Emb. Volume (cu.yds.)
Monroe County										
39 Bear; T 8 N; R 7 E; Sect. 22	Andalusia (AMS)	50	15.9	175.0	717	18,350	180.0	797	65	1,110,800
40 Bradley Mill; T 8 N; R 6 E; Sect. 26	Andalusia (AMS)	50	15.1	170.0	515	12,000	175.0	598	75	737,800
41 Brushy; T 7 N; R 8 E; Sect. 11	Andalusia (AMS)	50	26.0	250.0	996	27,885	256.0	1170	61	800,500
42 Trib. of Big Flat Cr.; T8N; R7E; Sect. 28 & 33	Andalusia (AMS)	50	7.1	175.0	299	5,987	180.0	420	50	372,400
43 Little River; T 4 N; R 4 E; Sect. 32	Andalusia (AMS)	50	125.2	100.0	2391	49,812	106.0	2800	56	819,500
44 Randons; T 6 N; R 5 E; Sect. 35	Andalusia (AMS)	50	50.8	150.0	1794	46,329	156.0	2950	71	1,403,600
45 Trib. Of Robinson Cr.; T8N; R9E; Sect. 9 & 10	Andalusia (AMS)	50	14.1	250.0	1495	43,845	256.0	1714	66	921,000
46 Walkers; T 7 N; R 8 E; Sect. 21	Andalusia (AMS)	50	17.6	225.0	1196	31,379	230.0	1360	70	587,300
Montgomery County										
47 Catoma; T 14 N; R 19 E; Sect. 26	Montgomery (AMS)	50	58.4	256.0	700	15,000	262.0	1100	20	137,100
Perry County										
48 Coffee; T 17 N; R 6 E; Sect. 12 & 13	Uniontown E (7½')	20	12.7	184.9	666	5,400	189.0	888	23	192,000
49 Taylor; T 17 N; R 6 E; Sect. 23	Uniontown E (7½')	20	7.7	191.0	372	3,305	194.0	540	24	252,000
Wilcox County										
50 Gravel; T 11 N; R 7 E; Sect. 14	Andalusia (AMS)	50	24.9	125	697	17,682	133	850	68	903,100
51 Hills; T 12 N; R 11 E; Sect. 1	Braggs (15')	20	10.3	182.0	400	4,120	187.0	600	27	117,000
52 Pine Barren; T 11 N; R 11 E; Sect. 15 & 22	Andalusia (AMS)	50	115.7	225	1893	41,595	233	2350	53	624,600
53 Pursley; T 11 N; R 9 E; Sect. 17 & 20	Andalusia (AMS)	50	7.5	245.0	370	2,750	252.0	540	22	153,500
54 Trib. of Pursley; T 12 N; R 8 E; Sect. 25	Andalusia (AMS)	50	7.9	187.0	190	2,000	195.0	260	30	166,400
CAHABA SUBBASIN										
Autauga & Perry County										
55 Little Oakmulgee; T 19 N; R 10 E; Sect. 26	Summerville (15')	20	39.2	240.0	1333	24,400	250.0	1850	50	319,200
Bibb County										
56 Affonce; T 23 N; R 8 E; Sect. 35	Montgomery (AMS)	20	29.7	255.0	1265	17,000	265.0	1880	40	266,000
57 Oldham; T 22 S; R 6 W; Sect. 29	Blocton (15')	20	30.5	360.0	293	4,355	370.0	580	48	103,800
58 Shades; T 21 S; R 5 W; Sect. 2 & 3	Blocton (15')	20	123.3	440.0	1000	30,350	455.0	2820	83	830,200
59 Six Mile; T 23 N; R 11 E; Sect. 15	Montgomery (AMS)	50	39.1	420.0	1180	14,500	430.0	1650	55	748,600
Jefferson County										
60 Cahaba River; T 16 S; R 1 E; Sect. 6	Argo (7½')	20	10.8	840.0	83	1,950	848.0	113	68	219,500
61 Cahaba River; T 16 S; R 1 W; Sect. 12	Argo (7½')	20	12.7	795.0	140	2,825	805.0	185	60	202,700
62 Hogpen Br.; T 17 S; R 1 W; Sect. 34	Irondale (7½')	20	4.1	540.0	98	1,654	545.0	122	48	67,300
63 Little Cahaba; T 16 S; R 1 E; Sect. 16	Argo (7½')	20	14.4	710.0	168	1,380	717.0	260	41	72,700
64 Little Shades; T 19 S; R 2 W; Sect. 8	Birmingham S. (7½')	20	10.9	428.0	90	1,400	435.0	113	35	18,500
65 Patton; T 19 S; R 3 W; Sect. 14	Birmingham S. (7½')	20	11.1	500.0	174	2,280	508.0	230	38	31,900
66 Trib. of Shades Cr.; T17S; R2W; Sect. 34	Irondale (7½')	20	1.8	710.0	70	1,200	715.0	80	47	69,500
Perry County										
67 Little Pryor; T 20 N; R 10 E; Sect. 33	Summerfield (15')	20	11.3	280.0	691	14,808	285.0	820	60	541,100
68 Oakmulgee; T20&21N; R10E; Sect. 6 & 31	Montgomery (AMS)	50	80.0	325.0	2192	33,367	330.0	2562	45	514,500
St. Clair County										
69 Big Black; T 15 S; R 1 E; Sect. 36	Odenville (7½')	20	10.5	655.0	255	4,780	665.0	345	55	90,000
70 Little Black; T 16 S; R 1 E; Sect. 24	Odenville (7½')	20	11.4	640.0	304	6,765	650.0	490	55	119,300

Appendix Table 7B -- Cont'd

Site Location (Site No.) (Creek; Township; Range; Section)	Quandrangle Sheet Used (name and size) 1/	Contour Inter- (ft.)	D. A. (sq.mi.)	STORAGE POOL Elev. (msl)	STORAGE POOL Surface Area (ac.)	STORAGE POOL Total Storage (ac.ft.)	TOP OF DAM Elev. (msl)	TOP OF DAM Surface Area (ac.)	Height (ft.)	Emb. Volume (cu.yds.)
Shelby County										
71 Big; T 21 S; R 4 W; Sect. 23	Montevallo (15')	50	7.6	446.0	140	8,000	456.0	210	85	269,900
72 Dry Brook; T19S; R2W; Sect. 32 & 33	Helena (7½')	20	6.0	500.0	207	2,713	506.0	250	39	82,000
73 Mayberry; T 24 N; R 11 E; Sect. 2	Montevallo (15')	50	8.0	445.0	240	8,500	455.0	295	85	344,200
74 Peavine; T 20 N; R 2 W; Sect. 30	Helena (7½')	20	9.0	500.0	262	4,026	507.0	330	44	198,900
COOSA SUBBASIN										
Calhoun County										
75 Little Tallahatchee; T 14 S; R 8 E; Sect. 27	Jacksonville (7½')	20	14.6	660.0	147	1,958	667.0	220	32	93,900
76 Tallahatchee; T 14 S; R 8 E; Sect. 5	Jacksonville (7½')	20	5.3	640.0	182	1,516	645.0	230	45	230,300
Cherokee & DeKalb Counties										
77 Little River; T 7 S; R 10 E; Sect. 29	Jamestown (7½')	20	110.3	1250.0	1110	25,000	1265.0	1550	81	561,500
Cleburne County										
78 Little Hillabee; T 17 S; R 9 E; Sect. 5	Hollis Crossroads (7½')	20	3.1	780.0	71	1,400	784.0	80	59	61,500
79 Shoal; T 14 S; R 10 E; Sect. 35	Piedmont S.E. (7½')	20	6.8	1100.0	88	1,431	1108.0	120	48	92,100
Clay County										
80 Buzzard; T 19 S; R 7 E; Sect. 31	Clairmont Springs (7½')	20	7.8	963.5	205	7,572	971.2	235	101	328,900
81 Caten Shoals; T 20 S; R 6 E; Sect. 1	Clairmont Springs (7½')	20	4.0	920.7	66	1,252	925.7	76	50	123,200
82 Gold Mine; T 19 S; R 7 E; Sect. 23	Clairmont Springs (7½')	20	4.2	1019.3	42	1,304	1024.8	49	78	175,300
83 Talladega; T 19 S; R 7 E; Sect. 13	Lineville West (7½')	20	4.8	1015.5	175	3,507	1024.8	226	57	251,600
Coosa County										
84 Baker (Socapatoy); T24N; R20E; Sect. 23	Goodwater (15')	20	2.9	800.0	143	2,180	808.0	195	48	127,400
85 Baker (Socapatoy); T23N; R20E; Sect. 4 & 5	Goodwater (15')	20	15.5	685.0	254	2,240	690.0	336	26	29,400
86 Brestworks; T 24 N; R 17 E; Sect. 8	Gantts Quarry (15')	20	5.3	690.7	144	2,185	696.8	190	52	77,200
87 Chipco; T 23 N; R 18 E; Sect. 27	Flagg Mountain (7½')	20	17.9	460.0	152	2,380	468.0	210	53	99,300
88 Davidson; T 23 N; R 19 E; Sect. 33	Rockford (7½')	20	6.6	520.0	66	1,860	526.0	80	66	245,200
89 Trib. of Hatchet; T 24 N; R 20 E; Sect. 7	Goodwater (15')	20	8.4	740.0	118	1,920	748.0	182	48	46,500
90 Trib. of Hatchet; T 24 N; R 19 E; Sect. 34	Goodwater (15')	20	9.2	720.0	411	7,590	747.0	520	47	69,500
91 Jacks; T 23 N; R 19 E; Sect. 33	Rockford (7½')	20	24.7	520.0	329	7,190	528.0	416	68	99,500
92 Mill; T 23 N; R 18 E; Sect. 5	Gantts Quarry (15')	20	8.8	655.8	159	2,937	658.1	169	46	104,800
93 Paint; T 24 N; R 17 E; Sect. 30	Gantts Quarry (15')	20	12.6	520.0	236	3,110	528.0	337	38	36,500
94 Socapatoy; T 23 N; R 19 E; Sect. 23	Rockford (7½')	20	45.6	600.0	590	11,061	612.0	920	70	152,200
95 Shelton; T 24 N; R 19 E; Sect. 6	Goodwater (15')	20	6.5	738.1	158	2,289	743.8	188	36	81,000
96 Swamp; T 21 N; R 19 E; Sect. 6	Rockford S.W. (7½')	20	25.7	566.0	620	9,200	575.0	950	59	91,400
97 Weogufka; T 24 N; R 19 E; Sect. 6	Goodwater (15')	20	9.2	740.0	310	3,910	744.4	408	39	103,100
98 Weoka; T 21 N; R 17 E; Sect. 34	Richville (7½')	20	58.4	395.0	336	3,360	405.0	590	38	40,300
DeKalb County										
99 Big Wills; T 6 S; R 9 E; Sect. 2	Dugout Valley (7½')	20	13.4	934.0	285	3,430	940.0	400	40	188,700
100 Jacks; T 7 S; R 8 E; Sect. 21	Chavies (7½')	20	8.0	810.0	53	1,670	816.0	57	51	136,500
101 W. Fork of Little River; T5S; R10E; Sect. 23	Valley Head (7½')	20	29.1	1684.0	310	8,000	1694.0	400	58	168,800

Appendix Table 7B -- Cont'd

Site Location (Site No.) (Creek; Township; Range; Section)	Quandrangle Sheet Used (name and size) 1/	Contour Interval (ft.)	D. A. (sq.mi.)	STORAGE POOL Elev. (msl)	STORAGE POOL Surface Area (ac.)	STORAGE POOL Total Storage (ac.ft.)	TOP OF DAM Elev. (msl)	TOP OF DAM Surface Area (ac.)	Height (ft.)	Emb. Volume (cu.yds.)
102 Sofkahatchee; T 19 N; R 19 N; Sect. 3	Wetumpka (15')	20	144.4	410.0	275	4,300	415.0	324	45	73,600
103 Weoka; T 20 N; R 18 E; Sect. 20	Elmore (15')	20	75.3	340.0	411	6,850	350.0	680	50	133,600
Etowah County										
104 Ballplay; T 11 S; R 8 E; Sect. 22	Ballplay (7½')	20	57.5	550.0	2152	34,195	556.0	3000	26	294,700
105 Black; T 10 S; R 7 E; Sect. 11	Kenner (7½')	20	9.1	808.2	287	4,425	814.0	350	37	90,000
106 Black; T 10 S; R 7 E; Sect. 29	Kenner (7½')	20	29.8	773.2	845	9,960	779.0	1070	34	29,000
St. Clair County										
107 Big Canoe; T 14 S; R 2 E; Sect. 21	Springville (7½')	20	37.8	695.0	730	16,090	705.0	900	73	860,000
108 Broken Arrow; T 16 S; R 3 E; Sect. 1	Wattsville (7½')	20	14.0	540.0	367	7,055	548.0	488	53	152,900
109 Broken Arrow; T 15 S; R 3 E; Sect. 34	Wattsville (7½')	20	10.7	560.0	103	1,380	570	180	38	48,900
110 Dry; T 17 S; R 3 E; Sect. 9	Pell City (7½')	20	4.5	540.0	422	8,640	544.0	482	64	272,200
111 Gulf; T 13 S; R 4 E; Sect. 17 & 18	Hyatt Gap (7½')	20	14.4	600.0	265	4,650	608.0	330	52	83,000
112 Kelly; T 17 S; R 2 E; Sect. 16	Cooks Spring (7½')	20	47.1	535.0	356	4,522	543.0	412	38	33,300
113 Shoal; T 15 S; R 3 E; Sect. 21	Wattsville (7½')	20	6.8	680.0	301	3,472	690.0	550	35	169,700
114 Shoal; T 17 S; R 2 E; Sect. 29	Cooks Springs (7½')	20	28.2	520.0	328	4,673	528.0	463	50	82,800
Shelby County										
115 Bear; T 18 S; R 1 E; Sect. 15	Vandiver (7½')	20	13.6	516.0	550	8,684	522.0	650	39	121,000
116 Buxahatchee; T 24 N; R 14 E; Sect. 5	Columbiana (15')	50	21.1	475.0	548	7,287	483.0	822	43	80,500
117 Camp Br.; T 21 S; R 1 W; Sect. 31	Columbiana (15')	50	21.5	519.6	632	9,125	525.0	730	40	80,500
118 South Fork Yellowleaf; T20S; R1W; Sect. 20	Chelsea (7½')	20	16.6	520.0	624	8,272	528.0	820	40	187,600
119 Waxahatchee; T21S; R1W; Sect. 21	Columbiana (15')	50	12.8	509.0	780	6,640	515.0	1030	35	160,000
Talladega County										
120 Dry; T 19 S; R 5 E; Sect. 23	Gantts Quarry (15')	20	9.9	640.0	200	7,679	645.8	244	108	514,700
121 Goring; T 19 S; R 6 E; Sect. 23	Clairmont Springs (7½')	20	6.4	881.7	104	1,929	884.9	122	60	126,000
122 Mump; T 19 S; R 6 E; Sect. 10	Gantts Quarry (15')	20	2.9	807.6	127	3,181	812.8	146	70	155,800
TALLAPOOSA SUBBASIN										
Bullock County										
123 Trib. of Line Cr.; T 14 N; R 21 E; Sect. 24	Phenix City (AMS)	50-100	4.1	291.0	230	1,953	295.0	280	22	65,600
124 Trib. of Line Cr.; T 14 N; R 21 E; Sect. 34	Phenix City (AMS)	50-100	3.8	335.0	336	3,073	340.0	440	23	84,600
125 Line; T 13 N; R 21 E; Sect. 16	China Grove (7½')	10	9.1	380.0	1014	14,890	385.0	1228	40	450,400
126 Trib. of Line Cr.; T13N; R22E; Sect. 7 & 18	Phenix City (AMS)	50-100	4.6	342.0	220	1,723	345.0	265	18	100,700
127 Panther; T 14 N; R 21 E; Sect. 17 & 20	Phenix City (AMS)	50-100	7.0	290.9	520	3,240	296.0	720	21	173,800
Chambers County										
128 Allen; T 23 N; R 26 E; Sect. 19	LaFayette (7½')	20	12.1	740.0	1012	17,420	748.0	1260	48	423,500
129 Carlise; T 24 N; R 26 E; Sect. 33	Milltown (7½')	20	8.6	690.0	280	3,140	696.0	400	46	171,100
130 Chikasanoxee; T 24 N; R 26 E; Sect. 24	Milltown (7½')	20	17.2	700.0	243	3,326	708.0	380	36	55,100
131 Chikasanoxee; T 24 N; R 25 E; Sect. 27	Wadley (7½')	20	69.0	660.0	805	10,212	668.0	1070	41	93,200
132 Little Chatahospee; T22N; R25E; Sect. 2	Dudleyville (7½')	20	23.4	660.0	553	7,840	668.0	742	43	75,000
133 Mill & Chatahospee; T22N; R26E; Sect. 7	LaFayette (7½')	20	26.3	660.0	347	4,357	668.0	606	33	166,800
Clay County										
134 Crooked; T 20 S; R 9 E; Sect. 23	Wildwood S.W. (7½')	20	49.7	790.0	270	3,450	800.0	370	45	54,800
135 Crooked; T 20 S; R 9 E; Sect. 19	Ironaton S.E. (7½')	20	30.4	940.0	310	4,430	948.0	410	58	88,600

Appendix Table 7B -- Cont'd

Site Location (Site No.) (Creek; Township; Range; Section)	Quandrangle Sheet Used (name and size) 1/	Con-tour Inter- (ft.)	D. A. (sq.mi.)	STORAGE POOL Elev. (msl)	STORAGE POOL Sur-face Area (ac.)	STORAGE POOL Total Storage (ac.ft.)	TOP OF DAM Elev. (msl)	TOP OF DAM Sur-face Area (ac.)	Height (ft.)	Emb. Volume (cu.yds.)
Cleburne County										
136 Cane; T 15 S; R 11 E; Sect. 3	Oak Level (7½')	20	5.4	1000.0	138	2,594	1005.0	155	50	102,000
137 Trib. of Cane; T 15 S; R 11 E; Sect. 17	Heflin (7½')	20	5.2	950.0	204	2,900	956.0	246	38	56,900
138 Dynne; T 17 S; R 10 E; Sect. 12	Ross Mountain (7½')	20	7.8	930.0	166	4,300	940.0	205	70	280,000
139 Knokes; T 17 S; R 12 E; Sect. 32	High Tower (7½')	20	10.3	980.0	134	2,215	988.0	180	50	82,400
140 Lochchelooge; T 17 S; R 10 E; Sect. 32 & 33	Ross Mountain (7½')	20	9.7	895.0	180	4,460	902.0	200	62	133,100
141 Muscadine; T 15 S; R 12 E; Sect. 5	Oak Level (7½')	20	23.4	970.0	554	6,600	980.0	840	43	80,000
142 Silas; T 16 S; R 12 E; Sect. 31	High Tower (7½')	20	10.5	945.0	210	3,200	955.0	290	43	98,000
143 Snake; T 16 S; R 10 E; Sect. 30	Hollis Crossrds (7½')	20	4.8	895.0	162	2,650	900.0	191	42	46,500
144 Verdin; T 16 S; R 11 E; Sect. 26	High Tower (7½')	20	7.3	885.0	55	775	891.0	92	33	22,200
Coosa County										
145 Elkahatchee; T 22 N; R 20 E; Sect. 12	Kellyton (7½')	20	12.9	650.0	460	7,200	657.0	640	47	78,300
Elmore County										
146 Chubbehatchee; T 18 N; R 20 E; Sect. 20	Wetumpka (15')	20	41.0	280.0	2528	47,966	285.0	2650	48	455,400
Lee County										
147 Choctafaula; T 18 N; R 25 E; Sect. 16	Loachapoka (7½')	10	8.6	470.0	184	2,519	475.0	240	43	58,500
148 Loblockee; T 19 N; R 25 E; Sect. 5 & 6	Waverly (7½')	20	40.2	59[illegible]1	670	6,644	611.0	1400	36	72,000
149 Ropes; T 19 N; R 24 E; Sect. 30	Notasulga (7½')	20	18.7	470.0	366	5,340	478.0	480	43	118,500
150 Trib. of Sougahatchee; T19N; R26E; Sect. 2&11	Opelika W. (7½')	10	5.4	680.0	178	2,375	685.0	228	40	163,400
Macon County										
151 Trib. of Calebee Cr.; T 16 N; R 23 E; Sect. 4	LaPlace (7½')	10	7.4	300.0	441	6,652	305.0	507	38	124,600
152 Long Br.; T 16 N; R 25 E; Sect. 1	Society Hill (7½')	10	10.5	380.0	323	4,179	384.0	382	36	104,200
153 Long Br.; T 16 N; R 25 E; Sect. 2	Little Texas (7½')	10	13.2	360.0	485	7,060	368.0	644	45	260,200
154 Miles; T 18 N; R 24 E; Sect. 24	Loachapoka (7½')	10	9.9	370.0	147	1,395	374.0	189	34	158,200
155 Wauxamaka; T 18 N; R 23 E; Sect. 30	Carrville (7½')	20	7.0	320.0	314	5,850	325.0	386	52	538,100
156 Trib. of Wolf Cr.; T 18 N; R 23 E; Sect. 14	Notasulga (7½')	20	4.5	380.0	180	3,024	384.0	217	52	288,700
Montgomery County										
157 Johnson; T 15 N; R 21 E; Sect. 31	Phenix City (AMS)	50-100	6.7	259.8	412	2,980	264.0	510	19	110,000
158 McDowell; T 15 N; R 20 E; Sect. 35	Montgomery (AMS)	50	4.4	266.0	280	2,040	270.0	370	20	77,000
Randolph County										
159 Cedar; T 21 S; R 10 E; Sect. 34	Malone (7½')	20	9.7	685.0	135	3,390	692.0	161	52	95,000
160 Cohobadiah; T 18 S; R 12 E; Sect. 7	Newell (7½')	20	15.6	940.0	114	1,800	948	175	48	133,400
161 Cornhouse; T 21 S; R 11 E; Sect. 10	Roanoke W. (7½')	20	19.1	800.0	417	9,890	808.0	507	68	241,500
162 Cutnose; T 18 N; R 12 E; Sect. 34	Graham N. E. (7½')	20	8.2	964.7	111	2,835	973.0	134	63	266,000
163 Trib. of Cutnose; T18N; R12E; Sect. 34	Graham N. E. (7½')	20	4.2	957.0	67	1,470	963.0	80	63	168,000
164 Green; T 20 S; R 11 E; Sect. 12	Wedowee (7½')	20	5.6	910.0	91	1,730	9.510	109	55	207,800
165 Hurricane; T 21 S; R 10 E; Sect. 28	Malone (7½')	20	11.9	770.0	183	3,743	770.0	219	53	107,300
166 Shoal; T 18 S; R 13 E; Sect. 29	Graham N.E. (7½')	20	11.0	1010.0	125	1,990	1017.0	149	52	143,700
167 Wedowee; T 20 S; R 11 E; Sect. 2	Wedowee (7½')	20	37.2	877.0	480	12,550	887.0	580	62	254,000
168 Wedowee; T 20 S; R 12 E; Sect. 6	Wedowee (7½')	20	26.4	940.0	190	3,200	948.0	280	70	223,500

Appendix Table 7B -- Cont'd

Site Location (Site No.) (Creek; Township; Range; Section)	Quandrangle Sheet Used (name and size) 1/	Contour Inter- (ft.)	D. A. (sq.mi.)	STORAGE POOL Elev. (msl)	STORAGE POOL Surface Area (ac.)	STORAGE POOL Total Storage (ac.ft.)	TOP OF DAM Elev. (msl)	TOP OF DAM Surface Area (ac.)	Height (ft.)	Emb. Volume (cu.yds.)
169 Trib. of Wedowee Cr.; T20S; R11E; Sect. 2	Wedowee ($7\frac{1}{2}'$)	20	3.0	860.0	99	2,461	864.0	106	63	308,400
170 Wolf; T 19 S; R 11 E; Sect. 2	Newell ($7\frac{1}{2}'$)	20	4.9	860.0	82	1,620	866.0	100	66	176,400
Russell County										
171 Opinflocco; T 16 N; R 26 E; Sect. 11 & 14	Society Hill ($7\frac{1}{2}'$)	10	14.6	400.0	465	3,935	404.0	617	24	163,400
Tallapoosa County										
172 Broken Arrow; T 24 N; R 21 E; Sect. 11	Hackneyville ($7\frac{1}{2}'$)	20	5.1	650.0	150	1,760	655.0	186	45	112,600
173 Chatahospee; T 23 N; R 24 E; Sect. 14	Dudleyville ($7\frac{1}{2}'$)	20	118.5	600.0	832	11,125	610.0	1200	40	103,800
174 Emuckfaw; T 24 N; R 24 E; Sect. 19	Daviston ($7\frac{1}{2}'$)	20	27.2	670.0	206	2,870	678.0	292	40	40,200
175 Emuckfaw; T 23 N; R 23 E; Sect. 10	Daviston ($7\frac{1}{2}'$)	20	62.7	620.0	1787	37,842	628.0	2160	63	124,500
176 Hackney; T 24 N; R 21 E; Sect. 36	Hackneyville ($7\frac{1}{2}'$)	20	6.9	600.0	154	2,058	606.0	204	34	42,500
177 Little Emuckfaw; T 24 N; R 23 E; Sect. 26	Daviston ($7\frac{1}{2}'$)	20	14.8	680.0	208	4,820	688.0	267	68	278,700
178 Little Sandy; T 21 N; R 24 E; Sect. 22	Camp Hill ($7\frac{1}{2}'$)	20	31.9	640.0	1184	19,935	648.0	1600	56	275,600
179 Trib. of Sandy Cr.; T 21 E; R 24 E; Sect. 8	Camp Hill ($7\frac{1}{2}'$)	20	6.1	640.0	114	1,340	645.0	176	30	38,400
180 Stone; T 18 N; R 22 E; Sect. 10	Carrville ($7\frac{1}{2}'$)	20	10.5	360.0	69	777	367.0	113	32	33,600
181 Timbergut; T 23 N; R 23 E; Sect. 6	New Site ($7\frac{1}{2}'$)	20	11.0	720.0	217	3,510	727.0	274	47	49,200
182 Town; T 24 N; R 21 E; Sect. 33	Hackneyville ($7\frac{1}{2}'$)	20	13.8	660.0	320	5,300	668.0	400	64	146,300

1/ ($7\frac{1}{2}'$) or (15') indicates $7\frac{1}{2}$ and 15 minute quadrangle series; (AMS) indicates Army Map Service series.

2/ Site numbers correspond to numbers on Site Potential Location Map, Volume I, Figure 2-8.

APPENDIX 8 -- GROUND WATER AVAILABILITY, ALABAMA RIVER BASIN.

Appendix Table 8A -- Description of geologic units and waterbearing characteristics 1/

MAP SYMBOL	GEOLOGIC UNITS	LITHOLOGY	WATER-BEARING CHARACTERISTICS	WATER QUALITY	RANGE IN WATER YIELD AND DEPTH
			APPALACHIAN RIDGES AND VALLEYS PHYSIOGRAPHIC AREA		
qs	Weisner Formation, Red Mountain Formation, Frog Mountain Formation, Pennington Formation, Parkwood Formation, and Pottsville Formation.	Chiefly sandstone with interbedded shale and siltstones; some quartzite and conglomerate.	Water for individual farm or family wells is usually available throughout the area. Many small springs issue from subsoil and outcrops. Steep ridges and shaly units are usually non-aquifer areas.	Water is usually of good quality but some units, particularly the shales, may be high in iron, sulfer, or acid content.	Yields vary widely from 2 to 250 gpm. Depth usually 300 feet or less.
dls	Shady Dolomite, Conasauga Limestone, Knox Dolomite, Odenville, Newala, Longview and Chickamauga Limestone, Fort Payne Chert, Bangor Limestone, Rome Formation and Floyd Shale.	Chiefly cherty dolomites and cherty limestones of Paleozoic Age. Some shaly limestone and pure (non-cherty) limestone, with interbedded silt stone.	The limestones and dolomites are generally good aquifers with success of wells dependent upon size and capacity of solution channels. Large capacity wells may be developed and many large springs issue from these formations. Wells in a few areas may encounter shaly rock or massive limestone without cavities.	Pollution from surface sources can be a problem where crevices and cavities are open to the surface. Hard water is a problem in some areas with occasional wells having highly mineralized waters.	Yields of 50 to 250 gpm are not uncommon; however, excessive pumping may trigger sink hole development. Depths usually less than 200 feet. Sandstone wells usually yield from 2 to 10 gpm.
			PIEDMONT PHYSIOGRAPHIC AREA		
sc	Ashland Mica Schist and others.	Chiefly quartz-mica-garnet graphitic schist, some quartzite and basic igneous intrusives.	The occurrence of water is controlled by the size and pattern of fracture, the topography, and the character and thickness of the saprolite. Most drilled wells produce water from the saprolite or from fractures in the upper 100 feet of bed rock.	Water is usually of good quality for household use.	Wells generally yield from 10 to 250 gpm. Most drilled wells range from 100 to 250 feet in depth.
ps	Wedowee Formation and slaty members of the Talladega Series. Butting Ram Sandstone, Cheaha Sandstone and ferruginous sandstone member of Talladega Series; Shady Limestone and Hollis Quartzite.	Sericite phyllite and slate interbedded with quartz schist, marble, and quartzite. Fine-grained quartzite, commonly micaceous, interbedded with schist, phyllite and marble.	Same as above but likely to be intensely fractured.	Same as above.	Yields vary widely; 2 to 250 gpm. Depths generally less than 300 feet.

Appendix Table 8A -- Cont'd

MAP SYMBOL	GEOLOGIC UNITS	LITHOLOGY	WATER-BEARING CHARACTERISTICS	WATER QUALITY	RANGE IN WATER YIELD AND DEPTH
gn	Pinkneyville Granite and others.	Gray, coarse-grained biotite granite and quartzdiorite gneiss.	Same as unit "sc".	Same as above.	Yields vary from 2 to 75 gpm. Average 16 gpm.
ag		Mica schist intruded by granite with long feldspar crystals. Includes biotite augen gneiss.	Same as unit "sc".	Same as above.	Yields vary from 2 to 75 gpm. Average 12 gpm.
hi	Hillabee Chlorite Schist and others.	Green schistose mafic rocks, chlorite schist, hornblende schist and amphibolite.	Same as unit "sc".	Same as above.	Yields vary from 2 to 75 gpm. Average 16 gpm.
sg		Chiefly mica schist, granite gneiss, biotite-hornblende gneiss, marble, quartzite, mylonite, and basic igneous rocks.	Same as unit "sc".	Same as above.	Yields range from 2 to 100 gpm. Average 25 gpm.
		COASTAL PLAINS PHYSIOGRAPHIC AREA			
Qbt	Alluvium and terrace deposits.	Silt, clay, sand, and gravel.	Wells yield small to moderate quantities of water where sands are thick enough.	Water is generally of good quality but may be high in iron content.	Yields vary from 5 to 100 gpm. Depths are usually less than 100 feet.
Tci	Citronelle Formation.	Fine to coarse-grained gravelly sand, clayey sand and clay.	Wells yield small to large quantities of water.	Same as above.	Yields range from 5 to 500 gpm. Depth generally less than 150 feet.
Tmu	Miocene Series (undifferentiated).	Fine to coarse-grained gravelly sand, clayey sand and clay.	Limited areal extent and insufficient thickness limit productivity of aquifer in basin. Wells tapping sand beds yield moderate quantities of water.	Same as above.	Yields range from 10 to 500 gpm. Depth generally less than 300 feet in the Alabama River Basin.
Tjo	Oligocene Series and Jackson Group (undifferentiated).	Soft argillaceous limestone with tough ledges, hard crystalline limestone and sandy, clayey marl.	Limited areal extent makes the aquifer of secondary importance. Wells may yield adequate quantities of water for domestic or stock use.	Same as above.	Yields vary from 5 to 100 gpm. Depths less than 500 feet.
Tgl	Gosport Sand and Lisbon Formation (undifferentiated).	Fine to coarse-grained sand with wedges of carbonaceous shale; calcareous, glauconitic sand, and sandy clay.	Wells tapping sand beds yield moderate to large quantities of water.	Same as above.	One mgd (700 gpm) or more can be obtained from individual wells. Usual range is 50 to 500 gpm. Depth of fresh-water wells ranges from less than 100 feet in the outcrop area to as much as 1,500 feet downdip.

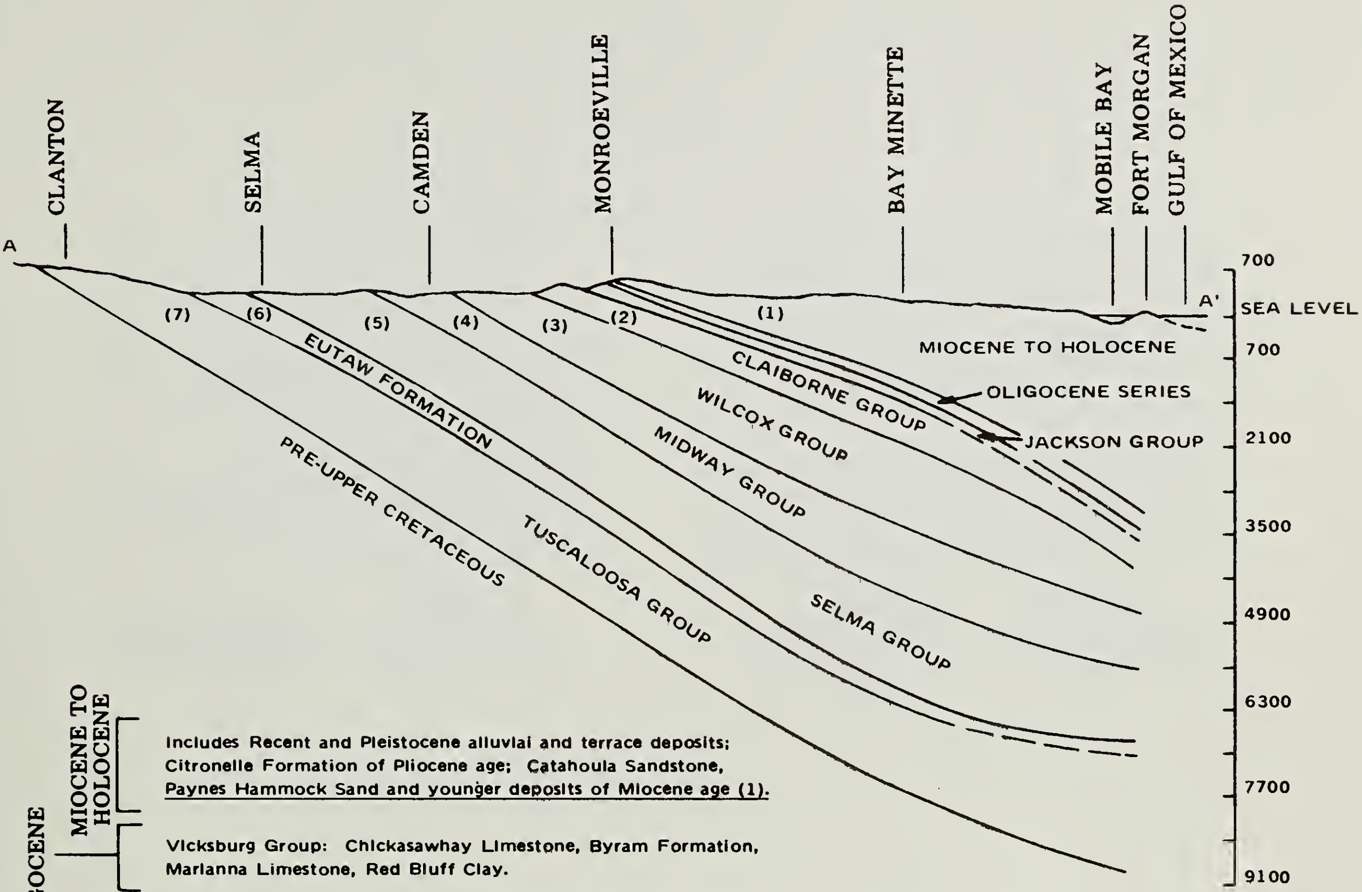
Appendix Table 8A -- Cont'd

MAP SYMBOL	GEOLOGIC UNITS	LITHOLOGY	WATER-BEARING CHARACTERISTICS	WATER QUALITY	RANGE IN WATER YIELD AND DEPTH
Tt	Tallahatta Formation.	Claystone with beds of glauconitic sand and sandstone.	Well yields are generally small.	Same as above.	Yields 0 to 10 gpm. Depths are shallow, generally less than 150 feet.
Th	Hatchetigbee Formation.	Gray and yellow fine-grained sand, olive-gray marls, gray silt, and clay.	Wells yield small to moderate quantities of water.	Same as above.	Where sufficient thickness of sand is present yields range up to 350 gpm. Usual range is 5 to 100 gpm. Depth range same as unit "Tgl".
Ttu	Tuscahoma Sand.	Fine-grained sand, clayey silt, glauconitic marls, some coarse-grained sand near the base of the formation.	Well yields are generally small to moderate.	Same as above.	Lower sands may yield 150 to 350 gpm. Usual range is 5 to 100 gpm. Depth range same as unit "Tgl".
Tnf	Nanafalia Formation	Coarse-grained sand near bottom, glauconitic sand, sandy clay, and massive clay near top.	Wells tapping the coarse sands of the formation yield large to very large quantities of water.	Same as above.	Individual wells may yield 1 mgd (700 gpm) or more. Range is normally 100 to more than 500 gpm. Depth range same as unit "Tgl".
Tna	Naheola Formation and Porters Creek Formation (undifferentiated).	Massive clay, sandy silt, silty clay and fine-grained sand.	Will yield small quantities to wells.	Same as above.	Normal range in yield is 5 to 10 gpm. Depth range same as unit "Tgl".
Tc	Clayton Formation.	Limestone, sandy limestone and sand.	Wells yield moderate quantities in easternmost part of the basin, yields decrease westward.	Same as above.	Yields 10 to 100 gpm in east--less westward. Depth range same as unit "Tgl".
Kr	Ripley Formation (including Prairie Bluff Chalk).	Very fine to coarse-grained sand interbedded with sandy limestone and clay (Prairie Bluff consists of compact white chalk).	Wells yield large to very large quantities of water. Yields decrease westward.	Same as above.	Normal range in yield is 100 to more than 500 gpm. Depth range same as unit "Tgl".
Ks	Selma Group--Demopolis Chalk, Blufftown Formation, Mooreville Chalk.	Pure chalk, marly chalk, sandy chalk, sandy clay and calcareous marl.	Formations do not yield water to wells.	Same as above.	Dug wells yield small to very small quantities.
Ke	Eutaw Formation and McShan Formation (undifferentiated).	Fine to coarse-grained sand interbedded with fossiliferous clay and beds of sandy clay.	Yields very large quantities of water in western and central Alabama. Yields are moderate in eastern part of the state.	Same as above.	Normal range in yield is 50 to more 500 gpm. Depth range same as unit "Tgl".
Kt	Tuscaloosa Group--Gordo Formation, Coker Formation.	Very fine to very coarse grained sand, sandy gravel, sandy clay, and massive clay.	Well yields range from moderate to very large. The Tuscaloosa Group includes some of the most productive aquifers in Alabama.	Same as above.	Normal range 50 to more than 500 gpm. Depth range same as unit "Tgl".

* Map symbols used in the Appalachian Ridges and Valleys and the Piedmont are abbreviations taken from the dominant rock type present in the area mapped (Example: "qs" is dominantly quartzite and sandstone; "dls" is dominantly dolomite and limestone). Map symbols in the Coastal Plains are standard geologic abbreviations combining the System and Formation name (Example: "Qbt" is Quaternary System, alluvial terrace; "Tci" is Tertiary System, Citronelle Formation).

1/ See Alabama River Basin Study, Volume 1, Figure 2-9.

Appendix 8B -- Generalized geologic cross section of the East Gulf Coastal Plain, Alabama.



MIOCENE TO HOLOCENE	Includes Recent and Pleistocene alluvial and terrace deposits; Citronelle Formation of Pliocene age; Catahoula Sandstone, Paynes Hammock Sand and younger deposits of Miocene age (1).
OLIGOCENE	Vicksburg Group: Chickasawhay Limestone, Byram Formation, Marianna Limestone, Red Bluff Clay.
EOCENE	Jackson Group: Yazoo Clay, Ocala Limestone, Moodys Branch Formation.
	Claiborne Group: Gosport Sand, Lisbon (2) and Tallahatta Formations.
	Wilcox Group: Hatchetigbee Formation, Tuscahoma Sand, Nanafalia (3) Formation.
PALEOCENE	Midway Group: Naheola Formation, Porters Creek and Clayton (4) Formations.
UPPER CRETACEOUS	Selma Group: Prairie Bluff Chalk, Ripley Formation (5), Demopolis and Mooreville Chalks.
	Eutaw Formation (6).
	Tuscaloosa Group (7): Gordo and Coker Formations.

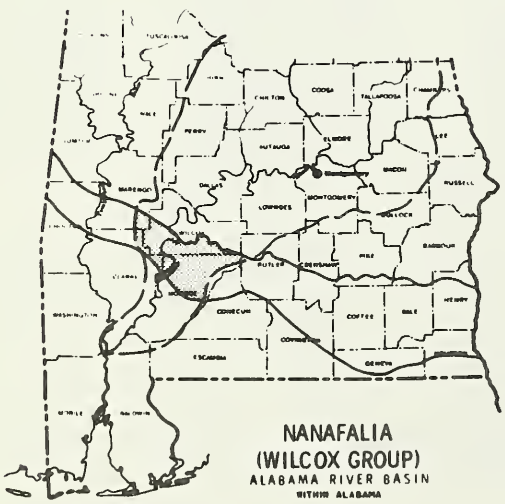
NOTE: Numbers in parenthesis refer to aquifers shown on following pages.

Source: Modified from Report for Development of Water Resources in Non-Appalachia Alabama, Appendix G - Geology, Geological Survey of Alabama, 1968.

Appendix 8C -- Generalized areas where major aquifers are tapped in the Coastal Plains.

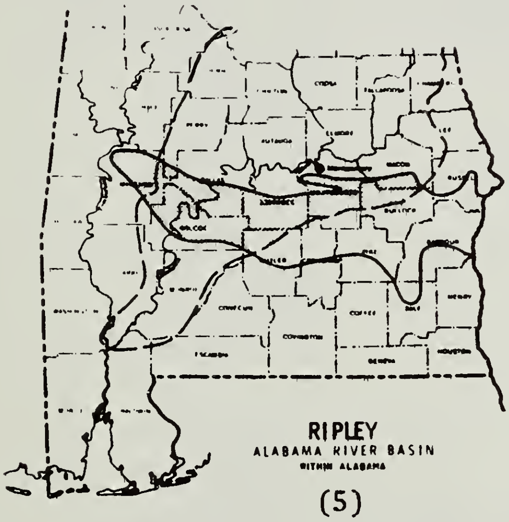
(1)

(2)

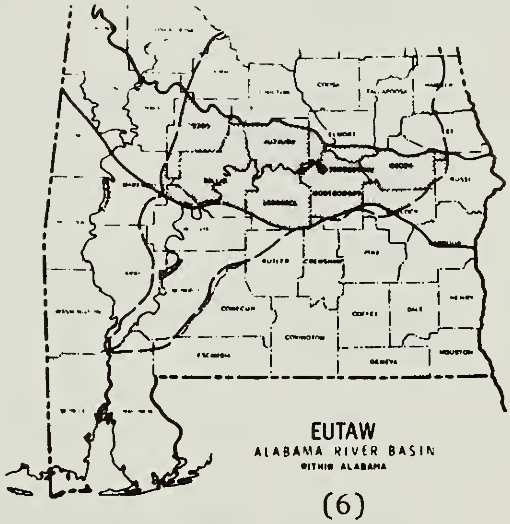


(3)

(4)



(5)



(6)

(7)

Source: Report for Development of Water Resources in Non-Appalachia Alabama, H - Hydrology and Ground Water, Geological Survey of Alabama, 1968.

Appendix Table 8D -- Usual cost of rural domestic wells, Alabama River Basin, 1975.

AREA	SIZE WELL (inches)	COST PER * FOOT (dollars)
Appalachian Ridges and Valleys		
Sandstone Ridges	6	5
Limestone Valleys	6	5 to 10
Piedmont	6	5 to 10
Coastal Plain (including the Black Belt)	4	4 to 6

* Cost includes casing but no development or improvements.

Source: Graves Well Drilling Co., Inc., Sylacauga, Alabama.

APPENDIX 9 -- GROUND WATER QUALITY, ALABAMA RIVER BASIN.

Appendix Table 9A -- Use limitations of water quality parameters.

CONSTITUENT	OBJECTIONABLE FEATURES OF EXCESSIVE CONCENTRATION	RECOMMENDED LIMITING CONCENTRATION FOR INDICATED USE (ppm) 1/						
		PUBLIC WATER SUPPLY 2/	COOLING WATER	FOOD PROCESSING	PULP & PAPER MAKING	PLASTICS MANUFACTURING	BOILERS	TEXTILE MANUFACTURING
Sulfate	Diuretic effect, bitter taste.	250		20-250				100
Hardness as $CaCO_3$	Boiler scale, produces insoluble "curd" when it reacts with soap.		50	10-400	100-200		2-80	0-50
Dissolved Solids	Diuretic effect, unpleasant taste.	500		850	200-500	200	50-3,000	
Iron	Unpleasant taste, stains porcelain and linen.	0.3	0.5	0.2	0.1-1.0			0.1-1.0
Manganese	Unpleasant taste, stains porcelain and linen.	0.05	.2-0.5	0.2	0.05-.5	0.02		0.1-1.0
Aluminum	Boiler scale.						0-3	
Suspended Solids 3/	Clogs treatment facilities and water courses.	5	50	1-10	10-100		0-10	0.3-25
pH 4/	Increases corrosiveness.			7.5			8.0-9.6	

1/ California Water Quality Control Board (1963).
2/ U. S. Public Health Service (1962).
3/ Turbidity, as silica, in parts per million.
4/ Value not to be less than limits shown.

Appendix Table 9B -- Chemical analyses of ground water samples, Alabama River Basin.

TEST DATE	SILICA (SiO_2)	IRON (Fe)	MANGANESE (mn)	CALCIUM (ca)	MAGNESIUM (Mg)	SODIUM (Na)	POTASSIUM (K)	BICARBONATE (HCO_3)	CARBONATE (CO_3)	SULFATE (SO_4)	CHLORIDE (Cl)	FLUORIDE (F)	NITRATE (NO_3)	DISSOLVED SOLIDS CALCULATED	DISSOLVED SOLIDS RESIDUE ON EVAPOR-ATION AT 180°C	HARDNESS AS $CaCO_3$	NONCARBONATE HARDNESS AS $CaCO_3$	SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C)	pH	COLOR	DEPTH OF WELL (FT)
City of Montgomery, Montgomery County J-3																					
5-7-73	22	.00	.01	6.4	1.0	48	3.6	137	0	6.6	7.8	.3	.1	163	158	20	0	263	7.5	--	631
City of Trussville, Jefferson County L-10																					
12-11-69	7.8	.00	--	55	3.1	2.4	1.0	172	0	3.9	4.0	0.1	3.0	165	163	150	9	274	7.3	1	320
City of Monroeville, Monroe County U-3																					
6-27-67	11	.02	--	3.0	.6	164	1.4	342	0	25	49	.2	.1	422	--	10	0	741	7.9	--	1365
Town of Maplesville, Chilton County O-2																					
2-19-70	37	8.7	--	16	3.6	3.2	2.2	57	0	13	2.4	.3	.1	106	--	55	8	121	6.6	--	253
City of Centreville, Bibb County P-5																					
5-13-69	9.4	.02	--	27	12	2.4	--	141	0	1.0	2.0	.0	3.1	126	--	118	2	230	7.5	--	119
Town of Wedowee, Randolph County K-3																					
5-12-70	8.5	.07	--	2.4	1.0	1.6	1.6	14	0	0.2	1.6	0.1	1.5	--	26	10	0	34	6.2	--	109
City of Columbiana, Shelby County DD-5																					
7-17-69	7.8	.04	--	30	15	.7	.2	163	0	.2	1.2	.1	.2	135	--	138	0	253	7.9	--	219
City of Montevallo, Shelby County AA-7																					
7-16-69	8.3	.02	--	37	19	1.5	.9	202	0	3.0	1.8	.1	.9	172	--	171	5	321	7.5	--	--

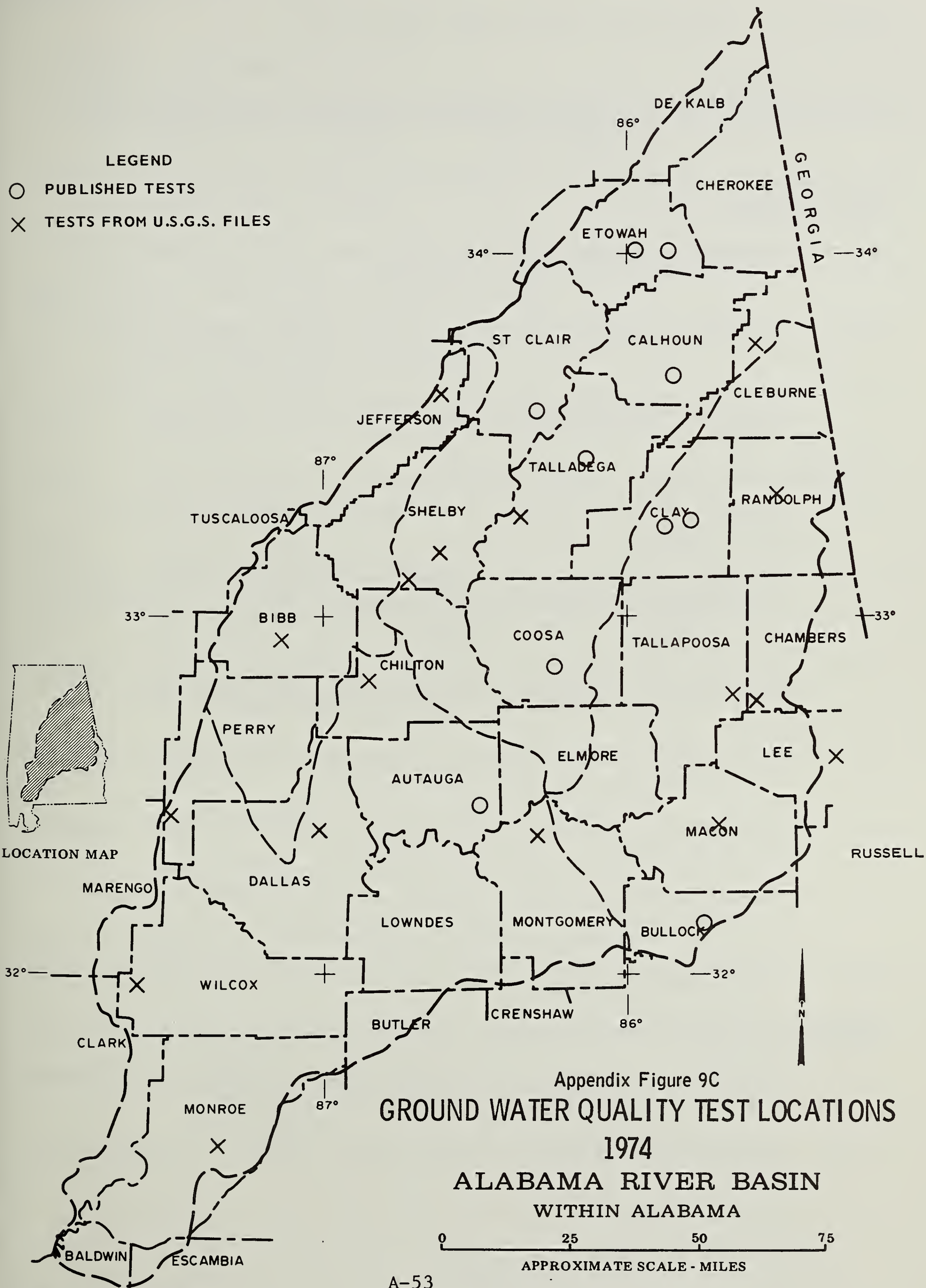
Appendix Table 9B -- Cont'd

TEST DATE	SILICA (SiO_2)	IRON (Fe)	MANGANESE (mn)	CALCIUM (ca)	MAGNESIUM (Mg)	SODIUM (Na)	POTASSIUM (K)	BICARBONATE (HCO_3)	CARBONATE (CO_3)	SULFATE (SO_4)	CHLORIDE (Cl)	FLUORIDE (F)	NITRATE (NO_3)	DISSOLVED SOLIDS CALCULATED	DISSOLVED SOLIDS RESIDUE ON EVAPORATION AT 180°C	HARDNESS AS $CaCO_3$	NONCARBONATE HARDNESS AS $CaCO_3$	SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C)	pH	COLOR	DEPTH OF WELL (FT)
South Georgia Gas Co., Lee County P-6																					
5-5-70	3.9	.12	--	6.0	1.2	5.2	1.8	61	0	1.8	2.6	.6	2.0	73	89	18	0	123	6.7	--	420
Rockford, Alabama																					
11-30-51	--	1.0	--	--	--	--	--	25.4	--	4.0	12.4	--	17.7	--	--	--	--	--	6.0	--	237
Pell City, Alabama																					
2-8-61	--	.04	--	--	--	--	--	122	--	0.8	0.5	0.1	.0	--	--	--	--	--	7.6	--	150
Talladega, Alabama																					
7-19-55	--	0.4	--	--	--	--	--	157.1	--	0.9	1.6	--	0.8	--	--	--	--	--	7.7	--	203
Anniston, Alabama																					
9-22-56	--	0.7	--	--	--	--	--	157	--	0	7.0	--	3.2	--	--	--	--	--	--	--	409
Gadsden, Alabama																					
1-26-52	--	--	--	--	--	--	--	--	--	--	2.9	--	--	--	--	--	--	--	7.4	--	150
Hokes Bluff, Alabama																					
12-3-51	--	0.2	--	--	--	--	--	449.3	--	6.5	10.5	--	--	--	--	--	--	--	7.1	--	300
Ashland, Alabama																					
10-27-65	--	.27	--	--	--	--	--	--	--	0.8	54	--	--	--	--	--	--	--	7.8	--	200
Lineville, Alabama																					
11-24-64	--	0.2	--	--	--	--	--	--	--	--	11.0	--	--	--	--	--	--	--	5.5	--	150

Appendix Table 9B -- Cont'd

TEST DATE	SILICA (SiO_2)	IRON (Fe)	MANGANESE (mn)	CALCIUM (ca)	MAGNESIUM (Mg)	SODIUM (Na)	POTASSIUM (K)	BICARBONATE (HCO_3)	CARBONATE (CO_3)	SULFATE (SO_4)	CHLORIDE (CI)	FLUORIDE (F)	NITRATE (NO_3)	DISSOLVED SOLIDS: CALCULATED	DISSOLVED SOLIDS: RESIDUE ON EVAPORATION AT 180°C	HARDNESS AS $CaCO_3$	NONCARBONATE HARDNESS AS $CaCO_3$	SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C)	pH	COLOR	DEPTH OF WELL (FT)
Union Springs, Alabama																					
1-24-41	--	.07	--	--	--	--	--	101	--	22	6.0	0.2	0.5	--	--	--	--	--	--	--	1049
Uniontown, Perry County V-3																					
7-24-68	16	.00	--	1.0	0.4	--	--	122	0	4.8	0.6	0.2	.0	130	129	4	0	210	7.4	--	945
Town of Camp Hill, Tallapoosa County P-2																					
2-5-70	39	.02	--	11	2.1	8.4	3.1	47	0	14	2.4	0.2	0.1	103	--	36	0	112	6.9	--	500
City of Selma, Dallas, County K-8																					
5-8-73	13	.37	.13	6.5	3.2	2.2	7.4	43	0	6.4	2.2	.3	.1	62	--	29	0	90	6.8	--	711
Childersburg Water, Sewage, and Gas Board, Talladega, Alabama																					
3-25-63	6.9	.04	--	29	13	1.8	0.9	149	0	0.0	4.2	0.2	1.0	130	137	127	5	248	7.5	5	420
Alabama Department of Conservation, Cleburne County Y-3																					
1-20-71	7.7	.04	.001	1.4	0.5	1.4	0.6	8	0	.0	2.0	.0	0.1	18	17	6	0	24	6.2	--	345
Tuskegee Institute, Macon County																					
4-29-55	16	--	--	1.2	.8	3.3	4.1	17	0	1.9	1.9	.0	2.0	--	--	2	0	38	6.4	7	335
City of Pine Hill, Wilcox County K-11																					
8-4-67	27	.05	--	14	2.2	372*	--	498	0	46	280	0.6	0.7	961	--	44	0	1780	8.1	5	194
Waverly School, Chambers County W-1																					
9-12-69	40	.02	--	7.2	1.9	8.4	1.7	42	0	2.0	6.0	0.2	2.1	91	86	26	0	101	6.6	0	400
Prattville, Alabama																					
9-26-44	--	.07	--	--	--	--	--	61.0	--	2.0	2.0	--	--	--	--	--	--	--	7.0	--	436

*Sodium plus potassium as sodium.



Appendix Figure 9C

GROUND WATER QUALITY TEST LOCATIONS 1974

ALABAMA RIVER BASIN

WITHIN ALABAMA

SOURCE: Data Compiled by SCS River Basin Study Staff

USDA-SCS-FORT WORTH, TEXAS 1976

REVISED JUNE 1976
NOVEMBER 1972

4-R-34890
BASE 4-R-32344

APPENDIX 10 -- GEOLOGY AND GROUND WATER PUBLICATIONS.

Appendix Table 10A -- Selected references on ground water availability, Alabama River Basin, Geological Survey of Alabama, December 1974.

COUNTY REPORTS

CR 4. Geology and ground water resources of Wilcox County, Alabama, by P. E. LaMoreaux and L. D. Toulmin.

CR 5. Geology and ground water resources of Marengo County, Alabama, by J. G. Newton, Horace Sutcliffe, Jr., and P. E. LaMoreaux.

CR 7. Geology and ground water resources of Calhoun County, Alabama, by J. C. Warman and L. V. Causey.

BULLETINS - Equivalent to county reports.

B 66. Geology and ground water in the Monroeville area, Alabama, by J. B. Ivey.

B 68A. Geology and ground water resources of Montgomery County, Alabama, with special reference to the Montgomery area, by D. B. Knowles, H. L. Reade, Jr., and J. C. Scott.

B 68A. Geology and ground water resources of Montgomery County, Alabama, with special reference to the Montgomery area, basic data, by D. B. Knowles, H. L. Reade, Jr., and J. C. Scott.

B 73. Geology and ground water resources in St. Clair County, Alabama, a reconnaissance report, by L. V. Causey.

B 74. Geology and ground water resources of Escambia County, Alabama, by J. W. Cagle, Jr., and J. G. Newton.

B 79. Geology and ground water resources of Cherokee County, Alabama, a reconnaissance report by L. V. Causey.

B 81. Availability of ground water resources in Talladega County, Alabama, a reconnaissance, by L. V. Causey.

INFORMATION SERIES - Interim reports, preliminary reports, etc.

IS 6. Ground water resources of Lowndes County, Alabama, a reconnaissance report, by J. C. Scott.

IS 16. Ground water resources of Macon County, Alabama, a reconnaissance report, by J. C. Scott.

INFORMATION SERIES (Cont'd)

IS 21. Ground water resources of Autauga County, Alabama, a reconnaissance report, by J. C. Scott.

IS 29. Ground water resources of Bullock County, Alabama, a reconnaissance report, by J. C. Scott.

IS 40. Mineral, water, and energy resources of Wilcox County, Alabama.

SPECIAL MAPS - Ground water availability maps.

SM 57. Water availability map of Butler County, Alabama, by J. C. Scott, H. G. Golden, and J. R. Avrett.

SM 69. Water availability map of Crenshaw County, Alabama, by R. G. McWilliams, J. C. Scott, H. G. Golden, and J. R. Avrett.

SM 96. Water availability map of Baldwin County, Alabama, by Philip C. Reed and J. F. McCain.

SM 97. Water availability map of Clarke County, Alabama, by Lawson V. Causey and Jerald F. McCain.

SM 98. Water availability map of Marengo County, Alabama, by J. G. Newton, J. F. McCain, and A. L. Knight.

SM 103. Water availability, Clay County, Alabama, by R. C. Chandler, G. C. Lines, and J. C. Scott.

SM 108. Surface water availability, Etowah County, Alabama, by J. R. Harkins.

SM 111. Water availability, Coosa County, Alabama, by G. C. Lines.

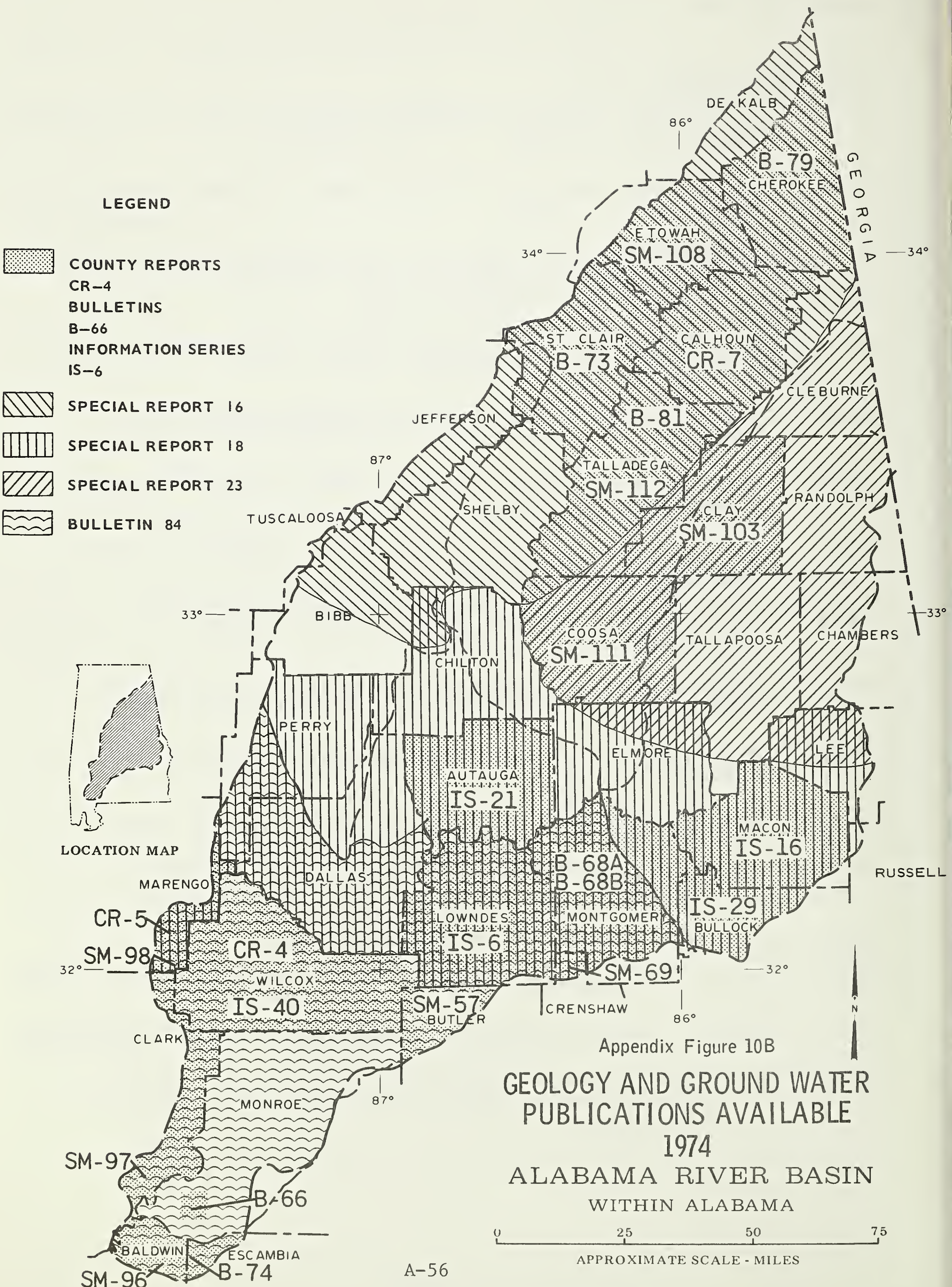
SM 112. Surface water availability, Talladega County, Alabama, by J. R. Harkins.

SPECIAL REPORT 16 - Ground waters of Northern Alabama.

SPECIAL REPORT 18 - Ground water resources of the Cretaceous area of Alabama.

SPECIAL REPORT 23 - Geology and ground water of the Piedmont area of Alabama.

BULLETIN 84 - Surface water in Southwestern Alabama, by L. B. Pierce, with a section on chemical quality of surface water, by S. M. Rogers.



Appendix Figure 10B

GEOLOGY AND GROUND WATER PUBLICATIONS AVAILABLE 1974

ALABAMA RIVER BASIN

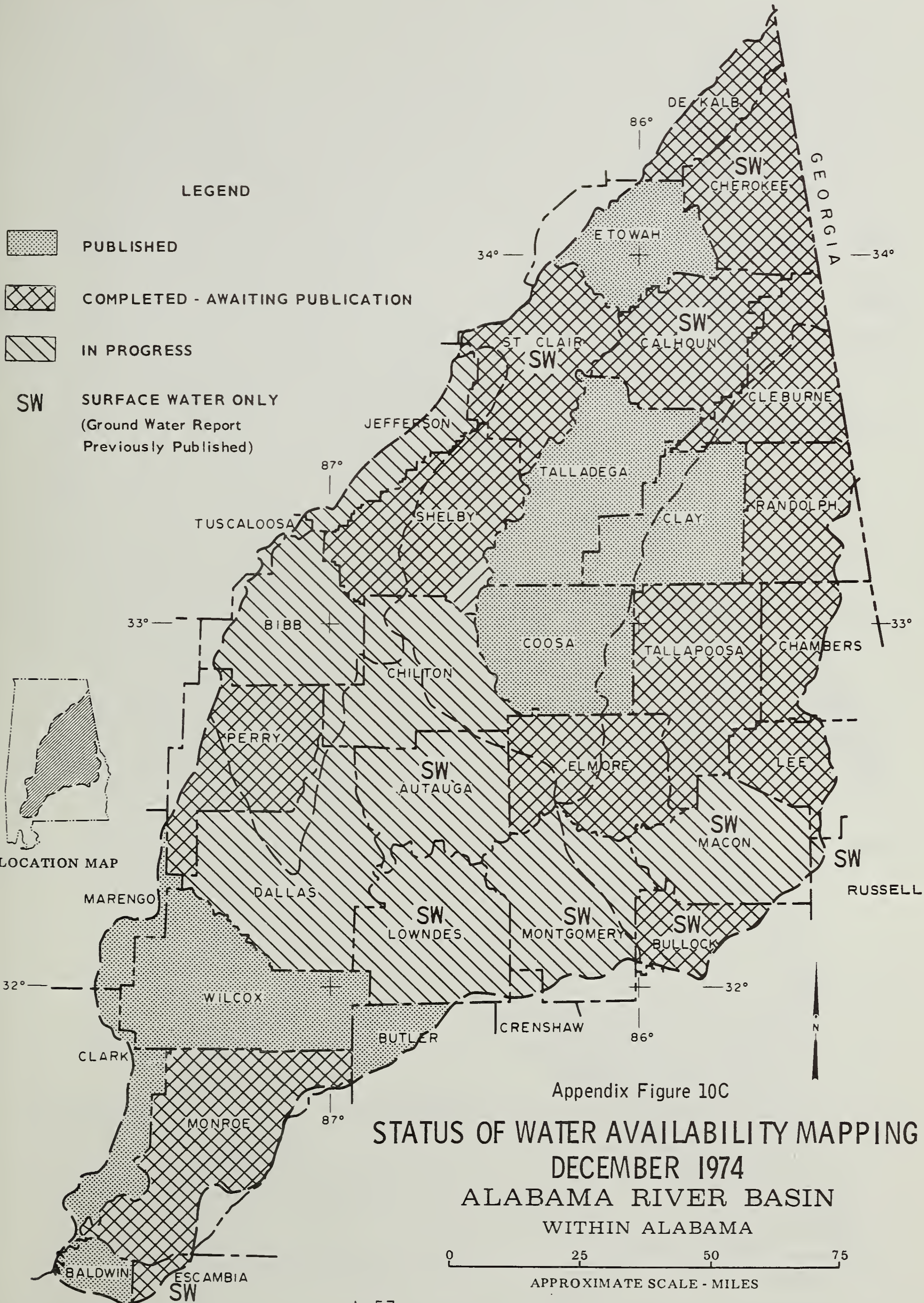
WITHIN ALABAMA

SOURCE: Data Compiled by SCS River Basin Study Staff.

REVISED JUNE 1976
NOVEMBER 1972

4-R-34886
BASE 4-R-32344

USDA-SCS-FORT WORTH, TEXAS 1976



Appendix Figure 10C

STATUS OF WATER AVAILABILITY MAPPING DECEMBER 1974
ALABAMA RIVER BASIN
WITHIN ALABAMA

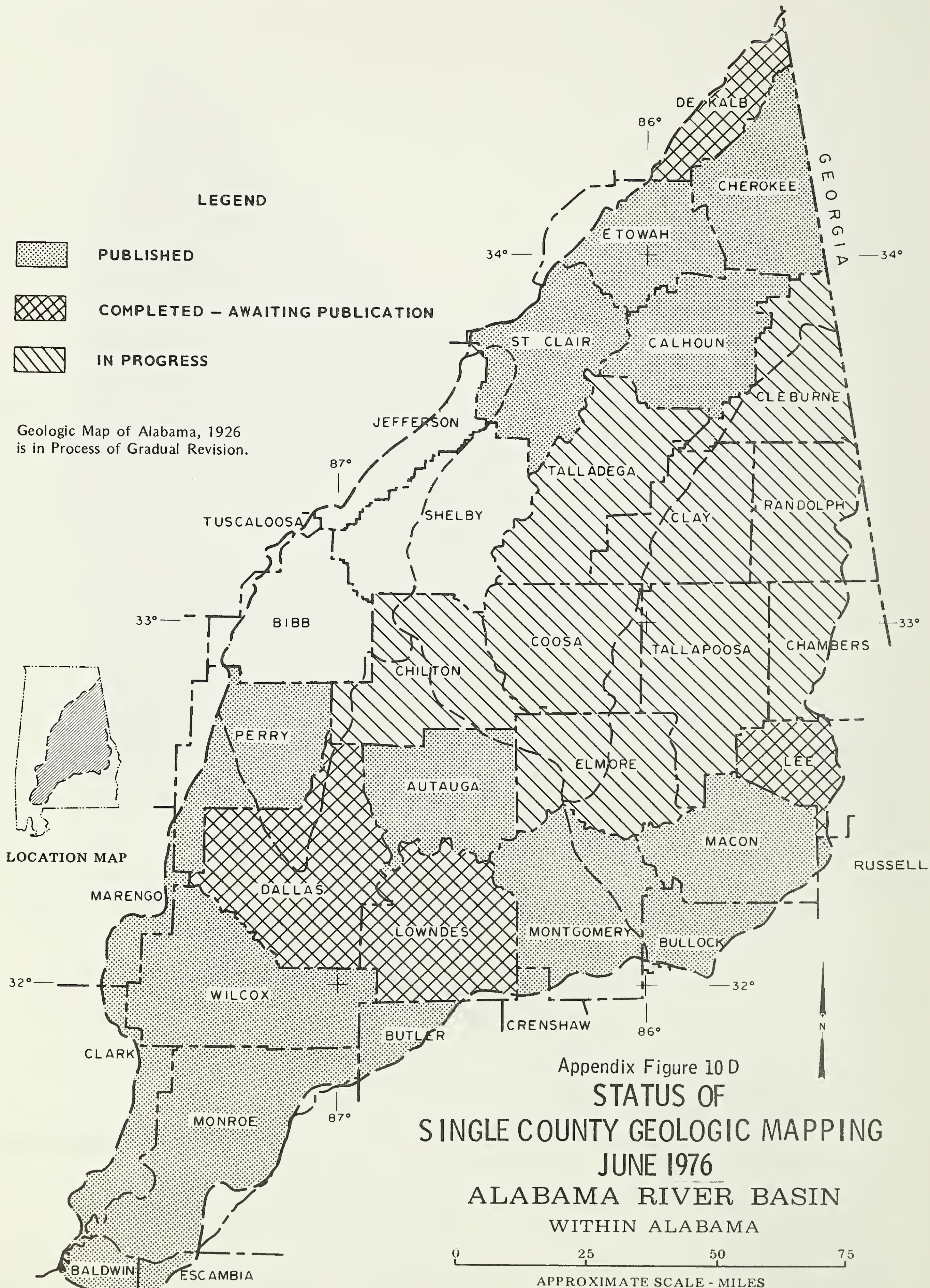
0 25 50 75
APPROXIMATE SCALE - MILES

SOURCE: Data Compiled by SCS River Basin Study Staff

USDA-SCS FORT WORTH TEXAS 1976

REVISED JUNE 1976
NOVEMBER 1972

4-R-34887
BASE 4-R-32344



Appendix Figure 10 D

STATUS OF
SINGLE COUNTY GEOLOGIC MAPPING
JUNE 1976
ALABAMA RIVER BASIN
WITHIN ALABAMA

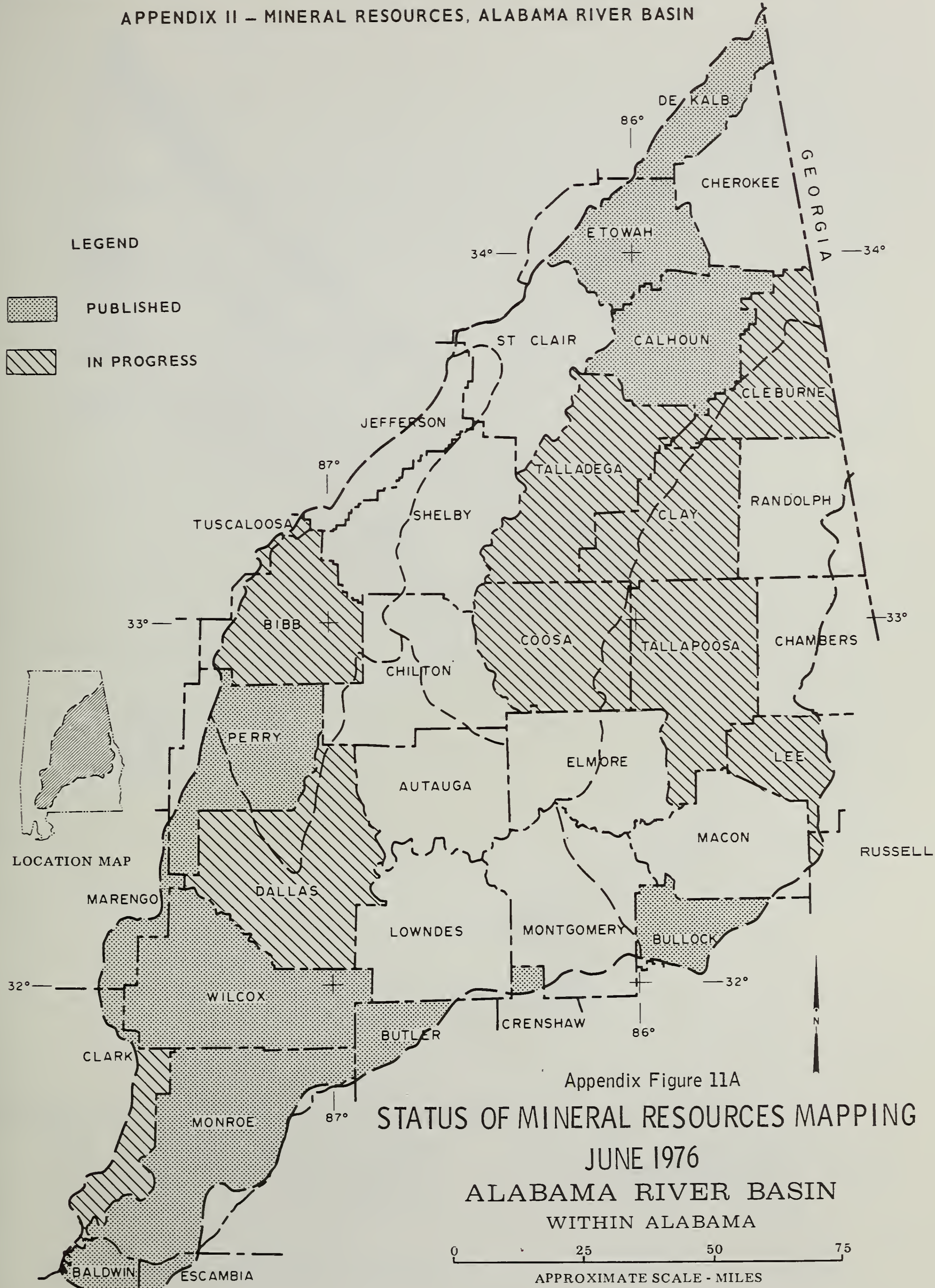
SOURCE: Data Compiled by SCS River Basin Study Staff.

USDA-SCS-FORT WORTH TEXAS 1976

REVISED JUNE 1976
NOVEMBER 1972

4-R-34884
BASE 4-R-32344

APPENDIX II – MINERAL RESOURCES, ALABAMA RIVER BASIN



Appendix Figure 11A

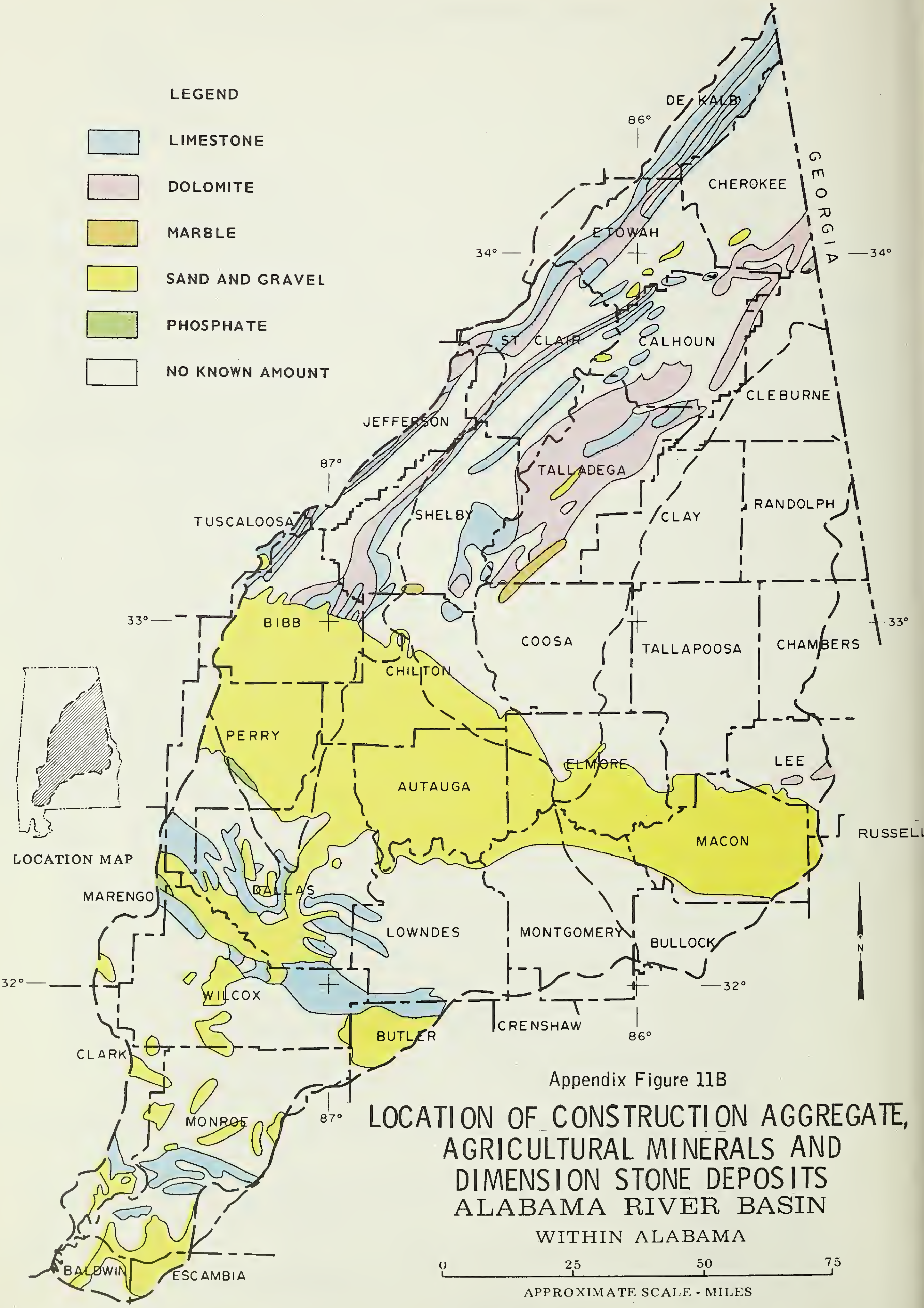
STATUS OF MINERAL RESOURCES MAPPING
JUNE 1976
ALABAMA RIVER BASIN
WITHIN ALABAMA

SOURCE: Data Compiled by SCS River Basin Study Staff

REVISED JUNE 1976
NOVEMBER 1972

4-R-34889
BASE 4-R-32344

USDA-SCS-FORT WORTH TEXAS 1976



Appendix Figure 11B

LOCATION OF CONSTRUCTION AGGREGATE, AGRICULTURAL MINERALS AND DIMENSION STONE DEPOSITS ALABAMA RIVER BASIN

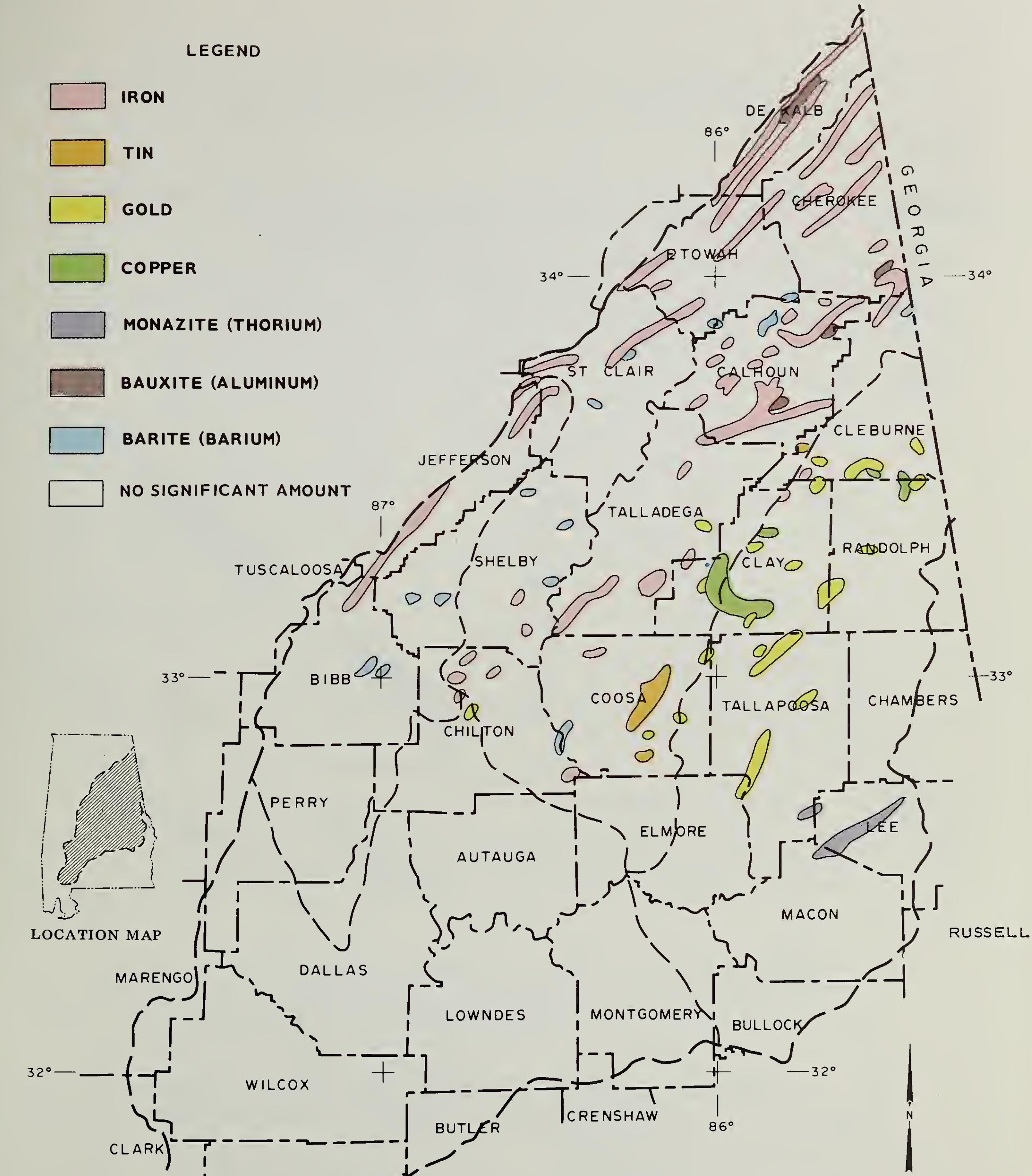
WITHIN ALABAMA

SOURCE: Minerals Map of Alabama, Geological Survey of Alabama, 1973.

USDA-SCS-FORT WORTH TEXAS 1976

REVISED JUNE 1976
NOVEMBER 1972

4-R-32519
BASE 4-R-32344



Appendix Figure 11C

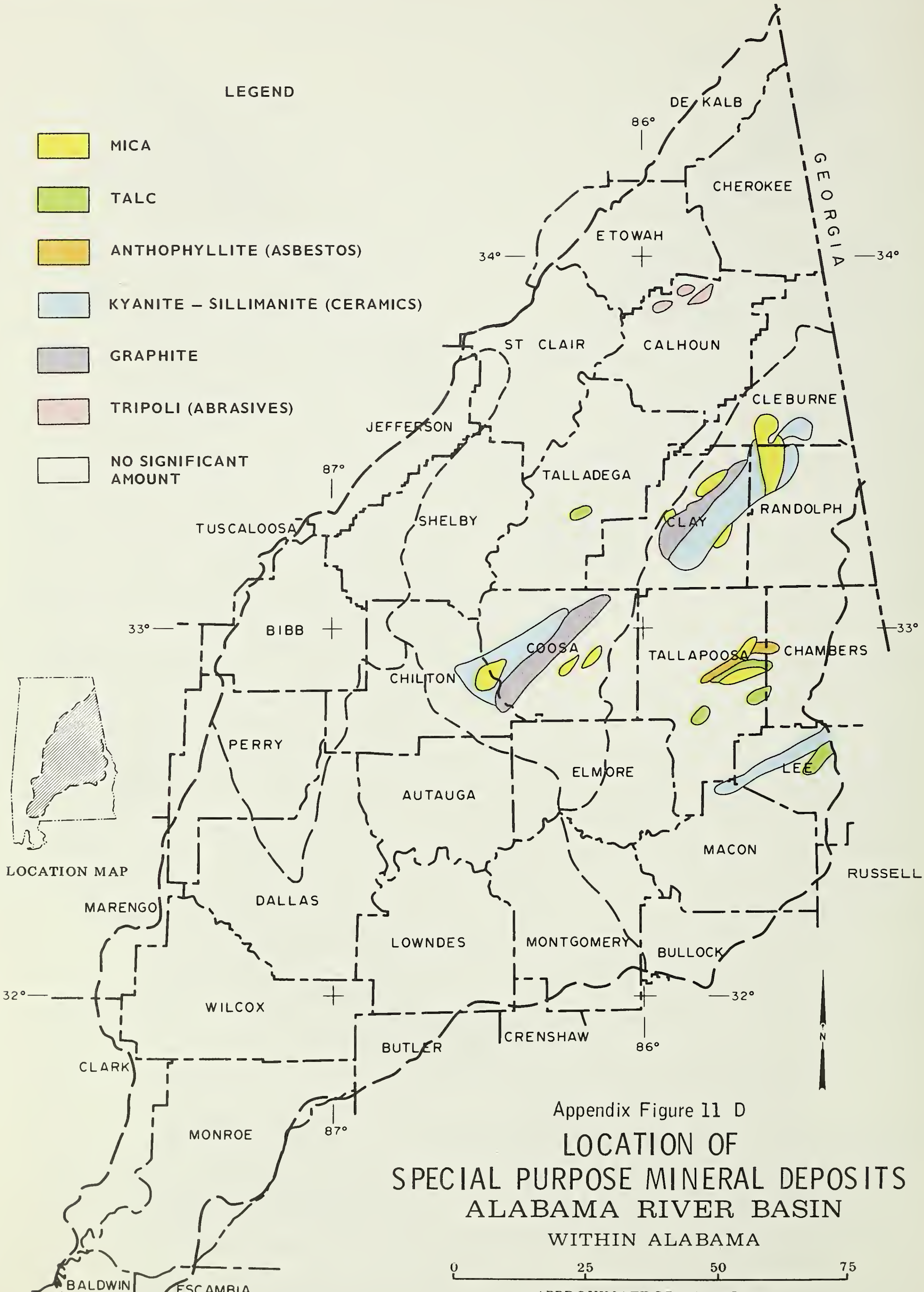
LOCATION OF METALLIC MINERAL DEPOSITS ALABAMA RIVER BASIN WITHIN ALABAMA

SOURCE: Minerals Map of Alabama, Geological Survey of Alabama, 1973.

USDA-SCS-FORT WORTH, TEXAS 1976

REVISED JUNE 1976
NOVEMBER 1972

4-R-32517
BASE 4-R-32344



Appendix Figure 11 D

LOCATION OF SPECIAL PURPOSE MINERAL DEPOSITS ALABAMA RIVER BASIN

WITHIN ALABAMA

SOURCE: Minerals Map of Alabama, Geological Survey of Alabama, 1973.

USDA-SCS-FORT WORTH TEXAS 1976

REVISED JUNE 1976
NOVEMBER 1972

4-R-32518
BASE 4-R-32344

Appendix Table 11E -- Estimated strippable reserves of Bituminous coal in the Alabama River Basin, by counties, 1974. 1/

	RESERVES CONTAINED IN BEDS 14 INCHES OR MORE IN THICKNESS			
	0-100 FT. OF OVERBURDEN 2/		100-300 FT. OF OVERBURDEN 2/	
AREA	MILLIONS OF TONS	APPROXIMATE MINABLE ACREAGE 3/	MILLIONS OF TONS	APPROXIMATE MINABLE ACREAGE 3/
Alabama	627.74	138,340	1,255.48	276,680
Alabama Basin	80.30	16,250	160.60	32,500
Coosa Subbasin	5.95	1,730	11.90	3,460
Coosa Field	3.24	900	6.48	1,800
St. Clair Co.	2.82	840	5.64	1,680
Shelby Co.	0.42	60	0.84	120
Plateau Field	2.71	830	5.42	1,660
(Lookout Mtn. Portion)				
Cherokee Co.	1.04	330	2.08	660
DeKalb Co.	1.67	500	3.34	1,000
Cahaba Subbasin	74.35	14,520	148.70	29,040
Cahaba Field	74.35	14,520	148.70	29,040
Bibb Co.	34.41	6,490	68.82	12,980
Jefferson Co.	8.50	1,570	17.00	3,140
St. Clair Co.	1.56	320	3.12	640
Shelby Co.	29.88	6,140	59.76	12,280

1/ Source: Culbertson, Geology and Coal Resources of the Coal-bearing Rocks of Alabama, Geological Survey Bulletin 1182-B, U. S. Geological Survey, Washington, 1964. (Updated to 1974 by Geological Survey of Alabama.)

2/ Estimated as directly proportional to Culbertson's reserves under 0-1,000 ft. of overburden; projected strippable depth of 300 feet based on expected advance in technology by 2020 (T. W. Daniel, Geological Survey of Alabama).

3/ Based on average thickness as shown in Culbertson's tables and average weight of coal at 1,800 tons per acre foot.

Appendix Table 11F -- Estimated reserves of strippable lignite in the Alabama River Basin, by counties, 1973. 1/

AREA	RESERVES CONTAINED IN THE OAK HILL LIGNITE AVERAGING 5 FEET IN THICKNESS AND 0-250 FEET OF OVERBURDEN	
	MILLIONS OF TONS	ACREAGE POTENTIALLY AFFECTED
Alabama	2,000	228,000
Alabama River Subbasin 2/	679	77,600
Marengo County	231	26,400
Wilcox County	448	51,200

1/ Daniel, T. W., Jr., A Strippable Lignite Bed in South Alabama, Geological Survey of Alabama Bulletin 101; University, Alabama, 1973.

2/ Alabama Subbasin is the only subbasin within the Alabama Basin in which minable lignite occurs.

APPENDIX 12— SOILS OF THE ALABAMA RIVER BASIN.

Appendix Table 12A -- Soil associations and interpretations for selected uses.

SOIL ASSOCIATION NAME & NO. 1/	DOMINANT SLOPE (%)	SOIL SUITABILITY AND MAJOR LIMITATION FOR: CROPLAND	PASTURELAND	WOODLAND	SOIL LIMITATIONS FOR: SEPTIC TANK ABSORPTION FIELDS	LOCAL ROADS AND STREETS	SMALL COMMERCIAL BUILDINGS	DWELLINGS WITHOUT BASEMENTS	CAMP AREAS	PICNIC AREAS	PLAY-GROUNDS	PATHS AND TRAILS
Cheaha-Leesburg (2)	20-50	Poor: slope, large stones	Poor: slope	Good	Severe: slope, depth to rock	Severe: slope	Severe: slope	Severe: slope	Severe: slope, large stones	Severe: slope	Severe: slope, large stones	Severe: slope, large stones
Colbert-Conasauga-Firestone (3)	1-6	Fair: too clayey	Good	Fair: too clayey	Severe: percs slowly	Severe: low strength, shrink-swell	Severe: low strength, shrink-swell	Severe: low strength, shrink-swell	Severe: percs slowly	Moderate: wetness	Severe: percs slowly	Moderate: wetness
Conasauga-Firestone-Talbott (4)	1-6	Fair: slope, too clayey	Good	Fair: too clayey	Severe: percs slowly	Severe: low stength	Moderate: low strength, shrink-swell	Moderate: low strength, shrink-swell	Moderate: percs slowly, wetness	Moderate: wetness	Moderate: wetness, percs slowly, slope	Slight
Decatur-Dewey-Allen (6)	1-10	Good	Good	Good	Slight	Moderate: low strength	Moderate: low strength	Moderate: low strength	Slight	Slight	Slight	Slight
Holston-McQueen-Chewacla (8)	0-6	Good	Good	Good	Slight	Moderate: low strength	Moderate: low strength	Moderate: low strength	Slight	Slight	Slight	Slight
Minvale-Bodine-Fullerton (10)	6-35	Poor: slope, small stones, droughty	Fair: slope, droughty	Good	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Moderate: slope
Minvale-Fullerton (11)	2-20	Fair: slope	Good	Good	Moderate: slope	Moderate: low strength, slope	Severe: slope	Moderate: slope	Moderate: slope	Moderate: slope	Moderate: slope	Slight
Hartsells-Linker-Albertville (12)	2-15	Good	Good	Good	Severe: depth to rock	Moderate: depth to rock	Moderate: slope, depth to rock	Moderate: depth to rock	Slight	Slight	Moderate: slope	Slight
Hartsells-Wynnville Albertville (14)	0-15	Good	Good	Good	Severe: depth to rock	Moderate: depth to rock	Moderate: depth to rock	Moderate: depth to rock	Slight	Slight	Moderate:	Slight
Hector-Rockland, Limestone-Allen (15)	25-40	Poor: slope, depth ro rock	Poor: slope, droughty	Poor: depth to rock	Severe: depth to rock, slope	Severe: depth to rock, slope	Severe: slope, depth to rock	Severe: slope, depth to rock	Severe: slope,	Severe: slope,	Severe: slope, depth to rock	Severe: slope
Montevallo-Townley-Enders (16)	6-40	Poor: slope, depth rock	Poor: slope, droughty	Poor: depth to rock	Severe: depth to rock, slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: depth to rock	Severe: slope

Appendix Table 12A -- Cont'd

SOIL ASSOCIATION NAME & NO. 1/	DOMINANT SLOPE (%)	SOIL SUITABILITY AND MAJOR LIMITATION FOR			SOIL LIMITATIONS FOR							
		CROPLAND	PASTURELAND	WOODLAND	SEPTIC TANK ABSORPTION FIELDS	LOCAL ROADS AND STREETS	SMALL COMMERCIAL BUILDINGS	DWELLINGS WITHOUT BASEMENTS	CAMP AREAS	PICNIC AREAS	PLAY-GROUNDS	PATHS AND TRAILS
Appling-Cecil (17)	2-15	Fair: slope	Good	Good	Moderate: percs slowly	Moderate: low strength	Severe: slope	Moderate: slope	Moderate: slope	Moderate: slope	Severe: slope	Slight
Cecil-Grover-Madison (18)	2-25	Poor: slope	Good	Good	Moderate: percs slowly	Moderate: low strength	Severe: slope	Moderate: slope	Moderate: slope	Moderate: slope	Severe: slope	Slight
Davidson-Hiwassee-Gwinnett (19)	2-30	Fair: slope	Good	Good	Moderate: percs slowly	Moderate: low strength	Severe: slope	Moderate: slope	Moderate: slope	Moderate: slope	Severe: slope	Slight
Iredell-Mecklenburg (20)	2-10	Fair: too clayey	Good	Fair: too clayey	Severe: percs slowly	Severe: low strength, shrink-swell	Severe: shrink-swell	Severe: shrink-swell	Moderate: percs slowly, too clayey	Moderate: too clayey	Moderate: percs slowly, slope	Moderate too clayey, slope
Gwinnett-Cecil-Appling (21)	2-30	Fair: slope	Good	Good	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Moderate slope
Madison-Louisa (22)	6-40	Poor: slope	Fair: slope	Good	Severe: slope	Severe: slope, low strength	Severe: slope, low strength	Severe: low strength, slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope
Madison-Tallapoosa (23)	2-25	Poor: slope	Fair: slope	Good	Moderate: slope, percs slowly	Severe: slope, low strength	Severe: slope, low strength	Severe: low strength	Moderate: slope	Moderate: slope	Severe: slope	Moderate slope
Musella-Gwinnett-Hiwassee (24)	1-25	Fair: slope, droughty	Good	Good	Moderate: slope, percs slowly	Moderate: low strength	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Moderate slope
Tallapoosa-Tatum (25)	6-50	Poor: slope, droughty	Poor: slope	Good	Severe: slope, depth to rock	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope
Demopolis-Sumter-Oktibbeha (26)	3-17	Poor: droughty	Fair: droughty	Fair: too clayey, depth to rock	Severe: percs slowly, depth to rock	Severe: shrink-swell, low strength	Severe: shrink-swell, low strength	Severe: shrink-swell, low strength	Moderate: slope, too clayey	Moderate: slope, too clayey	Severe: slope	Moderate too clayey
Sumter-Oktibbeha-Leeper (27)	0-12	Fair: droughty	Good	Fair: too clayey	Severe: percs slowly, depth to rock	Severe: shrink-swell, low strength	Severe: shrink-swell, low strength	Severe: shrink-swell, low strength	Moderate: slope, too clayey	Moderate: slope, too clayey	Moderate: slope, percs slowly	Moderate too clayey

Appendix Table 12A-- Cont'd

SOIL ASSOCIATION NAME & NO. 1/	DOMINANT SLOPE (%)	SOIL SUITABILITY AND MAJOR LIMITATION FOR: CROPLAND	PASTURELAND	WOODLAND	SOIL LIMITATIONS FOR: SEPTIC TANK ABSORPTION FIELDS	LOCAL ROADS AND STREETS	SMALL COMMERCIAL BUILDINGS	DWELLINGS WITHOUT BASEMENTS	CAMP AREAS	PICNIC AREAS	PLAY-GROUNDS	PATHS AND TRAILS
Wilcox-Mayhew-Eutaw (28)	0-5	Poor: too clayey	Fair: too clayey	Good	Severe: percs slowly	Severe: shrink-swell, low strength	Severe: shrink-swell, low strength	Severe: shrink-swell, low strength	Severe: percs slowly	Moderate: too clayey, wetness	Severe: percs slowly	Moderate wetness, too clayey
Boswell-Susquehanna (29)	2-15	Fair: too clayey	Good	Good	Severe: percs slowly	Severe: low strength shrink-swell	Severe: low strength, shrink-swell	Severe: low strength, shrink-swell	Severe: percs slowly	Moderate: slope, wetness	Severe: percs slowly, slope	Moderate wetness
Dothan-Fuquay-Wagram (30)	2-15	Good	Good	Good	Moderate: percs slowly	Slight	Moderate: slope	Slight	Slight	Slight	Moderate: slope	Slight
Luverne-Smithdale-Boswell (33)	6-30	Poor: slope	Fair: slope	Good	Severe: percs slowly	Severe: slope, low strength	Severe: slope, low strength	Severe: slope, low strength	Severe: slope	Severe: slope	Severe: slope	Moderate slope
Malbis-Orangeburg-Pansey (34)	0-5	Good	Good	Good	Moderate: percs slowly	Moderate: low strength	Slight	Slight	Slight	Slight	Moderate: slope	Slight
Orangeburg-Dothan-Luverne-Red Bay (36)	2-15	Fair: slope	Good	Good	Slight	Slight	Moderate: slope	Slight	Slight	Slight	Moderate: slope	Slight
Orangeburg-Red Bay-Dothan-Troup (37)	2-10	Fair: slope	Good	Good	Slight	Slight	Moderate: slope	Slight	Slight	Slight	Moderate: slope	Slight
Lucedale-Bama (39)	0-5	Good	Good	Good	Slight	Slight	Slight	Slight	Slight	Slight	Slight	Slight
Savannah-Ruston-Stough (41)	0-6	Good	Good	Good	Severe: percs slowly	Moderate: low strength	Moderate: wetness	Moderate:	Slight	Slight	Moderate: slope	Slight
Smithdale-Luverne-Troup (43)	6-35	Poor: slope	Fair: slope	Good	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Moderate slope
Smithdale-Troup-Lucedale Luverne (44)	5-30	Poor: slope	Fair: slope	Good	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Moderate slope
Smithton-Escambia-Troup (45)	0-5	Poor: wetness	Fair: wetness	Good	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness
Troup-Alaga-Lucy (46)	0-6	Fair: droughty	Fair: droughty	Good	Slight	Slight	Slight	Slight	Moderate: too sandy	Moderate: too sandy	Severe: too sandy	Moderate too sandy

Appendix Table 12A -- Cont'd

SOIL ASSOCIATION NAME & NO. 1/	DOMINANT SLOPE (%)	SOIL SUITABILITY AND MAJOR LIMITATION FOR			SOIL LIMITATIONS FOR							
		CROPLAND	PASTURELAND	WOODLAND	SEPTIC TANK ABSORPTION FIELDS	LOCAL ROADS AND STREETS	SMALL COMMERCIAL BUILDINGS	DWELLINGS WITHOUT BASEMENTS	CAMP AREAS	PICNIC AREAS	PLAY-GROUNDS	PATHS AND TRAILS
Troup-Luverne-Dothan-Orangeburg (47)	2-30	Poor: slope	Poor: slope	Good	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Moderate too sandy, slope
Troup-Smithdale-Esto (49)	2-25	Poor: slope	Poor: slope	Good	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Moderate too sandy, slope
Luverne-Boswell-Quitman-Smithdale (51)	0-30	Fair: slope	Fair: slope	Good	Severe: slope, percs slowly	Severe: low strength, slope	Severe: low strength, slope	Severe: low strength, slope	Severe: slope	Severe: slope	Severe: slope	Moderate slope
Cahaba-Chewacla-Myatt (53)	0-5	Good	Good	Good	Severe: floods	Severe: floods	Severe: floods	Severe: floods	Severe: floods	Severe: floods	Severe: floods	Severe: floods

1/ Soil association numbers correspond to those used on the General Soil Map of Alabama; SCS and Alabama Agricultural Experiement Station, Auburn University, Auburn, Alabama 1974.

Appendix Table 12B -- Selected properties of soil series found within soil associations shown in figure 2-12.

SERIES AND ASSOCIATION NO. 1/	PROFILE CHARACTERISTICS	DRAINAGE CLASS	PERME-ABILITY CLASS	REACTION 2/	DEPTH TO BEDROCK (IN.) HARD	DEPTH TO BEDROCK (IN.) RIPPABLE	HIGH WATER TABLE DEPTH (FT.)	HIGH WATER TABLE KIND	HIGH WATER TABLE MONTHS	FLOODING FRE-QUENCY	FLOODING DURATION	FLOODING MONTHS	SHRINK-SWELL POTENTIAL (SUBSOIL)	SLOPE RANGE (%)
Alaga (46)	Deep soil with brownish & yellowish sandy surface & subsoil.	well to somewhat excessive	rapid	strongly acid	60	60	6	-	-	none	-	-	low	0-25
Albertville (12) (14)	Deep soil with brownish loamy surface over brownish clayey subsoil.	well	mod. slow	strongly acid	60	40-72	6	-	-	none	-	-	moderate	2-25
Allen (6)	**Deep soil with brownish loamy surface** over reddish loamy subsoil.	well	mod.	strongly acid	60	60	6	-	-	none	-	-	low	2-40
Appling (17)	Deep soil with brownish loamy surface over brownish & yellowish clayey subsoil.	well	mod.	strongly acid	60	40-60	6	-	-	none	-	-	moderate	0-15
Bama (39)	Deep soil with brownish loamy surface over reddish loamy subsoil.	well	mod.	strongly acid	60	60	6	-	-	none	-	-	low	0-12
Bodine (10)	Deep soil with brownish loamy & cherty surface & subsoil.	somewhat excessive	rapid	strongly acid	60	60	6	-	-	none	-	-	low	5-60
Boswell (33) (29)	Deep soil with brownish loamy surfaces & reddish & grayish subsoils.	moderately well	very slow	strongly acid	60	60	6	-	-	none	-	-	high	1-17
Cahaba (53)	Deep soil with brownish loamy surface over reddish loamy subsoil.	well	mod.	strongly acid	60+	60+	6+	-	-	none-occasional	very brief	Nov-Feb	low	0-5
Cecil (17) (18) (21)	Deep soil with brownish loamy surface over reddish clayey subsoil.	well	mod.	strongly acid	60+	60+	6+	-	-	none	-	-	moderate	0-25
Cheaha (2)	Moderately deep soil with brownish, stony, loamy surface & subsoil.	well	mod.	strongly acid	20-40	-	6+	-	-	none	-	-	low	15-60
Chewacla (8)	Deep soil with brownish loamy surface over brownish & grayish loamy subsoil.	somewhat poorly	mod.	strongly acid	60+	60+	1.0-1.5	apparent	Nov-Apr	frequent	brief	Feb-May	low	0-2

Appendix Table 12B -- Cont'd

SERIES AND ASSOCIATION NO. 1/	PROFILE CHARACTERISTICS	DRAINAGE CLASS	PERMEABILITY CLASS	REACTION 2/	DEPTH TO BEDROCK (IN.) HARD	RIPPABLE	HIGH WATER TABLE DEPTH (FT.)	KIND	MONTHS	FLOODING FREQUENCY	DURATION	MONTHS	SHRINK-SWELL POTENTIAL (SUBSOIL)	SLOPE RANGE (%)
Colbert (3)	Deep soil with brownish loamy surface over brownish clayey subsoil.	moderately well to	very slow	strongly acid	40-60	-	6+	-	-	none	-	-	high	1-20
Consasuga (4)	Moderately deep soil with brownish loamy surface over brownish clayey subsoil.	moderately well	slow	strongly acid	60+	20-40	6+	-	-	none	-	-	high	1-45
Davidson (19)	Deep soil with brownish loamy surface over reddish clayey subsoil.	well	mod.	strongly acid	60+	60+	6+	-	-	none	-	-	moderate	2-25
Decatur (6)	Deep soil with brownish loamy surface over reddish clayey subsoil.	well	mod.	very strongly acid	60+	60+	6+	-	-	none	-	-	moderate	1-25
Demopolis (26)	Shallow calcareous soil with brownish loamy surface over chalk.	well	mod.	mod. alkaline	60+	4-16	6+	-	-	none	-	-	moderate	1-20
Dewey (6)	Deep soil with brownish loamy surface over reddish clayey subsoil.	well	mod.	strongly acid	60+	60+	6+	-	-	none	-	-	moderate	2-30
Dothan (30) (36)	Deep soil with brownish loamy surface and subsoil.	well	mod. slow	strongly acid	60+	60+	3.5-4.5	perched	Jan-Apr	none	-	-	low	0-10
Enders (16)	Deep soil with brownish gravelly and loamy surface over reddish clayey subsoil with grayish mottles in lower part.	well	very slow	very strongly acid	60+	40-96	6+	-	-	none	-	-	high	2-45
Escambia (45)	Deep soil with brownish loamy surfaces over yellowish loamy subsoils that have grayish and reddish mottles in the lower part.	somewhat poorly	slow	very strongly	60+	60+	1.5-2.5	Apparent	Dec-Mar	none	-	-	low	0-8
Esto (49)	Deep soil with brownish loamy surface over a clayey subsoil that is mottled in shades of yellow, gray, brown, and red.	well or moderately well	slow	very strongly acid	60+	60+	6+	-	-	none	-	-	moderate	2-17

Appendix Table 12B -- Cont'd

SERIES AND ASSOCIATION NO. 1/	PROFILE CHARACTERISTICS	DRAINAGE CLASS	PERME-ABILITY CLASS	REACTION 2/	DEPTH TO BEDROCK (IN.) HARD	RIPPABLE	HIGH WATER TABLE DEPTH (FT.)	KIND	MONTHS	FLOODING FRE-QUENCY	DURATION	MONTHS	SHRINK-SWELL POTENTIAL (SUBSOIL)	SLOPE RANGE (%)
Eutaw (28)	Deep woil with grayish clayey surface and sub-soil.	poorly	very slow	extremely acid	60+	60+	0.5	perched	Dec-Apr	none	-	-	very high	0-2
Firestone (3)	Moderately deep soil with brownish loamy and gravelly surface over reddish clayey subsoil.	well	slow	very strongly acid	60+	20-40	6+	-	-	none	-	-	high	2-25
Fullerton (10)	Deep soil with brownish cherty and loamy sur-face over reddish cherty and clayey subsoil.	well	mod.	very strongly acid	60+	60+	6+	-	-	none	-	-	low	2-40
Fuquay (30)	Deep soil with thick brownish sandy sur-faces over brownish loamy subsoil.	well	slow	strongly acid	60+	60+	6+	-	-	none	-	-	low	1-5
Grover (18)	Deep soil with brown-ish loamy surface brownish and reddish loamy subsoil.	well	mod.	strongly acid	60+	60+	6+	-	-	none	-	-	moderate	3-25
Gwinnett (21)	Moderately deep soil with reddish loamy surface over reddish clayey subsoil.	well	mod.	strongly acid	60+	20-40	6+	-	-	none	-	-	moderate	2-45
Hartsells (12)	Moderately deep soil with brownish loamy surfaces and subsoils.	well	mod.	very strongly acid	20-40	-	6+	-	-	none	-	-	low	3-35
Hector (15)	Shallow soil with brownish gravelly surface over brownish laomy subsoil.	well	mod. rapid	strongly acid	10-20	-	6+	-	-	none	-	-	low	2-60
Hiwassee (19)	Deep soil with brown-ish loamy surface over reddish clayey subsoil.	well	mod.	medium acid	60+	60+	6+	-	-	none	-	-	moderate	2-25
Holston (8)	Deep soil with brown-ish loamy surface and subsoil.	well	mod.	very strongly acid.	60+	60+	6+	-	-	none	-	-	low	0-20
Iredell (20)	Moderately deep soil with brownish loamy surface over brownish clayey subsoil.	moderately well to somewhat poorly	slow	neutral	40-60	20-40	1-2	perched	Nov-Mar	none	-	-	very high	0-10

Appendix Table 12B -- Cont'd

SERIES AND ASSOCIATION NO. 1/	PROFILE CHARACTERISTICS	DRAINAGE CLASS	PERME-ABILITY CLASS	REACTION 2/	DEPTH TO BEDROCK (IN.) HARD	RIPPABLE	HIGH WATER TABLE DEPTH (FT.)	KIND	MONTHS	FLOODING FRE-QUENCY	DURATION	MONTHS	SHRINK-SWELL POTENTIAL (SUBSOIL)	SLOPE RANGE (%)
Leeper (27)	Deep soil with brownish loamy surface over brownish and grayish clayey subsoil.	somewhat poorly	very slow	moderately alkaline	60+	60+	1-2	appar-ent	Jan-Mar	common	brief	Jan-Mar	high	0-3
Leesburg (2)	Deep soil with brownish gravelly and loamy sur-face and subsoil.	well	mod.	very strongly acid	60+	60+	6+	-	-	none	-	-	low	2-30
Linker (12)	Moderately deep soil with brownish loamy surface over reddish loamy subsoil.	well	mod.	very strongly acid	20-40	-	6+	-	-	none	-	-	low	1-20
Louisa (22)	Shallow soil with brown-ish gravelly and loamy surface and subsoils.	well to somewhat excessively	mod. rapid	very strongly acid	36-120	10-20	6+	-	-	none	-	-	low	2-40
Lucedale (39)	Deep soil with reddish and brownish loamy subsoil.	well	mod.	strongly acid	60+	60+	6+	-	-	none	-	-	low	0-15
Lucy (46)	Deep soil with thick brownish sandy surface over reddish loamy subsoil.	well	mod.	strongly acid	60+	60+	6+	-	-	none	-	-	low	0-15
Luverne (33) (51)	Moderately deep soil with brownish loamy surface over reddish clayey subsoil over stratified materials.	well	mod. slow	strongly acid	60+	60+	6+	-	-	none	-	-	moderate	0-35
Madison (22)	Moderately deep soil with brownish loamy and gravelly surface over reddish clayey subsoil.	well	mod.	strongly acid	36-120	21-48	6+	-	-	none	-	-	moderate	0-35
Malbis (34)	Deep soil with brownish loamy surface and sub-	moderately well	mod. slow	strongly acid	60+	60+	2.5-4	perched	Dec-Mar	none	-	-	low	0-8
Mayhew (28)	Deep soil with brownish loamy surface over gray-ish clayey subsoil.	poorly	very slow	very strongly	60+	60+	0-1	appar-ent	Jan-Mar	none	-	-	high	1-12
McQueen (8)	Deep soil with brownish loamy surface over red-dish clayey subsoil.	well	slow	strongly acid	60+	60+	6+	-	-	occa-sional rare	brief to very brief	Jan-Mar	moderate	0-6

SERIES AND ASSOCIATION NO. 1/	PROFILE CHARACTERISTICS	DRAINAGE CLASS	PERME-ABILITY CLASS	REACTION 2/	DEPTH TO BEDROCK (IN.) HARD	DEPTH TO BEDROCK (IN.) RIPPABLE	HIGH WATER TABLE DEPTH (FT.)	HIGH WATER TABLE KIND	HIGH WATER TABLE MONTHS	FLOODING FRE-QUENCY	FLOODING DURATION	FLOODING MONTHS	SHRINK-SWELL POTENTIAL (SUBSOIL)	SLOPE RANGE (%)
Mecklenburg (20)	Moderately deep soil with brownish loamy surface over reddish clayey subsoils.	well	slow	slightly acid	48-96	20-45	6+	-	-	none	-	-	moderate	2-20
Minvale (10) (11)	Deep soil with brownish cherty and loamy surface over reddish cherty and loamy subsoil.	well	mod.	strongly acid	60+	60+	6+	-	-	none	-	-	low	2-45
Montevallo (16)	Shallow soil with grayish shaly and loamy surface over brownish shaly and loamy subsoil.	well	mod.	strongly acid	60+	10-20	6+	-	-	none	-	-	low	2-45
Musella (24)	Shallow soil with brownish gravelly and loamy surface over reddish gravelly and loamy subsoil.	well	mod.	medium acid	40-60	10-20	6+	-	-	none	-	-	low	6-60
Myatt (53)	Deep soil with grayish loamy surface and subsoil.	poorly	slow	very strongly	60+	60+	0-1.0	apparent	Nov-Apr	common	brief	Nov-Mar	low	0-2
Oktibbeha (26)	Moderately deep soil with brownish clayey surface over reddish clayey subsoil.	mod. well	very slow	very strongly acid	60+	20-50	6+	-	-	none	-	-	high	1-12
Orangeburg (34)	Deep soil with brownish loamy surface over reddish loamy subsoil.	well	mod.	very strongly acid	60+	60+	6+	-	-	none	-	-	low	0-15
Pansey (34)	Deep soil with grayish loamy surface and subsoil.	poorly	slow	strongly acid	60+	60+	0-1.5	apparent	Dec-Mar	common	brief	Dec-Mar	low	0-2
Quitman (51)	Deep soil with brownish loamy surface and subsoil.	somewhat poorly to moderately well	mod.	strongly acid	60+	60+	1.5-2.0	perched	Jan-Mar	none	-	-	low	0-5
Red Bay (36) (37)	Deep soil with brownish loamy surface over reddish loamy subsoil.	well	mod.	strongly acid	60+	60+	6+	-	-	none	-	-	low	1-15
Ruston (41)	Deep soil with brownish loamy surface over reddish loamy subsoil.	well	mod.	strongly acid	60+	60+	6+	-	-	none	-	-	low	0-8
Savannah (41)	Deep soil with a fragipan, brownish loamy surface, subsoil, and fragipan.	mod. well	mod. slow	very strongly	60+	60+	1.5-3	perched	Jan-Feb	none	-	-	low	0-8

Appendix Table 12B -- Cont'd

SERIES AND ASSOCIATION NO. 1/	PROFILE CHARACTERISTICS	DRAINAGE CLASS	PERME-ABILITY CLASS	REACTION 2/	DEPTH TO BEDROCK (IN.)		HIGH WATER TABLE			FLOODING			SHRINK-SWELL POTENTIAL (SUBSOIL)	SLOPE RANGE (%)
					HARD	RIPPABLE	DEPTH (FT.)	KIND	MONTHS	FRE-QUENCY	DURATION	MONTHS		
Smithdale (43)	Deep soil with brownish loamy surface over reddish loamy subsoil.	well	moderate	strongly acid	60+	60+	6+	-	-	none	-	-	low	5-40
Smithton (45)	Deep soil with brownish loamy surface over grayish loamy subsoil.	poorly	moderately slow	very strongly acid	60+	60+	0-1.0	perched	Dec-May	none-occasional	brief-long	Dec-May	low	0-2
Stough (41)	Deep soil with brownish loamy surface over brownish and grayish loamy subsoil.	somewhat poorly	moderately slow	strongly acid	60+	60+	1.0-1.5	perched	Jan-Apr	none	-	-	low	0-5
Sumter (26)	Moderately deep soil with grayish clayey surface over grayish and olive clayey subsoil.	well	slow	mod. alkaline	60+	20-40	6+	-	-	none	-	-	high	1-17
Sasquehanna (29)	Deep soil with grayish loamy surface over mottled grayish, reddish, and brownish clayey subsoil.	somewhat poorly	very slow	very strongly acid	60+	60+	6+	-	-	none	-	-	high	1-17
Talbott (4)	Moderately deep soil with brownish loamy surface over reddish clayey subsoil.	well	moderately slow	strongly acid	20-40	-	6+	-	-	none	-	-	high	2-25
Tallapoosa (23)	Shallow soil with brownish loamy surface over reddish loamy subsoil.	well	moderate	very strongly acid	60+	3-20	6+	-	-	none	-	-	low	5-60
Tatum (25)	Moderately deep soil with brownish loamy surface over reddish clayey subsoil.	well	moderate	very strongly acid	60+	40-60	4-6	apparent	Jan-Apr	none	-	-	moderate	0-25
Townley (16)	Moderately deep soil with brownish loamy surface over reddish clayey subsoil.	well	slow	strongly acid	60+	20-40	6+	-	-	none	-	-	moderate	2-45
Troup (87)(43)(44)(45)(46)(47)(49)	Deep soil with very thick brownish sandy surface over reddish loamy subsoil.	well	moderate	strongly acid	60+	60+	6+	-	-	none	-	-	low	1-25
Wagram (30)	Deep soil with thick brownish sandy surface over brownish loamy subsoil.	well	moderately	strongly acid	60+	60+	6+	-	-	none	-	-	low	1-8

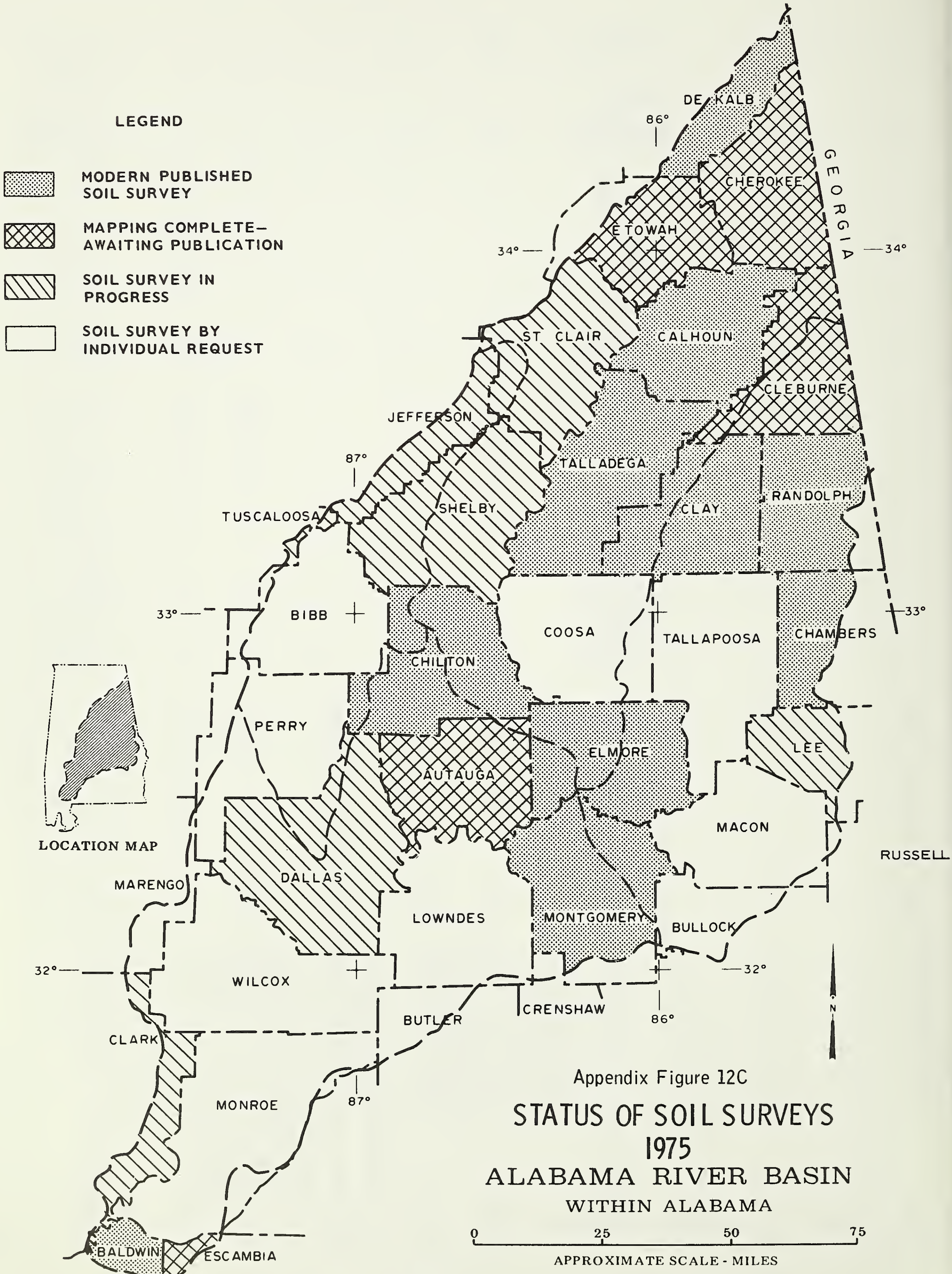
Appendix Table 12B -- Cont'd

SERIES AND ASSOCIATION NO. 1/	PROFILE CHARACTERISTICS	DRAINAGE CLASS	PERME-ABILITY CLASS	REACTION 2/	DEPTH TO BEDROCK (IN.)		HIGH WATER TABLE			FLOODING			SHRINK-SWELL POTENTIAL (SUBSOIL)	SLOPE RANGE (%)
					HARD	RIPPABLE	DEPTH (FT.)	KIND	MONTHS	FRE-QUENCY	DURATION	MONTHS		
Wilcox (28)	Deep soil with brownish loamy surface over grayish, brownish, and redish vlayey subsoil.	somewhat poorly	slow	very strongly	60+	40-80	1.5-3.0	perched	Jan-Apr	none	-	-	high	1-25
Wynnville (14)	Deep soil with fragipan. Brownish loamy surface over brownish loamy subsoil and brownish and grayish loamy fragipan.	mod. well	slow	very strongly	48-84	-	1.5-2.5	perched	Dec-Feb	none	-	-	low	0-10

1/ See General Soils Map, figure 2-12.

2/ Reaction refers to degree of acidity of the upper subsoil layer:

extremely acid	4.5+
very strongly acid	4.5-5.0
strongly acid	5.1-5.5
medium acid	5.6-6.0
slightly acid	6.1-6.5
neutral	6.6-7.3
mildly alkaline	7.4-7.8
moderately alkaline	7.9-8.4



Appendix Figure 12C

STATUS OF SOIL SURVEYS 1975

ALABAMA RIVER BASIN

WITHIN ALABAMA

SOURCE: Original draft by SCS State Soil Survey Staff.

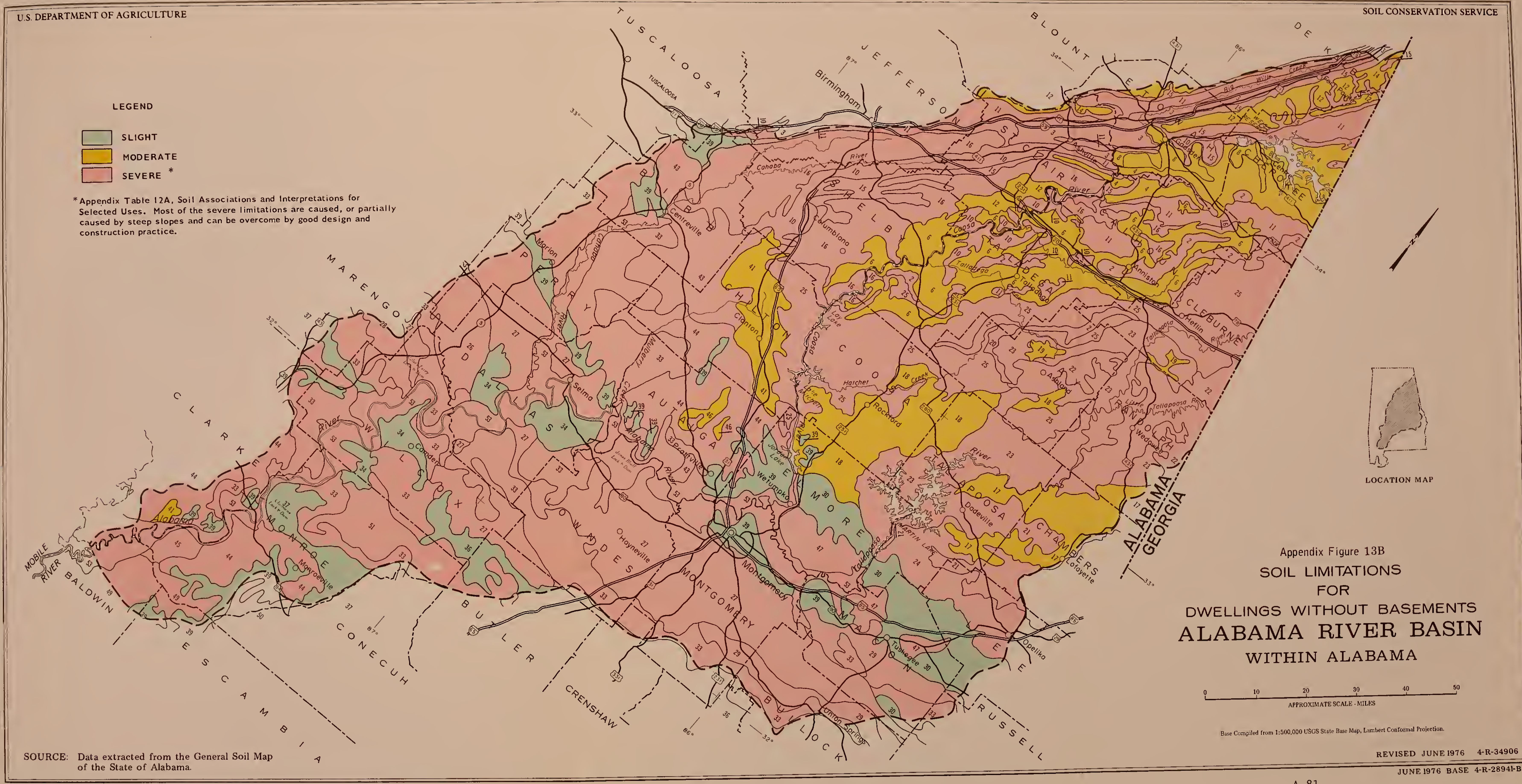
USDA-SCS-FORT WORTH TEXAS 1976

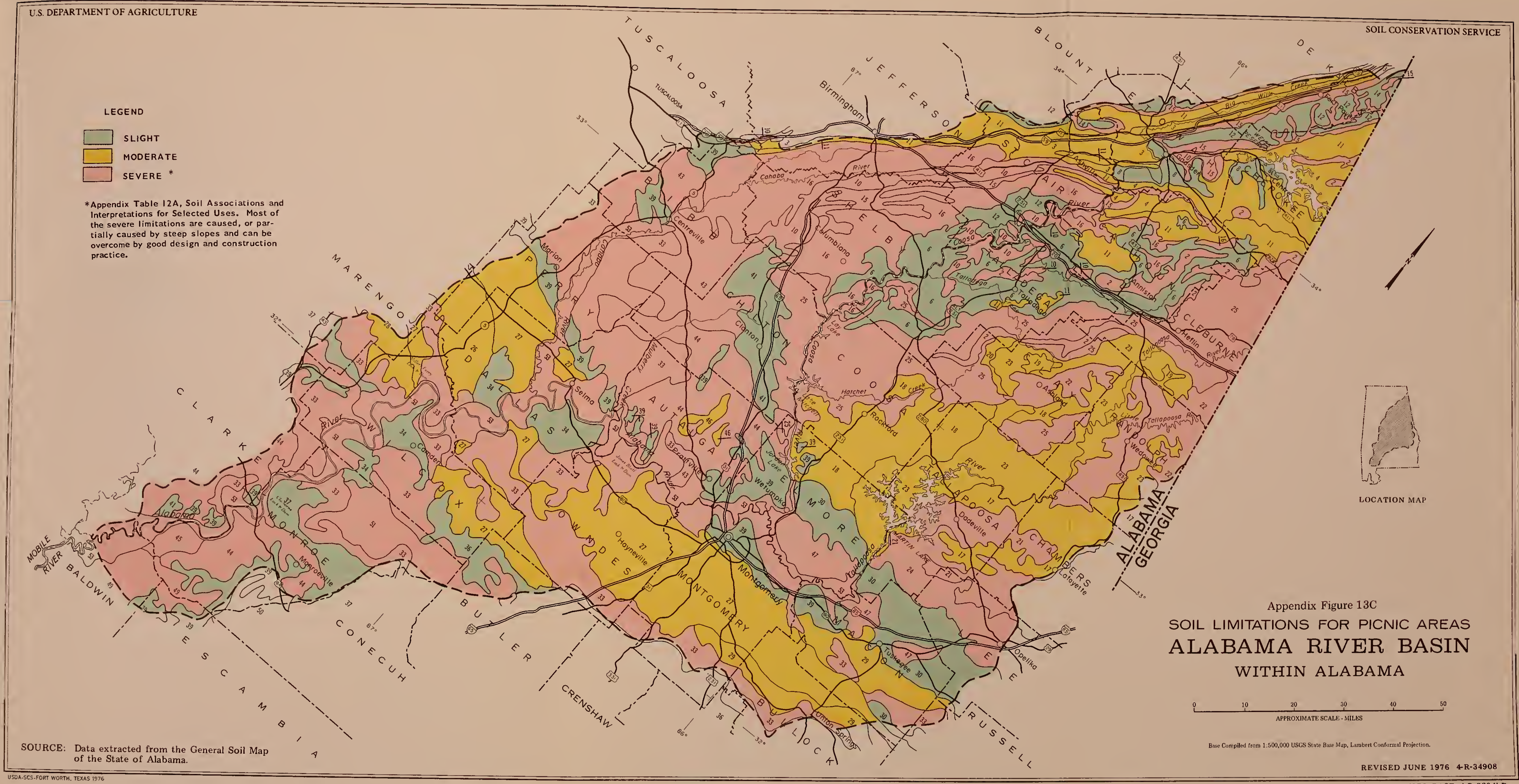
REVISED JUNE 1976
NOVEMBER 1972

4-R-34888
BASE 4-R-32344

APPENDIX 13 -- SOIL LIMITATION AND SUITABILITY MAPS


U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
LEGEND
SLIGHT
MODERATE
SEVERE *
*Appendix Table 12A, Soil Associations and Interpretations for Selected Uses. Most of the severe limitations are caused, or partially caused by steep slopes and can be overcome by good design and construction practice.
Figure 13A
SOIL LIMITATIONS FOR ROADS AND STREETS
ALABAMA RIVER BASIN
WITHIN ALABAMA
APPROXIMATE SCALE - MILES
0 10 20 30 40 50
Base Compiled from 1:500,000 USGS State Base Map, Lambert Conformal Projection.
LOCATION MAP
ALABAMA
GEORGIA
TUSCALOOSA
JEFFERSON
BLOUNT
DE KALB
ETOWAH
CHEROKEE
ST. CLAIR
SHELBY
CALHOUN
TALLADEGA
CLEBURNE
BIBB
PERRY
MARENGO
CHILTON
COOSA
CLAY
RANDOLPH
DALLAS
AUTAUGA
ELMORE
TALLAPOOSA
CHAMBERS
CLARKE
WILCOX
LOWNDES
MONTGOMERY
MACON
LEE
RUSSELL
BULLOCK
CRENSHAW
BUTLER
CONECUH
ESCAMBIA
MONROE
BALDWIN
MOBILE RIVER
Birmingham
Tuscaloosa
Centreville
Marion
Selma
Camden
Clanton
Columbiana
Talladega
Anniston
Gadsden
Heflin
Ashland
Rockford
Wedowee
Dadeville
Lafayette
Opelika
Tuskegee
Union Springs
Montgomery
Wetumpka
Prattville
Hayneville
Monroeville
SOURCE: Data extracted from the General Soil Map of the State of Alabama.
REVISED JUNE 1976 4-R-34881
JUNE 1976 BASE 4-R-28941-B
USDA-SCS-FORT WORTH, TEXAS 1976


U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
LEGEND
SLIGHT
MODERATE
SEVERE *
*Appendix Table 12A, Soil Associations and Interpretations for Selected Uses. Most of the severe limitations are caused, or partially caused by steep slopes and can be overcome by good design and construction practice.
LOCATION MAP
Appendix Figure 13B
SOIL LIMITATIONS
FOR
DWELLINGS WITHOUT BASEMENTS
ALABAMA RIVER BASIN
WITHIN ALABAMA
APPROXIMATE SCALE - MILES
Base Compiled from 1:500,000 USGS State Base Map, Lambert Conformal Projection.
REVISED JUNE 1976 4-R-34906
SOURCE: Data extracted from the General Soil Map of the State of Alabama.
ALABAMA
GEORGIA
TUSCALOOSA
JEFFERSON
BLOUNT
DE KALB
ETOWAH
CHEROKEE
ST. CLAIR
CALHOUN
CLEBURNE
SHELBY
TALLADEGA
CHILTON
COOSA
CLAY
RANDOLPH
BIBB
PERRY
MARENGO
DALLAS
AUTAUGA
ELMORE
TALLAPOOSA
CHAMBERS
LEE
MACON
RUSSELL
BULLOCK
MONTGOMERY
LOWNDES
WILCOX
CLARKE
MONROE
BALDWIN
ESCAMBIA
CONECUH
BUTLER
CRENSHAW
MOBILE RIVER
Birmingham
Anniston
Gadsden
Talladega
Centreville
Marion
Selma
Camden
Monroeville
Montgomery
Prattville
Wetumpka
Clanton
Columbiana
Rockford
Ashland
Wedowee
Heflin
Dadeville
Lafayette
Opelika
Tuskegee
Union Springs
Hayneville



Appendix Figure 13C
SOIL LIMITATIONS FOR PICNIC AREAS
ALABAMA RIVER BASIN
WITHIN ALABAMA

SOURCE: Data extracted from the General Soil Map of the State of Alabama.

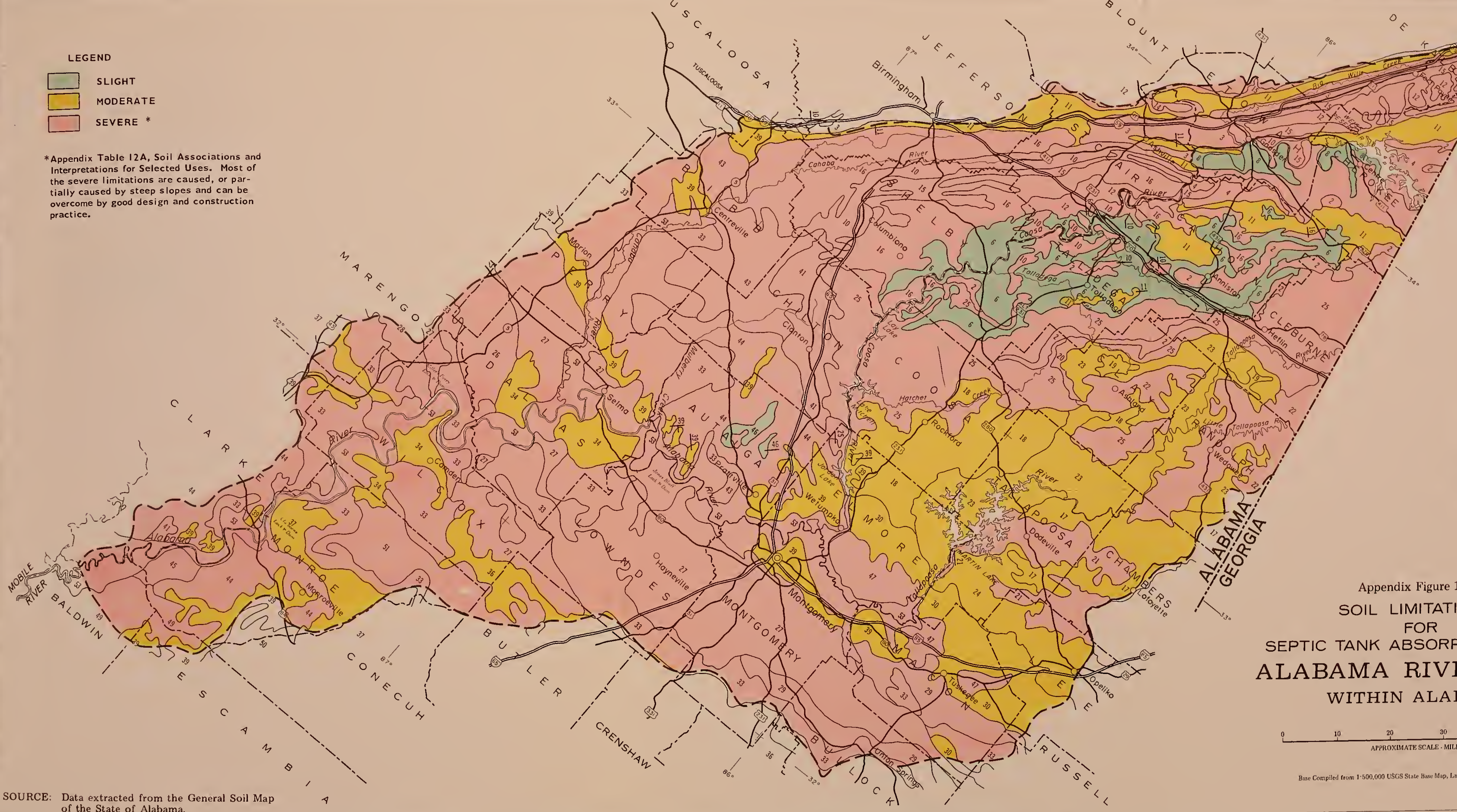
U.S. DEPARTMENT OF AGRICULTURE

SOIL CONSERVATION SERVICE

LEGEND

- SLIGHT
- MODERATE
- SEVERE *

*Appendix Table 12A, Soil Associations and Interpretations for Selected Uses. Most of the severe limitations are caused, or partially caused by steep slopes and can be overcome by good design and construction practice.



Appendix Figure 13D

SOIL LIMITATIONS FOR SEPTIC TANK ABSORPTION FIELDS

ALABAMA RIVER BASIN WITHIN ALABAMA

0 10 20 30 40 50

APPROXIMATE SCALE - MILES

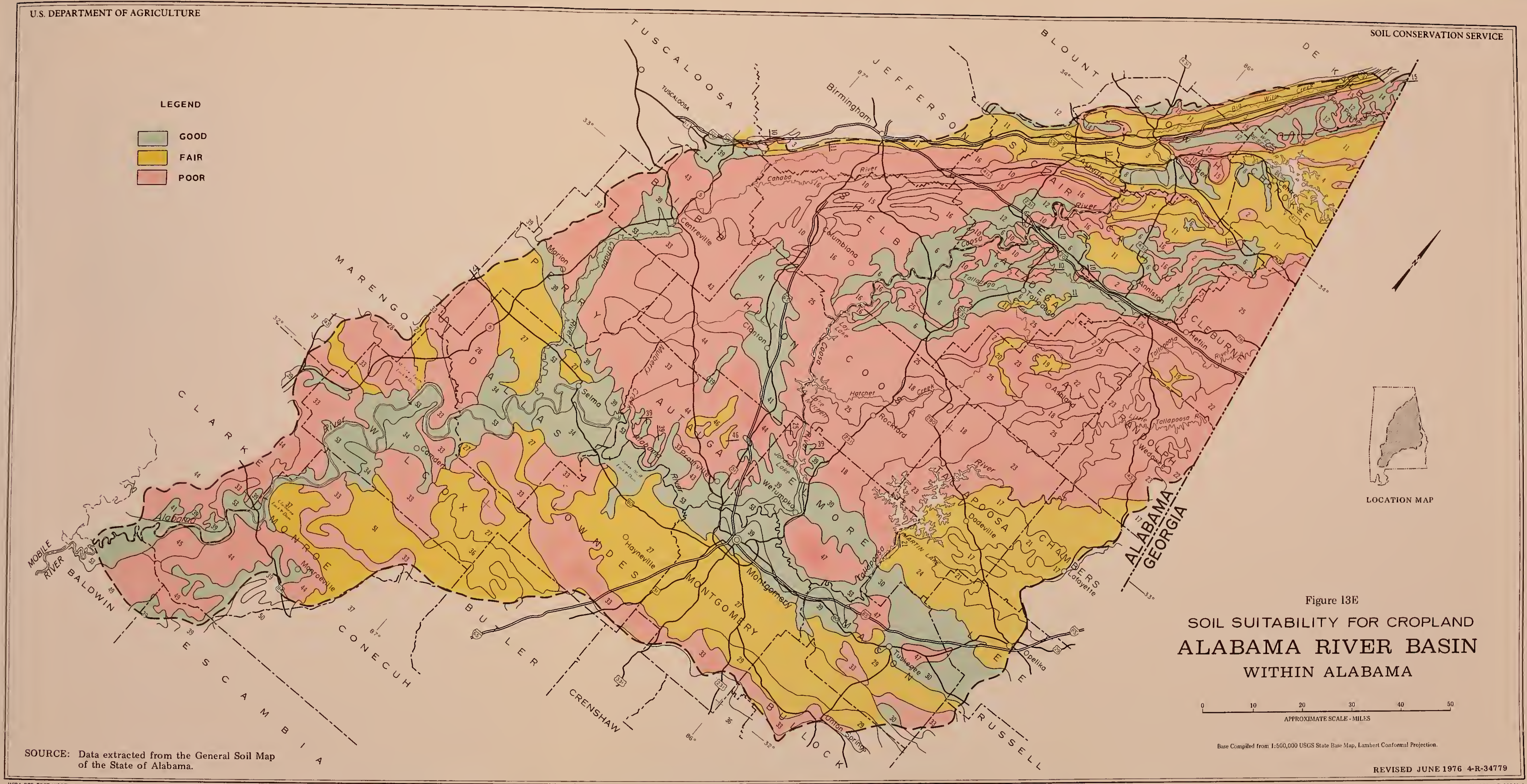
Base Compiled from 1:500,000 USGS State Base Map, Lambert Conformal Projection.

SOURCE: Data extracted from the General Soil Map of the State of Alabama.

REVISED JUNE 1976 4-R-34892

USDA-SCS-FORT WORTH, TEXAS 1976

JUNE 1976 BASE 4-R-28941-B



USDA-SCS-FORT WORTH, TEXAS 1976

REVISED MAY 1976 4-R-28941-A

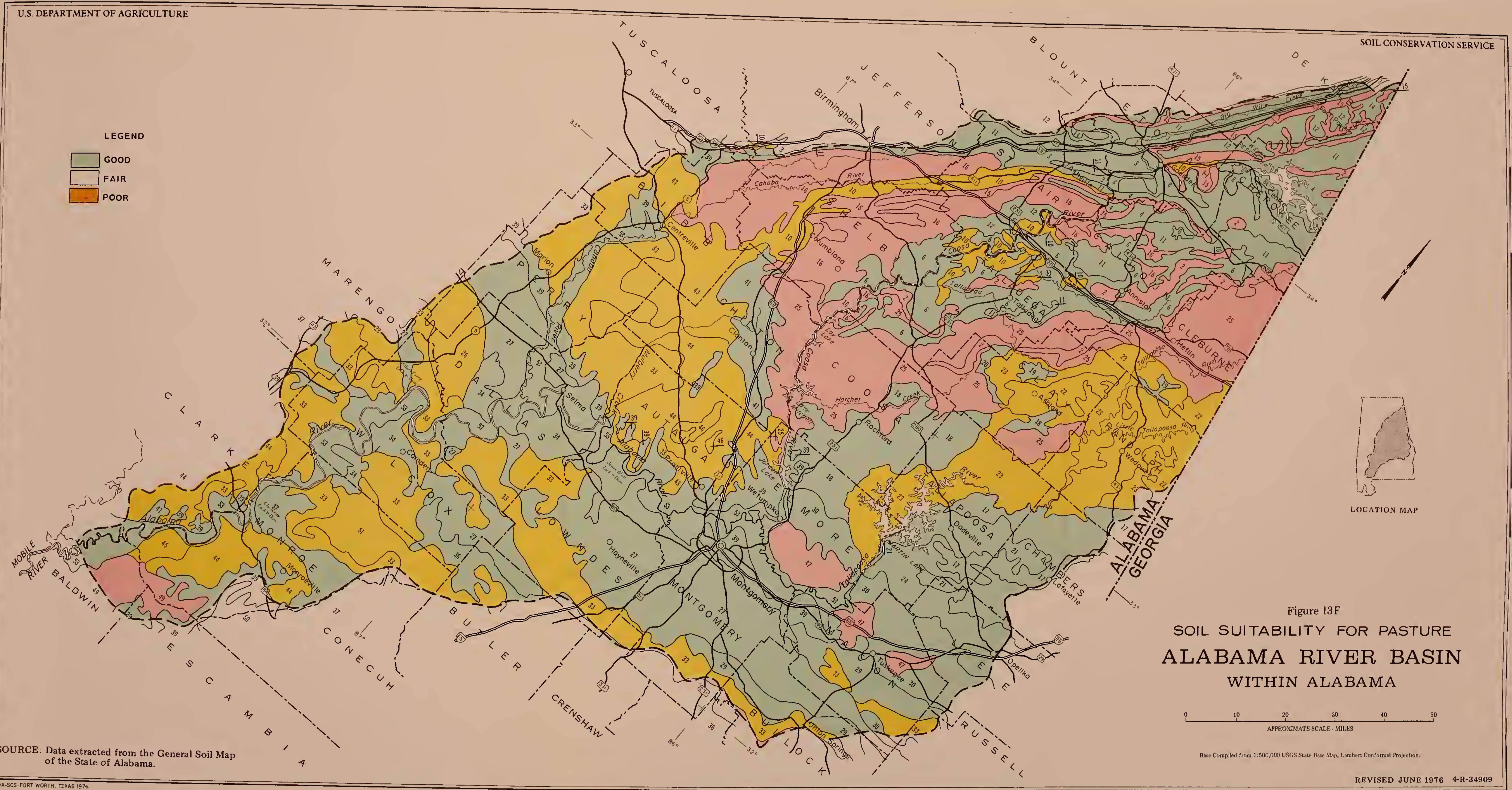


Figure 13F
SOIL SUITABILITY FOR PASTURE
ALABAMA RIVER BASIN
WITHIN ALABAMA

USDA-SCS-FORT WORTH, TEXAS 1976

JUNE 1976 BASE 4-R-28941-B

APPENDIX 14 -- LAND CAPABILITY CLASSIFICATION

14A -- Description of land capability classes and subclasses.

Class I lands have few limitations that limit their use.

Class II lands have moderate limitations that reduce the choice of plants or require moderate conservation practices.

Class III lands have severe limitations that reduce the choice of plants or require special conservation practices, or both.

Class IV lands have very severe limitations that restrict the choice of plants, require careful management, or both.

Class V lands have little or no erosion hazard but have other limitations that are impractical to remove, that limit their use largely to pasture, forest land, or wildlife.

Class VI lands have severe limitations that make them unsuitable for cultivation and limit their use largely to pasture, woodland, or for wildlife. Some can be used for grazing.

Class VII lands have very severe limitations that make them unsuitable to cultivation and restrict their use largely to woodland or wildlife. Some can be used for grazing.

Class VIII lands have limitations that preclude their use for commercial plant production and restrict their use to recreation, wildlife, water supply, or aesthetic purposes.

Appendix table 14B shows major land uses by land capability classes for the total basin and for each subbasin. The major portion, or 74 percent, of the cropland is on land capability classes I, II, and III. Pastureland is about equally distributed on land capability classes II, III, and IV, with about 78 percent of all pastureland on these three capability classes. Only about 19 percent of all forest is on class I, II, and III land; however, 55 percent of all forest land is on capability classes VI and VII.

The kind of limitation (subclass) is designated by a small letter, e, w, or s following the class numeral; e.g. IIe, IIw, IIs. The letter "e" indicates the main limitation is erosion, "w" indicates that the main limitation is excess water in or on the soil, and "s" indicates the limitation is due to soil properties such as drouthiness or limited soils depth for root growth. Subclasses are not shown in table 14B, but are described here in order to describe the condition that limit capability and because they are commonly shown in land capability tables for more detailed studies.

Appendix Table 14B -- Land use by land capability class, Alabama River Basin and subbasins, 1970. 1/

LAND USE	I	II	III	IV	V	VI	VII	VIII	LAND REPORTED WITHOUT A CLASSIFICATION	TOTAL
	LAND CAPABILITY CLASSES (Thousands of Acres)									
Alabama Subbasin										
Cropland	85	239	126	56	8	20	8	-	-	542
Pasture	27	208	153	170	25	54	21	-	-	658
Forest	16	224	301	481	338	328	693	-	6	2,387
Other	4	29	20	13	1	6	3	-	45	121
Urban	-	-	-	-	-	-	-	-	93	93
Subbasin Total	132	700	600	720	372	408	725	-	132	3,789
Cahaba Subbasin										
Cropland	6	38	13	11	1	3	-	-	-	72
Pasture	5	23	18	18	3	6	5	-	-	78
Forest	4	49	80	124	62	77	422	1	109	928
Other	-	4	4	2	-	2	5	-	53	70
Urban	-	-	-	-	-	-	-	-	54	54
Subbasin Total	15	114	117	155	66	86	432	1	212	1,198
Coosa Subbasin										
Cropland	25	141	114	78	-	18	6	-	-	382
Pasture	7	64	86	58	5	24	15	-	-	259
Forest	9	128	330	338	27	297	1,116	-	202	2,447
Other	2	15	16	20	1	9	11	-	123	197
Urban	-	-	-	-	-	-	-	-	185	185
Subbasin Total	43	348	546	494	33	348	1,148	-	499	3,459
Tallapoosa Subbasin										
Cropland	20	61	72	75	4	34	11	-	-	277
Pasture	9	59	79	97	19	49	20	-	-	332
Forest	9	57	189	312	148	317	630	1	46	1,709
Other	5	7	8	13	-	4	10	1	88	136
Urban	-	-	-	-	-	-	-	-	88	88
Subbasin Total	43	184	348	497	171	401	671	2	214	2,534
Entire Basin										
Cropland	136	479	325	220	13	75	25	-	-	1,273
Pasture	48	354	336	343	52	133	61	-	-	1,327
Forest	38	458	900	1,255	575	1,019	2,861	2	363	7,471
Other	11	55	48	48	2	21	29	1	309	524
Urban	-	-	-	-	-	-	-	-	420	420
Total	233	1,346	1,609	1,866	642	1,248	2,976	3	1,092	11,015

1/ Source: 1967 Soil and Water Conservation Needs Inventory adjusted to thousands of acres and/or U. S. Forest Service Memo 6-19-73.

APPENDIX 15 -- FISH AND WILDLIFE IN THE ALABAMA RIVER BASIN.

15A -- Methods of Inventory and Evaluation

An inventory and evaluation of the fish and wildlife resources in the Alabama River Basin were made by a multiple-agency work group composed of representatives from the Bureau of Sport Fisheries and Wildlife, Department of Conservation and Natural Resources, Auburn University, U. S. Forest Service, Economic Research Service, and the Soil Conservation Service. The Soil Conservation Service representative was designated as chairman of the work group. The objective of the work group was to determine the problems, needs, and possible solutions in the management of fish and wildlife resources in the basin.

This report presents basic information regarding opportunities for sport and commercial fishing, hunting, and such non-consumptive aspects of fish and wildlife as bird watching and nature photography in the Alabama River Basin.

Resource capacities are based on standards developed for the basin from research studies, recorded data, and by field observations conducted by one or more members of the work group.

Fisheries Resource -- It was necessary to inventory areas of freshwater habitat to establish a breakdown of the different types of fishing waters of varying capacities in the basin. Acres of fresh water were inventoried as follows: large impoundments (over 500 acres), small impoundments (both public and private), rivers, streams, and put, grow, and take ponds (see appendix tables 15B and 15C). The following agencies contributed to the water resource data: Department of Conservation and Natural Resources, U. S. Forest Service, Corps of Engineers, Alabama Power Company, Auburn University Agricultural Experiment Station, and the Soil Conservation Service.

Appraisal of the man-day fishing capacity in each type of freshwater habitat was based primarily on (1) the standing crop of sport fisheries, (2) the ratio of the standing crop to the harvestable crop, and (3) the average catch in pounds per man-days.

The standing crop, measured in pounds of fish per surface acre of water, is used as the index for productivity of a given body of water. The standing crop varies because habitat quality, fishing success, management of waters, fish migrations, and many other factors vary from season to season and from year to year. It was agreed that the average harvestable crop of fish is one-half of the standing crop. It was agreed, also, that one pound of fish is the standard harvest per man-day of fishing.

True fishing capacity is reached when increased fishing activity decreases fishing success to the extent that the number of new fishermen being attracted is balanced by those who stop fishing because of an unsatisfactory creel return. The minimum acceptable creel is understandably nebulous and varies by location, type of fishing, tolerance to crowding disturbance, past fishing experience, availability of other fishing, and numerous other factors. An average catch of one pound per man-day appears to be a realistic standard for this basin.

Outstanding wade and float fishing streams were selected by a concensus of field biologists and work group members. Size, productivity, water quality, and aesthetic values were considered in making the selections.

Wildlife Resource -- Wildlife resources within the basin were inventoried as a basis for establishing their potential capacities. Acreage of small game, big game, and waterfowl habitat available for public use was determined by a field survey in each county and from information supplied by the Department of Conservation and Natural Resources.

Capacity standards 1/ developed by the Agricultural Experiment Station of Auburn University were used to convert acres of habitat to man-days of hunting. The following standards were used.

Wildlife population studies in the basin are rather limited; consequently, much of the information obtained represents the best estimate of professional biologists and other field personnel. Deer and turkey populations were estimated in each county by experienced persons with knowledge of check station data, field studies, hunter surveys, or other information.

Estimates of hunting activity for small game were derived from the 1974-75 mail survey conducted by the Department of Conservation and Natural Resources. In the survey, questionnaires were mailed to randomly chosen individuals who had purchased hunting licenses. Technical assistance was provided for the survey by Dr. Don Hayne of the School of Statistics of the University of North Carolina.

The land area of the river basin is approximately 33 percent of the total land area of the state; and the percentages of cropland, forest land, pastureland, and other land in both the state and basin are almost identical. Therefore, with the exception of waterfowl, it is assumed that 33 percent of the total small game killed in Alabama is harvested in the Alabama River Basin.

The potential for developing hunting and fishing as recreational activities is summarized from recent county outdoor recreation potential studies. Information on non-consumptive activities related to fish and wildlife was gathered by a review of published literature and personal communications.

1/ Participation in Outdoor Recreation in Alabama, Agricultural Experiment Station, Auburn University, Agricultural Economics Series 20, October 1970.

Appendix Table 15B -- Freshwater fish habitat available for public use, and associated capacity, Alabama River Basin and subbasin, 1971.

SUBBASIN	EXISTING ACREAGE	ANNUAL 1/ HARVESTABLE PRODUCTION/AC.	ACTIVITY OCCASIONS PER ACRE 2/	TOTAL ACTIVITY OCCASIONS
Alabama				
Rivers	4,916	70 lbs.	70	344,120
Streams	1,362	25	25	34,050
Large impoundments 3/	35,650	50	50	1,782,500
Small impoundments 4/	2,891	75	75	216,825
Put, grow & take	279	1,500	500	139,500
Subtotal	45,098			2,516,995
Cahaba				
Rivers	1,440	40 lbs.	40	57,600
Streams	185	20	20	3,700
Large impoundments	1,000	75	75	75,000
Small impoundments	352	80	80	28,160
Put, grow & take	83	1,500	500	41,500
Subtotal	3,060			205,960
Coosa				
Rivers	2,663	50 lbs.	50	133,150
Streams	2,073	22	22	45,606
Large impoundments	81,313	40	40	3,252,520
Small impoundments	2,677	80	80	214,160
Put, grow & take	430	1,500	500	215,000
Subtotal	89,156			3,860,436
Tallapoosa				
Rivers	3,091	50 lbs.	50	154,550
Streams	1,362	25	25	34,050
Large impoundments	43,125	40	40	1,725,000
Small impoundments 4/	2,337	80	80	186,960
Put, grow & take	452	1,500	500	226,500
Subtotal	50,367			2,327,060
Total	187,681			8,910,451

1/ Based on information from district fishery biologist, Alabama Department of Conservation and Natural Resources.
2/ One pound per acre used as standard.
3/ Impoundments larger than 500 acres.
4/ Availability for public use estimated by state and federal agencies in each county, includes all public fishing lakes.

Appendix Table 15C -- Numbers and acres of ponds stocked by State and Federal Hatcheries through September 30, 1970, by counties, Alabama River Basin.

COUNTY	NUMBER	ACREAGE
Autauga	200	1,194
Baldwin	349	2,919
Bibb	122	547
Bullock	882	2,347
Butler	576	1,377
Calhoun	392	1,652
Chambers	280	1,274
Cherokee	92	271
Chilton	314	804
Clarke	198	485
Clay	260	973
Cleburne	229	1,112
Coosa	200	667
Dallas	356	1,839
DeKalb	1,217	1,911
Elmore	566	1,857
Etowah	371	1,223
Jefferson	401	2,760
Lee	697	3,406
Lowndes	971	4,674
Macon	464	2,029
Monroe	230	804
Montgomery	1,990	6,437
Perry	187	1,099
Randolph	243	877
Shelby	441	2,361
St. Clair	360	1,091
Talladega	225	1,490
Tallapoosa	357	934
Wilcox	277	751
TOTAL	13,437	51,165

Source: Alabama Department of Conservation, Department of Natural Resources.

Appendix Table 15D -- Conversion of acres of wildlife habitat to man-days of hunting.

HUNTING ACTIVITY	NUMBER OF HUNTERS/AC. OF HABITAT	DAILY RATE OF TURNOVER	LENGTH OF HUNTING SEASON (DAYS)	ACTIVITY OCCASIONS/AC. OF HABITAT
Big game	0.0055	1	90	0.50
Small game	0.0167	1	120	2.00
Waterfowl	0.0167	1	60	1.00

APPENDIX TABLE 16 -- MAJOR RECREATION FACILITIES AT STATE-OWNED FISHING LAKES, ALABAMA RIVER BASIN, 1975. 1/

A. Clay County Lakes - three lakes totaling 65 acres, on a 360 acre tract, 2 miles west of Delta and 30 miles south of Anniston; first lake opened in 1951; concession stand with restrooms, 16 picnic tables, and 13 boats for rent.

B. Oak Mountain State Park - this park is located in Shelby County approximately 16 miles south of Birmingham. Two 85-acre fishing lakes are located in the northeast end of the park, and there is an 18-acre lake near the middle of the park. Facilities presently available include swimming, rental boats, fishing and boat access areas.

C. Dallas County Lake - 100-acre lake on 306-acre site, 15 miles south of Selma; restrooms, picnic tables, rental boats, and earthen launching ramp.

D. Monroe County Lake - 94-acre lake on 245-acre site; 1 mile from Beatrice; opened in 1969, concession stand, 31 boats for rent, and concrete launching ramp.

1/ See Volume I, figure 2-26--State-operated public hunting and fishing areas, Alabama River Basin, 1975.

Appendix 17 -- Threatened, Endangered, and Special Concern Organisms in Alabama. 1/

Threatened and Endangered Vertebrates -- The following is an explanation of some of the terms used in this inventory.

1. Endangered

   Any species or subspecies occurring in Alabama threatened with extinction through: the destruction, drastic modification, or severe curtailment, or the threatened destruction, drastic modification or severe curtailment, of its habitat, or its over-utilization for commercial or sporting purposes, or the effect on it of disease or predation, or other natural or man-made factors affecting its continued existence.

2. Threatened

   Any species or subspecies occurring in Alabama which is likely to become endangered within the foreseeable future throughout all, or a significant portion of its range.

3. Special Concern

   A species or subspecies that, although not presently threatened or endangered, exists in such small numbers that it may be endangered if its environment deteriorates.

ENDANGERED VERTEBRATES 1/

Birds

Brown Pelican	Pelecanus occidentalis
Bald Eagle	Haliaeetus leucocephalus
Osprey	Pandion haliaetus
Peregrine Falcon	Falco peregrinus anatum
Snowy Plover	Charadrius alexandrinus
Red-cockaded Woodpecker	Dendrocopos borealis
Ivory-billed Woodpecker	Campephilus principalis
Backman's Warbler	Vermivora bachmanii
Golden Eagle	Aquilia chrysaetos

Amphibians and Reptiles

Atlantic Ridley	Lepidochelys kempi
Green Seat Turtle	Chelonia mydas
Red Hills Salamander	Phaeognathus hubrichti
Flatwoods Salamander	Ambystoma cingulatum
Florida Pine Snake	Pituophis melanoleucus mugitis
Black Pine Snake	Pituophis melanoleucus lodungii
Eastern Indigo snake	Drymarchon carais couperi
Atlantic Hawsbill	Erctmochelys imbricata imbricata
Atlantic Loggerhead	Caretta C. caretta

Fishes

Alabama Carefish	Speoplatyrhinus poulsoni
Shovelnose Sturgeon	Scaphirhynchus platorynchus
Frecklebelly Madtom	Noturus minitus
Cahaba Shiner	Notropis sp. (Undescribed species)
Pygmy Sculpin	Cottus pygmaeus
Watercress Darter	Etheostoma nuchale
Goldline Darter	Percina aurolineata
American Brook Lamprey	Lampetra lamotteni
Spring pygmy sunfish	Elassoma sp.

Mammals

Gray Myotis	Myotis grisescens
Indiana Myotis	Myotis sodalis
Alabama Gulf Beach Mouse	Peromyscus polionotus ammobates
Perdido Bay Beach Mouse	Peromyscus polionotus trissyllepsis
Northern Black Bear	Ursus americanus americanus
Florida Black Bear	Ursus americansus floridanus
Florida Panther	Felis concolor coryi

THREATENED

Birds

Reddish Egret	Dichromanassa rufescens
Mottled Duck	Anas fulvigula

Amphibians and Reptiles

Alabama Red-bellied Turtle	Pseudemys alabamensis
Dusky Gophen Frog	Rana areolata sevosa
Gopher Tortoise	Gopherus polyphemus
American Alligator	Alligator mississippiensis
Hellbender	Cryptobranchus a. alleganiensis
Atlantic Leatherback	Dermochelys coriacea
Flattened Mush Turtle	Sternothaerus depressus

Fishes

American Brook Lamprey	Lampetra lamottei
Atlantic Sturgeon	Acipenser oxyrhynchus
Alabama Shad	Alosa alabamae
Flame Chub	Hemitremia flammea
Blue Sucker	Cycleptus elongatus
Harelip Sucker	Lagochila lacera
Whiteline Topminnow	Fundulus albolineatus
Least Killifish	Heterandria formosa
Bluespotted Sunfish	Enneacanthus gloriosus
Ashy Darter	Etheostoma cinereum
Crystal Darter	Ammocrypta asprella
Slackwater Darter	Etheostoma boschungii
Coldwater Darter	Etheostoma ditrema
Tuscumbia Darter	Etheostoma tuscumbia
Freckled darter	Percina lenticula
Warrior muscadine darter	Percina sp.

SPECIAL CONCERN STATUS

Mammals

Southeastern Shrew	Sorex 1. longirostris
Florida Yellow Bat	Lasiurus floridanus
Meadow Jumping Mouse	Zapus hudsonius americanus
Prarie Vole	Microtus ochrogaster ochrogaster
Bayou Gray Squirrel	Sciurus carolinensis fuliginosus
New England Cottontail	Sylvilagus transitionalis
Marsh Cottontail	Sylvilagus palustris palustris
Little Brown Bat	Myotis lucifugus lucifugus
Southeastern Myotis	Myotis a. austroriparius
Rafinesque's Big-eared Bat	Plecotus rafinesquii
Keen's myotis	Myotis Keenii Septentrionalis

Birds

Swallow-tailed Kite	Elanoides forficatus
Sharp-skinned Hawk	Accipiter straitus
Cooper's Hawk	Accipiter cooperii
Sandhill Crane	Grus canadensis
American Oystercatcher	Haematopus palliatus
Bewick's Wren	Thryomanes bewickii
Little Blue Heron	Florida caerulea
Black-crowned Night Heron	Nycticorax nycticorax
Wood Stork	Mycteria americana
Red-shouldered Hawk	Buteo lineatus
Merlin	Fako colambarius
Black Rail	Laterallus jamaicensis
Swaninson's Warbler	Limnothlypis swainsonii
Bachman's Sparrow	Aimophila aestivalis

Amphibians and Reptiles

Tennessee Cave Salamander	Gyhinophilus palleucus palleucus
Mountain Dusky Salamander	Desmognathus ochrophaeus
Wood Frog	Rana sylvatica
Eastern Diamond-back Rattle Snake	Crotalus adamanteus
Sipsey waterdog	Necturus malculosus
Seepage Salamander	Desmognathus aeneus

Amphibians and Reptiles (Cont'd)

Least Tree Frog	Hyla ocularis
River Frog	Rana hecksheri
Greater Siren	Siren lacertina
Red-backed Salamander	Plethodon cinereus ssp.
Barbour's Map Turtle	Graptemys barbouri
Florida Softshell Turtle	Trionyx ferox
Florida Green Water Snake	Natrix cyclopion floridana
Northern Florida Black Swamp Snake	Seminatrix p. pygaea
Pinewoods Snake	Rhadinaea flavilata
Red Milk Snake	Lampropeltis doliata syspila
Eastern Milk Snake	Lampropeltis triangulum triangulum
Eastern Spiny Softshell	Trionyx spiniferus spiniferus

Fishes

Flame Chub	Hemitrimia flammea
Bigeye Shiner	Notropis boops
Warpaint Shiner	Notropis coccogenis
Dusky Shiner	Notropis cummingsae
Sawfin Shiner	Notropis sp. (Undescribed species)
Stargazing Minnow	Phenacobius uranops
Southern Redbelly Dace	Phoxinus erythrogaster
Elegant Madtom	Noturus elegans
Stonecat	Noturus flavus
Brindled Madtom	Noturus miurus
Southern Cavefish	Typhlichthys subterraneus
Pygmy Killifish	Leptolucania ommata
Bluefish Killifish	Lucania goodei
Mottled Sculpin	Cottus bairdi
Shoal Bass	Micropterus sp.
Blotchside logperch	Percina burtoni
Blotched Chub	Hybopsis insignis
Broadstripe Shiner	Notropis earyzonus
Banded Top Minnow	Fundulus ungulatus
Northern Banded Darter	Etheostoma z. zonale
Blue Shiner	Notropis caeruleus
Bluestripe Shiner	Notropis callitaenia
Blenny Darter	Etheostoma blennius
(Unnamed) Snubnose Darter	Etheostoma sp. (Undescribed species)

ENDANGERED INVERTEBRATES 1/

Naiad Mollusks

Margaritifera hembeli ssp
Alasmidonta mccordi
Pegias fabula
Lasmigona holstonia
Quadrula cylindrica cylindrica
Quadruls intermedia
Quadrula stapes
Fusconaia maculata maculata
Fusconaia cuneolus
Fusconaia cor
Fusconaia barnesiana
Lexingtonia dolabelloides
Plethobasus cicatricosus
Plethobasus cooperianus
Pleurobema altum
Pleurobema nucleopsis
Pleurobema clava
Pleusobema oviforme
Pleurobema decisum
Pleurobema perovatum
Pleurobema curtum
Pleurobema showalteri
Pleurobema hartmanianum
Pleurobema altum
Pleurobema bulborum
Pleurobema rubellum
Pleurobema plenum
Pleurobema taitianum
Pleurobema marshalli
Elliptio arcus
Hemistena lata
Ptychobranchus subtentum
Cyprogenia stegaria
Dromus dromus
Actinonaias ligamentina lignamintina
Actinonaias pectorosa
Obtovaria olivaria
Obovaria jacksoniana
Obovaria unicolor
Obovaria subratunda
Obovaria retusa
Leptodea leptodon

Naiad Mollusks (Cont'd)

Potamilus inflatus
Potamilus laevissimus
Toxolasma lividus lividus
Toxolasma cylindrella
Medionidus conradicus
Medionidus mcylameriae
Villosa fabalis
Villosa taeniata taeniata
Lampsilis virescens
Lampsilis ovata
Lampsilis binominata
Lampsilis perovalis
Epioblasma triquetra
Epioblasma penita
Epioblasma othcaloogensis

THREATENED

Naiad Mollusks

Pleurobema pyriforme
Ptychobranchus greeni
Truncilla truncata
Epioblasma brevidens
Epioblasma metastriata

SPECIAL CONCERN

Naiad Mollusks

Cumberlandia monodonta
Alasmidonta marginata
Alasmidonta wrightiana
Alasmidonta triangulata
Quadrula apiculata apiculata
Quadrula nodulata
Fusconaia escambia
Plethobarus cyphyus
Ptychobranchus fasciolaris
Lampsilis orbiculata

1/ Adapted from the unpublished proceedings of a symposium on Endangered and Threatened Plants and Animals of Alabama held March 6-7, 1975, at the University of Alabama.

APPENDIX 18 -- ENDANGERED AND THREATENED PLANTS, ALABAMA, 1975. 1/

ENDANGERED

Aconitum uncinatum L.
Aster chapmanii T & G
Aster eryngiifolius T & G
Castauea deutata
Clematis gattingeri; small
Croton alabamensis
Echinacea laevigata (Bognton & Beadle) Blake
Epidendrum conopseum R. Br.
Eriogonum harperı Goodman
Hexastylis speciosa Harper
Hibiscus cocineus Walt.
Hydrastis canadensis L.
Hymenocallis coronaria (Le Conte) Kunth
Ilex amelanchier M.A. Curtis
Jamesianthus alabamensis Black & Sherff
Leptograma pusila
Lilium iridollae M.G. Henry
Lilium superbum L.
Lindera melissaefolium (Walter) Blume
Lysimachia fraseri Duby
Lysimachia graminea (Greene) Hand-Mazzetti
Marshallia mohrii Beadle & Bognton
Nexiusia alabamensis H. Gray
Oenothera grandiflora ait.
Panax quinquefolium L.
Parassia asarifolia Vent.
Parnassia caroliniana michx.
Phlox pulchra Wherry
Plantago cordata Lam.
Rhododendron prunifolium Millais
Sarracenia oreophila (Kearney) Wherry
Schizandra glabra (Brickell) Rehder
Selaginella tortipila R. Braun
Synandra hispidula (Michx.) Baillon
Talinum appalchianum W. Wolf
Trichomanes buschianum Sturm ex Bosh.
Trichomanes petersii Gray
Trillium pusillum Michx.
Cyclodon alabamensis
Arabis perstellata
Levenworthia alabamica var. brachystyla
Leavenworthia crassa
Leavenworthia crassa var. elongata
Leavenworthia exiqua var. Lutea
Lesquerella densipila
Lesquerella lyrata
Viburnum bracteafum
Rhynchospora crinipes

THREATENED

Asplenium bradleyi
Asplenium ebenoides
Asplenium rutamarina
Brickellia cordifolia Robinson
Cacalia diversifolia T & G
Canna Flaccida Salisb.
Cheilanthes alabamensis (Buckley) Kumze
Cleistes divaricata (L.) Ames
Coreopsis gladiata Wather
Croomia pauciflora (Nutt.) Torr.
Cyprepedium acaule Ait.
Cyprepedium calceolus var. pubescens (Wild.) Cornell
Disporum maculatum (Buckley) Britton
Echinacea pallida Nutt.
Gordonia loasianthus (L.) Ellis
Heuchera longiflor (Ryd.) Rosend
Hypericam nitidam Lam.
Lilium canadense
Lycopodium porophylliam Lloyd & Underwood
Lygodium palmatum
Monusia iguanea (L.) Rose & Standley
Nestronia umbellula Raf.
Quercus georgiana M.A. Curtis
Rhapidophyllum hystrix (Pursh) Wendland & Drude
Rhexia salicifolia Kral & Bostich
Ribes curvatum Small
Sabatia brexifolia Raf.
Sagerretia minutiflora (Michx.) Trel.
Sarracenia psittacina
Sarracenia rubra
Stylophoram diphyllum (Michx) Nutt.
Thalictrum debile Buckley
Trillium erectum L. var. suleatum Barksdale
Trillium lancefolium Raf.
Viquiera porteri (A. Gray) Blake
Warea amplexifolia Small
Warea sessilifolia
Ptilimium fluviatile
Rudbeckia auriculata
Leavenworthia alabamica
Leavenworthia torulosa
Arenaria godfreyi

Carex baltzellii
Astragalus tennesseensis
Petalostemon Foliosum A. Gray
Quercus georgiana
Hypericum dolabriforme
Scutellario alabamense
Linum sulcatum var. Harperi
Panicum nudicaule
Talinum mengesii
Xyris drummondii
Pieris phillyreaefolia
Luduigia arcuata

1/ Adapted from the unpublished proceeding of a symposium on Endangered and Threatened Plants and Animals of Alabama. The symposium was held The symposium was held on March 6-7, 1975, at the University of Alabama.

APPENDIX 19 -- WETLANDS INVENTORY, ALABAMA RIVER BASIN, 1974.

19A -- Methodology

The basic approach utilized in the wetlands inventory involved a field survey conducted by the district conservationist in each county. The district conservationist was usually assisted by a district biologist or conservation officer from the Alabama Department of Conservation and Natural Resources. In some counties, employees of other state and federal agencies made valuable contributions to the field survey.

District conservationists were instructed to use Types 1, 2, 3, 4, 6, and 7 as defined in Circular 39, Wetlands of the United States, to classify wetland areas in the Alabama River Basin. Photo index sheets, soils maps, aerial photographs, flood prone area maps, quadrangle sheets, and other available information were used to assist field personnel. All wetland areas inventoried were delineated in red on a county photo index map and returned to the SCS state office for review and tabulation.

After review of the wetlands survey data collected by field personnel, some apparent inconsistencies occurred in interpretation of Circular 39 wetland types. The differing opinions stemmed primarily from three aspects of the definitions:

1. Deciding what portion of the flood plain should be Type 1 wetland.
2. Determining average depths of water and periods of inundation.
3. Defining a conglomerate of wetland types where vegetation and eutrophication is in various stages of development.

To eliminate as many inconsistencies as possible in classification, the river basin staff grouped Wetland Types 2, 3, 4, and Types 6 and 7 as shown in figure 2-31, Volume I. Type 1 wetlands were considered as being a percent of the 861,400 acres of flood plain area in the basin.

Appendix Table 19B -- Selected wetland types, by counties, Alabama River Basin, 1974

COUNTY	1	2	3	4	5	6	7	TOTAL
				WETLAND TYPE				
Autauga				260	70	10	920	1190
Baldwin								
Bibb							100	100
Bullock					220	60		60
Butler								
Calhoun								
Chambers			50	40	50	130	1360	1580
Cherokee								
Chilton							330	330
Clarke					70	3530		3530
Clay						40	40	70
Cleburne								
Conecuh								
Coosa							20	20
Crenshaw							160	160
Dallas			10		140	90	6160	6260
DeKalb								
Elmore			410		60	1050	2760	4220
Escambia			20				420	440
Etowah							4250	4250
Jefferson		80						80
Lee					60		860	860
Lowndes					220	540	830	1370
Macon						1330	190	1520
Marengo							20	20
Monroe			20				520	545
Montgomery					400		990	990
Perry					70	60	600	660
Randolph								
Russell								
Shelby		120	360		320		620	1100
St. Clair							250	250
Talladega			80			30	20	130
Tallapoosa							200	200
Tuscaloosa						30		30
Wilcox			50				6830	6880
TOTAL		200	1000	300	1/	6900	28500	36900

1/ Type 5 consists primarily of farm ponds and was, therefore, not shown in the Total column.

APPENDIX 20 — LISTING OF HISTORIC ARCHAEOLOGICAL, AND SCENIC SITES BY COUNTIES, ALABAMA RIVER BASIN.

COUNTY	SITE AND LOCATION
Autauga	Autaugaville Methodist - Autaugaville, 1829; oldest Methodist Church building in the state; early Greek Revival architecture, white clapboard construction; 6 columns and a recessed portico. "Crown of Thorns" spire atop steeple; a cemetery adjoins the church grounds and the church has been in constant use now for almost a century and a half. (4)
	Jones - (1875-1910) The rural community of Jones, in northwest Autauga County, is scattered around a complex consisting of a general store, Post Office, gasoline pumps and a grist mill and water wheel, now in disuse. The most prominent building is a two-story pioneer-type combination dwelling and commercial structure. (4)
	Grist Mill, Whitewater Pond - In the vicinity of Whitewater Pond, south of U. S. Highway 82, north and slightly east of Autaugaville; 1875. It is still intact and was formerly used to grind rice, wheat and corn. (4)
	Huffman's Bluff Site - along the Alabama River approximately 4 miles south of Alabama Highway 14 between Prattville and Autaugaville; about 2 miles from the Creek Indian "Holy Ground" in Lowndes County. William Weatherford, Chief Red Eagle, is reputed to have escaped the Mississippi Militia on Christmas Eve, 1813, by jumping his horse from the bluff into the Alabama River. (4)
	Old Kingston Site - 1829-1868; the deserted site of Old Kingston consists of approximately 15 acres adjacent to the present small rural community of Kingston in central Autauga County 4 miles north of U. S. Highway 82. The town was the second seat of Autauga County government moved from Washington. (4)
	Old Milton - 1820-1880; The Town of Milton located approximately a mile southeast of the present community of Milton is now a ghost settlement. Abandoned because of repeated flooding of Mulberry Creek. (4)
	Montgomery-Janes-Whittaker House - "Buena Vista" Autauga County Road 4 between Prattville and the Alabama River; 1821; three-story white clapboard house with four Ionic columns and brick portico. (1)
	Vernon Fields - Located 2 miles south of Autaugaville where Swift Creek joins the Alabama River, contains the remains of an aboriginal Indian Village and Indian burial ground. The village, called Kinsha-Chapinta has never been scientifically excavated to any extent. (4)
	Washington Site - 1818; the site of the town of Washington, now abandoned; located 4 miles south of Prattville; covering approximately 10 acres; first seat of government when the county was delineated by the second Territorial Legislature in 1818. Location is now called "Washington Hill". (4)
	White Oak Tree - This tree located on the site of the Judge C. E. Thomas home is authenticated as the tallest White Oak Tree in the United States. It measures approximately 25 feet in circumference. (4)
Baldwin	Fort Mims - Four miles from Tensaw on the Alabama River; home of Samuel Mims who settled here in 1778; stockade built around his house for defense against Indians; Fort Mims massacre occurred here in 1813. (1) (2) (4)
	Weatherford (William) Grave - near Old Montepellier at Tait's Old Brickyard Plantation on Little River; grave of noted Creek Chief, Red Eagle, who was accused of leading the Fort Mims Massacre. (4)
Bibb	Bibb Naval Furnaces-Brierfield Furnaces - One-half mile, located on Alabama Highway 25 west of Wilton; principal iron producer for Confederate foundry at Selma. Furnaces destroyed 1865 by Wilson's Raiders; rebuilt 1866; owned by Kimberly-Clark Corporation; c. 1851. Arched tunnel goes through structure. (1) (2) (4)
	Ebenezer Church - April 1, 1865; cavalry engagement here among the fiercest of the Civil War; fought between Forrest and Wilson; church owned. (2) (4)
	Montebrier - Near Montevallo; 1854; Victorian with gingerbread. (1) (4)
	First Bibb County Courthouse - Antioch; c. 1820's; two-story frame. (4)
	Piper-Coleanor (Little Cahaba Coal Co. Site) - Mining towns, mines opened 1900; closed 1950; reunion held each year for residents, families, and friends associated with the old mines. (4)
Bullock	Chunnenuggee Gardens, Site of - First formal garden in the United States. (4)
	Chunnenuggee Female College - Chunnenuggee Ridge; 1844; college was closed down at the outbreak of the Civil War. (4)
	Fort Coffee, Site of - four miles east of the Fitzpatrick settlement south of Hobdy's Bridge and about eight miles from Williams settlement; built during Indian uprising in 1836. (4)

COUNTY	SITE AND LOCATION
Calhoun	Cane Creek Furnace - Highway 78 east of Eastaboga; 1840; ruins of one of the earlier pig iron furnaces built in Alabama; destroyed 1864 by U. S. Calvary raiders under General Rousseau. (2) (4)
	Coldwater Covered Bridge - Six miles southwest of Anniston and visible from I-20; one-span, 60'; modified King post truss; c. 1900. (1) (4)
	Ft. McClellan Indian Site - 700 year old Indian village.
	Weaver Cave - Weaver; ½ mile southeast of Weaver on county road, natural and undeveloped cave. (3)
	Tallahatchee Covered Bridge - North of Anniston, 2½ miles east of U. S. 431 and 1½ miles east of Wellington, c. 1900; 60' long, of rare King post design; owned and maintained by the Calhoun County Commission.
	J. C. Francis Doctor's Office and Apothecary Shop - 100 Gayle Street, Jacksonville. (1) (2) (4)
	Crowan Cottage - 1427 Woodstock Avenue, Anniston; 1872; two story, shingle-style structure designed for James Noble, Sr., by Stanford White.
	Tallishatchee Town - Three miles southwest of Jacksonville; large Upper Creek town; site of battle between Creeks and General John Coffee, November 3, 1813; one of the first engagements of the Creek War; first American victory to avenge Fort Mims (2) (4)
	Aderholt's Mill - Three miles north of Anniston, off Highway 21; 1832; one of the state's oldest surviving grist mills. (4)
	Anniston Inn Kitchen - 120 W. 15th Street, Anniston; 1885; the kitchen and dining room of the Anniston Inn; two story brick and stone; National Register. Art-Architecture, Victorian.
	Booker T. Washington Park - Blue Mountain Ridge, c. 1900; recreation park for citizens of Hobson City. (4)
	Boozer Site - intersection of Glover and Clark Drive unclassified; projectile points, pot-sherds and statite sherds urcovered here.
	Choccolocco Village - 4 miles southeast of Oxford on North bank of Big Shoal Creek; Upper Creek town, friendly to whites during the Creek War 1813-1814. (4)
	Janney Furnace - Ohatchee; ruins of early furnace. (4)
	Ladiga Cavalry Skirmish Site - Piedmont last fighting between armies of Hood and Sherman, 1864. (4)
Chambers	Bibby's Ferry - 15 miles northwest of LaFayette; operated since mid-1800's; last county operated ferry in Alabama; still in use. (4)
	Ripville (Rock Shoals) - Hoototchlocco Creek; c. 1840; stone and frame grist mill; mill stones were made and purchased in France. (4)
Cherokee	Cornwall Furnace - 1862; made iron for Confederacy; best preserved furnace in the state; Cedar Bluff area. (1) (4)
	Yellow Creek Falls-Blue Pond; Near U. S. 411; beautiful waterfall off Lookout Mountain into Lake Weiss. (3)
	Barry Springs - near Georgia line, large stockade built here for Indians before their removal to the west.
	Blacksmith Shop - Cedar Bluff; 1832; log.
	Braswell Mill - Pleasant Gap; c. 1868-70; two-story frame.
	Broomtown Valley - named for Cherokee Indian Chief Broom, a national council of Cherokee Indian Chiefs held here September 11, 1808, on September 5, 1863, Brigadier General George Crook commanding second division U. S. Army engaged Confederate forces in this valley on October 14, 1864, located on State Route 35 at intersection with County Road 15 at Blanche. (4)
	Cobia's Mill - State Route 68, two miles north of Cedar Bluff; mid-19th century; two-story frame; grist, flour and saw mill. (4)
	Costa Indian Village - Cedar Bluff; DeSoto camped here in 1540. (4)
	Edgins (G. Jeff) Grave - Moshat Church Cemetery; grave of G. Jeff Edgins born in Spartanburg, South Carolina, October 28, 1838, died near here January 24, 1890, he was a member of the battery that fired the shot at Fort Sumter, South Carolina on April 12, 1861, which began the Civil War. (4)
	Forrest Defeats Streight Site - May 3, 1863, site where General Forrest with about 500 men forced surrender of Colonel Streight's army of about 1,500. (4)
	Fort Armstrong - two miles south of Cedar Bluff on Williamson Island; 1813.
	Little River Canyon - 14 miles northwest of Gaylesville; evidence of early aboriginal habitation; deepest gorge east of the Rockies; scenic tourist attraction. (4)
	McElrath Mill (Old Ice Plant) - Centre; 1842; corn and flour mill, cotton gin and ice plant, was one of four ice plants in the world that made ice by water power. (4)

COUNTY	SITE AND LOCATION
Cherokee (cont'd)	Rock City - along brow of Lookout Mountain; very large rocks, columns of boulders of eroded limestone and sandstone; Indians inhabited this area from aborigines to Cherokees (1838). (4)
	Split Rock - in the wall of Little River Canyon; large Crevasse, "Indian Smoke House" used by Indians and early settlers-favorite picnic area 1890-1930. (4)
	Turkey Town Council Site - located at Centre; in front of Junior High School; important Indian Council site from about 1707; named for noted Chief "the Turkey", October, 1816, a council of Cherokees, Creeks, and Chickasaws met to settle boundaries and ratify a peace treaty, General Andrew Jackson, Samuel Dale and David Crocket were there. (4)
	Union Occupation of Cedar Bluff Site - Major General J. M. Schofield, commanding the U. S. Army of the Ohio, occupied Cedar Bluff with about 9,000 troops on October 20, 1864, Major General O. O. Howard, commanding U. S. Army of the Tennessee, with about 10,000 joined him on October 28, 1864, General W. T. Sherman ordered both armies to begin their "March to the Sea through Georgia" from here on October 30, 1864. (4)
	Yellow Creek Mill - near Sand Rock; 1880-1970; water powered grist mill. (4)
Chilton	Verbena Historic District - Settled by people fleeing from epidemics of yellow fever; the town once had a gold mine, and was one of the leading producers of gold in Alabama. District includes at least 13 structures. (4)
	Battle of Abenezer Church - Stanton Community; April 1, 1865. C.S.A. forces under General N. B. Forrest engages Union forces under General James H. Wilson here April 1, 1865 in one of the fiercest cavalry engagements of the war. Forrest was seeking to block Wilson's mission of capturing the Confederate Arsenal at Selma. Swollen streams and intercepted orders blocked aid for Forrest and forced his retreat. (4)
	Confederate Memorial Cemetery - Mountain Creek; 1902-1933; two cemeteries several yards apart; an old soldier's home; small cottages; a hospital; a meeting house and a dàiry made up the community.
	Old Indian Fort - near Blue Creek; c 500 AD; rock rubble ruins; walls were probably six to eight feet high.
	Plier's Mill - Route one, Clanton; 1918; several worker's cottages remain.
	Yellow Leaf Creek Grist Mill - built 1830; still in operation. (4)
	H. H. Miller Grist Mill - Cane Creek Community, 1½ miles off Lay Dam Road; only water grist mill in county. (3)
Clarke	Choctaw Bluff Earthworks - Between Alabama and Tombigbee Rivers, Civil War fortifications constructed on the west bank of the Alabama River to guard the salt works near Jackson and the naval foundry and arsenal at Selma. Cannons were never fired but blown up by Col. Mims in 1865, later Choctaw Bluff was a busy river port but today nothing remains. (4)
	Fort Madison Site - 12 miles S. E. of Grove Hill, 1812; site of pioneer stockade; commanded by Captain Sam Dale and Evan Austill; Choctaw chieftain Pushmataha often visited; nothing remains of original. (4)
Clay	Hillabi Town On Koufadi or Little Hillabi Creek; near the line of Clay and Tallapoosa Counties, in the vicinity of Gilbert's Mill, opposite to, and a short distance from, present Pinkneyville; a main Hillabee town which prior to 1761 threw off several settlements nearby.
	Potus-Hatchi (Potchushatchi) On the headwaters of Hatchet Creek, 6 miles from the present town of Hatchet Creek and a short distance from the present community of Coleta; this was an Upper Creek Town that extended 1 mile up and down the creek.
	Hugo Black Home - 15 miles south of Ashland, brithplace of Hugo Black, U. S. Supreme Court member. (1) (4)
	Clairmont Springs Historic District - Off Highway 77 between Ashland and Talladega; c. 1908; district includes two-story frame, 50 room hotel, resort and mineral springs. (4)
	East Mill - On Mad Indian Creek 4 miles east of Barfield off Highway 9; c. 1900; water powered, cotton gin, grist mill and saw mill. (4)
	Simmons Mill - On Little Hillaby Creek, 3/4 mile west of Millerville; pre-Civil War; first wheat mill construted in Alabama, water powered wheat, grist, saw and handle mill; wheat stones imported from Ireland. (4)
Cleburne	Oakfuskee - On the Tallapoosa River; Upper Creek town; considered the largest Creek community of the Creek Confederacy.
	Cheaha Mountain State Park - Able; highest mountain in Alabama, elevation 2,407 feet; very scenic view. (3) (4)
	Arbacoochee-Indian Village - near present community called Arbacoochee, Creek Village. (4)
	Arbacoochee Site - 8 miles south of Heflin; gold capital of the country in 1840's. (4)
	Atchinalgi - On the east bank of the Tallapoosa River near the mouth of Cedar Creek, Upper Creek town destroyed during Creek War in 1813. (4)

COUNTY	SITE AND LOCATION
Cleburne	Neufaka - On the south bank of the Tallapoosa River; an Upper Creek town. (4)
	Oakfushee - On the Tallapoosa River; an Upper Creek town; oldest Creek community of Creek Confederacy. (4)
	Shoal Creek Church - Shoal Creek; c 1814; log structure, one-story, exposed beams and rafters. (4)
	Wehogan - Creek Indian Village. (4)
Coosa	Itaba (Itawa) - On Hatchett Creek, 4 miles north of Rockford, on highway from Rockford to Sylacauga at point where the stream flows through deep gulches; an Upper Creek town of great antiquity; visited by DeSoto in 1540. (4)
	Okachoy Covered Bridge - Southeast of Rockford on Alabama 22, turn right on Alabama 9 near Nixburg; built of homemade timber, one-span 56 foot modified Queenpost bridge, 1915. (4)
	Sakapataye - On Socapatoy branch of Hatchett Creek, a few miles west of Kellyton; a small Upper Creek town. (4)
	Shepherd Falls - Hissop; 1 mile north of Highway 22; 30 foot waterfall surrounded by natural wooded area. (3)
	East Wetumpka - Idian village. (4)
	Lalokalka - East of Hissop, upstream on one of the branches of Elkhatchee Creek; an Upper Creek town.
	Opil'ako - On Picthlocco Creek, 20 miles upstream from the Coosa River, a few miles west of Nixburg, in Picthlocco Creek swamps; Upper Creek town; appeared on DeCrenay's map of 1733 as Pitlacco. (4)
	Pakana-Talahassi - At Hatchett Creek, on right bank 4 miles from its influx into the Coosa River, and in the fork formed by Weogufka Creek; an Upper Creek town. (4)
	Rockford Jail (Old Coosa County Jail) - Rockford; mid-19th century; three story rock building; in operation until 1938. (1) (4)
	Weogufki (Uiukufki) - On the east bank of Weogufka Creek, 5 miles above its confluence with Hatchett Creek; an Upper Creek town. (4)
Dallas	Cahawba Historic District - Site of Alabama's first permanent capital 1820-26; county seat of Dallas County, 1820-66; Confederate Prison during the Civil War. (1) (2) (4)
	Caxa - On the Alabama River just below the mouth of Cedar Creek; Indian village visited by DeSoto's expedition in 1540. (4)
	Morgan (Sen. John T.) House - 719 Tremond St., Selma; two-story frame. Home of confederate general and U. S. Senator. (1) (4)
	Live Oak Cemetery -West Dallas Avenue, Selma; mausoleum contains the remains of Wm. Rufus King, Vice-President of the United States; a marble shaft marks the grave of U. S. Senator John T. Morgan. (4)
	Sturdivant Hall - 713 Mabry St., Selma; 1853; designed by Thomas Helm Lee for Edward T. Watts; two-story brick and stucco; Neo-classic architecture. (1) (2) (4)
	Talasi - At Durant's Bend, 35 miles from Montgomery; an aboriginal town of great antiquity; DeSoto stayed here for 20 days in 1540.
	Water Avenue Historic District (21 structures) - Water Riverfront, Selma; 21 commercial buildings within five blocks; built between the late 1830's and the end of the 19th century; all buildings are brick or stone, from one to three stories and have one or two story iron verandahs; architectural styles are varied.
	Blue-Girth Swamp - 6 miles east of Selma; 200 acre natural swamp of exceptional wildlife value.(3)
	Bienville Monument - Alabama River Bluff; commemorates meeting of Bienville and the Alabama Indians in the 18th century. (4)
	Brooke Gun Foundry Site - Selma; one of two heavy gun foundries of the Confederacy; foundry destroyed by Federal Troops in 1865, a number of cannons survived; privately owned. (4)
	Cahawba Mounds - At the old town of Cahawba; two extensive mounds believed by some to be part of earthworks which fortified French encampments; c. 1750.
	Casiste - On the left bank of the Alabama River opposite the mouth of the Cahaba River; DeSoto's expedition visited this town October 5, 1540 and departed October 6, 1540; Upper Creek town. (4)
	Confederate Arsenal Monuments - Church Street at Water Avenue; two marble monuments which mark entrance to Arsenal Place.
	Confederate Naval Foundry Site - Sylvan Street at Water Avanue; site of Confederate foundry during Civil War; Tennessee Confederate ironclad steam ram built here.

COUNTY	SITE AND LOCATION
Dallas	Kenan's Mill - two miles north of Selma off Summerfield Road; c. 1825; powered by water of Valley Creek; has been in operation since its construction; owned by Mrs. James Kenan. (4)
	Federal Building - Courthouse, Selma; built in 1909; heavily influenced by the Florentine Palazzo; owned by the U. S. Government. Political Affairs-Establishment and Administration of Government.
DeKalb	Fort Payne Opera House - Fort Payne; 1889 structure from Fort Payne's days as a "Boom town"; built from native stone. (1) (2) (4)
	Manitou Cave - Fort Payne; home of early man, 250 million years old; Indians camped here; large cave room used as ballroom during the ante-bellum and Civil War periods. (4)
	Will's Town - Will's Valley; a short distance north of present Lebanon, 6 miles south of Fort Payne; Cherokee town of considerable importance founded in 1770. (4)
	Railway Terminal - Fort Payne; c. 1889; large hewn stone block construction; Richardsonian Romanesque. (1) (4)
	Casey Grist Mill - Near Colbran; two story, rock. (4)
	Cherokee - Fort Payne; mansion built in the late 1800's around a two story log cabin which may have been built by John Ross, Cherokee Indian chief in 1790; Sequoyah taught the Cherokee alphabet in this general area; two story frame structure. (4)
	Desoto Falls - Near Valley Head; scenic water fall - 70 feet drop to Little River; Desoto explored this area. (4)
Elmore	Bibb (William Wyatt) - Grave site; private cemetery near home, Millbrook; first governor of Alabama, 1819-1820; only governor of Alabama Territory 1817-1819. (2)
	Fuoihatchi - One mile above Ware's Ferry, on the right bank of the Tallapoosa River, two miles below the old Indian town of Huithelwalli; an Upper Creek town; some Kaisa tribe united with the Creeks here. (4)
	Hoithlewalli (Ulibahali) Town and Mound - On the right bank of the Tallapoosa River, east of the influx of Mitchell Creek and extended one-half mile back from the Creek; this town was visited by DeSoto on August 31, 1540. Extensive mound located on this site. (4)
	Ikanhbatki Mounds - About opposite the influx of the Eight Mile Creek into the Tallapoosa River; extensive mounds.
	Koasati - On the right bank of the Alabama River, three miles below the confluence of the Coosa and Tallapoosa Rivers, near Coosada; this was an Alibamon town of the Upper Creeks. (4)
	Tomonfa (Tomopa) - On the west bank of the Coosa River, opposite old Fort Toulouse; an Alibamon town of great antiquity which lost its identity to the Indian town of Witumpka.
	Fort Toulouse (Fort Alabamu: Fort Jackson Site): Within the junction of the Tallapoosa and the Coosa Rivers, three miles west of Alabama Highway 9, about 13 miles from Montgomery; built in 1714 by French Captain de La Tour, by orders of Bienville, at the request of the Chiefs of the Alibamu for a trading center; here in 1814 William Weatherford, the Red Eagle surrendered to Gen. Andrew Jackson, signalling the end of the Creek War. (1) (2) (4)
	Tuckabatchi Mound (Tookabatcha) - Large mound on the west bank of the Tallapoosa River, 2½ miles below the present city of Tallassee; site of an influential town and the ancient capital of the Upper Creeks. (4)
	Witumpka - Practically on the site of the present city of Wetumpka; an Upper Creek town, this town incorporated the small Indian village of Tomonpa which was adjoining. (4)
	Wi-Wux-Ka (Weewoka) - On the left bank of Wewoka Creek, four miles from the Coosa River; an Upper Creek town; the name meaning "Roaring Waters". (4)
	Woksoyudshi - East of the Coosa River, two miles east of Fort Toulouse; an Upper Creek town of several villages adjoining one another at this location. (4)
	Alabama State Penitentiary - One mile north of Wetumpka on Highway 231; 1841; consists of three brick structures. (1) (4)
	Atchinanhinahatchi - On the present Cheneyhatchie or Channahatchie Creek, southeast of the village of Cotton and just east of Central; an upper Creek town, settled from older town of Kailaidshi. (4)
	First United Methodist Church - 306 West Tuskeena Street, Wetumpka; 1854; modified Greek Revival with Italianate influences. (1) (4)
	Hut-Chit-Chapa - On the headwaters of Mitchell Creek, a few miles south of present town of Central; this village was settled in a pine forest by people from Kailaidohi; destroyed by hostile Creeks in 1813, but later rebuilt. (4)
	Ikanhbatki - At the site of the Rifle Range of the U. S. Army in 1917-18; oppsite the influx of the Eight Mile Creek into the Tallapoosa River; an Upper Creek town. (4)

COUNTY	SITE AND LOCATION
Elmore (cont'd)	Jackson's Lake Mounds - At old club on Jackson's lake near Millbrook; burial mound near present course of Alabama River; also two mounds and burial site near clubhouse. (4)
	Kailaidshi (Kowiija) (Kialigi) - South of Little Kowaligi Creek, near the present Prospect Methodist Church, One mile west of Kowaligi; an Upper Creek town. (4)
	Koasiti Mound - Just above the Coosada Ferry; large mound.
	McGillivray Planation Site ("Little Talisi") - Wallsboro; 1740-1800; first white settler in the region; married half Indian daughter of French Commandant of Fort Toulouse. (4)
	Okchayudshi - On east bank of Coosa River, about two miles below Wetumpka; a small Upper Creek village.
	Parker's Island Mound - At the junction of the Coosa and Tallapoosa Rivers-area dotted with towns and villages. (4)
	Tallassee Armory Site - Tallassee; 1864; only Confederate armory not destroyed by Federal forces; Colonel Gorgas, ordinance chief, had carbine shop moved here into the Tallassee Manufacturing Company mill in spring of 1864 as war threatened Richmond, Virgina armory.
	Taskigi Mound - large Indian mound at the junction of the Tallapoosa and Coosa Rivers, three miles off Alabama Highway 9.
	Fort Toulouse (Fort Alabama - Fort Jackson Site) - Within the junction of the Tallapoosa and the Coosa Rivers, three miles west of Alabama Highway 9, about 13 miles from Montgomery; built in 1714 by French Captain de la Tour, by orders of Bienville at the requests of the Chiefs of the Alibamu for a trading center; here in 1814 William Weatherford, the Red Eagle surrendered to General Andrew Jackson, signalling an end of the Creek War.
	Woksoyudshi Mound - East of the Coosa River, two miles upstream from its junction with the Tallapoosa River; mound. (4)
Etowah	Gilliland Covered Bridge (Old Reece City Bridge) - In Gadsden at Noccalula Falls; 1899; one-span, 40 foot town bridge; first completely restored covered bridge in Alabama. (4)
	Noccalula Falls Park - Gadsden on Alabama Highway 227; park, pioneer museum, botanical garden; contains authentic post office, covered bridge; meeting house, grist mill, barn, and pioneer house; name of falls came from a legend that an Indian girl, Noccalula, jumped to her death when refused permission to marry. (4)
	Natural Bridge - Gallant, County Highway 35; natural rock bridge on Little Canoe Creek. (3)
	Atall Village Site - Attalla; Cherokee Inidan village until 1832. (4)
	Bull Town Site - A branch of Turkeytown. (4)
	Estanaula Village Site - not far from Turkeytown; branch town of Turkeytown. (4)
	Rock City - Five miles south of Gadsden, on Alabama 1; natural rock formations and aboriginal dwellings carved in solid rock. (4)
	Sansom (Emma) Memorial Statue - Gadsden; she led General Forrest, in pursuit of Colonel Streight, to shallow place in the creek after the bridge was burned. (4)
	Sullysqash Village Site - Near Turkeytown; branch town of Turkeytown. (4)
	Turkeytown Site - Ballplay; at site of Turkeytown; Ballplay on U. S. 411; capital of the Cherokee Indian nation. (4)
	Vann's Town Site - Near Turkeytown; branch town of Turkeytown. (4)
	Duck Springs Bridge - Ten miles north of Gadsden between Kenner and Duck Springs; one span, 119 feet long, resembles the hull of a boat. Partially destroyed by arson, the steel truss remains. Restoration may be attempted as funds permit.
Jefferson	Indian Burial - Near Pinson; 500-1000 AD; remains of 44 corpses.
	Alabama Caverns - Near Clay, 18 miles from Birmingham and Gadsden Road; used commercially just after their discovery in 1840; and used as a saltpeter mine during the Civil War. (4)
	Genery's Gap - Old Montevallo Road, Southern part of county; gateway to Birmingham cut 1869-71; huge piles of rock are still neatly along the cut. (4)
Lee	Noble Hall - On Shelton's Mill Road, N.E. of Auburn; 1854; two story rock and mortar; Greek Revival. (1) (4)
	Auburn University Players Theater - Auburn; 1850; log and brick structure; used as church, hospital and in 1926 became a theater. (4)
	Chewacla Lime Works - Chewacla, mid 19th Century, stone and stucco.
	Lee County Courthouse - South 9th Street, Opelika; 1896; two-story, brick.

COUNTY	SITE AND LOCATION
Lee (cont'd)	Loachapoka Historic District - Mid 19th Century village; 17 structures show Greek Revival and Victorian influences; commercial center during the mid-19th Century. (1) (4)
	Scott-Yarborough House, 101 DeBardeleben Street, Auburn.
	Ebeneezer Missionary Baptist Church on Summer Hill, built in 1865, Negro. Society-Religion; Black History.
Lowndes	Holy Ground Battle Site (Ikan-A-Cha-Ka) - 2½ miles due north of Whitehall on Alabama River Break; Creek Indians soundly defeated here in 1813; now a marked overlook area of the Corps of Engineers.
	Lowndes County Courthouse - Washington Street, Hayneville 1856; Greek Revival; one of only four ante-bellum courthouses still in use in Alabama. (1) (4)
	Lowndesboro - Village contains 20 structures 1818-1888; Greek Revival; predominately ante-bellum community. (1) (4)
Macon	Atassi (Autosee) - 20 miles east of the mouth of the Coosa River, below and adjoining Calebee Creek, on the south side of the Tallapoosa River; an Upper Creek town shown on De Crenay's map of 1733; Indians from this Red Stick tribe took part in the Fort Mims massacre; in November 1813, General John Floyd burned the town; located on this site is a large flat-topped mound in regular shape. (4)
	Conaliga - Southwest of Society Hill; Upper Creek town; friendly with whites; in 1813 fought against the Upper Creeks. (4)
	Nafolee (Yufali) - On the east bank of the Tallapoosa River, near its confluence with Eufaubee Creek; shown on De Craney's map of 1733; an Upper Creek town of great antiquity; Oxceola, the great Seminole Chief, was born here. (4)
	Thloblocco - On the Thloblocco Creek, a tributary of Cubahatchee Creek, and 4 miles east of the Montgomery to Tuskegee Highway, U. S. 80; Upper Creek town; home of Jim Boy, a leader during the Civil War. (4)
	Tuskegee Institute; Tuskegee - early 1900's; educational landmarks associated with Booker T. Washington and George Washington Carver. (1) (2) (4)
	Calebee, Battle of - West of Tuskegee; 1813; Creeks attacked General Floyd's men, nearly an Indian victory.
	Carver (George W.) Museum - Tuskegee; had a fire four years ago; lost some paintings but is still standing. (4)
	Fort Decatur - On the Tallapoosa River, near the present site of Milsted, about five miles from the old Indian town of Atassi, two miles from U. S. Highway 80; an American fort erected by Carolina trops in March, 1814; John Sevier of Tennessee buried here; his body was later removed and returned to Knoxville, Tennessee. (4)
	Fort Hull - five miles southeast of Tuskegee; 1813; built by General John Floyd as a defense against the Indians. (4)
	Oaks, The - Tuskegee; 1887; one story brick; home of Booker T. Washington, founder and first Presidnet of Tuskegee Institute. (4)
	Talisi - East bank of Tallapoosa River and just above its confluence with Yafabi Creek; Upper Creek town of great antiquity; shown on De Crenay's map of 1733; abandoned in 1799. (4)
	Yafalo - On Yaphapee Creek, 15 miles from its confluence with the Tallapoosa River; Upper Creek town; French census of 1760 showed it to have 100 warriors. (4)
Monroe	Atahatchee - On the east bank of the Alabama River near Tinela; here, in 1540 DeSoto took Chief Tuscaloosa prisoner. (4)
	Fort Claiborne - At the mouth of Limestone Creek, on the east bank of the Alabama, 10 miles east of Monroeville; 1813-1814; used in the Creek War. (2) (4)
	Lisbon Formation, Gosport Sand & Moody's Branch Formation of Eocene Age - Claiborne Bluff on the east side of the Alabama River; beds under bridge and along the road to the Claiborne Landing; pelecypods; gastropods and echinoids.
	Piachi - At the old town of Claiborne; aboriginal Indian village visited by DeSoto in 1540. (4)
	Anderson Stage Stop - Old Federal Road between Montgomery and Mobile. Dog trot house with two exterior chimneys on either end. There is a long porch with part of one end enclosed to provide another room. The out buildings include a separate kitchen, carriage shed, smoke house, livery stable, and a corncrib; privately owned. (4)
	Burnt Corn Creek Battle Site - Burnt Corn Community; spring 1813. Here, the Creek Indians and the white settlers fought along the creek; the Indians were first driven back, but rallied and defeated the settlers, burning their corn--hence the name. This battle marked the beginning of the Creek War (1813-1814). (4)
	Flat Creek Indian Site - Village was located where Flat Creek flows into the Alabama River. (4)

COUNTY	SITE AND LOCATION
Monroe (cont'd)	Limestone Creek Indian Mound - Near Claiborne; 17th or 18th Century; man-made earthen burial mound, about 40' x 100' x 18' high. (4)
	Monroe County Courthouse - Monroeville; 1903; moved the Claiborne courthouse to Monroeville; old court room is used as a museum; "To Kill a Mockingbird" was filmed here. Listed on the National Register. (4)
	Mystery Stones - Pine Orchard Community, ante-18th Century; wheel shaped stones of soft limestone from 18" to 40" in diameter and from 30 to 1,500 pounds; most stones have a hole in the center; they were possibly used by the Indians as a calender or for ceremonial purposes. (4)
	Primitive Indian Fire Pit - Pine Orchard Area; contains crude circle of stones used by Indians as a fire pit about 700 years ago; privately owned. (4)
	Stage Coach Inn - On the Old Federal Road near Old Texas, mid-19th Century; log, covered with siding; "dogtrot" style with full width front porch; one of few surviving old stage coach inns in the state, owned by Ziba M. Anderson. (4)
Montgomery	Alibamu Town Mounds - One mile south of Jackson's Ferry, on the west and east side of Jackson Ferry Road within a half mile of each other; three mounds, thought to be the mound of Alibamu Town. (4)
	First White House of the Confederacy - 664 Washington Avenue, Montgomery; 1825(1840?); two story frame; Greek Revival; home of Jefferson Davis, first President of the Confederacy from early March until the end of May 1861; moved to its present location in 1927. (1) (2) (4)
	Gilmer-Thomas House - 3175 Thomas Avenue, Montgomery; 1821; Greek Revival; one of the oldest houses in Central Alabama; oldest planation house intact in Montgomery. (1)
	Hu-Ithie-Walli - At the mouth of Mitchell's Creek, on the Tallapoosa River; an extensive branch village of the Creek Indians. (4)
	Kulumi (Caloomi) - On the Tallapoosa River, one mile below old Ware's Ferry, 12 miles east of Montgomery; a town of great antiquity, visited by DeSoto on September 2, 1540. (4)
	Muklassa - On the left bank of Eight-Mile Branch, 1½ miles from the south bank of the Tallapoosa River; very old Upper Creek town, home of Wolf Kong, important 18th Century Creek leader; belonged to the Red Sticks during the Creek War, 1813-1814. (1) (4)
	Rice-Semple House (Haardt Building) - 725 Monroe Street, Montgomery; early 1850's; home of a Chief Justice of the Alabama Supreme Court, Samuel F. Rice; Victorian and Creole architectural influences. (1) (4)
	Sawonogi - On the south bank of the Tallapoosa River, near Ware's Ferry, one mile below and adjoining what was later the pioneer town of Augusta; a Shawnee and Creek town; Shawnees were of the Hatawekela Bank; Red Stick town during the Creek War; home of Savannah Jack, a Creek leader. (4)
	Ordeman-Shaw House - 230 North Hull Street, Montgomery; 1850; two story brick structure with scored stucco finish and partially raised basement; early Italianate Style with Tuscan influences, interior trim is Greek Revival; outbuildings. (1) (4)
	State Capitol - Head of Dexter Avanue, Montgomery; 1851; built on "Goat Hill"; Stephen D. Button, architect; east wing added, 1885; south wing, 1905; north wing, 1911; Confederate government organized here; Greek Revival; spiral staircases. (1) (4)
	Winter Building - Southeast corner of Court and Dexter, Montgomery; 1840-1850; three story brick structure; Southern Telegraph office on the second floor for many years; through this office was transmitted the order that resulted in the firing on Ft. Sumter. (1) (4)
	DeSoto Trail - Montgomery; 1540; route traveled by first Europeans to visit Alabama, marker on Bell Street near Maxwell Air Force Base.
	Dexter Avenue Baptist Church - 454 Dexter Avenue, Montgomery; 1877; red brick structure; several ministers have attracted national attention; most notably Dr. Vernon Johns and Dr. Martin Luther King. Society-Religion; Black History.
	Iconchati - Vicinity of I-65 Alabama River Bridge; c. 1500-1814; Creek Indian village of Iconchati, village most nearly on the site of the City of Montgomery.
	Governor's Mansion (Ligon House) - 1142 South Perry Street, Montgomery; 1907; two story Neo-Classical structure, home of General R. F. Ligon; since 1950 has been official residence of Alabama Governors. (1) (4)
	Line Creek Village - On the south bank of Line Creek; site of a small Creek village. (4)
	Montgomery Union Station - Water Street, Montgomery; 1898; three story masonry structure. (4)

COUNTY	SITE AND LOCATION
Montgomery (cont'd)	Murphy House - Corner of Bibb and Coosa Streets, Montgomery; 1851; two story brick stuccoed over and scored; Greek Revival; Corinthian capitals; constructed as town house of wealthy cotton merchant; National Register.
	Old Continental Gin - east of U. S. Highway 231, near Teasby's Mill, Pine Level vicinity; 1927; one of the two oldest Continental Gins from the Prattville factory still being operated in the South from the original plant founded by Daniel Pratt.
	Pakana - South bank of Tallapoosa River, east of William L. Yancey Bridge; c. 1650-1814; site of Upper Creek town; significant archaeological finds. (4)
	Perry Street Historic District - Montgomery; 19 structures including two churches and the Teague, Washburn, Cody, Lomax, Knox, Griel, and Falcomer Houses and four Victorian row houses. (1) (4)
	Powder Magazine - Eugene Street, Montgomery; 1840; commercial gun powder warehouse; later confederate army magazine; brick with barrell-vaulted arches in ceiling; the site is being converted into a riverside park area. (1) (4).
	Powokti Mounds - South bank of Alabama River near Washington Ferry Road; site of Powokti Village, believed to be Mississippian, five mounds. (4)
	Thomas Home (Edgewood) - 3175 Thomas Avenue, Montgomery; 1821; two story frame structure with two story portico, elements of Federal and Greek Revival; oldest house in Montgomery. (1) (4)
	William Lowndes Yancey Home - Across from Gunter Air Force Station, U. S. Highway 231; c. 1850; one-story frame house; last home and death place of William L. Yancey; prominent secessionist.
Perry	Marion Female Seminary (Perry County High School) - Marion; 1836; formerly three story brick (two stories since 1930); Greek Revival; Nicola Maroschall (musician and artist) designed the first Confederate flag and Confederate uniform here. (1) (3) (4)
	Brave Harry's Grave - Marion Cemetery, Marion, in 1854 a slave named Harry died from burns and a fall he sustained trying to awaken all the students in the burning dormitory of old Howard College (now Samford University) when it was located in Marion. He was the first black buried in the Marion Cemetery and a marble shaft was erected at his grave by Howard College students and the Alabama Baptist Association. Owned by the city of Marion. (4)
	Confederate Cemetery - Behind St. Wilfrid's Episcopal Church, Marion, Perry County; the graves of 77 soldiers of the Civil War were moved to this location from the old Howard College present Marion Institute campus in 1872 by the Ladies Memorial Association; here is also what is supposed to be the largest redwood in the eastern United States. Owned by St. Wilfrid's Episcopal Church. (4)
Randolph	Aboriginal Structure - Seven miles northeast of Wedowee; at this point is seen a circular stone structure, two or three feet high, with two entrances, one on the east side and the other on the west; running from this structure, in a northeasterly direction, can be seen traces, for more than a mile, stone pillars about two feet high, located 100 yards apart. (4)
	Kitcho Pataki - On a creek by the same name, locally spelled Ketchapedrakee, at its influx into the Tallapoosa River, a few miles below the present village of Okfuski; this was an Upper Creek town. (4)
	Lutchapoga - On the Tallapoosa River, nearly opposite the mouth of Corn House Creek; and below Welborne's Ferry; this was an Upper Creek town, the name signifies "Terrapin gathering place." (4)
	Wah-Wah-Wee (Wee-Dah-Wee) - One-half mile south of Trylett's Ferry, on the west bank of The Tallapoosa River, near the present town of Wedowee, this was the village of the Indian Chief "Wee Dow Wee", whose name was given to the modern town near this location. (4)
	Horton's Waterfall - Rock stand, off U. S. 431; beautiful waterfall.
	Bald Rock - Three miles northeast of Wadley on Highway 78; eighty acres granite out crop has c. 1900 syrup mill, grist mill, and home; used as school; listed in Registry of National Environmental Education Landmarks.
	Foster's Bottoms - Near Wedowee; excavation produced projectile points and gorgets of the Woodland Period.
	Grist Mill - Northwest Randolph County near Rockdale; on Piney Woods Creek; built 19th century by Jeptha Smith and his son William Hush Smith who was one of Alabama's reconstruction governors.
	'Lap'Lako - On the Tallapoosa River this was an Upper Creek town that was destroyed by the forces of General Adnrew Jackson in 1814.
	Louina - In the east central part of the county, on the west bank of the Tallapoosa River, at Hunter's Ferry; this was the site of the old trading post, established by an Indian woman, Louina, about 1830, and was named for her; this post was the metropolis of its day and section; she sold the trading post when the Indians were removed to the west, 1836; the grist mill of the old trading post still stands.

COUNTY	SITE AND LOCATION
St. Clair	Tasqui - Aboriginal town on the Coosa River; visited by DeSoto on July 14, 1540 and mentioned in his chronicles.
	Horse Pens 40 - Near Steele; unusual rock formation on Chandler Mountain.
	Broken Arrow - Indian Village Historic Site; first white settlement here called Bolton's Cross Roads.
	Fort Strother - Six miles east of Ragland on Coosa River in St. Clair County; headquarters for General Andrew Jackson during his campaign against the Creek Indians; 1813-14.
	Inzer House - Ashville; one story; built 1852 of handpressed brick for Moses Dean; became property of John W. Inzer in 1866; owned and occupied by Miss Sally Inzer; National Register.
	Litafatchee - Eight miles north of Ashville on Canoe Creek; General Jackson sent out foraging party under Colonel Dyer who discovered and destroyed Litafathcee, October 29, 1813, Chief Cataula.
	Looney-Lonnergan House - Beaver Valley, six miles from Ashville,; two story log structure with dog trot; built 1818-19; excellent example of pioneer architecture; property of St. Clair Historical Society. Art-Architecture, Log Cabin Style.
	Otipalin - Four miles west of Ohatchee on Coosa River in St. Clair County; name means "Ten Islands"; later site of Fort Strother.
	St. Clair Springs Historic District - Late 19th century resort town; 21 structures; mostly Victorian.
Shelby	Athens Shale of Ordovician age; roadcut on south side of Alabama Highway 25, 2.3 miles west of intersection of Alabama Highway 25 & U. S. Highway 31 in Calera; graptolites are preserved as carbonaceous films in dark gray shale.
	King Mansion House and Cemetery - Montevallo; 1823; two story brick; first brick structure in the county and had first glass windows to be used in that part of the state; oldest building on campus.
	Tulauhabsho (Tulawahajah - Old Mad Town) - About ten miles south of present Birmingham on the east bank of the Cahaba River; Upper Creek town in the extreme northwestern section of Creek Territory.
	Falling Rock Falls - Between Dogwood and Pearidge; water plunges 60 feet vertically, unusual rock formation and plant life.
	Columbiana City Hall - Columbiana; 1850.
	Hotel Shelby - Shelby; 1900; oldest hotel in state operating daily; first Alabama hotel to have running water and lights; has 30 rooms; used for political conventions in early 1900's; still operating; first constructed in 1863, totally destroyed by fire in 1898; rebuilt in 1900; two story frame with porch running entire length of house, 4 double sets of columns and small balcony on second floor.
	Shelby Furnace - Shelby; 1850; only ruins now; some ovens intact.
	Shelby Springs - At Shelby Springs between Calera and Columbiana; site of one of the state's most notable resorts (1830's to 1861); used as a Confederate Hospital during the Civil War; many of the patients who died are buried in the adjoining cemetary.
	Wihasha - Identified with town of Breed Camp; 1761; Upper Creek town; name signifies "Home of Emigrants."
Talladega	Abi'hka - In Talladega County, near the Coosa River, south of Tallaseehatchie Creek, about 2½ miles south of Rendalia; Upper Creek town considered one of the oldest; this town was located in the northern limits of the Creek Country; and was a defense outpost against hostile tribes from the north.
	Abiku'dshi - Five miles east of the Coosa River, on the right bank of the Tallaseehatchie Creek, on the property of Adam Riser, of Childersburg; inhabitants of this town spoke Chickasaw, and they lived among white people.
	Cedar Creek Village - On the Coosa River, at the mouth of Cedar Creek, near present Talladega Springs; old Upper Creek Village.
	Chickasaw Town (Tchikachas, Chicachas) - On the south bank of the headwaters of Talladega Creek, just north of Chandler Springs; inhabitants were Chickasaws; prior to 1755.
	Curry (J.L.M.) Home - Talladega; three miles northeast of Talladega on Alabama Highway 31; 1830's.
	Cosa (Coca, Coosa Old Town) - Between the mouths of the Talladega and Tallaseehatchee Creeks, 1½ miles northeast of Childersburg on the Central of Georgia Railroad; town of great antiquity; DeSoto arrived here with his expedition on July 16, 1540.

COUNTY	SITE AND LOCATION
Talladega (cont'd)	Istapoga - At the mouth of Eastaboga Creek, which flows into Choccolocco Creek, about 10 miles above it's influx into the Coosa River; Upper Creek settlement, the name meaning "where people reside'; remains of this town are still visible.
	Kymulga Cave - 18 miles south of Anniston, three miles west of Winterboro; largest natural cave in the state; has colorful stalactites and stalagmite formations and a small lake; supposed to have been used in prehistoric times and is referred to in the Indian tradition and legends.
	Naotche (Nachez) - On the flats below the ford of Tallaseehatchie Creek, about four miles west of Sycamore; a Natchez town; the people here were friendly to the whites and they took refuge with other tribes in Talladega County.
	Fort Williams Site - At the mouth of Cedar Creek, about six miles southwest of Fayetteville, and three miles below Talladega Springs, erected by General Andrew Jackson as a base of supplies shortly before the Battle of Horseshoe Bend, which was fought in 1814, now underwater (Lay Lake).
	Salt Creek Falls - Eight miles southeast of Munford near Salt Creek Road; 50 foot waterfall.
	Sulphur Springs - Talladega Springs, three miles west of Fayetteville; large boiling springs of sulphur water.
	Oakchinawa - On both banks of Oakchinawa Creek, or Salt Creek, near its influx into Big Shoal Creek; Upper Creek town of great antiquity.
	Chalykagay (Sylacoggy, Sauwanoos) - Near the present waterworks of the town of Sylacauga; town of great antiquity; inhabited as early as 1740; the name signifies or means "Buzzard's Roost."
	Coosa - May be oldest city in United States; DeSoto visited here in 1540; and it was already an old town of 30,000 to 50,000 residents.
	Fort Lashley Site (Leslie's Trading Post) - Near present town of Talladega; 1813; built by Alexander Leslie, around his trading post, for protection against hostile Indians.
	Gantt's Quarry - Sylacauga is built on a marble foundation; 32 miles long and 400 feet deep; marble taken from Gantt's Quarry, two miles from Sylacauga, for U.S. Supreme Court.
	Kymulga (Kiamulgy, Kayomulga) - In the western part of the county 14 miles southwest of Talladega; small Indian town near the old town of Coosa.
	Kymulga Covered Bridge - Between Childersburg and Alpine on Laniers Road; two-span, Town-type bridge, 105 feet long is near one of Alabama's most prominent grist mills.
	Kymulga Grist Mill - Between Childersburg and Alpine; 1864-1867; water power and old original turbines buildings; completely operated by water power.
	Pattillo's Mill - Carrsville; c. 1930; credited with developing self-rising corn meal.
	Prievil Forest - 5.3 miles northeast of Childersburg; a stand of gigantic hardwoods with possibly the largest white oaks east of the Rockies.
	Riddle's Old Mill - Near Talladega on Alabama Highway 77 by Talladega Creek; 1820; machinery made from some of the first Alabama iron; ruins.
	Sulphur Springs - Natural sulphur springs; health resort of the mid-19th Century.
	Swayne Hall - Talladega; 1879; three-story brick, built by the Freedman's Bureau as part of Talladega School.
	Talladega Court Square District - Town Square, Talladega; 39 structures include 1834 courthouse and late 19th Century commercial buildings.
	Talladega Furnace Site - U.S. Highway 231, just south of Talladega; 1889-1930; the International Furnace.
	Talladega Village - Between Cosa and Eufaula old town, a later day Upper Creek town.
	Waldo Covered Bridge - Four miles southwest of Talladega off Alabama 77; date of construction unknown, but may have been built as early as the turn of the century; one span, Town truss, 115 feet long. Partially restored; part of Alabama Hocutt Park.
Tallapoosa	Chattukchufaula - A short distance north of the present town of East Tallassee; Upper Creek town, home of Peter McQueen, Indian leader of 1813; destroyed 1813 by Indians friendly to the white settlers.
	Horseshoe Bend Battle - Now a National Military Landmark; in a bend of the Tallapoosa River, 12 miles north of Dadeville; also site of Fort Tohopeka; known by Indians as Cholocco Litabixee; March 26, 1814; scene of a battle between General Andrew Jackson and the Creek Red Sticks; Jackson's victory broke the power of the Creeks, and on August 9, 1814, they signed a peace treaty at Fort Jackson.

COUNTY	SITE AND LOCATION
Tallapoosa (cont'd)	Imuckfa - At the mouth of Imuckfa Creek near Horseshoe Bend; Upper Creek town used as a concentration point by the Creeks during the Creek War.
	Okfuski - On both banks of the Tallapoosa River at the mouth of Sandy Creek; largest town in the Creek Confederacy.
	Soapstone Quarry - Near Horseshoe Bend; Indian soapstone quarry; three of the largest soapstone bowls found in America have been found near Horseshoe Bend and are believed to have come from here.
	Suk-At-Ispoka - 12 miles upstream from Okfuski; Upper Creek town; here on May 14, 1760; the first white trader in what is now Alabama was killed by Indians.
	Archibald Patterson Cabin - Carrville, 1845; the notched log cabin has a double signifance: first, it stands on land which was completely controlled by the Creek Indian Nation until after 1830; second, the builder was the ancestor of the Patterson family whose prominence and leadership in the Tallassee area and the State has been continuous well over a century; structure is a large pioneer dwelling rustic design, end gable roof, shed roof porch, end exterior chimneys, three doors at front and shed addition at rear; notched, hewn timbers, foundation pillars and chimneys entirely of fieldstone.
	Emuckfaw Creek Battle - At influx of Emuckfaw Creek into the Tallapoosa River; January 21, 1914: battle between Jackson's forces and the Creeks; Creek victory.
	Enitachopoko, Battle of - 2½ miles northeast of Hackneyville; Creeks attacked Andrew Jackson; minor Creek victory.
	Hornsby's Mill - On Highway 50, 3½ miles north of Mountain Dam; 1870. Owner V. L. Boulware still uses mill for grinding corn.
	Instudshilaiki - Four miles south of mother town of Hillabee; small Hillabee village.
	Jackson's Oak - Near Horseshoe Bend; it is believed General Andrew Jackson held staff meetings under this tree's boughs in March 1814.
	Nafolee - A short distance from East Tallassee; Upper Creek town shown on Mitchell map of 1755.
	Niuyaka (Niuyaxa) - On the left bank of the Tallapoosa; a short distance above Horseshoe Bend; Upper Creek town.
	Okfuski Fort - Near Indian town of Idfuski; 1735; built by British to counteract the French influence among the Upper Creek Indians; result was a failure.
	Saugahatchi - On a stream by the same name; Upper Creek town in the northern part of the Creek Nation.
	Talimuchasi (Taluc-Mutchasi) - Across from Little Okfuski; Upper Creek town.
	Tallassee Mills - Tallassee, 1841; supplied mill goods to the Confederate Army and when it became necessary to move the arsenal at Richmond further south, the Tallassee facility was converted to production of weapons and ammunition.
	Ufawlee (Yufala) - Two miles downstream from Okfuski, and southwest of Horseshoe Bend; Upper Creek town and one of several of that name.
	Uktahassi - At the mouth of Sandy Creek, about five miles east of Kellyton; small branch Hillabee town.
Wilcox	Clifton Ferry Landing - South of the intersection of Highway 35 and the east bank of the Alabama River; early 19th century settlement; originally called Upper Standing Peach Tree for the peach trees found there, at the site of an abandoned Indian village during the 1813 Creek War; it was once an important cotton shipping point.
	Davis Ferry - Lower Peach Tree, ferry crossing to Monroe County; still in operation.
	Drake Field Mounds - Four miles south of Furman at property called Drake Fields; three mounds; privately owned.
	Hamburg Cemetery - Near Allentown Community; 19th century; rural cemetery where two Revolutionary and several Confederate veterans as well as many other early settlers are buried here; enclosed by an iron fence; owned by Bethel Associate Reformed Presbyterian Church.
	Humati - On the west bank of the Alabama River, north of Camden; Choctaw Indian town, probably visited by DeSoto in 1540; privately owned.
	Lower Peach Tree Community - ca. 1820; oldest settlement in the county; was a bustling 19th century commercial center on the Alabama River; Governor Benjamin M. Miller taught school here; the Methodist organized a church in 1825; early private schools, Lower Peachtree Academy and Montgomery Institute were established here about 1820.

COUNTY	SITE AND LOCATION
Wilcox (cont'd)	Uxapita - At the mouth of Pursley Creek, at its junction with the Alabama River, eight miles southwest of Camden; ancient Maubillian town.
	Wilcox Female Institute - Canton Street, Camden; built 1850; brick; two story; the rear is greatly changed; the original institute became a Presbyterian school and later Wilcox County High School; owned by Wilcox County.

NOTE: Special notation has been given to certain items and is indicated by the number (1) places appearing on the National Register of Historic Places, (2) places designated by historic highway markers, (3) places of scenic value recorded in the Appraisal of Potentials for Outdoor Recreation Development of each county, or (4) places included in the draft Inventory for the Statewide Plan prepared by the Alabama Historical Commission.

APPENDIX 21 -- A SYNOPSIS OF THE BARTRAM TRAIL RECOGNITION EFFORT, PREPARED BY THE ALABAMA HISTORICAL COMMISSION, DECEMBER 14, 1974.

Definition: The path traveled by William Bartram from Philadelphia to the Louisiana Delta through Alabama and several other Southern states in the 1770's. Bartram, a famous naturalist and botanist, entered Alabama in 1775 near Fort Mitchell in Russell County. He headed west through Macon, Elmore and Montgomery Counties and turned south through Lowndes, Butler, Conecuh, Monroe, Baldwin and Mobile Counties. He traveled extensively by canoe along both shores of Mobile Bay and touched upon or crossed the Chattahoochee, Coosa, Tallapoosa, Alabama, Tombigbee and Mobile Rivers in Alabama. Following an examination of the Mississippi and Louisiana coasts, the self-taught Bartram returned through Alabama in 1776. Bartram's Trail covered some 215 miles in Alabama.

Discoveries:

Botanical -- Franklinia (named for his close personal friend Benjamin Franklin, who later published his travels) and the Giant Primrose, still found fighting for survival in Baldwin and Monroe Counties.

Historical -- The French Fort Toulouse (in Elmore County near Montgomery) and its adjacent Indian mound and village, Fort Mitchell and Uchee Village, Fort Conde-Charlotte and the settlement called Mobile. Bartram also walked the future sites of Tuskegee, Fort Jackson, Tuskegee National Forest, Montgomery, the Battle of Holy Ground, Greenville, Blakley, Fort Morgan, Fort Gaines, Claiborne and portions of Interstates 85 and 65.

Collections -- Bartram, botanist to King George of England, collected samples, conducted studies and made excellent drawings of plants, birds, insects, reptiles, mammals and fish. His journal also includes excellent anthropological accounts of the Uchee and Alibamos (Creek Confederacy) and Choctaw Indians.

Proposals -- (1) To mark the Bartram Trail as part of America's Bicentennial Celebration in 1976. (2) To develop the Bartram Trail in Alabama and other states as a visual learning center for hikers, students, bicyclists and canoers where the botanical, zoological, geological, archaeological and historical features and landmarks may be explored and enjoyed in their natural settings. (3) To include the Bartram Trail in the National Trails Systems created in 1968, beginning with a feasibility study funded by the United States Congress.

Sponsors -- The Alabama Environmental Quality Association, the Garden Club of Alabama (Mrs. James T. Durden, Miss Martha McInnis, James J. Britton, Montgomery and others), the Alabama Conservancy (Mrs. Thomas Horne of Fairhope and others), the Alabama Historical Commission, the Sierra Club and the Alabama Revolutionary Bicentennial Commission.

APPENDIX 22 -- POPULATION AND EMPLOYMENT, ALABAMA RIVER BASIN.

Appendix Table 22A -- Urban-rural composition of the population, Alabama River Basin and subbasins, 1950 and 1970.

AREA & COMPOSITION	1950	1970
	----------Thousand----------	
Alabama River Basin		
Total population	949	998
Urban	474	655
Rural	475	343
Farm 1/	319.4	88.3
Alabama Subbasin		
Total population	298	308
Urban	162	213
Rural	136	95
Farm 1/	105.8	36.0
Tallapoosa Subbasin		
Total population	189	195
Urban	72	113
Rural	117	82
Farm 1/	76.9	19.4
Coosa Subbasin		
Total population	365	393
Urban	196	255
Rural	169	138
Farm 1/	117.1	29.0
Cahaba Subbasin		
Total population	96	102
Urban	44	74
Rural	52	28
Farm 1/	19.6	3.9

1/ Alabama Social Science's Advisory Committee estimates of 1970 farm population.

U. S. Bureau of the Census, Census of Agriculture, 1950 and 1970.

Appendix Table 22B -- Urban-rural composition of the population, Alabama River Basin and subbasins, 1990-2020.

ITEM	PROJECTED 1990	2000	2020
	------Thousand------		
Alabama River Basin			
Total population	1,203	1,324	1,624
Urban	887	1,045	1,365
Rural	316	279	259
Farm 1/	67.7	63.0	56.0
Alabama Subbasin			
Total population	374	413	496
Urban	287	332	416
Rural	87	81	80
Farm 1/	27.3	25.5	23.0
Tallapoosa Subbasin			
Total population	227	251	296
Urban	159	186	237
Rural	68	65	59
Farm 1/	14.5	13.6	12.2
Coosa Subbasin			
Total population	486	534	678
Urban	342	415	570
Rural	144	119	108
Farm 1/	22.7	20.9	18.2
Cahaba Subbasin			
Total population	116	126	154
Urban	99	112	142
Rural	17	14	12
Farm 1/	3.2	3.0	2.6

1/ Alabama Social Science's Advisory Committee estimates of farm population 1990 to 2020.

Economic Research Service, USDA, population projections.

Appendix Table 22C -- Unemployment rates in Alabama River Basin counties, and selected study areas, March 1973 to January 1975.

ITEM	PERCENT OF WORK FORCE UNEMPLOYED MAR. 1973	DEC. 1974	JAN. 1975
	--------------Percent	--------------	--------------
High unemployment			
Etowah	4.8	8.5	12.0
Bibb	6.0	11.2	11.9
Talladega	4.6	9.4	10.5
Lowndes	6.3	7.5	9.8
Calhoun	3.4	6.6	9.3
DeKalb	3.8	9.3	N.A.
Dallas	4.7	8.4	N.A.
Medium unemployment			
Lee	1.8	3.8	6.9
Randolph	2.7	4.7	6.8
Cleburne	4.1	6.2	N.A.
Coosa	3.3	3.3	6.2
Wilcox	3.9	6.0	N.A.
Montgomery	2.4	4.3	5.9
Jefferson	3.8	4.8	5.8
Monroe	3.8	5.7	N.A.
St. Clair	5.7	4.7	5.7
Shelby	3.8	4.4	5.4
Bullock	4.4	5.3	N.A.
Butler	4.0	5.0	N.A.
Low unemployment			
Perry	4.6	4.8	N.A.
Chilton	3.4	4.8	N.A.
Cherokee	7.6	4.8	N.A.
Elmore	2.4	3.5	4.8
Tallapoosa	2.0	4.8	4.2
Clay	2.0	4.3	4.1
Autauga	3.6	2.9	4.0
Chambers	1.8	3.4	3.7
Macon	2.0	3.8	2.6
Alabama basin	3.6	5.8	7.0
Alabama	3.8	5.7	7.2
Southeastern states	N.A.	N.A.	8.2
U. S.			8.2

Center for Business and Economic Research, University of Alabama.

N.A. -- Not available.

APPENDIX 23 -- AGRICULTURAL PRODUCTION, ALABAMA RIVER BASIN.

Appendix Table 23A -- Production of major farm products, 1975 with projections to 2020, Alabama.

		ALABAMA PRODUCTION		
COMMODITY GROUP	UNIT	1975	1990	2020
		---Thousands---		
Crops				
Corn	Bu.	35,000	33,000	50,000
Cotton	Bales	312	290	170
Peanuts	Lbs.	535,600	530,000	650,000
Soybeans	Bu.	31,440	38,500	61,000
Wheat	Bu.	3,240	4,400	6,500
Oats	Bu.	1,120	760	420
Grain Sorghum	Bu.	1,280	50	1/
Vegetables	Lbs.	230,300	278,000	270,000
Potatoes	Lbs.	137,800	278,000	275,000
Hay	Tons	1,134	770	870
Livestock Products 2/				
Beef and Veal	Lbs.	650,000	1,050,000	1,540,000
Pork	Lbs.	250,000	305,000	353,000
Poultry	Lbs.	1,500,000	2,480,000	3,776,000
Eggs	Doz.	250,000	340,000	491,000
Milk	Lbs.	686,000	450,000	226,000

1/ Less than 50,000 bushels.
2/ Livestock estimates are liveweight.

Source: Alabama Agricultural Statistics, 1975, Alabama Crop and Livestock Reporting Service, and ERS, USDA estimates of future production.

Appendix Table 23B -- Production of agricultural commodities, 1975, with projections to 2020 for the Alabama River Basin.

COMMODITY GROUP	UNIT	1975	PROJECTED 1990	2020
Crops	Thou			
Corn	Bu.	6,664	10,100	13,900
Cotton	Bales	93	54	22
Peanuts	Lbs.	7,488	4,500	23,000
Soybeans	Bu.	6,600	10,100	17,600
Wheat	Bu.	744	2,900	490
Oats	Bu.	337	195	285
Grain Sorghum	Bu.	435	0	0
Vegetables	Lbs.	73,700	123,000	203,000
Potatoes	Lbs.	10,875	18,000	156,000
Hay	Tons	468	470	670
Livestock Products	Mil			
Beef and Veal	Lbs.	240	345	530
Pork	Lbs.	72	49	65
Poultry	Lbs.	435	615	830
Eggs	Doz.	90	116	150
Milk	Lbs.	260	150	75

Source: Alabama Agricultural Statistics, 1975, and Economic Research Service estimates of future production.

APPENDIX 24 -- LAND USE, ALABAMA RIVER BASIN

Appendix Table 24A -- Agricultural land use, current and projected assuming no accelerated development, Alabama, the Alabama River Basin and its subbasins.

	1975	1990	2020
	Thousands of Acres		
Alabama			
Cropland in production 1/	3,420	2,247	2,215
Improved pasture	1,900	3,059	4,239
Total	5,320	5,306	6,454
Alabama Basin			
Cropland in production	823	614	591
Corn	123	148	128
Cotton	111	40	13
Peanuts	3	3	8
Soybeans	275	239	322
Wheat	30	75	12
Oats	10	4	3
Grain Sorghum	13	1	0
Vegetables	11	15	18
Potatoes	1	1	5
Hay	246	88	82
Improved pasture	700	1,024	1,473
Total	1,523	1,638	2,062
Alabama Subbasin			
Cropland in production	379	255	288
Corn	48	49	27
Cotton	42	8	5
Peanuts	2	1	1
Soybeans	126	123	175
Wheat	15	4	2
Oats	5	2	1
Grain Sorghum	10	0	0
Vegetables	7	3	16
Potatoes	1	0	0
Hay	123	65	61
Improved pasture	350	525	701
Total	729	780	989
Coosa Subbasin			
Cropland in production	278	235	159
Corn	48	46	47
Cotton	42	20	5
Peanuts	0	1	1

Appendix Table 24A -- Cont'd

	1975	1990	2020
	----------------Thousands of Acres------------		
Coosa Subbasin (Cont'd)			
Soybeans	94	90	90
Wheat	7	63	2
Oats	2	1	2
Grain Sorghum	1	0	0
Vegetables	1	3	2
Potatoes	0	1	5
Hay	82	10	5
Improved pasture	136	222	347
Total	414	457	506
Tallapoosa Subbasin			
Cropland in production	115	78	62
Corn	22	40	33
Cotton	20	4	2
Peanuts	1	1	0
Soybeans	27	13	12
Wheat	4	1	1
Oats	2	1	0
Grain Sorghum	1	1	0
Vegetables	1	8	0
Potatoes	0	0	0
Hay	37	9	14
Improved pasture	173	224	384
Total	288	302	446
Cahaba Subbasin			
Cropland in production	51	46	82
Corn	5	13	21
Cotton	7	8	1
Peanuts	0	0	6
Soybeans	28	13	45
Wheat	4	7	7
Oats	1	0	0
Grain Sorghum	1	0	0
Vegetables	1	1	0
Potatoes	0	0	0
Hay	4	4	2
Improved pasture	41	53	41
Total	92	99	123

Source: Statistical Reporting Service 1975 and projections developed by Economic Research Service USDA.

1/ Harvested, conservation land used for water disposal, and fallow land in rotation supporting production.

Appendix Table 24B -- Land Use Without Accelerated Resource Development, Alabama River Basin, 1970-2020

LAND USE	TIME	ALABAMA	CAHABA	COOSA	TALLAPOOSA	TOTAL BASIN
		--------------Thousands of Acres--------------				
Cropland harvested, fallow, or in water disposal	1970	289	39	226	99	653
	1990	255	46	235	78	614
	2020	288	82	159	62	591
Other cropland	1970	253	33	156	178	620
	1990	255	33	157	180	625
	2020	265	35	163	187	650
Improved pasture	1970	263	31	104	133	531
	1990	525	53	222	225	1,025
	2020	701	41	347	384	1,473
Unimproved pasture	1970	395	47	155	199	796
	1990	269	32	106	135	542
	2020	80	9	31	40	160
Forest land	1970	2,387	928	2,447	1,709	7,471
	1990	2,220	893	2,326	1,716	7,155
	2020	2,129	856	2,231	1,646	6,862
Urban and Other land	1970	129.7	107.4	307.6	137.3	682.0
	1990	184.6	126.1	346.4	116.6	773.7
	2020	230.2	155.9	454.6	122.0	962.7
Impounded water 1/	1970	65.0	11.0	94.7	74.3	245.0
	1990	73.1	13.3	97.9	79.0	263.3
	2020	88.8	18.0	104.9	88.6	300.3
Rivers and streams 2/	1970	6.3	1.6	4.7	4.4	17.0
	1990	6.3	1.6	4.7	4.4	17.0
	2020	6.0	1.1	4.5	4.4	16.0
TOTAL AREA		3,788	1,198	3,495	2,534	11,015

1/ Includes surface areas of large impoundments, small impoundments, oxbows, dead lakes, beaver ponds, borrow pit lakes, etc.

2/ Includes surface area of rivers and streams with drainage areas greater than one square mile.

Appendix Table 24C

URBAN LAND REQUIREMENTS

None of the areas are densely populated and are not expected to be by 2020. This statement is based in part on analysis of 1967 population densities for various sizes of cities in Alabama. CNI county-urban land use figures for 1967 were used to update land use information in the 1960 Census of Population in arriving at the estimated urban land area of all basin cities in 1967. These data were coupled with population estimates provided by the University of Alabama Bureau of Business Research to determine the densities shown in the table below.

Population density by size of city, Alabama, 1967. 1/

POPULATION	ACRES PER PERSON	PERSONS PER SQ. MILE
0-2,499	1.10	582
2,500-4,999	0.95	674
5,000-9,999	0.56	1,143
10,000-25,000	0.42	1,524
Over 25,000	0.25	2,560

1/ Developed from the 1967 CNI and population estimates provided by the Bureau of Business Research, University of Alabama.

The densities are quite low when compared to other areas. This condition is expected to continue in view of the level of projected population. Anniston was the most densely populated basin city in 1967, with 2,900 residents per square mile, followed by Montgomery (2,700), and Auburn (2,100).

Future land requirements for urban expansion can be estimated based on the projected urban population, population distribution by size of city, and the densities in the table above.

The projections in the table below indicates that more than 100,000 additional acres will be needed for urban development in the Study Area between 1967 and 1990. The most rapid urbanization and resulting loss of agricultural land will continue to be around Montgomery. Of the 104,000 acres projected to shift to urban uses by 1990, 28,000 acres (27 percent) are in the Montgomery SMSA (Standard Metropolitan Statistical Area).

Appendix Table 24C -- Cont'd

Urban land use projections to 2020, Alabama, and the Alabama River Basin and its subbasins.

AREA	1967	PROJECTED 1990	2000	2020
	Thousand Acres			
Alabama Statewide	1,364	1,908	2,145	2,690
Alabama River Basin	420	524	590	719
Coosa Subbasin	185	227	258	319
Alabama Subbasin	93	122	136	170
Tallapoosa Subbasin	88	105	117	135
Cahaba Subbasin	54	70	79	95

Source: CNI 1967 - ERS Projections.

METHODOLOGY AND ASSUMPTIONS IN STATE AGRICULTURAL MODEL

Grouping of Soils

Alabama soils were classified into 39 soil resource groups, hereafter referred to as SRG's on the basis of their degree of productivity and their hazards. Groupings were prepared with the assistance of the Soil Conservation Service Agronomist and State Soil Scientist. Soil groups are described in appendix 24E. Row crops could be produced on 17 groups. Fifteen SRG's would support improved pasture only, while 7 soil groups composed of beach areas and swamps were judged completely unproductive and not used in the model.

Land Availability and Use

The 1967 Alabama Conservation Needs Inventory (CNI) was selected as the appropriate land inventory for the study. The CNI is the only source of agricultural land use information by soil capability and by hydrologic subbasin, both necessary for the programming model. Alabama Crop and Livestock Reporting Service estimates were used to disaggregate CNI acreages to determine detailed cropland use by SRG, by subbasin, in the base year. The amount of land available for future agricultural production in each subbasin was projected by deducting non-agricultural land requirements for 1990 and 2020 from the 1967 land base. The remaining openland, i.e., cropland and pasture, was assumed to be available for agricultural use. Woodland clearing was not an option in the baseline assessment due to the large acreage of idle crop and pastureland available for production.

Yields

Technical yield guides prepared by the SCS were used to determine base (1967) yields for each enterprise by soil groups. Base yields assuming average management are shown in appendix 24F. Trends in Alabama yields for the period 1950 to 1970 were studied and projections developed for 1990 and 2020. These extrapolations were discussed with specialists at Auburn University and with the SCS Agronomist and State Resource Conservationist. Projected yields finalized during these meetings are also shown in appendix 24F. These are yields that can be expected under average management assuming improvements in crop varieties and fertilizers, and private expenditures for land and water development as in the past.

Cost and Returns

Production costs for the 21 crops considered in the model were estimated by soil groups from budgets prepared by Auburn University and the USDA. Cost per unit of output varied considerably depending upon the requirements of each SRG. Production inputs were assumed to increase at the same rate as had occurred during the past two decades, or about 1½ percent annually on a constant basis. Prices received for commodities were current normalized prices authorized for use in river basin planning by the Water Resources Council. These prices, however, had no effect upon the utimate solution, as the objective function was to minimize production costs rather than to maximize returns.

SOIL RESOURCE GROUP DESCRIPTIONS (SRG) 1/

Coastal Plain Soils

Group 1

Classes (1-12),2/ 1-11, 1-13. Deep, well drained soils on uplands and stream terraces. 0 to 2 percent slopes with slight erosion. Gray, brown or reddish-brown fine sandy loam surfaces and yellowish-brown, yellowish-red or red friable fine sandy clay loam to clay loam subsoils. May be underlain by loamy sand at three to five feet. Rapid to medium rate of infiltration. Permeability is moderate. Major soils are Cahaba, Kalmia, Norfolk, Orangeburg, Red Bay, and Ruston.

Group 2

Classes (2E-12, 3E-12), 2E-11, 2S-11, 2E-112, 3E-10, 3E-11. Deep, well drained soils on uplands and stream terraces. 2 to 8 percent slopes with slight to moderate erosion. Gray, brown or reddish-brown surfaces and yellowish-brown, yellowish-red or red fiable fine sandy loam, fine sandy clay loam to clay loam subsoils. May be underlain by beds of loamy sand at three to five feet. Water moves through the soil at a moderate rate. Storage of water for plant use is low to medium. Principally Cahaba, Kalmia, Norfolk, Orangeburg, Red Bay, Ruston, and Saffell soils.

Group 3

Classes (2E-15), 2E-13, 2E-14, 2E-16, 2S-12, 2S-14, 2S-15, 3E-16, 3E-17, 3E-111, 4E-11, 4E-12, 4E-111. Moderately deep to deep, moderately well to well drained soils on uplands and stream terraces. 2 to 5 percent slopes with slight erosion. Dark gray to light gray fine sandy loam or silt loam surfaces and yellowish-brown, yellowish-red to red firm clay subsoils which become plastic when wet and hard when dry. Water moves through the soils at a slow to very slow rate. Storage of water for use by plants is low to medium. Mostly Angie, Sawyer, and Shubuta soils.

Group 4

Classes (3E-14, 3E-15), 3E-19, 4E-15. Deep to moderately deep, moderately well drained soils on uplands. 2 to 8 percent slopes with slight to moderate erosion. Grayish brown fine sandy loam surface soils and brownish-yellow or red friable to-firm sandy clay subsoils which become mottled with gray at 15 to 30 inches. Subsoils are sticky when wet and hard when dry. Water moves through the soil at a slow rate. Storage of water for plant use is low to medium. Major soils are Sawyer and Shubuta.

1/ Soil groupings are based upon similarity of productivity, water hazards, and production costs. The descriptions given are for the dominant land capability unit (LCU) within each SRG and may not be entirely descriptive of minor soils in the group. The dominant LCU(s) is shown in ().

2/ Land capability units (LCU) are described in the SCS technical guide for field offices.

Group 5

Classes (2W-11), 2W-12, 2W-14. Deep, moderately well drained and well drained soils in depressions in the uplands and around stream heads and on broad flood plains. Brown friable fine sandy loam and loam surfaces and suboil. Water enters these soils at a medium rate and moves through the subsoil at a moderate rate. Storage of water and natural fertility are moderately high. Water may stand on these soils for short periods after rains. Principally Iuka and Ochlockonee soils.

Group 6

Classes (2W-16), 2W-13, 2W-15, 2W-17. Deep and moderately deep, moderately well drained to somewhat poorly drained soils on uplands and stream terraces. 0 to 2 percent slopes with slight erosion. Dark gray to gray sandy loam surfaces and yellowish-brown to pale yellow fine friable sandy loam or fine sandy clay loam upper subsoil and yellowish-brown mottled with gray and brown sandy clay loam or sandy clay lower subsoil. Water moves through the soils at a moderately slow rate. Storage of water is medium to low. Surface runoff after rains is slow. Major soils are Goldsboro, Irvington, Dothan, Ora, Angie, and Lynchburg.

Group 7

Classes (3S-11), 3S-110, 3S-120, 3S-19, 3S1EO, 3SO11, 3S-111. Deep, well drained to excessively drained soils on uplands and stream terraces with slight erosion on 0 to 5 percent slopes. Gray to brown loamy fine sand surfaces and subsoils. Water enters and moves through these soils at a very rapid rate. Storage of water is low to very low. Fertility and organic matter are very low. Fertilizer is leeched out rapidly. Mostly Americus, Eustis, Lakeland, and Alaga soils.

Group 8

Classes (4E-130), 3E-112, 3E-114, 3E-115, 3E-130, 3E-174, 4E-113, 4E-014, 4E-115, 4E-140. Moderately deep, moderately well drained soils on uplands. 5 to 12 percent slopes with slight to moderate erosion. Gray to brown fine sandy loam or gravelly fine sandy loam surfaces. Subsoils are yellowish-brown or yellowish-red friable sandy clay loam. Water moves through the upper subsoil at a moderate rate and through the lower subsoil at a slow rate. Storage of water is low. Principally Dothan, Gilead, Ora, and Prentiss soils.

Group 9

Classes (4W-11), 3W-11 through 3W-16, 4W-12, 4W-14, 4W-19. Deep, poorly drained and somewhat poorly drained soils on stream flood plans and uplands. Nearly level areas with slight erosion. Brown or gray fine sandy loam, loam or silt loam surfaces and gray mottled with yellow and brown fine sandy loam, loam, silt loam or sandy clay subsoils. Subsoils of the Leaf and Chastain series are sticky and plastic. These soils have a high water table and the Mantachie, Bibb and Chastain are subject to frequent overflow. Major soils include Bibb, Chastain, Leaf, Mantachie, Myatt, and Rains.

Group 10

Classes (5W-12), 5W-11, 5W-13. Deep, poorly drained to somewhat poorly drained soils on stream flood plains. These soils have gray to brown silt loam, loam or sandy loam surfaces and subsoils. Gray and yellow mottles occur at 0 to 24 inches below the surface. These soils will flood occasionally for long periods or frequently for short periods. Mostly wet alluvial land and poorly drained sandy alluvial soils. Severe flood damage conditions.

Group 11

Classes (4S-11), 4S-12, 4S-14, 4S-19, 4E-19. Excessively drained to moderately well drained soils on uplands with 5 to 8 percent slopes and slight erosion. Gray or brown loam fine sandy surfaces and subsoils. Water moves through these soils at a rapid rate. Low in organic matter and natural fertility and fertilizer leeches at a rapid rate. Principally Americus, Eustis, Chipley, Lakeland and Flomaton soils.

Group 12

Classes (6S-11), 5S-11, 6E-11 through 6E-14, 6E-19, 6S-12, 6S-19. Deep, excessively drained and somewhat excessively drained soils on uplands with 8 to 12 percent slopes and slight erosion. These soils have gray, brown, or reddish-brown loamy fine and surfaces and yellow-brown or red loamy fine sand subsoils. Water enters and moves through these soils at a rapid rate. Major soils include Americus, Eustis, and Lakeland.

Group 13

Classes (6E-113), 6E-111. Deep and moderately deep, well drained soils on uplands with 8 to 12 percent slopes that have lost more than 75 percent of the top soil. Reddish-brown or brown clay loam or sandy clay loam surfaces with a few areas of fine sandy loam. Subsoils are red, brown or yellow friable fine sandy loam or fine sandy loam. Water enters soil at a slow to medium rate and runoff may be very rapid. Mostly Lucedale, Carnegie, Greenville, Gilead, Luverne, Ora, Orangeburg, Red Bay, Ruston, and Saffell soils.

Black Belt Soils

Group 14

Classes (2E-22, 2E-24), 2E-21, 2E-26, 2S-21, 3E-21. Moderately deep, well drained alkaline and acid soils on prairie uplands with 1 to 3 percent slopes. Sumter soils have olive gray to dark gray clay or silty clay surfaces and gray or pale olive gray clay subsoils. Oktibbeha soils have greyish-brown sandy surfaces and red clay subsoils that are intensely mottled in the lower part. Infiltration and permeability are slow. Storage of water is moderately high. Fertility is medium. Primary soils are Sumter, Oktibbeha, and Houston.

Group 15

Classes (3E-23, 3E-22, 2E-23), 3E-24 through 3E-26, 4E-23, 4E-29, 4E-22. Moderately deep, moderately well drained, strongly acid soils on uplands in the prairie section with slopes ranging from 1 to 5 percent. These soils are underlain by calcareous material at 24 to 48 inches. They have reddish-brown clay surfaces and red clay subsoils that are mottled in the lower part. Water enters these soils slowly but their capacity to store water for plant use is moderately high. Principally Oktibbeha soils.

Group 16

Classes (4E-25), 2E-24, 3E-222, 3E-253, 4E-222, 4E-223, 4E-225. Shallow to moderately deep, moderately well drained and somewhat poorly drained acid soils on prairie uplands with slopes between 3 to 8 percent. Erosion has been moderate to severe. In some areas the underlying calcareous material is less than 20 inches below the surface. Water enters these soils slowly and surface runoff is rapid. Fertility is low. Mostly Vaiden soils.

Group 17

Classes (2W-23, 2W-21, 2W-22). Deep, moderately well drained to somewhat poorly drained, alkaline, local alluvial soils at the head of small streams and on prairie stream flood plains. Dark gray to black plastic clay surfaces and gray to dark olive gray plastic clay subsoils. Infiltration and permeability are slow. Natural fertility is high and capacity to store water for plant use is moderately high. Major soils are Trinity and Catalpa.

Group 18

Classes (4W-23), 3W-21 through 3W-24, 4W-21, 4W-22. Deep, poorly drained and somewhat poorly drained, medium to strongly acid soils on prairie uplands and stream terraces with 0 to 1 percent slopes. These soils have dark grayish-brown sandy loam, silty clay or clay surfaces and gray mottled clay subsoils. Infiltration, permeability and surface runoff are slow. Capacity to store water for plant use is medium. Fertility is medium. These soils flood frequently. Primary soils include Eutaw, Una, and Leeper.

Group 19

Classes (6E-24), 6E-22, 6E-29. Shallow to moderately deep, well drained to somewhat poorly drained acid and alkaline soils on prairie uplands and stream terraces with slopes ranging from 3 to 12 percent. Oktibbeha and Vaiden soils have grayish-brown thin sandy or clayey soils surface and red or yellowish-brown clay or silty clay subsoils that are mottled in the lower part. Binnsville soils have gray to dark gray surfaces and light gray very hard chalk subsoils. Fertility and organic matter content are low. Permeability is very slow and surface runoff is rapid. Major soils include Oktibbeha, Vaiden and Binnsville.

Piedmont Soils

Group 20

Classes (2E-31), 1-31, 1-32, 2E-32. Deep, and moderately deep well drained soils on uplands and stream terraces, Slopes are 0 to 6 percent with slight to moderate erosion. Brown or reddish-brown sandy loam, loam or silt loam surfaces and red or dark red friable to firm sandy clay or clay subsoil. Infiltration is moderate to rapid and permeability is moderate. Storage of water is medium. Mostly Cecil, Madison, Davidson, and Wickham soils.

Group 21

Classes (3W-32), 2W-32, 2W-34. Deep, moderately well drained to somewhat poorly drained soils on stream flood plains with 0 to 2 percent slopes. They have brown fine sandy loam or silt loam surfaces and brown mottled with gray silt loam or fine sandy loam friable subsoils. Water and air moves through the soils at a rapid rate. The soils are flooded frequently for periods of one to two days. Includes Chewacla soils.

Group 22

Classes (3W-31, 2W-31). Moderately deep, moderately well to somewhat poorly drained, soils on stream terrace and uplands. Slopes are 0 to 6 percent. Grayish-brown sandy loam surfaces and grayish-brown mottled with brown firm silty clay or sandy clay subsoils. Movement of air and water through these soils is slow. Water may stand for short periods after rains. Major soils are Augusta, Colfax, and Altavista.

Group 23

Classes (3E-31, 4E-31), 3E-32, 3E-34, 4E-32. Deep and moderately deep, well drained soils on uplands and stream terraces. Slopes are 6 to 15 percent with slight to moderate erosion. Brown or reddish-brown sandy loam, gravelly silt loam or gravelly sandy loam and friable to firm sandy clay or silty clay subsoils. Infiltration is medium and permeability is moderate. Storage of water is low to moderately high. Primary soils are Appling, Cecil, Madison, Helena, Gwinnett, Mecklenburg, and Wickham.

Group 24

Classes (4E-331), 2E-312, 2E-330, 2E-340, 3E-33, 3E-39, 3E-312, 3E-331, 3E-335, 3S-31, 4E-33, 4E-39, 4E-332. Moderately deep, well drained, soils on uplands and stream terraces slopes are 10 to 15 percent with severe erosion. Yellowish-brown, brown or reddish-brown sandy loam, gravelly silt loam or gravelly sandy loam surfaces and yellowish-brown, yellowish-red or red friable to firm sandy clay subsoils. Movement of air and water through these soils is moderate. Storage of water is medium. Includes Appling, Cecil, Helena, Gwinnett, Mecklenburg, Madison, Vance, and Wickham soils.

Group 25

Classes (4W-31), 5W-31, 5W-32. Deep, poorly drained soils on nearly level stream terraces and flood plains. Dark gray silt loam and sandy loam surfaces and mottled gray, yellow and brown silty clay and sandy clay subsoils. Water stands on these soils for long periods. Mostly Roanoke, Wehadkee, and poorly drained alluvial soils.

Group 26

Classes (6S-31, 6E-31), 6E-32, 6E-34, 6E-39. Moderately deep and shallow well drained, soils on uplands slopes are 6 to 25 percent. Slopes with slight to severe erosion. These soils have stony sandy loam or stony sandy clay loam surfaces and yellowish-red to red sandy clay or clay subsoils. Water and air move through these soils at a moderate rate. Storage of water in these soils for plant use is low to medium. Major soils are Appling, Cecil, Gwinnett, Louisa, Louisburg, Madison, and Wilkes.

Group 27

Classes (6E-331), 6E-335, 6E-339, 6E-341. Moderately deep, well drained soils on uplands. Slopes are 15 to 25 percent slopes with severe erosion. They have yellowish-brown, brown or reddish-brown sandy clay loam or gravelly sandy clay loam surfaces and yellowish-brown, yellowish-red or red friable to firm sandy clay subsoils. Water and air move through the soil at a moderate rate. Storage of water for plant growth is low to medium. Principally Appling, Cecil, Gwinnett, and Madison soils.

Limestone and Shale Soils

Group 28

Classes (1-43), 1-41, 1-42, 1-460, 1-510. Deep, well drained, nearly level, friable soils, developing in local alluvium. Commonly in depressional areas, and along narrow drainageways and draws. Grasmere soils are red to dark reddish-brown throughout. Staser and Priutton soils generally are somewhat coarser in texture than the Grasmere. Major soils are Grasmere, Priutton, and Staser.

Group 29

Classes (2E-42, 2E-45), 2E-41, 2E-43, 2E-44, 2E-48, 2E-49, 2E-451. Moderately deep and deep, well drained, and moderately well drained permeable soils on uplands, stream terraces, and footslopes on the plateaus, and on stream terraces and footslopes in the valleys. Slopes range from 2 to 6 percent, and the erosion is slight to moderate. Friable grayish-brown, and dark reddish-brown fine sandy loam, or silty loam surface soils, five to eight inches thick, that may be gravelly or shaly, and friable to firm, yellowish-brown, yellowish-red to dark red sandy clay loam, clay loam, or silty clay loam subsoils which may also be gravelly or shaly. Mostly Allen, Linker, Hartsell, Dickson, Locust, Decatur, Dewey, and Wynnville. Dickson, Locust and Wynnville soils have a fragipan.

Group 30

Classes (2W-41), 2W-42, 2W-45. Deep, well drained and moderately well drained soils with somewhat poorly drained inclusions. In local and general alluvium positions on the plateaus and in the valleys. Surface soil and subsoil textures range from fine sandy loam, loam, silt loam, and silty clay loam. The moderately well-drained soils will have drainage mottles at about 18 inches in depth, whereas the well drained soils are mottle free to a depth of at least 30 inches. Subject to not more than moderate damage from ponding or stream overflow. Major soils are Pruitton, Lobelville, and Ellisville.

Group 31

Classes (3W-41), 3W-42, 3W-43, 3W-48. Deep, moderately well drained to poorly drained, nearly level, medium and fine textured soils developing in local and general alluvium in depressional areas, at the heads of and along narrow drainageways and draws, on first bottoms and flood plains, and on plateaus. The soils are subject to not more than moderate crop damage from excess standing water, ponding, or stream overflow. The water table is at or near surface during wet seasons. Primarily Taft, Lee, Gaylesville, and Tupelo soils.

Group 32

Classes (3E-42, 3E-43), 2S-42, 2S-44, 2S-45, 3E-41, 3E-45, 3E-441, 3E-442, 3E-443, 2S-43, 2S-451. Moderately deep and deep, well drained, permeable soils on uplands, stream terraces, and footslopes on the plateaus, and on stream terraces and footslopes in the valleys. Baxter, Fullerton, Minvale, and Bodine soils are Cherty derived principally from limestone. Slopes range from 6 to 10 percent, and the erosion is slight to moderate. They have friable grayish-brown, dark brown, and dark, reddish-brown, fine sandy loam and loam surface soils, that may be gravelly or shaly, five to eight inches thick, and friable to firm, yellowish-brown, yellowish-red to dark red sandy clay loam or clay loam subsoils which may also be gravelly or shaly. Includes Allen, Hartsells, Holston, Minvale, Fullerton and Waynesboro soils.

Group 33

Classes (4E-43), 4E-41, 4E-42, 4S-42. Moderately deep and deep, well drained permeable cherty soils on uplands and footslopes in the limestone valleys and chert ridges derived principally from cherty limestone. Slopes range from 10 to 15 percent. Erosion is slight to moderate. Friable grayish-brown to dark brown, cherty silt loam surfaces five to eight inches thick, and friable yellowish-brown, yellowish-red, or dark red cherty silty clay subsoils. Mostly Fullerton, Dellrose, and Bodine.

Group 34

Classes (4E-441), 4E-442 through 4E-445, 3E-444, 3E-445, 4E-448, 4E-449, 3E-446, 3E-449, 4E-446. Moderately deep and deep, well drained, permeable severely eroded soils on uplands, stream terraces, and footslopes in the limestone valleys. Some friable cherty soils. Slopes range from 6 to 10 percent. Thin reddish clay loam, silty clay loam, silty clay or clay surface layers over red to dark-red firm clay loam, silty clay loam, silty clay, or clay subsoils. May be shaly in places. Major soils are Decatur, Dewey, Fullerton, Minvale, and Etowah.

Group 35

Classes 4W-41. Deep, poorly drained, medium and fine-textured soils in upland depressions and on low stream terraces. Surface soils are faintly to distinctly mottled silt loams and fine sandy loams, 6 to 18 inches thick. Subsoils are distinctly to prominently mottled silt loams to silty clay loams. Water may stand on these soils for long periods after intensive rains or prolonged wet periods. Chiefly Guthrie and Dowellton soils.

Group 36

Classes (3E-44), 3E-49, 4E-44, 4E-45. Moderately deep to deep, well drained soils on uplands derived primarily from shales with some sandstone influence. Slopes range from 2 to 15 percent and the erosion is slight to moderate. Friable grayish-brown very fine sandy loam, loam, or silt loam surface soils, five to seven inches thick, and yellowish-brown to yellowish-red or red friable silty clay loam to firm silty clay or clay subsoils. Mostly Albertville, Nectar and Enders soils.

Group 37

Classes (4E-49), 3S-41, 3E-46, 3E-48, 4E-46, 4E-48. Moderately deep to shallow, well drained soils on uplands derived from sandstones and shales. Slopes range from 6 to 10 percent, and the erosion is slight to moderate. Friable, medium textured surface soils that may or may not be gravelly or shaly, and friable to firm medium to fine textured subsoils. Depth to bedrock ranges from 12 to 40 inches. Major soils are Hector, Montevallo, and Townley.

Group 38

Classes (6E-49, 6E-43), 6E-42, 6E-44, 6E-46, 6E-48, 6S-42, 6S-48, 6S-49. Deep to shallow, well drained to excessively drained upland soils derived from sandstone, shale, and cherty limestone. Slopes range from 10 to 25 percent, and the erosion is slight to moderate. Friable, medium-textured surface soils and friable to firm medium to fine textured subsoils. Depth to bedrock ranges from 10 to 60 inches or more. Mostly Enders, Hartsells, Montevallo, Fullerton, and Bodine soils.

Group 39

Classes (6E-441, 6E-443), 6E-442, 6E-446, 6E-448, 6E-449. Moderately deep and deep, well drained permeable, cherty and severely eroded soils on uplands, stream terraces, and footslopes in the limestone valleys and on the plateaus. Slopes range from 10 to 25 percent. Friable, fine textured surface soils and subsoils that may be gravelly, shaly, or cherty in places. Primary soils include Decatur, Dewey, Albertville, and Enders.

APPENDIX 24F -- Crop yields without accelerated water resource development, Alabama, 1967-69, and 1990.

SOIL GROUP 1/	Corn		Soybeans		Wheat		Oats		Grain Sorghum		Cotton		Peanuts		Vegetables		Irish Potatoes	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
	Yield Per Acre																	
	Bushels		Bushels		Bushels		Bushels		Bushels		Pounds		Pounds		Cwt		Cwt	
1	54	75	27	36	31	41	54	70	35	49	628	832	1,650	2,275	76	95	140	195
2	49	69	26	38	26	35	53	69	34	48	536	711	1,486	2,050	62	77	120	170
3	38	54	21	28	22	26	49	57			376	500	1,250	1,525				
4	29	41	22	27	20	24	43	50	33	46	365	486	1,170	1,425				
5	69	97	35	46	22	29	69	90			614	810	1,580	1,930	58	73		
6	52	71	27	36	22	29	53	61	29	41	360	477	1,430	1,860			160	225
7	32	39	20	27	21	28	44	57			295	320	1,355	1,870	42	53		
8	24	34			19	26	38	49			266	351						
9			16	22														
14	38	53	29	39	30	40	51	66	33	46	398	526			47	59		
15	30	42	20	27	23	30	36	47	30	42	277	369						
16	23	32			18	24	25	32										
17	57	80	34	46	33	44	55	71	37	52	418	558			48	60		
20	42	59					50	65			436	580			42	53		
21	75	100																
22	40	56					40	52										
23	38	49					40	52			337	446						
24							22	29			270	360						
28	80	108	41	55	36	48	89	115			706	945			62	77	150	210
29	59	83	27	36	29	43	74	96	38	53	653	868			53	66	180	235
30	60	88	37	50	29	39	59	77			624	832			50	62		
31	40	56	29	39			36	47	33	46								
32	56	78	27	34	25	33	69	90			607	806			42	52		
34	35	59	20	27	18	24	53	69			414	554						
36	40	56	22	30	21	28	56	73			472	608			31	39		
37	20	28																

(1) Base condition yields, 1967-1969.

(2) Projected yields, 1990, assuming normal increases in technology and management.

1/ Soil groups not used for a specific crop are omitted in this table.

APPENDIX 24G -- Hay and Improved pasture yields without accelerated water resource development, Alabama, 1967-69, and 1990.

SOIL GROUP	HAY						IMPROVED PASTURE					
	Coastal Bermuda		Johnson Grass		Serecia & Coastal		Bahia		Dallisgrass-Clover		Fescue	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
	Yield Per Acre											
	Tons		Tons		Tons		AUM 1/		AUM 1/		AUM 1/	
1	5.4	7.3					5.8	7.6				
2	4.2	5.7					5.1	7.1				
3	3.4	4.6					4.2	4.9				
4	2.6	3.5					3.8	4.4				
5	4.8	6.5					7.0	8.6				
6	3.6	4.9					5.3	6.9				
7	2.4	3.2					3.7	4.5				
8	2.4	3.2					3.8	4.4				
9							3.8	5.5				
10							3.0	4.5				
11							3.3	4.1				
12							2.9	3.6				
13							2.3	3.0				
14			2.4	3.2					4.7	6.0		
15			1.8	2.4					4.3	5.6		
16			1.7	2.3					3.7	5.2		
17			2.9	3.9					9.0	9.7		
18			1.9	2.6					7.0	7.5		
19			1.3	1.8					2.5	3.5		
20					3.4	4.6					5.5	7.4
21					1.9	2.9					6.5	8.2
22					1.8	2.4					5.7	7.4
23					2.8	3.7					4.5	6.4
24					2.7	3.6					4.3	5.9
25											5.8	7.1
26											3.5	5.0
27											3.0	4.5
28	4.9	6.5									5.8	7.6
29	4.0	5.4									6.0	7.9
30	4.5	6.1									6.3	8.2
31											5.9	7.5
32	3.2	4.3									3.8	5.5
33	3.3	4.4									3.5	5.0
34	2.5	3.4									3.0	4.5
35											3.0	4.2
36	2.5	3.3									3.3	5.1
37	2.4	3.2									2.5	3.7
38											2.3	3.4
39											2.7	3.9

(1) Base condition yields, 1967-1969.
(2) Projected yields, 1990, assuming normal increases in technology and management.

1/ Animal unit months of grazing.

APPENDIX 25 -- FLOOD PROBLEMS, ALABAMA RIVER BASIN.

Appendix Table 25A -- Communities having flood problems by source, by counties, Alabama River Basin, 1974.

COMMUNITY NAME/POPULATION	SOURCE(S) OF FLOODING
Autauga County	
Autaugaville, Town of/870	Swift, Whitewater, Yellowater Creeks
Prattville, City of/13,116	Auatuga Creek
Bibb County	
Brent, Town of/2,100	Local drainage
Centreville, Town of/2,233	Cahaba River
West Blocton, Town of/1,800	Local drainage
Bullock County	
Union Springs, Town of/4,324	Town Creek, Local drainage
Calhoun County	
Alexandria/600	Alexandria Branch
Anniston, City of/31,637	Snow Creek
Coldwater/300	Coldwater & Choccolocco Creeks
Hobson City, City of/1,124	Secondary drainageways
Jacksonville, City of/7,715	Jacksonville Branch
Oxford, City of/6,486	Snow & Choccolocco Creeks
Piedmont, City of/5,063	Nance Creek & Tributaries
Weaver, City of/2,091	Weaver
West Anniston/5,515	Secondary drainageways
Chilton County	
Clanton, Town of/5,885	Poley & Goose Pond Creeks
Coopers/596	Chestnut Creek
Maplesville, Town of/200 est.	Mulberry Creek
Dallas County	
Hwy. 14 East/300	Alabama River & Local drainage
Orrville, Town of/400	Local drainage
Selma, City of/30,000	Alabama River & Local drainage
Selmont/2,500	Alabama River & Local drainage
DeKalb County	
Collinsville, Town of/1,271	Stream overflow & Local drainage
Fort Payne, Town of/8,435	Stream overflow & Local drainage
Valley Head, Town of/470	Stream overflow & Local drainage

Appendix Table 25A -- Cont'd

COMMUNITY NAME/POPULATION	SOURCE(S) OF FLOODING
Elmore County	
Millbrook, Town of/3,513	Alabama River, Mill Creek
Tallassee, Town of/3,404	Tallapoosa River, Graveyard Creek
Wetumpka, Town of/3,786	Coosa River
Coosada	Coosada Creek
Etowah County	
Attalla, City of/7,510	Little Wills, Big Wills, & Dry Creeks
Gadsden, City of/53,928	Black Creek, Big Wills Creek & Coosa River
Glencoe, Town of/2,901	Air Service Depot Branch
Coats Bend/500	Coosa River
Southside, Town of/500	Coosa River
Tidmore Bend/1,000	Coosa River
Tillison Bend/1,000	Coosa River
Wills Valley/880	Big Wills, Little Wills Creeks
Whorten Bend/2,000	Coosa River
Jefferson County	
Birmingham, City of/300,910	Shades, Five Mile, Village Creeks
Homewood, City of/20,958	Shades Creek
Hoover, Town of/1,393	Patton Creek
Irondale, Town of/3,143	Shades Creek
Leeds, City of/6,979	Little Cahaba River
Mountain Brook, City of/19,287	Shades Creek
Vestavia Hills, City of/8,323	Patton Creek
Trussville, City of/2,923	Little Cahaba River
Lee County	
Auburn, City of/22,767	Sougahatchee, Moores Mill, & Parkerson Mill Creeks
Opelika, City of/19,027	Sougahatchee, Hallawakee, & Chewacla Creeks
Lowndes County	
Benton, Town of/115	Alabama River, Old Town Creek & Big Swamp Creeks

Appendix Table 25A -- Cont'd

COMMUNITY NAME/POPULATION	SOURCE(S) OF FLOODING
Macon County	
Armstrong/75	Local drainage
Fort Davis/100	Local drainage
Hardaway/75	Local drainage
Milstead/50	Local drainage
Notasulga, Town of/833	Local drainage
Roba/50	Local drainage
Tuskegee, City of/11,028	Local drainage
Monroe County	
Monroeville, City of/4,846	Local drainage (sinks)
Montgomery County	
Montgomery, City of/133,386	Alabama River, Catoma Creek, White's Slough, Geneta Ditch
Perry County	
Cunningham/40	Washington Creek
Hamburg/25	Boguechitto Creek
Heiberger/45	Cahaba River
Marion/4,289	Rice Creek
Sprott/20	Cahaba River
Suttle/15	Cahaba River
Randolph County	
Wadley, City of/700	Tallapoosa River
Roanoke/5,200	High Pine Creek
St. Clair County	
Ashville, City of/986	Canoe Creek
Moody, Town of/504	Little Cahaba River
Odenville, Town of/533	Beaver Creek
Pell City, City of/5,602	Dye Creek
Ragland, Town of/1,239	Trout Creek
Shelby County	
Alabaster/4,300	Buck Creek
Pelham/3,047	Buck Creek
Cahaba Valley/400	Cahaba Valley Creek
Montevalla/3,700	Shoal Creek

COMMUNITY NAME/POPULATION	SOURCE(S) OF FLOODING
Talladega County	
Childersburg, City of/4,200	Talladega Creek, Tallaseehatchie Creek, & Trib. Surface water
Lincoln, Town of/1,127	Blue Eye Creek
Sylacauga, City of/12,255	Shirtee Creek & Surface drainage
Talladega, City of/17,662	Isbell Branch & Trib. surface drainage
Tallapoosa County	
Alexander City/12,358	Hillabee Creek Tribs.
Dadeville/2,847	Sandy Creek

Source of Data: HUD Type 21 Flood Insurance Study July 1973, prepared by the Soil Conservation Service and supplemented by data from the Alabama Development Office and the Corps of Engineers.

Appendix Table 25B -- Flood plain areas along the principal streams, Alabama River Basin, 1/

			FLOOD PLAIN AREA IN ACRES				
	STREAM MILE 2/		RURAL				
STREAM	FROM	TO	CLEARED	WOODS	TOTAL	URBAN	TOTAL
Coosa River	569.6	540.1	100	100	200	-	200
Coosa River	540.1	520.7	5,000	3,600	8,600	-	8,600
Coosa River	520.7	493.4	6,800	6,700	13,500		13,500
Coosa River	493.4	462.4	5,100	5,100	10,200	1,000 3/	11,200
Coosa River	462.4	414.1	1,700	3,200	4,900	-	4,900
Coosa River	414.1	333.3	4,800	2,700	7,500	1,780 4/	9,280
Coosa River	333.3	314.4	3,500	4,100	7,600	350 5/	7,950
Subtotal for Coosa River	569.6	314.4	27,000	25,500	52,500	3,130	55,630
Alabama River	314.4	245.4	33,700	25,700	59,400	1,650 6/	61,050
Alabama River	245.4	203.9	21,400	13,800	35,200	6,000 7/	41,200
Alabama River	203.9	142.3	21,500	16,300	37,800	-	37,800
Alabama River	142.3	36.6	18,100	75,000	93,100	-	93,100
Alabama River	36.6	0.0	-	-	-	-	-
Subtotal for Alabama River	314.4	0.0	94,700	130,800	225,500	7,650	233,150
Tallapoosa River	137.7	123.6	1,000	1,000	2,000	-	2,000
Tallapoosa River	123.6	112.2	1,400	1,500	2,900	-	2,900
Tallapoosa River	112.2	92.0	2,500	2,900	5,400	-	5,400
Tallapoosa River	49.7	0.0	25,100	20,600	45,700	-	45,700
Subtotal for Tallapoosa River	137.7	0.0	30,000	26,000	56,000	-	56,000
Cahaba River	88.8	64.8	4,900	5,700	10,600	-	10,600
Cahaba River	64.8	25.1	14,100	15,900	30,000	-	30,000
Cahaba River	25.1	8.2	8,800	4,000	12,800	-	12,800
Subtotal for Cahaba River	88.8	8.2	27,800	25,600	53,400	-	53,400
TOTAL FOR BASIN WITHIN ALABAMA			179,500	207,900	387,400	10,780	398,180

Appendix Table 25B -- Cont'd

1/ Adapted from Corps of Engineers Data, Mobile District; area based on approximately the 100 year storm.

2/ Miles shown are from the mouth of each respective river except that miles for Coosa River are from mouth of Alabama River.

3/ Gadsden, Alabama

4/ Childersburg, Alabama

5/ Wetumpka, Alabama

6/ Montgomery, Alabama

7/ Selma and Selmont, Alabama

Appendix Table 25C -- Estimated average annual damage along the principal streams, Alabama River Basin. 1/

STREAM	STREAM MILE 2/ FROM	TO	AGRICULTURAL DAMAGE CROPS	OTHER THAN CROPS	SUBTOTAL	ROADS AND RAILROADS	URBAN	TOTAL
			dollars					
Coosa River	569.6	540.1	600	1,400	2,000	2,000	-	4,000
Coosa River	540.1	520.7	2,000	3,000	5,000	-	-	5,000
Coosa River	520.7	493.4	6,000	31,000	37,000	8,000	-	45,000
Coosa River	493.4	462.4	38,000	46,000	84,000	11,000	40,000 3/	135,000
Coosa River	462.4	414.1	12,900	8,100	21,000	4,000	-	25,000
Coosa River	414.1	333.3	3,800	5,200	9,000	-	5,000 4/	14,000
Coosa River	333.3	314.4	31,700	9,300	41,000	1,000	3,000 5/	45,000
Subtotal for Coosa River	569.6	314.4	95,000	104,000	199,000	26,000	48,000	273,000
Alabama River	314.4	245.4	71,000	17,000	88,000	4,000	178,000 6/	270,000
Alabama River	245.4	203.9	45,800	11,200	57,000	2,000	201,000 7/	260,000
Alabama River	203.9	142.3	40,800	10,200	51,000	-	-	51,000
Alabama River	142.3	36.6	112,700	27,300	140,000	14,000	-	154,000
Alabama River	36.6	0.0	-	-	-	-	-	-
Subtotal for Alabama River	314.4	0.0	270,300	65,700	336,000	20,000	379,000	735,000
Tallapoosa River	137.7	123.6	16,000	4,000	20,000	2,000	-	22,000
Tallapoosa River	123.6	112.2	31,800	8,200	40,000	3,000	-	43,000
Tallapoosa River	112.2	92.0	7,300	2,700	10,000	2,000	-	12,000
Tallapoosa River	49.7	0.0	88,700	24,300	113,000	1,000	-	114,000
Subtotal for Tallapoosa River	137.7	0.0	143,800	39,200	183,000	8,000	-	191,000

Appendix Table 25C -- Cont'd

STREAM	STREAM MILE 2/ FROM	TO	AGRICULTURAL DAMAGE CROPS	OTHER THAN CROPS	SUBTOTAL	ROADS AND RAILROADS	URBAN	TOTAL
			-----------------	-----------------	dollars	-----------------	-----------------	-----------------
Cahaba River	88.8	64.8	13,000	8,000	21,000	2,000	-	23,000
Cahaba River	64.8	25.1	23,500	13,500	37,000	3,000	-	40,000
Cahaba River	25.1	8.2	30,500	15,500	46,000	8,000	-	54,000
Subtotal for Cahaba River	88.8	8.2	67,000	37,000	104,000	13,000	-	117,000
TOTAL FOR BASIN WITHIN ALABAMA			576,100	245,900	822,000	67,000	427,000	1,316,000

1/ Adapted from Corps of Engineers Data, Mobile District.
2/ Miles shown are from the mouth of each river; Coosa River mileage is from mouth of Alabama River.
3/ Gadsden, Alabama
4/ Childersburg, Alabama
5/ Wetumpka, Alabama
6/ Montgomery, Alabama
7/ Consists of $145,000 at Selma and $56,000 at Selmont, Alabama.

Appendix Table 25D -- Estimated flood plain land use and flood damage by watersheds and subbasins, Alabama River Basin, 1972.

WATERSHED	CNI NO. 1/	AVG. NO. DAMAGING FLOODS PER YEAR	DRAINAGE AREA	FLOOD PLAIN LAND USE DISTRIBUTION: FLOOD PLAIN	CROPLAND	PASTURE	FOREST	MISC.	AVERAGE ANNUAL FLOOD DAMAGE: CROP AND PASTURE	OTHER AND INDIRECT	TOTAL	SEDIMENT DAMAGE (PERCENT OF TOTAL FLOOD DAMAGE)
Alabama River Subbasin (35a)												
			Acres						Dollars			
Mulberry River	1,2,4,5	1.5	174,296	17,430	2,614	3,486	10,458	872	48,800	18,300	67,100	40
Valley Creek	3,12,15,16	4.5	55,727	2,786		418	2,368		3,300	1,300	4,600	20
Little Mulberry Creek	6,7	1.5	76,529	7,653	77	383	7,193		3,700	1,400	5,100	55
Swift Creek	8,9	1.5	97,820	7,782	98	489	9,195		4,700	1,800	6,500	60
Upper Ala.-West Tribs.	10,11,13,14, 19,20	1.5	210,300	21,030	210	631	20,189		6,700	2,500	9,200	55
Blue Girth Beech Creek	17	1.5	43,210	12,963	1,296	4,926	6,482	259	49,800	18,700	68,500	30
Upper Alabama Tribs.	18,32-36	2.25	164,589	32,918	2,633	5,267	24,689	329	63,200	23,700	86,900	15
Galbraith Mill Creek	22	1.5	33,595	11,785	5,892	1,179	2,946	1,768	56,600	21,200	77,800	5
Boguechitto Creek	23-27,29,30	2.25	225,557	22,557	2,256	4,511	15,790		54,100	20,300	74,400	10
Middle Alabama Tribs.	28,31,44,55	2.25	180,891	9,045		905	8,140		7,200	2,700	9,900	10
Wilcox Tribs.	42,43,53,54, 58,59,63,64,67	3.0	428,201	25,692		3,854	21,838		30,800	11,600	42,400	10
Cypress (Lowndes) Creek	38	4.5	29,766	2,977	60	893	2,024		7,600	2,900	10,500	5
Pintlalla-Tallawassee Creek	39,40,47-49	4.5	195,492	25,413	254	9,657	15,248	254	79,300	29,300	108,600	5
Catoma Creek	41,50-52	4.5	243,056	24,306		10,937	10,937	2,432	87,500	32,800	120,300	5
Cedar Creek	45,61,62	2.25	175,249	17,525	175	6,835	10,515		56,100	21,000	77,100	5
Dry Cedar Creek	56	2.25	83,075	8,308	332	3,157	4,819		27,900	10,500	38,400	5
Lower Ala.-West Tribs.	57,73	2.25	244,620	36,693	1,468	2,202	33,023		29,400	11,000	40,400	10
Flat Creek	68-70	2.25	241,031	36,155	3,616	7,232	25,307		86,800	32,500	119,300	8
Lower Alabama Tribs.	71,72,74-81	4.5	207,742	6,232		312	5,920		2,500	900	3,400	-
SUBTOTAL				331,250	20,981	67,274	237,081	5,914	706,000	264,400	970,400	
Coosa River Subbasin (35a-1)												
Chatooga & Little Rivers	2,3,5	3.0	197,612	3,952	988	1,581	1,383		20,600	7,700	28,300	3
Big Wills Creek	1,6	3.0	164,347	8,217	41	7,395	740	41	59,500	22,300	81,800	5
Upper Coosa Tribs.	4,9	3.0	132,902	6,645	1,994	465	3,654	532	19,700	7,400	27,100	15
Little Wills - Black	7	4.5	96,362	4,818	241	3,372	964	241	28,900	10,800	39,700	15
Upper Middle Coosa Tribs.	8,11-13,17	2.25	178,641	3,572	357	1,072	1,786	357	11,400	4,300	15,700	90
Big Canoe Creek	10,16	4.5	164,247	24,637	246	2,217	20,942	1,232	19,700	7,400	27,100	5
Ohatchee Creek	18	4.5	56,102	2,805	280	533	1,964	28	6,500	2,400	8,900	10
Tallahatchee Creek	20	4.5	86,811	5,209	1,042	1,042	3,021	104	16,700	6,300	23,000	10
Middle Coosa Tribs.	22,26-28,34	2.25	205,210	10,261	103	103	9,952	103	1,600	600	2,200	5
Kelly Creek	24,25	2.25	123,515	6,176	31	62	5,990	93	700	300	1,000	5
Yellowleaf Creek(Shelby)	31-33,36	4.5	152,633	7,632	763	763	5,724	382	12,200	4,600	16,800	24
Waxahatchee Creek	37,42	2.25	134,949	6,747	135	202	6,073	337	2,700	1,000	3,700	5
Yellowleaf-Walnut Creek	48,52	1.5	92,424	9,242		462	8,780		3,700	1,400	5,100	8
Lower Middle Coosa Tribs.	38,39,44,45,49	4.5	136,388	13,639	273	3,410	9,820	136	29,500	11,000	40,500	20
Cedar Creek (Talladega)	43	4.5	33,737	3,374	101	844	2,395	34	7,600	2,800	10,400	10
Hatchet Creek	41,51,54	2.25	239,300	7,179	144	862	6,101	72	8,000	3,000	11,000	10
Lower Coosa Tribs.	53,55-59,61	1.5	217,373	6,521	326	1,565	4,565	65	15,100	5,700	20,800	5
Yellow-Taylor Creek	60,62	1.5	67,768	2,033	102	407	1,524		4,100	1,500	5,600	5
SUBTOTAL				132,659	7,167	26,357	95,378	3,757	268,200	100,500	368,700	

Appendix Table 25D -- Cont'd

WATERSHED	CNI NO. 1/	AVG. NO. DAMAGING FLOODS PER YEAR	DRAINAGE AREA	FLOOD PLAIN	FLOOD PLAIN LAND USE DISTRIBUTION: CROPLAND	PASTURE	FOREST	MISC.	AVERAGE ANNUAL FLOOD DAMAGE: CROP AND PASTURE	OTHER AND INDIRECT	TOTAL	SEDIMENT DAMAGE (PERCENT OF TOTAL FLOOD DAMAGE)
		Tallapoosa River Subbasin (35a-2)										
			---------------------------	-Acres-	------------	------------	------------	------------	------------	--Dollars--	------------	------------
Muscadine Creek	2	4.5	15,017	901	225	90	496	90	2,500	900	3,400	5
Upper Tallapoosa Tribs.	3,5,6,8,10, 15,18	2.25	168,725	8,436	169	2,158	6,158		18,200	6,800	25,000	5
Chickasanoxee-Chatahospee Creek	11,12,14,16, 17,19-22,24	3.0	138,047	6,902	68	1,726	5,108		14,400	5,400	19,800	10
Lake Martin-West Tribs.	40-41	6.5	131,124	6,556	65	328	6,163		3,100	1,200	4,300	-
Lake Martin-East Tribs.	42,46-50,52	6.5	241,852	12,093	121	1,209	10,763		10,600	4,000	14,000	-
Sougahatchee Creek	53,54,59	3.5	129,190	3,876			3,837	39				-
Uphapee-Storie; Sawacklahatchee- Opintlocco Creek	60-64, 72	2.25 2.25	129,712	25,942	1,038	5,188	19,457	259	49,800	18,700	68,500	10
Cubahatchee Creek	69	4.5	82,225	12,334	987	4,070	7,030	247	40,500	15,200	55,700	20
Calebee Creek	70,71,74	4.5	124,661	19,946	1,995	6,981	10,571	399	71,800	26,900	98,700	20
Lower Tallapoosa-So. Tribs.	66,67	2.25	51,335	5,134	1,283	1,284	1,284	1,283 2/	20,500	7,700	28,200	5
Lower Tallapoosa-No. Tribs.	55-57,65	2.25	122,740	24,548	7,364	4,910	12,274		98,200	36,800	135,000	10
Channahatchee Creek	51,58	1.5	40,118	2,006	100	301	1,605		3,200	1,200	4,400	5
Middle Tallapoosa Tribs.	26,27,31-34,37	6.5	175,891	17,589	880	2,287	14,071	351	25,300	9,500	34,800	10
SUBTOTAL				149,365	14,388	31,941	100,368	2,668	370,500	139,000	509,500	
		Cahaba River Subbasin (35a-3)										
Upper Cahaba Tribs.	1,2,4,5	3.75	230,589	4,612		46	4,520	46	400	100	500	5
Shades Creek	3	4.5	86,546	1,731		52	1,662	17	400	200	600	50
Upper Middle Cahaba Tribs.	8-10,14	2.25	142,387	14,239	71	142	13,670	356	1,700	600	2,300	9
Cahaba Valley Creek Tribs.	6,7	2.25	50,288	2,514	25	503	1,860	126	4,200	1,600	5,800	10
Little Cahaba Tribs.	11,12,15,16	2.25	190,297	19,030	190	1,142	17,698		10,700	1,000	11,700	25
Affonee Creek	13	2.25	121,435	14,572	438	874	13,260		10,500	3,900	14,400	20
Middle Cahaba Tribs.	17,18	3.0	100,559	10,056	2,011	3,017	4,525	503	40,200	15,100	55,300	20
Lower Cahaba-Oakmulgee Tribs.	24	4.5	202,501	40,500	810	2,835	36,450	405	29,200	10,900	47,300	50
Lower Middle Cahaba Tribs.	21,32	2.25	73,408	11,011	911	3,303	6,607	110	34,400	12,900	47,300	30
SUBTOTAL				118,265	4,536	11,914	100,252	1,563	131,700	49,300	181,000	
TOTAL BASIN				731,539	47,072	137,486	533,079	13,902	1,476,400	553,200	2,029,600	

1/ Alabama Conservation Needs Inventory, 1967 (see map, appendix 25F).
2/ Gravel pits.

Appendix Table 25E -- Estimated flood plain land use and flood damages within PL-566 and RC&D Watersheds by subbasins, Alabama River Basin, 1972.

WATERSHED	CNI NO. 1/	AVG. NO. DAMAGING FLOODS PER YEAR	DRAINAGE AREA	FLOOD PLAIN	FLOOD PLAIN LAND USE DISTRIBUTION: CROPLAND	PASTURE	FOREST	MISC.	AVERAGE ANNUAL FLOOD DAMAGE: CROP AND PASTURE	OTHER AND INDIRECT	TOTAL	SEDIMENT DAMAGE (PERCENT OF TOTAL FLOOD DAMAGE)
			------	------	acres	------	------	------	------	dollars	------	
COOSA - 35a - 1												
Terrapin Creek	14	2.25	183,675	13,786	5,927	3,309	4,135	415	144,979	28,502	173,481	5
Choccolocco Creek	21	2.5	240,600	16,129	3,871	10,000	2,258		169,611	58,782	228,393	10
Blue Eye	29	4.5	14,131	1,402	308	883	211		10,049	11,416	21,465	5
Cheaha	30	4.5	72,934	4,341	1,216	2,865	217	43	34,860	14,778	49,638	20
Talladega	35	6.5	105,970	5,014	1,705	2,105	1,052	152	42,000	50,000	92,000	20
Tallaseehatchie	40	4.5	131,077	10,139	1,014	3,547	5,070	506	72,606	154,375	226,981	10
Weogufka	46,47,50	5.5	85,632	4,000	160	1,200	2,600	40	33,400	31,600	65,000	10
Shoal Creek	19	4.5	21,120	831	14	322	453	41	2,474	1,094	3,568	10
SUBTOTAL				55,642	14,215	24,223	15,996	1,197	509,979	350,547	860,526	
TALLAPOOSA - 35a - 2												
Cahulga	4	4.5	12,032	378	132	170	45	31	7,657	4,456	12,113	5
Dynne	7	4.5	16,200	1,183	331	544	284	24	7,685	8,446	16,131	5
Ketchepedrakee	9	4.5	35,110	2,367	876	1,184	284	23	24,814	9,301	34,115	10
Lost	13	1.0	17,139	995	375	510	80	30	7,851	2,449	10,300	5
Fox	23	6.5	27,237	800	56	440	264	40	4,446	2,525	6,971	5
Crooked	25	6.5	63,558	3,896	234	2,493	1,169		10,672	3,517	14,189	10
High Pine	28	5.5	51,590	3,495	769	1,398	1,328		50,818	13,456	64,274	13
Old Town	73	6.5	106,554	15,902	1,272	6,679	7,633	318	127,587	63,695	191,282	7
Little Hillabee	30	4.5	44,894	1,240	155	481	604		13,657	8,550	22,207	10
SUBTOTAL				30,256	4,200	13,899	11,691	466	255,187	116,395	371,582	
ALABAMA - 35a												
Mill Creek	21	1.5	6,790	679	20	41	75	543 2/		24,590	24,590	10
Upper Big Swamp	37	3.0	83,667	14,445	578	5,489	8,378		146,072	54,532	200,604	5
Lower Big Swamp	37	3.0	100,045	25,821	775	9,554	15,492		218,571	75,141	293,712	5
Mush	46	2.25	38,726	3,100	2,294	620	186		44,400	11,000	55,400	-
SUBTOTAL				44,045	3,667	15,704	24,131	543	409,043	165,263	571,306	
CAHABA - 35a - 3	No Flood Control Plans											
TOTAL BASIN				129,943	22,082	53,082	51,818	2,206	1,174,209	632,205	1,806,414	

1/ Alabama Conservation Needs Inventory, 1967 (see map, appendix Figure 25F).
2/ Urban - Residential

NOTE: These watersheds are in various stages of planning and development.

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APPENDIX 26 -- FOREST LAND EROSION, ALABAMA RIVER BASIN.

26A -- Methodology

This analysis is based on 435 one-quarter acre plots used for 7,741,600 acres. The sample area was stratified by soil associations and forest land. Sample intensity varied in proportion to the size of each strats.

Various forest disturbances were sampled to determine the average erosion conditions for natural conditions versus each forest disturbance. The plot data is run through KAOS II which involves a modified Musgrave equation to determine the erosion rates for each forest disturbance.

The sediment delivered to the stream is a percentage estimate by the observer recording the field plot data. The soil triangle and the analysis of soil texture downslope toward the stream is used to estimate this percent.

The result of this analysis is shown in the following table.

Appendix Table 26B -- Forest land erosion and sediment rates, Alabama River Basin, 1972.

CAUSE OF EROSION	AREA (ACRES)	EROSION (TONS/YR.)	PERCENT OF TOTAL EROSION (PERCENT)	AVERAGE EROSION RATE (TONS/AC./YR.)	ESTIMATED SEDIMENT (TONS/YR.)	PERCENT ESTIMATED SEDIMENT PRODUCTION (PERCENT)	SUSPENDED SEDIMENT (PPM)	YRS. TO RECOVER TO NATURAL (RATE)
Natural	7,471,600	3,428,300	12.6	0.46	27,100	0.4	0.3	
Logging	358,600	4,325,300	16.0	12.06	335,500	5.4	4.5	3
Skid Trails	109,900	4,523,900	16.7	41.16	1,326,000	21.5	18.1	3
Spur Roads	25,400	342,700	1.3	13.49	98,600	1.6	1.3	3
Fire	186,800	1,041,200	3.8	5.57	47,700	0.8	0.7	3
Grazing	254,000	2,101,400	7.7	8.27	135,900	2.2	1.8	
Mechanical Site Preparation	117,600	11,366,200	41.9	96.65	4,192,700	68.1	57.3	4
TOTAL	7,471,600	27,129,000	100.0	3.63	6,163,500	100.0	84.0	

APPENDIX 27 -- ESTIMATES OF SEDIMENT YIELD, ALABAMA RIVER BASIN.

27A -- Methodology

The attached tables of average annual sediment yield were produced in response to ADO's request for the information concerning the watersheds indicated in the tables.

Sediment yield was estimated by standard SCS procedures in use across the South Region and outlined in Fort Worth, Engineering and Watershed Planning Unit, Technical Guide - 12. These procedures relate sediment yield as a percentage of gross erosion. The basic data were average erosion rates developed for selected PL-566 watershed projects. The proportion of total sediment carried as bedload suspended load was estimated based on the geologic nature of the material eroded from the watersheds. Sediment concentration is the average annual suspended sediment load compared to the average annual runoff and expressed as parts per million (ppm approximately equals milligrams per liter in the range 0-16,000).

It should be recognized that the figures are expanded from a sample and should not be used for operational planning. They should, however, serve as indicators of long term average annual amounts, remembering that long term averages may not be indicative of conditions in any one year.

Appendix Table 27B -- Estimated average annual sediment yield to main stream reservoirs, Alabama River Basin, 1972.

REACH	EROSION RATE	UNCONTROLLED DRAINAGE AREA	SEDIMENT FROM UNCONTROLLED AREA	SEDIMENT FROM UPSTREAM RESERVOIRS	TOTAL SEDIMENT	SEDIMENT TRAPPED (EST. 85%)	SEDIMENT PASSING TO NEXT RESERVOIR
	Tons/Sq. Mi.	Sq. Mi.	1,000's tons				
Tallapoosa System							
To Martin Lake	5,030	2,963	2,981	--	2,981	2,534	447
Martin Lake to Yates Dam	5,030	302	349	447	796	677	119
Yates Dam to Thurlow Dam	5,030	32	56	119	175	149	26
Thurlow Dam to Confluence with Coosa	5,030	1,367	1,375	26	1,401	--	1,401 1/
Coosa System							
From Georgia to Weiss Lake	3,430	3,784	2,596	153 2/	2,749	2,337	412
Weiss Lake to H. Neely Henry Lake	3,430	1,330	912	412	1,324	1,125	197
H. Neely Henry Lake to Logan Martin Lake	3,430	1,170	803	197	1,000	850	159
Logan Martin Lake to Lay Lake	3,430	1,317	903	150	1,053	895	158
Lay Lake to Jordan Lake	3,430	1,005	689	158	847	720	127
Jordan Lake to Confluence with Tallapoosa	3,430	174	137	127	264	--	264 2/
Cahaba System							
To Confluence with Alabama River	2,942	1,821	1,071	--	1,071	--	1,071 3/
Alabama System							
From Confluence of Coosa-Tallapoosa to Jones Bluff Lock & Dam	5,114	1,370	1,041	1,665 4/	3,066	2,606	460
Jones Bluff Lock & Dam to Wm. F. Dannelly Reservoir	5,114	4,400	4,500	1,531 5/	6,031	5,126	905
Wm. F. Dannelly Reservoir to Claiborne Lock & Dam	5,114	820	839	905	1,744	1,482	262
Claiborne Lock & Dam to Tombigbee Cut-Off	5,114	1,128	1,269	262	1,531	--	1,531

1/ Passed downstream to Jones Bluff Lock and Dam.
2/ Sediment passed downstream from lakes on Coosa Tributaries in Georgia.
3/ Passed downstream to Wm. F. Dannelly Reservoir.
4/ Combined sediment passing Thurlow Dam and Jordan Lake.
5/ Combined sediment from Cahaba system and sediment passed through Jones Bluff Lock and Dam.

Appendix Table 27C -- Estimated average annual sediment yield at the mouth of selected streams; Rev. January 1975.

ALABAMA RIVER SUBBASIN - NUMBER 35a 1/

WATERSHED NAME	CNI NO. 2/	DRAINAGE AREA ACRES	ON-SITE EROSION RATE TON/AC. 3/	SEDIMENT DELIVERY RATIO (%) 4/	TOTAL SEDIMENT 1,000 TON/YR.	BED MATERIAL 1,000 TONS 5/	SUSPENDED MATERIAL 1,000 TONS 6/	SEDIMENT CONCEN-TRATION PPM 7/
Little River Creek	79,81	85,129	10.4	24	212.5	42.5	170.0	882
Randons Creek	74	55,146	10.4	27	154.8	31.0	123.8	991
Limestone Cr.	71,72,75	127,313	10.4	22	291.3	58.3	233.0	808
Big Flat Cr.	68,69,70	209,742	5.4	23	260.5	52.1	208.4	439
Pursley Cr.	59,64	72,308	6.6	25	119.3	23.4	95.4	582
Pine Barren Creek	60,65,66	241,031	6.0	23	332.6	66.5	266.1	487
Chilatchee Creek	28	105,688	5.8	24	147.1	29.4	117.7	492
Turkey Creek	53,54	163,905	6.6	23	248.8	49.8	199.0	536
Boquechitto Creek	23-30	225,570	9.6	23	498.1	99.6	398.5	780
Big Cedar Creek	45,46,56 61,62	258,324	6.0	23	356.5	71.3	285.2	487
Big Swamp Cr.	31	24,020	9.9	28	66.6	13.3	53.3	980
Valley Creek	3,12,15	55,727	5.8	27	323.2	64.6	258.6	205
Big Mulberry Creek	1,2,4,5	174,296	6.1	23	244.5	48.9	195.6	495
Swift Creek	8,9	97,820	9.4	25	229.9	46.0	183.9	830
Pintala Creek	40,47 48,49	162,936	5.9	23	221.1	44.2	176.9	479
Catoma Creek	41,50 51,52	243,056	6.3	23	352.2	70.4	281.8	512
Autauga Creek	10-19	97,820	8.9	25	217.6	43.5	174.1	786
Mortar Creek	11,14	60,305	8.9	26	139.5	27.9	111.6	817

1/ Atlas of River Basins of the United States, Second Edition; June 1970; USDA-SCS, Washington, D. C. 20250.

2/ Conservation Needs Inventory - Alabama, June 1970; USDA-SCS, Auburn, Alabama 36830 and unpublished map with subbasin numbers updated to R/B Atlas, Second Edition 1/.

3/ Average annual gross erosion rates on open land from selected watersheds, USDA-SCS, Auburn, Alabama. Forest land erosion rates by USDA, Forest Service, 1974.

4/ Delivery ratio is the percentage of sediment delivered to a given point compared to the gross erosion; from curves developed by USDA-SCS.

5/ Estimated at 20 percent of total sediment load.

6/ Estimated at 80 percent of total sediment load.

7/ Average annual suspended sediment concentration--related to average annual runoff; expressed as parts per million.

Appendix Table 27C -- Cont'd

TALLAPOOSA RIVER SUBBASIN - NUMBER 35a2 1/

WATERSHED NAME	CNI NO. 2/	DRAINAGE AREA ACRES	ON-SITE EROSION RATE TON/AC. 3/	SEDIMENT DELIVERY RATIO (%) 4/	TOTAL SEDIMENT 1,000 TON/YR.	BED MATERIAL 1,000 TONS 5/	SUSPENDED MATERIAL 1,000 TONS 6/	SEDIMENT CONCENTRATION PPM 7/
Line Creek	68-73	205,612	6.6	23	312.1	62.4	249.7	536
Cubahatchee Creek	69	82,225	9.6	25	197.3	39.5	157.8	847
Calebee Creek	70,71,74	124,661	11.1	24	332.1	66.4	265.7	941
Uphapee Creek	61-64,72	290,471	8.6	22	549.6	164.9	384.7	585
Saugahatchee Creek	53,54,59	129,190	5.0	24	155.0	62.0	93.0	318
Sandy Creek	46-49	241,852	5.4	23	300.4	120.2	180.2	329
Elkahatchee Creek	40	16,442	5.4	29	25.7	10.3	15.4	414
Hillabee Cr.	29,30,36	179,251	5.8	23	239.1	95.6	143.5	353
Chatahospee Creek	43-45	87,110	5.7	26	129.1	51.6	77.5	393
High Pine Cr.	28	49,108	5.8	26	74.1	29.6	44.5	400
Crooked Creek	25	62,861	6.7	26	109.5	43.8	65.7	461
Cahulga Creek	4	17,585	5.6	29	28.6	11.4	17.2	432
Wedowee Creek	24	37,055	5.7	27	57.0	22.8	34.2	407
Shoal Creek	17	14,274	5.7	29	23.6	9.4	14.2	439

1/ Atlas of River Basins of the United States, Second Edition; June 1970; USDA-SCS, Washington, D. C. 20250.

2/ Conservation Needs Inventory - Alabama, June 1970; USDA-SCS, Auburn, Alabama 36830 and unpublished map with subbasin numbers updated to R/B Atlas, Second Edition 1/.

3/ Average annual gross erosion rates on open land from selected watersheds, USDA-SCS, Auburn, Alabama. Forest land erosion rates by USDA, Forest Service, 1974.

4/ Delivery ratio is the percentage of sediment delivered to a given point compared to the gross erosion; from curves developed by USDA-SCS.

5/ Estimated at 20 percent of total sediment load.

6/ Estimated at 80 percent of total sediment load.

7/ Average annual suspended sediment concentration--related to average annual runoff; expressed as parts per million.

Appendix Table 27C -- Cont'd

COOSA RIVER SUBBASIN - NUMBER 35a1 1/

WATERSHED NAME	CNI NO. 2/	DRAINAGE AREA ACRES	ON-SITE EROSION RATE TON/AC. 3/	SEDIMENT DELIVERY RATIO (%) 4/	TOTAL SEDIMENT 1,000 TON/YR.	BED MATERIAL 1,000 TONS 5/	SUSPENDED MATERIAL 1,000 TONS 6/	SEDIMENT CONCEN-TRATION PPM 7/
Hatchet Creek	41,51	239,300	2.7	23	148.6	59.4	89.2	164
Weoka Creek	58	70,871	3.6	25	63.8	25.5	38.3	239
Weogufka Cr.	46,47,50	81,929	4.5	25	92.2	38.9	55.3	298
Walnut Creek	52	33,565	3.2	27	29.0	11.6	17.4	229
Yellowleaf Creek (lower)	48	58,859	3.2	26	49.0	19.6	29.4	220
Waxahatchee Creek	37,42	134,949	3.7	23	114.8	45.9	68.9	225
Yellowleaf Creek (upper)	31,32 33,36	152,633	3.8	24	139.2	55.7	83.5	242
Tallaseehatchee Creek	40	128,284	4.6	24	141.6	56.6	85.0	293
Talladega Cr.	35	125,528	3.7	24	111.5	44.6	66.9	235
Kelly Creek	24,25	123,513	2.8	24	83.0	33.2	49.8	178
Choccolocco Creek	21	315,731	5.7	22	395.9	158.4	237.5	332
Dye Creek	26	5,680	3.0	32	5.4	2.2	3.2	249
Cane Creek	23	60,751	2.6	26	41.1	16.4	24.7	180
Ohatchee Cr.	18,20	142,913	3.0	23	98.6	39.4	59.2	183
Big Canoe Cr.	10	164,247	3.8	24	149.8	59.9	89.9	242
Big Wills Cr.	1-6	220,052	4.2	23	214.5	85.8	128.7	258
Terrapin Cr.	14	197,114	3.0	23	136.0	54.4	81.6	183
Chattooga Cr.	3,5	262,004	3.1	22	178.7	71.5	107.2	162
Little River Creek	2	171,167	3.1	23	122.0	48.8	73.2	189
Spring Creek	9	30,590	3.1	28	26.5	10.6	15.9	229
Chestnut Cr.	55	49,225	3.0	26	38.4	15.4	23.0	206

1/ Atlas of River Basins of the United States, Second Edition; June 1970; USDA-SCS, Washington, D. C. 20250.

2/ Conservation Needs Inventory - Alabama, June 1970; USDA-SCS, Auburn, Alabama 36830 and unpublished map with subbasin numbers updated to R/B Atlas, Second Edition 1/.

3/ Average annual gross erosion rates on open land from selected watersheds, USDA-SCS, Auburn, Alabama. Forest land erosion rates by USDA, Forest Service, 1974.

4/ Delivery ratio is the percentage of sediment delivered to a given point compared to the gross erosion; from curves developed by USDA-SCS.

5/ Estimated at 20 percent of total sediment load.

6/ Estimated at 80 percent of total sediment load.

7/ Average annual suspended sediment concentration--related to average annual runoff; expressed as parts per million.

Appendix Table 27C -- Cont'd

CAHABA RIVER SUBBASIN - NUMBER 35a3 1/

WATERSHED NAME	CNI NO. 2/	DRAINAGE AREA ACRES	ON-SITE EROSION RATE TON/AC. 3/	SEDIMENT DELIVERY RATIO (%) 4/	TOTAL SEDIMENT 1,000 TON/YR.	BED MATERIAL 1,000 TONS 5/	SUSPENDED MATERIAL 1,000 TONS 6/	SEDIMENT CONCEN-TRATION PPM 7/
Big Oakmulgee Creek	19,20	155,219	6.1	24	227.2	90.9	136.3	338
Rice Creek	21	27,618	6.4	28	49.5	19.8	29.7	475
Little Cahaba River (lower)	11,12 15,16	190,297	5.5	23	240.7	96.3	144.4	335
Shades Creek	3	86,546	8.5	25	183.9	73.6	110.3	563
Buck Creek	6,7	50,288	5.6	26	73.2	29.3	43.9	385
Patton Creek	5	40,817	5.2	27	57.3	22.9	34.4	372
Little Cahaba River (upper)	4	80,007	5.5	25	110.0	44.0	66.0	364
Upper Cahaba River	1	109,765	5.1	24	134.4	53.8	80.6	324

1/ Atlas of River Basins of the United States, Second Edition; June 1970; USDA-SCS, Washington, D. C. 20250.

2/ Conservation Needs Inventory - Alabama, June 1970; USDA-SCS, Auburn, Alabama 36830 and unpublished map with subbasin numbers updated to R/B Atlas, Second Edition 1/.

3/ Average annual gross erosion rates on open land from selected watersheds, USDA-SCS, Auburn, Alabama. Forest land erosion rates by USDA, Forest Service, 1974.

4/ Delivery ratio is the percentage of sediment delivered to a given point compared to the gross erosion; from curves developed by USDA-SCS.

5/ Estimated at 20 percent of total sediment load.

6/ Estimated at 80 percent of total sediment load.

7/ Average annual suspended sediment concentration--related to average annual runoff; expressed as parts per million.

APPENDIX TABLE 28 -- LAND TREATMENT NEEDS BY SUBBASINS, ALABAMA RIVER BASIN, 1970.

CONSERVATION TREATMENT NEEDS	TOTAL STUDY AREA	SUBBASINS			
		ALABAMA	CAHABA	COOSA	TALLA-POOSA
	Thousand Acres				
Cropland					
Land Adequately Treated	241	74	13	60	94
Treatment Needs:					
Crop Residues or Annual Cover Crops	392	229	28	88	47
Sod in Rotation	207	63	11	85	48
Contouring Only	36	21	2	2	11
Strip Cropping, Terraces and Diversions	292	110	13	116	53
Change to Permanent Cover, Grass or Trees	83	37	3	20	23
Drainage	32	12	3	16	1
Total Needing Treatment	(1,042)	(472)	(60)	(327)	(183)
TOTAL CROPLAND	1,273	542	72	382	277
Pastureland					
Land Adequately Treated	163	46	13	57	47
Treatment Not Feasible	2	1	-	-	1
Treatment Needs:					
Protection from Over-grazing	118	27	10	31	50
Improvement in Plant Cover	697	382	47	113	155
Reestablishment of Vegetative Cover	345	202	8	56	79
Change of Land Use to Trees	2	-	-	2	-
Total Needing Treatment	(1,162)	(611)	(65)	(202)	(284)
TOTAL PASTURELAND	1,327	658	78	259	332
Forest Land					
Land Adequately Treated	1,727	578	199	546	404
Treatment Needs:					
Establishment and Reinforcement	2,524	846	291	797	590
Timber Stand Improvement	2,857	957	329	902	669
Total Needing Treatment	(5,381)	(1,803)	(620)	(1,699)	(1,259)
TOTAL FOREST LAND	7,108	2,381	819	2,245	1,663
Other Land					
Land Adequately Treated	130	46	10	45	29
Land Needing Treatment	85	30	7	29	19
TOTAL OTHER LAND	215	76	17	74	48
TOTAL LAND IN THE INVENTORY	9,923	3,657	986	2,960	2,320

Source: Alabama Conservation Needs Inventory, 1970.

1/ Treatment needs and standards are different than those in table 4-16, Vol. I.

APPENDIX TABLE 29 -- STATUS OF LAND DISTURBED BY SURFACE MINING, ALABAMA RIVER BASIN AND SUBBASINS, JANUARY 1974.

	ALABAMA RIVER BASIN				
	BASIN TOTAL	ALABAMA SUBBASIN	CAHABA SUBBASIN	COOSA SUBBASIN	TALLAPOOSA SUBBASIN
	Acres				
A. Total Land Disturbed (Items 1 & 2 below)	52,942	5,560	16,318	23,246	7,818
1. Land Requiring Reclamation (Items a & b below)	12,729	3,080	2,165	3,604	3,880
a. "Orphan" surface-mined areas for which there is no obligation to reclaim them in accordance with any law.					
(Items 1 + 2 + 3 below) Subtotal	11,369	2,815	1,290	3,484	3,780
(1) Coal Mines	1,400	0	200	1,200	0
(2) Sand and gravel pits	6,909	2,681	365	1,222	2,641
(3) All other surface mined commodities	3,060	134	725	1,062	1,139
b. Surface-mined areas (active or inactive which must be reclaimed according to law).					
(Items 1 + 2 + 3 below) Subtotal	1,360	265	875	120	100
(1) Coal mines	625	0	625	0	0
(2) Sand and gravel pits	335	265	0	20	50
(3) All other surface mined commodities including rock quarries	400	0	250	100	50
2. Land Not Requiring Reclamation	40,213	2,480	14,153	19,642	3,938
B. Total Mined Land Reclaimed in Conservation Districts	21,356	1,170	13,318	5,106	1,762
C. Number of District Cooperators Involved	97	35	15	23	24

Appendix Table 30 -- Public water supply present and projected use by towns, counties, and subbasins in the Alabama River Basin.

COMMUNITIES 1/ WATER SYSTEM	SOURCE OF SUPPLY 2/ 1973	MAXIMUM CAPACITY OF SOURCE OF SUPPLY 1973	POPULATION SERVED 1973	MAXIMUM USE 1973	PROJECTED USE 1990	PROJECTED USE 2000	PROJECTED USE 2020	FUTURE 2/ SOURCE OF SUPPLY
		Million Gallons Per Day						
ALABAMA SUBBASIN								
Monroe County								
Frisco City	2-W	0.86	1,500	0.30	0.80	1.00	1.30	W
Monroeville	4-W	4.50	7,000	2.00	2.40	2.80	4.00	W
Mexia	P-Monroeville		1,450					P-Monroeville
Uriah	2-W	0.29	500	0.05				W
Wilcox County								
Camden	3-W	0.75	2,500	0.22	0.35	0.39	0.46	W
Pine Hill	S-R	1.00	800	0.20	0.40	0.50	0.70	S-R
Lowndes County								
Black Belt	1-W	0.24	500	0.023				W
Crosby	1-W	0.07	105					W
Fort Deposit	2-W	0.86	1,407	0.86	0.16	0.22	0.40	W
Hayneville	1-W	0.14	1,000	0.06				
Lee Place-Calhoun	P-Fort Deposit		520					P-Fort Deposit
Logan	P-Fort Deposit		650		0.02	0.03	0.04	P-Fort Deposit
Lowndesboro	1-W	0.29	235	0.14				W
Moses	1-W	0.07	1,000	0.03				
Dallas County								
Craig AFB	3-W	6.68	3,383	1.02				W
Plantersville	1-W	0.10	500	0.70				W
Selma	5-W	6.00	30,000	5.80	6.30	9.10	11.30	W
Selmont	2-W	1.00	6,000	0.40	0.45	0.50	0.70	W
Perry County								
Marion	3-W	3.00	4,289	0.95	1.50	1.79	2.36	W
Autauga County								
Marbury	1-W	0.22	850	0.04	0.05	0.07	0.09	W
Prattville	8-W	4.40	17,000	4.20	4.70	6.20	8.00	W-S-R
Montgomery County								
Montgomery	42-W-S-R	49.00	180,000	37.00	51.16	63.37	91.39	W
Pine Level	1-W	0.25	1,500	0.25				W
Pintlalla	W	0.216	500	0.09				W
Ramer	W	0.144	500	0.065				W
Sellers	W	0.20		0.10				W
Snowdown	1-W	0.22	500	0.22				W
Elmore County								
Draper Prison	2-W	2.88	1,000	0.25				W
Elmore	W	0.36		0.66				W
Holtville	2-W	0.45	2,500	0.22				W
Millbrook	2-W	1.08		0.54				W
Chilton County								
Maplesville	1-W	0.29	704	0.10				W

Appendix Table 30 -- Cont'd

COMMUNITIES 1/ WATER SYSTEM	SOURCE OF SUPPLY 2/ 1973	MAXIMUM CAPACITY OF SOURCE OF SUPPLY 1973	POPULATION SERVED 1973	MAXIMUM USE 1973	PROJECTED USE 1990	PROJECTED USE 2000	PROJECTED USE 2020	FUTURE 2/ SOURCE OF SUPPLY
		Million Gallons Per Day						
COOSA SUBBASIN								
Elmore County								
Blue Ridge Estates	1-W	0.1	640	0.05				P-Wetumpka
Holtville	2-W	0.432	2,200	0.15				P-Wetumpka
Wetumpka	S-R	1.15	3,912	0.621	0.95	1.66	3.70	S-R
Coosa County								
Goodwater	S-C	0.50	2,107	0.30	0.36	0.40	0.60	S-C
Kelleyton	P-Alexander City	0.288	600					P-Alexander City
Rockford	W	0.07	600	0.40	0.08	0.08	0.09	S-C-I
Chilton County								
Clanton	S-R	2.60	6,000	2.00	2.40	3.00	4.10	S-R
Jemison	4-W	0.25	2,660	0.26	0.37	0.45	0.52	P-Clanton
South Chilton	1-W	0.07	4,000	0.07	0.09	0.13	0.15	P-Clanton
Thorsby	3-W	0.10	1,002	0.10	0.15	0.18	0.20	
Shelby County								
Calera	1-Sp 1-W	0.75	8,000	0.75	0.75	1.16	1.93	P-Columbiana
Columbiana	2-W	2.00	7,000	2.00	2.80	3.50	4.50	W
Harpersville	1-W	0.60	600	0.58	0.10	0.20	0.30	W
Vincent	3-Sp	0.96	1,500	0.10				Sp
Westover	1-W	0.72	3,000	0.30	0.40	0.50	0.60	W
Wilsonville	2-W	0.216	590	0.10	0.38	0.49	0.78	W
Sterrett-Vandiver	1-W	0.13	700	0.13				W
Talladega County								
Avondale Mills (Sylacauga)	3-Sp-2-W-P	2.10	2,000	1.75				P-Sylacauga
Childersburg	3-W	1.00	6,000	1.00	1.27	1.77	2.57	W
Handley Hill WW Inc.	3-W	0.10	1,200	0.10				W
Lincoln	2-W	0.045	1,700	1.15	1.35	1.60	1.66	W
Munford	2-W	0.49	1,500	0.30				W
Sycamore	3-W	0.10	1,200	0.06				W
Sylacauga	2-W-S-C-I	4.00	12,000	4.00	6.00	8.00	12.00	W-S-C-I
Talladega	3-W-S-C-I	7.31	18,000	4.00	5.50	6.40	10.50	W-S-C-I
St. Clair County								
Acmar	P-Moody		4,500					P-St. Clair System
Ashville	1-Sp	1.469	986	0.095	0.20	0.30	0.06	P-St. Clair System
Margaret	3-W	0.07	760	0.03				
Mays Bend Inc.	1-W	0.43	100					W
Moody	P-Leeds		1,800	0.20				P-Leeds
Odenville	2-W	0.26	750	0.10	0.12	0.14	0.24	P-St. Clair System
Pell City	2-W	2.20	5,602	1.37	3.25	4.75	9.00	P-St. Clair System
Ragland	5-W	0.58	1,804	0.20	0.23	0.30	0.58	P-St. Clair System
Springville	1-Sp	1.50	1,400	1.50	2.00	3.00	4.50	P-St. Clair System
N. W. St. Clair	P-Springville		600					P-Springville
Steele	2-W	0.32	798	0.12				P-St. Clair System
Wattsville	2-W	0.90	2,000	0.24				P-Pell City

COMMUNITIES 1/ WATER SYSTEM	SOURCE OF SUPPLY 2/ 1973	MAXIMUM CAPACITY OF SOURCE OF SUPPLY 1973	POPULATION SERVED 1973	MAXIMUM USE 1973	PROJECTED USE 1990	PROJECTED USE 2000	PROJECTED USE 2020	FUTURE 2/ SOURCE OF SUPPLY
		------	Million Gallons	Per Day	------	------	------	
COOSA SUBBASIN (Cont'd)								
Calhoun County								
Alexandria	1-Sp	2.16	1,800	0.72				Sp
Anniston	1-Sp-2-S-C-I	23.00	50,000	18.00	27.60	31.30	62.80	Sp-S-C-I
Hobson City	1-W-P-Anniston	0.144	2,000	0.06	0.91	1.20	2.10	P-Anniston
Jacksonville	2-Sp	2.348	8,663	1.00	2.00	3.00	4.00	P-Anniston
Ohatchee	1-Sp-1-W	0.29	550	0.10	0.08	0.09	0.16	P-Alexandria
Oxford	P-Anniston		6,800					P-Anniston
Piedmont	1-Sp-5-C	1.50	5,063	1.01	1.60	2.20	3.00	S-C-I
Weaver	3-W	1.40	4,500	0.70	1.00	1.20	1.50	P-Anniston
Etowah County								
North East Etowah	1-W	0.14	500	0.14				S-P-Gadsden
Fords Valley	P-Hokesbluff	0.216	684	0.14				P-Gadsden
Gadsden	S-R	15.00	66,000	16.20	19.40	26.00	39.00	S-R
Attalla	P-Gadsden		10,500					P-Gadsden
Rainbow City	P-Gadsden		5,500					P-Gadsden
Glencoe	1-Sp-2-W	2.16	3,500	1.00	1.40	1.80	2.80	P-Gadsden
Hokesbluff	1-Sp	0.648	2,115	0.60	0.66	0.74	1.00	P-Gadsden
Southside	1-Sp-1-W	0.68	2,500	0.30	0.40	0.50	0.70	P-Gadsden
Reece City	1-W	0.42	510	0.02				W
Ridgeville	1-W	0.11	220	0.02				
Cherokee County								
Cedar Bluf	S-R	0.17	956	0.09	0.12	0.14	0.18	S-R
Centre	S-R	1.00	2,418	0.34	0.45	0.51	0.66	S-R
Cherokee Co. Water Authority	1-Sp	0.029	1,500	0.90				Sp-P-Centre
Gaylesville	1-W	0.07	210	0.25				
DeKalb County								
Collinsville	1-W-1-Sp	0.32	1,300	0.32				W
Fort Payne	S-C-I	3.00	13,600	1.85	2.50	3.00	4.30	S-C-I
Mentone	S	0.20	1,000	0.15				S
Valley Head	1-Sp	2.88	800	0.10				Sp
TALLAPOOSA SUBBASIN								
Montgomery County								
Mitylene-Arrowhead	W	0.50	800	0.24				W
Bullock County								
Union Springs	3-W	1.94	4,200	1.90	2.39	2.59	2.98	W
Marion County								
Notasulga	S-P-Tallassee	0.72	880	0.30				P-Tuskegee
Tuskegee	S-R	4.00	17,000	2.00	3.00	4.00	6.35	S-R

Appendix Table 30 -- Cont'd

COMMUNITIES 1/ WATER SYSTEM	SOURCE OF SUPPLY 2/ 1973	MAXIMUM CAPACITY OF SOURCE OF SUPPLY 1973	POPULATION SERVED 1973	MAXIMUM USE 1973	PROJECTED USE 1990	PROJECTED USE 2000	PROJECTED USE 2020	FUTURE 2/ SOURCE OF SUPPLY
		---Million Gallons Per Day---						
TALLAPOOSA SUBBASIN (Cont'd)								
Lee County								
Auburn	1-W-S-I-C	8.70	24,000	4.00	9.60	10.80	11.80	S-I-C
Loachapoka	P-Tuskegee		2,000					P-Tuskegee
Opelika	1-Sp-S-I-C	10.90	20,000	6.00	10.00	12.00	13.00	S-I-C
Elmore County								
Tallassee	S-R	2.80	10,000	1.80	2.50	3.80	5.40	S-R
Eclectic	W-P-Tallassee	0.21	1,100	0.15	0.32	0.46	0.80	P-Tallassee
Friendship	P-Tallassee		2,000	0.08				P-Tallassee
Redland	P-Montgomery		1,280					P-Montgomery
Tallapoosa County								
Alexander City	S-C	8.00	14,000	6.00	11.00	14.30	20.00	S-C-I
New Site	2-W	0.05	548	0.07				P-Alexander City
Russell Mills	S-I-C-P-Alexander City	2.44	4,000	1.44				P-Alexander City
Camp Hill	S-C	0.72	1,554	0.27	0.36	0.48	0.62	S-C-I
Reeltown-Liberty City	P-Tallassee	0.36	2,500	0.07				P-Tallassee
Carrville	P-Tallassee							P-Tallassee
Wall Street	P-Tallassee		1,000					P-Tallassee
Dadeville	S-I-R	0.72	3,300	0.675	0.94	1.06	1.36	S-I-R
Jackson's Gap	P-Dadeville		1,360					P-Dadeville
Chambers County								
LaFayette	S-C-I	0.57	3,940	0.47	0.60	0.70	0.90	S-C-I
Randolph County								
Roanoke	S-C-I	1.40	5,288	1.00	0.94	1.07	1.38	S-C-I
Roanoke (Hadley Mfg. Co.)	2-W-P-Roanoke							P-Roanoke
Wadley	3-W	0.23	658	0.05	0.05	0.60	0.07	W
Wedowee	3-W	0.22	842	0.08	0.28	0.40	0.57	S-R-I
Woodland	1-W	0.09	350	0.09				P-Wedowee
Clay County								
Ashland	1-Sp-F-W-S-C-I	1.00	1,921	0.54	0.75	0.85	1.05	S-C-I
Lineville	6-W-S-C-I	1.00	1,984	0.052	0.70	0.80	1.00	S-C-I
Cleburne County								
Fruithurst	2-W	0.10	305	0.10				P-Heflin
Heflin	8-W-S-C-I	1.87	3,300	0.50	1.00	1.40	1.73	S-C-I
Ranburne	6-W + C	0.07	400	0.07	0.10	0.12	0.18	P-Heflin

Appendix Table 30 -- Cont'd

COMMUNITIES 1/ WATER SYSTEM	SOURCE OF SUPPLY 2/ 1973	MAXIMUM CAPACITY OF SOURCE OF SUPPLY 1973	POPULATION SERVED 1973	MAXIMUM USE 1973	PROJECTED USE 1990	PROJECTED USE 2000	PROJECTED USE 2020	FUTURE 2/ SOURCE OF SUPPLY
		-----Million Gallons Per Day-----						
CAHABA SUBBASIN								
Bibb County								
Brent	3-W	0.72	2,500	0.28	0.30	0.35	0.40	W
Green Pond	1-W	0.14	550	0.028				W
Randolph	P-Wilton	0.17	550	0.07				P-Wilton
West Blocton	1-Sp	1.51	1,200	0.50	0.60	0.70	0.80	W
Centreville	3-W	1.40	2,633	0.70	1.00	1.20	1.50	W
Shelby County								
Alabaster Silura	3-W	2.40	7,000	2.50	4.00	5.00	6.00	W
Helena	1-W	0.14	1,110	0.90	1.40	1.70	2.00	W
Montevallo	1-W	1.08	6,000	1.00	1.70	2.40	3.90	W
Pelham	3-W	4.40	4,000	1.30	3.50	4.00	5.50	W
Wilton	1-W	0.72	1,200	0.14	0.24	0.30	0.40	W
Jefferson County								
Irondale	3-W	1.77	3,164	1.30	1.36	1.59	2.06	P-Birmingham
Leeds	3-Sp	2.00	9,500	1.75	2.35	2.71	3.64	Sp-W
Trussville	6-W	4.22	6,000	2.88	4.40	5.50	8.00	W
Vestavia Hills	P-Birmingham							P-Birmingham

1/ Information from Public Water Supplies, Alabama.
2/ Sp-Spring, 3-W-Number of wells, S-Surface, R-River, C-Creek, I-Impoundment, P-Purchase.

APPENDIX TABLE 31 -- MINIMUM NUMBER OF DROUGHT-DAYS FOR DIFFERENT MONTHS, SOIL STORAGE CAPACITIES AND PROBABILITIES.

ALABAMA SUBBASIN

MONTH 1/	PROB.	MINIMUM DROUGHT DAYS IF SOIL HAS AVAILABLE MOISTURE CAPACITY IN THE ROOT ZONE OF 1 INCH	2 INCHES	3 INCHES	5 INCHES
April	1 in 10	16	9	0	0
	2 in 10	14	6	0	0
	3 in 10	12	3	0	0
	5 in 10	8	0	0	0
May	1 in 10	26	21	15	5
	2 in 10	23	18	12	0
	3 in 10	21	15	10	0
	5 in 10	18	11	6	0
June	1 in 10	26	25	23	19
	2 in 10	24	22	20	15
	3 in 10	22	20	18	12
	5 in 10	19	16	13	6
July	1 in 10	22	20	19	19
	2 in 10	18	16	15	14
	3 in 10	16	13	12	11
	5 in 10	12	8	6	5
August	1 in 10	28	26	24	22
	2 in 10	24	21	17	15
	3 in 10	21	16	12	9
	5 in 10	16	10	4	0
September	1 in 10	25	25	24	21
	2 in 10	21	21	19	16
	3 in 10	19	18	16	11
	5 in 10	16	11	8	2
October	1 in 10	28	28	27	27
	2 in 10	26	25	25	23
	3 in 10	24	23	21	19
	5 in 10	21	18	15	11

1/ January, February, March, November, and December not shown because crops are rarely damaged by drought in these months.

Source: Bulletin 316 Agricultural Drought in Alabama September 1959, Alabama Agricultural Experiment Station.

Appendix Table 31 -- Cont'd

CAHABA AND TALLAPOOSA SUBBASINS

MONTH 1/	PROB.	MINIMUM DROUGHT DAYS IF SOIL HAS AVAILABLE MOISTURE CAPACITY IN THE ROOT ZONE OF 1 INCH	2 INCHES	3 INCHES	5 INCHES
April	1 in 10	15	7	0	0
	2 in 10	12	5	0	0
	3 in 10	11	2	0	0
	5 in 10	8	1	0	0
May	1 in 10	25	21	19	7
	2 in 10	23	18	14	4
	3 in 10	21	16	11	1
	5 in 10	17	12	6	0
June	1 in 10	25	25	24	21
	2 in 10	23	22	20	16
	3 in 10	20	19	18	12
	5 in 10	17	14	13	6
July	1 in 10	22	20	20	18
	2 in 10	18	17	16	14
	3 in 10	16	13	13	11
	5 in 10	12	9	7	5
August	1 in 10	22	18	17	16
	2 in 10	19	14	12	10
	3 in 10	17	12	8	6
	5 in 10	14	8	3	0
September	1 in 10	26	25	24	21
	2 in 10	22	20	20	15
	3 in 10	20	17	16	10
	5 in 10	16	12	8	3
October	1 in 10	26	26	26	26
	2 in 10	24	23	22	22
	3 in 10	22	20	18	16
	5 in 10	19	14	8	1

1/ January, February, March, November, and December not shown because crops are rarely damaged by drought in these months.

Source: Bulletin 316 Agricultural Drought in Alabama September 1959, Alabama Agricultural Experiment Station.

Appendix Table 31 -- Cont'd

COOSA SUBBASIN

MONTH 1/	PROB.	MINIMUM DROUGHT DAYS IF SOIL HAS AVAILABLE MOISTURE CAPACITY IN THE ROOT ZONE OF 1 INCH	2 INCHES	3 INCHES	5 INCHES
April	1 in 10	14	5	0	0
	2 in 10	11	0	0	0
	3 in 10	9	0	0	0
	5 in 10	5	0	0	0
May	1 in 10	24	21	14	1
	2 in 10	21	16	8	0
	3 in 10	18	12	4	0
	5 in 10	14	6	0	0
June	1 in 10	25	25	25	17
	2 in 10	22	20	19	11
	3 in 10	19	17	15	7
	5 in 10	16	12	8	1
July	1 in 10	23	22	20	17
	2 in 10	20	17	15	12
	3 in 10	17	13	11	8
	5 in 10	13	7	5	1
August	1 in 10	21	18	15	13
	2 in 10	18	14	11	7
	3 in 10	16	11	7	3
	5 in 10	13	6	2	0
September	1 in 10	25	24	22	19
	2 in 10	21	19	16	13
	3 in 10	18	16	12	8
	5 in 10	14	10	5	0
October	1 in 10	25	23	22	21
	2 in 10	21	18	17	15
	3 in 10	18	15	12	10
	5 in 10	14	9	6	3

1/ January, February, March, November, and December not shown because crops are rarely damaged by drought in these months.

Source: Bulletin 316 Agricultural Drought in Alabama September 1959, Alabama Agricultural Experiment Station.

APPENDIX 32 -- RECREATION SUPPLY/DEMAND

32A--Methodology

The methodology involved in the basin analysis is the same as that used by Auburn University in developing the State Comprehensive Outdoor Recreation Plan (SCORP). A detailed discussion of the methodology involved has been published as a separate planning document by Auburn University. 1/ A sample worksheet used in estimating facilities is presented in appendix table 52-1. Facility needs can be estimated from population projections alone, however, much background research has been accomplished to derive the coefficients found in supporting appendix tables 52-2 through 52-14. The Auburn study considered 13 socio-economic factors such as age, education, race, mobility, income, sex, residence, employment, and family size among other factors in estimating local demand for various activities. For purposes of the Alabama Basin Study, the coefficients for Region 2 in the State Plan were applied to the Coosa and Cahaba Subbasins, while estimates for Region 4 were used for the Alabama and Tallapoosa Subbasins.

The recreation population was assumed to be those persons 12 years of age and over, except for swimming, camping, boating, and picnicking. For these four activities, persons under 12 were considered as recreating also. Tourist demand for recreation in the basin was estimated from the projected regional tourist demand data found in Volume 2 of the Statewide Comprehensive Outdoor Recreation Plan. 2/

Inventory data were obtained from the 1974 Alabama Survey of Outdoor Recreation Sites by major river basins. This inventory conducted as a part of the SCORP effort. Fishing and hunting resources were inventoried independently by Soil Conservation Service biologists working closely with state and county conservation personnel. Once supply and demand were determined, the obvious step was to pinpoint areas of need, both current and anticipated.

An example of the derivation of picnicking facility needs for the Alabama Subbasin is shown in appendix table 32B. In 1974, 157 acres developed for public picnicking were needed along with 1,414 tables.

Following the picnicking example for the Alabama Subbasin, 480 acres of developed picnicking acreage was available in 1974 along with 1,340 tables. Acreage is more than sufficient to satisfy current demand, but there is a need for an additional 74 tables throughout the subbasin. Results are shown in appendix table 32L under picnicking.

1/ Participation in Outdoor Recreation In Alabama (A Guide For Establishing Recreational Needs), Agricultural Economics Series 20, Agricultural Experiment Station, Auburn University, October 1970.

2/ Demand for Outdoor Recreation in Alabama, Agricultural Economics and Rural Sociology Department, Auburn University, Volume 2, pages 67-77, May 1970.

Appendix Table 32B -- A sample of the worksheets used for estimating picnicking facility needs, Alabama River Basin, 1974.

ALABAMA SUBBASIN		SOURCE	FACTOR
Picnicking			
1.	Area population	OBERS Projections	321,000
2.	Percentage participation of region residents (insert local estimates when available).	Appendix Table	37%
3.	Number of residents participating	1 x 2	118,770 (164,258) 1/
4.	Average number of activity occasions per participant per year (insert local estimates when available).	Appendix Table	14
5.	Total resident activity occasions.	3 x 4	2,299,612
6.	Percentage resident participation with State (insert local estimates when available).	Appendix Table	50%
7.	Total resident within State activity occasions.	5 x 6	1,149,806
8.	Percentage resident participation within local area.	Local Data	90%
9.	Total resident activity occasions within local area.	7 x 8	1,034,825
10.	Number of tourist activity occasions.	Local Data	873,676
11.	Total activity occasions in local area.	9 x 10	1,908,501
12.	Conversion standard for activity (insert local estimates when available).	Appendix Table	12,150 A.O./ac. 1,350 Table
13.	Facility needs for local area	11 - 12	157 ac. & 1,414 Tables

1/ Adjusted to include children under 12.
2/ The existing supply facilities should be subtracted from facility needs to determine unmet needs.

Appendix Table 32C -- Present and projected percentage of the population over 12 participating in selected activities by subbasins, Alabama River Basin, 1974, 1990 and 2020.

ACTIVITY	COOSA AND CAHABA SUBBASINS			ALABAMA AND TALLAPOOSA SUBBASINS		
	1974	1990	2020	1974	1990	2020
Picnicking	45	54	66	37	45	51
Fishing, all waters	37	40	40	37	40	40
Swimming	27	31	37	30	35	37
Playing golf	5	6	7	5	6	7
Boating	15	20	28	13	17	22
Water skiing	6	8	12	4	6	10
Camping	8	10	12	6	8	9
Hiking	12	13	10	5	5	4
Hunting	11	11	11	11 1/	11 1/	11 1/

1/ 12 percent in the Tallapoosa.

Source: Participation In Outdoor Recreation in Alabama (A Guide for Establishing Needs), Auburn University, Agricultural Economics Series 20, October 1970.

Appendix Table 32D - Annual participation in selected recreation activities, present and projected, Alabama River Basin

ACTIVITY	ACTIVITY OCCASIONS PER PERSON					
	COOSA & CAHABA			ALABAMA & TALLAPOOSA		
	1974	1990	2020	1974	1990	2020
Picnicking	10	10	9	14	12	12
Fishing, all waters	8	9.5	11	9	13	15
Swimming	25	28	46	24	28	32
Playing golf	26	33	64	27	36	71
Boating	16	21	30	21	26	37
Water skiing	21	28	37	26	38	50
Camping	13	22	33	20	30	44
Hiking	6	11	20	16	32	42
Hunting	15	20	20	31	41	41

Source: Participation In Outdoor Recreation in Alabama (A Guide for Establishing Needs), Auburn University, Agricultural Economics Series 20, October 1970.

Appendix Table 32E - Percentage of recreation activities satisfied within the state, present and projected, Alabama River Basin

ACTIVITY	PERCENT OF DEMAND SATISFIED WITHIN THE STATE					
	COOSA & CAHABA			ALABAMA & TALLAPOOSA		
	1974	1990	2020	1974	1990	2020
Picnicking	54	58	70	50	62	70
Fishing, all waters	98	90	80	96	90	80
Swimming	73	67	66	69	67	61
Playing golf	82	58	51	77	61	55
Boating	67	59	55	63	62	59
Water skiing	59	62	60	59	65	65
Camping	32	23	21	28	27	24
Hiking	53	48	43	48	52	47
Hunting	95	93	90	97	97	97

Source: Participation In Outdoor Recreation in Alabama (A Guide for Establishing Needs), Auburn University, Agricultural Economics Series 20, October 1970.

Appendix Table 32F -- Annual use standards for selected outdoor recreation activities, Alabama River Basin.

ITEM		ACTIVITY OCCASIONS
Fishing		
per acre of water:		
Lakes and reservoirs	Range of:	40 to 80
Rivers and streams		38 to 61
Small impoundments		75 to 90
Put, grow and take ponds		500
Hunting		
per acre of habitat:		
Big game		0.5
Small game		2
Waterfowl		1
Boating		
per acre of water		72
Swimming		
per acre of beach:		
Lakes and reservoirs		23,100
per sq. ft. in pools		8
Water skiing		
per acre of water		45
Camping		
per acre of land:		
Tent		1,620
Trailer		2,700
per bed, group		90
Hiking		
per mile of trail		1,400
Picnicking		
per acre		12,150
per table		1,350
Golfing		
per 9 hole course		23,760

Source: Participation In Outdoor Recreation In Alabama, Agricultural Experiment Station, Auburn University, Agricultural Economics Series 20, October 1970, and internal data, USDA.

Appendix Table 32G -- Boating demand, public supply, and development needs by subbasins, Alabama River Basin, 1974, 1990, and 2020.

ITEM	ALA. RIVER BASIN	SUBBASINS ALABAMA	COOSA	TALLAPOOSA	CAHABA
	--------------1000 Activity Occasions--------------				
1974					
Demand	2,755	945	1,060	600	150
Existing facilities:					
Water, acres 1/	197,540	44,820	88,725	61,015	2,980
Ramps, number	392	51	282	58	1
Supply capacity	11,633	2,735	5,235	3,478	185
Surplus (+)	8,878	+1,790	+4,175	2,878	+35
Water need, acres. . .	0	0	0	0	0
1990					
Demand	6,280	1,950	2,780	1,180	370
Deficit or surplus	+5,353	+785	+2,455	+2,298	-185
Water need, acres. . .	2,800	0	0	0	2,800
2020					
Demand	6,280	3,720	6,210	2,220	780
Deficit or surplus	-1,297	-985	-975	1,258	-595
Water need, acres. . .	38,300	14,900	14,800	0	8,600

Source: Alabama Statewide Comprehensive Outdoor Recreation Plan.

1/ Includes all streams, rivers, and impoundments open to the public.

Appendix Table 32H -- Swimming demand, public supply, and development needs, by subbasins, Alabama River Basin, 1974, 1990, and 2020.

ITEM	ALA. RIVER BASIN	SUBBASINS ALABAMA	COOSA	TALLAPOOSA	CAHABA
	--------------1000 Activity Occasions--------------				
1974					
Demand	10,004	3,219	3,784	2,019	982
Existing capacity: 1/					
Beach	2,913	977	1,074	543	319
Pools	5,090	1,326	2,440	784	540
TOTAL	8,003	2,303	3,514	1,327	859
Deficit	-2,001	-916	-270	-692	-123
Beach needed, acres. . .	87	40	12	30	5
1990					
Demand	19,860	5,670	8,660	3,460	2,070
Deficit	-11,857	-3,367	-5,146	-2,133	-1,211
Beach needed, acres. . .	513	146	223	92	52
2020					
Demand	37,020	9,080	18,290	5,410	4,240
Deficit	-29,017	-6,777	-14,776	-4,083	-3,381
Beach needed, acres. . .	1,257	294	640	177	146

1/ Recreation projects funded for construction are assumed to be a part of existing capacity in all recreation tables.

Source: Alabama Statewide Comprehensive Outdoor Recreation Plan

Appendix Table 32I -- Water skiing demand, public supply, and development needs by subbasin, Alabama River Basin, 1974, 1990, and 2020.

ITEM	ALA. RIVER BASIN	SUBBASINS			
		ALABAMA	COOSA	TALLAPOOSA	CAHABA
	--------------1000 Activity Occasions--------------				
1974					
Demand	944	265	420	230	29
Capacity of large impoundments	6,110	1,319	2,927	1,824	40
Surplus	+5,166	+1,054	+2,507	+1,594	+11
Additional water needs, acres. . .	0	0	0	0	0
1990					
Demand	2,845	780	1,340	640	85
Deficit or surplus	+3,265	+539	+1,587	+1,184	-45
Additional water needs, acres. . .	1,100	0	0	0	1,100
2020					
Demand	5,525	1,240	2,960	1,150	175
Deficit or surplus	+585	+79	-33	+674	-135
Additional water needs, acres. . .	3,940	0	800	0	3,140

Source: Alabama Statewide Comprehensive Outdoor Recreation Plan.

Appendix Table 32J -- Camping demand, public supply, and development needs, by subbasins, Alabama River Basin, 1974, 1990, and 2020.

ITEM	ALA. RIVER BASIN	SUBBASINS			
		ALABAMA	COOSA	TALLAPOOSA	CAHABA
	--------------1000 Activity Occasions--------------				
1974					
Demand	1,520	446	631	279	164
Existing capacity 1/	3,166	644	1,934	464	124
Deficit (-) or surplus (+)	+1,646	+198	+1,303	+185	-40
Additional needs:					
Tent camping, acres or. . .	25	0	0	0	25
Trailer/tent camping, acres. . .	15	0	0	0	15
or Group camping, beds. . .	444	0	0	0	444
1990					
Demand	3,910	1,135	1,685	685	405
Deficit or surplus	-744	-491	+249	-221	-281
Additional needs:					
Tent camping, acres or. . .	612	303	0	136	173
Trailer/tent camping, acres. . .	368	182	0	82	104
or Group camping, beds. . .	11,034	5,456	0	2,456	3,122
2020					
Demand	8,330	2,220	3,900	1,320	890
Deficit	-5,164	-1,576	-1,966	-856	-766
Additional needs:					
Tent camping, acres or. . .	3,188	973	1,214	528	473
Trailer/tent camping, acres. . .	1,913	584	728	317	284
or Group camping, beds. . .	57,378	17,511	21,844	9,511	8,267

1/ Developed camping facilities.

Source: Alabama Statewide Comprehensive Outdoor Recreation Plan.

Appendix Table 32K -- Hiking demand, public supply, and development needs, by subbasin, Alabama River Basin, 1974, 1990, and 2020.

ITEM	ALA. RIVER BASIN	SUBBASINS ALABAMA	COOSA	TALLAPOOSA	CAHABA
	--------------1000 Activity Occasions--------------				
1974					
Demand	511	159	202	98	52
Developed trail, miles	341	60	189	46	46
Capacity of existing trails	477	84	265	64	64
Additional trail needed, miles. . .	78	54	0	24	0
1990					
Demand	1,080	360	400	220	100
Deficit	-603	-276	-135	-156	-36
Additional trail needed, miles. . .	403	197	96	111	26
2020					
Demand	1,810	490	840	290	190
Deficit	-1,333	-406	-575	-226	-126
Additional trail needed, miles. . .	952	290	411	161	90

Source: Alabama Statewide Comprehensive Outdoor Recreation Plan.

Appendix Table 32L -- Picnicking demand, public supply, and development needs, by subbasin, Alabama River Basin, 1974, 1990, and 2020.

ITEM	ALA. RIVER BASIN	SUBBASINS			
		ALABAMA	COOSA	TALLAPOOSA	CAHABA
	1000 Activity Occasions				
1974					
Demand	6,292	1,909	2,545	1,179	659
Capacity of:					
Developed acreage	14,884	4,702	5,006	3,937	2,138
Tables	5,165	1,809	2,548	894	798
Deficit or surplus					
of acres	+9,671	+2,793	+2,641	+2,758	+1,479
of tables	- 243	- 100	+ 3	- 285	+ 139
Additional acres needed. . .	0	0	0	0	0
Additional tables needed . .	285	74	0	211	0
1990					
Demand	9,930	2,680	4,570	1,600	1,080
Deficit or surplus					
of acres	+5,853	+2,022	+ 436	+2,337	+1,058
of tables	-3,881	- 871	-2,022	- 706	- 282
Additional acres needed. . .	0	0	0	0	0
Additional tables needed . .	2,875	645	1,498	523	209
2020					
Demand	14,100	3,900	6,100	2,500	1,600
Deficit or surplus					
of acres	+1,683	+ 802	-1,094	+1,437	+ 538
of tables	-8,051	-2,091	-3,552	-1,606	- 802
Additional acres needed. . .	90	0	90	0	0
Additional tables needed . .	5,964	1,549	2,631	1,190	594

Source: Alabama Statewide Comprehensive Outdoor Recreation Plan.

Appendix Table 32M -- Golfing demand, public supply, and development needs, by subbasin, Alabama River Basin, 1974, 1990, and 2020.

ITEM	ALA. RIVER BASIN	SUBBASINS			
		ALABAMA	COOSA	TALLAPOOSA	CAHABA
	--------------1000 Activity Occasions--------------				
1974					
Demand	1,326	393	543	249	141
Existing capacity	2,194	578	753	317	546
Deficit or surplus	+868	+185	+210	+68	+405
Additional needs:					
9 hole or. . .	0	0	0	0	0
18 hole courses. . .	0	0	0	0	0
1990					
Demand	2,934	932	1,161	564	277
Deficit or surplus	-740	-354	-408	-247	+269
Additional needs:					
9 hole or. . .	42	15	17	10	0
18 hole courses. . .	32	11	13	8	0
2020					
Demand	5,868	1,830	2,401	1,092	545
Deficit	-3,675	-1,252	-1,648	-775	+1
Additional needs:					
9 hole or. . .	155	53	69	33	0
18 hole courses. . .	116	40	52	24	0

Source: Alabama Statewide Comprehensive Outdoor Recreation Plan.

Appendix Table 32N -- Fishing demand, public supply, and development needs, by subbasins, Alabama River Basin, 1974, 1990 and 2020.

ITEM	ALA. RIVER BASIN	SUBBASINS ALABAMA	COOSA	TALLAPOOSA	CAHABA
	--------------1000 Activity Occasions--------------				
1974					
Demand in:					
Lakes & reservoirs	3,564	1,200	1,336	663	365
Rivers & streams	1,244	419	466	231	128
Small impoundments 1/	1,478	498	554	275	151
Put, grow & take ponds	339	111	123	61	34
TOTAL	6,615	2,228	2,479	1,230	678
Capacity of:					
Lakes & reservoirs	6,835	1,782	3,253	1,725	75
Rivers & streams	807	378	179	189	61
Small impoundments	646	217	214	187	28
Put, grow & take ponds	623	140	215	226	42
TOTAL	8,911	2,517	3,861	2,327	206
Total deficit or surplus	+2,296	+289	+1,382	+1,097	-472
Additional needs:					
Lakes & reservoirs, acres	3,410	--	--	--	3,410
Rivers & streams, acres	10,990	680	7,550	1,000	1,760
Small impoundments, acres	10,360	3,475	4,250	1,100	1,540
Put, grow & take ponds, acres	--	--	--	--	--
TOTAL	24,760	4,150	11,800	2,100	6,710
1990					
Demand in:					
Lakes & reservoirs	5,453	1,868	2,091	974	520
Rivers & streams	1,387	475	532	248	132
Small impoundments	2,478	849	950	443	236
Put, grow & take ponds	595	204	228	106	57
TOTAL	9,913	3,396	3,801	1,771	945
Capacity of;					
Lakes & reservoirs	7,280	1,782	3,253	2,165	80
Rivers & streams	849	383	185	219	62
Small impoundments	1,053	342	315	288	108
Put, grow & take ponds	760	160	250	250	100
TOTAL	9,942	2,667	4,003	2,922	350
Total deficit or surplus	+29	-729	+202	+1,151	-595

Appendix Table 32N - Cont'd

ITEM	ALA. RIVER BASIN	SUBBASINS ALABAMA	COOSA	TALLAPOOSA	CAHABA
	--------------1000 Activity Occasions--------------				
1990 (Cont'd)					
Additiona' needs:					
Lakes & reservoirs, acres	7,220	1,720	--	--	5,500
Rivers & streams, acres	12,921	1,508	8,897	674	1,842
Small impoundments, acres	15,830	5,630	7,060	1,720	1,420
Put, grow & take ponds, acres	88	88	--	--	--
TOTAL	36,059	8,946	15,957	2,394	8,762
2020					
Demand in;					
Lakes & reservoirs,	7,353	2,476	2,917	1,273	687
Rivers & streams,	1,871	630	742	324	175
Small impoundments	3,342	1,125	1,326	578	313
Put, grow & take ponds	802	270	318	139	75
TOTAL,	13,368	4,501	5,303	2,314	1,250
Capacity of:					
Lakes & reservoirs	7,280	1,782	3,253	2,165	80
Rivers & streams	850	383	185	219	63
Small impoundments	1,215	405	360	315	135
Put, grow & take ponds	862	175	275	262	150
TOTAL	10,207	2,745	4,073	2,961	428
Total deficit or surplus	-3,161	-1,756	-1,230	+647	-822
Additional needs:					
Lakes & reservoirs, acres	21,468	13,880	--	--	7,588
Rivers & streams, acres	23,721	4,049	14,282	2,442	2,948
Small impoundments, acres	23,620	8,000	10,730	2,920	1,970
Put, grow & take ponds, acres	276	190	86	--	--
TOTAL, acres	69,085	26,119	25,098	5,362	12,506

1/ Under 500 acres.

Source: Alabama Statewide Comprehensive Outdoor Recreation Plan and inventory material provided by the U.S.D.A., Alabama Department of Conservation and Natural Resources, and Bureau of Sport Fisheries and Wildlife U.S.D.I.

Appendix Table 32P -- Hunting demand, public supply, and development needs, by subbasin, Alabama River Basin, 1974, 1990, and 2020.

ITEM	ALA. RIVER BASIN	SUBBASINS ALABAMA	COOSA	TALLAPOOSA	CAHABA
	1000 Activity Occasions				
1974					
Demand for:					
Big game	640	300	145	165	30
Small game	1,470	645	355	390	80
Waterfowl	49	19	15	11	4
TOTAL	2,159	964	515	566	114
Existing capacity:					
Big game	1,223	278	575	259	111
Small game	4,893	1,111	2,300	1,037	445
Waterfowl	57	21	16	13	7
TOTAL	6,173	1,410	2,891	1,309	563
Deficit or surplus:					
Big game	+583	-22	+430	+94	+81
Small game	+3,423	+466	+1,945	+647	+365
Waterfowl	+8	+2	+1	+2	+3
Hunting needs:					
Big game, acres	44,000	44,000	0	0	0
Small game, acres	0	0	0	0	0
Waterfowl, acres	14,000	0	11,000	3,000	0
TOTAL, acres	58,000	44,000	11,000	3,000	0
1990					
Demand for:					
Big game	782	350	200	190	42
Small game	1,920	850	490	480	100
Waterfowl	86	40	21	21	4
TOTAL	2,788	1,240	711	691	146
Deficit or surplus:					
Big game	+441	-72	+375	+69	+69
Small game	+2,973	+261	+1,810	+557	+ 345
Waterfowl	-29	-19	-5	-8	+3

Appendix Table 32P -- (Cont'd)

ITEM	ALA. RIVER BASIN	SUBBASINS ALABAMA	COOSA	TALLAPOOSA	CAHABA
1990 (Cont'd)					
Needs:					
Big game, acres	144,000	144,000	0	0	0
Small game, acres	0	0	0	0	0
Waterfowl, acres	32,000	19,000	5,000	8,000	0
TOTAL, acres	176,000	163,000	5,000	8,000	0
	--------------1000 Activity Occasions----------------				
2020					
Demand for:					
Big game	1,020	460	260	250	50
Small game	2,530	1,130	650	620	130
Waterfowl	116	50	30	30	6
TOTAL	3,666	1,640	940	900	186
Deficit or surplus:					
Big game	+203	-182	+315	+9	+61
Small game	+2,363	-19	+1,650	+417	+315
Waterfowl	-59	-29	-14	-17	+1
Needs:					
Big game, acres	364,000	364,000	0	0	0
Small game, acres	10,000	10,000	0	0	0
Waterfowl, acres	60,000	29,000	14,000	17,000	0
TOTAL, acres	475,000	403,000	14,000	17,000	0

Source: Alabama Statewide Comprehensive Outdoor Recreation Plan and inventory material provided by the U.S.D.A., Alabama Department of Conservation and Natural Resources, and Bureau of Sport Fisheries Wildlife, U.S.D.I.

APPENDIX 33 -- WILDLIFE HABITAT EVALUATION PROGRAM (WHEP).

33A -- Methodology and Objectives

WHEP (Wildlife Habitat Evaluation Program) is designed to provide broad interpretation of wildlife and other forest resource data for use in framework studies such as USDA River Basin Plans. This Forest Service program provides a general overview of the existing wildlife potential for forest game species.

The survey consists of 435 one-quarter acre plots. Sample intensity varied in proportion to the size of each strata. The sample area was stratified by soil associations and forest land. These soils were then grouped by forest types. Some overlap of forest type occurs on the soil associations, but the decision was made to use soils as the basis for the study due to the inherent productivity characteristics. The smallest mapping unit for the soil association is 6 square miles. Forest land is mapped on a 330-acre cell size MIADS - (Map Information Assembly and Display System) system, using 1/20,000 scale photo index sheets.

OBJECTIVE: To evaluate and describe the existing and potential wildlife resource on forest land in the Alabama River Basin.

A. Evaluate habitat condition for forest game species.
   1. Gray squirrel
   2. Bobwhite quail
   3. Turkey
   4. White-tailed deer

B. Assumptions
   1. Water is not a critical factor in the Alabama River Basin; average rainfall 54", and water can be developed to meet the needs.
   2. A breedable population of species under consideration exists on the site, or can be stocked.

C. Stratification
   Determine basic strata for the survey. Soil associations and forest land are the basic strata for the Alabama study. MIADS (Map information assembly and display system) provided acres of forest land by each soil association. Sampling was proportioned by the size of the strata.

D. Habitat Evaluation
   1. Through a review of wildlife research literature, and a cooperative effort of wildlife biologists, the following is accomplished:
      a. Habitat requirements in terms of canopy levels of the forest are identified and rated good, fair, and poor for each of the species studied.

      b. Quantitative values are placed on habitat condition. Good receives 3 points, while poor is valued 1 point. The total points varying with the number of significant habitat conditions provides the overall rating for the strata.

E. Potential Populations

1. Compute habitat rating for individual field plots; then group into plots by strata:

EXAMPLE:

Strata A.

White-tailed Deer		Gray Squirrel	Quail	Turkey
Rating	% of Plots	% of Plots	% of Plots	% of Plots
Good	50	60	00	10
Fair	40	60	00	10
Poor	10	10	80	50

2. Multiply the percent of total rating for each species by the total acres within the strata:

EXAMPLE:

White-tailed Deer

Rating	% of Plots	x	Total Acres in Strata		Acres by Habitat Condition
Good	50	x	100	=	50
Fair	40	x	100	=	40
Poor	10	x	100	=	10

4. Multiply the number of animals per acre by the acres in each condition class within the strata:

EXAMPLE:

Strata A.

White-tailed Deer

Rating	Acres by Strata A.		Animals Per Ac.		Potentials Pop.
Good	50	x	.056	=	3*
Fair	40	x	.029	=	1
Poor	10	x	.015	=	0
					4

* (Rounded to nearest whole number)

F. HUNTER DAYS

1. Determine the allowable harvest through research literature and assistance of wildlife biologists. This is the amount of animals or birds that can be harvested, but will sustain relatively the same population from year to year.

Percent Allowable Harvest by Species

Gray Squirrel	Bobwhite Quail	Turkey	Deer
20%	40%	33%	20%

2. Determine the number of hunter days required to kill one game species.

Number of Days to Kill One Game Species

Gray Squirrel	Bobwhite Quail	Turkey	White-Tailed Deer
.56	.33	9.5	16.7

3. Multiply the potential population by the allowable percent harvest by the number of days it takes to harvest one game species. This gives the potential hunter days by habitat condition class.

EXAMPLE:

Strata A.

White-tailed Deer

Rating	Potential Populations		Allowable Harvest		Days/Kill		Potential Hunter Days
Good	3	x	.20	x	16.7	=	10
Fair	2	x	.20	x	16.7	=	7
Poor	0	x	.20	x	16.7	=	0
TOTAL HUNTER DAYS							17

Appendix 33

33B--Criteria for Habitat Evaluation

GRAY SQUIRREL

Category III

3 Points Each

- 81 - 100% Hdw. type.
- 3 den trees/Ac.
- Stand Age - 61 + Yrs. (Bottom lands 41 + Yrs.)
- Overstory 76 - 100% of total ground cover.
- 26 + % midstory plants; nut or fruit bearing.

Category II

2 Points Each

- 51 - 80% Hdw. type.
- 2 den trees/Ac.
- Stand Age - 41 - 60 Yrs. (Bottom lands 30 - 40 Yrs.)
- Overstory composes 51 - 75% ground cover.
- 11 - 25% midstory plants; nut or fruit bearing.

Category I

1 Point Each

- 1 - 50% Hdw. type.
- 1 den tree/Ac.
- Stand Age 10 - 40 Yrs. (Bottom land 15 - 29 Yrs.)
- Overstory composes 25 - 50% ground cover.
- Less than 1 - 10 midstory plants; nut or fruit bearing.

RATING	TOTAL POINTS
Good	11 - 15
Fair	6 - 10
Poor	1 - 5

Appendix 33B (Cont'd)

BOBWHITE QUAIL

Category III

3 Points Each

- 61 - 100% Pine Type.
- Midstory - 0 - 10% or less of total ground cover.
- Grass 20 - 30" tall.
- Grass & Herbs - 41 - 60% of total ground cover.
- Burning within past 1 - 2 Yrs.
- Stand Age - 1 - 5 or 41 + Yrs.
- Edge Effect - 3

Category II

2 Points Each

- 51 - 60% Pine Type.
- Midstory - 11 - 2-% total ground cover.
- Grass - 10 - 20" tall.
- Grass & Herbs - 31 - 40, or 61 - 70% of total ground cover.
- Burning within past 3 - 5 Yrs.
- Stand Age - 21 - 40 Yrs.
- Edge Effect - 2

Category I

1 Point Each

- 1 - 50% Pine Type.
- Midstory - 21 - 40% of total ground cover.
- Grass - 0 - 10" tall.
- Grass & Herbs - 1 - 30, or 71 - 100% total ground cover.
- Burning within past 6 - 9 Yrs.
- Stand Age - 5 - 20 Yrs.
- Edge Effect - 1

RATING	TOTAL POINTS
Good	15 - 21
Fair	8 - 14
Poor	1 - 7

Appenaix 33B (Cont'd)

TURKEY

Category III

3 Points Each

- 31 - 100% Hdw. Type.
- Stand Age - 1 - 6 or 61 +
- Midstory 0 - 40% of total ground cover.
- Midstory 41 - 100% plants; nut or fruit bearing.
- Years since last burn - 1 - 3.
- Edge Effect - 3.

Category II

2 Points Each

- 16 - 30% Hdw. Type.
- Stand Age 31 - 60 Yrs.
- Midstory 41 - 70% ground cover.
- Midstory 16 - 40% plants; nut or fruit bearing.
- Years since last burn - 4 - 5.
- Edge Effect - 2.

Category I

1 Point Each

- 1 - 15% Hdw. Type.
- Stand Age 6 - 30 Yrs.
- Midstory 70 - 100% total ground cover.
- Midstory 1 - 15% plants; nut or fruit bearing.
- Years since last burn - 6 - 9.
- Edge Effect - 1.

RATING	TOTAL POINTS
Good	13 - 18
Fair	7 - 12
Poor	1 - 6

WHITE-TAILED DEER

Category III

3 Points Each	- 21 - 100% Hdw. Type. - Stand Age 1 - 5 or 41 + Yrs. - Understory Browse 51 - 100% total ground cover. - Understory grass & herbs 61 - 100 total ground cover. - Edge Effect - 3.

Category II

2 Points Each	- 11 - 20 Hdw. Type. - Stand Age 5 - 15 or 26 - 40 Yrs. - Understory Browse 21 - 50% total ground cover. - Understory Grass & Herbs 21 - 60 total ground cover. - Edge Effect - 2.

Category I

1 Point Each	- 1 - 10% Hdw. Type. - Stand Age 16 - 25 Yrs. - Understory Browse less than 1 - 20 % total ground cover. - Understory Grass & Herbs 1 - 20% of total ground cover. - Edge Effect - 1.

RATING	TOTAL POINTS
Good	11 - 15
Fair	6 - 10
Poor	1 - 5

Appendix 33C -- Example of WHEP plot rating.

Appendix Table 33C gives an example of how each plot is rated. The field plot data is in the upper right hand corner of the sheet. Each habitat characteristic is analyzed and receives either 3, 2, or 1 points based on the criteria described for the species being evaluated. The points by habitat characteristics are totaled. In this example, the plot totals 9 points and is rated fair. All field plots are analyzed for each of the game species.

Appendix Table 33C -- Gray squirrel worksheet

EXAMPLE ONLY

				FIELD PLOT DATA
3 Points	(3)	X	81-100% HDW	90% HDW
			3 den trees/ac.	1 Den tree/ac.
			Stand age 61 +	Stand age 55
			Overstory 76-100%	Overstory 75 %
			Midstory N & F 26+%	N & F Mid. 5%
2 Points			51-80% HDW	
			2 Den trees/ac.	
	(2)	X	Stand age 41-60	
	(2)	X	Overstory 51-75%	
			Midstory N & F 11-25%	
1 Point			1-50% HDW	
	(1)	X	1 Den tree/ac.	
			Stand age 10-40	
			Overstory 25-50%	
	(1)	X	Midstory N & F 1-10%	

TOTAL POINTS 9

POINTS	RATING
11-15	Good
6-10	Fair
1-5	Poor

Appendix 33D -- Potential populations by forest types and condition class (WHEP), rating standards, Alabama River Basin.

ACRES/ANIMAL

	GOOD	FAIR	POOR
Longleaf Slash			
Squirrel	-	-	-
Deer	1/45 Ac.	1/60 Ac.	1/90 Ac.
Turkey	1/50 Ac.	1/65 Ac.	1/90 Ac.
Quail	1/2 Ac.	1/4 Ac.	1/8 Ac.
Loblolly-Shortleaf			
Squirrel	-	-	-
Deer	1/25 Ac.	1/45 Ac.	1/80 Ac.
Turkey	1/65 Ac.	1/80 Ac.	1/100 Ac.
Quail	1/4 Ac.	1/6 Ac.	1/10 Ac.
Oak-Pine			
Squirrel	1/2 Ac.	1/5 Ac.	1/10 Ac.
Deer	1/20 Ac.	1/40 Ac.	1/70 Ac.
Turkey	1/35 Ac.	1/65 Ac.	1/90 Ac.
Quail	1/7 Ac.	1/12 Ac.	1/18 Ac.
Oak-Hickory			
Squirrel	1/1.5 Ac.	1/4 Ac.	1/8 Ac.
Deer	1/18 Ac.	1/35 Ac.	1/65 Ac.
Turkey	1/35 Ac.	1/65 Ac.	1/90 Ac.
Quail	-	-	-
Oak-Gum-Cypress			
Squirrel	3/1 Ac.	1.3/1 Ac.	1/2 Ac.
Deer	1/13 Ac.	1/20 Ac.	1/40 Ac.
Turkey	1/35 Ac.	1/60 Ac.	1/85 Ac.
Quail	-	-	-

Forest management practices influence these game species. Squirrel is the most vulnerable, seeking a hardwood site with specific habitat criteria. A reduction in hardwood age class, species, or size class of trees could be extremely detrimental to this species.

A reduction of hardwood species is also detrimental to deer and turkey. Impacts on habitat criteria will be evaluated in alternative plans. These key limiting habitat factors are rated as the highest being 3, while the lowest is 1. Forest type is used to determine habitat deficiencies, for example, if the goal is to improve squirrel habitat in the Oak-pine type, the following practices might be implemented:

1. Favor hardwoods in management.
2. Increase the length of the cutting cycle.
3. Favor soft mast-producing species in the midstory.

These practices would create a more dense overstory (dominant and co-dominate trees) and increase the number of den trees. This management system would increase the squirrel habitat elements in the Oak-Pine type on table 53-3.

Computations for Potential Population of Hunter Days

Acreages in the longleaf-slash and loblolly-shortleaf pine types were not included since squirrel is not featured in management in these types. Also acreages in 0-20 year age classes are not included in the calculations for potential squirrel populations.

The data generally indicates stands 11-20 years of age had limited potential for quail, turkey, and deer. These acreages were excluded in the calculation. Quail is not featured in oak-hickory or bottom land hardwood types, so these reductions were also made.

WHEP output is summarized as follows:

Appendix 34A -- White-tailed deer

The diversity of deer habitat is also reflected in the WHEP program. Almost all forest types had good, or fair ratings (see appendix figure 34A). The oak-hickory and bottom land hardwood sites rated highest. Most of the oak-pine and loblolly-shortleaf types rated fair. Longleaf-slash types rated poor, probably due to insufficient plot data. Ratings by forest types are shown in the following table.

White-tailed Deer - WHEP Rating - All Plot Data

FOREST TYPE	WHEP NUMERICAL RATING
LoblollyShortleaf	8.0
Oak-Pine	8.0
Oak-Hickory	8.5
Bottom land Hardwoods	9.6

Figure 34A1 graphically displays the ratings by forest type and age class. Bottom land hardwoods far exceed other types in productivity. OakPine and Loblolly-Shortleaf types reflect similar productivity due to the high percent of pine in the oak-pine stands. This probably reflects the overlap of forest types on soil associations. Ratings showing percent of plots rated good, fair, and poor are in the table below.

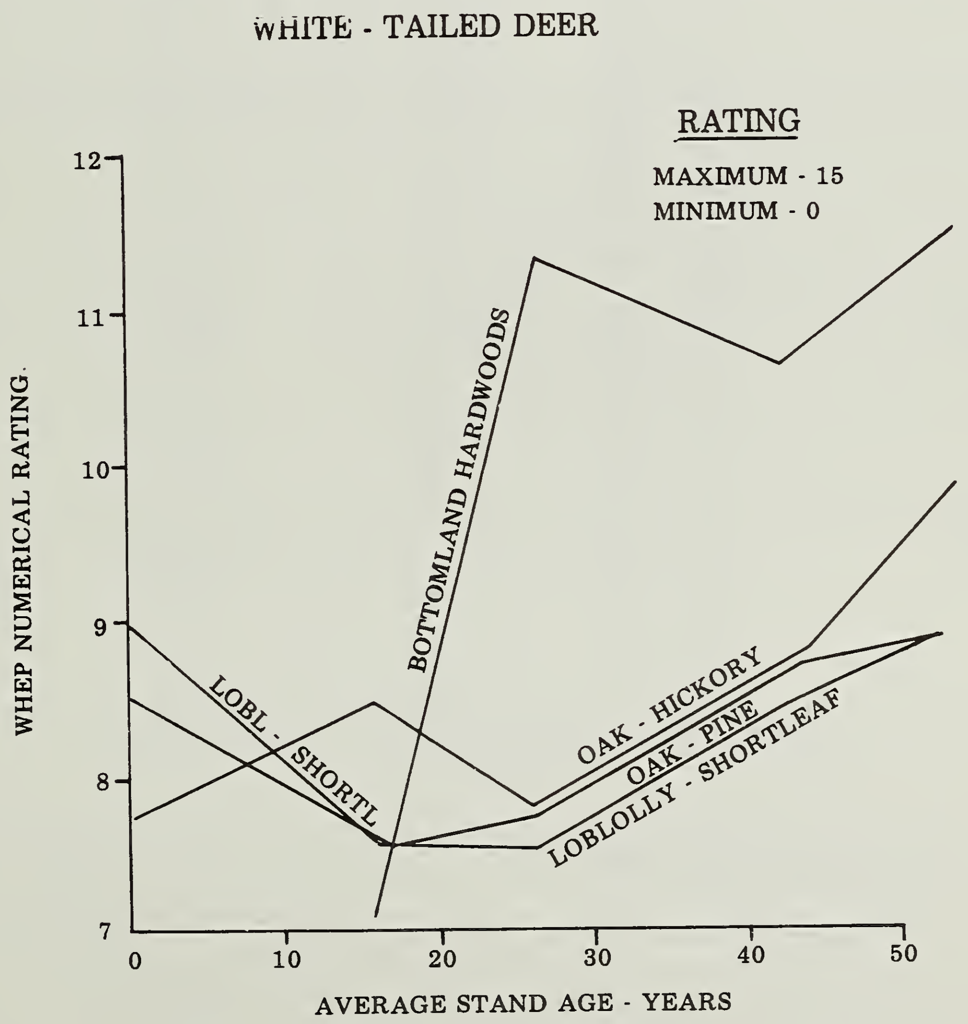

Figure 34A1 -- White-tailed deer WHEP numerical rating by timber type by stand age, Alabama River Basin.

Deer habitat rating by forest type and stand age.

FOREST TYPE	STAND AGE (YRS.)	PERCENT PLOTS RATED GOOD	FAIR	POOR
Longleaf-Slash	0 - 10	-	-	-
	11 - 20	-	-	-
	21 - 30	0	0	100
	31 - 50	0	80	20
	51 -100	-	-	-
	All	0	67	33
Loblolly-Shortleaf	0 - 10	24	76	0
	11 - 20	0	88	12
	21 - 30	3	91	6
	31 - 50	9	89	2
	51 -100	19	81	0
	All	10	82	8
Oak-Pine	0 - 10	19	79	2
	11 - 20	13	76	11
	21 - 30	22	59	19
	31 - 50	13	87	0
	51 -100	13	87	0
	All	13	80	7
Oak-Hickory	0 - 10	0	100	0
	11 - 20	0	92	8
	21 - 30	22	59	19
	31 - 50	20	80	0
	51 -100	35	65	0
	All	19	75	6
Bottom land Hardwoods	0 - 10	-	-	-
	11 - 20	0	80	20
	21 - 30	67	33	0
	31 - 50	48	52	0
	51 -100	-	-	-
	All	40	49	11

Appendix 34B -- Gray Squirrel

Squirrel habitat received best ratings in the bottom lands and in the oak-hickory forest type (see appendix figure 34B). Fair ratings also occurred in some oak-pine stands. The numerical ratings for all plot data by forest type are shown on the table on the following page.

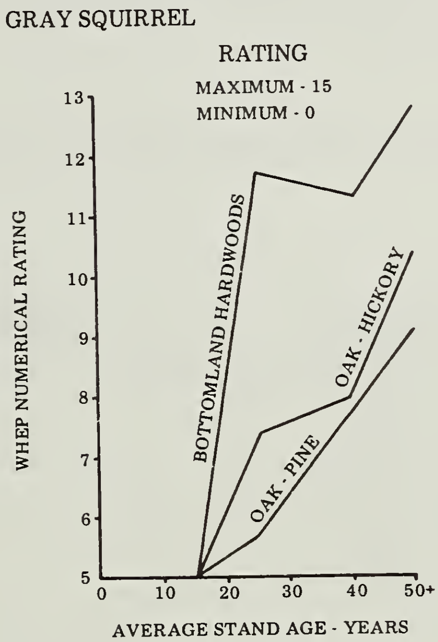

Figure 34B1 -- WHEP Habitat Rating for Grey Squirrel

Gray Squirrel - WHEP Rating - All Plot Data

FOREST TYPE	WHEP NUMERICAL RATING
Longleaf-Slash	5.2
Loblolly-Shortleaf	4.5
Oak-Pine	5.8
Oak-Hickory	6.8
Bottom land Hardwoods	9.7

The plot data is further disaggregated by forest type and groupings of age classes (see figure 4-41). Longleaf-Slash and Loblolly-Shortleaf types are not shown in this figure since these types would not feature gray squirrel management. Some irregularities in the graphic display are attributed to sample. Insufficient plot data is the probable cause.

The table on the following page presents the percent of plots rated good, fair, or poor. In all types, as the stand age increased, the habitat improved for squirrel.

Squirrel habitat rating by forest type and stand age class.

FOREST TYPE	STAND AGE (YRS.)	PERCENT PLOTS RATED GOOD	FAIR	POOR
Longleaf-Slash	0 - 10	-	-	-
	11 - 20	-	-	-
	21 - 30	0	0	100
	31 - 50	0	60	40
	51 -100	-	-	-
	All	0	50	50
Loblolly-Shortleaf	0 - 10	0	11	89
	11 - 20	0	46	54
	21 - 30	0	56	44
	31 - 50	0	53	47
	51 -100	0	68	32
	All	0	41	59
Oak-Pine	0 - 10	0	12	88
	11 - 20	0	42	58
	21 - 30	0	69	31
	31 - 50	4	87	9
	51 -100	19	75	6
	All	4	55	41
Oak-Hickory	0 - 10	0	6	94
	11 - 20	0	46	54
	21 - 30	4	81	15
	31 - 50	16	72	12
	51 -100	39	61	0
	All	12	59	29

Appendix 34B (Cont'd)

Bottom land	0 - 10	-	-	-
Hardwoods	11 - 20	0	60	40
	21 - 30	67	33	0
	31 - 50	76	20	4
	51 -100	100	0	0
	All	59	25	16

Appendix 34C -- Eastern wild turkey

Turkey habitat rated most productive on the hardwood sites (see figure 34C). The bottom land hardwoods and upland oak sites received the highest ratings. Oak-pine and Longleaf-slash pine stands received fair to good ratings.

Turkey ratings by forest types are listed in the table below.

Eastern Wild Turkey - WHEP Rating - All Plot Data

FOREST TYPE	WHEP NUMERICAL RATING
Longleaf-Slash	7.0
Loblolly-Shortleaf	7.7
Oak-Pine	8.5
Oak-Hickory	8.7
Bottom land Hardwoods	8.8

The table on the following page lists the percent of plots rated good, fair, or poor by stand age. The habitat gradually improves as the stand age increases. Young stands 0 - 10 years of age also received fair ratings in the Oak-Pine forest type.

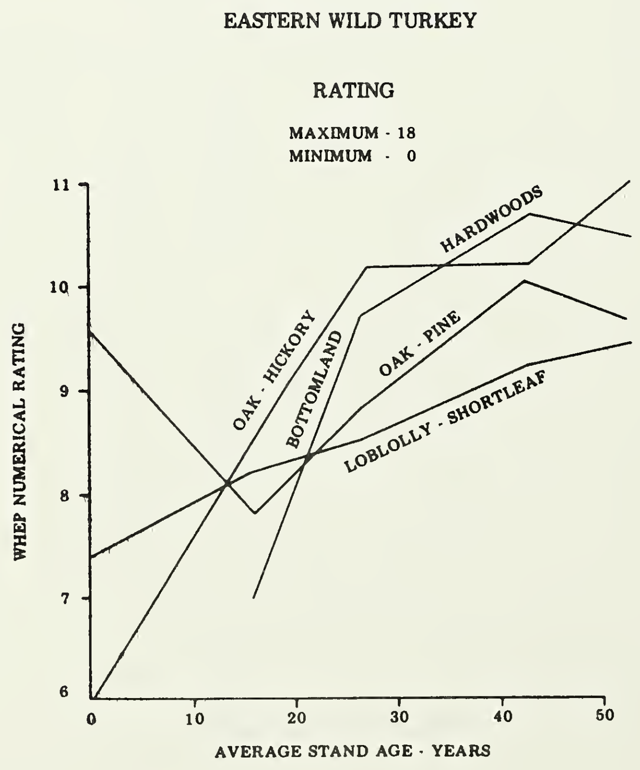

Figure 34C -- Eastern Wild Turkey - WHEP Rating-All Plot Data

Turkey habitat rating by forest type and stand age class

FOREST TYPE	STAND AGE (YRS.)	PERCENT PLOTS RATES GOOD	FAIR	POOR
Longleaf-Slash	0 - 10	-	-	-
	11 - 20	-	-	-
	21 - 30	0	0	100
	31 - 50	0	80	20
	51 -100	-	-	-
	All	0	50	50
Loblolly-Shortleaf	0 - 10	4	42	54
	11 - 20	0	75	25
	21 - 30	3	75	22
	31 - 50	4	93	3
	51 -100	6	88	6
	All	3	65	32
Oak-Pine	0 - 10	19	70	11
	11 - 20	3	68	29
	21 - 30	4	88	8
	31 - 50	4	93	3
	51 -100	0	87	13
	All	5	77	18
Oak-Hickory	0 - 10	13	19	68
	11 - 20	0	77	23
	21 - 30	4	85	11
	31 - 50	8	88	4
	51 -100	9	91	0
	All	5	75	20
Bottom land Hardwoods	0 - 10	-	-	-
	11 - 20	0	60	40
	21 - 30	0	100	0
	31 - 50	4	96	0
	51 -100	20	80	0
	All	0	84	16

Quail habitat received best ratings in areas of the Coastal Plain and Piedmont land resource areas (see appendix figure 34D). Fair conditions also exist in areas adjacent to crop and pastureland in the Coosa Valley.

Quail ratings by forest type are shown in the table below. Longleaf-Slash pine types rated highest while bottom land hardwood types received the lowest rating.

Bobwhite Quail - WHEP Rating - All Plot Data

FOREST TYPE	WHEP NUMERICAL RATING
Longleaf-Slash	10.8
Loblolly-Shortleaf	10.4
Oak-Pine	9.2
Oak-Hickory	8.8
Bottom land Hardwoods	7.4

The plot data is further displayed by forest type and age class categories in figure 34D1.

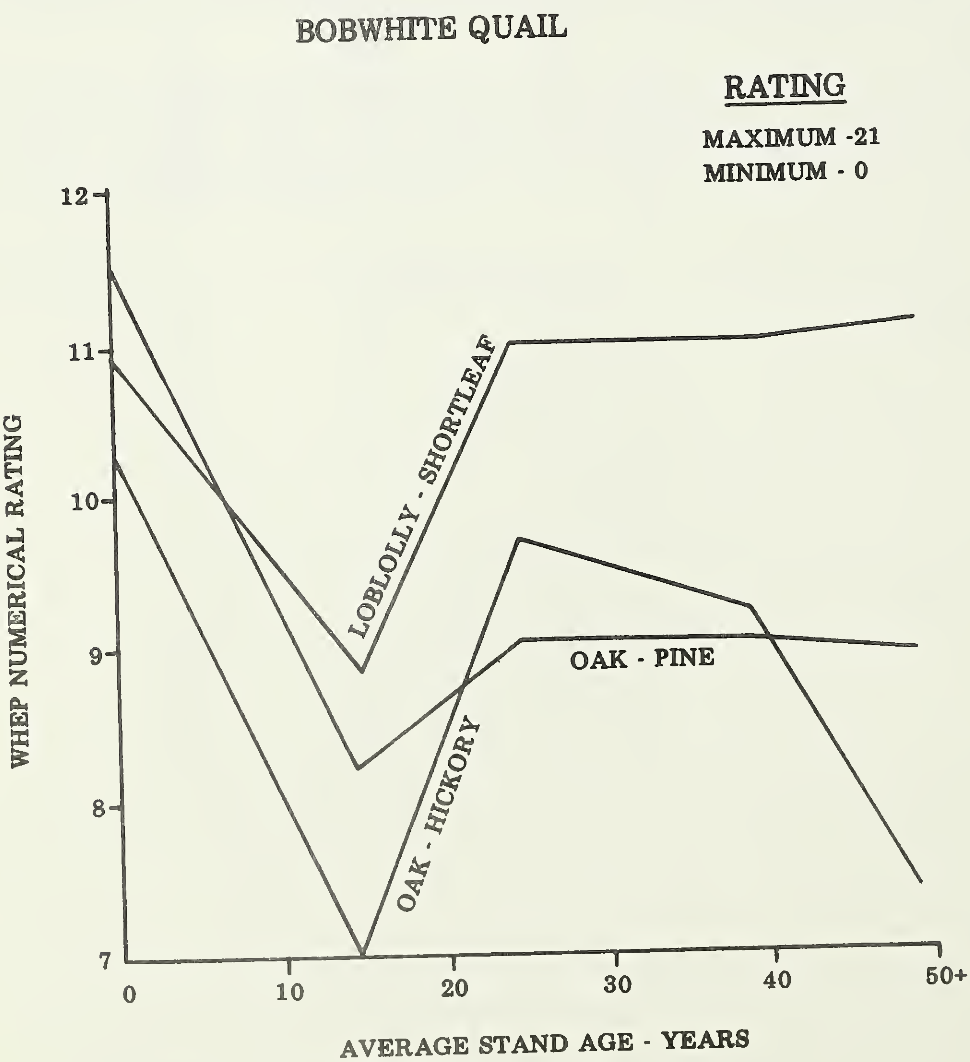

Figure 34D1 -- WHEP Rating - All Plot Data

The table below list the percent of plots rated good, fair, or poor by stand age.

Quail habitat rating by forest type and stand age class.

FOREST TYPE	STAND AGE (YRS.)	GOOD	PERCENT PLOTS RATED FAIR	POOR
Longleaf-Slash	0 - 10	-	-	-
	11 - 20	-	-	-
	21 - 30	0	100	0
	31 - 50	0	100	0
	51 -100	-	-	-
	All	0	100	0
Loblolly-Shortleaf	0 - 10	7	89	4
	11 - 20	4	67	29
	21 - 30	11	67	22
	31 - 50	11	74	15
	51 -100	6	84	10
	All	8	73	19
Oak-Pine	0 - 10	16	72	12
	11 - 20	0	55	45
	21 - 30	12	54	34
	31 - 50	9	60	31
	51 -100	0	78	22
	All	8	62	30
Oak-Hickory	0 - 10	0	100	0
	11 - 20	0	23	77
	21 - 30	11	63	26
	31 - 50	12	52	36
	51 -100	0	39	61
	All	6	56	38
Bottom land Hardwoods	0 - 10	-	-	-
	11 - 20	0	60	40
	21 - 30	0	0	100
	31 - 50	0	48	52
	51 -100	0	40	60
	All	0	43	57

APPENDIX TABLE 35 -- BEAVER PONDS IN ALABAMA, EXPANDED DATA AND ESTIMATES BY COUNTY, ALABAMA RIVER BASIN, 1967.

COUNTY	BEAVER PONDS	POND ACRES	STREAM MILES	COUNTY	BEAVER PONDS	POND ACRES	STREAM MILES
Autauga	222	3112	230	Jefferson	48	119	160
Baldwin	212	1121	305	Lee	179	2510	185
Bibb	272	3389	185	Lowndes	179	2510	185
Bullock	169	2369	175	Macon	188	2636	195
Bulter	237	2853	250	Marengo	266	1926	240
Calhoun	47	74	125	Mobile	181	957	260
Chambers	70	133	160	Monroe	160	846	230
Cherokee	53	83	140	Montgomery	183	2566	199
Chilton	199	2480	135	Perry	199	1441	180
Clarke	163	862	235	Randolph	81	154	185
Clay	75	108	130	Shelby	57	141	190
Cleburne	59	93	155	St. Clair	97	186	220
Coosa	73	139	165	Talladega	79	150	180
Dallas	316	2288	285	Tallapoosa	86	163	195
DeKalb	70	110	185	Wilcox	238	1723	215
Elmore	198	2776	205				
Etowah	53	83	140	TOTAL	4691	40101	7215

Source: Alabama Beaver Symposium, 1967.

APPENDIX 36 -- CONFINED LIVESTOCK OPERATIONS, ALABAMA RIVER BASIN, 1972 1/

Appendix table 36A -- Number of confined livestock operations, animals and waste treatment systems, by subbasins, Alabama River Basin, 1972.

	TYPE OF OPERATION 2/											
	HOG PARLORS				DAIRY OPERATIONS				CATTLE FEEDLOTS			
SUBBASIN	NO. OF OPERATOR	NO. OF ANIMALS	NO. & % OF OPERATIONS WITH TREATMENT		NO. OF OPERATORS	NO. OF ANIMALS	TREATMENT NO.	TREATMENT %	NO. OF OPERATORS	NO. OF ANIMALS	TREATMENT NO.	TREATMENT %
Coosa	33	11,105	17	52	53	5,860	28	53	6	2,640	6	100
Cahaba	7	2,000	6	86	23	3,635	17	74	-	-	-	-
Alabama	90	29,200	45	50	27	4,919	8	30	8	5,350	6	75
Tallapoosa	38	9,025	20	53	13	1,756	2	15	3	400	2	67
TOTAL	168	51,330	88	52	116	16,170	55	47	17	8,390	14	82

1/ Data was compiled from questionnaires completed by each Soil Conservation Service field office in the river basin.

2/ Inventory includes all hog parlors, dairy herds kept in continous confinement, dairy herds exceeding 100 head, and beef cattle feedlots exceeding 100 animals.

Appendix Table 36B -- Summary of existing animal waste stabilization basins permitted by the Alabama Water Improvement Commission, by counties and subbasins, Alabama River Basin, April 1975. 1/

SUBBASIN/COUNTY	NUMBERS OF FACILITIES-NUMBERS OF ANIMALS 2/ HOGS	COWS	LAYERS
ALABAMA			
Autauga	13-4,730		
Chilton	2-475		
Dallas	2-1,850	1-150	
Lowndes	1-20		
Monroe	5-2,050		
Montgomery	4-825	6-2,230	
Perry		1-200	
Subbasin Total	27-9,950	8-2,580	
CAHABA			
Chilton	1-50		
Jefferson		1-150	
Perry	2-665	1-200	
St. Clair	1-608		
Subbasin Total	4-1,323	2-350	
COOSA			
Cherokee	4-1,565		1-14,000
Calhoun	8-1,644		
DeKalb	21-4,249	4-370	10-259,350
Etowah	6-333		
Talladega	3-754	1-70	
Elmore	3-1,610	3-700	
Shelby	2-575		
St. Clair		1-150	
Subbasin Total	47-10,730	9-1,290	11-273,350
TALLAPOOSA			
Chambers	3-560		2-85,000
Bullock	1-300	1-150	
Clay		1-60	
Cleburne		2-395	
Tallapoosa		1-200	
Elmore	1-50	1-300	
Lee	1-1,000		
Randolph	4-1,112		1-8,000
Subbasin Total	10-3,022	6-1,105	3-93,000
TOTAL	88-25,025	25-5,325	14-366,350

1/ Listing of permits issued by the Alabama Water Improvement Commission was field checked by Soil Conservation Service personnel to determine the number of permitted facilities that were actually constructed in April 1975.

2/ Number of animals that systems are designed to accomodate.

VOLUME II

ALABAMA RIVER BASIN COOPERATIVE STUDY

RESOURCE DEVELOPMENT OPPORTUNITIES

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
ECONOMIC RESEARCH SERVICE
FOREST SERVICE

APRIL 1977

RESOURCE DEVELOPMENT OPPORTUNITIES

ALABAMA RIVER BASIN

WITHIN ALABAMA

VOLUME II

COOPERATIVE STUDY

Prepared by

UNITED STATES DEPARTMENT OF AGRICULTURE
Soil Conservation Service
Economic Research Service
Forest Service

In cooperation with the

ALABAMA DEVELOPMENT OFFICE

Auburn, Alabama

August 1977

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PREFACE

A basic tenet of Alabama's water resources policy is that the total water resources of the state shall be conserved, developed, and used for the maximum benefit of all the people of the state and that development of the state's water and related land resources shall complement and be compatible with the development plan for the total resources of the state. State policy encourages economic development at greater than the National average, but at the same time calls for protection and conservation of natural and human resources.

Three U. S. Department of Agriculture agencies, the Soil Conservation Service, the Economic Research Service, and the Forest Service are completing an extensive study of water and related land resource problems in the Alabama Basin under sponsorship of the Alabama Development Office. The inventory of basin resources and projection of the future demands on these resources is presented in Volume I, Alabama River Basin Cooperative Study, May 1977.

The final phase of the basin study is presented herein. Chapter 2 of this Volume, presents two alternatives for water and land resource development in the Alabama River Basin that were designed to satisfy varying levels of economic development and environmental quality enhancement. These alternatives were developed by the USDA staff with input by numerous interested local, state and federal agencies and organizations. Following an extensive review of these alternatives, the Suggested Plan, Chapter 3, was developed from comments received and earlier expressions of interest in the individual plan elements. Implementation opportunities are identified in Chapter 4.

ADDENDUM

Alabama River Basin, Alabama

This addendum shows the costs, benefits, and benefit-cost ratio based on 6 3/8 percent interest rate, 1975 installation costs, and current normalized prices for agricultural commodities. Annual costs, benefits, and benefit-cost ratio for three alternatives are as follows:

NED Alternative - Table 2-11

1. Costs are $5,895,000.

2. Benefits are $14,500,000.

3. Benefit-cost ratio is 2.5:1.

EQ Alternative - Table 2-24

1. Costs are $6,190,000

2. Benefits are $11,800,000.

3. Benefit-cost ratio is 1.9:1.

Suggested Plan - Table 3-12

1. Costs are $5,895,000.

2. Benefits are $14,500,000.

3. Benefit-cost ratio is 2.5:1.

CHAPTER 1

RESOURCE DEVELOPMENT NEEDS

INTRODUCTION

A comprehensive water and related land resources inventory for the Alabama River Basin was completed in 1976. Results are documented in a separate report, Alabama River Basin, Cooperative Study, Volume I, hereafter referred to as Volume I. Major areas covered include natural resource availabilities, human and economic resources, projections, problems, and development needs.

Component needs were classified by the major planning objective to which they are primarily related. National Economic Development (NED) components will enhance national economic development by increasing the value of the nation's output of goods and services and improving national economic efficiency. Environmental Quality (EQ) components will enhance environmental quality by the management, conservation, preservation, creation, restoration or improvement of the quality of certain natural and cultural resources and ecological systems. The classification of components or component needs as primarily NED or EQ does not preclude the use of elements of those components in planning toward either objective.

Emphasis was given to determining gross needs under present conditions and projected needs for 1990 and 2020 without accelerated resource development activities. Those needs that could be satisfied with existing facilities and ongoing programs were subtracted from gross needs to obtain the net needs for 1990 and 2020. For a more detailed discussion of methodologies and assumptions, the reader is referred to Chapter 5 of Volume I, Component Needs. These needs are shown in table 1-1, along with a brief resume of information presented in Chapter 5, Volume I.

Land use under present conditions and projected for 1990 and 2020 without accelerated resource development is the basis for most planning. Present and projected land use is shown in Chapter 4 of Volume I, table 4-3, and in tables 2-2, 2-14, 3-2, and 3-16 of this volume.

Table 1-1 -- Specific components and component needs, present and projected, Alabama River Basin, 1975

SPECIFIC COMPONENTS	COMPONENT NEEDS	UNITS	QUANTITY PRESENT	QUANTITY 1990	QUANTITY 2020
PRIMARILY NED					
1. Increased or more efficient output of food and fiber.					
a. Improved efficiency of production and resulting agricultural income	Flood reduction--agricultural land	Thou. acres	239	203	203
	Erosion damage reduction				
	Cropland and pastureland	Thou. acres	2,172	2,053	2,073
		Thou. tons	9,198	6,255	9,533
	Increased drainage - on farm	Thou. acres	169	170	202
	Improved production efficiency				
	Cropland	Thou. acres	738	614	591
	Pastureland	Thou. acres	603	1,024	1,473
b. Increased forest production and utilization	Increased forest production	Mil.cu.ft./yr.	0	0	82.0
	Reduction of fire losses	Ac./yr.	7,429	7,129	6,845
	Increased forest grazing	Mil.lbs./yr.	47.0	19.2	16.4
2. Urban flood damage reduction	Urban damage reduction	No. of comm.	80	90	110
3. Increased and more efficient production of agricultural, municipal, and domestic water supply	Create additional surface water supply	MGD	6	25	71
4. Increased output of outdoor recreation opportunities	Increased recreation activities				
	Boating	Thou. ac. of water	0	2.8	38
	Water skiing	Thou. ac. of water	0	1.1	4
	Fishing	Thou. ac. of water	25	36	69
	Hunting	Thou. ac.	58	176	457
	Swimming	Mil. act. occas./yr.	2.0	11.9	29.0
	Camping	Mil. act. occas./yr.	0.4	0.7	5.2
	Hiking	Miles of trails	78	400	950
	Picnicking	No. of tables	285	2,900	6,000
	Golfing	Thou. ac. of land	0	4.8	17.4
		No. of 18-hole courses	0	32	116

Table 1-1 -- cont'd

SPECIFIC COMPONENTS	COMPONENT NEEDS	UNITS	QUANTITY PRESENT	1990	2020
PRIMARILY EQ					
5. Improved quality aspects of water, land and air					
a. Improved waste disposal	Solid waste disposal improvement	Industrial waste disposal (ac.)	100	200	400
b. Improved stream water quality	Low quality streams improvement	Flow (cfs)	231.5	231.5	231.5
c. Reduction in sedimentation	Reduction in total sediment load	Mil. tons/yr.	14.1	14.7	16.4
d. Reduction in non-point critical erosion	Critical erosion reduction				
	Streambanks	Thou. acres	21.0	21.0	21.0
		Thou. tons	777	777	777
	Roadside erosion	Thou. acres	2.0	2.3	2.3
		Thou. tons	390	449	449
	Critical areas	Thou. acres	115.0	113.0	117.0
		Thou. tons	10,925	10,735	11,115
	Strip mine reclamation	Thou. acres	12.7	15.3	15.3
		Thou. tons	1,842	2,219	2,219
e. Reduction in "disturbed" forest erosion	Disturbed forest erosion reduction	Thou. acres	60	74	114
		Thou. tons	12,200	17,900	23,300
6. Improvement, protection and/or preservation of areas of natural beauty for man's enjoyment					
a. Protection of and increased access to scenic areas	Scenic streams	Miles	420	300	350
	Natural scenic sites	Numbers	130	90	75
7. Enhancement or preservation of biological resources					
a. Improved quality and increased quantity of fish and wildlife habitat	Fish & wildlife habitat improvement				
	Upland habitat	Thou. acres	100	150	220
	Wetland habitat	Thou. acres	18	25	40
	Improved management	Thou. acres	7	8	10
	Stream improvement	Thou. acres	4	3	5
b. Protection of rare and endangered species of flora and fauna	Protection of flora & fauna				
	Flora	No. of species	26	40	50
	Fauna	No. of species	40	50	62
8. Preservation of archaeological and historical resources	Protection of archaeological and historical sites				
	Archaeological sites	No. of sites 1/	120	110	100
	Historical sites	No. of sites 1/	255	200	180

1/ Based on recognized sites.

Agricultural Flood Damage Reduction

The study revealed a flood problem on 861,000 acres of flood plain. Two-thirds of this area is forest land with insignificant flood damages. 1/ This land, along with 86,000 acres having flood control projects installed or expected to be installed by 1990, was deducted from the total, leaving 203,000 acres (49,000 acres of cropland and 154,000 acres of pastureland) needing flood damage reduction by 1990. No flood control projects were identified for installation under future without accelerated resource development after 1990, therefore the 2020 needs would remain at 203,000 acres.

Erosion Reduction

In 1970, 2,600,000 acres of the basin were devoted to cropland and pastureland. Total projected acreage of these uses is estimated to be 2,806,000 in 1990 and 2,874,000 in 2020, a two percent increase.

Treatment accomplishments to reduce erosion show going programs and planned projects can provide adequate treatment on 753,000 acres by 1990. This acreage was deducted from 2,806,000 to obtain a net treatment need of 2,053,000 acres for 1990. Net needs for 2020 were determined in a similar manner.

Net erosion reduction needs were determined by comparing the projected erosion with the erosion that the resource base can tolerate. Erosion needs to be reduced by 6.3 million tons in 1990 and 9.5 million tons by 2020.

Agricultural Drainage

Improved drainage is needed on 32,000 acres of cropland and 137,000 acres of pastureland to provide orderly removal of excess water and improve production efficiency.

An analysis of existing programs indicated they are adequate to satisfy the recurring needs. The future drainage needs for cropland and pastureland will be 36,000 and 134,000 acres respectively by 1990 and 33,000 and 169,000 acres by 2020 respectively.

Production Efficiency

Projected increases in the demand for food, feed, and fiber from agricultural land can be met in 1990 and 2020 without accelerated resource development; however, continued unwise land use will result in deterioration of the land resource base. Much misuse of the land and water base is occurring, and will continue to occur without some form of accelerated resource development programs.

1/ Minor flood problems may exist on small areas of forest in the flood plain.

Depletion of the resource base cannot continue if we hope to satisfy long run commodity needs. In this sense, there is a definite component need to improve use and management efficiencies on 1.6 million acres of land projected to be in crops and pasture by 1990. This figure will exceed 2 million acres by 2020.

Increased Forest Production

Projections of timber supply and demand in the basin indicate an increase in demand from 225 million cubic feet in 1970 to 600 million cubic feet in 2020 while forest acreage is projected to decline from 7,471,000 acres to 6,862,000. By 2020, demand will exceed supply at an annual rate of 82 million cubic feet per year assuming a continuation of present trends in management.

Reduction of Fire Losses

Currently, 7,429,000 acres of forest land needs accelerated fire protection in order to reach the goal of 0.25 percent of the forest burned annually. By 1990, this need will decrease to 7,129,000 acres, and by 2020, to 6,845,000 acres as forest land acreage declines.

Increased Forest Grazing

Projections indicate that demand for beef from forest grazing will drop sharply from 59.3 million pounds of beef in 1970, to 30.6 million in 1990 and 25.6 million in 2020. As demands for timber rise, beef production from forest grazing will decline from 12.3 million pounds of beef in 1970 to 11.4 million in 1990, and 9.2 million by 2020.

Urban Flood Damage Reduction

Eighty urban communities were experiencing flooding in 1970. Unless necessary conservation treatment is installed and zoning measures are implemented, the number of communities suffering flood damage is expected to reach 90 by 1990 and 110 by 2020.

Water Supply

The study focused on those communities with significant increases in future water supply needs that could not be met through additional wells or from available stream flows. Water supply treatment and distribution were considered to be outside the scope of this study.

Thirteen communities needing additional supplies of municipal and industrial water by 1990 were identified; by 2020, seven other communities will need new water supplies as is shown in table 1-2 below. Supply deficits of 25 MGD by 1990, and 71 MGD by 2020 are projected.

Table 1-2 -- Communities needing additional supply of municipal and industrial water by time frames - Alabama River Basin

Need Additional Supply By 1990	Will Need Additional Supply Between 1990-2020
Piedmont	Sterrett-Vandiver
Jacksonville	Westover
Calera	Wilsonville
Columbiana	Ashville
Margaret	Springville
Moody	Steele
Odenville	Auburn
Wedowee	
Woodland	
Ranburne	
Fruithurst	
Opelika	
Lookout Mountain (Gadsden)	

Increased Recreation

Currently, the Basin supplies an average of about 32 million activity occasions of recreation annually. By 1990 demand is expected to double. Development of swimming, fishing, and hiking facilities is particularly critical as is shown in table 1-1.

Solid Waste Disposal

Currently there is a need for the development and operation of two cooperative waste disposal sites for hazardous solid industrial wastes. These sites, approximately 100 acres each, will be needed within the basin by 1990 while a total of 400 acres will be needed for this purpose by 2020.

Low Quality Stream Improvement

Twenty streams have been identified which have now or will have a pollution problem during periods of low streamflow. The majority of these are a result of insufficient streamflow to transport effluent from municipal and industrial waste treatment facilities. Total flow in these streams should be increased approximately 230 cubic feet per second to maintain the allowable dissolved oxygen content of 5 parts per million.

Reduction in Sedimentation

For the Alabama River Basin Study, a reduction in sedimentation goal was set at that amount of sediment that would be produced if erosion could be reduced to "T" erosion basinwide. 1/ The sediment goal is 7.3 million tons annually for both 1990 and 2020. Projected annual sediment yield without a plan is expected to be about 22 million tons by 1990 and 23.7 million tons by 2020. The sediment reduction need is the difference between projected sediment yield and the "sediment goal"; consequently, the need is to reduce sediment yield 14.7 million tons by 1990 and 16.4 million tons by 2020.

Reduction of Critical Erosion

Reconnaissance surveys indicate there are 150,700 acres of critically eroding land in the Basin. Projections weighing the effects of on-going conservation programs against the development of new gullies and critical areas estimate that 151,600 acres and 155,600 acres will need critical area treatment in 1990 and 2020, respectively.

Reduction of Erosion on "Disturbed" Forest Lands

By 1990 there will be 74,000 acres of highly disturbed forest land that are actively eroding and by 2020 this figure will reach 114,000 acres. Erosion on these areas is critical and must be reduced if the overall erosion average on forest lands is to be reduced to 2 tons per acre per year. Annual erosion on forest land needs to be reduced by 17.9 million tons in 1990 and 23.3 million tons in 2020.

Protection of Scenic Rivers and Streams

Currently, 416 miles of scenic streams including all or portions of the Cahaba River, Tallapoosa River, Little River, Shoal Creek and Hatchett Creek need protection (see Volume I, p. 2-47). It was assumed that the current mileage of scenic streams needing protection will be reduced about 25 percent by 1990 because 16 miles will be impounded and about 100 miles will be protected through current private, state, or federal programs. There will remain about 300

1/ Soil loss tolerance "T" on open land averages 4.0 tons per acre per year.

miles to be protected from unregulated development, special interest exploitation, or other unwanted abuse. A projected 350 miles of streams will need protection by 2020 to preserve an ample supply of this resource.

Natural Scenic Sites

A list of 130 natural scenic sites that need protection to preserve and maintain their unique or aesthetic qualities was developed (see Volume I, p. 2-61). By 1990 about 10 sites will be irreversibly degraded, commercialized, or otherwise be unavailable for public use. An additional 30 sites will receive adequate protection through ongoing programs, leaving a net of 90 sites that would need protection in 1990. By 2020, at least 75 sites should need protection.

Improve the Quality and Quantity of Fish and Wildlife Habitat

Landowners in the basin have made substantial contributions toward fish and wildlife habitat improvement through expenditure of private funds. Future needs are based on the assumption that this interest in, and effort toward, natural resources conservation and development will continue.

Currently, (1976) there is a need for fish and wildlife habitat improvement on 129,000 acres in the Basin. By 2020, this figure is projected to be 275,000 acres. The future for squirrel hunting is bleak unless large acreage of hardwoods can be preserved or developed; the demand-supply relationship for waterfowl hunting is becoming critical also.

Protection of Endangered Species of Flora and Fauna

Presently, about 66 plants and animals native to the basin are classified as "endangered" on a state or federal list. This number is expected to increase to 90 by 1990 and 112 by 2020. These organisms were assumed to be in need of adequate protection although the Endangered Species Act was passed in 1973.

Protection of Archaeological and Historical Sites

The basin contains 120 recognized archaeological sites needing preliminary investigation and/or protection. This number is expected to decline to 110 by 1990, and 100 by 2020. The present estimate of 255 historical sites needing preservation can be expected to decline to 200 by 1990 and 180 by 2020. The primary need in assuring protection of these sites is thorough documentation of the location and value of these sites followed by an appropriate public awareness effort.

CHAPTER 2

NATIONAL ECONOMIC DEVELOPMENT AND ENVIRONMENTAL QUALITY ALTERNATIVES

GENERAL INTRODUCTION

Many state and federal agencies in the study area are concerned with resource planning. Among those groups actively developing proposals are the USDA through RC&D and watershed work, the U. S. Army Corps of Engineers, the National Forest System, several planning and development commissions, and various city and county planners. The work of each of these groups was reviewed to determine to what extent plans, currently being developed, might satisfy component needs. Priorities for development, types of facilities desired, and possible funding were assessed through contacts with knowledgeable groups. The list of possible projects was based upon local interest, location in relation to existing facilities, population centers, future growth corridors, and previously determined needs for specific facilities.

Projects of highest priority were identified for further assessment. Project proposals were developed for each element based on the component needs expressed earlier. The development alternatives contain USDA project proposals as well as projects of other agencies.

Neither alternative completely satisfies all future demands. This was not the intention of the study. A plan to fully satisfy all needs would be both unrealistic and uneconomical. Each alternative simply represents a set of projects with high priority and expressed local interest.

The formulation of alternatives to meet specified component needs included the development of alternatives for national economic development (NED) and environmental quality (EQ). Alternatives for NED and EQ were formulated to achieve varying levels of contributions to the specified components of the objectives. Effectiveness of both the NED and EQ alternatives is shown in figure 2-3 and table 2-8, and indicates possible tradeoffs among components and resource allocation. The beneficial and adverse effects of each alternative have been evaluated and displayed for the four accounts of national economic development, regional development, environmental quality, and social well-being (see table 2-12). The identification of effects from various elements are presented in monetary and/or non-monetary terms. An element or measure may accrue effects to more than one account.

NATIONAL ECONOMIC DEVELOPMENT ALTERNATIVE

The overall purpose of the NED alternative is to promote national economic development by increasing the value of the nation's output of goods and services and improving national economic efficiency. The NED alternative reflects increases in the nation's productive output measured by the continuous flow of goods and services into direct consumption or investment. Elements included in the NED alternative were selected on the basis of their ability to satisfy component needs while emphasizing national economic development (table 2-1). Benefits and costs for those elements adaptable to monetary evaluations are shown in table 2-11.

Land Use

The NED alternative includes four elements designed specifically to reduce erosion and to improve production efficiency through proper use of land resources. Necessary land use changes would be accomplished through increased technical assistance to landowners in the development and implementation of sound conservation plans. The elements include provisions to:

1. Gradually shift row crops to capability class I through III soils; limit improved pasture to classes I through IV land (see Appendix to Volume I, p. A-91).

2. Require additional conservation or support acreage for each acre harvested--the additional acres to be used for proper water disposal, field borders, and fallow land to support crop production.

3. Remove high risk flood plain land (primarily subclasses IIIw and IVw) from possible use for crops and pasture.

4. Accelerate the current rate of land use change.

Economic analyses of factors affecting land use, particularly land availability, resource productivity, and consumer demands, indicate that without accelerated resource development, approximately 614,000 acres of basin cropland will be harvested in 1990. Elements included in the NED alternative would increase this figure by about 25 percent to 766,000 acres (see table 2-2). This increase is largely due to the movement of 130,000 acres of corn and cotton into the basin. There would be very little effect upon other major crops, i.e., soybeans, wheat, or hay.

Table 2-1 -- Measures included in the early action portion of the NED Alternative, Alabama River Basin

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Land Resource Development

Conservation treatment on 1,271,000 acres of agricultural and forest land for erosion reduction.
Drainage of 7,000 acres of cropland, 32,000 acres of pastureland, and 6,000 acres of converted woodland and unimproved pastureland would improve production efficiency.
Changed land use for improved production efficiency on 382,000 acres of cultivated land.
Conservation measures to reduce sediment in streams by 7.7 million tons/year.
Roadside and gullied area stabilization to reduce critical erosion on 46,000 acres.
Reduction of forest fire losses from 0.54 to 0.35 percent on 7,129,000 acres of forest land.
Prescribed burning on 110,000 acres of forest to increase beef production.
Improve timber production efficiency on 530,000 acres. 1/

Water Resource Development

Changed land use on 38,000 acres to reduce flood damage.
Six watershed flood control projects.
Six reservoirs for municipal and industrial water supply.

Recreation and Culture

Recreational development at 27 sites to provide 2.9 million activity occasions annually.
Acquisition and protection of 75 miles of scenic streams and 5 natural scenic sites.
Wildlife habitat improvement on 63,000 acres.
Identification and protection of 7 species of flora and fauna.

Waste Disposal

Acquisition of 200 acres for solid waste disposal.

1/ This area needs treatment during the early action period in order to meet harvesting requirements in 2020.

Under the NED alternative, basin farmers would account for a third of the State's cropland harvested in both 1990 and 2020, rather than the 28 percent projected without development. Net return to land, labor and management would increase about $10 million annually by 1990. Both net returns and production are shown in table 2-3.

This alternative is strongly oriented to the reduction of soil losses from erosion. Implementation of NED elements would shift 55,000 acres of capability classes IVe through VIe soils, projected to be in crop production without development, to timber by 1990. Erosion control measures in support of harvested cropland would necessitate an additional 45,000 acres of supporting conservation land by 1990. This acreage would be used for proper water disposal and/or grass rotations to reduce sheet and rill erosion from row crops to acceptable levels.

Forest land acreage would remain at 7,155,000 acres in 1990. A total of 136,000 acres of capability class I and subclass IIw and IIIw forest land would be cleared for crops between 1975 and 1990. This acreage would be replaced by an equal amount of subclass IVe cropland to be reforested.

The category "urban and other land" includes all urban and built-up areas, home sites, farm roads, feed lots, ditch and road banks, non-farm or "urban" residences, and marshes. The NED option would have no effect upon the total acreage shifting to urban uses. However, the alternative calls for reservoirs that will inundate 4,000 acres of "other land" by 1990; consequently, the projected total in these uses would be reduced slightly in both 1990 and 2020.

Agricultural Flood Damage Reduction

Changed Land Use--An opportunity exists for using nonstructural means to reduce flood damage in small watersheds. To meet the needs for flood damage reduction in agricultural areas, study participants evaluated the effects of changing a portion of the flood plain use from crops and pasture to other uses having less damageable values. Flood damage in these watersheds could be reduced by nonstructural elements such as changed land use (i.e., by relocating a portion of the crops and pasture out of the lower levels of the flood plain where flooding is most severe and dollar damages are highest). This change could be accomplished through intensive conservation planning efforts that would utilize flood hazard information in selecting the best use for current cropland and pastureland being grown on soil capability subclasses IIIw and IVw.

Table 2-2 -- Land use, present, projected and NED alternative, Alabama River Basin, 1990 & 2020

LAND USE	1970	PROJECTED			
		1990 LAND USE		2020 LAND USE	
		W/O DEV. 1/	NED PLAN	W/O DEV. 1/	NED PLAN
	1,000 Acres				
Cropland & conservation acres:	653	614	766	591	718
Harvested acres	653	580	687	560	658
Supporting conservation ac. 2/	NA.	34	79	31	60
Other cropland	620	625	610	650	761
Pasture, improved	531	1,025	872	1,473	1,076
Pasture, unimproved	796	542	558	160	319
Forest land	7,471	7,155	7,155	6,862	6,862
Urban and other land	682	774	770	963	961
Impounded water	245	263	267	300	302
Rivers & streams	17	17	17	16	16
TOTAL	11,015	11,015	11,015	11,015	11,015

1/ Future "WITHOUT" accelerated resource development.
2/ Used for proper water disposal and/or grass rotations to reduce erosion.

Table 2-3 -- Projected production of major farm commodities, and total net returns, NED alternative, Alabama River Basin, 1990 & 2020.

ITEM	UNIT	1990	2020
Crop Production	Thou.		
Corn	Bu.	16,160	21,900
Cotton	Bales	150	47
Peanuts	Lbs.	13,200	39,700
Soybeans	Bu.	10,650	22,200
Wheat	Bu.	2,280	430
Oats	Bu.	525	300
Hay	Tons	500	690
Livestock	Mil.		
Beef & Veal	Lbs.*	300	420
Pork	Lbs.*	49	65
Poultry	Lbs.*	615	830
Eggs	Doz.	116	150
Milk	Lbs.	150	75
Net Returns	Mil.		
NED Plan	Dol.	50.3	84.8
Without Accelerated Resource Development	Dol.	40.3	70.8

*Liveweight

The changed land use method of reducing agricultural damages is most applicable in areas where crops and pasture currently grown on capability subclasses IIIw and IVw and can be moved to upland soils with suitable capability classes. The availability of suitable upland soils on a given farming unit will limit the extent that this measure can be applied. In the portion of flood plain where this measure was evaluated, it was assumed that damage reduction on about 15 percent of the cropland and about 20 percent of the pastureland could reasonably be accomplished. The desire by individual landowners to minimize flood losses and take advantage of other land use opportunities would provide the incentive to accomplish this measure. Land use in flood plains of these watersheds amounts to about 49,000 acres of crops and about 154,000 acres of pasture.

Early action (1990) to remove crops and pasture from flooded areas would involve changed land use on about 7,000 acres of cropland and about 31,000 acres of pastureland. By the year 2020, this measure would be expected to increase to 8,000 acres for crops and 35,000 acres for pasture. The flood plain land where these crops and pastures were formerly grown could be used for timber production, open space, recreation, wildlife habitat, or other uses with low-damageable values.

Structural Measures--The magnitude of flooding in the flood plain of some watersheds was so great it was not reasonable to assume that the problem could be adequately solved by changed land use alone. Structural measures for flood prevention were considered as an alternative method of flood damage reduction on agricultural areas for the remaining flood plain. These measures include floodwater retarding structures, flood dikes, and channel work. Structural measures were selected with assistance from officials representing the appropriate Soil and Water Conservation District, and state and federal agencies.

Structural measures to protect 2,000 acres of cropland and 8,000 acres of pastureland consist of 13 floodwater retarding structures, 3 multiplepurpose structures, 14.3 miles of channel work, and 0.7 miles of flood dikes. These measures are contained in six watershed projects shown in table 2-4 and located on the NED alternative map (see figure 2-1). These projects can be installed during the early action period under Public Law 83-566 or Resource Conservation and Development authority.

Erosion Reduction

The study reveals there is enough land in the basin to meet future forestry and agriculture production needs and reach a reasonable goal of erosion damage reduction thereby protecting the resource base. Unproductive acreage needed to adequately protect harvested areas was considered a part of cropland needed for an expected harvest.

An NED goal was selected that would use existing and new programs to reduce erosion on 75 percent of the cropland and pastureland to the acceptable limit of two to five tons per acre per year. The goal for reducing erosion on "Other" cropland and unimproved pasture was established for adequate treatment on 50 percent of this land.

Since a major portion of erosion is taking place on about one-third of the basin's land, the most logical method to reduce erosion is to convert these highly erodible lands to less intensive uses. The NED alternative proposes to change the use of most land classified as capability subclass IVe, VIe, and VIIe along with some acreage of shallow soils to some type of permanent cover, probably forest.

Table 2-4 -- Average annual benefits and costs for watersheds found economically feasible, NED alternative, Alabama River Basin 1975

WATERSHED	CNI NO. 1970 R-B ATLAS	AVERAGE ANNUAL DIRECT BENEFITS 1/			TYPE AND AMOUNT OF STRUCTURAL MEASURES	AVERAGE ANNUAL COST 2/
		Flood Prevention	Recreation	Total		
Early Action (1990)						
Mulberry Creek	35a-1,2,4,5	86,500	14,800	101,300	7 single purpose FRS 1 multiple purpose structure	101,100
Johnson-Panther Creeks	35a2-68	230,000	-	230,000	4 single purpose FRS 10.4 mi. channel work	182,200
Cedar Creek	35a-45,61,62	224,300	650,000	874,300	2 single purpose FRS 1 multiple purpose structure	403,500
Glencoe Creek	35a1-11	69,000	-	69,000	3.9 mi. channel work	27,800
Upper Cahaba Tributary	35a3-1,2,4	3,800	-	3,800	0.7 mi. flood dike	2,200
Black Creek	35a1-7	39,700	157,500	197,200	1 multiple purpose structure	108,600
Subtotal		653,300	822,300	1,475,600		825,400
Long Range (2020)						
Boguechitto Creek Watershed						
Bear Creek Trib.	35a-29	122,000	-	122,000	1 single purpose FRS	36,300
Washington Creek Trib.	35a-23	86,000	-	86,000	1 single purpose FRS	48,000
Dry Channey Creek Trib.	35a-27	25,000	-	25,000	1 single purpose FRS 2.6 mi. channel work	14,300
TOTAL		886,000	822,300	1,708,600		924,000

1/ Price base: Current normalized prices 1975, all dollar amounts.
2/ Amortized at 6-1/8 percent interest for 100 years.

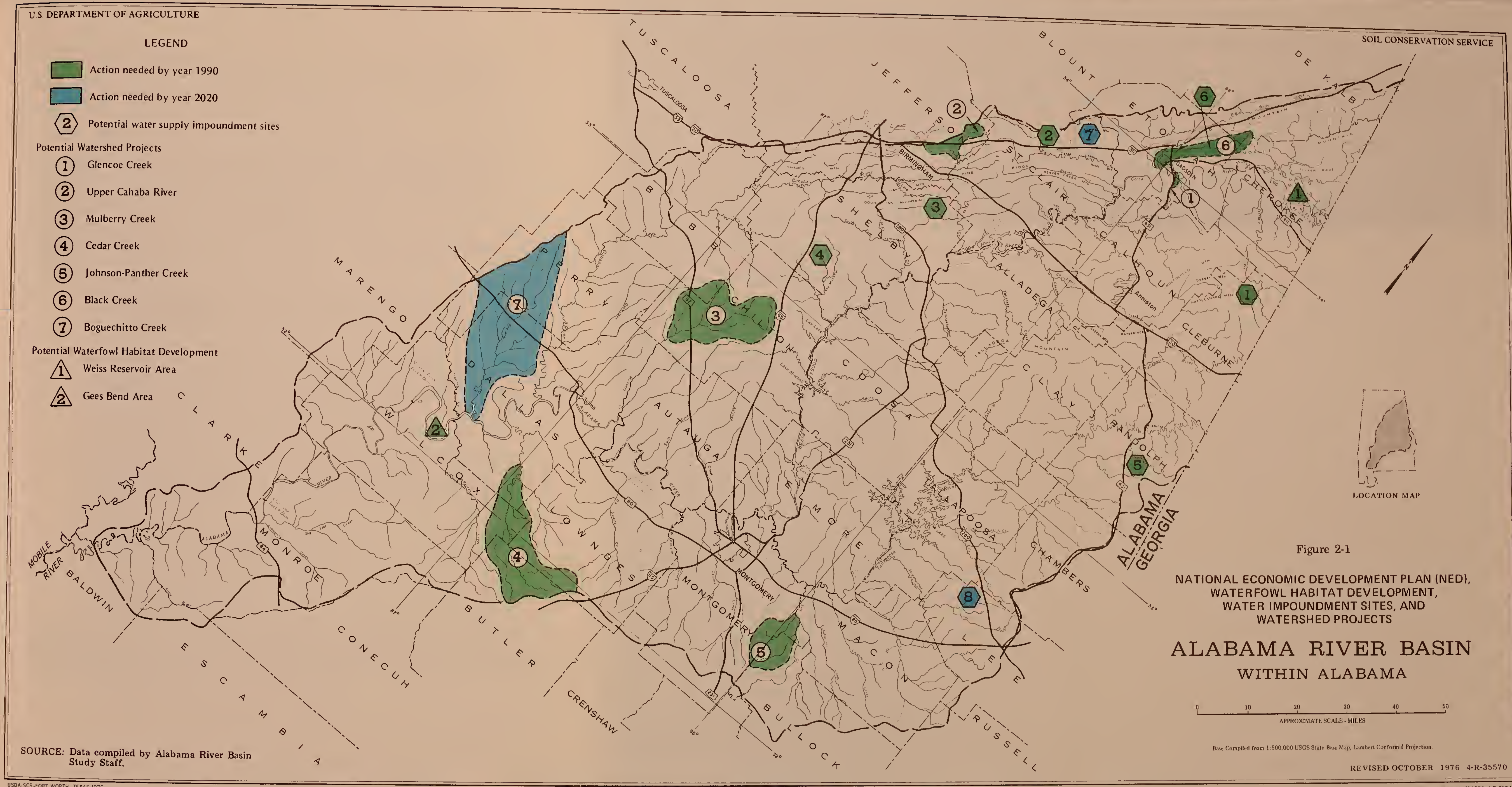

Figure 2-1

NATIONAL ECONOMIC DEVELOPMENT PLAN (NED), WATERFOWL HABITAT DEVELOPMENT, WATER IMPOUNDMENT SITES, AND WATERSHED PROJECTS

ALABAMA RIVER BASIN
WITHIN ALABAMA

USDA-SCS-FORT WORTH, TEXAS 1976

REVISED MAY 1976 4-R-28941-A

In the NED alternative, 98 percent of the crops would be grown on land capability classes I through III. On these lands, conservation systems would restrict soil loss to within a 25 percent tolerance of the allowable loss established for the dominant soil in each soil resource group.

A program of prevention and rehabilitation can reduce forest erosion in 1990 from a projected 33.5 million tons annually to 13.7 million tons. This program is based upon the prescription and application of forest watershed standards and practices equal in effectiveness to those described in the U. S. Forest Service Watershed Management Standards for the Southern Appalachians.

The following is one of the more practical combinations of measures that will produce the necessary erosion reduction to meet the standards described in Chapter 4, Volume I:

1. Reduce the acreage of spur roads and skid trails disturbance from 60,000 to 35,000 acres through proper planning and location of roads. This will reduce the erosion volume by 2,160,000 tons per year.

2. Lower the combined erosion rate for skid trails and spur roads from 33.5 tons/acre/year to 9.0 tons/acres/year through practices such as water bars on spur roads and skid trails, seeding bare soil, and shaping banks. This will reduce erosion volume by 2,934,000 tons per year. A total of 30,000 acres will be treated.

3. Lower the erosion rate from mechanical site preparation areas from 96.7 tons/acre/year to 18 tons/acre/year to obtain a reduction of 13,363,000 tons per year; 19,000 acres will require modified installation, site preparation, and/or vegetative measures.

4. Attain the fire protection goal for 1990. This should reduce erosion volume by 406,000 tons per year.

5. Accelerating the conversion of 3,500 acres of cropland to forest each year of the early action plan will reduce erosion by 450,000 tons per year.

With the NED alternative, general erosion could be reduced from a projected 53.6 million tons annually in 1990 to 33.6 million tons. The reduction would be primarily from treatment of general erosion on cropland, pastureland, and forest land (table 2-5).

Table 2-5 -- Total annual erosion, present, projected and NED alternative, Alabama River Basin, 1990 & 2020

TYPE OF EROSION	PRESENT 1970	1990 W/O	1990 NED	2020 W/O	2020 NED
	Millions of Tons				
General 1/	50.4	53.6	33.6	62.7	30.2
Gullies and other critical	14.8	14.9	10.2	15.3	8.2
TOTAL	65.2	68.5	43.8	78.0	38.4

1/ Includes sheet erosion and forest erosion.

The general* erosion reduction measures included in the NED alternative for 1990 consists of conservation measures such as cover crops, sod in rotation, complete water disposal systems, pasture planting and management measures to protect 1,197,000 acres and forest site preparation and forest vegetative measures, to protect 74,000 acres. Treatment is summarized in table 2-6. Table 2-7 compares projected average erosion rates without a plan and with the NED alternative implemented.

Agricultural Drainage

The 1990 NED alternative provides for the installation of drainage measures on 7,000 acres of cropland, 32,000 acres of pastureland, and 6,000 acres of converted forest land and unimproved pastureland. Drainage to be installed under NED concepts includes land capability subclasses IIw and IIIw cropland and IIw, IIIw, and IVw pastureland which is not classified as wetland in Volume I. Drainage will also be installed on forest land converted to cropland, unimproved pastureland converted to cropland and unimproved pastureland converted to improved pastureland.

Past records indicate that it is possible and practical to accelerate present drainage programs 3,000 acres per year. The present programs are considered to be meeting the recurring needs.

The 2020 NED alternative provides for the installation of drainage measures on 21,000 acres of cropland, 98,000 acres of pastureland and 16,000 acres of converted forest land and unimproved pastureland.

* Includes sheet erosion and other dispersed erosion in contrast to critical, or concentrated, erosion.

Table 2-6 -- Erosion reduction measures, NED alternative, Alabama River Basin, 1990 & 2020

LAND TREATMENT TO MEET "T" VALUE NEEDS (2 TO 5 TONS/ACRE/YEAR EROSION)	1990		2020	
	TREATED	REMAINING	TREATED	REMAINING
	1,000 Acres			
Cropland				
Crop residue use or cover cropping Contour farming or drainage systems	212	78	272	101
Contour farming Crop residue use, water disposal systems, sod in rotation	148	55	79	29
Other Cropland				
Establish perennial cover	220	247	258	313
Improved Pastureland				
Planting and management	480	144	592	179
Unimproved Pastureland				
Pasture management	137	293	108	130
Forest Land				
Site preparation	19	0	30	0
Log roads and skid trails installation and rehabilitation	55	-	84	-
TOTAL	1,271	817	1,423	752

Table 2-7 -- Erosion rates, present, projected and NED alternative, Alabama River Basin, 1990 & 2020

LAND USE	PRESENT 1970	1990 W/O	1990 NED	2020 W/O	2020 NED
	------------Tons per acre per year------------				
Cropland harvested	9.5	7.6	3.8	7.5	3.8
Other Cropland	13.4	11.4	7.5	16.4	7.5
Improved Pasture	3.4	2.8	2.4	3.4	2.1
Unimproved Pasture	4.1	5.2	4.3	5.8	3.8
Forest, slight to undisturbed	0.9	0.9		0.7	
Forest, disturbed	33.6	33.0	2.5 1/	33.0	2.0 2/
Urban and "Other" Land	5.3	5.0	5.0	4.8	4.8

1/ Weighted average erosion for all forest lands is 2.5.
2/ Average erosion for all forest lands is 2.0.

The planned drainage measures for cropland to be installed by 2020 will meet the need shown in the 1967 conservation needs inventory for subclasses IIw and IIIw cropland. All of the drainage needs for the converted land will be met by 2020. There will be 71,000 acres of pastureland remaining in 2020 that needs drainage. It was decided that it is not practical or economical to accelerate drainage programs sufficiently to meet all the drainage needs for pastureland.

Improved Production Efficiency

Elements to improve agricultural production efficiency are tied closely to nonstructural measures associated with erosion control. These measures center around shifting crop production from highly erodible to less erodible soils. Crop production would be shifted almost exclusively to capability classes I-III soils, with pasture limited to classes I-IV. This would be brought about through a program of technical assistance and landowner education conducted by Alabama Cooperative Extension Service and Soil Conservation Service field personnel. Another element would require removing 38,000 acres of severe risk flood plains from production of crops and pasture.

Efficiency gains within the basin would stem from land use adjustments on 382,000 acres in the form of cropland shifted to pasture or vice-versa, conversion of idle pasture to crops, and clearing of forest land for conversion to crop production during the early action phase of the plan. The net effect within the basin would be an increase of about 150,000 acres of cropland harvested, offset by a similar reduction in improved pasture for beef.

Net returns to basin operators would increase about $10 million annually, largely as a result of the increased share of state crop production--28 to 33 percent by 1990. A breakdown of the $10 million benefit reveals that $3 million accrues purely from efficiency gains, i.e., reduced per unit costs applied to the original output, while the remaining $7 million results from a shift of crop production into the area coupled with increased efficiency of production.

Increased Forest Production

The NED alternative will provide the additional 82 million cubic feet of roundwood in 2020 assuring an output of 600 million cubic feet. Improved utilization measures will provide 70 percent of the increased volume, while 30 percent will come from accelerated forest management.

By increasing utilization efficiency 0.4 percent each year throughout the period 1980 to 2020, an additional 57.4 million cubic feet of roundwood can be produced. This increase may be achieved by training employees involved in manufacturing and harvesting wood products through operations analysis and recommendations, proper use of existing equipment, felling and bucking techniques for optimum use of trees and correct use of new equipment and techniques as they are developed.

Accelerated forest management will require reforesting 100,000 acres and improvement cutting on 687,000 acres. The program must be completed in 15 years, 1980 to 1995, in order to meet timber requirements for sawtimber and pulp in 2020. This will demand regenerating an additional 6,700 acres per year and timber stand improvement on 46,000 acres per year.

Reduction of Fire Losses

Presently, there are 39 forest fire control units in the basin. To meet the projected NED goals, an additional 31 units are necessary by 1990.

Increased Forest Grazing

The major result of the forest range program is not so much one of production, but a shift in range use from fragile to more compatible sites.

The NED grazing alternative will produce an additional 1.2 million pounds of beef in 1990. In 2020, 600,000 pounds will be supplied from forest grazing.

A minimum range program is built around prescribed burning of 110,000 acres of pine forests on favorable soils. A portion of such burning every year in stands up until they are 30 years old.

Urban Flood Damage Reduction

Approximately eighty communities in the basin have an urban flood problem (table 1-1). The number is expected to increase. In flood plain areas where urban developments are intense, flood damage could be reduced with the installation of various combinations of nonstructural measures such as watershed treatment, flood warning systems, flood proofing, and flood plain use regulations. Preparation of a detailed combination of measures for each community, and computation of the associated costs and benefits of each cannot be developed in a study of this intensity. Time and manpower limitations precluded detailed studies of individual communities. Therefore, no elements are included in either alternative plan for achieving urban flood damage reduction. When remedial efforts are undertaken, first consideration should be given to nonstructural measures described below (also discussed in the Suggested Plan.

Watershed Treatment--Conservation measures for watershed protection can be installed with assistance from state and federal agencies. This nonstructural measure is basic to watershed projects, Resource Conservation & Development project measures, and river basin plans. Combinations of agriculturally oriented measures make up a conservation cropping system that is tailored to meet the needs for protecting land and reducing runoff in urban as well as agricultural areas. These measures may include crop residue management, cover crops, terraces, grassed waterways, contour farming, grass in rotation with crops, or permanent grass cover.

Floodwarning Systems--Local communities should work with the National Weather Service and state agencies to obtain an effective floodwarning system. One type of warning system is based on the collection of rainfall data by time periods. The data is reported to a central location where a forecast of peak stage is made. An alternative system could include an automatic gaging station at selected stream locations that activate alarm systems. In either case, local residents are warned that flooding is imminent and appropriate action can be taken.

Flood Proofing--Flood proofing consists of measures designed to prevent or limit flood damage to structures and contents of buildings. Measures generally are installed to reduce damage once the water reaches a building and could result in substantial reduction in flood losses.

Flood Plain Use Regulations--To help bring about the economic use of flood plains, governmental bodies frequently adopt comprehensive flood plain regulations. They may also request the preparation of flood hazard maps based on detailed analysis as a means of securing flood insurance. Regulations may be incorporated in building codes, subdivision regulations and/or zoning ordinances to insure that flood plain use is compatible with the degree of flood risk.

Water Supply

Municipal water supply studies were conducted for 20 communities. Storage sites were selected based on potential to supply the amount of water needed and the comparable costs of other available sources. A total of six sites supplying 19.5 MGD were selected to serve 10 communities in 1990 (see figure 2-1). Two additional sites were selected to supplement long-range needs. Multiple use of these water supply reservoirs is planned. Water supply reservoirs are expected to furnish sufficient water for municipal, industrial, and domestic use commensurate with projected population growth (see table 2-8).

Increased Recreation

Development plans center around a system of six county parks located on major reservoirs between Lake Weiss and Jordan Lake (see figure 2-2). Emphasis is on family outings, with swimming, picnicking, playground areas, boating, skiing and hiking to be enjoyed. Campsites could be developed later as needed. The county parks, located about 40 miles apart, would be connected by a system of hiking trails with primitive campsites along the way. Initially, 40 miles of trail would run from Talladega County Park on Logan Martin Lake to Shelby County Park on Lay Lake. This trail would be of an experimental nature, and if successful, would be expanded to link the entire six park system. None of the six counties involved (Elmore, Chilton, Shelby, Talladega, St. Clair, and Cherokee) have a countywide park of this type, yet all are in the populous, Montgomery-Birmingham-Gadsden growth corridor. The general location and type of facilities to be provided are shown in table 2-9.

Table 2-8 Potential water supply impoundment sites, NED alternative

COMMUNITIES SERVED	BASIN 1/ PLAN	STREAM NAME	SITE LOCATION S. T. R.	DRAINAGE AREA (SQ. MI.)	M&I STORAGE (AC. FT.)	SURFACE AREA (AC.)	WATER 2/ SUPPLY (MGD)	WATER 3/ NEEDS (MGD) 1990	2020	OTHER PURPOSES SERVED
NED Plan										
Randolph Co.										
Wedowee Woodland	1990	Wedowee Cr.	Sec. 2, T20S,R11E	37.2	2,000	240	9.7	1.5	2.0	-
Calhoun Co.										
Jacksonville Piedmont	1990	Terrapin Cr.	Sec. 18, T13S,R11E	29.0	2,000	111	8.4	3.6	7.0	FC 4/
Shelby Co.										
Calera Columbiana	1990	Camp Branch	Sec. 31, T21S,R1W	21.5	3,000	440	8.5	9.0 5/	18.1 5/	-
Sterrett-Vandiver Westover Wilsonville	1990	Bear Cr.	Sec. 15, T18S,R18E	13.6	4,800	442	7.8			-
St. Clair Co.										
Margaret Moody Odenville	1990	Canoe Cr.	Sec. 21, T14S,R2E	37.8	4,000	415	11.0	4.4 6/	18.0 6/	-
Ashville Springville Steele	2020	Gulf Cr.	Sec. 17&18 T13S,R4E	14.4	3,500	260	7.0			-
Lee Co.										
Auburn Opelika	2020	Loblockee Cr.	Sec. 5&6 T19N,R25E	40.2	4,500	670	12.0	4.0	8.0	-
Etowah Co.										
Lookout Mtn. (Gadsden)	1990	Black Cr.	Sec. 29, T10S,R7E	29.8	2,000	485	8.5	1.0	2.0	FC 4/ Rec. 7/

1/ Early action, 1990 -- long-range, 2020
2/ Designed to fully utilize the site potential.
3/ Total needs by time frame
4/ F. C. - Flood Control
5/ Total needs for all Shelby Co. communities listed.
6/ Total needs for all St. Clair Co. communities listed.
7/ Rec. - Recreation

A total of 27 recreation sites, providing 2.9 million activity occasions of recreation annually, are proposed during the early action phase of the 1990 NED plan. The plan would return an estimated $3.1 million yearly, at a cost of $1.5 million. In addition to the county parks, proposals include recreation in eight PL-566 watersheds, expansion of camping and hiking areas in both the Talladega and Tuskegee National Forests, and construction of three city parks along rivers. Several groups are actively seeking funds to identify and reestablish the Bartram Trail. This trail will meet a large portion of the basin's hiking trail needs.

Solid Waste Disposal

Two 100-acre disposal sites needed for hazardous solid wastes should be located in the Blackland Prairies section of the basin by 1990. The specific location of these sites has not been selected. An additional 200 acres of disposal area will need to be developed by 2020. There is no precedent in the state at present for the location and operation of this type of solid waste disposal site though this is a critical need identified by the State Department of Public Health, Solid Waste Division. The best approach to solving this problem would be through a cooperative effort involving participating private industries with planning assistance provided by the State Department of Public Health, Solid Waste Division.

Reduction in Sedimentation

Basic assumptions were that (1) sediment reduction is directly proportional to erosion reduction and that (2) sediment production cannot be totally eliminated.

Plans to reduce sediment load are closely tied to conservation measures for erosion control. These measures include conservation treatment on cropland, pastureland, forest land and other dispersed sediment source areas as well as critical area treatment. The combined effects of all measures to be installed by 1990 will reduce sedimentation by 7.7 million tons per year (table 2-10). By treating more acres, the long-range plan would reduce sedimentation by 11.4 million tons annually by the year 2020. No debris basins or other reservoirs having sediment entrapment as a primary purpose are included in the plan. The sediment discharge of major streams was not estimated.

Reduction of Critical Erosion

Critically eroding areas are widely dispersed throughout the basin. Inventory estimates by counties are available in the river basin files.

Table 2-9 -- Recreation sites proposed in the NED Alternative, early action and long-range plans, Alabama River Basin

SITE NO.	FACILITY	FACILITIES TO BE PROVIDED: SWIMMING	PICNICKING	CAMPING	PLAYGROUND	HIKING	BOATING	FISHING	WATERSKIING	GOLF
Immediate Need										
1	Weiss Lake Park (Cherokee)	X	X	To be	X	X	X	X	X	X
2	Neely Henry Park (St. Clair)	X	X	added as	X	X	X	X	X	
3	Logan Martin Park (Talladega)	X	X	needed	X	X	X	X	X	
4	Lay Lake Park (Shelby)	X	X		X	X	X	X	X	
5	Lake Mitchell (Chilton)	X	X		X	X	X	X	X	
6	Lake Jordan (Elmore)	X	X		X	X	X	X	X	
7	Lake Minooka		X	X		X	X	X		
8	Cornwall Furnace		X	X		X				
9	Hatchett Creek Canoe Trail						X	X		
10	Tallassee-Carrville Park	X	X	X	X		X	X	X	
11	Brent-Centerville Park	X	X	X	X		X	X		
12	West Blocton Park	X	X	X	X					
13	Canoe Creek	X	X	X	X		X	X		
14	Terrapin Creek		X		X		X	X		
15	Wedowee Creek		X		X		X	X		
16	Bear Creek		X		X		X	X		
17	Camp Branch	X	X		X		X	X		
18	Cedar Creek	X	X	X	X		X	X		
19	Mulberry Creek	X	X	X	X		X	X		
20	Hiking--Talladega N.F.			X		X				
21	Hiking--Sites 3 to 4			X		X				
22	Bartram Trail			X		X				
23	Hiking--Oak Mt.			X		X				
24	Roadside Park--Tuskegee N.F.		X	X	X					
25	Camping--Tuskegee N.F.			X						
26	Camping--Talladega N.F.		X	X		X				
27	Black Creek	X	X	X	X	X	X	X		
Long Range										
28	Gulf Creek	X	X	X	X		X	X		
29	Loblockee Creek	X	X	X	X		X	X	X	
30	Hiking--Talladega N.F.			X		X				
31	Hiking--Sites 2 to 3			X		X				
32	Hiking--Sites 4 to 6			X		X				
33-38	Addition of camping to existing county parks			X						
39	Camping--Talladega N.F.			X						

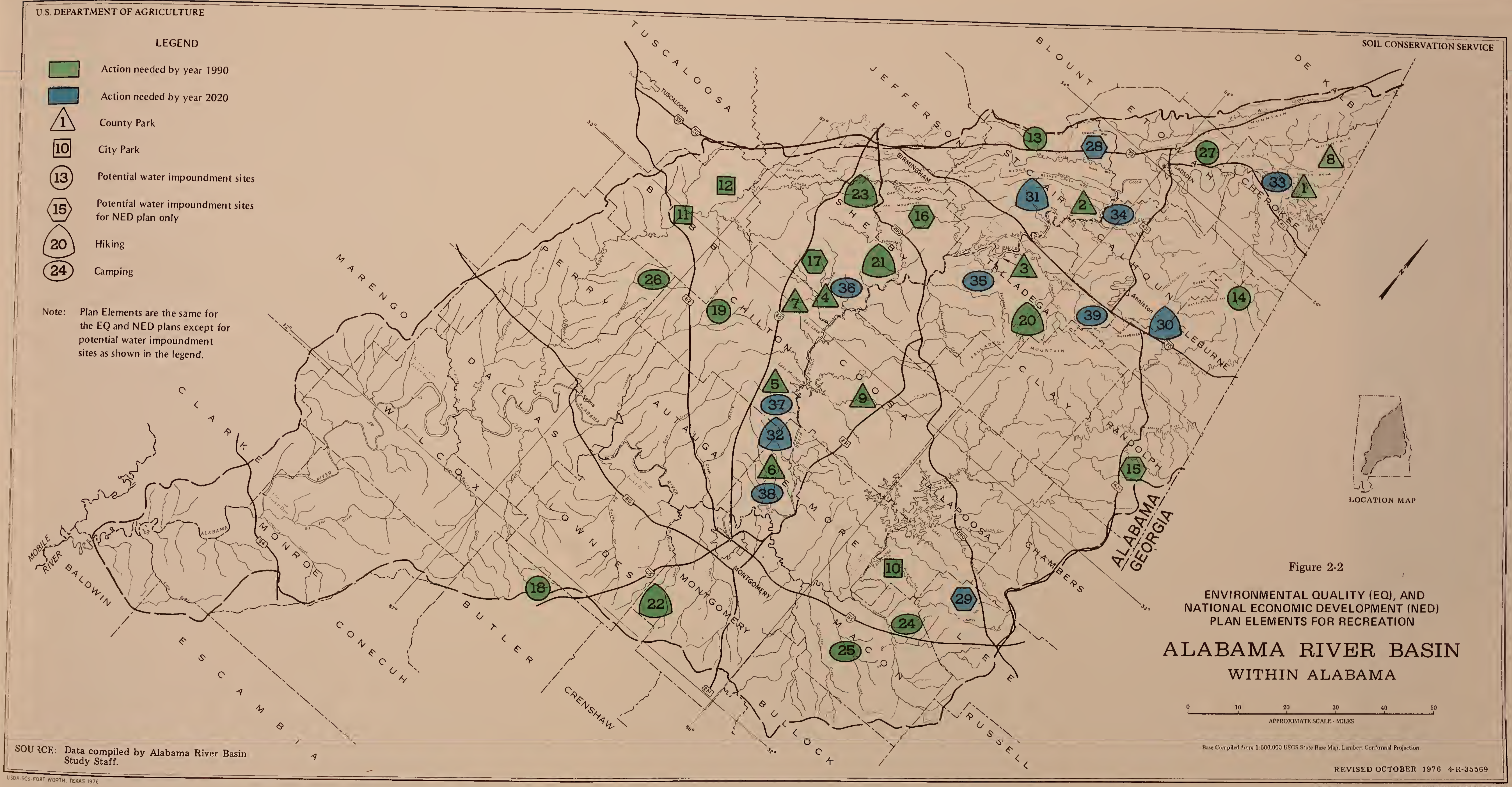

Figure 2-2

ENVIRONMENTAL QUALITY (EQ), AND NATIONAL ECONOMIC DEVELOPMENT (NED) PLAN ELEMENTS FOR RECREATION

ALABAMA RIVER BASIN WITHIN ALABAMA

Table 2-10 -- Annual sediment production, present, projected and NED alternative, Alabama River Basin, 1990 & 2020

SOURCE OF SEDIMENT	PRESENT 1970	1990 W/O	1990 NED	2020 W/O	2020 NED
	Millions of Tons				
General erosion 1/	12.7	13.4	8.5	14.8	7.8
Critically eroding areas	8.7	8.6	5.8	8.9	4.5
TOTAL	21.4	22.0	14.3	23.7	12.3

1/ Includes "disturbed" forest lands eroding at "critical" rates.

The NED alternative will provide erosion protection to 45,200 acres of gullied land by 1990 and to 70,200 acres by 2020. Treatment will consist of grading and shaping, installing simple diversions, planting and establishing temporary and permanent vegetation. In a few instances, because of large amounts of runoff to be handled, gullies will be stabilized by combining vegetative measures with structural outlet works such as concrete spillways and flumes.

Roadside erosion control measures are planned for 920 acres by 1990 and 1,380 acres by 2020. Roadside erosion will be controlled by combinations of vegetation, shaping, paved gutters, and concrete drop structures. No streambank or mine spoil treatment is included under the NED alternative.

Scenic Rivers and Streams

Scenic rivers and streams were evaluated primarily on their aesthetic value, size, location, and water quality.

Data regarding scenic streams was obtained from the National Scenic Rivers Study, Alabama Statewide Comprehensive Outdoor Recreation Plan, and appraisals of potential for outdoor recreation development in each county. In addition, the county representative for state and federal agencies responsible for natural resource management was contacted and their input solicited.

The NED alternative would protect 75 miles of scenic streams by 1990 and 125 miles by 2020 through site acquisition and state legislation. A total of 225 miles will remain unprotected in 1990. This proposal would involve state, federal, and private programs in addition to existing USDA activities. The specific mileage by stream system to be protected should be determined through more detailed study. However, several streams such as Shoal Creek, Hatchett Creek, Little River, Tallapoosa River, and the Cahaba River should be given a priority consideration.

Natural Scenic Sites

Elements proposed for the preservation and protection of natural scenic sites involve the purchase or lease of five sites by 1990 and ten sites by 2020. The exact location of these sites was not finalized in this study. A properly designated state or federal agency should be authorized to recommend the specific natural scenic sites to be acquired as in the scenic river proposal. It is suggested, however, that one or two sites from each of five representative categories be selected. The major categories for natural scenic sites are overlooks, caves, springs or waterfalls, swamps, and unique rock formations. Obviously, some sites such as Horse Pens Forty and Blue Girth-Beech Creek Swamp could be considered in more than one division if they encompass more than one scenic characteristic.

Fish and Wildlife Habitat Improvement

Elements for fish and wildlife habitat improvement were formulated primarily through the efforts of a multiagency work group. Local input was obtained from appropriate officials both at the county and state levels. Most of the elements are oriented toward improving habitat for fish and wildlife species that are utilized primarily in consumptive recreation endeavors such as hunting or fishing. However, consideration was given to habitat improvement for both game and nongame animals for nonconsumptive purposes such as nature photography.

It was assumed that 13,500 acres necessary to develop two waterfowl management areas could be obtained. Several assumptions were made regarding the status of wetland habitat without development include: a projected public access to at least 20 percent of the small impoundments and 30 percent of Type 1 and Type 2 wetlands, 1/ existing wetland acre values would not decline significantly, and future utilization of waterfowl and other birdlife associated with wetland areas will remain at a relatively constant rate.

Habitat improvement needs were categorized by four habitat types upland, wetland, impoundment, and stream. The proposals for stream improvement assume certain point sources of pollution will be properly regulated by 1990.

1/ See Volume I, p. 2-57 and Circular 39, Wetlands of the United States.

Upland Habitat--The NED alternative will supply 50,000 acres of the needed 150,000 acres of habitat improvement by 1990 and 100,000 acres of the needed 250,000 acres by 2020. Specifically, the proposals include the leasing and management of 30,000 acres for public hunting, and intensified management on 20,000 acres of private, state and federal land.

Wetland Habitat--Wetland habitat for waterfowl refuges and management areas is noticeably absent from the basin. Wetlands are somewhat limited especially those areas which have a high value for waterfowl. The NED elements will supply 9,000 acres by 1990 with no increase projected for 2020.

The NED alternative consists of a waterfowl refuge and management area of 2,500 acres on Weiss Lake and a comparable area of 3,500 acres near Gee's Bend on the lower reaches of the Alabama River. Management of beaver ponds and greentree reservoirs 1/ would comprise the remaining 3,000 acres. The refuge areas would offer needed protection for waterfowl so they would be less likely to leave under hunting pressure.

Impoundments--Field surveys indicate a need for impoundment habitat management on at least 8,000 acres by 1990 and 10,000 acres by 2020. The NED alternative will contribute about 40 percent of these needs. The elements involve accelerated technical assistance and cost sharing to implement new management techniques and encourage more public access to private ponds.

Streams--The NED elements include accelerating or creating state and federal programs to improve 1,000 acres of streams by 1990 and 2,000 acres by 2020. This will be accomplished by selective snagging and clearing, selective stocking, instream devices to create habitat, bank stabilization, and improved access.

Protection of Endangered Species of Flora and Fauna

The NED elements propose critical habitat acquisition (37,000 acres), habitat management (15,000 acres), and accelerated protection of 7 species of plants and animals by 1990 and 11 species by 2020. This alternative will stress protection of species with likely economical influences such as the American alligator.

1/ Greentree reservoirs are areas of bottomland hardwoods (mostly mast-bearing oaks) around which low dikes are built.

Table 2-11 -- Benefits and costs, NED alternative, Alabama River Basin, 1990

COMPONENTS & PLAN ELEMENTS	TOTAL INST. COST	ANNUAL COSTS 1/	ANNUAL BENEFITS
	---------Thousand Dollars-----------		
Flood Reduction			
Changed land use	5,500	340	375
Structural measures	8,000	494	653
Urban-nonstructural	NA	NA	NA
Increased Drainage			
Surface and subsurface	2,700	170	200
Increased Beef Production			
Prescribed burning (forest land)	4,850	300	415
Create Water Supply			
Impoundments	4,000	255	339
Increased Recreation			
Facilities	24,000	1,499	3,100
Erosion Reduction			
Conservation systems	(21,000) 2/	(1,297) 2/	NA
Improved Production Eff.			
Changed land use	12,200	750	4,700
Reduced Fire Losses			
Equipment	(1,750) 2/	(110) 2/	NA
Critical Erosion Reduction			
Stabilization	(60,000) 2/	(3,900) 2/	NA
Reduced Sediment Load			
Conservation systems	NA	NA	NA
Solid Waste Disposal			
Acquisition	(400) 2/	(25) 2/	NA
Scenic Streams Acquisition	(180) 2/	(11) 2/	NA
Natural Scenic Sites			
Acquisition	(680) 2/	(42) 2/	NA
Fish and Wildlife Habitat			
Management and improvement	(4,100) 2/	(253) 2/	NA
Protection of Flora and Fauna			
Acquisition	(850) 2/	(52) 2/	NA
Increased Timber Production			
Utilization and Accel. Mgmt.	30,000	1,859	4,715
TOTAL	$ 91,250	$ 5,667	$ 14,497

1/ Amortized @ 6 1/8 percent interest for 100 years and includes O&M.
2/ Not included in total cost.

Table 2-12 -- National economic development account, NED alternative, (dollars) 1/

COMPONENTS	MEASURES OF EFFECTS	COMPONENTS	MEASURES OF EFFECTS
Beneficial effects:	(Average Annual) 1/	Adverse effects:	(Average Annual) 1/
A. The value to users of increased outputs of goods and services		A. The value of resources required for the NED plan:	
1. Flood damage reduction	1,020,000	1. Multi-purpose reservoirs, floodwater retarding structures, recreational and water supply reservoirs, channel work, and recreational facilities	
2. Increased drainage	198,000	Project installation	1,513,000
3. Increased beef production (forest)	410,000	OM&R	1,000,000
4. Create water supply	335,000	2. Nonstructural--increased beef production on forest land--prescribed burning	300,000
5. Increased recreation	3,070,000	3. Increased timber production	1,859,000
6. Increased timber production	4,670,000	4. Production efficiency	750,000
7. Production efficiency	4,664,000	5. Project administration	245,000
8. Utilization of unemployed and underemployed labor resources			
a. Project construction	130,000		
Total beneficial effects	14,497,000	Total adverse effects	5,667,000
		Net beneficial effects	8,830,000

1/ Amortized over 100 years at 6-1/8 percent interest.

Table 2-12 -- cont'd., regional development account, NED alternative

COMPONENTS	MEASURES OF EFFECTS	
	STATE OF ALABAMA	REST OF NATION
Income		
Beneficial effects:	(Average Annual) 1/	
A. The value of increased output of goods and services to users residing in the region		
1. Flood damage reduction	1,020,000	0
2. Increased drainage	198,000	0
3. Increased beef production	410,000	0
4. Create water supply	335,000	0
5. Increased recreation	2,770,000	300,000
6. Increased timber prod.	4,670,000	0
7. Production efficiency	4,664,000	0
8. Utilization of unemployed and underemployed regional labor resources		
a. Project construction	130,000	0
B. The value of output to users residing in the region from external economics		
1. Indirect activities associated with increased net returns from flood damage reduction, and increased beef production	640,000	2/
Total beneficial effects	14,837,000	300,000

COMPONENTS	MEASURES OF EFFECTS	
	STATE OF ALABAMA	REST OF NATION
Income		
Adverse effects:	(Average Annual) 1/	
A. The value of resources contributed from the region to achieve the output		
1. Multi-purpose reservoirs, floodwater retarding structures, recreational and water supply reservoirs, channel work and recreational facilities		
Project installation	973,000	540,000
OM&R	1,000,000	0
2. Nonstructural--increased beef production on forest land--prescribed burning	300,000	0
3. Increased timber production	1,859,000	0
4. Production efficiency	0	750,000
5. Project administration	123,000	122,000
Total adverse effects	4,255,000	1,412,000
Net beneficial effects	10,582,000	-1,112,000

1/ Amortized over 100 years at 6-1/8 percent interest.
2/ National externalities were not evaluated.

Table 2-12 -- cont'd., regional development account, NED alternative

COMPONENTS	MEASURES OF EFFECTS		COMPONENTS	MEASURES OF EFFECTS	
	STATE OF ALABAMA	REST OF NATION		STATE OF ALABAMA	REST OF NATION
Employment			Employment		
Beneficial effects:			Adverse effects:		
A. Increase in number and types of jobs			A. Decrease in number and types of jobs		
1. Employment for project construction	200 semi-skilled jobs for 5 yrs.	-	1. Loss in agricultural employment from project take area	10 man-yrs. of agricultural employment	-
2. Employment in recreation service sector	150 permanent seasonal semi-skilled jobs	-	2. Loss in indirect and induced employment associated with project take area	15 permanent semi-skilled jobs	- -
3. Employment for project OM&R	87 permanent semi-skilled jobs	-	Total adverse effects	25 permanent semi-skilled jobs	-
4. Indirect and induced employment from output of projects's goods and services	250 permanent semi-skilled jobs	-	Net beneficial effects	312 permanent semi-skilled jobs 150 permanent seasonal semi-skilled jobs 200 semi-skilled jobs for 5 yrs.	- - -
Total beneficial effects	337 permanent semi-skilled jobs 150 permanent seasonal semi-skilled jobs 200 semi-skilled jobs for 5 yrs.	- - -			

Table 2-12 -- cont'd., regional development account, NED alternative

COMPONENTS	MEASURES OF EFFECTS: STATE OF ALABAMA	MEASURES OF EFFECTS: REST OF NATION
Population Distribution		
Beneficial effects	Creates 312 permanent semi-skilled jobs, 150 permanent seasonal jobs and 200 semi-skilled jobs for 5 years in an area which has experienced a 1 percent reduction in population in the last 10 years.	-
Adverse effects	-	-
Regional Economic Base and Stability		
Beneficial effects	Provides flood protection on 10,000 acres of crops and pasture, 18.5 million gallons per day of municipal water supply and 2,900,000 activity occasions of recreation opportunities. Creates 312 permanent semi-skilled jobs, 150 permanent seasonal semi-skilled jobs, and 200 semi-skilled jobs for 5 years in an area where 27 percent of the families have incomes less than the national poverty level.	-
Adverse effects	-	-

Table 2-12 -- cont'd., environmental quality account, NED alternative

COMPONENTS	MEASURES OF BENEFICIAL AND ADVERSE EFFECTS
A. Areas of natural beauty	1. Project benefits will enhance 3,300,000 acres on 18,000 farms. 2. Create 4 multi-purpose lakes of 2,570 acres with 61 miles of shoreline. 3. Establish water-based recreational facilities at 26 locations. 4. Disruption of rural tranquility by 2,900,000 recreational occasions annually.
B. Quality consideration of water and land resources	1. Reduce sediment load in streams by 7.7 million tons per year. 2. Revegetation of 46,100 acres of critically eroded land and roadsides. 3. Maintain quality of land on 237,000 acres by using less erosive soils. 4. Reduce erosion on 496,000 acres of cropland, 616,000 acres of pastureland, and 190,000 acres of forest land. 5. Reduce fire losses on 7,129,000 acres of forest land.
C. Biological resources and selected ecosystems	1. Create 3,690 acres of flatwater fish and waterfowl habitat. 2. Inundate 24 miles of stream fish habitat. 3. Provide 3,690 acres resting areas for migratory waterfowl. 4. Inundate 3,690 acres of wildlife habitat. 5. Improve deer and other wildlife habitat by providing permanent watering places in lakes. 6. Disrupt 14.3 miles of aquatic ecosystems through channel alterations.
D. Irreversible or irretrievable commitments	1. Conversion of 3,200 acres of forest land, 390 acres of pastureland, and 100 acres of cropland to reservoir pools. 2. Commit 100 acres of land to channel rights-of-way.

Table 2-12 -- cont'd., social well-being account, NED alternative

COMPONENTS	MEASURES OF BENEFICIAL AND ADVERSE EFFECTS
A. Real income distribution	1. Create 425 low to medium income permanent jobs for area residents. 2. Net monetary benefits of $10,582,000 provide opportunities to improve the income of about 27 percent of the families within the basin whose income is below the poverty level.
B. Life, health and safety	1. Increased output will be in livestock, grain, and fiber products. 2. Increased risk of drowning or injury at lake sites. 3. Reduced water pollution resulting from reduced sediment load in streams. 4. Develop 200 acres for solid waste disposal. 5. Improved municipal water supply services for 12 communities.
C. Cultural and recreational opportunities	1. Creates 2,900,000 recreational activity occasions annually.

ENVIRONMENTAL QUALITY ALTERNATIVE

The environmental quality objective is to enhance environmental quality by the conservation, preservation, and restoration of the quality of certain natural and cultural resources, and ecological systems. This objective reflects society's concern and emphasis for the natural environment and its maintenance and enhancement as a source of present enjoyment and a heritage for future generations.

The EQ alternative recognizes the desirability of diverting a portion of the Nation's resources from production of more conventional market-oriented goods and services in order to accomplish environmental objectives. As incomes and living standards increase, society appears less willing to accept environmental deterioration in exchange for additional goods and services.

Measures included in the EQ alternative are shown in table 2-13. The effectiveness of elements are displayed graphically in figure 2-3 and in detail in table 2-26. Benefit-cost analysis, and four-account displays are shown in tables 2-24 and 2-25.

Land Use

A primary objective of the EQ alternative is the maximum reduction of erosion while continuing to meet production needs. To do this, the alternative calls for the gradual shifting of row crops to classes I and II, and subclass IIIw soils. A concerted educational effort would be maintained to remove row crops from subclass IIIe soils. An effort would be made through increased numbers of educational personnel and/or incentive payments, to accelerate the necessary land use changes. Other EQ program elements are the same as in the NED alternative, i.e. the use of additional conservation acreage for each acre harvested, and the elimination of high risk class IV through VI flood plain land from crop production.

Implementation of the EQ alternative would have the effect of changing land used for crops and pasture from 1,639,000 acres to 1,634,000 acres in 1990. This change would be from 2,064,000 acres to 1,995,000 acres in 2020 (table 2-14). The mix of crops, pasture, and resulting net returns would be quite different basinwide. Eliminating subclass IIIe soils for row crops would result in 100,000 acres of pasture replacing land previously cropped. A trade-off would occur in the form of reduced erosion and sedimentation at the expense of increased income from crop sales. Net returns would total $38.6 million, $11.7 million less than with the NED option in 1990.

Table 2-13 -- Measures included in the early action portion of the EQ alternative, Alabama River Basin

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Land Resource Development

Conservation treatment on 1,359,000 acres of agricultural and forest land for erosion reduction.
Changed land use for improved production efficiency on 54,000 acres of cultivated land.
Conservation measures to reduce sediment in streams by 12.5 million tons/year.
Streambank, roadside, critical area, and strip mine stabilization to reduce critical erosion on 95,000 acres.
Reduction of forest fire losses from 0.54 to 0.35 percent on 7,129,000 acres of forest land.
Prescribed burning on 120,000 acres of forest to increase beef production.
Improve timber production efficiency on 1.8 million acres.

Water Resource Development

Five watershed flood control projects.
Two reservoirs for municipal and industrial water supply.

Recreation and Culture

Recreational development at 23 sites to provide 2.9 million activity occasions annually.
Acquisition of 150 miles of scenic streams and 25 natural scenic sites.
Wildlife habitat improvement on 186,000 acres.
Identification of 18 species of flora and fauna needing protection.
Identification, investigation and/or preservation of 250 archaeological and historical sites.

Waste Disposal

Acquisition of 200 acres for solid waste disposal.
Provide increased streamflow (230 cfs) for improved stream water quality.

Table 2-14 -- Land use, present, projected and EQ alternative, Alabama River Basin, 1990 & 2020

		PROJECTED			
		1990 LAND USE		2020 LAND USE	
LAND USE	1970	W/O DEV.	EQ PLAN	W/O DEV.	EQ PLAN
	-----1,000 Acres-----				
Cropland & conservation acres:	653	614	659	591	700
Harvested acres	653	580	571	560	622
Supporting conservation ac. 1/	NA.	34	88	31	78
Other cropland	620	625	200	650	62
Pasture, improved	531	1,025	975	1,473	1,295
Pasture, unimproved	796	542	235	160	80
Forest land	7,471	7,155	7,892	6,862	7,599
Urban and other land	682	774	770	963	961
Impounded water	245	263	267	300	302
Rivers & streams	17	17	17	16	16
TOTAL	11,015	11,015	11,015	11,015	11,015

1/ Used for proper water disposal and/or grass rotations to reduce erosion.

Soybeans and corn should account for 70 percent of the basins cropland harvested in 1990. The basin would maintain a strong competitive position relative to other parts of the state, producing about 20 percent of the state's soybeans, 33 percent of the corn, 35 percent of the beef and veal, and 45 percent of the cotton in 1990. Production and net returns associated with the EQ alternative are shown in table 2-15.

The major change evident in table 2-14 is a substantial increase in forest acreage, from 7,155,000 acres to 7,892,000 acres in the early action phase of development. This land should be established in trees as soon as possible to provide the necessary increment to supply 2020 demands for forest products. Much of this increase would come from class IV and VI openland projected to be in crop or pasture production without development. This land totaling about 340,000 acres would supply roughly one-half of the acreage necessary to sustain production while reducing erosion losses to the level specified as the EQ goal.

Table 2-15 -- Projected production of major farm commodities and total net returns, EQ alternative, Alabama River Basin, 1990

ITEM	UNIT	1990	2020
Crop Production	Thou.		
Corn	Bu.	14,130	26,000
Cotton	Bales	127	20
Peanuts	Lbs.	6,300	4,900
Soybeans	Bu.	8,780	15,900
Wheat	Bu.	800	375
Oats	Bu.	140	300
Hay	Tons	350	790
Livestock	Mil		
Beef & Veal	Lbs.*	340	455
Pork	Lbs.*	49	65
Poultry	Lbs.*	615	830
Eggs	Doz.	116	150
Milk	Lbs.	150	75
Net Returns	Mil		
EQ Plan	Dol.	38.6	74.6
Without accelerated resource development	Dol.	40.3	70.8

* Liveweight

Agricultural Flood Damage Reduction

The EQ elements for flood damage reduction include structural and nonstructural measures. Structural measures to protect 600 acres of cropland and 1,300 acres of pastureland consist of 3 multiple-purpose structures, 3.9 miles of channel work, and 0.7 miles of flood dikes.

These measures could be installed during the early action period under Public Law 83-566 or Resource Conservation and Development programs. They are included in five potentially feasible watershed protection projects identified on the EQ alternative map (see table 2-16 and figure 2-4).

Nonstructural means should be used where practical to reduce flood damage in all watersheds where crops and pasture are currently grown on capability subclasses IIIw and IVw. Damages in these watersheds could be reduced through changed land use by relocating a portion of the crops and pasture out of the most severely damaged portion of the flood plain. Evaluations indicate that about 17 percent of the cropland and 24 percent of the pastureland could be removed from the flood plain. This would amount to about 8,400 acres of crops and 37,700 acres of pasture by 1990. Long-range accomplishments to the year 2020 would include changed land use on 9,000 acres of crops and 39,000 acres of pasture. The flood plain land where these crops and pasture were formerly grown could be used for timber production, open space, recreation, wildlife habitat, or other uses with low damageable values.

Erosion Reduction

The EQ measures, if installed, would cut erosion losses from all sources to 31.5 million tons by 1990 (table 2-17).

The EQ alternative provides for conservation treatment and protection on 1.3 million acres of cropland, pastureland, and forest land (see table 2-18). This amounts to about 85 percent of the land in these uses. By the year 2020, an additional 130,000 acres of cropland and pastureland will be treated. Accelerated conservation planning will be needed to get additional landowners interested in shifting row crops to less erosive soils, and in protecting the additional acres. The EQ proposal would reduce the erosion rate on cropland to 3.7 tons per acre by 1990, compared to 7.6 tons without the plan (table 2-19).

Table 2-16 -- Average annual benefits and costs for watersheds found economically feasible, EQ alternative, Alabama River Basin

WATERSHED	CNI NO. 1970 R-B ATLAS	AVERAGE ANNUAL DIRECT BENEFITS 1/			TYPE AND AMOUNT OF STRUCTURAL MEASURES	AVERAGE ANNUAL COST 2/
Early Action (1990)		Flood Prevention	Recreation	Total		
Mulberry Creek	35a-1,2,4,5	5,000	14,800	19,800	1 multiple purpose structure	13,200
Cedar Creek	35a-45,61,62	20,000	650,000	670,000	1 multiple purpose structure	335,000
Glencoe Creek	35a1-11	69,000	-	69,000	3.9 mi. channel work	27,800
Upper Cahaba Tributary	35a3-1,2,4	3,800	-	3,800	0.7 mi. flood dike	2,200
Black Creek	35a1-7	39,700	157,500	197,200	1 multiple purpose structure	108,600
Total		137,500	822,300	959,800		486,800

1/ Price base: Current normalized prices 1975, all dollar amounts.
2/ Amortized at 6-1/8 percent interest for 100 years.

Table 2-17 -- Total annual erosion, present, projected and EQ alternative, Alabama River Basin, 1990 & 2020

TYPE OF EROSION	PRESENT 1970	1990 W/O	1990 EQ	2020 W/O	2020 EQ
	Millions of Tons				
General 1/	50.4	53.6	25.7	62.7	25.4
Gullies and other critical	14.8	14.9	5.8	15.3	3.8
TOTAL	65.2	68.5	31.5	78.0	29.2

1/ Includes sheet erosion and forest erosion.

A program of fire prevention and timber stand rehabilitation can reduce forest erosion in 1990 from an estimated 41 million tons annually to 14.8 million tons. This program is based upon the prescription and application of forest watershed standards and practices equal in effectiveness to those described in the U. S. Forest Service Watershed Management Standards for the Southern Appalachians.

The following combination of measures is one of the more feasible that will produce the same results as described on page 4-52, Vol. I:

1. Reducing the acreage of spur roads and skid trails disturbances from 64,000 to 38,000 acres will reduce the erosion volume by 2,750,000 tons per year.
2. Lowering the combined erosion rate for skid trails and spur roads from 35.7 tons/acre/year to 8.9 tons/acre/year will further reduce the erosion volumes by 2,794,000 tons per year. A total of 26,000 acres will be treated with such measures as water-bars seeding on bare soil, shaping banks, etc.
3. Dropping the erosion rate from mechanically site prepared areas from 96.7 tons/acre/year to 17.8 tons/acre/year will yield a reduction of 14,100,000 tons per year. This can be achieved by modified installation and/or re-vegetation on 45,000 acres of site preparation.
4. Attaining the fire protection goal for 1990 should reduce erosion volumes by 450,000 tons per year.
5. Reforestation on 53,000 acres of abandoned cropland, by lowering the average erosion rate from 11.4 tons/acre/year to 4.8 tons/acre/year, will reduce the annual erosion volume some 900,000 tons per year.

Table 2-18 -- Erosion reduction measures, EQ alternative, Alabama River Basin, 1990 & 2020

LAND TREATMENT TO MEET "T" VALUE NEEDS (2 TO 5 TONS/ACRE/YEAR EROSION)	1990 TREATED	1990 REMAINING	2020 TREATED	2020 REMAINING
	1,000 Acres			
Cropland				
Crop residue use or cover cropping, Contour farming or drainage systems	165	22	231	30
Contour farming Crop residue use, water disposal systems, sod in rotation	211	27	182	25
Other Cropland				
Establish perennial cover	114	13	37	1
Improved Pastureland				
Planting and management	634	63	843	84
Unimproved Pastureland				
Pasture management	85	97	27	30
Forest Land				
Site preparation	45	157	54	124
Log roads and skid trails installation and rehabilitation	52	173	62	144
Tree planting	53	177	90	211
TOTAL	1,359	729	1,526	649

Table 2-19 -- Erosion rates, present, projected and EQ alternative, Alabama River Basin, 1990 & 2020

LAND USE	PRESENT 1970	1990 W/O	1990 EQ	2020 W/O	2020 EQ
	------------	Tons per acre per year			------------
Cropland harvested	9.5	7.6	3.7	7.5	3.5
Other Cropland	13.4	11.4	4.5	16.4	4.5
Improved Pasture	3.4	2.8	2.1	3.4	2.1
Unimproved Pasture	4.1	5.2	3.8	5.8	3.9 1/
Forest, slight to undisturbed	0.9	0.9		0.7	
Forest, disturbed	33.6	33.0	2.0 2/	33.0	2.0 2/
Urban and "Other" Land	5.3	5.0	4.8	4.8	4.5

1/ Erosion rate on unimproved pasture is projected to be slightly higher in the EQ alternative because of the small number of total acres with a high percentage of rough land.
2/ Weighted average erosion for all forest lands is 2.0.

Improved Production Efficiency

The EQ alternative seeks to improve efficiency through accelerated technical assistance and conservation education aimed at shifting production to less erosive soils. The alternatives differ in several ways: (1) the EQ alternative includes gradually shifting row crop production to capability subclasses I, IIe, IIw, and IIIw. The use of subclass IIIe for row crops is reduced to a minimum. (2) 46,000 flood plain acres would be removed from possible crop and pasture production; (3) timber clearing for crop production is not considered because of detrimental environmental effects; and (4) the EQ proposal includes an extensive assistance program to accomplish the needed application of conservation measures at an accelerated rate.

Basinwide, net returns with the EQ proposal would be about $1.7 million below that anticipated without accelerated development by 1990, largely as a result of a change in the mix of crops grown. As in the state, production cost per unit of basin output would remain about the same as in the without development option. Over the long run, however, the outlook for the basin within the EQ framework would improve. A substantial increase in row crop production between 1990 and 2020 would increase annual net returns to basin farmers about $4 million above that expected without development. Beef production would continue to increase, though not as rapidly as expected without the EQ alternative.

Increased Forest Production

The major difference in this alternative and the NED proposal is the added measure of increasing the forest land base to provide an increment of the 2020 demand for forest products. A 15-year installation period is necessary in order to meet these demands. The acreage must be held in forest production continuously throughout the projection period in order to yield the necessary volumes of specific wood products. Growth rates for this portion of the alternative are assumed to be the same as for the baseline projections. The 2020 demands are met as follows: 22 percent from the 737,000 acre increased forest land; 53 percent through better utilization; and 25 percent as a result of accelerated management as shown in table 2-20.

Table 2-20 - Timber production expected from elements in the EQ alternative

		EQ ELEMENTS NECESSARY TO SATISFY 2020 TIMBER DEMANDS			
YEAR	BASELINE PRODUCTION	ACREAGE INCREASE	INCREASED UTILIZATION	ACCEL. MGMT.	TOTAL
	Cubic Feet/Acre/Year				
1970	56.1	-	-	-	56.1
1990	56.3	-	-	-	56.3
2020	75.8	+2.6	+6.1	+2.9	87.4

Utilization--An increase in the utilization rate of 0.26 percent each year throughout the period 1980-2020 will provide slightly over half of the necessary 91.5 million cubic feet of roundwood to be harvested in 2020 to meet the demands projected for that year.

Forest Acreage Increase--A total of 737,000 acres of current crop and pastureland is assumed to be available for forest management. This land will need reforestation at a rate of 49,000 acres a year to have all acreage in trees by 2000.

Accelerating Forest Management--Increasing the current forest stocking on ten percent of the acres not now well-stocked will increase the average net annual growth by 2.9 cubic feet per acre per year - 25 percent of the increment added to baseline production in 2020. This will require reforesting 90,000 acres (6,000 acres per year) and timber stand treatment and improvement cutting on 600,000 acres (40,000 acres per year) to complete the program within 15 years.

Reduction in Fire Losses

To meet the projected EQ fire control goals, an additional 39 fire control units are planned in the early action proposal to supplement the existing 39 units.

Increased Forest Grazing

Prescribed burning on about 120,000 acres of pine forest lands will provide increased forest grazing opportunities. This practice will be accomplished annually in pine stands up until they are 30 years old. This EQ grazing program will produce about 1.9 million pounds of beef annually in 1990.

Urban Flood Damage Reduction

No elements are included in this alternative for achieving urban flood damage reduction because this study did not include a detailed identification of individual communities having this problem. When remedial efforts are undertaken, first consideration should be given to nonstructural measures identified in the NED alternative.

Water Supply

Concepts used in formulating the EQ alternative placed constraints on water supply developments. To minimize the adverse effect on fish and wildlife habitat, surface storage was planned only where there was no other alternative water source available to supply the volume needed. Two reservoir sites, Terrapin Creek and Canoe Creek, were selected to meet the needs (see figure 2-4). These sites will supply 8 MGD of the 25 MGD needed by 1990 and 25 MGD of 71 MGD needed by 2020 (see table 2-21).

Increased Recreation

Basically, the EQ and NED recreation proposals are the same. The only difference involves exclusion of reservoir sites on Wedowee Creek, Bear Creek, and Camp Branch from the EQ proposal because of adverse environmental effects. Without these projects, the short range EQ alternative provides 2.7 million activity occasions annually at a cost of $1.39 million.

Table 2-21 -- Potential water supply impoundment sites, EQ alternative, 1990 & 2020

COMMUNITIES SERVED	BASIN 1/ PLAN	STREAM NAME	SITE LOCATION S. T. R.	DRAINAGE AREA (SQ.MI.)	M&I STORAGE (AC.FT.)	SURFACE AREA (AC.)	WATER 2/ SUPPLY (MGD)	WATER 3/ NEEDS (MGD) 1990	WATER 3/ NEEDS (MGD) 2020	OTHER PURPOSES SERVED
EQ Plan										
Calhoun Co.										
Jacksonville Piedmont	1990	Terrapin Cr.	Sec. 2, T20S,R11E	29.0	2,000	111	8.4	3.6	7.0	FC 4/
St. Clair Co.										
Margaret Moody Odenville	1990	Canoe Cr.	Sec. 21, T14S,R2E	37.8	4,000	415	11.0	4.4 5/	18.0 5/	-
Ashville Springville	2020									

1/ Early action, 1990--long-range, 2020
2/ Designed to fully utilize the site potential.
3/ Total needs by time frame.
4/ F.C. - Flood Control
5/ Total needs for all St. Clair Co. communities listed.

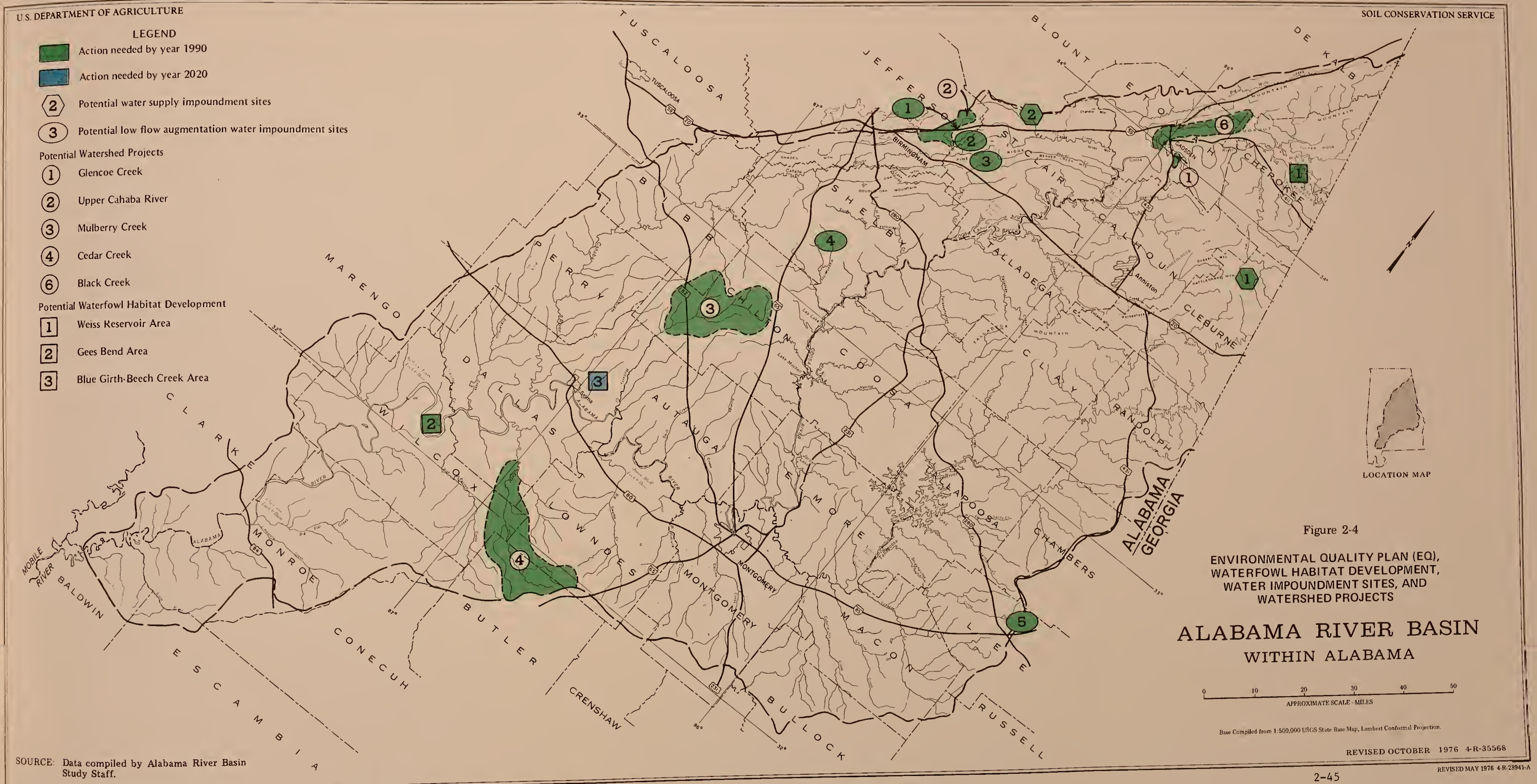


Figure 2-4

ENVIRONMENTAL QUALITY PLAN (EQ), WATERFOWL HABITAT DEVELOPMENT, WATER IMPOUNDMENT SITES, AND WATERSHED PROJECTS

ALABAMA RIVER BASIN WITHIN ALABAMA

USDA-SCS-FORT WORTH, TEXAS 1976

Solid Waste Disposal

Proposals include the establishment and operation by 1990 of two 100-acre solid waste disposal sites for the disposal of hazardous industrial wastes. An additional 200 acres would be developed by 2020.

Low Quality Stream Improvement

The 1990 and 2020 EQ proposals include 5 reservoir sites for low-flow augmentation to improve stream quality at five pollution problem locations (see figure 2-4). These sites are located upstream from the problem areas to utilize gravity flow.

A number of the pollution problems identified cannot be solved by low-flow augmentation. These areas were either physically located such that upstream reservoir sites did not exist or the required flow was greater than the dependable yield from the upstream drainage area. Structure cost and fixed improvements in the reservoir area were also considered in selecting feasible sites. The available storage and dependable yields from the drainage areas of the sites selected will meet, in whole or in part, the required discharge to augment low flows by 1990. Statistical data are shown in table 2-22.

Reduction in Critical Erosion

The EQ alternative differs from the NED alternative in intensity of treatment of those items that contribute to aesthetic quality and general environmental improvement. The critical erosion features of the EQ alternative are based on the expectation of public desire for environmental improvement and emphasis on aesthetic quality.

Where there is a clear, strong public desire to improve the environmental quality, the public's willingness to pay for the improvement can be considered to indicate that the improvement is worth the cost; that is, the benefit is at least equal to the cost.

The EQ alternative will provide for the treatment of 67,800 acres of gullied land, 1,600 acres of roadsides, 9,200 acres of mined land and 16,500 acres of land affected by streambank erosion by 1990. The EQ alternative for 2020 provides for treatment of 87,000 acres of gullied land, 2,100 acres of roadsides, 11,500 acres of mined land, and maintenance of the 16,500 acres of streambanks which were treated in the early action phase.

Table 2-22 -- Statistical data for potential reservoir sites for low-flow augmentation, EQ alternative for early action

SITE NO.	SITE LOCATION	DRAINAGE AREA (SQ. MI.)	POOL SURFACE AREA (ACRES)	WATER DEPTH (FEET)	TOTAL STORAGE VOLUME AVAILABLE (AC. FT.)	USABLE STORAGE VOLUME (AC. FT.)	DEPENDABLE YIELD (CFS)	LOW FLOW REQUIRED (CFS)
1	Cahaba River 2½ mi. N of Trussville R1E, T16S, Sect. 12	12.7	140	50	2,825	2,200	9.5	1/
2	Big Black Creek 8 mi. NE of Trussville R1E, T15S, Sect. 36	10.5	255	45	4,780	4,200	7.9	1/
3	Little Black Creek 6 mi. E of Trussville R1E, T16S, Sect. 24	11.4	304	45	6,765	6,000	8.5	1/
4	Waxahatchee Creek 2½ mi. W of Columbiana R1W, T21S, Sect. 21	12.8	374	20	3,740	3,040	6.2	4.5
5	Saugahatchee Creek 4 mi. NW of Auburn R26E, T19N, Sect. 2	5.4	178	35	2,375	2,000	3.2	23.0

1/ Three sites are needed to provide a required flow of 23.1 cfs.

See figure 4 for general location.

Reduction in Sedimentation

The EQ alternative provides intensive treatment and protection from erosion, thereby, reducing sediment substantially (see table 2-23). This intensive treatment is costly but offers protection to the environment and helps to enhance the aesthetic quality of the landscape.

The combined effects of the erosion control measures would reduce the sediment load from a projected 22 million tons annually to 9.5 million tons in 1990.

Table 2-23 -- Sediment production, present, projected and EQ alternative, Alabama River Basin, 1990 & 2020

SOURCE OF SEDIMENT	PRESENT 1970	1990 W/O	1990 EQ	2020 W/O	2020 EQ
	Millions of Tons				
General erosion 1/	12.7	13.4	6.4	14.8	6.3
Critically eroding areas	8.7	8.6	3.1	8.9	2.2
TOTAL	21.4	22.0	9.5	23.7	8.5

1/ Includes "disturbed" forest lands eroding at "critical" rates.

Scenic Rivers and Streams

Elements in the EQ alternative provide for the protection and preservation of 150 miles of scenic waterways by 1990 and 200 miles by 2020. Elements include site acquisition, site improvement and the adaption of state legislation to reinforce preservation of scenic water courses. Proposals for the early time frame involve protecting and improving portions of the Cahaba River, Tallapoosa River, Little River, Shoal Creek, and Hatchett Creek. The long-range proposals include similar programs for portions of Shoal Creek and Little River. The specific location of mileage to be protected or preserved should be selected by an appropriately designated group in conjunction with the desires and interest of local landowners.

Natural Scenic Sites

The proposed elements include the purchase or lease of 25 natural scenic sites by 1990 and 35 sites by 2020. These sites meet the criteria outlined in Volume I for natural sites needing protection. These sites are scattered throughout the river basin and represent a significant portion of those sites needing protection. Specific sites should be selected by appropriate state agencies, interested organizations, and local citizens. It is suggested, however, that several sites from each of the major categories be selected. This would include such areas as Horse Pens Forty and Blue-Girth Beach Creek Swamp. The major categories for natural scenic sites are overlooks, caves, springs and waterfalls, swamps, and geologic formations.

Fish and Wildlife Habitat Improvement

Upland Habitat--The EQ alternative will supply 133,000 acres of the 150,000 acres of habitat improvement needed by 1990 and 200,000 acres of the 220,000 acres needed by 2020. Specifically, the proposals include the purchase of 1,000 acres of nongame habitat, lease and management of an additional 100,000 acres for public hunting, and intensified management on 32,000 acres of private, state, and federal land.

Wetland Habitat--Wetland habitat for waterfowl refuges and management areas is lacking in the basin. Elements of the EQ alternative will supply 21,000 acres of the 25,000 acres needed by 1990. This includes 5,000 acres of habitat development and improvement in beaver ponds and greentree reservoirs, 13,500 acres in two waterfowl management areas (3,500 acres at Gee's Bend and 10,000 acres on Lake Weiss) and 2,500 acres of flood plain management. By 2020, the EQ elements will provide 25,000 acres of the projected 45,000 acres needed. Additional elements for 2020 include the acquisition of a 4,000 acre wetland area in the Blue Girth-Beech Creek Swamp.

Impoundments--Environmental quality elements will supply about 75 percent of the 8,000 acres needed by 1990 and the 10,000 acres needed by 2020. In essence, the elements involve accelerated technical assistance and cost sharing to implement new management techniques in exchange for public access to private ponds.

Streams--The EQ elements include improving 1,000 acres of stream habitat by 1990 and 2,000 acres by 2020. This can be accomplished by accelerating or creating state and federal programs under existing authorities. Specific practices would include selective snagging, bank stabilization, pollution control, and improved access.

Protection of Flora and Fauna

The environmental alternative emphasizes habitat acquisition (92,000 acres), habitat management (20,000 acres), and accelerated protection of 18 species by 1990 and 25 species by 2020. The 18 species include 10 animals and 8 plants while the 25 species represent 15 animals and 10 plants. In addition to the proposed elements, it is assumed that ongoing programs to protect endangered organisms will be continued.

Protection of Archaeological and Historical Sites

An intensified effort should be made through the Alabama Historical Commission to improve the consistency of archaeological and historical site identification. Sufficient federal legislation exists to protect important archaeological sites and those historic sites that meet the criteria for listing in the National Register of Historic Places. The adoption of state legislation should be considered to protect sites on the Alabama Register of Heritage and Landmarks where appropriate.

A preliminary investigation of many archaeological sites could be conducted if state or local funds were available to supplement federal funds. Following such investigations, sites could be classified as to their preservation value. If archaeological site investigation funding was coordinated at the state level, federal, state, and local funds for investigations could be directed into those areas of the basin most likely to be disturbed by future resource development.

While coordination of historic site identification and preservation is needed at the state level, some of the most valuable assistance could be provided through local groups such as the seven-county North Central Alabama Heritage Association organized recently in the northern portion of the basin. These local organizations can assist in site identification and provide the leadership in distributing information concerning historical sites. They can also erect historic markers, organize public tours to increase public awareness and appreciation of historic sites, and organize local fund-raising efforts for site acquisition.

Primary emphasis should be placed on the preservation of districts of all types rather than single structures. By concentrating on preservation of districts of all types, greater numbers of landmarks will be protected. It will also preserve more of a "place-in-time" than the preservation of single structures. Elements provide for the protection of 250 sites out of 310 sites designated as needing protection by 1990. No additional elements were designated for protection for 2020.

Table 2-24 -- Benefits and costs, EQ alternative, Alabama River Basin

COMPONENTS & PLAN ELEMENTS	TOTAL INST. COST	ANNUAL COSTS 1/	ANNUAL BENEFITS
	---------Thousand Dollars-----------		
Flood Reduction			
Changed land use	6,100	375	415
Structural measures	2,400	151	225
Urban-nonstructural	NA	NA	NA
Increased Beef Production			
Prescribed burning (forest land)	4,660	287	650
Create Water Supply			
Impoundments	1,800	116	154
Increased Recreation			
Facilities	22,000	1,386	2,840
Erosion Reduction			
Conservation systems	(24,000) 2/	(1,495) 2/	NA
Improved Production Eff.			
Changed land use	8,900	550	2,800
Reduced Fire Losses			
Equipment	(2,500) 2/	(176) 2/	NA
Solid Waste Disposal			
Site acquisition	(400) 2/	(25) 2/	NA
Low Quality Streams			
Low flow augmentation	(4,550) 2/	(280) 2/	NA
Reduced Sediment Load			
Conservation systems	NA	NA	NA
Critical Erosion Reduction			
Stabilization	(150,000) 2/	(11,740) 2/	NA
Scenic Streams			
Acquisition	(350) 2/	(22) 2/	NA
Natural Scenic Sites			
Acquisition	(3,250) 2/	(199) 2/	NA
Fish and Wildlife Habitat			
Management and improvement	(6,530) 2/	(401) 2/	NA
Protection of Flora and Fauna			
Acquisition	(1,800) 2/	(112) 2/	NA
Increased Timber Production			
Utilization & Accel. Mgmt.	50,000	3,079	4,715
Protection of Archaeological and Historical Sites			
Cooperative identification & preservation program	NA	NA	NA
TOTAL	$ 95,860	$ 5,944	$11,799

1/ Amortized @ 6 1/8 percent interest for 100 years and includes O&M.
2/ Not included in total cost.

Table 2-25 -- National economic development account, EQ alternative, (dollars) 1/

COMPONENTS	MEASURES OF EFFECTS	COMPONENTS	MEASURES OF EFFECTS
Beneficial effects:	(Average Annual) 1/	Adverse effects:	(Average Annual) 1/
A. The value to users of increased outputs of goods and services		A. The value of resources required for the EQ plan:	
1. Flood damage reduction	634,000	1. Multi-purpose reservoirs, recreational and water supply reservoirs, channel work, and recreational facilities	
2. Increased beef production	644,000	Project installation	1,305,000
3. Create water supply	152,000	OM&R	600,000
4. Increased recreation	2,810,000	2. Nonstructural--increased beef production on forest land--prescribed burning	287,000
5. Increased timber production	4,665,000	3. Increased timber production	3,079,000
6. Production efficiency	2,770,000	4. Production efficiency	550,000
7. Utilization of unemployed and underemployed labor resources		5. Project administration	123,000
a. Project construction	124,000		
Total beneficial effects	11,799,000	Total adverse effects	5,944,000
		Net beneficial effects	5,855,000

1/ Amortized over 100 years at 6-1/8 percent interest.

Table 2-25 -- cont'd, regional development account

COMPONENTS	MEASURES OF EFFECTS STATE OF ALABAMA	REST OF NATION
Income		
Beneficial effects:	(Average Annual) 1/	
A. The value of increased output of goods and services to users residing in the region		
1. Flood damage reduction	634,000	0
2. Increased beef production	644,000	0
3. Create water supply	152,000	0
4. Increased recreation	2,560,000	250,000
5. Increased timber prod.	4,665,000	0
6. Production efficiency	2,770,000	0
7. Utilization of unemployed and underemployed regional labor resources		
a. Project construction	124,000	0
B. The value of output to users residing in the region from external economics		
1. Indirect activities associated with increased net returns from flood damage beef production	550,000	
Total beneficial effects	12,099,000	250,000

COMPONENTS	MEASURES OF EFFECTS STATE OF ALABAMA	REST OF NATION
Income		
Adverse effects:	(Average Annual) 1/	
A. The value of resources contributed from the region to achieve the output		
1. Multi-purpose reservoirs, floodwater retarding structures, recreational and water supply reservoirs channel work and recreational facilities		
Project installation	825,000	480,000
OM&R	600,000	0
2. Nonstructural--increased beef production on forest land--prescribed burning	287,000	0
3. Increased timber prod.	3,079,000	0
4. Production efficiency	0	550,000
5. Project administration	62,000	61,000
Total adverse effects	4,853,000	1,091,000
Net beneficial effects	7,246,000	-841,000

1/ Amortized over 100 years at 6-1/8 percent interest.
2/ National externalities were not evaluated.

Table 2-25 -- cont'd, regional development account

COMPONENTS	MEASURES OF EFFECTS	
	STATE OF ALABAMA	REST OF NATION
Employment		
Beneficial effects:		
A. Increase in number and types of jobs		
1. Employment for project construction	175 semi-skilled jobs for 5 yrs.	-
2. Employment in recreation service sector	140 permanent seasonal semi-skilled jobs	-
3. Employment for project OM&R	77 permanent semi-skilled jobs	-
4. Indirect and induced employment from output of projects's goods and services	200 permanent semi-skilled jobs	-
Total beneficial effects	277 permanent semi-skilled jobs 140 permanent seasonal semi-skilled jobs 175 semi-skilled jobs for 5 yrs.	- - -

COMPONENTS	MEASURES OF EFFECTS	
	STATE OF ALABAMA	REST OF NATION
Employment		
Adverse effects:		
A. Decrease in number and types of jobs		
1. Loss in agricultural employment from project take area	8 man-yrs. of agricultural employment	-
2. Loss in indirect and induced employment associated with project take area	12 permanent semi-skilled jobs	- -
Total adverse effects	20 permanent semi-skilled jobs	-
Net beneficial effects	257 permanent semi-skilled jobs 140 permanent seasonal semi-skilled jobs 175 semi-skilled jobs for 5 yrs.	- - -

Table 2-25 -- cont'd, regional development account

COMPONENTS	MEASURES OF EFFECTS	
	STATE OF ALABAMA	REST OF NATION
Population Distribution		
Beneficial effects	Creates 257 permanent semi-skilled jobs, 140 permanent seasonal jobs and 175 semi-skilled jobs for 5 years in an area which has experienced a 1 percent reduction in population in the last 10 years.	-
Adverse effects	-	-
Regional Economic Base and Stability		
Beneficial effects	Provides flood protection on 1,900 acres of crops and pasture, 8.0 million gallons per day of municipal water supply and 2,900,000 activity occasions of recreation opportunities. Creates 257 permanent semi-skilled jobs, 140 permanent seasonal semi-skilled jobs for 5 years in an area where 27 percent of the families have incomes less than the national poverty level.	-
Adverse effects	-	-

Table 2-25 -- cont'd, environmental quality account

COMPONENTS	MEASURES OF BENEFICIAL AND ADVERSE EFFECTS
A. Areas of natural beauty	1. Project benefits will enhance 3,300,000 acres on 18,000 farms. 2. Create 4 multi-purpose lakes of 2,570 acres with 61 miles of shoreline. 3. Establish water-based recreational facilities at 22 locations. 4. Disruption of rural tranquility by 2,800,000 recreational occasions annually.
B. Quality consideration of water and land resources	1. Reduce sediment load in streams by 13.5 million tons per year. 2. Revegetation of 79,000 acres of critically eroded land, streambanks, roadsides, and strip mines. 3. Maintain quality of land on 54,000 acres by using less erosive soils. 4. Reduce erosion on 279,000 acres of crop-land, 562,000 acres of pastureland, and 460,000 acres of forest land. 5. Reduce fire losses on 7,129,000 acres of forest land.
C. Biological resources and selected ecosystems	1. Create 5,155 acres of flatwater fish habitat. 2. Inundate 39 miles of stream fish habitat. 3. Provide 5,155 acres resting areas for migratory waterfowl. 4. Inundate 5,155 acres of wildlife habitat. 5. Improve deer and other wildlife habitat by providing permanent watering places in lakes.
D. Irreversible or irretrievable commitments	1. Conversion of 4,700 acres of forest land, 330 acres of pastureland, and 125 acres of cropland to reservoir pools.

Table 2-25 -- cont'd, social well-being account

COMPONENTS	MEASURES OF BENEFICIAL AND ADVERSE EFFECTS
Beneficial & adverse effects:	
A. Real income distribution	1. Create 360 low to medium imcome permanent jobs for area residents. 2. Net monetary benefits of $7,246,000 will provide opportunities to improve the income of about 27 percent of the families within the basin whose income is below the proverty level.
B. Life, health and safety	1. Increased output will be in livestock, grain, and fiber products. 2. Increased risk of drowning or injury at lake sites. 3. Reduced water pollution resulting from reduced sediment load in streams. 4. Improved municipal water supply services for five communities.
C. Cultural and recreational opportunities	1. Creates 2,800,000 recreational activity occasions annually. 2. Identification and investigation and/or preservation of 250 archaeological and historical sites.

Table 2-26 -- Effectiveness of proposed elements in meeting component needs for NED and EQ alternatives, Alabama River Basin

COMPONENT NEEDS	UNIT	YEAR 1990	YEAR 2020	ALTER-NATIVE	PROPOSED ELEMENTS (EARLY ACTION)	UNIT	EFFECTIVENESS EARLY ACTION - YEAR 1990 PROVIDES	EFFECTIVENESS EARLY ACTION - YEAR 1990 REMAINING NEED
Flood Damage Red.								
Cropland	Thou. ac.	49	49	NED	Changed land use			
Pastureland	Thou. ac.	154	154	Alt.	Cropland	Thou. ac.	7.0	Cropland 40
		203	203		Pastureland		31.0	(49-7-2=40)
					Total		38.0	Pastureland 115
								(154-31-8=115)
					Structural measures			
					Cropland	Thou. ac.	2.0	
					Pastureland		8.0	
					Total		10.0	
					FRS	No.	13	
					Multi-purpose str.	No.	3	
					Channel work	Mi.	14.3	
					Flood dike	Mi.	0.7	
				EQ	Changed land use			
				Alt.	Cropland	Thou. ac.	8.4	Cropland 40
					Pastureland		37.7	(49-8.4-0.6=40)
					Total		46.1	Pastureland 115
					Structural measures			
					Cropland	Thou. ac.	0.6	
					Pastureland		1.3	
					Total		1.9	
					FRS	No.	0	
					Multi-purpose str.	No.	2	
					Channel work	Mi.	3.9	
					Flood dike	Mi.	0.7	

Table 2-26 -- cont'd

COMPONENT NEEDS	UNIT	YEAR 1990	YEAR 2020	ALTER-NATIVE	PROPOSED ELEMENTS (EARLY ACTION)	UNIT	EFFECTIVENESS EARLY ACTION - YEAR 1990 PROVIDES	EFFECTIVENESS EARLY ACTION - YEAR 1990 REMAINING NEED
Erosion Reduction	Thou. ac.	2,088	2,175	NED Alt.	Cropland			
					Covercrop or residue, terraces or drainage, sod in rotation	Thou. ac.	580	380
					Pasture			
					Pasture planting	Thou. ac.	191	96
					Pasture management		426	341
					Forest			
					Site preparation	Thou. ac.	19	0
					Log roads and skid trails installation and rehabilitation		55	0
					Total		1,271	817
				EQ Alt.	Cropland			
					Covercrop or residue, terraces or drainage, sod in rotation	Thou. ac.	490	62
					Pasture			
					Pasture planting	Thou. ac.	226	58
					Pasture management		466	129
					Forest			
					Site preparation	Thou. ac.	45	0
					Log roads and skid trails installation and rehabilitation		52	0
					Tree planting		53	0
					Total		1,332	249

Table 2-26 -- cont'd

COMPONENT NEEDS	UNIT	YEAR 1990	YEAR 2020	ALTER-NATIVE	PROPOSED ELEMENTS (EARLY ACTION)	UNIT	EFFECTIVENESS EARLY ACTION - YEAR 1990 PROVIDES	EFFECTIVENESS EARLY ACTION - YEAR 1990 REMAINING NEED
Increased Drainage	Thou. ac.	170	202	NED Alt.	Surface and subsurface	Thou. ac.	45	125
				EQ Alt.	Surface and subsurface	Thou. ac.	0	170
Improved Prod. Efficiency	Thou. ac.	1,638	2,064	NED Alt.	Changed land use	Thou. ac.	382	1,256
				EQ Alt.	Changed land use	Thou. ac.	741	897
Increase Forest Production 1/	Mil. cu. ft./yr.	0	82.0	NED Alt.	Regeneration (67,000 ac.) Timber stand improvement (460,000 ac.) Improve utilization (0.40% annually)	Mil.cu.ft./yr.	0	0
				EQ Alt.	Reforestation (737,000 ac.)	Mil.cu.ft./yr.	-	-
					Accelerate mgt. (690,000 ac.)		-	-
					Improve utilization (0.26% annually)		-	-
					Total		2.0	0
Reduced Fire Losses	Thou. ac.	7,129	6,845	NED Alt.	Capital imp. and equipment	Thou. ac.	7,129	0
				EQ Alt.	Capital imp. and equipment	Thou. ac.	7.129	0

1/ While there are no unmet needs for timber production in 1990, the timber management programs must begin no later than 1980 and be completed by 1995 in order that the timber requirements be met: softwood/hardwood; sawtimber/pulpwood; veneer/construction, etc. Therefore, a forestry program is presented in the early action plan but only that portion of the program to be accomplished in the early action plan period and in terms of measures accomplished.

Table 2-26 -- cont'd

COMPONENT NEEDS	UNIT	YEAR 1990	YEAR 2020	ALTERNATIVE	PROPOSED ELEMENTS (EARLY ACTION)	UNIT	EFFECTIVENESS EARLY ACTION - YEAR 1990 PROVIDES	REMAINING NEED
Increased Grazing Forest Land	Mil.lbs. beef/yr.	19.2	15.7	NED Alt.	Prescribed burning (110,000 ac.)	Mil.lbs. beef/yr.	12.6	6.6
				EQ Alt.	Prescribed burning (120,000 ac.)	Mil.lbs. beef/yr.	13.3	5.9
Urban Damage Red.	No. of comm.	90	110	NED-EQ	Non-structural	No. of comm.	N/A	N/A
Create Water Supply	MGD	25	71	NED Alt.	Impoundments (5 sites)	MGD	19.5	5.5
				EQ Alt.	Impoundments (2 sites)	MGD	8.0	17.0

Table 2-26 -- cont'd

COMPONENT NEEDS	UNIT	YEAR 1990	YEAR 2020	ALTER-NATIVE	PROPOSED ELEMENTS (EARLY ACTION)	UNIT	EFFECTIVENESS EARLY ACTION - YEAR 1990 PROVIDES	REMAINING NEED
Increased Recreation	Thou. act. occ.	9,935	29,368	NED Alt.	Picnic tables (1,410) Swimming (43 ac. beach) Boating (3,405 ac.) Golfing (1-9 course) Water skiing (2,225 ac.) Camping (715 sites) Hiking trails (245 mi.) Fishing (3,545 ac.) Hunting: Waterfowl habitat (9,000 ac.) Big game (193,000 ac.) Small game (140,000 ac.)	Thou. act. occ.	2,935	7,000
				EQ Alt.	Picnic tables (1,320 ac.) Swimming (38 ac. beach) Boating (2,285 ac.) Golfing (1-9 course) Water skiing (1,345 ac.) Camping (625 sites) Hiking trails (245 mi.) Fishing (2,425 ac.) Hunting: Waterfowl habitat (21,000 ac.) Big game (193,000 ac.) Small game (140,000 ac.)	Thou. act. occ.	2,705	7,230
Solid Waste Disposal Sites	Acres	200	400	NED Alt.	Site acquisition	Ac.	200	0

Table 2-26 -- cont'd

COMPONENT NEEDS	UNIT	YEAR 1990	YEAR 2020	ALTER-NATIVE	PROPOSED ELEMENTS (EARLY ACTION)	UNIT	EFFECTIVENESS EARLY ACTION - YEAR 1990 PROVIDES	REMAINING NEED
Solid Waste Disposal Sites---Cont'd				EQ Alt.	Site acquisition	Ac.	200	0
Low Quality Streams Augmentation	cfs	230	230	NED Alt.	Low flow augmentation	Flow (cfs)	0	230
				EQ Alt.	Low flow augmentation	Flow (cfs)	35.3	194.7
Reduced Sediment Load	Thou. tons/yr.	14.7	16.4	NED Alt.	See erosion reduction measures	Thou. tons/yr.	7.7	7.0
				EQ Alt.	See erosion reduction measures	Thou. tons/yr.	12.5	2.2
Critical Erosion Red.	Thou. ac.	151.6	155.6	NED Alt.	Streambank stab.	Thou. ac.	-	15.3
					Roadside stab.		0.9	1.4
					Critical area stab.		45.2	67.8
					Strip mine stab.		-	21.0
					Total		46.1	105.5

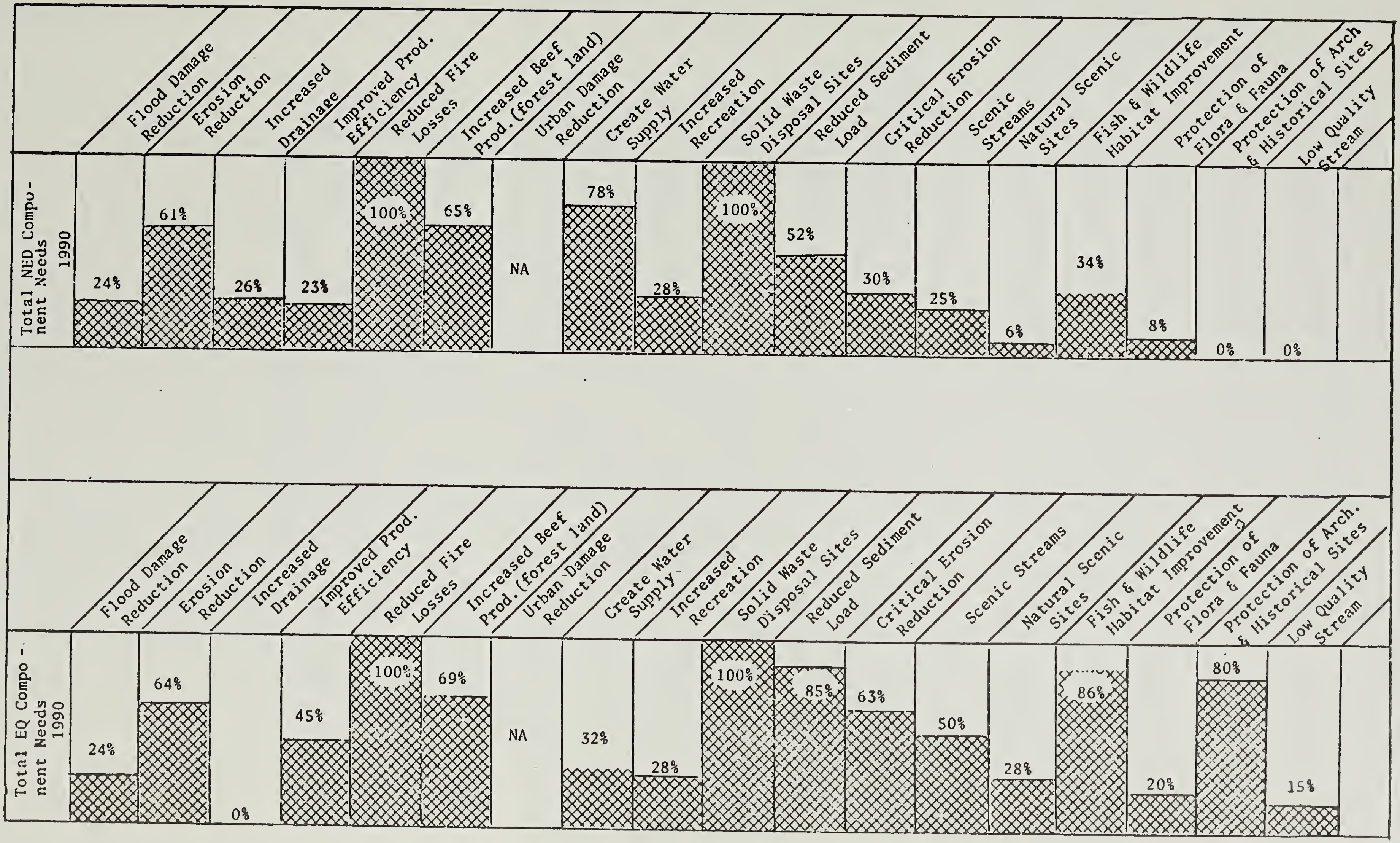
Table 2-26 -- cont'd

COMPONENT NEEDS	UNIT	YEAR 1990	YEAR 2020	ALTER-NATIVE	PROPOSED ELEMENTS (EARLY ACTION)	UNIT	EFFECTIVENESS EARLY ACTION - YEAR 1990 PROVIDES	REMAINING NEED
Critical Erosion--Cont'd				EQ Alt.	Streambank stab.	Thou. ac.	16.5	4.5
					Roadside stab.		1.6	0.7
					Critical area stab.		67.8	45.2
					Strip mine stab.		9.2	6.1
					Totals		95.1	56.5
Scenic Streams	Mi.	300	350	NED Alt.	Site acquisition	Mi.	75	225
				EQ Alt.	Site acquisition	Mi.	150	150
Natural Scenic Sites	Sites	90	75	NED Alt.	Site acquisition	Sites	5	85
				EQ Alt.	Site acquisition	Sites	25	65
Fish & wildlife Habitat Imp.	Thou. ac.	186	275	NED Alt.	Upland habitat imp.	Thou. ac.	50	100
					Wetland habitat imp.		9	16
					Impoundment mgt.		3	5
					Stream improvement		1	2
					Total		63	123

Table 2-26 -- cont'd

COMPONENT NEEDS	UNIT	YEAR 1990	YEAR 2020	ALTER-NATIVE	PROPOSED ELEMENTS (EARLY ACTION)	UNIT	EFFECTIVENESS EARLY ACTION - YEAR 1990 PROVIDES	EFFECTIVENESS EARLY ACTION - YEAR 1990 REMAINING NEED
Fish & Wildlife Habitat--Cont'd				EQ Alt.	Upland habitat imp.	Thou. ac.	133	17
					Wetland habitat imp.		21	4
					Impoundment mgt.		5	3
					Stream improvement		1	2
					Total		160	26
Protection of Flora & Fauna	No.	90	112	NED Alt.	Identification Site acquisition	Species (no.)	7	83
				EQ Alt.	"	Species (no.)	18	72
Protection of Archaeological & Historical Sites	Sites	310	280	NED Alt.	Identification	Sites	0	310
				EQ Alt.	Identification	Sites	250	60

FIGURE 2-3 RELATIVE PROPORTION OF COMPONENT NEEDS ACCOMPLISHED BY THE NED & EQ PLANS (1990)



CHAPTER 3

SUGGESTED PLAN

INTRODUCTION

Formulation of the suggested plan was guided by a desire to select a balance of elements from the NED alternative and the EQ alternative that would emphasize economic development and contribute to environmental amenities. An effort was made to meet substantial portions of the national economic development and environmental quality objectives. Trade-offs among various elements were necessary to minimize conflicts in resource use.

Table 3-13 displays the beneficial and adverse effects for the four accounts of national economic development, regional development, environmental quality, and social well-being. Figure 3-4 and table 3-14 illustrate the effectiveness of the plan elements in meeting expressed component needs. Table 3-15 is a summary comparison between the Suggested Plan and the NED and EQ alternatives.

Interested groups and knowledgeable individuals made technical contributions and valuable suggestions to achieve the desired levels of national and regional output of goods and services, environmental amenities, and social opportunities. The suggested plan reflects physical, technological, and public policy constraints identified by the sponsoring state organization, state planning units, and the USDA planning agencies. Measures included in the early action portion of this plan are shown in table 3-1. Inclusions of measures generally reflects a high degree of local interest or an expression of interest by some agency, organization or unit of government.

This plan contains the most effective combination of elements from the NED and EQ alternatives to reduce undesirable conditions to acceptable levels and to provide for resource needs in the future. The location and types of plan elements are mapped on figures 3-1 and 3-3. Figure 3-4 shows the effectiveness of this plan in satisfying component needs. Beneficial effects of those elements that could be elevated in monetary terms amount to $9.8 million annually (table 3-12). Net beneficial effects total 4.9 million.

Table 3-1 -- Measures included in the early action portion of the Suggested Plan, Alabama River Basin

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Land Resource Development

Conservation treatment on 1,271,000 acres of agricultural and forest land for erosion reduction.
Drainage of 7,000 acres of cropland, 32,000 acres of pastureland, and 6,000 acres of converted woodland and unimproved pastureland.
Changed land use for improved production efficiency on 382,000 acres of cultivated land.
Conservation measures to reduce sediment in streams by 10.4 million tons/year.
Streambank, roadside, strip mine, and gullied area stabilization to reduce critical erosion on 95,000 acres.
Reduction of forest fire losses from 0.54 to 0.35 percent on 7,129,000 acres of forest land.
Prescribed burning on 110,000 acres of forest to increase beef production.
Improve timber production efficiency on 530,000 acres. 1/

Water Resource Development

Six watershed flood control projects.
Six reservoirs for municipal and industrial water supply.

Recreation and Culture

Recreational development at 27 sites to provide 2.9 million activity occasions annually.
Acquisition of 150 miles of scenic streams and 25 natural scenic sites.
Wildlife habitat improvement on 160,000 acres.
Identification of 18 species of flora and fauna needing protection.
Identification, investigation and/or preservation of 250 archaeological and historical sites.

Waste Disposal

Acquisition of 200 acres for solid waste disposal.
Provide increased streamflow (230 cfs) for improved stream water quality.

1/ This area needs treatment during the early action period in order to meet harvesting requirements in 2020.

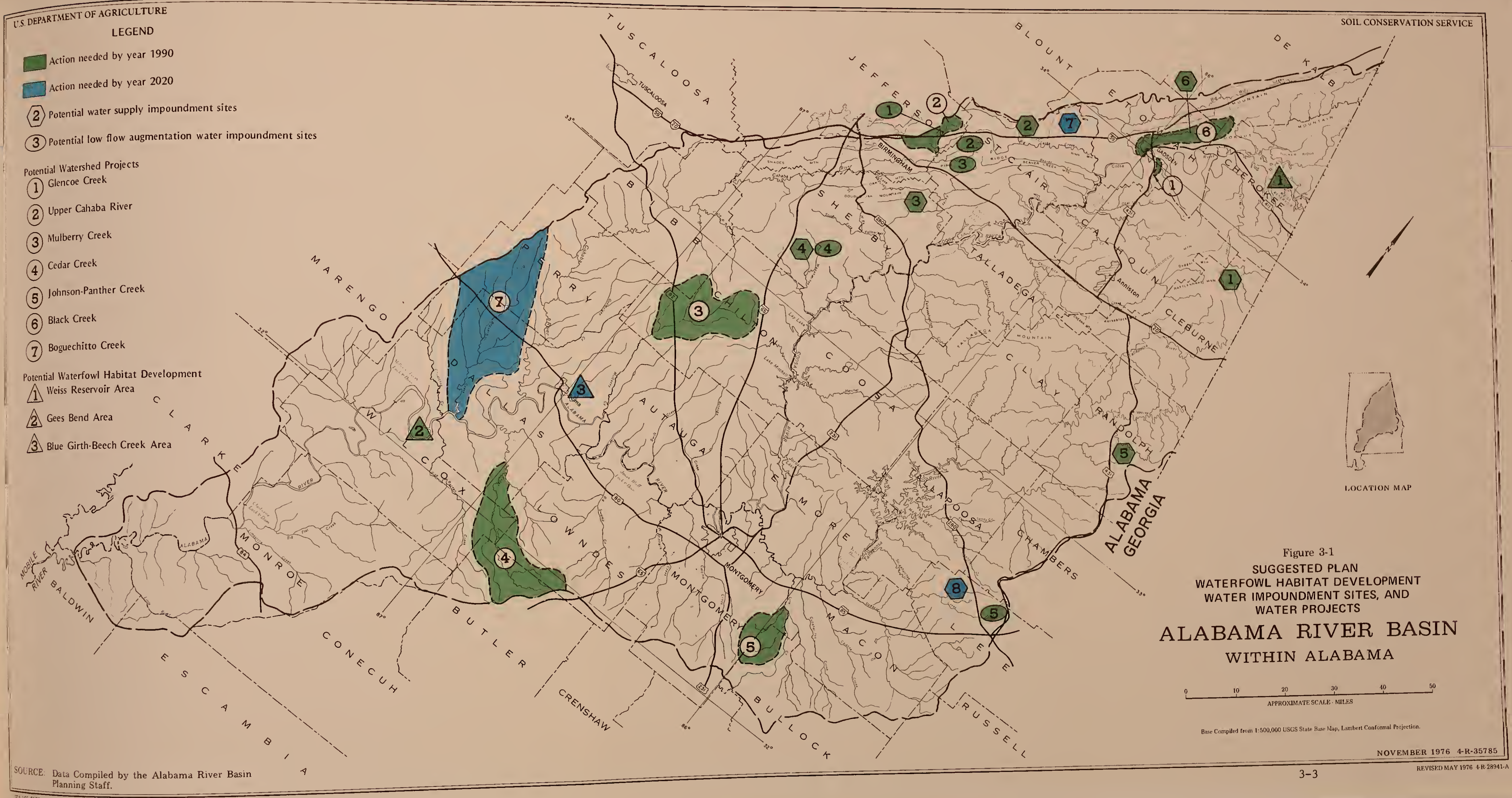


Figure 3-1
SUGGESTED PLAN
WATERFOWL HABITAT DEVELOPMENT
WATER IMPOUNDMENT SITES, AND
WATER PROJECTS
ALABAMA RIVER BASIN
WITHIN ALABAMA

PLAN ELEMENTS

Land Use

The suggested plan seeks to reduce soil loss while sustaining agricultural output, the aim being to focus on the use of those soils that can be utilized without continuous degradation of the land resource. This is a very real development need which, if not corrected, will seriously damage Alabama's ability to sustain production.

Statewide application of elements similar to those in the suggested plan would substantially reduce the amount of land needed to supply projected production. Land use efficiencies would reduce state agricultural land needs about three percent by 1990, and by about nine percent by 2020. At the state level more than 500,000 acres could be released for other uses by 2020, while maintaining projected without plan production levels, and adequately treating land remaining in production.

Implementation of plan elements to achieve both conservation and production goals, would shift production throughout the state. A region with highly erosive soils could be expected to gradually shift from row crops to pasture. Other areas with flat, less erosive slopes would gradually capture a larger share of state row crop production. The net effect would be a substantial improvement in land use efficiency on all acres in production.

This explains the apparent incongruency within the Alabama River Basin, i.e., cropland harvested increasing despite the many elements for improving efficiency and ultimately reducing land needs. This would be the case only if production at the basin level was held constant, which it was not. The suggested plan increases basin row crop production and slows the rate of increase in improved pasture from a projected 25,000 acres annually to about 17,000 acres each year. The combined efficiency gains from crop and pasture shifts within the basin would total $3 million annually by 1990.

The plan calls for no appreciable change in the total amount of land used for crop, livestock, and timber production through 1990 (see table 3-2). It would, however, result in a substantial change in the mix of crops and pasture as shown in figure 3-2. An additional 130,000 acres of the state's corn and cotton would shift into the basin by 1990. This, combined with a slight expansion of soybean and minor crops, would increase the basin's share of Alabama's cropland harvested from a projected 27 percent to 34 percent. Offsetting the increase in crops would be a reduction in the rate of increase of improved pasture used for beef (see table 3-3). The net effect of the trade-off in terms of land use would be no change in the projected 1.64 million acres used for crops and improved

Table 3-2 -- Land use, present, projected and Suggested Plan, Alabama River Basin, 1990 & 2020

LAND USE	1970	PROJECTED 1990 LAND USE W/O DEV.	PROJECTED 1990 LAND USE SUGGESTED PLAN	PROJECTED 2020 LAND USE W/O DEV.	PROJECTED 2020 LAND USE SUGGESTED PLAN
	----------	----------	1,000 Acres	----------	----------
Cropland & conservation acres:	653	614	766	591	718
Harvested acres	653	580	687	560	658
Supporting conservation ac. 1/	NA.	34	79	31	60
Other cropland	620	625	610	650	761
Pasture, improved	531	1,025	872	1,473	1,076
Pasture, unimproved	796	542	558	160	319
Forest land	7,471	7,155	7,155	6,862	6,862
Urban and other land	682	774	770	963	961
Impounded water	245	263	267	300	302
Rivers & streams	17	17	17	16	16
TOTAL	11,015	11,015	11,015	11,015	11,015

1/ Used for proper water disposal and/or grass rotations to reduce erosion.

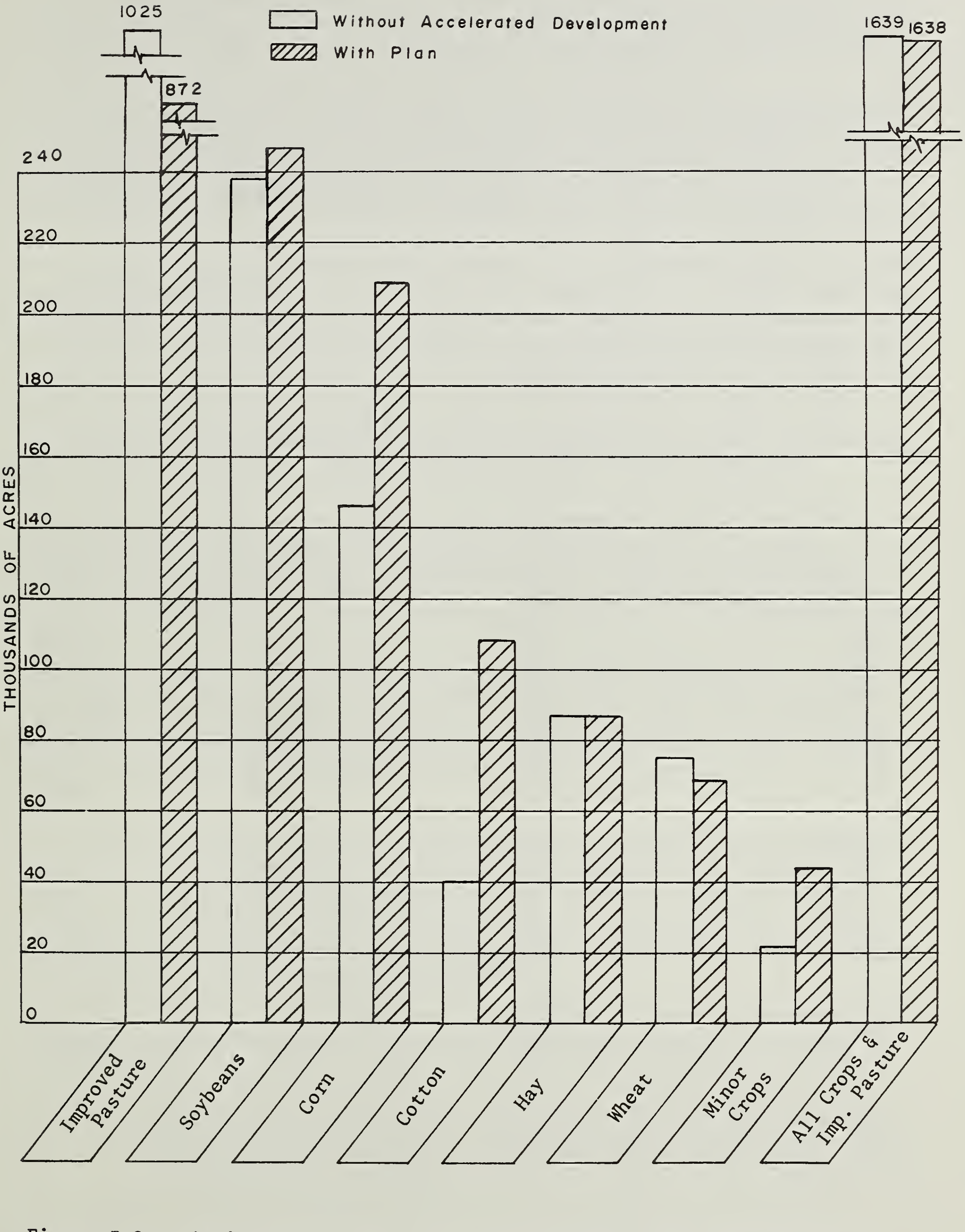


Figure 3-2 -- Agricultural land use, with and without the Suggested Plan, Alabama River Basin, 1990 pasture in 1990. Roughly 58 percent of the basin's open land would be utilized for crops and pasture, leaving 1.1 million acres, most of which would be suitable only for pasture.

The erosion control measures would change 58,000 acres of capability subclasses IVe and VIe soils from projected cropland harvested to timber by 1990. This shift, together with the concentration of row crops on class I through III land, would reduce the projected annual soil loss from sheet and rill erosion to 33.6 million tons, compared to more than 53.6 million tons without the plan.

The plan would not affect the trend in total forest acreage. Forest land will continue to decline, reaching 7,155,000 acres by 1990. This represents a 4 percent loss of the current forest base. However, with improved management and technology, timber production can be sustained on the available acreage.

Table 3-3 -- Projected production of major farm commodities and total net returns, Suggested Plan, Alabama River Basin, 1990 & 2020

ITEM	UNIT	1990	2020
Crop Production	Thou.		
Corn	Bu.	16,160	21,900
Cotton	Bales	150	47
Peanuts	Lbs.	13,200	39,700
Soybeans	Bu.	10,650	22,200
Wheat	Bu.	2,280	430
Oats	Bu.	525	300
Hay	Tons	500	690
Livestock	Mil.		
Beef & veal	Lbs.*	300	420
Pork	Lbs.*	49	65
Poultry	Lbs.*	615	830
Eggs	Doz.	116	150
Milk	Lbs.	150	75
Net Returns	Mil.		
NED Plan	Dol.	50.3	84.8
Without accelerated resource development	Dol.	40.3	70.8

*Liveweight

The plan would have minimal effects on land used for urban and other purposes. About 4,000 acres of water would be impounded in small reservoirs by 1990. These impoundments would provide municipal and industrial water as well as recreational opportunities.

In essence, land use resulting from the suggested plan corresponds closely to that outlined in the NED alternative. This course of action appears to be the most effective and acceptable means of reaching the goal of resource conservation and continued expansion of farm output.

Erosion Reduction

A plan goal was selected that would use existing and new programs to reduce erosion on 75 percent of the harvested cropland and pastureland to the acceptable limit of two to five tons per acre per year ("T" averages 4 tons per acre per year in the basin). The goal for reducing erosion on "other" cropland and unimproved pasture was set for 50 percent of the land adequately treated by 1990 and 2020.

The suggested plan would remove land in capability subclasses IVe, VIe, and VIIe along with some acreage of shallow soils in other capability classifications from cultivation. These lands would be converted to permanent cover, probably forest. Crops would be grown primarily on land capability classes I through III.

Erosion rates on cropland could be reduced from a projected 7.6 tons per acre in 1990 to 3.8 tons per acre under the plan. Erosion rates for other uses could be cut by 15 to 55 percent. The 25 to 50 percent of land not treated under this plan accounts for some erosion rates being projected higher than the 4 ton ("T") average for the basin.

A program of prevention and rehabilitation can reduce forest erosion in 1990 from an estimated 33.5 million tons annually to 13.7 million tons. This program is based upon the prescription and application of forest watershed standards and practices equal in effectiveness to those described in the U. S. Forest Service Watershed Management Standards for the Southern Appalachians.

Applying the following combination of measures is one of the more feasible that will produce the necessary erosion reduction to meet the standards described on page 4-52 of Volume I:

1. Reduce the acreage of spur roads and skid trails disturbance from 60,000 to 35,000 acres through proper planning and location of roads. This will reduce the erosion volume by 2,160,000 tons per year.

2. Lower the combined erosion rate for skid trails and spur roads from 33.5 tons/acre/year to 9.0 tons/acre/year through practices such as water bars on spur roads and skid trails, seeding bare soil and shaping banks. This will reduce erosion volume by 2,934,000 tons per year. A total of 30,000 acres will be treated. 1/

3. Lower the erosion rate from mechanical site preparation areas from 96.7 tons/acre/year to 18 tons/acre/year to obtain a reduction of 13,363,000 tons per year; modified installation, site preparation, and/or vegetative measures. 2/

4. Attain the fire protection goal of 0.35 percent burn on 7,129,000 acres by 1990. This should reduce erosion volume by 406,000 tons per year.

5. Accelerating the conversion of 3,500 acres of cropland to forest each year of the early action plan will reduce erosion by 450,000 tons per year.

Table 3-4 shows a comparison of projected total erosion from general and critical areas without a plan and with the suggested plan implemented. With the suggested plan general erosion could be reduced 37 percent by 1990 and 52 percent by 2020. Total (basinwide) erosion could be reduced 42 percent by 1990 and 56 percent by 2020. Critical area erosion is presented in table 3-4.

Table 3-4 -- Erosion totals, present, projected and Suggested Plan, Alabama River Basin, 1970, 1990, and 2020

TYPE OF EROSION	PRESENT 1970	1990 W/O	1990 PLAN	2020 W/O	2020 PLAN
	----------------Millions of tons				
General	50.4	53.6	33.6	62.7	30.2
Critical Area	14.8	14.9	5.8	15.3	3.8
Total	65.2	68.5	39.4	78.0	34.0

The general erosion reduction measures in the suggested plan for 1990 consist of best management practices such as cover crops, sod in rotation, complete water disposal systems, and pasture and hayland planting and management to protect 1,197,000 acres; and forest site preparation

1/ Treating this acreage will result in an equivalent three-fold reduction for skid trails and spur roads and a four-fold reduction for the site prepared areas.

2/ Many other combinations of measures can be prepared which will also reach the erosion control goals.

and vegetative measures to protect 74,000 acres. The kinds and amounts of erosion reduction measures to be provided in this plan are presented in table 3-5.

Table 3-6 compares projected average erosion rates with and without the suggested plan. An apparent contradiction exists when average erosion on other cropland and unimproved pasture increases while ongoing programs continue to operate (future without accelerated resource development). It should be noted that the increases in average erosion are on steep, marginal land (see Volume I, page 4-40). This abused land is not only very erosive but is most difficult to reach with voluntary treatment programs since the areas are generally small acreages not returning enough to the landowner to encourage investment in soil conservation practices.

Table 3-5 -- Erosion reduction measures, Suggested Plan, Alabama River Basin, 1990 and 2020

LAND TREATMENT TO MEET "T" VALUE NEEDS (2 TO 5 TONS/AC./YR. EROSION)	1990		2020	
	TREATED	REMAINING	TREATED	REMAINING
	--------------1,000 Acres-------------------			
Cropland Harvested				
Crop residue use or cover cropping, Contour farming or drainage	212	78	272	101
Contour farming, crop residue use, water disposal systems, sod in rotation	148	55	79	29
Other Cropland				
Establish perennial cover	220	247	258	313
Improved Pastureland				
Planting and management	480	144	592	179
Unimproved Pastureland				
Pasture management	137	293	108	130
Forest Land				
Site preparation	19	0	20	0
Installation and rehabilitation of log roads and skid trails.	55	0	84	0
TOTAL	1,271	817	1,423	752

Table 3-6 -- Erosion rates, present, projected and Suggested Plan, Alabama River Basin, 1990 and 2020

LAND USE	PRESENT 1970	1990 W/O	1990 PLAN	2020 W/O	2020 PLAN
	----------------Tons per acre per year------------				
Cropland harvested	9.5	7.6	3.8	7.5	3.8
Other cropland	13.4	11.4	7.5	16.4	7.5
Improved pasture	3.4	2.8	2.4	3.4	2.1
Unimproved pasture	4.1	5.2	4.3	5.8	3.8
Forest, slight to undisturbed	0.9	0.9	2.5 1/	0.7	2.0 2/
Forest, disturbed	33.6	33.0		33.0	
Urban and Other	5.3	5.0	5.0	4.8	4.8

1/ Weighted average erosion for all forest land is 2.5.
2/ Weighted average for all forest land is 2.0.

Reduction of Critical Erosion

The suggested plan will provide treatment for 67,800 acres of gullied land, 1,600 acres of roadsides, 9,200 acres of mined land and 16,500 acres of streambank land by 1990. By 2020, the plan provides treatment for 87,000 acres of gullied land, 2010 acres of roadsides, 11,500 acres of mined land and maintenance of the 16,500 acres of streambanks which were treated in the early action plan. Implementation of the suggested plan will reduce critical area erosion 61 percent by 1990 and 75 percent by 2020 (see table 3-6).

Reduction in Sedimentation

The suggested plan will accomplish reduction in sedimentation by treatment of erosion which is the source of sediment. The erosion reduction features of the plan are a combination of conservation treatment on 75 percent of the cropland and improved pastureland, 50 percent of the unimproved pastureland and other land, and 100 percent of the disturbed forest land (NED general erosion features); and 75 percent of the critically eroding areas (EQ - critical erosion features). The plan emphasizes conservation treatment that will produce substantial reductions in stream sediment loads. Intensive treatment is planned for streambanks, roadbanks, and gullied land which introduce sediment directly into streams. Slightly less intensive treatment is planned for forests, cropland and pastureland (general erosion sources).

The combined effects of the erosion control measures would reduce stream sediment load from a projected 22 million tons annually in 1990 to 11.6 million tons (table 3-7).

Table 3-7 -- Sediment production, present, projected and Suggested Plan Alabama River Basin, 1990 and 2020

SOURCE OF SEDIMENT	PRESENT 1970	1990 W/O	1990 PLAN	2020 W/O	2020 PLAN
	Millions of Tons				
General erosion	12.7	13.4	8.5	14.8	7.8
Critical Area	8.7	8.6	3.1	8.9	2.2
Total	21.4	22.0	11.6	23.7	10.0

Improved Production Efficiency

The suggested plan calls for changed land use on 4 percent of the state's 8.8 million acres projected to be in agricultural production by 1990. Roughly one-third of the change, 136,000 acres, would involve clearing of subclasses IIw and IIIw forest land for row crops. The remaining 246,000 acre adjustment would involve the transfer of steep erosive cropland to pasture, the use of flat pastureland for row crops, and the conversion of idle pasture to cropland.

In addition to the conservation benefits, the proposed land use changes would effectively reduce per unit production costs for most commodities, resulting in a substantial increase in net farm income.

With the suggested plan, net returns to basin farm operators should increase about $10 million annually by 1990. The increase would depend on the basin capturing a larger share of the state's crop production, and increasing production efficiency. Studies indicate that $3 million in benefits would accrue solely from reduced unit production costs, while the additional $7 million would result from increased crop sales. Efficiency gains associated with this plan are similar to those presented in the NED alternative.

Increased Recreation

This plan involves development of 27 recreation sites which would provide 2.9 million activity occasions of recreation annually. Included are six large (250-acres each) county parks, three city parks, recreation at eight multi-use reservoirs, expansion of camping areas in both the Talladega and Tuskegee National Forests, and the establishment of 240 miles of hiking trails by 1990. The 2020 plan consists of a total of 39 projects and will provide 2.3 million activity occasions annually. A detailed listing of all facilities to be provided in the early action phase is shown in table 3-8 and on figure 3-3. The plan would cost $1.5 million annually, while returning $3.1 million.

A major feature of the plan would be a system of six county parks located on major reservoirs along the Coosa River between Lake Weiss and Jordan Lake. The parks would serve the populous Montgomery-Birmingham-Gadsden area of the state, where 80 percent of the basin's recreation demand originates. The parks would be family oriented, offering swimming, white sand beaches, picnicking, playground facilities, boating, skiing, and hiking trails. Campsites would be developed as needed. The parks, shown in figure 3-3, would be roughly 40 miles apart. A system of hiking trails with primitive campsites would eventually link the entire six park system.

Currently none of the six counties involved (Elmore, Chilton, Shelby, Talladega, St. Clair, and Cherokee) have a county park or facility similar to this. Demands for such a development can be expected to intensify. Recreation proposals presented in the NED alternative were chosen for the suggested plan.

Increased Forest Production

The suggested plan will provide the additional 82 million cubic feet needed by 2020 to bring production to 600 million cubic feet. Improved utilization measures will provide 70 percent of the increased volume, or about 57.4 million cubic feet of round wood. This increase can be achieved by improved manufacturing and harvesting methods as well as proper use of equipment and felling and bucking techniques.

Accelerated forest management will provide the remaining 30 percent of the needs. This measure includes reforesting 100,000 acres, improved cutting on 687,000 acres, regenerating 6,700 acres per year and timber stand improvement on 46,000 acres per year.

Reduction of Fire Losses

Presently, there are 39 fire control units in the basin. To meet future needs, an additional 31 units are recommended by 1990. The units, as they are acquired, will be stationed in those counties where they will do the most good (see figure 4-16, Vol. I).

Increased Forest Grazing

The major result of the forest grazing program is a shift in range use from fragile sites to sites more compatible to forage production. A minimum grazing program involves prescribed burning of 110,000 acres of pine forests on favorable soils. A portion of such burning will be prescribed every year in stands up until they are 30 years old. The timing of the burning and the size of the area burned will be based on ambient pollution levels to insure that the burning is conducted in compliance with the State's air quality regulations and standards. This grazing alternative will produce an additional 1.2 million pounds of beef in 1990 and 600,000 pounds by 2020.

Agricultural Flood Damage Reduction

The suggested nonstructural means of reducing agricultural flood damage consists of changed land use. In the portion of the flood plain where this measure is suggested, it was assumed that about 15 percent of the cropland and about 20 percent of the pastureland could reasonably be relocated to higher elevations. This method is most applicable in small watersheds where crops and pasture are currently grown on soil capability subclasses IIIw and IVw. This change could be accomplished through intensive conservation planning efforts that would utilize flood hazard information in selecting the best use for current cropland and pastureland.

Early action (by 1990) to remove crops and pasture from flooded areas would involve changed land use on about 7,000 acres of crop-land and about 31,000 acres of pastureland. By the year 2020, this measure would be expected to increase to 8,000 acres for crops and 35,000 acres for pasture. The desire by individual farmers to minimize flood losses and take advantage of other use opportunities would provide the incentive to accomplish this measure. The flood plain land where these crops and pastures are currently grown could be used for timber production, open space, recreation, wildlife habitat, or other uses less susceptible to damage.

Intensive land use and the extent of flooding in many watersheds indicated that flood damages could not be substantially reduced by nonstructural means. Structural measures for flood prevention would be needed for protecting the remaining flood plain. These measures include floodwater retarding structures, flood dikes, and channel work. The suggested plan for flood damage reduction include structural measures to protect 2,000 acres of cropland and 8,000 acres of pastureland by 1990. These measures consist of 13 floodwater retarding structures, 3 multiple purpose structures, 14.3 miles of channel work, and 0.7 miles of flood dikes. They are contained in six watershed projects shown in table 3-9, and located on the suggested plan map (see figure 3-1). One additional project suggested for

Table 3-8 -- Recreation sites proposed in the Suggested Plan, early action and long-range plans, Alabama River Basin

SITE NO.	FACILITY	FACILITIES TO BE PROVIDED								
		SWIMMING	PICNICKING	CAMPING	PLAYGROUND	HIKING	BOATING	FISHING	WATERSKIING	GOLF
Immediate Need										
1	Weiss Lake Park (Cherokee)	X	X	To be added as needed	X	X	X	X	X	X
2	Neely Henry Park (St. Clair)	X	X		X	X	X	X	X	
3	Logan Martin Park (Talladega)	X	X		X	X	X	X	X	
4	Lay Lake Park (Shelby)	X	X		X	X	X	X	X	
5	Lake Mitchell (Chilton)	X	X		X	X	X	X	X	
6	Lake Jordan (Elmore)	X	X		X	X	X	X	X	
7	Lake Minooka		X	X		X	X	X		
8	Cornwall Furnace		X	X		X				
9	Hatchett Creek Canoe Trail						X	X		
10	Tallassee-Carrville Park	X	X	X	X		X	X	X	
11	Brent-Centerville Park	X	X	X	X		X	X		
12	West Blocton Park	X	X	X	X					
13	Canoe Creek	X	X	X	X		X	X		
14	Terrapin Creek		X		X		X	X		
15	Wedowee Creek		X		X		X	X		
16	Bear Creek		X		X		X	X		
17	Camp Branch	X	X		X		X	X		
18	Cedar Creek	X	X	X	X		X	X		
19	Mulberry Creek	X	X	X	X		X	X		
20	Hiking--Talladega N.F.			X		X				
21	Hiking--Sites 3 to 4			X		X				
22	Bartram Trail			X		X				
23	Hiking--Oak Mt.			X		X				
24	Roadside Park--Tuskegee N.F.		X	X	X					
25	Camping--Tuskegee N.F.			X						
26	Camping--Talladega N.F.		X	X		X				
27	Black Creek	X	X	X	X	X	X	X		
Long Range										
28	Gulf Creek	X	X	X	X		X	X		
29	Loblockee Creek	X	X	X	X		X	X	X	
30	Hiking--Talladega N.F.			X		X				
31	Hiking--Sites 2 to 3			X		X				
32	Hiking--Sites 4 to 6			X		X				
33-38	Addition of camping to existing county parks			X						
39	Camping--Talladega N.F.			X						

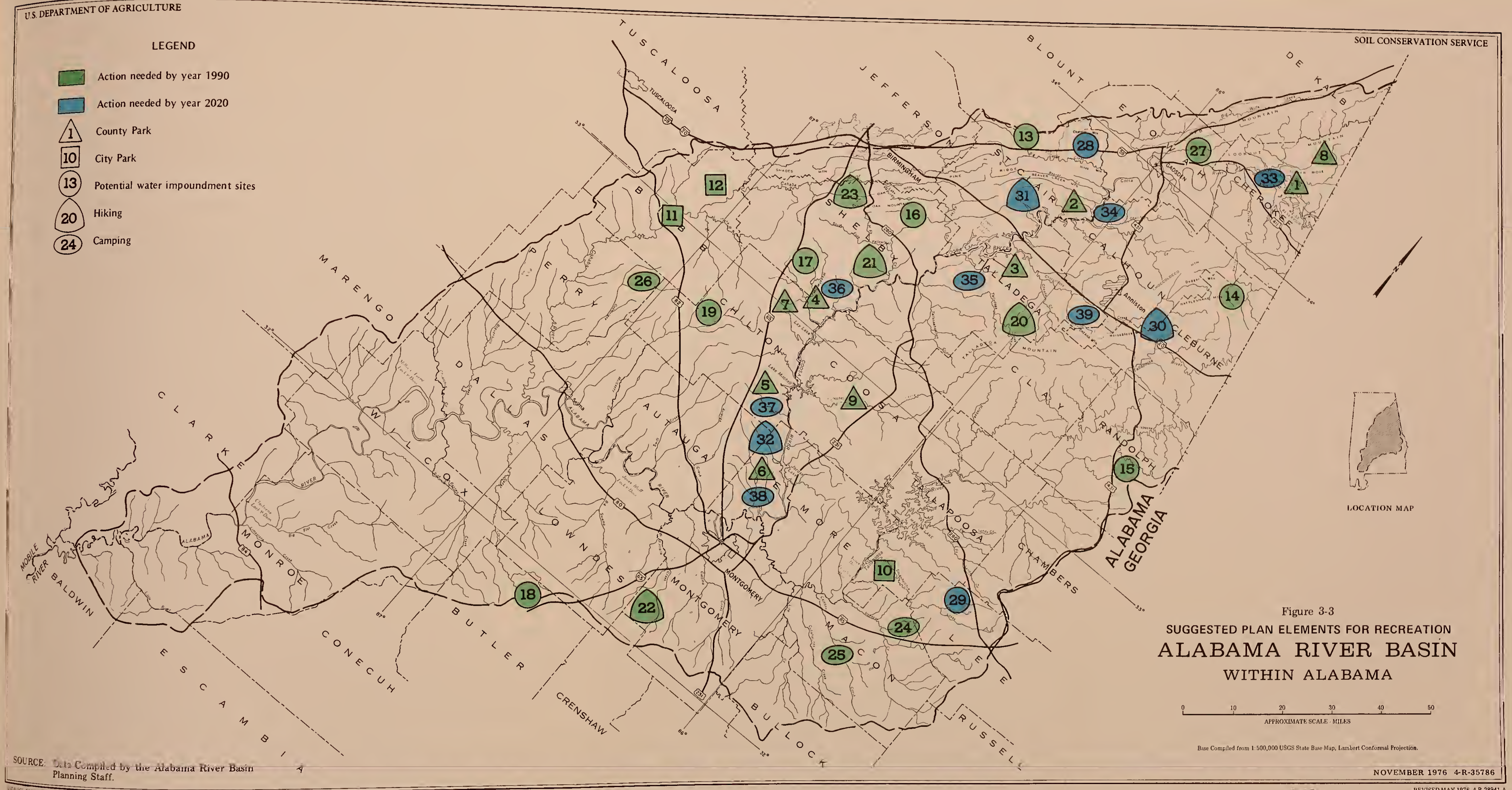


Figure 3-3
SUGGESTED PLAN ELEMENTS FOR RECREATION
ALABAMA RIVER BASIN
WITHIN ALABAMA

Table 3-9 -- Average annual benefits and costs for watersheds found economically feasible, Suggested Plan, Alabama River Basin

WATERSHED	CNI NO. 1970 R-B ATLAS	AVERAGE ANNUAL DIRECT BENEFITS 1/ Flood Prevention	Recreation	Total	TYPE AND AMOUNT OF STRUCTURAL MEASURES	AVERAGE ANNUAL COST 2/
Early Action (1990)						
Mulberry Creek	35a-1,2,4,5	86,500	14,800	101,300	7 single purpose FRS 1 multiple purpose structure	101,100
Johnson-Panther Creeks	35a2-68	230,000	-	230,000	4 single purpose FRS 10.4 mi. channel work	182,200
Cedar Creek	35a-45,61,62	224,300	650,000	874,300	2 single purpose FRS 1 multiple purpose structure	403,500
Glencoe Creek	35a1-11	69,000	-	69,000	3.9 mi. channel work	27,800
Upper Cahaba Tributary	35a3-1,2,4	3,800	-	3,800	0.7 mi. flood dike	2,200
Black Creek	35a1-7	39,700	157,500	197,200	1 multiple purpose structure	108,600
Subtotal		653,300	822,300	1,475,600		825,400
Long Range (2020)						
Boguechitto Creek Watershed						
Bear Creek Trib.	35a-29	122,000	-	122,000	1 single purpose FRS	36,300
Washington Creek Trib.	35a-23	86,000	-	86,000	1 single purpose FRS	48,000
Dry Channey Creek Trib.	35a-27	25,000	-	25,000	1 single purpose FRS 2.6 mi. channel work	48,000
TOTAL		886,300	822,300	1,708,600		924,000

1/ Price base: Current normalized prices 1975, all dollar amounts.
2/ Amortized at 6-1/8 percent interest for 100 years.

installation by 2020 would protect 800 acres of cropland and 1,800 acres of pasture. Three floodwater retarding structures and 2.6 miles of channel work are included in this potential project. Measures to reduce flood damages were selected from the NED alternative.

Urban Flood Damage Reduction

Eighty communities in the basin have an urban flood problem. In flood plain areas where urban developments are intense, flood damage could be reduced with the installation of various combinations of nonstructural measures such as watershed treatment, flood warning systems, flood proofing, and flood plain use regulations. Time and manpower limitations precluded detailed studies of individual communities. Therefore, no elements are included in this plan for achieving urban flood damage reduction. When remedial efforts are undertaken, first consideration should be given to nonstructural measures identified and described below.

Watershed Treatment--Conservation measures may include crop residue management, cover crops, terraces, grassed waterways, contour farming, grass in rotation with crops, or permanent grass cover. Combinations of agriculturally oriented measures make up a conservation cropping system that is tailored to meet the needs for protecting land and reducing runoff in urban as well as agricultural areas.

Floodwarning Systems--Local communities should work with the National Weather Service and state agencies to develop an effective floodwarning system. One type of warning system is based on the collection of rainfall data by time periods. The data is reported to a central location where a forecast of peak stage is made. An alternative system could include an automatic gaging station at selected stream locations that activate alarm systems.

Flood Proofing--Flood proofing consists of measures designed to prevent or limit flood damage to structures and contents of buildings. Measures generally are installed to reduce damage once the water reaches a building and could result in substantial reduction in flood losses.

Flood Plain Use Regulations--Governmental bodies can adopt comprehensive flood plain regulations. They may also request the preparation of flood hazard maps based on detailed analysis as a means of securing flood insurance.

Regulations may be incorporated in building codes, subdivision regulations and/or zoning ordinances. The use allowed is usually based on degree of flood risk.

Water Supply

Local community officials and planning agencies selected the proposed water supply sites after all sites were identified that had potential to supply the amount of water needed. A total of six sites supplying 19.5 MGD were selected to serve 10 communities in 1990. The six reservoir sites selected are located on the suggested plan map (see figure 3-1). Two additional sites were selected to supplement long range needs. Multiple use of these water supply reservoirs is planned. Water supply reservoirs in the suggested plan are expected to furnish sufficient water for municipal, industrial, and domestic use commensurate with projected population growth. Detailed information for each site is shown in table 3-10. The municipal water supply for the suggested plan and the NED alternative are identical.

Agricultural Drainage

The early action phase of the suggested plan provides for installation of drainage measures on 7,000 acres of cropland, 32,000 acres of pastureland and 6,000 acres of converted woodland and unimproved pastureland. In the long run, the plan provides for installation of drainage measures on 21,000 acres of cropland, 98,000 acres of pastureland and 16,000 acres of converted woodland and unimproved pastureland. The drainage measures for the suggested plan are the same as those for the NED alternative.

Low Quality Stream Improvement

The 1990 suggested plan includes five reservoir sites for low-flow augmentation to improve stream quality at five pollution problem locations (see figure 3-1). These sites are located upstream from the problem areas to utilize gravity flow. The available storage and dependable yields from the drainage areas of the sites selected will meet, in whole or in part, the required discharge to augment low flows in 1990. Statistical data is shown in table 3-11.

Scenic Rivers and Streams

Many waterways in the basin have sections displaying scenic value but five stream systems were selected as having exceptional scenic qualities. This plan recommends that about 150 miles of scenic waterways be preserved or protected from unregulated development by 1990 and 200 miles by 2020. Proposals for the early action time frame involve protecting and preserving portions of the Cahaba River, Tallapoosa River, and Hatchett Creek. The long-range proposals include similar programs for Shoal Creek and Little River. Priority of plan elements and specific locations of scenic stream segments should be selected at the appropriate time.

Table 3-10 -- Potential water supply impoundment sites, Suggested Plan, Alabama River Basin, 1990 and 2020

COMMUNITIES SERVED	BASIN 1/ PLAN	STREAM NAME	SITE LOCATION S. T. R.	DRAINAGE AREA (SQ. MI.)	M&I STORAGE (AC. FT.)	SURFACE AREA (AC.)	WATER 2/ SUPPLY (MGD)	WATER 3/ NEEDS (MGD) 1990	WATER 3/ NEEDS (MGD) 2020	OTHER PURPOSES SERVED
Randolph Co. Wedowee Woodland	1990	Wedowee Cr.	Sec. 2, T20S,R11E	37.2	2,000	240	9.7	1.5	2.0	-
Calhoun Co. Jacksonville Piedmont	1990	Terrapin Cr.	Sec. 18, T13S,R11E	29.0	2,000	111	8.4	3.6	7.0	FC 4/
Shelby Co. Calera Columbiana	1990	Camp Branch	Sec. 31, T21S,R1W	21.5	3,000	440	8.5	9.0 5/	18.1 5/	-
Sterrett-Vandiver Westover Wilsonville	1990	Bear Cr.	Sec. 15, T18S,R18E	13.6	4,800	442	7.8			
St. Clair Co. Margaret Moody Odenville	1990	Canoe Cr.	Sec. 21, T14S,R2E	37.8	4,000	415	11.0	4.4 6/	18.0 6/	-
Ashville Springville Steele	2020	Gulf Cr.	Sec. 17&18 T13S,R4E	14.4	3,500	260	7.0			-
Lee Co. Auburn Opelika	2020	Loblockee Cr.	Sec. 5&6 T19N,R25E	40.2	4,500	670	12.0	4.0	8.0	-
Etowah Co. Lookout Mtn. (Gadsden)	1990	Black Cr.	Sec. 29, T10S,R7E	29.8	2,000	485	8.5	1.0	2.0	FC 4/ Rec. 7/

1/ Early action plan, 1990--long-range plan, 2020.
2/ Designed to fully utilize the site potential.
3/ Total needs by time frame.
4/ F.C. - Flood Control
5/ Total needs for all Shelby Co. communities listed.
6/ Total needs for all St. Clair Co. communities listed.
7/ Rec. - Recreation

Table 3-11 -- Potential reservoir sites for low-flow augmentation, Suggested Plan, Alabama River Basin, 1990

SITE NO.	SITE LOCATION	DRAINAGE AREA (Sq. Mi.)	POOL SURFACE AREA (Acres)	WATER DEPTH (Feet)	TOTAL STORAGE VOLUME AVAILABLE (Ac. Ft.)	USABLE STORAGE VOLUME (Ac. Ft.)	DEPENDABLE YIELD (cfs)	LOW FLOW REQUIRED (cfs)
1	Cahaba River 2½ mi. N of Trussville R1E, T16S, Sect. 12	12.7	140	50	2,825	2,200	9.5	1/
2	Big Black Creek 8 mi. NE of Trussville R1E, T15S, Sect. 36	10.5	255	45	4,780	4,200	7.9	1/
3	Little Black Creek 6 mi. E of Trussville R1E, T16S, Sect. 24	11.4	304	45	6,765	6,000	8.5	1/
4	Waxahatchee Creek 2½ mi. W of Columbiana R1W, T21S, Sect. 21	12.8	374	20	3,740	3,040	6.2	4.5
5	Saugahatchee Creek 4 mi. NW of Auburn R26E, T19N, Sect. 2	5.4	178	35	2,375	2,000	3.2	23.0

1/ Three sites are needed to provide a required flow of 23.1 cfs.

See figure 3-1 for general location.

Natural Scenic Sites

A list of 130 natural scenic sites that warrant protection to preserve and maintain their unique or aesthetic qualities was developed from the Alabama SCORP, [1/] Volume 18, and the County Appraisals of Potential for Outdoor Recreation. The list included about five sites per county, ranging from two sites in Lowndes County to ten sites in Talladega County. It was projected that 90 sites would merit protection by 1990 and that 75 additional sites would need attention by 2020.

The suggested plan includes elements to protect, preserve or maintain 25 sites by 1990 and 35 sites by 2020. It is recommended that several sites from each of the major categories (e.g., overlooks, caves, springs, waterfalls, swamps, and geologic formations) be considered when specific sites are selected.

Improve the Quality and Quantity of Fish and Wildlife Habitat

The suggested plan will supply 160,000 acres of the 186,000 acres of habitat improvement needed by 1990 and 234,000 acres of the 275,000 acres needed by 2020. The need to improve fish and wildlife habitat was based primarily on the anticipated acreage needed to satisfy public demand, both consumptive and non-consumptive, for animal resources in the Alabama Basin.

Upland Habitat--Suggested plan elements that will improve upland habitat include the purchase of 1,000 acres of non-game habitat, lease and management of an additional 100,000 acres for public hunting, and intensified management on 32,000 acres of private, state, and federal land.

Wetland Habitat--Elements of the suggested plan will supply 21,000 acres of the 25,000 acres of wetland habitat needed by 1990. This includes 5,000 acres of habitat development and improvement in beaver ponds and green tree reservoirs, 13,500 acres in two waterfowl management areas (3,500 acres at Gee's Bend and 10,000 acres on Lake Weiss) and 2,500 acres of flood plain management. Additional plan elements for 2020 include the acquisition of a 4,000 acre wetland area in the Blue Girth-Beech Creek Swamp.

Impoundments--Suggested plan elements will supply about 75 percent of the 8,000 acres needed by 1990 and the 10,000 acres needed by 2020. In essence, the plan elements involve accelerated technical assistance and governmental cost sharing to implement new management techniques in exchange for public access to private ponds.

1/ Statewide Comprehensive Outdoor Recreation Plan.

Streams--The suggested plan elements include improving 1,000 acres of stream habitat by 1990 and 2,000 acres by 2020. This can be accomplished by accelerating or creating state and federal programs under existing authorities. Specific practices include selective snagging, restocking, bank stabilization, pollution control, and improved access.

Protection of Endangered Species of Flora and Fauna

Presently, about 66 species in Alabama are classified as "endangered" on a state or federal list. This number is expected to increase to 90 by 1990 and 112 by 2020. These species were assumed to be in need of protection even though an Endangered Species Act was passed by Congress in 1973 to protect threatened and endangered plants and animals.

The suggested plan will emphasize habitat acquisition, habitat management, and accelerated protection for 18 species by 1990 and 25 species by 2020. This includes 10 species of animals and 8 species of plants.

Protection of Archaeological and Historical Sites

Presently, there are about 120 archaeological sites and 255 historical sites in the basin that need preliminary investigation and/or protection. These numbers are projected to diminish to 110 archaeological sites and 200 historical sites by 1990. The suggested plan encourages action that will identify and protect about 250 historical and archaeological sites by 1990. These sites are expected to remain the same through 2020.

Primary emphasis should be placed on the preservation of residential districts possessing similar historical qualities rather than single structures. By concentrating on preservation of districts, greater numbers of landmarks will be protected. It will also preserve more of a "place-in-time" than the preservation of single structures.

A preliminary investigation of many archaeological sites could be conducted if state or local funds were available to supplement federal funds. Following such investigations, sites could be classified as to their preservation value. If archaeological site investigation funding was coordinated at the state level; federal, state, and local funds for investigations could be directed into those areas of the basin most likely to be disturbed by future resource development.

Solid Waste Disposal

Two 100 acre disposal sites for hazardous solid wastes needed in the basin should be located in the Blackland Prairies section of the basin by 1990. The specific location of these sites has not been selected as part of this basin study. An additional 200 acres of disposal area will need to be developed in the basin by 2020. There is no precedent in the state at present for the location and operation of this type of solid waste disposal site. The best approach to solving this problem would be through a cooperative effort involving participating private industries with planning assistance provided by the State Department of Public Health, Solid Waste Division. Financial assistance could be provided through various state and federal programs with participating industries sharing the major portion of the costs.

Table 3-12 -- Benefits and costs for the early action portion of the Suggested Plan, Alabama River Basin

COMPONENTS & PLAN ELEMENTS	TOTAL INST. COST	ANNUAL COSTS 1/	ANNUAL BENEFITS
	---------Thousand Dollars-----------		
Flood Reduction			
Changed land use	5,500	$ 340	$ 375
Structural measures	8,000	494	653
Urban-nonstructural	NA	NA	NA
Increased Drainage			
Surface and subsurface	2,700	170	200
Increased Beef Production			
Prescribed burning (forest land)	4,850	300	415
Create Water Supply			
Impoundments	4,000	255	339
Increased Recreation			
Facilities	24,000	1,499	3,100
Erosion Reduction			
Conservation systems	(21,000) 2/	(1,297) 2/	NA
Improved Production Eff.			
Changed land use	12,200	750	4,700
Reduced Fire Losses			
Equipment	(1,750) 2/	(110) 2/	NA
Critical Erosion Reduction			
Stabilization	(150,000) 2/	(11,740) 2/	NA
Reduced Sediment Load			
Conservation systems	NA	NA	NA
Solid Waste Disposal			
Acquisition	(400) 2/	(25) 2/	NA
Scenic Streams			
Acquisition	(350) 2/	(22) 2/	NA
Natural Scenic Sites			
Acquisition	(3,250) 2/	(199) 2/	NA
Fish and Wildlife Habitat			
Management and improvement	(6,530) 2/	(401) 2/	NA
Protection of Flora and Fauna			
Acquisition	(1,800) 2/	(112) 2/	NA
Low Quality Streams			
Low flow augmentation	(4,550) 2/	(280) 2/	NA
Protection of Archaeological and Historical Sites			
Cooperative identification and preservation program	NA	NA	NA
Increased Timber Production			
Utilization and Accel. Mgmt.	30,000	1,859	4,715
TOTAL	$ 91,250	$ 5,667	$ 14,497

1/ Amortized @ 6 1/8 percent interest for 100 years and includes O&M.
2/ Not included in total cost.

Table 3-13 -- National economic development account, Suggested Plan alternative, Alabama River Basin, 1990

COMPONENTS	MEASURES OF EFFECTS	COMPONENTS	MEASURES OF EFFECTS
Beneficial effects:	(Average Annual Dollars) 1/	Adverse effects:	(Average Annual Dollars) 1/
A. The value to users of increased outputs of goods and services		A. The value of resources required for the NED plan:	
1. Flood damage reduction	1,020,000	1. Multi-purpose reservoirs, floodwater retarding structures, recreational and water supply reservoirs, channel work, and recreational facilities	
2. Increased drainage	198,000		
3. Increased beef production (forest)	410,000		
4. Create water supply	335,000		
5. Increased recreation	3,070,000	Project installation	1,513,000
6. Increased timber production	4,670,000	OM&R	1,000,000
7. Production efficiency	4,664,000	2. Nonstructural--increased beef production on forest land--prescribed burning	300,000
8. Utilization of unemployed and underemployed labor resources		3. Increased timber production	1,859,000
		4. Production efficiency	750,000
a. Project construction	130,000	5. Project administration	245,000
Total beneficial effects	14,497,000	Total adverse effects	5,667,000
		Net beneficial effects	8,830,000

1/ Amortized over 100 years at 6-1/8 percent interest.

Table 3-13 -- cont'd., regional development account

COMPONENTS	MEASURES OF EFFECTS	
	STATE OF ALABAMA	REST OF NATION
Income		
Beneficial effects:	(Average Annual) 1/	
A. The value of increased output of goods and services to users residing in the region		
1. Flood damage reduction	1,020,000	0
2. Increased drainage	198,000	0
3. Increased beef production	410,000	0
4. Create water supply	335,000	0
5. Increased recreation	2,770,000	300,000
6. Increased timber production	4,670,000	0
7. Production efficiency	4,664,000	0
8. Utilization of unemployed and underemployed regional labor resources		
a. Project construction	130,000	0
B. The value of output to users residing in the region from external economics		
1. Indirect activities associated with increased net returns from flood damage reduction, and increased beef production	640,000	2/
Total beneficial effects	14,837,000	300,000

COMPONENTS	MEASURES OF EFFECTS	
	STATE OF ALABAMA	REST OF NATION
Income		
Adverse effects:	(Average Annual) 1/	
A. The value of resources contributed from the region to achieve the output		
1. Multi-purpose reservoirs, floodwater retarding structures, recreational and water supply reservoirs, channel work and recreational facilities		
Project installation	973,000	540,000
OM&R	1,000,000	0
2. Nonstructural--increased beef production on forest land--prescribed burning	300,000	0
3. Increased timber production	1,859,000	0
4. Production efficiency	0	750,000
5. Project administration	123,000	122,000
Total adverse effects	4,255,000	
Net beneficial effects	10,582,000	-1,112,000

1/ Amortized over 100 years at 6-1/8 percent interest.
2/ National externalities were not evaluated.

Table 3-13 -- cont'd., regional development account

COMPONENTS	MEASURES OF EFFECTS STATE OF ALABAMA	REST OF NATION
Employment		
Beneficial effects:		
A. Increase in number and types of jobs		
1. Employment for project construction	200 semi-skilled jobs for 5 yrs.	-
2. Employment in recreation service sector	150 permanent seasonal semi-skilled jobs	-
3. Employment for project OM&R	97 permanent semi-skilled jobs	-
4. Indirect and induced employment from output of projects's goods and services	290 permanent semi-skilled jobs	-
Total beneficial effects	387 permanent semi-skilled jobs	-
	150 permanent seasonal semi-skilled jobs	-
	200 semi-skilled jobs for 5 yrs.	-

COMPONENTS	MEASURES OF EFFECTS STATE OF ALABAMA	REST OF NATION
Employment		
Adverse effects:		
A. Decrease in number and types of jobs		
1. Loss in agricultural employment from project take area	10 man-yrs. of agricultural employment	-
2. Loss in indirect and induced employment associated with project take area	15 permanent semi-skilled jobs	- -
Total adverse effects	25 permanent semi-skilled jobs	-
Net beneficial effects	362 permanent semi-skilled jobs	-
	150 permanent seasonal semi-skilled jobs	-
	200 semi-skilled jobs for 5 yrs.	-

Table 3-13 -- cont'd., regional development account

COMPONENTS	MEASURES OF EFFECTS: STATE OF ALABAMA	MEASURES OF EFFECTS: REST OF NATION
Population Distribution		
Beneficial effects	Creates 362 permanent semi-skilled jobs, 150 permanent seasonal jobs and 200 semi-skilled jobs for 5 years in an area which has experienced a 1 percent reduction in population in the last 10 years.	-
Adverse effects	-	
Regional Economic Base and Stability		
Beneficial effects	Provides flood protection on 10,000 acres of crops and pasture, 18.5 million gallons per day of municipal water supply and 2,900,000 activity occasions of re-creation opportunities. Creates 362 permanent semi-skilled jobs, 150 permanent seasonal semi-skilled jobs, and 200 semi-skilled jobs for 5 years in an area where 27 percent of the families have incomes less than the national poverty level.	-
Adverse effects	-	-

Table 3-13 -- cont'd., environmental quality account

COMPONENTS	MEASURES OF BENEFICIAL AND ADVERSE EFFECTS
A. Areas of natural beauty	1. Project benefits will enhance 3,300,000 acres on 18,000 farms. 2. Create 9 lakes of 3,820 acres with 98 miles of shoreline. 3. Establish water-based recreational facilities at 26 locations. 4. Disruption of rural tranquility by 2,900,000 recreational occasions annually.
B. Quality consideration of water and land resources	1. Reduce sediment load in streams by 10.4 million tons per year. 2. Revegetation of 95,100 acres of critically eroded land, streambanks, roadsides, and strip mines. 3. Maintain quality of land on 237,000 acres by using less erosive soils. 4. Reduce erosion on 496,000 acres of cropland, 616,000 acres of pastureland, and 190,000 acres of forest land. 5. Reduce fire losses on 7,129,000 acres of forest land. 6. Low flow augmentation at 5 sites for water quality improvement.
C. Biological resources and selected ecosystems	1. Create 4,940 acres of flatwater fish and waterfowl habitat. 2. Inundate 36 miles of stream fish habitat. 3. Provide 4,940 acres resting areas for migratory waterfowl. 4. Inundate 4,940 acres of wildlife habitat. 5. Improve deer and other wildlife habitat by providing permanent watering places in lakes. 6. Disrupt 14.3 miles of aquatic ecosystems through channel alternations.
D. Irreversible or irretrievable commitments	1. Conversion of 4,450 acres of forest land, 390 acres of pastureland, and 100 acres of cropland to reservoir pools. 2. Commit 100 acres of land to channel rights-of-way.

Table 3-13 -- cont'd., social well-being account

COMPONENTS	MEASURES OF BENEFICIAL AND ADVERSE EFFECTS
A. Real income distribution	1. Create 475 low to medium income permanent jobs for area residents. 2. Net monetary benefits of $10,582,000 provide opportunities to improve the income of about 27 percent of the families within the basin whose income is below the proverty level.
B. Life, health and safety	1. Increased output will be in livestock, grain, and fiber products. 2. Increased risk of drowning or injury at lake sites. 3. Reduced water pollution resulting from reduced sediment load in streams. 4. Develop 200 acres for solid waste disposal. 5. Improved municipal water supply services for 10 communities.
C. Cultural and recreational opportunities	1. Creates 2,900,000 recreational activity occasions annually.

Table 3-14 -- Effectiveness of plan elements in meeting component needs for the Suggested Plan, Alabama River Basin

		QUANTITIES NEEDED		PLAN EFFECTIVENESS			
				YEAR 1990		YEAR 2020	
COMPONENT NEEDS	UNIT	1990	2020	PROVIDES	REMAINING	PROVIDES	REMAINING
Flood Damage Red.							
Nonstructural measures							
Cropland	Thou. ac.	49	49	7.0	Cropland 40 (49-7-2=40)	8	Cropland 38 (49-8-3)
Pastureland		154	154	31.0	Pastureland 115 (154-31-8=115)	35	Pastureland 109 (154-35-10)
Total		203	203	38.0		43	
Structural measures							
Cropland	Thou. ac.			2.0		3	
Pastureland				8.0		10	
Total				10.0		13	
FRS	No.	16	16	13	3	16	0
Multi-purpose str.	No.	3	3	3	0	3	0
Channel work	Mi.	16.9	16.9	14.3	2.6	16.9	0
Flood dike	Mi.	0.7	0.7	0.7	0	0.7	0
Erosion Reduction		2,088	2,175				
Cropland							
Covercrop or residue, terraces or drainage, sod in rotation	Thou. ac.			580	380	609	443
Pasture							
Pasture planting	Thou. ac.			191	96	220	100
Pasture management				426	341	480	209
Forest							
Site preparation	Thou. ac.			19	0	20	0
Log roads and skid trails installation and rehabilitation				55	0	84	0
Total				1,271	817	1,423	752

Table 3-14 -- Cont'd

COMPONENT NEEDS	UNIT	QUANTITIES NEEDED		PLAN EFFECTIVENESS			
				YEAR 1990		YEAR 2020	
		1990	2020	PROVIDES	REMAINING	PROVIDES	REMAINING
Increased Drainage							
Surface and subsurface	Thou. ac.	170	202	45	125	135	67
Improved Production Efficiency							
Changed land use	Thou. ac.	1,638	2,064	382	1,256	650	1,414
Increase Forest Production 1/		0	82.0				
Improved utilization	Mil. cu. ft./yr.			0	0	57	0
Accelerated forest management				0	0	25	0
Reduced Fire Losses							
Capital imp. and equipment	Thou. ac.	7,129	6,845	7,129	0	6,845	0
Increased Grazing Forest Land							
Prescribed burning	Mil. lbs. beef/yr.	19.2	15.7	12.6	6.6	6.0	9.7
Urban Damage Red.							
Nonstructural	No. of Comm.	90	110	NA	NA	NA	NA
Create Water Supply							
Impoundments	MGD	25	71	19.5	5.5	53.3	17.7

1/ While there are no unmet needs for timber production in 1990, the timber management programs must begin no later than 1980 and be completed by 1995 in order that the timber requirements be met: softwood/hardwood; sawtimber/pulpwood; veneer/construction, etc. Therefore, a forestry program is presented in the early action plan but only that portion of the program to be accomplished in the early action plan period and in terms of measures accomplished.

Table 3-14 -- Cont'd

COMPONENT NEEDS	UNIT	QUANTITIES NEEDED		PLAN EFFECTIVENESS			
				YEAR 1990		YEAR 2020	
		1990	2020	PROVIDES	REMAINING	PROVIDES	REMAINING
Increased Recreation	Thou. act. occ.	9,935	29,368	2,935	7,000	NA	NA
Picnic tables (1,375)							
Swimming (41 ac. beach)							
Boating (2,810 ac.)							
Golfing (1-9 course)							
Water skiing (2,225 ac.)							
Camping (680 sites)							
Hiking trails (240 mi.)							
Fishing (2,950 ac.)							
Hunting:							
Waterfowl habitat (9,000 ac.)							
Big game (193,000 ac.)							
Small game (140,000 ac.)							
Solid Waste Disposal Sites							
Site acquisition	Acres	200	400	200	0	400	0
Low Quality Streams Augmentation							
Low flow augmentation	cfs	230	230	230	0	230	0

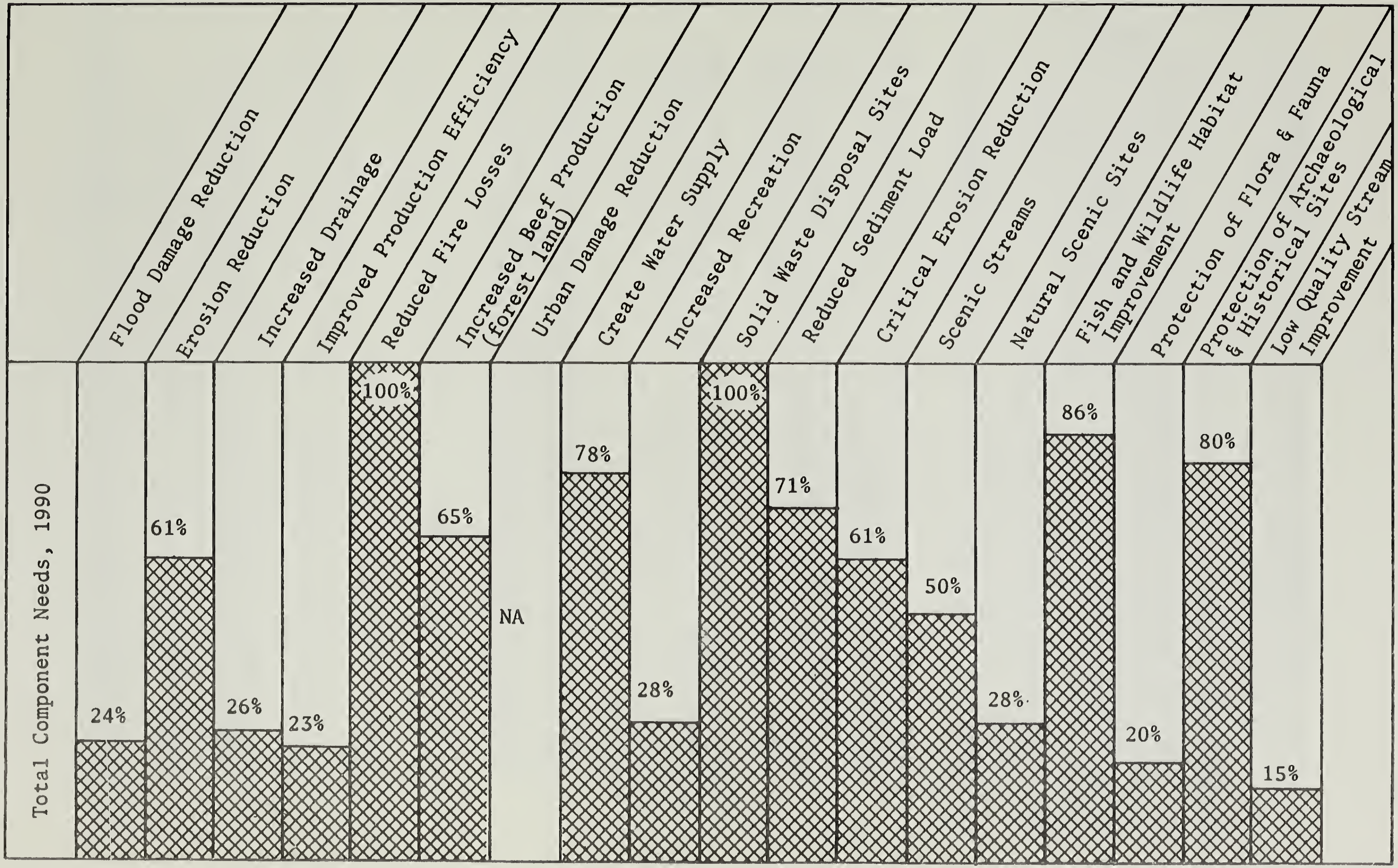
Table 3-14 -- Cont'd

COMPONENT NEEDS	UNIT	QUANTITIES NEEDED 1990	QUANTITIES NEEDED 2020	PLAN EFFECTIVENESS YEAR 1990 PROVIDES	YEAR 1990 REMAINING	YEAR 2020 PROVIDES	YEAR 2020 REMAINING
Reduced Sediment Load							
See erosion reduction for specific measures	Thou. tons/yr.	14.5	16.1	10.4	4.1	10.0	6.1
Critical Erosion Red.	Thou. ac.	151.6	155.6				
Streambank stab.				16.5	4.5	16.5	9.5
Roadside stab.				1.6	0.7	2.0	0.3
Critical area stab.				67.8	45.2	87.0	26.0
Strip mine stab.				9.2	6.1	11.5	3.8
Total				95.1	56.5	117.0	39.6
Scenic Streams							
Site acquisition	Mi.	300	350	150	150	200	150
Natural Scenic Sites							
Site acquisition	Sites	90	75	25	65	35	40
Fish & Wildlife Habitat Imp.	Thou. ac.	186	275				
Upland habitat imp.				132	18	199	39
Wetland habitat imp.				21	4	25	0
Impoundment mgt.				6	2	8	2
Stream improvement				1	2	2	0
Total				160	26	234	41
Protection of Flora & Fauna							
Identification	No.	90	112	18	72	25	87
Protection of Archaeological & Historical Sites							
Identification	Sites	310	280	250	60	260	20

Table 3-15 -- Summary comparison between the Suggested Plan and the NED and EQ Alternatives, Alabama River Basin

ACCOUNTS	NED PLAN	EQ PLAN	SUGGESTED PLAN	DIFFERENCES (SUGGESTED PLAN MINUS ALTERNATIVE SHOWN)	
				NED	EQ
1. National economic development					
Beneficial effects	$14,497,000	$11,799,000	$14,497,000	0	+$2,698,000
Adverse effects	5,667,000	6,144,000	5,667,000	0	- 477,000
Net beneficial effects	8,830,000	5,655,000	8,830,000	0	+ 3,175,000
2. Environmental quality Beneficial and adverse effects					
A. Create lakes for natural beauty and human enjoyment	20 lakes	19 lakes	25 lakes	+5 lakes	+6 lakes
B. Disrupt aquatic ecosystems of natural streams	14.3 miles of streams	3.9 miles of streams	14.3 miles of streams	0	+10.4 miles of streams
C. Wildlife habitat improvement-enhanced by all measures	63,000 acres of habitat	160,000 acres of habitat	160,000 acres of habitat	+97,000 acres of habitat	0
D. Erosion Reduction	21.4 mil. tons	33.7 mil. tons	25.8 mil. tons	+4.4 mil. tons	-7.9 mil. tons
3. Regional development - State of Alabama					
A. Income:					
Beneficial effects	$14,837,000	$12,099,000	$14,837,000	0	+$2,738,000
Adverse effects	4,255,000	4,853,000	4,255,000	0	- 598,000
Net beneficial effects	10,582,000	7,246,000	10,582,000	0	+ 3,336,000
B. Employment Net beneficial effects	462 medium income permanent jobs	437 medium income permanent jobs	512 medium income permanent jobs	+50 medium income permanent jobs	+75 medium income permanent jobs
4. Social well-being					
A. Provide a more stable water supply	10 communities	5 communities	10 communities	0	+5 communities
B. Provide recreational opportunities	2,935,000 activity occs.	2,705,000 activity occs.	2,935,000 activity occs.	0	+230,000 activity occs.
C. Acquisition of scenic streams	75 miles	150 miles	150 miles	+75 miles	0
D. Acquisition of scenic sites	5 sites	25 sites	25 sites	+20 sites	0
E. Preservation of archaeological and historical sites	0 sites	250 sites	250 sites	+250 sites	0
F. Identification of flora and fauna species	7 species	18 species	18 species	+11 species	0

Figure 3-4 -- Relative proportion of component needs accomplished by the Suggested Plan (1990), Alabama River Basin



ENVIRONMENTAL IMPACTS OF U.S.D.A. PLAN ELEMENTS

General Introduction

The suggested plan is a complementary and economically feasible combination of projects and measures to satisfy water and related land resource problems and needs of the Alabama River Basin. The primary needs are for flood control, erosion and sediment control, improved conservation management systems, reduction in agricultural pollution, and improvement to the environment. The suggested plan will satisfy a portion of these needs.

Plan elements of the early action plan that can be implemented through USDA program assistance are identified below.

Changed Land Use - shift an additional 130,000 acres of corn and cotton into the basin

Flood Damage Reduction - on 10,000 acres of flood plain by installing 16 floodwater retarding structures and 14.7 mile channel improvement; also changed land use on 38,000 acres

Erosion Reduction - on 1,271,000 acres of agricultural and forest land

Production Efficiency - improvement on 382,000 acres of cultivated land

Increased Forest Production - on 530,000 acres of timberland

Reduction in Fire Losses - from 0.54 percent to 0.35 percent annually on 7,120,000 acres

Increased Forest Grazing - to produce about 1.2 million pounds of beef

Increased Recreation - at 23 sites

Reduction in Critical Erosion - on 95,000 acres of roadsides and gullies

Wildlife Habitat Improvement - on 16,000 acres of National Forest Service land and 16,000 acres of private land

Fish Habitat Improvement - 4,000 acres of impoundments

Table 4-1 provides more detailed discussion for implementation of the plan elements proposed for inclusion in the early action plan.

In general, most USDA plan elements will contribute to the overall improvement of environmental quality within the basin. Flooding, erosion and sediment damages will be reduced. Revegetation of critical areas, planting of trees, installation of terraces, timber stand improvement, and other conservation practices will help improve the aesthetic quality of the landscape. Water quality will be improved by the combined results of all practices which reduce erosion resulting in stream pollution. Impetus most likely will be generated to guarantee the preservation of these areas and enhance the basin's environmental appeal.

The environmental impacts of the USDA plan elements in the early action plan are discussed below. In addition, a system of accounts to display beneficial and adverse effects of the entire suggested plan is shown in table 3-9.

During detailed planning, the implementing federal state and local agencies providing assistance to project sponsors should give full consideration to minimizing and mitigating adverse impacts on the environment. This should include consideration of all resource values necessary for the orderly development of the basin's water and related land resources.

The projected land use changes resulting from implementation of USDA plan elements for selected time frames are shown in table 3-2. These projections are compared to future conditions without planned development.

The suggested plan, in contrast to the future without accelerated resource development condition, should generally improve habitat conditions for most animal life in the basin by increasing cropland by 137,000 acres and decreasing total pastureland by a comparable amount. Usually, pastureland is inherently low value wildlife habitat.

Environmental Impacts

Non-Structural Measures--Non-structural plan elements primarily involve accelerated land treatment programs and reallocating land use within soil capabilities. The environmental impacts of these elements will be to maintain quality of land on 237,000 acres by using less erosive soils, and to reduce erosion on 496,000 acres of cropland, 616,000 acres of pastureland and 190,000 acres of forest land through land treatment measures and proper land use. The combined effects of all measures will be to reduce erosion by 20 million tons per year and sediment by 5.9 million tons per year. Reduced sediment will improve water quality, thus benefiting associated aquatic life. The plan will provide erosion protection to 95,000 acres of gullied land which will reduce sediment production by 5.5 million tons per year. Improved fire protection will improve hydrologic conditions on the total forest land acreage. Flood damages will be reduced on 38,000 acres of flood plain by converting this acreage to less intensive uses.

Structural Measures--The early action plan includes 22 impoundments in 10 project proposals providing 3,690 acres of surface water at normal pool level. About 3,230 acres of forest land and 460 acres of open land will be inundated by these impoundments. Preliminary field investigations indicate that no unique wildlife habitat exists at proposed impoundment sites. However, more detailed surveys will be conducted prior to planning any particular project. About 60 acres (23 miles) of free-flowing stream habitat will be changed to lake-type aquatic habitat. The floodwater retarding structures will reduce flood damages on 10,000 acres.

The 22 impoundments will create approximately 3,690 acres of aquatic habitat and an estimated 88 miles of shoreline to benefit animal life associated with small lake habitat. The flood pools will include capacity for 8,000 acre-feet of sediment storage. These impoundments will also provide 49,000 acre-feet of floodwater storage during periods of storm runoff.

Six municipal and industrial water supply structures will supply 19.5 million gallons of water per day. Water-based recreation facilities will be established at 23 sites providing over 2 million recreational occasions annually. There will be a disruption of tranquility in some rural areas associated with increased recreation.

Channel alterations are planned for about 14 miles of existing streams by 1990. This will cause adverse effects to fish and wildlife resources. Fish habitat will be degraded as water courses are widened and become more shallow. Water temperatures are generally increased as streamside vegetation is removed. Some wildlife habitat is destroyed as channels are widened and excavated.

Alternatives

There were basically two alternatives considered during the formulation of the suggested plan; one alternative to promote national economic development (NED) and another to enhance environmental quality (EQ). The impact effects of these two alternatives are displayed by the four-accounts system in tables 2-11 and 2-17. A third viable alternative would be no accelerated project action. Future-without-development conditions were used as baseline data to establish projected needs by the selected time frames. Obviously, if no project action is taken as recommended in the suggested plan, anticipated economic and environmental benefits as displayed in

Table 3-9 will be foregone. Future economic and environmental conditions in the basin without resource development are presented in Chapter 4, Volume I. One would expect an increase in erosion rates, sedimentation, flood problems and continued encroachment on ecologically sensitive areas without positive resource planning.

Short-Term Vs. Long-Term Use of Resources

Trends in the basin indicate future land use will be agricultural with increased rural-residential development. The suggested plan is expected to be compatible with short-term uses of land, water, and other natural resources in the basin without precluding any significant long-term options. Short-term food and fiber needs can be met through continuation of the present allocation of land resources. Changes in land use and the acceleration of conservation treatment application is essential, however, to preserve the quality of the land resource base for use in meeting long-term needs. Continued depletion of the soil resource would have serious detrimental effects on the basin's capacity to sustain food and fiber production for future generations.

The suggested plan was formulated to meet present and future needs without depeleting the basin's resources. Major interaction of short-term vs. long-term uses are summarized below.

1. Accelerated conservation land treatment and use of soils within their inherent capability will contribute to both an immediate and long-range improvement of water quality in the basin's streams through reduction of sediment entering the waterways.

2. The present level of forest resource management and forest product utilization will meet the basin's needs only through 2000. The measures proposed in the suggested plan will provide for these needs to be met on a long-term basis.

3. Short-range objectives of increased timber production, mostly through increased pine tree plantings, coupled with a conversion of hardwood lowlands to other forest types or other land uses will have a long-term detrimental impact on animal life associated with mature hardwood stands.

4. Residential and industrial water supply is adequate on a community basis for only a short-term period. Additional supply needs to be developed for six communities as indicated in the suggested plan.

5. Without adequate planning, the allocation of land resources for non-agricultural uses such as transportation system rights-of-ways, residential areas, and industrial parks may result in a long-term loss of prime agricultural land.

Irreversible and Irretrievable Commitments of Resources

An estimated 3,690 acres of land will be committed to the installation of 13 floodwater retarding structures, 3 multipurpose impoundments, 6 water supply sites and their associated dams, spillways, and borrow areas. Of this total, about 3,230 acres are forest land and about 460 acres are in pasture and row crops. Production lost on the land committed to impoundments is expected to be offset by benefits that will require an initial irretrievable commitment of labor and additional labor for operation and maintenance of plan elements.

CHAPTER 4

PLAN IMPLEMENTATION

IMPLEMENTATION OF THE EARLY ACTION PORTION

The suggested plan includes a mix of elements from the NED and EQ alternatives with implementation opportunities for individual plan elements through a variety of federal, state, and local programs. The priorities and schedule for installation of various elements will depend upon the willingness of local units of government and other local organizations to initiate requests for assistance and assume leadership, financial, and legal responsibilities as appropriate. Technical and financial assistance for most plan elements can be obtained through existing programs of local, state, and federal agencies. The regional planning and development commissions can assist in making applications for this assistance. Some plan elements can only be installed with significant increase in levels of funding or additional local, state, or federal legislation and program authorities may be needed. Consideration should be given to rearranging some USDA program priorities if funding and personnel increases are not realized. Higher prioroties could be given to such work as soil surveys and critical erosion stabilization.

The ADO is responsible for coordinating the development of the state's human, physical and economic resources; and to promote the health, safety, and general welfare of its citizens; and to comprehensively plan for the state's total development. It therefore can effectively serve as the pivotal state agency for involving and coordinating the programs of the various agencies, in order to accomplish the objectives of local units of government. If additional funding or legislative support is identified as being required, ADO would also be the appropriate agency to initiate these actions.

Local organizations have indicated a high degree of interest and support for many of the measures included in the suggested plan. The kind and amount of measures that can be implemented under USDA programs and other programs are identified in tables 4-1 and 4-2. Additional information on methods of implementing these elements are described in the following sections:

Erosion Damage Reduction

Erosion damage reduction will be accomplished on cropland, pastureland, and forest land by applying best management practices that are tailored to soil groups in use. Programs of the USDA provide technical

Table 4-1 -- Suggested Plan elements and program means for implementation, early action portion, Alabama River Basin

ELEMENTS	U. S. DEPARTMENT OF AGRICULTURE UNITS	U. S. DEPARTMENT OF AGRICULTURE AGENCY/PROGRAM	OTHER THAN USDA UNITS	OTHER THAN USDA AGENCY/PROGRAM
Flood Damage Reduction				
Changed Land Use	38,000 ac.	PL-75-46, Co-op Ext. Service		National Weather Service, USGS,
Watershed Projects	6 watersheds	PL-83-566 & RC&D		Corps of Engineers, HUD-FIA
Erosion Reduction				
Cropland	36,000 ac.	PL-83-566, RC&D, ACP, PL-75-46		PL-92-500, AWIC
Pastureland	544,000 ac.	PL-75-46, ACP		
	38,000 ac.	PL-83-566, RC&D, ACP		
Forest	579,000 ac.	PL-75-46, ACP		
	5,000 ac.	PL-83-566, RC&D, ACP		
	69,000 ac.	CM-2, CFM		Alabama Forestry Commission PL-92-500
Critical Erosion Reduction				
Streambank Stab. (16,500)	1,000 ac.	PL-83-566, RC&D, ACP		PL-92-500, C. of E., AWIC, Ala. State
Roadside Stab. (1,600)	15,500 ac.	PL-75-46, ACP		Hwy. Dept., Ala.
	100 ac.	PL-83-566, RC&D, ACP		Surface Mining (Act 551)
Critical Area Stab. (67,800)	1,500 ac.	PL-75-46, ACP		
	4,200 ac.	PL-83-566, RC&D, ACP		
Strip Mine Stab. (9,200)	63,600 ac.	PL-75-46, ACP		
	600 ac.	PL-83-566, RC&D, ACP		
	8,600 ac.	PL-75-46, ACP		
Increased Drainage				
Surface and Subsurface	45,000 ac.	PL-75-46, PL-83-566, ACP & FmHA		
Improved Production Efficiency				
Changed Land Use	328,000 ac.	PL-75-46, Co-op Ext. Service		
Increased Forest Production				
Regeneration	67,000 ac.	USFS-FPU, CFM,		Alabama Forestry
Timber Stand Imp.	460,000 ac.	GFA, CM-4, FIP, & RC&D, NFS		Commission

Table 4-1 -- Cont'd

ELEMENTS	U. S. DEPARTMENT OF AGRICULTURE UNITS	AGENCY/PROGRAM	OTHER THAN USDA UNITS	AGENCY/PROGRAM
Reduced Fire Losses				
Capitol Imp. & Equipment	7,129,000 ac.	RM-2, PL-83-566, RC&D		Alabama Forestry Commission
Increased Forest Grazing	110,000 ac.	CFS, CM-2		
Urban Damage Reduction				
Nonstructural Measures	NA	PL-83-566, RC&D	NA	National Weather Service, HUD, Corps of Engineers
Water Supply				
Impoundments	6 sites	PL-83-566, RC&D FmHA		HUD, EDA, Revenue Sharing, HEW
Increased Recreation				
County Parks Systems along Alabama River	6 (250 ac. ea.)	RC&D		Alabama Power Co. ADC & NR
Other	8	PL-83-566		USDI-BOR (15.400)
City Parks			3	HUD
Hiking Trails				
Bartram trail			125 mi.	USDI-BOR (15.400) USDI-NPS (15.904) ADC & NR
Connecting Co. Parks	65 mi.	RC&D		
Talladega N.F.	50 mi.	N.F.		
Other Camping:				
Talladega N.F.	180 sites	N.F.		
Canoe Trail			40 mi.	USDI-BOR (15.400) ADC & NR
Golf Course	1-9 hole	RC&D		
Waterfowl Mgt. Area			6,000 ac.	Alabama Power Co. USDI-F&WS Pittman-Robertson Program
Historic Sites			Civil War Furn-ace	USDI-NPS Historic Preservation Program

Table 4-1 -- Cont'd

ELEMENTS	U. S. DEPARTMENT OF AGRICULTURE UNITS	U. S. DEPARTMENT OF AGRICULTURE AGENCY/PROGRAM	OTHER THAN USDA UNITS	OTHER THAN USDA AGENCY/PROGRAM
Solid Waste Disposal				
Site Acquisition			200 ac.	Alabama Department of Public Health, EPA, Revenue Sharing, Private Industry
Improved Stream Water Quality				
Low Flow Augmentation			35 cfs	Alabama Department of Public Health, EPA
Reduced Sediment Load	See erosion reduction	See erosion reduction		
Scenic Streams				
Site Acquisition			150 mi.	USDI, Land & Water Conservation Fund, Wild & Scenic Act, Open Space Act
Natural Scenic Sites				
Site Acquisition			25 sites	USDI, National Trails System Act, Land & Water Conservation Fund, Open Space Program
Fish & Wildlife Hab. Imp.		PL-83-566, ACP RC&D, PL-75-46 Water Bank Act		Dingell-Johnson Act, Duck Stamp Act, Federal Aid in Fish & Wildlife Restoration Acts, Pittman-Robertson Act, Ala. Dept. of Consvn. & Nat. Resources
Upland Hab. Imp.	17,000 ac.		116,000 ac.	
Wetland Hab. Imp.	2,000		19,000 ac.	
Impoundment Mgt.	3,000 ac.		2,000 ac.	

Table 4-1 -- Cont'd

ELEMENTS	U. S. DEPARTMENT OF AGRICULTURE UNITS	AGENCY/PROGRAM	OTHER THAN USDA UNITS	AGENCY/PROGRAM
Fish & Wildlife Hab. Imp. (Cont'd)				
Stream Improvement			1,000 ac.	Fish & Wildlife Coordination Act, Wetlands Acquisition Act, Migratory Bird Conservation Act
Protection of Flora & Fauna				
Identification & Site Acquisition (18 species)			18 species	Endangered Species Act of 1973, Lacy Act, Dingell-Johnson Act, Fish & Wildlife Coordination Act
Protection of Archaeological & Historical Sites				
Identification (250 sites)			250 sites	National Register of Historic Places, Alabama Historical Commission, Alabama Environmental Quality Council, HUD-Community Development Program, ADC & NR

assistance on a limited basis. Acceleration of this assistance by an estimated 8,600 man-days annually for a 10 year period or 86,000 man-days by 1990 is needed to provide management plans and the knowledge operators need to treat the acreage outlined in the suggested plan. Evaluation of accomplishments shows that these acres will not be treated by current going programs.

Assistance under going programs is now provided through organized Soil and Water Conservation Districts at the county level. Public Law 75-46, through the Soil Conservation Service, provides for furnishing technical assistance in treating any land within the districts. Annual accomplishments under going programs are currently offset by obliteration of practices.

Detailed soil surveys are used as a basis for making conservation planning decisions. In the Alabama River Basin, soil surveys are completed and published for only nine counties. Four other counties have field work for soil surveys completed. Five additional counties have soil surveys in progress. The remaining counties have soil surveys made for selected areas only after requests for assistance are received from landowners and planning can be scheduled. Acceleration of soil surveys needs to be made on about 6,000,000 acres to provide adequate soils information in the other 17 counties. This would require an estimated additional 35,000 man-days to complete the surveys by 1990.

Acceleration of services occurs when a watershed is planned under PL 83-566 or a project measure is planned in an RC&D project area. Thirty PL 83-566 projects and 11 RC&D water resource project measures have applications that include land treatment acceleration. The Soil Conservation Service and U. S. Forest Service have the major responsibilities for planning and installing these projects. Watershed restoration and resource development work on state and private forest lands can be performed by the Alabama Forestry Commission in cooperation with the U. S. Forest Service; and by the U. S. Forest Service on National Forest lands. Local landowners or sponsors are responsible to county governments for operating and maintaining the installed measures.

County Agricultural Stabilization and Conservation Service (ASCS) programs provide cost sharing on some treatment measures throughout the basin when financial assistance is available. Currently, funds are available to individual counties that range from $40,000 to $100,000 per county depending upon the needs to treat land through going programs.

Major practices applied for erosion reduction are as follows:

Establishing Permanent Vegetative Cover
Planting Trees
Improving a Stand of Forest Trees
Constructing Terrace Systems
Animal Waste Storage and Diversion Facilities
Improving Permanent Vegetative Cover
Water Impoundment Reservoirs
Diversions
Permanent Wildlife Habitat
Sediment Retention, Erosion or Water Control Structures
Sediment, Chemical or Water Runoff Control Measures
Developing Facilities for Livestock Water
Winter Cover Crop
Streambank Stabilization
Permanent Open Drainage Systems
Underground Drainage Systems
Conservation Tillage
Strip Cropping

The present level of funding is not sufficient for cost-sharing in an accelerated program. Funds will have to be more than doubled to meet the needs of going programs and the additional measures included in the suggested plan for protecting the productive base of the soil.

The Alabama Water Improvement Commission will prepare a statewide plan under PL 92-500 that will contain guidelines for erosion control measures to reduce non-point sources of pollution.

Critical Erosion Reduction

The USDA programs for the treatment of critical areas include providing technical assistance for all items and cost-sharing on other items. Rapid acceleration of services will be required in order to achieve the planned level of treatment. Some acceleration will occur when the suggested watersheds are planned and installed under PL-83-566; acceleration will also occur as project measures are installed in RC&D project areas. The Soil Conservation Service and U. S. Forest Service have the major responsibilities for planning and installing these projects. Local landowners or sponsors are responsible for operating and maintaining the installed measures.

Critical areas which are not in authorized watersheds or RC&D Project Areas are limited to technical assistance provided to local Soil and Water Conservation Districts (PL 75-46). In counties where the local ASCS committee has programs that cover these measures, financial assistance (cost-sharing) is available. The U. S. Forest Service treats critical areas on National Forest lands under several programs which allow for complete management and conservation treatment on those lands.

Additional authorization is needed to stimulate accelerated installation of protective measures. Going programs have historically been funded at a low level of cost-sharing (incentive) which has had the effect of producing a low level of participation on the part of private landowners.

Non-USDA Programs for Critical Erosion Reduction

The Water Pollution Control Act Amendment of 1972 (PL 92-500), administered by the Environmental Protection Agency (EPA), contains sections that affect critically eroding areas. Section 208 of the act includes authority for EPA to require studies on an area basis relating to non-point sources of pollution, specifically sediment and related non-point pollution. Study plans have been proposed to EPA which will result in non-point pollution control. Soil and Water Conservation Districts, and state agencies that control air and water quality, will have major inputs. The Alabama State Department of Public Health, the Alabama Water Improvement Commission, the Alabama Forestry Commission, and the Alabama Soil and Water Conservation Committee are the primary state agencies involved.

All federal agencies are required to comply with the laws that deal with pollution occurring as the result of any construction project of the agencies.

Surface mined land is reclaimed by the operators under provisions of the Alabama Surface Mine Reclamation Act of 1975. Technical assistance (only) is available through the Soil Conservation Service as discussed under USDA implementation programs.

At present, there is no statewide cost-share or project implementation program for abandoned ("orphan") mined lands or streambank protection. This is an area where additional authorization is needed, and may become available when non-point pollution abatement planning is completed under Section 208 of the Water Pollution Control Act, or by new or amended Surface Mine Acts.

Reduction of Sedimentation

Programs for reduction of sedimentation are primarily erosion control measures. Implementation of these erosion control measures is discussed under Erosion Damage Reduction and Reduction of Critical Erosion. Other reductions in sedimentation occur as a result of installation of reservoirs. USDA programs that include reservoir construction are the Watershed Protection and Flood Prevention Program (PL 83-566) and RC&D project measures.

Non-USDA Implementation - Reduction of Sedimentation

Plans to control non-point sources of pollution, including sedimentation, are being prepared for the Environmental Protection Agency under Section 208 of the Water Pollution Control Act Amendment of 1972. These plans will, hopefully, provide the needed new programs to accomplish accelerated treatment.

Flood Damage Reduction

Structural and nonstructural means are available to alleviate flood problems in a variety of ways. These measures to reduce flood damages through USDA programs include the Small Watershed Program (PL 83-566) and the Resource Conservation and Development Program (PL-87-703). Potential watershed projects are identified in table 2-3. Application for assistance in planning watershed projects are submitted to the State Soil and Water Conservation Committee. The Soil Conservation Service has primary responsibility for administering PL 83-566 and the RC&D Program. Local sponsorship and public participation is required before planning can be initiated. The Farmer's Home Administration (FmHA) can make grants on low interest and deferred payment loans to sponsoring organizations to assist in implementing flood prevention projects. Loans are used to finance the local cost-sharing items as required by individual projects.

When remedial measures are undertaken, first consideration should be given to nonstructural measures such as land treatment to reduce storm runoff and changed land use in the flood plain to reduce monetary damages. An increase in funding is needed so that technical assistance can be provided by SCS through PL 75-46 to identify those areas most adaptable to this means.

The Soil Conservation Service participates in flood hazard analyses to identify flood plains in urban and adjacent areas subject to future development. Requests for this assistance can be directed (after co-ordination with the appropriate regional planning and development commission) to the Alabama Development Office. The purpose of these studies is to provide data to state and local governments in their flood plain management programs.

Agricultural Drainage

The drainage in the suggested plan can be accomplished by installation of surface drainage ditches, subsurface drainage systems, channel work, and associated conservation treatment. Open ditches are the most common measure used to remove surface water. Internal water caused by an inherently high water table can be removed by subsurface drainage systems. Large channels may be needed in some cases to provide a suitable outlet for other drainage systems. A group or project-type action may be necessary to obtain an adequate outlet.

The PL 75-46 program of the Soil Conservation Service can provide technical assistance through the local Soil and Water Conservation Districts for planning and installing conservation treatment measures. An acceleration of this technical assistance is available for watersheds planned under PL 83-566 and for areas where project measures are planned in the RC&D project areas. A portion of the drainage will be installed by individual landowners with no assistance from outside sources.

Alabama Law, Act No. 685, provides for the formation of Water Management Districts to accomplish projects which are beyond the scope of individual landowners.

Cost-sharing for installing some of the plan elements are available through the Agricultural Stabilization and Conservation Service where the county committees have an applicable program. Assistance is available on both individual and group projects. The Farmers Home Administration has loan programs for group projects and the installation of land improvement measures by individual landowners.

Water Supply

Programs of the USDA are presently available for use by local sponsors to develop potential water supply impoundment sites in the basin. Provisions of the Watershed Protection and Flood Prevention Act (PL 83-566) include multi-purpose reservoirs, including water storage for water supply. Assistance is given in developing plans. The Farmers Home Administration (FmHA) can make grants and loans to local sponsors to assist in implementing flood prevention projects. Loans are used to finance the local cost-sharing items as required by the individual projects.

The Coosa Valley RC&D project plan includes provision for developing water supply within a portion of the basin. State and county revenue sharing funds are used by local sponsors to finance developments in addition to local funds.

Financial assistance is available from various departments and agencies of the federal government. Long-term loans are provided by the U. S. Department of Housing and Urban Development for the development of water supply and distribution systems. In addition, financial assistance is provided by the Economic Development Administration and Appalachian Regional Commission for the development of water resources and other employment generating projects, and by the Department of Health, Education, and Welfare for water supply and treatment facilities.

Low Quality Stream Improvement

Low-flow augmentation for pollution abatement is generally considered to be a last resort solution to water quality problems. After all practical levels of waste treatment have been achieved in a drainage basin, low-flow augmentation could be used as a supplemental method of maintaining desired water quality requirements during periods of low flow.

The reservoirs listed in table 3-7 and shown on figure 3-1 could be impounded by earth fill dams with concrete inlet and outlet structures. Each dam would have an ungated emergency spillway.

City or county governments near the location of the pollution problems could sponsor planning and installation of these reservoirs. Projects of this nature should have the concurrence of the Alabama Water Improvement Commission. The Sanitary Engineer for Jefferson County has expressed interest in proposed reservoir sites on the Cahaba River and its tributaries. Usually, the Environmental Protection Agency will consider low-flow augmentation as an approach to solving pollution problems only after the best available treatment systems have been installed.

Improved Production Efficiency

Efficiency gains resulting from using less erosive soils for crops and pasture can only be achieved through landowner decisions based on detailed soil capability information. Soil Conservation Service technical assistance can be provided to (1) make soil surveys; (2) educate producers as to which soils are best suited for various crops; and most importantly, (3) follow through and guide landowners in accomplishing the needed land use changes. A statewide educational program aimed at soil conservation and utilization will require a significant increase in SCS technical personnel and funding. The Alabama Co-operative Extension Service can make significant contributions to this effort by providing information and education to landowners.

Currently, only one-half of the state is covered by modern soils maps. At the present rate of mapping, complete state coverage will not be achieved until 1995. The Alabama legislature is currently studying a bill sponsored by the Alabama Agricultural Council to provide for a 10-year plan to complete mapping by 1987.

This study suggests that landowners will gradually change the use of their lands to more efficient patterns, but this will be retarded by the time required for normal consolidation of farm units and changes in legal and personal preferences of individual landowners. But some short run exploitation of soil resources will continue. Incentive payment in the form of cost sharing on establishment costs and on conservation practices will induce some farmers to make desirable but marginally feasible changes in the short run. Education, technical assistance, and social pressure will correct some land uses considered undesirable from a conservation and environmental standpoint. Remaining instances of undesirable land use should be addressed by local units of government with broad powers.

Recreation

Recreation proposals in the suggested plan could be implemented through a combination of federal assistance programs, state appropriations, and local funding. Local cost sharing is usually involved; consequently, the success of the recreation measures depend largely upon the financial ability of the public to accept this type of obligation.

Several federal programs are available, a major one being the Resource Conservation and Development Program administered through the USDA, Soil Conservation Service. This program provides project grants and planning assistance for public water based recreation and fish and wildlife developments. Each of the six major county parks proposed along the Coosa River could qualify for this type of funding. State and county governments must assume a leadership role if these parks are to become a reality.

The Outdoor Recreation-Acquisition and Development Program (15.400) administered by the Bureau of Outdoor Recreation, U. S. Department of the Interior, is another federal source of recreation funds. Grants are made to state and county agencies for purchase and development of outdoor recreation areas. These funds could be used to develop county parks, city parks emphasizing outdoor recreation, the Hatchett Creek Canoe Trail, and the Bartram Trail.

The PL 83-566 program of the Soil Conservation Service provides grants for planning assistance, land acquisition, and development of public recreation areas. The early action phase of the suggested plan includes eight such developments. These parks would be adjacent to multi-purpose reservoirs, averaging about 400 acres in size.

The Farmers Home Administration, USDA, provides low interest loans for recreational developments through their Watershed Protection and Flood Prevention Loan Program (10.419). These loans are made to sponsoring local organizations and may equal total project costs.

The U. S. Department of Interior, National Park Service, offers grants for the preservation of historic sites through a Historic Preservation Program (15.904). Additional assistance in site preservation can be provided by the Alabama Historical Commission. The Cornwall Furnace project, and sections of the Bartram Trail should qualify for such funds.

The Forest Service, USDA, maintains hiking trails and campsites in all National Forest areas. Funds are appropriated through the Forest Service for developments in both the Talladega and Tuskegee National Forests.

Two waterfowl refuge and management areas are proposed in the suggested plan. Grants for this type of development are available through the Wildlife Restoration (Pittman-Robertson) Program offered by the U. S. Department of Interior, Fish and Wildlife Service. These funds go directly to state fish and game departments for restoration and management of wildlife populations.

Solid Waste Disposal

The Solid Waste Division of the State Health Department assists cities, counties, and the Association of Industries plan for solid waste disposal systems. Planning and installation of systems for solid waste should be coordinated with EPA and the State Health Department. Programs to fund construction of solid waste disposal areas are not presently available.

Reduced Fire Losses

The Alabama Forestry Commission provides the essential manpower, equipment and organization for forest fire protection and control on state and private lands. Through the Cooperative Forest Fire Control (CM-2) program, the U. S. Forest Service provides coordination and financial and technical assistance including training of fire control personnel, development and acquisition of equipment, and application of research findings. All state, industrial, and federal resources must be integrated in order to be able to reach the stated goal of 0.25 percent burn by 1990. In areas of especially high fire incidence, supplemental funding for fire control can be provided through PL 83-566 and RC&D programs.

Increased Forest Grazing

There are two major means for increasing forest grazing on favorable soil and vegetative types: prescribed burning to increase forage production, and shifting grazing to more productive and less hazardous lands. The Cooperative Forest Fire Control (CM-2) program can provide assistance in accomplishing the goal of prescribed burning on 11,000 acres of pine forest per year. Burning can be accomplished without violating air quality standards by following methods prescribed by the USFS and the Alabama Forestry Commission. Aid in encouraging a shift in grazing to more suitable lands can be handled through the Cooperative Forest Management (CFM) program administered by the Forest Service in cooperation with the Alabama Forestry Commission.

Increased Forest Production

The U. S. Forest Service, in cooperation with the Alabama Forestry Commission, can provide the training necessary to increase forest utilization through the Forest Products Utilization (FPU) program authorized by the Cooperative Forest Management Act of 1950. Acceleration of this program will provide the skill and knowledge necessary to achieve the goals of the suggested plan.

Technical and financial assistance needed to reach stated goals in reforestation and improvement cuttings is available through acceleration of such programs as: Cooperative Forest Management (CFM), General Forestry Assistance (GFA), Cooperative Tree Seeding (CM-4), and Forestry Incentives Program (FIP) administered by ASCS and State Forestry Commission.

In addition, supplemental funding for both increased forest utilization and accelerated forest management can be provided through Resource Conservation and Development (RC&D) programs.

Improve the Quality and Quantity of Fish and Wildlife Habitat

Implementation of plan elements to achieve the desired improvements in fish and wildlife habitat in the basin will be accomplished primarily through programs other than USDA activities. However, several plan elements can be accomplished, at least partially, through PL 83-566, RC&D projects, and ASCS cost-sharing programs. The primary responsibility for management and protection of fish and wildlife resources rests with the Alabama Department of Conservation and Natural Resources and the U. S. Fish and Wildlife Service. Specific plan elements that were suggested for implementation include land acquisition and lease for wildlife management areas, accelerated wildlife management on state and federal lands, continued cost sharing for fish and wildlife habitat development on private lands, and improved access to streams and private lands by the public. These elements are compatible with accomplishments toward wildlife habitat preservation and development on private lands, funded by private sources.

Federal laws under which the selected plan elements may be implemented include Dingell-Johnson Sport Fish Restoration Act, Duck Stamp Act, Federal Aid in Fish and Wildlife Restoration Acts, Fish and Wildlife Coordination Act, Migratory Bird Conservation Act, Pittman-Robertson Wildlife Restoration Act, Water Bank Act, Wildlife Restoration Projects, and the Wetlands Aquisition Act.

Scenic Rivers and Streams

The suggested plan includes provisions for the protection of 150 miles of scenic waterways by 1990. Plan elements involve site acquisition, site improvement, and enactment of appropriate state legislation to ensure preservation of scenic water courses.

Proposals for the early action time frame would protect or preserve portions of the Cahaba River, Tallapoosa River, and Hatchett Creek. The programs necessary to implement this aspect of the plan are, for the most part, outside current USDA activities. Protection for many of the rivers and streams may be achieved through PL 93-621, the Wild and Scenic Rivers Act as amended. This program is administered through the Department of Interior. It is essential that local sponsorship and interest in support of projects be apparent and be directed through proper channels. For example, local interested citizens and concerned organizations have been instrumental in the recently initiated study of the Cahaba River as a scenic or recreation river.

Natural Scenic Sites

Implementation of the suggested plan would protect, preserve or maintain 25 sites by 1990 and 35 sites by 2020. Plan elements to accomplish the desired level of protection can be achieved through programs administered by the Department of Interior, the Alabama Department of Conservation and Natural Resources, HUD and by laws enacted through the Alabama Legislature. Specific programs are provided through the Land and Water Conservation Fund Loan Act, National Trails System Act, Open Space Program, and the American Land Trust.

It is important that project support exists on the local level for effective implementation of available state and federal programs.

The Alabama Environmental Quality Council as well as regional councils have given splendid leadership to various environmentally oriented groups in their efforts to protect and preserve the scenic areas within the state.

Protection of Endangered Flora and Fauna

Implementation of the suggested plan will emphasize habitat acquisition and accelerated protection for 18 species of endangered plants and animals in the basin. In addition, efforts should be made to increase public awareness and appreciation of endangered species.

These elements can be implemented through existing programs administered by the Department of Interior and the Alabama Department of Conservation and Natural Resources. The programs include the Endangered Species Act of 1973, Environmental Education Act and the Lacey Act. Private organizations such as the Alabama Conservancy, Sierra Clubs, Alabama Wildlife Federation, etc., could provide valuable assistance in the public education effort.

Protection of Archaeological and Historical Sites

The suggested plan includes elements that will identify and/or protect about 250 historical and archaeological sites by 1990. Implementation should be made through the Alabama Historical Commission assisted by Regional Planning and Development Commission and representatives of appropriate local, state, or federal agencies. Sufficient federal legislation exists to protect important sites that meet the criteria for listing in the National Register of Historic Places. The adoption of state legislation should be considered to protect sites on the Alabama Register of Heritage and Landmark where appropriate. Coordination of historic site identification and preservation is needed at the state level. Valuable assistance could be provided through local groups such as the North Central Alabama Heritage Association as well as the state and regional environmental quality councils. These local organizations can assist by erecting historic markers, increasing public awareness, and by organizing local fund-raising efforts for site acquisition.

Table 4-2 -- Summary of program and agency means for implementing Suggested Plan elements, Alabama River Basin

PLAN ELEMENTS	USDA PROGRAMS AND AGENCIES					
	PUBLIC LAW 75-46	PUBLIC LAW 83-566	RC&D	FmHA	ASCS	U. S. FOREST SERVICE
Changed Land Use	X	X	X			
Watershed Projects		X	X	X		X
Increased Drainage	X	X	X	X	X	
Imp. Production Efficiency - Crops & Pasture	X	X	X		X	
Increased Forest Production	X	X	X	X	X	X
Reduced Fire Losses	X	X	X			X
Recreation	X	X	X	X		X
Erosion Reduction	X	X	X		X	X
Critical Erosion Reduction	X	X	X		X	X
Increased Forest Grazing		X	X	X		X
Urban Flood Damage Reduction		X	X	X		X
Water Supply		X	X	X		
Solid Waste Disposal			X			
Low Quality Streams		X	X	X		
Reduced Sediment	X	X	X	X		X
Scenic Streams			X			X
Natural Scenic Sites			X			
Fish & Wildlife Habitat	X	X	X	X	X	X
Protection of Flora & Fauna			X			
Protection of Archaeological and Historical Sites			X			

Table 4-2 -- cont'd

PLAN ELEMENTS	OTHER FEDERAL PROGRAMS AND AGENCIES														
	BOR	F&WL SERVICE	ARC	NATIONAL WEATHER SERVICE	DOI	C OF E	HUD	EPA	USGS	EDA	NPS	WILD & SCENIC ACT	END. SPECIES ACT	DINGELL-JOHNSON ACT	PITTMAN-ROBERTSON ACT
Changed Land Use															
Watershed Projects			X										X	X	X
Increased Drainage								X							
Imp. Production Efficiency - Crops and Pasture															
Increased Forest Production															
Reduced Fire Losses					X										
Recreation	X	X			X	X		X			X				
Erosion Reduction			X			X		X							
Critical Erosion Reduction			X		X	X		X							
Increased Forest Grazing					X										
Urban Flood Damage Reduction				X		X	X	X	X			X	X		
Water Supply									X	X					
Solid Waste Disposal			X					X							
Low Quality Streams					X	X	X	X	X						
Reduced Sediment			X			X	X	X	X						
Scenic Streams	X				X			X				X			
Natural Scenic Sites	X				X			X			X	X			
Fish & Wildlife Habitat	X							X					X	X	X
Protection of Flora & Fauna		X			X			X					X	X	
Protection of Archaeological and Historical Sites	X				X		X	X							

Table 4-2 -- cont'd

PLAN ELEMENTS	STATE AGENCIES & PROGRAMS, LOCAL GOVTS., AND PRIVATE INDUSTRY											
	GEO. SVY. AL	STATE HWY. DEPT.	AL DEPT. PUBLIC HEALTH	STATE SURFACE MINING COMM.	AL FORESTRY COMM.	AWIC	ADC & NR	AL HIST. COMM.	AL ENV. QUALITY COUNCIL	COOP. EXT. SER.	PRIVATE INDUSTRY	LOCAL GOVTS. & ORG.
Changed Land Use										X	X	X
Watershed Projects					X					X		X
Increased Drainage										X		X
Imp. Production Efficiency - Crops and Pasture										X	X	X
Increased Forest Production					X					X	X	
Recreation							X				X	X
Erosion Reduction		X		X		X					X	X
Critical Erosion Reduction		X		X		X					X	X
Increased Forest Grazing					X							
Urban Flood Damage Reduction												X
Water Supply	X		X									X
Solid Waste Disposal	X		X						X		X	X
Low Quality Streams	X		X	X		X			X			X
Reduced Sediment	X	X		X		X						
Scenic Streams	X						X	X	X			X
Natural Scenic Sites	X						X	X	X			X
Fish & Wildlife Habitat							X			X	X	X
Protection of Flora & Fauna							X		X			X
Protection of Archaeological and Historical Sites	X						X	X	X			X