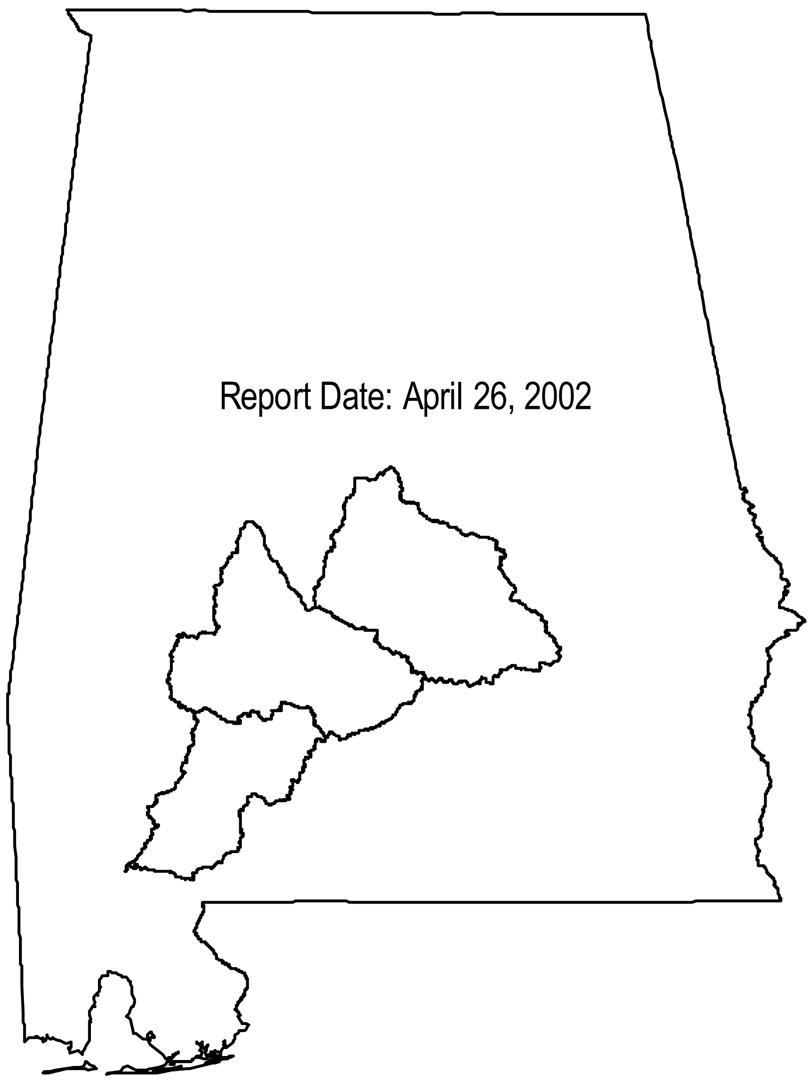
SURFACE WATER QUALITY SCREENING ASSESSMENT OF THE ALABAMA RIVER BASIN – 2000



Report Date: April 26, 2002

Aquatic Assessment Unit - Field Operations Division
Alabama Department of Environmental Management

SURFACE WATER QUALITY SCREENING ASSESSMENT OF THE ALABAMA RIVER BASIN – 2000

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AQUATIC ASSESSMENT UNIT ✦ FIELD OPERATIONS DIVISION
ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

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ADDRESS COMMENTS AND QUESTIONS TO :

AQUATIC ASSESSMENT UNIT
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EXECUTIVE SUMMARY

***Background*:** In 1996, the Alabama Department of Environmental Management (ADEM) adopted a basinwide approach to nonpoint source monitoring and management using a repeating 5-year management cycle. Because of the 5-year rotation, basins are placed into groups so that all basins receive equal focus. Concentrating planning and implementation efforts within one basin group allows a focused review of available data and provides coordinated water quality monitoring and assessment efforts, efficient implementation of control activities on a geographic basis, and consistent and integrated decision-making for awarding CWA §319 funds.

During 2000, the Aquatic Assessment Unit (AAU) of the Field Operations Division completed basinwide screening assessments of the Coosa, Tallapoosa, and Alabama River basins. At the request of the Office of Education and Outreach, separate screening assessments were conducted within each of these basins, although together, they comprise one of ADEM's basin groups. This document provides an overview of the basinwide screening assessment conducted in the Alabama River basin. Landuse information and assessment data available from each of the 61 sub-watersheds in the Alabama River basin are summarized.

Landuse: Landuse percentages and estimates of animal populations and sedimentation rates were obtained from information provided to ADEM by the Alabama Soil and Water Conservation Committee (ASWCC) and local Soil and Water Conservation Districts (SWCD). This information was provided on Conservation Assessment Worksheets completed in 1998 (FY97 CWA § 319 Workplan Project #4) and entered into an ACCESS database by ADEM.

Estimates of percent land cover differed among the Upper, Middle, and Lower Alabama River cataloging units (CUs) (Table E-1). Percent pasture and urban areas were highest in the Upper Alabama River CU.

Table E-1. Estimates of percent land cover within the Upper, Middle, and Lower Alabama River CUs (ASWCC and SWCD 1998).

Cataloging Unit	Forest	Row crop	Pasture	Mining	Urban	Open Water	Other
Upper Alabama	53%	8%	26%	<1%	8%	2%	2%
Middle Alabama	71%	10%	16%	0%	1%	1%	1%
Lower Alabama	87%	8%	3%	0%	1%	<1%	<1%

Nonpoint source (NPS) impairment potential: The potential for NPS impairment was estimated for each sub-watershed in the Alabama River basin using data compiled by the local SWCD (1998) and information on the number of current construction stormwater authorizations (Tables E-2a and E-2b). Results indicated more sub-watersheds at risk to

NPS impairment in the Upper and Middle Alabama River CUs. Impairment from forestry was a concern throughout the Alabama River basin. Crop and pasture lands were potential sources of NPS impairment within Upper and Middle Alabama River CUs.

Table E-2a. Number of sub-watersheds with moderate or high ratings for each NPS category

Cataloging Unit	Total # sub-watersheds	Overall Potential	Animal husbandry	Aqua-culture	Row crop	Pasture	Mining	Forestry	Sediment
Upper Alabama	26	20	7	0	12	16	4	13	4
Middle Alabama	22	8	1	4	8	11	0	6	0
Lower Alabama	13	7	0	0	4	0	1	13	0

Table E-2b. Number of sub-watersheds with moderate or high ratings for each point source or urban category

Category	% Urban	Development	Septic tank failure
Upper Alabama	9	8	6
Middle Alabama	0	3	5
Lower Alabama	1	1	0

Historical data/studies: The majority of assessments conducted within the Alabama River basin and presented in this report were from 8 major projects conducted by ADEM. Data collected by Auburn University at Montgomery (Appendix F-7), CH2M-Hill (Appendix F-4a and F-4b), and the Montgomery Water and Sewer Board (Appendix F-4c) are also provided.

These data include both monitored and evaluated assessments. Monitored assessments are based on chemical, physical, and/or biological data collected using commonly accepted and well-documented methods. Evaluated assessments are based on observed conditions, limited water quality data, water quality data older than 5 years, or estimated impacts from observed or suspected activities.

Results of monitored assessments were used in this report to assess habitat, biological, and chemical conditions within a sub-watershed. Monitored assessments were conducted during 7 projects (Table E-3). Evaluated assessments were conducted in conjunction with ADEM's ALAMAP Program (Appendix F-8), Ambient Trend Monitoring Program (Appendix F-9), and Clean Water Strategy Project (Appendix F-10). A summary of each project, including lead agency, project objectives, data collected, and applicable quality assurance manuals, is provided in the appendices.

Table E-3. Projects that have generated monitored assessment information.

Project	Appendix
ADEM's Ecoregional Reference Site Program	F-1
ADEM's State Parks Monitoring Project	F-2
ADEM's §303(d) Waterbody Monitoring Program	F-3
Catoma Creek Watershed Monitoring Project	F-4
ADEM's Special Studies	F-5
ADEM's Reservoir Monitoring Program	F-6
University Tributary Nutrient Project	F-7

Assessments conducted during the ACT Basin Screening Assessment: Sub-watersheds were selected for assessment during the screening assessment if recent monitoring data were not available, potential impacts from point sources or urban areas were minimal, and the potential for impairment from nonpoint sources was estimated as *moderate* or *high*. Because of the number of sub-watersheds located within the Coosa, Tallapoosa, and Alabama basin group, some sub-watersheds meeting these criteria could not be monitored. Assessments were conducted in 12 sub-watersheds in the Alabama River basin.

Sub-watershed summaries**:** Current and historical monitoring data were combined to provide a comprehensive assessment. A summary of information available for each of the 61 sub-watersheds is provided. The summaries are organized in 3 sections by CU. Each summary discusses landuse, NPS impairment potential, assessments conducted within the sub-watershed, and the NPS priority rating based on available data. The summaries point out significant data and reference appropriate tables and appendices. Assessment of habitat, biological and chemical conditions are based on long-term data from ADEM's Ecoregional Reference Site Program. Tables referenced in the summaries are located at the end of each summary section. Appendices are located at the end of the report.

Sub-watershed assessments: Habitat, chemical/physical, and biological indicators of water quality were monitored at 59 stations within 27 sub-watersheds. These data are summarized for the Upper (Table 10a), Middle (Table 10b), and Lower (Table 10c) Alabama River CUs. Habitat and macroinvertebrate assessments were conducted at each of the 59 stations. Fish community Index of Biotic Integrity (IBI) assessments were conducted at 19 of these stations. The overall condition for each station was rated as the lowest biological assessment result obtained. Thirty-three (56%) stations were assessed as *excellent* or *good*. Eighteen (30%) stations were assessed as *fair* and 8 (14%) stations were assessed as *poor*.

Priority sub-watersheds**:** Ten priority sub-watersheds were identified within the Alabama River basin (Table E-4). Five (50%) were located within the Upper Alabama River CU, 3 (30%) in the Middle Alabama River CU, and 2 (20%) were located within the Lower Alabama River CU.

Table E-4. Sub-watersheds recommended for NPS priority status.

Sub-watershed Number	Sub-watershed Name	Lowest Station Assessment	Suspected Cause(s)	Suspected nonpoint source(s)
0201-060	Upper Catoma Creek	Fair	Nutrient enrichment	Forestry, pasture runoff, animal husbandry
0201-070	Ramer Creek	Fair	Nutrient enrichment	Pasture runoff, animal husbandry
0201-220	Lower Mulberry Creek	Fair	Nutrient enrichment	Forestry
0201-230	Soapstone Creek	Poor	Nutrient enrichment	Agriculture
0201-250	Valley Creek	Fair	Pathogens, nutrient enrichment	Silviculture, flow modification
0203-080	Upper Boguechitto Creek	Poor	Nutrient enrichment	Forestry, pasture runoff, animal husbandry
0203-090	Lower Boguechitto Creek	Poor	Nutrient enrichment	Pasture runoff, animal husbandry
0203-100	Chilatchee Creek	Fair	Nutrient enrichment	Forestry
0204-070	Randons Creek	Fair	Nutrient enrichment, Sedimentation	Forestry and cropland
0204-090	Wallers Creek	Poor	Nutrient enrichment, Sedimentation	Forestry

Upper Catoma Creek (0315-0201-060): Macroinvertebrate and fish bioassessments conducted in conjunction with the Catoma Creek Watershed Longterm Monitoring Project indicated Little Catoma Creek and Catoma Creek to be in *fair* condition. The local SWCD estimated the sub-watershed to be 55% pasture. Cattle operations were also common within the sub-watershed. Biochemical oxygen demand (BOD-5), ammonia-nitrogen, and TKN-nitrogen were above normal levels.

Ramer Creek (0315-0201-070)**:** The SWCD estimates of percent pasture (60%) indicated a *high* potential for NPS impairment in the sub-watershed. There was a *moderate* potential for impairment from animal concentrations (0.19 AU/acre), primarily cattle (0.17 AU/acre) (Table 11a), within the sub-watershed. Since 1995, macroinvertebrate and fish assessments have been conducted within the sub-watershed as part of the Catoma Creek Watershed Longterm Monitoring Project. The fish IBI assessment indicated Ramer Creek to be in *fair* condition. Water quality samples suggest nutrient enrichment to be a potential source of impairment. Chromium has also been detected at both stations monitored during the project.

Lower Mulberry Creek (0315-0201-220)**:** A macroinvertebrate assessment was conducted at Buck Creek, an ecoregional reference site. Although the potential for NPS impairment was *low*, silvicultural activities were prevalent within the sub-watershed. Total suspended solids, total Kjeldahl nitrogen, and orthophosphorus were higher than normal within the sub-watershed.

Soapstone Creek (0315-0201-230)**:** Percent land cover of the Soapstone Creek sub-watershed was estimated as 30% row crop and 20% pasture. A fish IBI assessment conducted within the sub-watershed indicated the fish community to be in *poor* condition.

Valley Creek (0315-0201-250): Biological conditions within the Valley Creek sub-watershed were assessed as *fair*. Water quality data indicated elevated fecal coliform concentrations and biochemical oxygen demand after a rain storm event. Biological impairment may be caused by silvicultural activities within the sub-watershed or the Valley Creek Lake impoundment upstream of the sampling stations.

Upper Boguechitto Creek (0315-0203-080)**:** The SWCD estimated percent land cover as 33% pasture and 39% row crop. Aquaculture was also prevalent within the sub-watershed. Five macroinvertebrate assessments and two fish IBI assessments were conducted. Results of the assessments indicated the macroinvertebrate and fish communities to be in *fair* or *poor* condition. Dissolved oxygen was measured below the Fish and Wildlife Use Classification standard of 5.0 mg/l at one station on Boguechitto Creek and two stations on Mud Creek. Ammonia-nitrogen was above normal at two stations on Boguechitto Creek.

Lower Boguechitto Creek (0315-0203-090)**:** The SWCD estimated percent land cover as 40% pasture and 29% row crop. There was a *moderate* potential for NPS impairment from activities associated with animal husbandry. Aquaculture was also prevalent throughout the sub-watershed. Intensive water quality monitoring has indicated elevated nutrient concentrations along Lower Boguechitto Creek. Biological conditions were assessed as *fair* or *poor* throughout the sub-watershed.

Chilatchee Creek (0315-0203-100): The SWCD estimated percent land cover as 24% pasture and 12% row crop. Aquaculture was prevalent throughout the sub-watershed. The macroinvertebrate community was in *fair* condition at 3 of the 4 sites assessed.

Randons Creek (0315-0204-070)**:** The SWCD estimated percent land cover as 32% row crop. Fish IBI assessment results indicated the fish community to be in *fair* condition at Lovetts Creek. The concentration of nitrate-nitrite nitrogen was above normal for the region and stream type.

Wallers Creek (0315-0204-090)**:** There was a *moderate* potential for NPS impairment from crop runoff. The macroinvertebrate and fish communities at Baileys Creek and Wallers Creek were in *fair* condition. The fish community at Potts Bayou Shomo Creek was in *poor* condition.

ACKNOWLEDGEMENTS

Thank you to Montgomery Water Works and Sewer Board for sharing the Catoma Creek water quality data. Thank you to Vic Payne, the State Soil and Water Conservation Committee, and the Local Soil and Water Conservation Districts (SWCDs) in the Alabama River Basin for providing the Conservation Assessment Worksheet information for inclusion in this report. Special thanks also to Dr. Pat O'Neil (GSA), ADEM's Office of Education and Outreach, and the Water Quality Branch of ADEM's Water Division for their review and comments.

TABLE OF CONTENTS

LIST OF TABLES

EXECUTIVE SUMMARY TABLES

METHODS TABLES

ALABAMA RIVER BASIN: SUMMARY TABLES

SECTION A. UPPER ALABAMA RIVER CATALOGING UNIT TABLES

SECTION B. MIDDLE ALABAMA RIVER CATALOGING UNIT TABLES

SECTION B. MIDDLE ALABAMA RIVER CATALOGING UNIT TABLES, CONTINUED

SECTION C. LOWER ALABAMA RIVER CATALOGING UNIT TABLES

LIST OF FIGURES

LIST OF APPENDICES

LIST OF ABBREVIATIONS

Abbreviation	Interpretation
§	Section
AAU	Aquatic Assessment Unit of ADEM's Field Operations Division (Formerly EIS)
ACT	Alabama, Coosa, and Tallapoosa Basin Group
ADEM	Alabama Department of Environmental Management
ALAMAP	Alabama Monitoring and Assessment Program
AU	Animal Unit as defined by ADEM CAFO Rules
BMP	Best Management Practices
Br	Branch
CAFO	Concentrated Animal Feeding Operation
cfs	Cubic Feet per Second
Chem.	Chemical/Physical Water Quality
Co.	County
Confl.	Confluence
Cr	Creek
CU	Cataloging Unit
CWA	Clean Water Act
CWP	Clean Water Partnership
ds	Downstream
EIS	Environmental Indicators Section of ADEM's Field Operations Division
EPA	U.S. Environmental Protection Agency
FOD	Field Operations Division
GPS	Global Positioning System
GSA	Geological Survey of Alabama
IBI	Index of Biotic Integrity (fish community)
Macroinv.	Aquatic Macroinvertebrate
MB-EPT	Multihabitat Bioassessment for Ephemeroptera, Plecoptera and Trichoptera
mg/L	Milligrams per Liter
mi^2	square miles
Mod.	Moderate
NPDES	National Pollutant Discharge Elimination System
NPS	Nonpoint Source
nr	Near
NRCS	Natural Resources Conservation Service
OE/DO	Organic Enrichment/Dissolved Oxygen
R	River
Rd	Road
RM	River Mile
SSWCC	State Soil and Water Conservation Committee
SWCD	Soil and Water Conservation District
TMDL	Total Maximum Daily Load
TNTC	Too numerous to count
TVA	Tennessee Valley Authority
ug/g	Micrograms per Gram
ug/L	Micrograms per Liter
us	Upstream
WQDS	Water Quality Demonstration Study

INTRODUCTION

The Alabama Department of Environmental Management (ADEM) is charged with monitoring the status of the state's water quality pursuant to the Clean Water Act and the Alabama Water Pollution Control Act. Under the Clean Water Act of 1977, the United States Environmental Protection Agency (EPA) emphasized programs addressing the chemical contamination of the nation's waters (National Research Council 1992). State and federal programs initiated to meet these water quality guidelines have been largely successful in controlling and reducing certain kinds of chemical pollution from point source discharges (National Research Council 1992, ADEM 1996b). The detection, assessment, and control of impairment from point sources is well understood because the pollutants, their concentrations, and probable points of impact are known (National Research Council 1992, EPA 1997a).

Nonpoint source (NPS) pollution, defined as any unconfined or diffuse source of contamination, accounts for approximately two-thirds of the water quality impairments in Alabama's streams (ADEM 2001a). It is generated irregularly and often associated with storm water runoff or atmospheric deposition (EPA 1997a). NPS impairment is associated with landuse within a watershed, such as agriculture, silviculture, and mining. The pollutants, their concentrations, and/or their source(s) may not be known or well defined. Because of their transient nature, these pollutants may not be detected by periodic water quality measurements (National Research Council 1992).

The 1987 amendments to the Clean Water Act added Section 319, which established a national program to assess and control NPS pollution. Under this program, states are asked to assess their NPS pollution problems and submit these assessments to EPA. In 1996, ADEM adopted a basinwide approach to water quality monitoring using a 5-year rotating basin group cycle. Concentrating monitoring efforts within one basin provides the Department with a framework for more centralized management and implementation of control efforts and provides consistent and integrated decision making for awarding CWA §319 NPS funds.

In 1997, the Aquatic Assessment Unit (AAU) of ADEM's Field Operations Division (FOD) developed methods that could be used to complete basinwide screening assessment projects. These methods have been refined as new information and techniques have become available. The projects are completed in 5 phases. During Phase I, landuse information, Departmental regulatory databases, available historical data, and other assessment information are used to identify data gaps and to prioritize sub-watersheds with the greatest potential for NPS impairment. Phase II includes reconnaissance and selection of assessment sites. During Phase III, sites are assessed using macroinvertebrate and fish community assessments, habitat assessments, and collection of physical/chemical water quality data. During Phase IV, data collected during Phase III, as well as existing data and assessment information, are analyzed to evaluate the level of impairment within each sub-watershed and determine the cause(s) and source(s) of impairment. A comprehensive report is completed during the final phase.

The Aquatic Assessment Unit (AAU) of ADEM's FOD has completed basinwide NPS screening assessments of the Black Warrior (1997), the Tennessee (1998), and the southeast Alabama River basins (1999). The results of these assessments have been reported in 5 separate documents (ADEM 1999h, ADEM 2000g, ADEM 2002a, ADEM 2002b, ADEM 2002c).

During 2000, the AAU completed basinwide NPS screening assessments of the Alabama, Coosa, and Tallapoosa (ACT) River basins. At the request of the ADEM's Office of Education and Outreach, separate screening assessment projects were conducted within each of these basins, although these basins together comprise one of ADEM's basin-groups. Combined, these basins contain 189 sub-watersheds. Sampling efforts were divided evenly among the three basins using desktop screening methods to target the ten (14-17%) sub-watersheds per basin most at risk from NPS impairment. This document summarizes the assessment information and results obtained within the Alabama River basin.

METHODOLOGY

Study Area

The Alabama River basin (0315) is comprised of 4 major cataloging units (CUs): the Cahaba River (0202) and the Upper (0201), Middle (0203), and Lower Alabama (0204) River CUs. For management purposes, the Cahaba River is monitored separately during ADEM's 5-year watershed monitoring plan. A basinwide screening assessment of the Cahaba River was conducted by the Geological Survey of Alabama (GSA) during 1996 (O'Neil and Shepard 1997). It is scheduled for monitoring by ADEM in 2002.

The Upper, Middle, and Lower Alabama River CUs contain 61 sub-watersheds draining approximately 6,023 mi^2 (11.5%) of Alabama's land area. They flow through parts of 17 counties in central Alabama (Fig. 1).

Ecoregions

Ecoregions are relatively homogeneous ecological areas defined by similarity of climate, landform, soil, potential natural vegetation, hydrology, or other ecologically relevant variables. Since 1991, ADEM has maintained a network of least-impaired ecoregional reference sites (ADEM 2000a). Intensive monitoring assessments, including chemical, physical, habitat, and biological data, are collected to develop baseline reference conditions for each of Alabama's 29 Level IV subecoregions (Griffith et al. 2001). The reference condition establishes the basis for making comparisons and detecting use impairment (Omernik and Griffith 1991, Omernik 1995).

The Alabama River basin lies below the Fall Line and drains 7 subecoregions of the *Southeastern Plains (65)* ecoregion (Fig. 2). The EPA subregionalized this ecoregion in Alabama and Mississippi in 1990 (ADEM and MSDEQ 1995). These subecoregions were revised in 2001 to reflect differences in soils, stream flows, and natural vegetation (Griffith et al. 2001).

The flat-to-undulating ***Blackland Prairie*** (65a) is characterized by distinctive Cretaceous-age chalk, marl, and calcareous clay with poor drainage. Stream flows tend to vary with both season and rainfall. Elevations are generally 150-250 feet. The area's natural vegetation of sweetgum, post oak, red cedar, and blue stem prairie has been transformed to cropland and pasture, with small patches of mixed hardwoods. Aquaculture, primarily pond-raised catfish, has increased in recent years.

The ***Flatwoods/Blackland Prairie Margins*** (65b) subecoregion combines two slightly different areas. The Flatwoods are comprised of a mostly-forested lowland area of little relief, formed primarily on dark, massive marine clay. Soils are deep, clayey, somewhat poorly to poorly drained, and acidic. The Blackland Prairie Margins are undulating, irregular plains, with slightly more relief than the Flatwoods, but also tend to have heavy clay soils that are either sticky when wet or hard and cracked when dry, with generally poor drainage.

The ***Southern Hilly Gulf Coastal Plain (65d***) drains portions of the Lower Alabama River CU. This subecoregion is characterized by dissected irregular plains and gently rolling hills. It developed over diverse east-west trending bands of sand, clay, and marl formations. Broad cuestas with gentle southern slopes and steeper northern slopes are common. It has more rolling topography, higher elevations, higher-gradient streams, and more relief than subecoregions 65a, 65b, 65f, and 65g. The natural vegetation of oak-hickory-pine forest grades into southern mixed forest to the south. Land cover is mostly forest and woodland with some cropland and pasture.

The ***Southern Pine Plains and Hills (65f)*** subecoregion, which is located in the southern-most section of the Alabama River basin, has a different mix of vegetation and landuse compared to 65d. Streams tend to be tea-colored and more acidic as one moves south. The oak-hickory-pine forest of the north in 65d grades into Southern mixed-forest and longleaf pine forest in this region. Loblolly and slash pine plantations now cover wide areas.

The northern-most section of the Upper Alabama River CU lies within the ***Fall Line Hills (65i)*** subecoregion. This area is composed primarily of Cretaceous age loamy and sandy sediments. It is mostly forested terrain of oak-hickory-pine on hills with 200-400 foot relief. Longleaf pine is being reintroduced in many areas.

The ***Southeastern Floodplains and Low Terraces (65p)*** comprise a riverine ecoregion of large sluggish rivers and backwaters with ponds, swamps, and oxbow lakes. River swamp forests of bald cypress and water tupelo and oak-dominated bottomland hardwood forests provide important wildlife corridors and habitat. In Alabama, cropland is typical on the higher, better-drained terraces, while hardwoods cover the floodplains.

The ***Buhrstone/Lime Hills (65q***) subecoregion has some of the most rugged terrain of the Alabama coastal plain. The rough, hilly topography is attributed to the hardened beds of claystone, sandstone, and resistant limestones. Many of the streams have relatively high gradients and hard-rock bottoms. Some fish species that are generally found above the Fall Line are also found in this region because of its streams with upland characteristics.

Topography/Soils

The Alabama River basin contains three distinct soil areas. The *Blackland Prairie* soils, derived from alkaline Selma Chalk or acid marine clays, generally delineate the Blackland Prairie (65a) and the Flatwoods/Blackland Prairie Margins (65b) subecoregions. Acid and alkaline soils are intermingled throughout the area. Sumter soils, which are typical of the alkaline soils, are clayey throughout, have a dark-colored surface layer, and a yellowish-colored sub-soil. Oktibbeha soils are acid and clayey throughout. They have red subsoil layers overlying chalk. The clayey Wilcox, Mayhew, and Vaiden soils are the dominant soils of the rolling pine woodlands along the southern edge of the Prairie. They are acidic and poorly drained. (ACES 1997)

Figure 1. Sub-watersheds of the Alabama River Basin.

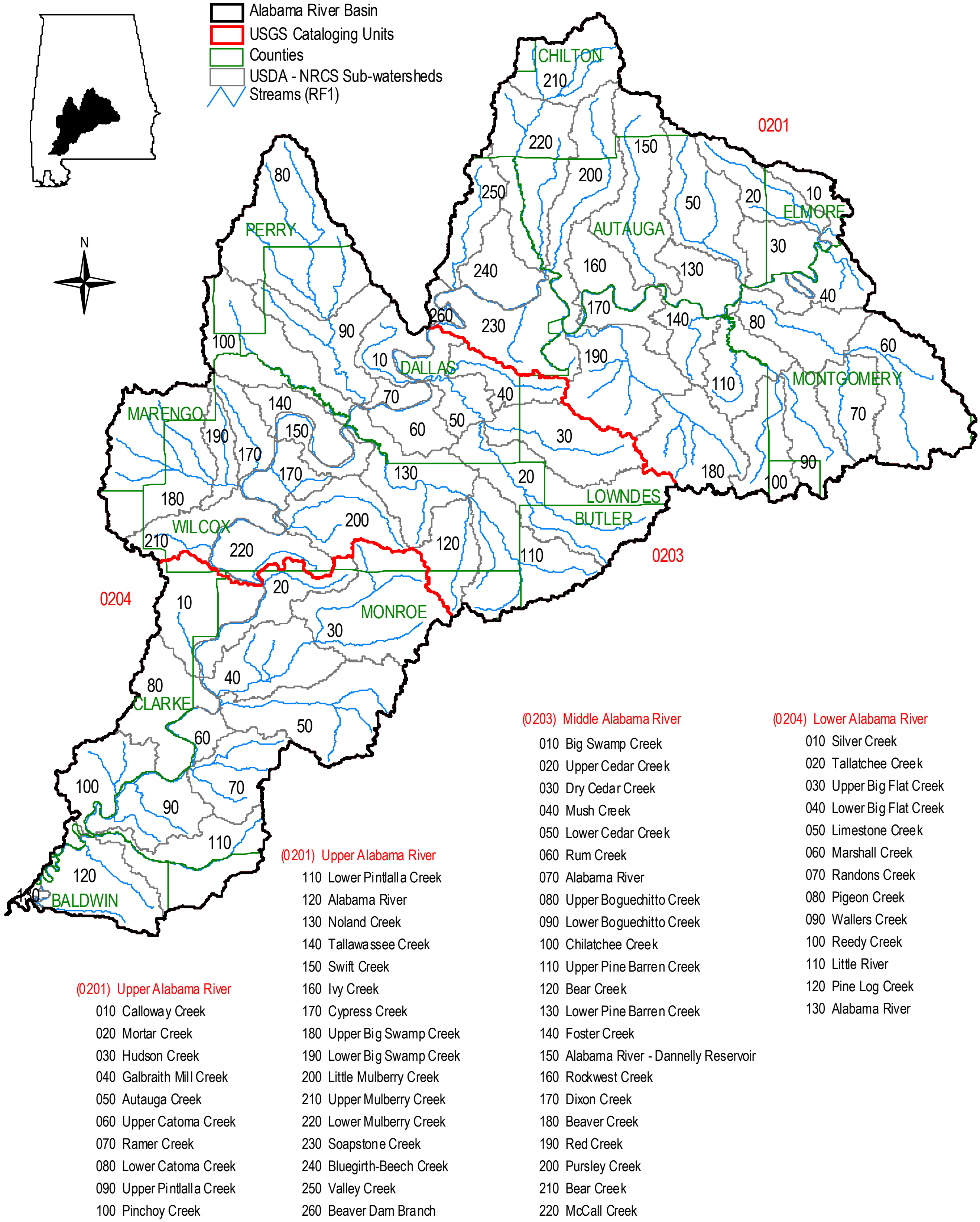

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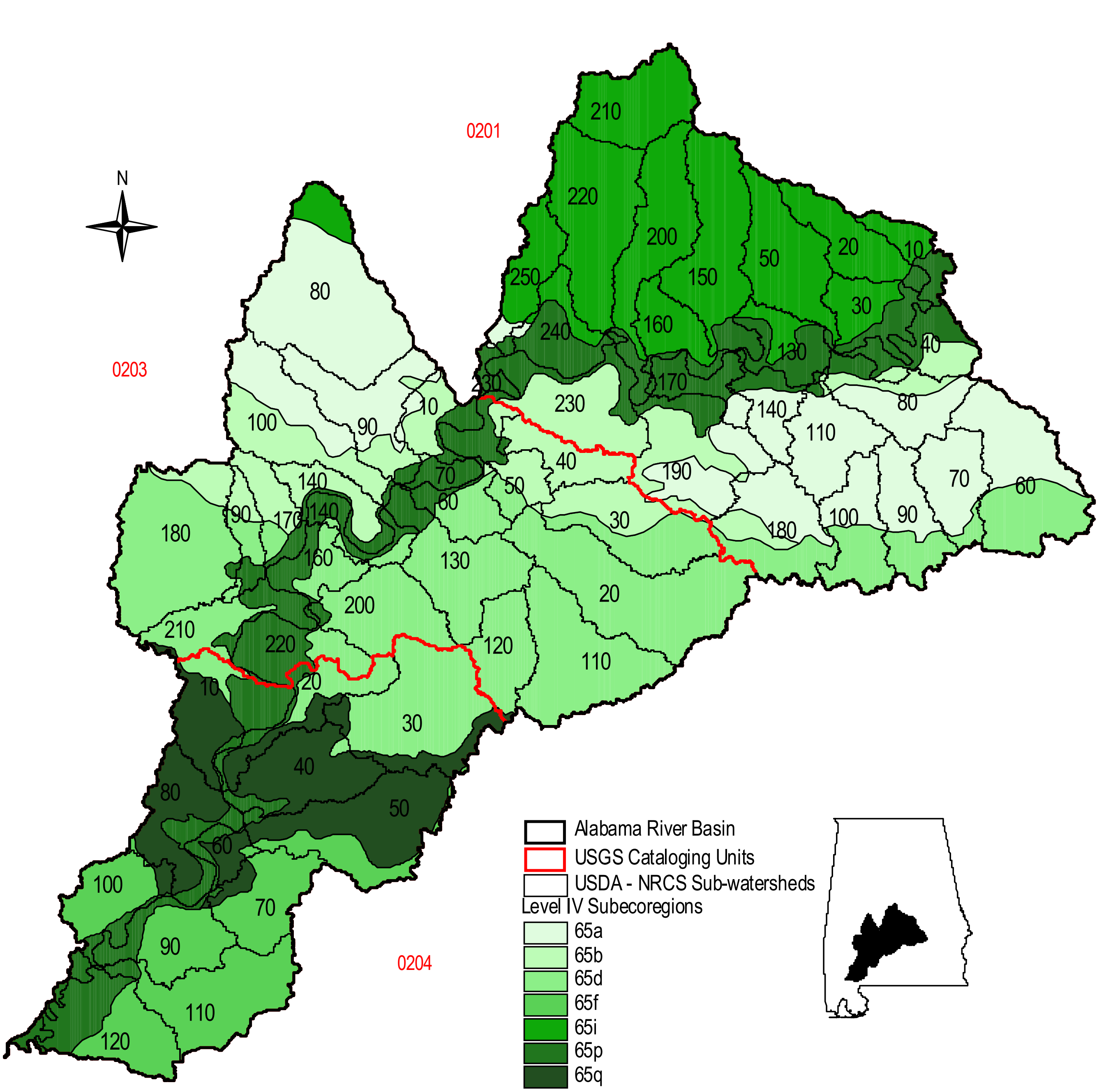
Figure 2. Level III and IV Ecoregions of the Alabama River Basin (Griffith et al. 2001).



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Most of the soils in the *Coastal Plain* are derived from marine and fluvial sediments eroded from the Appalachian and Piedmont plateaus. The Alabama basin drains both *Upper* and *Lower Coastal Plain* soils. Smithdale, Luverne and Savannah soils are extensive in the *Upper Coastal Plains*. They have either loamy or clayey sub-soils and sandy loam or loam surface layers. Savannah soils have a fragipan. Within this basin, topography is generally level with cultivated terraces. Most of the area is forested, with elevations ranging from 200 to 500 feet. Smithdale and Ruston soils are very extensive in the western part of the *Lower Coastal Plain*. These soils have loamy subsoils and sandy loam surface layers. Most slopes are less than 10%. Elevations range from sea level to 500 feet. (ACES 1997)

The soils of the *Major Flood Plains and Terraces* are not extensive but important where they are found along the major streams and rivers throughout the Alabama River basin. They are derived from alluvium deposited by the streams. The Cahaba, Annemaine, and Urbo series represent major soils of this area. A typical area consists of cultivated crops on the nearly level terraces and bottomland hardwood forests on the floodplain of streams. (NRCS 1997)

Review of Available Data

The use of available data was an important component of the ACT basinwide screening assessment because it allowed ADEM to concentrate efforts in those areas where recent data were not available. Chemical, habitat, and biological data from other projects were used to supplement data collected during the ACT Basin NPS Screening Assessment. However, water quality data and information can range from casual observations to intensive water chemistry, biological, and physical characterization. To use existing data to accurately assess conditions within a sub-watershed, it is important to understand the objectives of these projects.

During 2000, ADEM identified two levels of waterbody assessments: monitored and evaluated (ADEM 2000h). When information such as observed conditions, limited water quality data, water quality data older than 5 years, or estimated impacts from observed or suspected activities are used as the basis for the assessment, the assessment is generally referred to as “evaluated”. Evaluated assessments usually require the use of some degree of professional judgement by the person making the assessment. Monitored assessments are based on chemical, physical, and/or biological data collected using commonly accepted and well-documented methods. There is a higher level of certainty associated with monitored assessments than with evaluated assessments.

Monitored assessments have been conducted in conjunction with ADEM’s Ecoregional Reference Site Program (Appendix F-1), State Parks Monitoring Project (Appendix F-2), §303(d) Waterbody Monitoring Program (Appendix F-3), the Catoma Creek Watershed Monitoring Project (Appendix F-4), ADEM’s Reservoir Monitoring Program (Appendix F-6), and the University Reservoir Tributary Nutrient Project (Appendix F-7). Evaluated assessments have been conducted in conjunction with ADEM’s ALAMAP Program (Appendix F-8), Ambient Trend Monitoring Program (Appendix F-9), and Clean Water Strategy Project (Appendix F-10). A summary of each project, including lead agency, project objectives, type of assessments conducted and data collected, and applicable quality assurance manuals is provided in the appendices.

Other data/information: ADEM's Departmental municipal, industrial, mining, and CAFO databases were reviewed to rule out sub-watersheds primarily impacted by point sources or monitored in conjunction with NPDES permits (ADEM 1999e, 2001d). Biological and chemical data were also reviewed to concentrate efforts of the ACT Basin Screening Assessment in areas that have not been recently assessed.

Landuse*:* Estimates of landuse percentages, animal populations, and sedimentation rates were obtained from information provided to ADEM by the Alabama Soil and Water Conservation Committee (ASWCC) and local Soil and Water Conservation Districts (SWCD). This information was provided on Conservation Assessment Worksheets completed in 1998 (FY97 CWA § 319 Workplan Project #4). Additional landuse information was obtained from estimates of percent land cover for the entire southeastern U.S. published by EPA (EPA 1997a). These estimates were based on leaves-off Landsat TM data acquired in 1988, 1990, 1991, 1992, and 1993. Recent ground-truthing of these estimates have indicated 58% accuracy due to a decrease in agricultural use and an increase in plantation pine in some areas of Alabama within the last 10 years (Pitt 2000). Use of these estimates to locate least-impaired ecoregional reference sites in Georgia has indicated an accuracy of 40-60% (Olson and Gore 2000). Therefore, only the conservation assessment worksheets were used to evaluate potential for impairment from nonpoint sources. A comparison of landuse estimates from the conservation assessment worksheets and the EPA Landsat data is provided in Tables 5a through 5c. The finer landuse categories defined by the EPA landuse dataset are provided in Appendices A-1a through A-1c. Descriptions of the Landsat TM data are provided in Appendix A-2.

Animal population estimates*:* The potential NPS impairment from activities associated with animal husbandry was assessed. The impairment potential among the different animal types was standardized by converting animal populations into animal units (AU). Animal unit estimates were calculated for each of the animal types based on the current conversion factors found in ADEM Administrative Code Chapter 335-6-7 (Table 1). These values considered characteristics such as live weight equivalent waste quantity and constituent composition (limiting nutrients, moisture, additive compounds, etc.) (ADEM 1999b). AU estimates for each animal type were further standardized by converting to animal unit densities (AU/acre of sub-watershed).

Table 1. Current conversion factors found in ADEM Administrative Code Chapter 335-6-7 (CAFO Program Rules).

Animal Type (CAFO Definition)	Numbers of Animals	Animal Units (AU)
Cattle (slaughter, feeder, dairy heifers)	1	1.0
Dairy (mature)	1	1.4
Swine (>55 lbs)	1	0.4
Poultry (Broiler & Layer)	125	1.0

Forestry practices: Where the information was available, 3 categories were added to assess the potential for impairment from forestry practices: percent acres clear-cut, percent of acres harvested annually, and percent of forest needing improvement. This information was provided by the local SWCD and the Alabama Forestry Association.

Urban nonpoint sources: Percent urban land, number of current construction/stormwater authorizations, and number of failing septic systems were used to identify sub-watersheds potentially impaired by urban landuses.

Nonpoint Source Impairment Potential and Sub-watershed Ranking

For each sub-watershed and CU, potential for nonpoint source impairment was estimated for several categories: animal husbandry, row crops, pasture runoff, mining, forestry practices, and sedimentation. Each sub-watershed was assigned an impairment potential for each category. Table 2 shows the range of values used to define low, moderate, and high impairment potential for each category. These ranges were determined using the mean and standard deviation of ACT data for each parameter. A value of less-than-or-equal-to the calculated mean was assigned a *low* potential. Values greater than the mean, but equal-to-or-less-than two-standard deviations above the mean were assigned a *moderate* potential and values greater than two-standard deviations above the mean were assigned a *high* potential for NPS impairment. The potential for impairment from forestry activities was estimated by summing the percent of acres clear-cut, percent of acres harvested annually, and percent of forest in need of improvement.

For each sub-watershed and CU, the impairment potential for each category was converted from low, moderate, and high to scores of 1, 3, and 5, respectively. These values were summed to rate overall NPS impairment potential. Scores greater than or equal to the 90th percentile were rated as *high*; scores greater than the 50^{th} percentile, but less than the 90^{th} percentile were *moderate*; scores less than the 50^{th} percentile were *low*. In addition, sub-watersheds and CUs that scored in the *low* range, but received a *moderate* rating in at least one category were rated as *moderate* for overall NPS potential. Sub-watersheds and CUs that scored in the *moderate* range, but received a *high* rating in at least two categories were rated as *high* for overall NPS potential.

High ranked sub-watersheds also having a *high* non-rural NPS potential were further evaluated to determine the probable source location in relation to potential assessment sites. Any sub-watershed containing a CWA §303(d) segment or assigned a *high* potential in any category were ranked highest on the impairment potential list, regardless of its overall impairment potential status. The “non-rural” and “other” NPS categories were used as indicators of potential problems in the watersheds but were not addressed in this project. The 1998 SWCD Conservation Assessment information was used to compile the rural NPS categories.

Table 2. Range of values used to define “low”, “moderate”, and high potential for impairment for each nonpoint source category.

Category	**Impairment Potential**		
Rural NPS Categories	**Low**	**Moderate**	**High**
Cropland Landuse (highest rating)			
% Cropland	<7	7 to 23	>23
% of Acres where Pesticides used	<8	8 to 33	>33
% Pastureland	<14	14 to 38	>38
% Mining	<0.3	0.3 to 2.1	>2.1
% Forestry Activities	<17	17 to 42	>42
% of Acres Clear Cut	<2.0	2.0 to 5.5	>5.5
% of Acres Harvested Annually	<4	4 to 11	>11
% of Forest Needing Improvement	<13	13 to 41	>41
Animal Units per Acre	<0.12	0.12 to 0.56	>0.56
% Aquaculture (Acres/Acre)	<0.2	0.2 to 2.6	>2.6
Sedimentation rate (tons/acre/yr)	<4.0	4.0-17.0	>17.0
Overall NPS Impairment	**<11**	**11-14**	**>14**

Table 3. Range of values used to define “low’, “moderate”, and “high” potential for impairment for each urban or point source category.

Category	Impairment Potential		
Urban NPS Categories	Low	Moderate	High
% Urban	<4	4 to 23	>23
Development (highest rating)			
# constr./strmwater author. (CSA)	<5	5 to 21	>21
# CSA/acre of sub-watershed	<0.11	0.11 to 0.47	>0.47
# Septic Tanks failing per acres	<0.003	0.003 to 0.011	>0.011

The ACT basins may not be applicable to water quality conditions and activities in other basins of Alabama. These categories and ranges are intended to be descriptive, but are open to differing interpretations considering alternative data analysis techniques and are subject to refinement as data availability and analysis warrants.

The local SWCDs also evaluated the streams for each of the sub-watersheds located in their respective counties. These evaluations were discussed during public meetings and were used to rank the sub-watersheds as to their perceived priority for conducting water quality improvement projects. The 1st priority was given to the sub-watershed with the greatest need. A single sub-watershed may have more than 1 priority if 2 or more of the counties containing the sub-watershed gave it a top-five priority ranking. This information was used to supplement the sub-watershed estimates of NPS impairment potential.

Site Selection

NPS impairment potential estimates were used to rank the sub-watersheds for the ACT basins. Additional review of municipal, industrial and mining permit tracking databases were used to identify those sub-watersheds most impaired by point sources. Approximately 10 sub-watersheds were chosen from each of the 3 basins (~30 total) to select candidate assessment sites and conduct field reconnaissance. Where possible, assessment sites were located in relatively small drainages to relate water quality to specific nonpoint sources and to compare results to ADEM's network of least-impacted reference sites.

Habitat Assessment

In the absence of water quality impairment, aquatic biological condition of the fish and macroinvertebrate communities is generally correlated with the quality of available habitat. The presence of stable and diverse habitat generally supports a diverse and healthy aquatic fauna (Barbour and Stribling 1991, Barbour and Stribling 1994). Therefore, habitat quality was assessed at each site to evaluate stream condition and to assist in the interpretation of biological data. Primary, secondary, and tertiary habitat parameters were evaluated. Primary habitat parameters evaluate the availability and quality of substrate and instream cover. They include those characteristics that directly support aquatic communities, such as substrate type and stability, and availability. Secondary habitat parameters evaluate channel morphology, which is determined by flow regime, local geology, land surface form, soil, and human activities. Channel morphology indirectly affects the biological communities by affecting sediment movement through a stream (Barbour and Stribling 1991). Secondary habitat parameters include an evaluation of flow regime, sinuosity/ instream geomorphology, and sediment deposition and scouring. Tertiary habitat characteristics evaluate bank structure and riparian vegetation. Bank and riparian vegetation prevent bank erosion and protect the stream from stormwater runoff from impervious surfaces. The presence of overhanging riparian vegetation also determines the primary energy source for aquatic macroinvertebrate communities—the base of the fish food chain (Vannote et al. 1980). Tertiary parameters include bank condition, bank vegetative protection, and riparian zone width.

The EPA has published 2 versions of stream habitat assessment forms to evaluate primary, secondary, and tertiary habitat parameters (Plafkin et al. 1989, Barbour et al. 1999). ADEM used the original habitat assessment form from 1989 through 1996. The EPA published revised habitat assessment forms that evaluated riffle/run (Appendix B-1) and glide/pool (Appendix B-2) streams separately (EPA 1997b). The primary habitat parameters of the glide/pool habitat assessment emphasize characteristics important to this stream-type, primarily pool structure and variability. The ADEM began using the revised forms in 1996 because they assess habitat quality and degradation to the glide/pool streams of south Alabama more accurately (ADEM 1999f). In addition, because they measure impairment to habitat quality, the scores (converted into percent of maximum score) were comparable between stream types and can be used to evaluate streams throughout the basin. At each site, all field personnel completed a riffle/run or glide/pool habitat assessment. The scores were averaged to obtain a final habitat assessment score. One physical characterization sheet was filled out at each station (Appendix C).

Aquatic Macroinvertebrate Assessment: Multi-habitat EPT Method

A three-member team conducted the ADEM's Multihabitat EPT screening method at 107 sites within the 3 basins. At each station, basic field parameters were measured and a stream flow was estimated using an abbreviated cross-section flow measurement technique of 6-10 measurements (ADEM 1999f). A Global Positioning System (GPS) Unit was used to determine the latitude and longitude of each station (if possible).

The Multihabitat EPT (MB-EPT) method is used in watershed screening assessment studies, which entail assessments at multiple sites over a large area. The MB-EPT decreases collection effort and analysis time by processing the samples in the field and focusing on the collection of the pollution-sensitive Ephemeroptera, Plecoptera, and Trichoptera (EPT) taxa. This method was used to prioritize sub-watersheds most impaired by NPS pollution. Once priority sub-watersheds are identified, more extensive monitoring efforts are needed to document and assess trends in water quality after BMP implementation.

Collect samples from multiple habitats: The productive habitats at a site will differ naturally between upland streams and Coastal Plain streams. Located above the Fall Line, upland streams are generally moderate-to-high gradient, "riffle-run" streams. Coastal Plain streams, located below the Fall Line, are usually low gradient, "glide-pool" streams, characterized by sandy substrates, a lack of riffle habitat, and meandering flows. All available habitats were sampled at each site. Habitats routinely sampled using this method include riffles, leaf packs, rootbanks, snags/logs and rocks, and sand.

Process samples in the field: After each habitat was sampled, the organic material was elutriated from the inorganic material. The inorganic material was visually inspected for organisms (esp. Trichoptera in stone cases). The organic matter was washed down, and large debris was visually inspected and removed.

***Collect pollution-sensitive taxa*:** Representative "EPT" organisms were removed from the sample and preserved in a pre-labeled vial by habitat. The vials for each station were returned to the lab in a Nalgene container labeled with the station number, date and time collected, the names of the habitats collected at the station, and the initials of the team member who processed the sample. The organisms were identified to family level in the laboratory.

Field QA/QC procedures: At 10% of the field-picked stations, the debris remaining from all habitats was preserved in a wide-mouth container and returned to the laboratory to verify the removal of all EPT taxa and calculate the accuracy of the field method.

Laboratory QA/QC procedures: Laboratory identifications for 10% of macroinvertebrate samples were verified by a second qualified biologist. All data entered in the aquatic macroinvertebrate mainframe Pace database are verified for accuracy. Ten percent of all metric calculations completed by the database are hand calculated to document accuracy.

Data analysis: The total number of pollution-sensitive EPT families collected from each station was compared to EPT Index data collected from least-impaired ecoregional reference sites to evaluate the health of each stream reach (ADEM 2000a). Each site was assessed as *excellent*, *good*, *fair*, or *poor* based on the number of pollution-sensitive EPT families collected (ADEM 1999g).

Fish IBI Assessment

Site selection: Fish IBI assessments were completed July 6th through July 20th of 2000. Personnel from the AAU completed fish community Index of Biotic Integrity (IBI) assessments at 9 stations throughout the Upper, Middle, and Lower Alabama River CUs. Fish IBI assessments were conducted if impairment from sedimentation or habitat degradation was suspected or if aquatic macroinvertebrate assessment bordered between two impairment categories.

Sample collection: The fish IBI assessment developed by the GSA was used to evaluate water quality at 34 stations throughout the ACT basins. The methods summarized here are described in more detail in O'Neil and Shepard (1998). They are currently being incorporated into the ADEM's Fish Community Assessment standard operating procedures manual. Additional information pertaining to metrics testing and criteria development is included in these sources.

At each station, one three-person team conducted a timed, multi-habitat assessment of the fish community, sampling all available habitats including riffles, pools, runs, snags, and undercut banks. Small streams were sampled for 30 minutes while larger streams were sampled for 1 hour. Nylon minnow seines (1/8 to 3/16-inch mesh) and a portable backpack shocking unit were used to sample all habitat areas.

In the field, collected specimens were fixed in 10 to 20% formalin and preserved in 70% ethanol, sorted to species, measured, and weighed to the nearest gram. A field sheet was completed at each site. In the laboratory, results were converted into the number of fish collected per hour to calculate indices of biotic integrity.

Fish IBI metrics: Twelve metrics are used to evaluate species richness and composition, trophic composition, and fish abundance and condition (O'Neil and Shepard 1998). Assessment criteria for each metric, developed specifically for upland and coastal streams within the Black Warrior and Cahaba River basins, have been applied statewide because data from other basins were insufficient to refine scoring criteria. As the available dataset increases in size the method will be refined for each of the State's basins.

Chemical Assessment

Table 4 lists the analysis method and detection limits for parameters analyzed by ADEM in conjunction with its monitoring programs. During the ACT Basin Screening Assessment, chemical parameters were used as indicators of NPS impairment including sedimentation (total suspended solids, total dissolved solids), nutrient enrichment (total phosphorus, nitrate/nitrite, BOD-5), agricultural impacts (pesticide scan), and mining impacts (iron, manganese).

Stream flow estimates, routine field parameters, and water quality samples were collected at each of the stations in September of 2000. Chemical analyses of water samples were conducted by ADEM's Central Laboratory in Montgomery. Water quality samples for laboratory analysis were collected, preserved, and transported to ADEM's

Laboratory as described in ADEM Field Operations Standard Operating Procedures and Quality Control Assurance Manual, Volume I - Physical/Chemical (2000f). Laboratory analyses were conducted in accordance with ADEM's Quality Assurance Manual for the Alabama Department of Environmental Management Central Laboratory (ADEM 1999i).

Duplicate field parameters and samples were collected during 10% of the sampling events. Water quality samples and routine field parameters were collected in conjunction with several other studies conducted or funded by ADEM (Appendix F). Water quality parameters were assessed as *exceeding* or *not exceeding* background levels as defined by the 95th percentile of ADEM's current database of least-impaired ecoregional reference sites.

Chain of Custody

Sample handling and chain-of-custody procedures were used for all biological and chemical samples as outlined in ADEM Field Operations Standard Operating Procedures and Quality Control Assurance Manual, Volumes I and II to ensure the integrity of all samples collected (1999f, 2000f).

Final Assessment and Ranking of Sub-watersheds

Although the phases of this project resulted in a fully integrated assessment of the ACT basins, biological, habitat, and chemical assessments were weighted differently in ranking and prioritizing sub-watersheds. Monitoring changes in biological communities, which respond to stresses of various degrees over time, can detect impairment caused by infrequent or low-level NPS pollution. The results of fish and aquatic macroinvertebrate assessments were therefore used to identify priority sub-watersheds. Landuse patterns, habitat condition, chemical water quality measurements, and Conservation Assessment Worksheet data were used to evaluate the cause(s) of impairment.

Macroinvertebrate or fish community assessments of *fair* or *poor* identified priority sub-watersheds. Sub-watersheds meeting these criteria but impaired primarily by point sources or urban runoff were not recommended as priority sub-watersheds for implementation of NPS controls.

Table 4. List of parameters analyzed by ADEM. Analysis method, reference, and detection limit are also listed.

Parameter	***Method***	***Reference***	***Detection Limit***
Air Temperature	Thermometer	ADEM SOP Vol. 1	1^oC
Water Temperature	Thermometer/Thermistor	ADEM SOP Vol. 1	1^oC
Dissolved Oxygen	Modified Winkler Membrane Electrode	ADEM SOP Vol. 1	0.1 mg/L
pH	Glass Electrode	ADEM SOP Vol. 1	0.1 su
Conductivity	Wheatstone Bridge	ADEM SOP Vol. 1	0.1
Turbidity	Nephelometer	ADEM SOP Vol. 1	0.1 NTU
Stream Flow	Modified Cross Sectional	ADEM SOP Vol. 1	0.1 cfs
5-day Biochemical Oxygen Demand (BOD-5)	EPA 405.1	EPA/600/4-79/020	0.1 mg/L
Alkalinity (Alk)	EPA 310.1	EPA/600/4-79/020	1 mg/L
Aluminum, Total (Al)	EPA 200.7	EPA/600/R-94/111	0.2 mg/L
Ammonia Nitrogen (NH_3)	EPA350.1	EPA/600/R-93/100	0.015 mg/L
Arsenic, Total (As)	EPA 206.2	EPA/600/4-79/020	10 ug/L
Cadmium, Total (Cd)	EPA 200.7	EPA/600/R-94/111	0.003 mg/L
Carbonaceous BOD-5 (CBOD-5)	EPA 405.1	EPA/600/4-79/020	0.1 mg/L
Chloride (Cl)	EPA 300.A EPA 325.1	EPA/600/R-93/100 EPA/600/4-79/020	0.5 mg/L
Chlorophyll a (Chlor a)	SM 10200H	APHA et al. 1992	$0.1\ mg/m^3$
Chromium, Total (Cr-T)	EPA 200.7	EPA/600/R-94/111	0.015 mg/L
Copper, Total (Cu)	EPA 200.7	EPA/600/R-94/111	0.02 mg/L
Fecal Coliform	Membrane Filter	ADEM SOP Vol. 6	---
Hardness	EPA 130.2 / SM2340B	EPA/600/4-79/020	1 mg/L
Hexavalent Chromium (Cr^{+6})	SM 3500CrD	APHA et al. 1992	0.02 mg/L
Iron, Total (Fe)	EPA 200.7	EPA/600/R-94/111	0.02 mg/L
Lead, Total (Pb)	EPA 239.2	EPA/600/4-79/020	2 ug/L
Magnesium, Total (Mg)	EPA 200.7 EPA 242.1	EPA/600/R-94/111 EPA/600/4-79/020	0.05 mg/L
Manganese, Total (Mn)	EPA 200.7	EPA/600/R-94/111	0.02 mg/L
Mercury, Total (Hg)	EPA 245.2 EPA 245.5	EPA/600/4-79/020 EPA/600/4-91/010	0.3 ug/L
Nickel, Total (Ni)	EPA 200.7	EPA/600/R-94/111	0.03 mg/L
Nitrate+Nitrite Nitrogen (NO_3+NO_2-N)	EPA 353.2	EPA/600/R-93/100	0.003 mg/L
Organochlorine Pesticides	SW 8081A	EPA 1994	---
Organophosphorus Pesticides	SW 8141	EPA 1994	---
Ortho-Phosphorus (Ortho-P)	EPA 365.3	EPA/600/4-79/020	0.004 mg/L
Selenium, Total (Se)	EPA 270.2	EPA/600/4-79/020	10 ug/L
Silver, Total (Ag)	EPA 200.7	EPA/600/R-94/111	0.01 mg/L
Total Dissolved Solids (TDS)	EPA 160.1	EPA/600/4-79/020	1 mg/L
Total Kjeldahl Nitrogen (TKN)	EPA 351.2	EPA/600/R-93/100	0.15 mg/L
Total Organic Carbon (TOC)	EPA 415.2		0.5 mg/L
Total Organic Nitrogen (TON)	TKN-NH_3	EPA 1994	0.2 mg/L
Total Phosphorus (Total P)	EPA 365.4	EPA/600/4-79/020	0.004 mg/L
Total Suspended Solids (TSS)	EPA 160.2	EPA/600/4-79/020	1 mg/L
Zinc, Total (Zn)	EPA 200.7	EPA/600/R-94/111	0.03 mg/L
Zinc, Total (Zn)	EPA 200.7	EPA/600/R-94/111	0.03 mg/L

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Alabama River Basin Summary

Landuse: Table R-1 summarizes SWCD estimates of percent land cover within the Upper, Middle, and Lower Alabama River CUs. Estimates of percent pasture and urban areas were highest in the Upper Alabama River CU. Estimates of percent forest were highest in the Lower Alabama River CU.

Table R-1. Estimates of percent land cover within the Upper, Middle, and Lower Alabama River CUs (ASWCC and SWCD 1998).

Cataloging Unit	Forest	Row crop	Pasture	Mining	Urban	Open Water	Other
Upper Alabama	53%	8%	26%	<1%	8%	2%	2%
Middle Alabama	71%	10%	16%	0%	1%	1%	1%
Lower Alabama	87%	8%	3%	0%	1%	<1%	<1%

NPS impairment potential: Results indicated more sub-watersheds at risk to NPS impairment in the Upper and Middle Alabama River CUs (Fig. 3). Impairment from forestry was a concern throughout the Alabama River basin (Fig 4). Crop (Fig 5) and pasture (Fig. 6) lands were potential sources of NPS impairment within the Upper and Middle Alabama River CUs. Animal husbandry (Fig. 7) and urban areas (Fig. 8) were also concerns within the Upper Alabama River CU.

***Historical data/studies*:** The majority of assessments conducted within the Alabama River basin and presented in this report were from 8 major projects conducted by ADEM. Data collected by Auburn University at Montgomery (Appendix F-7), CH2M-Hill (Appendix F-4a and F-4b), and the Montgomery Water and Water Board (Appendix F-4c) are also provided. Fig. 9 shows the location of historical sampling stations throughout the Alabama River basin.

Historical data included both monitored and evaluated assessments. Monitored assessments are based on chemical, physical, and/or biological data collected using commonly accepted and well-documented methods. Evaluated assessments are based on observed conditions, limited water quality data, water quality data older than 5 years, or estimated impacts from observed or suspected activities.

Results of monitored assessments were used in this report to assess habitat, biological, and chemical conditions within a sub-watershed. Monitored assessments were conducted during 7 projects (Table R-2). Evaluated assessments were conducted in conjunction with ADEM's ALAMAP Program (Appendix F-8), Ambient Trend Monitoring Program (Appendix F-9), and Clean Water Strategy Project (Appendix F-10). A summary of each project, including lead agency, project objectives, data collected, and applicable quality assurance manuals, is provided with the appropriate appendices.

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Figure 3. NPS impairment potential estimated for each sub-watershed in the Alabama Basin.

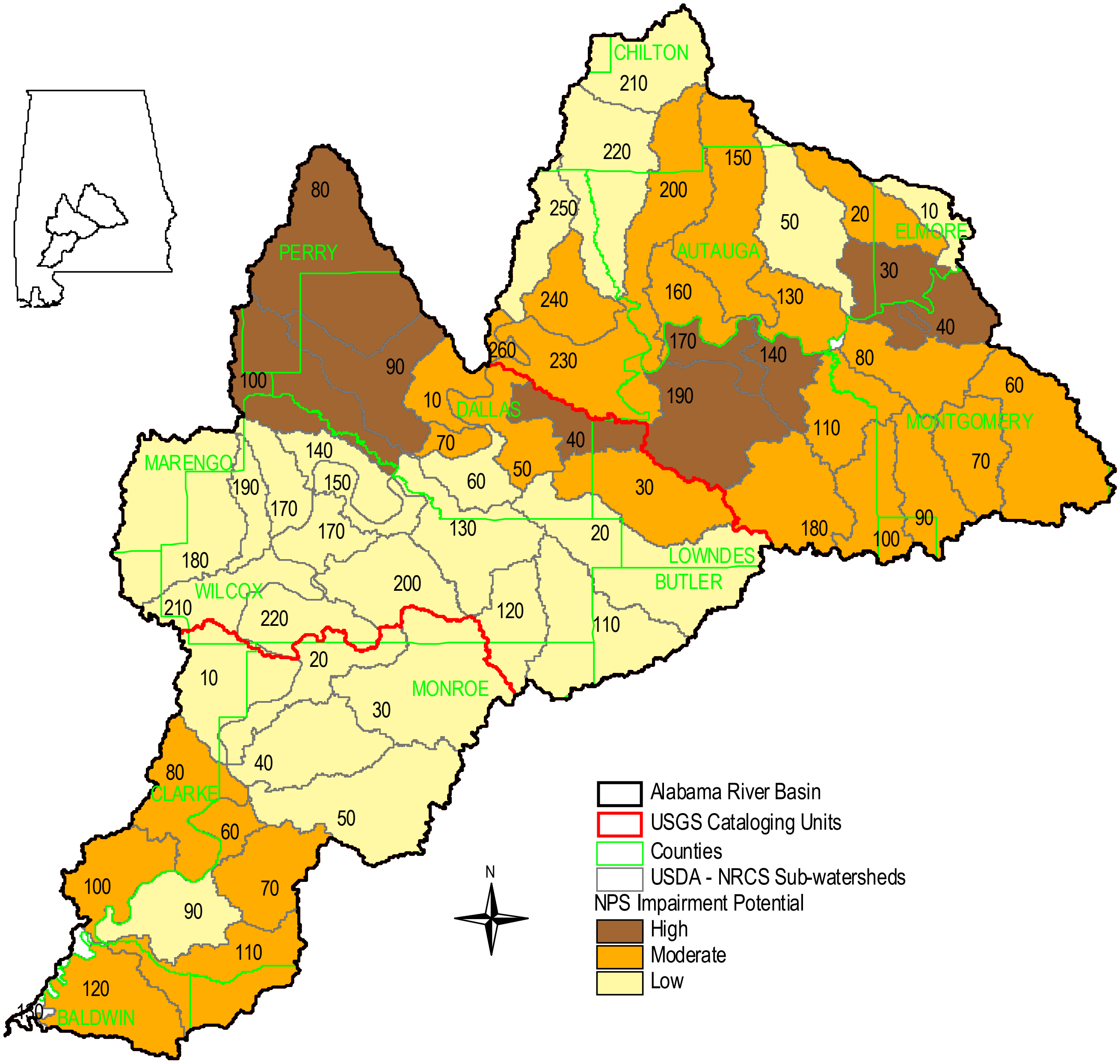

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Figure 4. The estimated potential for impairment associated forestry activities.

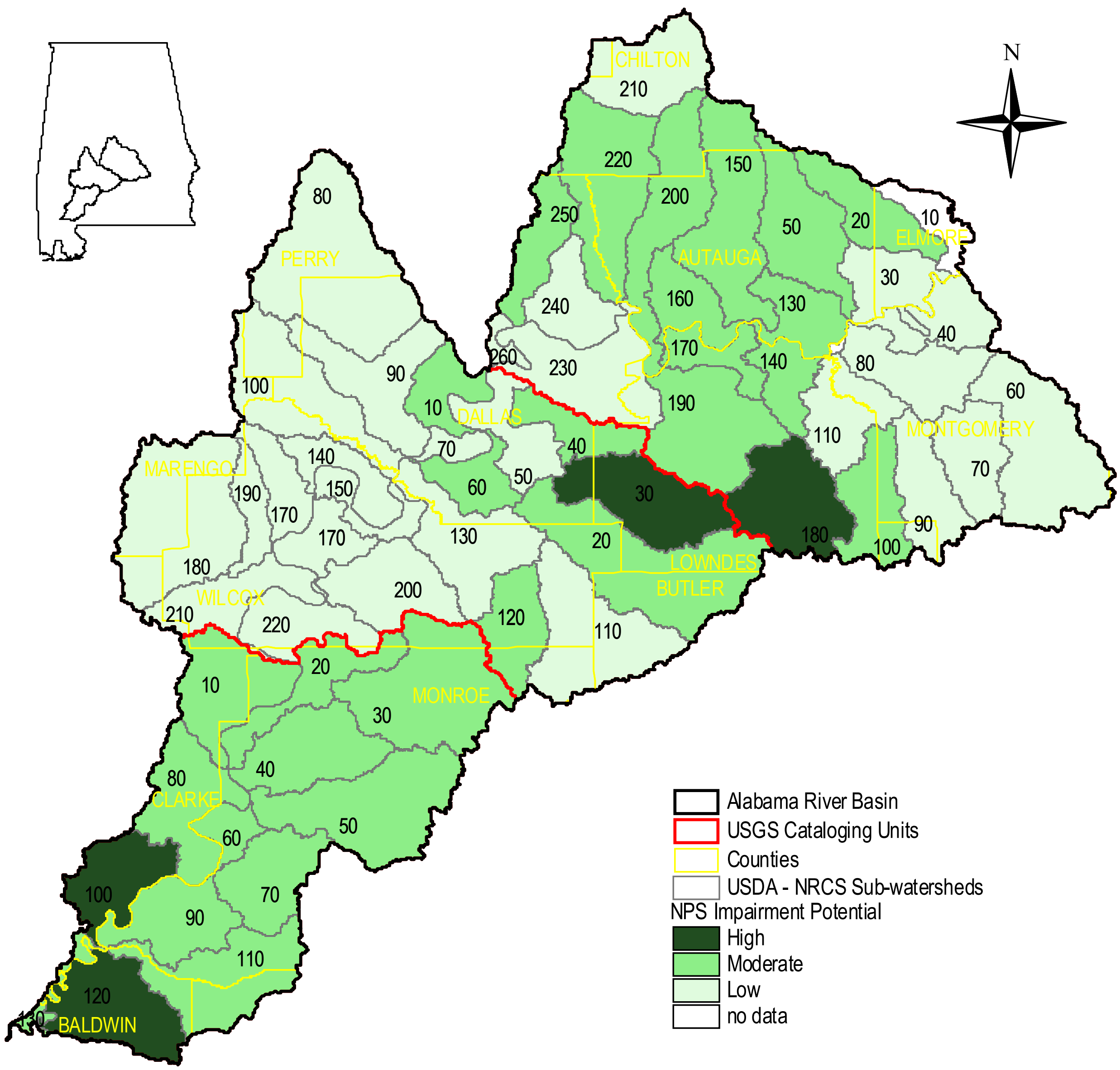

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Figure 5. The estimated potential for impairment from croplands.

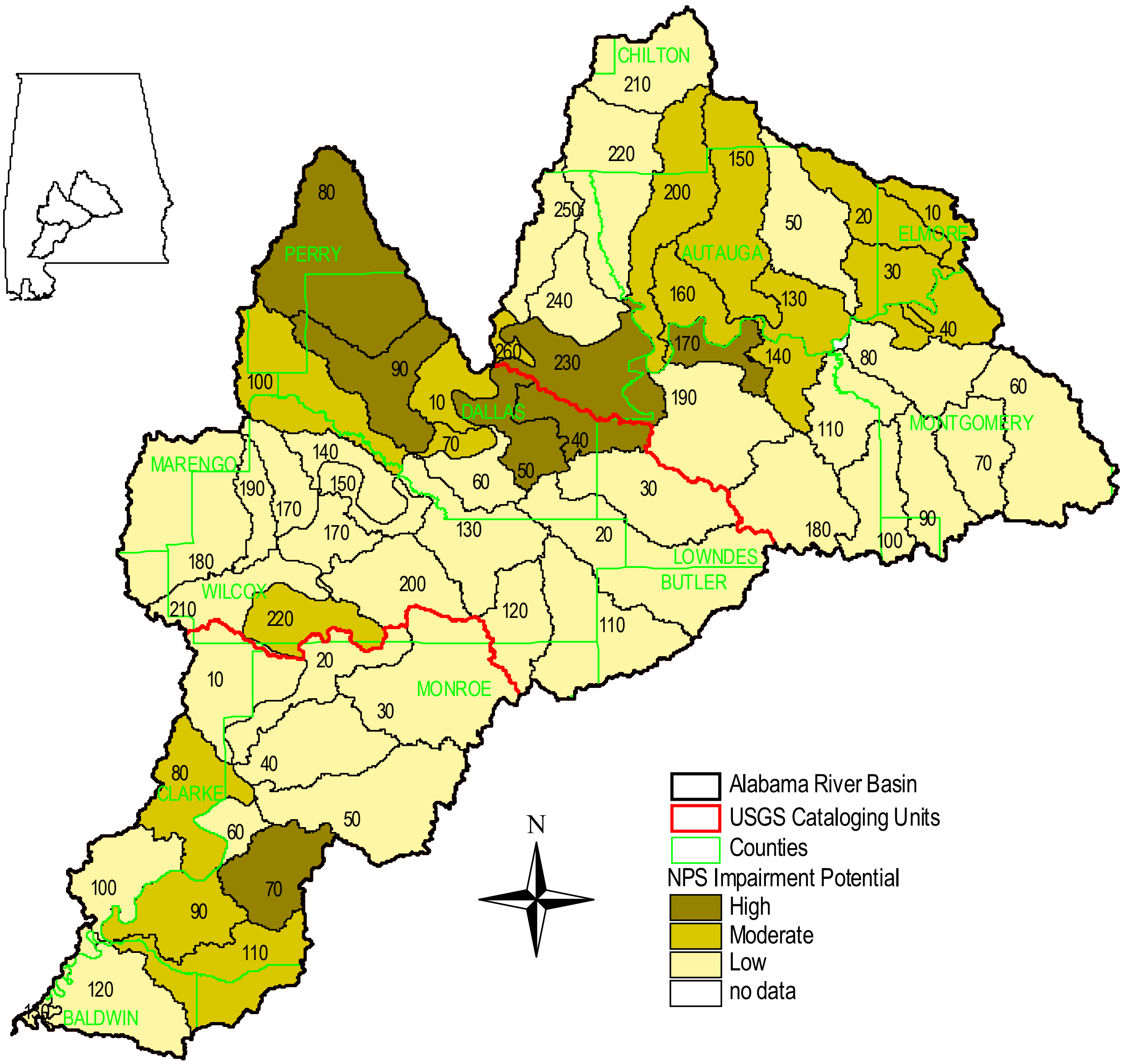

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Figure 6. The estimated potential for impairment from pasturelands.

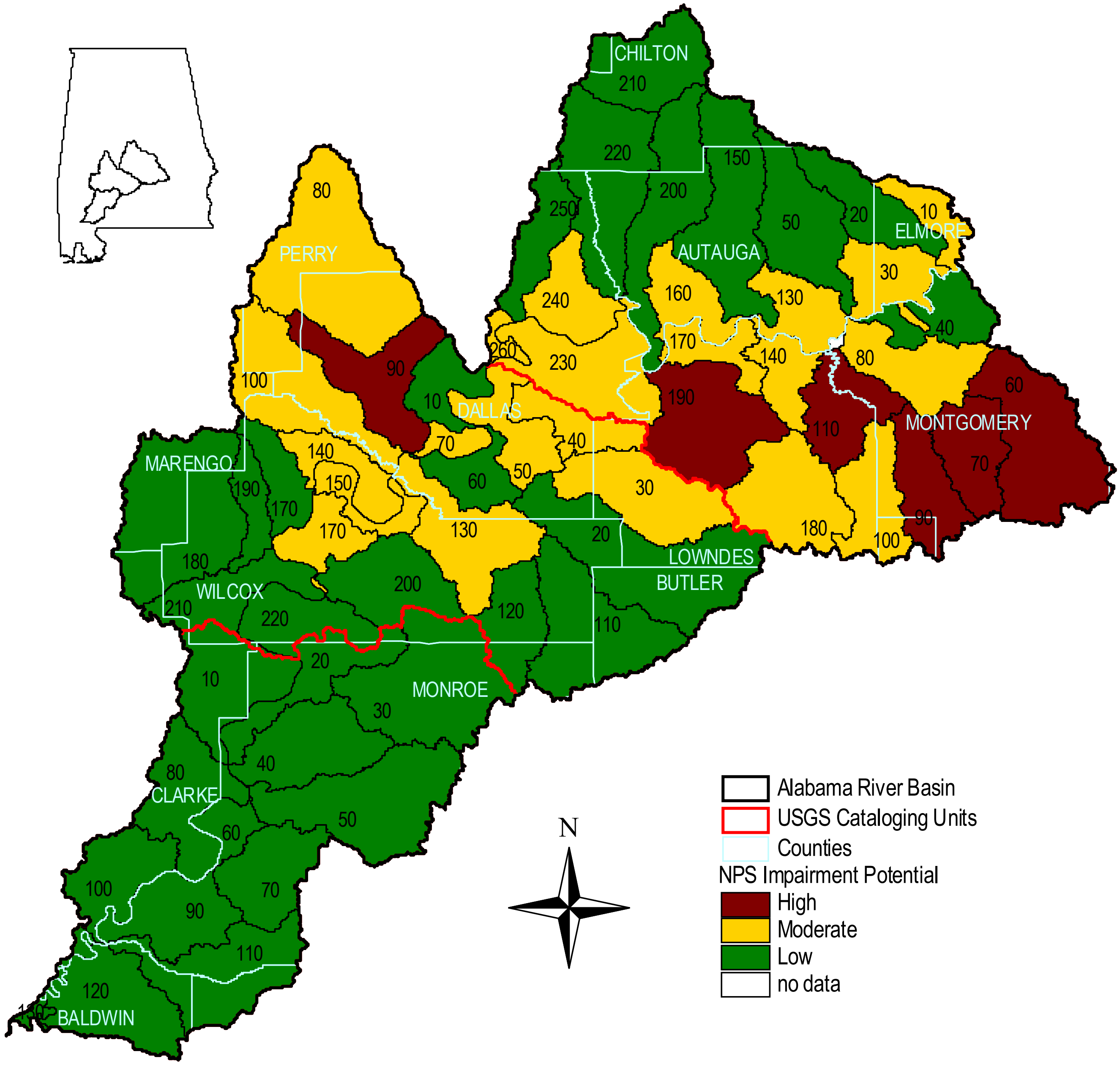

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Figure 7. The estimated potential for impairment from animal husbandry.

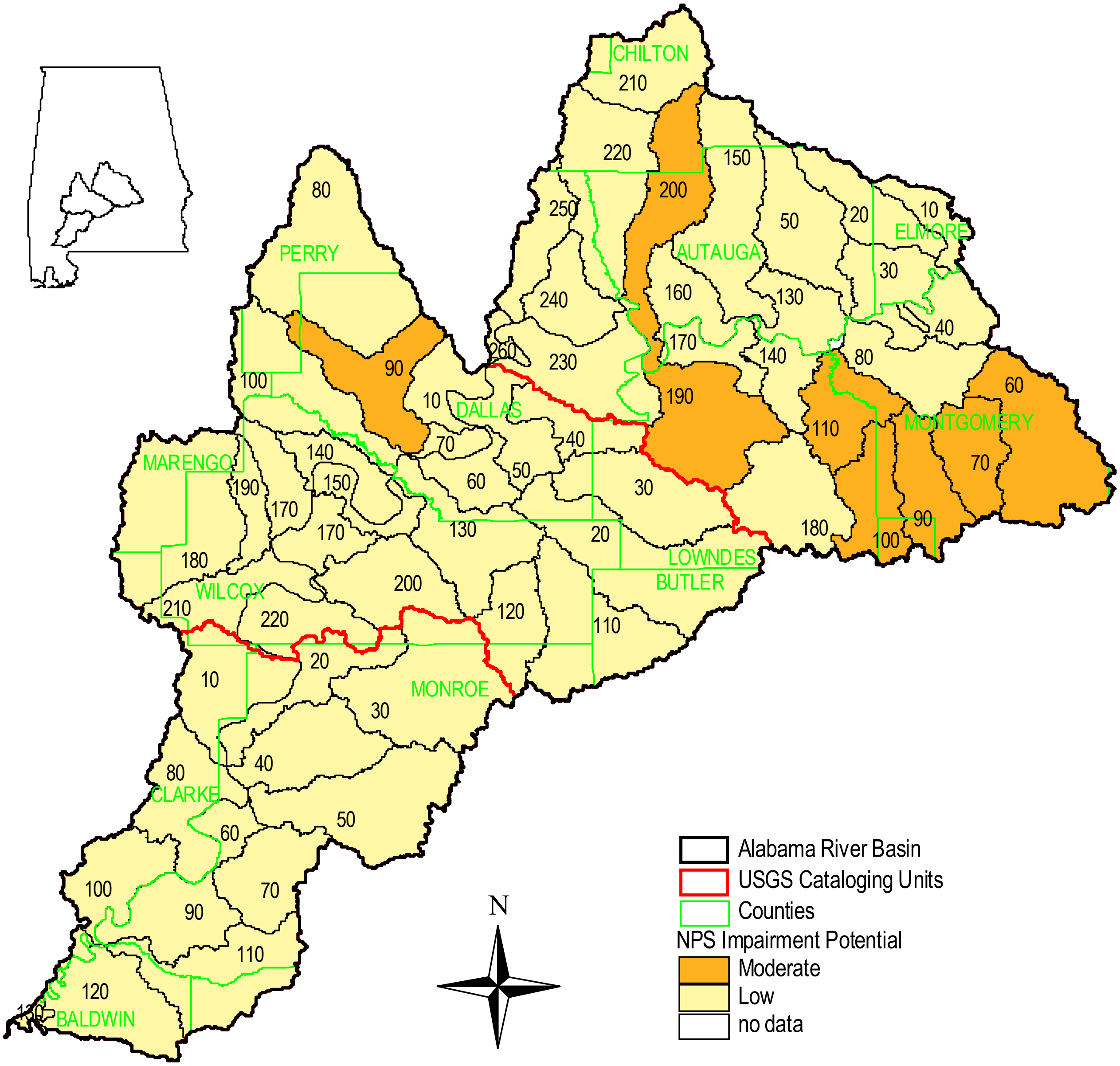

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Figure 8. The estimated potential for impairment from urban runoff.

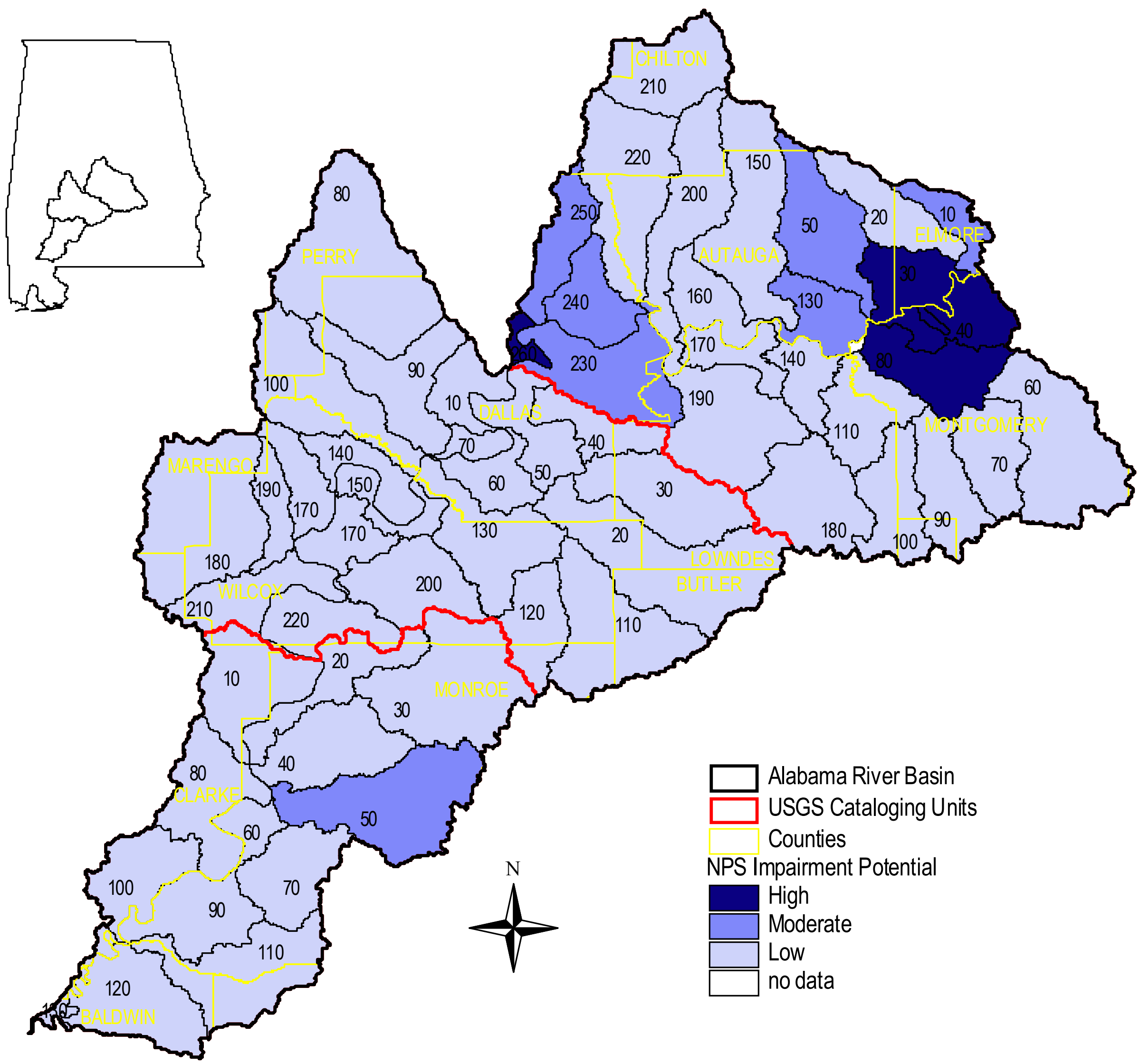

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Figure 9. Historical sampling locations established throughout the Alabama River basin.

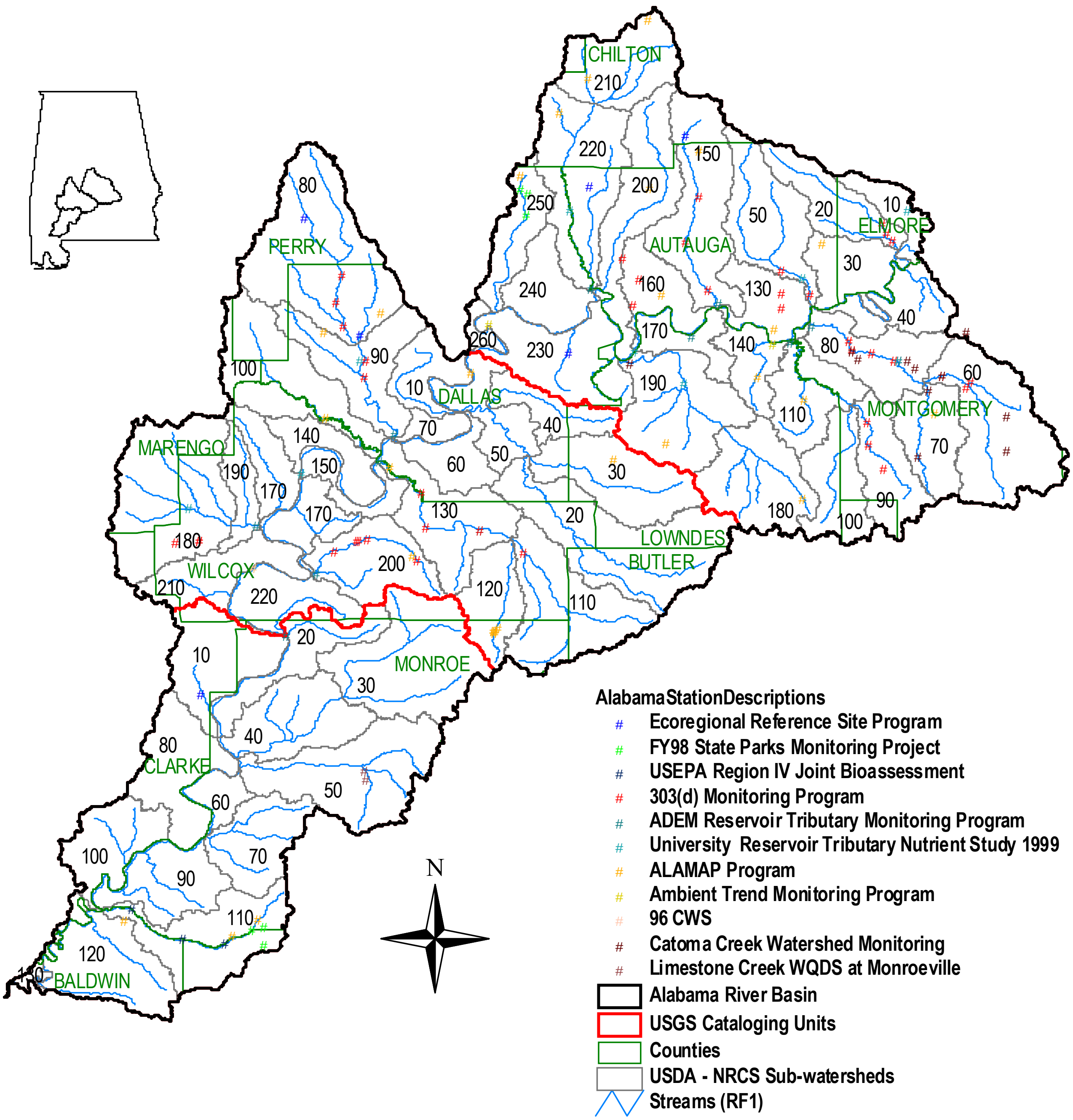

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Table R-2. Projects that have generated monitored assessment information.

Project	Appendix
ADEM's Ecoregional Reference Site Program	F-1
ADEM's State Parks Monitoring Project	F-2
ADEM's §303(d) Waterbody Monitoring Program	F-3
Catoma Creek Watershed Monitoring Project	F-4
ADEM's Special Studies	F-5
ADEM's Reservoir Monitoring Program	F-6
University Tributary Nutrient Project	F-7

Assessments conducted during the ACT Basin Screening Assessment: Sub-watersheds were selected for assessment during the screening assessment if recent monitoring data were not available, potential impacts from point sources or urban areas were minimal, and the potential for impairment from nonpoint sources was estimated as *moderate* or *high*. Because of the number of sub-watersheds located within the ACT basin group, some sub-watersheds meeting these criteria could not be monitored. Assessments were conducted in 12 sub-watersheds in the Alabama basin (Fig. 10).

***Sub-watershed summaries*:** Current and historical monitoring data were combined to provide a comprehensive assessment. A summary of information available for each of the 61 sub-watersheds is provided. The summaries are organized in 3 sections by CU. Each summary discusses landuse, NPS impairment potential, assessments conducted within the sub-watershed, and the NPS priority rating based on available data. The summaries point out significant data and reference appropriate tables and appendices. Assessment of habitat, biological, and chemical conditions are based on long-term data from ADEM's Ecoregional Reference Site Program (ADEM 1999g). Tables referenced in the summaries are located at the end of each summary section. Appendices are located at the end of the report.

Sub-watershed assessments: Habitat, chemical/physical, and biological indicators of water quality were monitored at 59 stations within 27 sub-watersheds. These data are summarized for the Upper (Table 10a), Middle (Table 10b), and Lower (Table 10c) Alabama River CUs. Habitat and macroinvertebrate assessments were conducted at each of the 59 stations. Fish IBI assessments were conducted at 19 of these stations. The overall condition for each station was rated as the lowest biological assessment result obtained. Thirty-three (56%) stations were assessed as *excellent* or *good*. Eighteen (30%) stations were assessed as *fair* and 8 (14%) stations were assessed as *poor* (Fig. 11).

***Priority sub-watersheds*:** Figure 11 shows the 10 priority sub-watersheds identified within the Alabama River Basin. Five (50%) were located within the Upper Alabama River CU, 3 (30%) in the Middle Alabama River CU, and 2 (20%) were located within the Lower Alabama River CU.

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Figure 10. Sampling locations chosen for assessment during the NPS Screening Assessment.

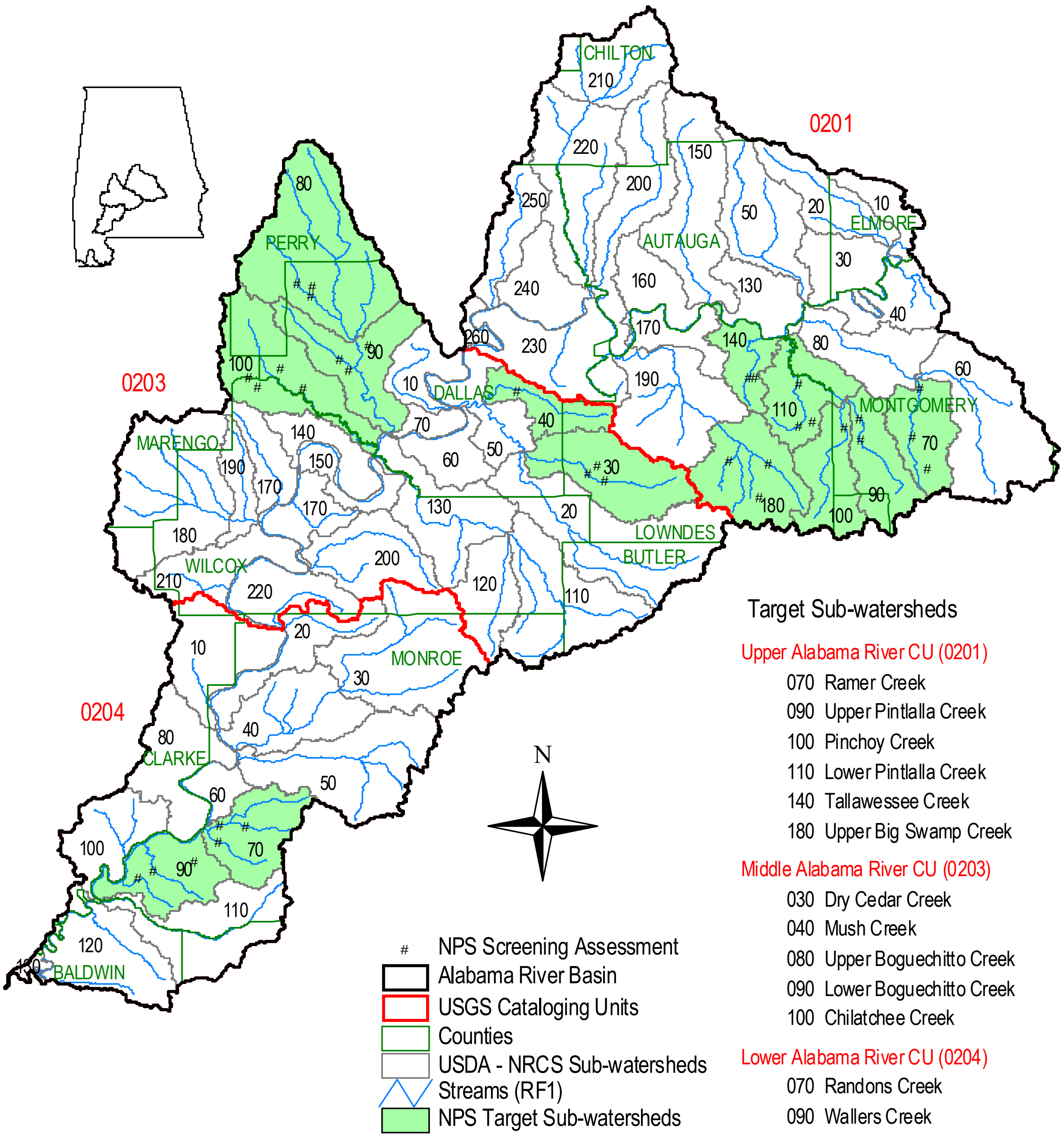

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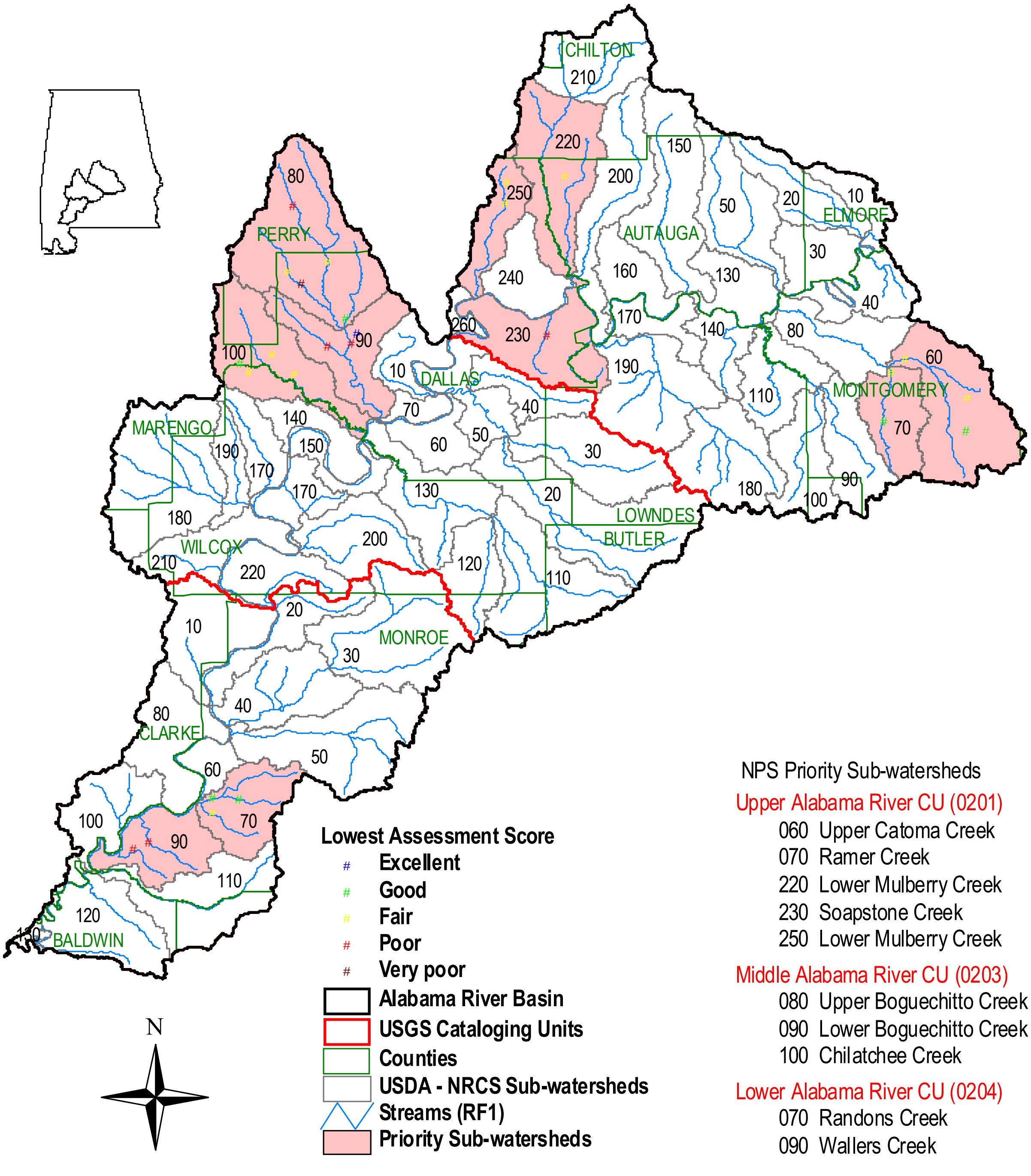
Figure 11. Location of priority sub-watersheds identified during the NPS Screening Assessment. Overall assessment of stations located in priority sub-watersheds are also indicated.



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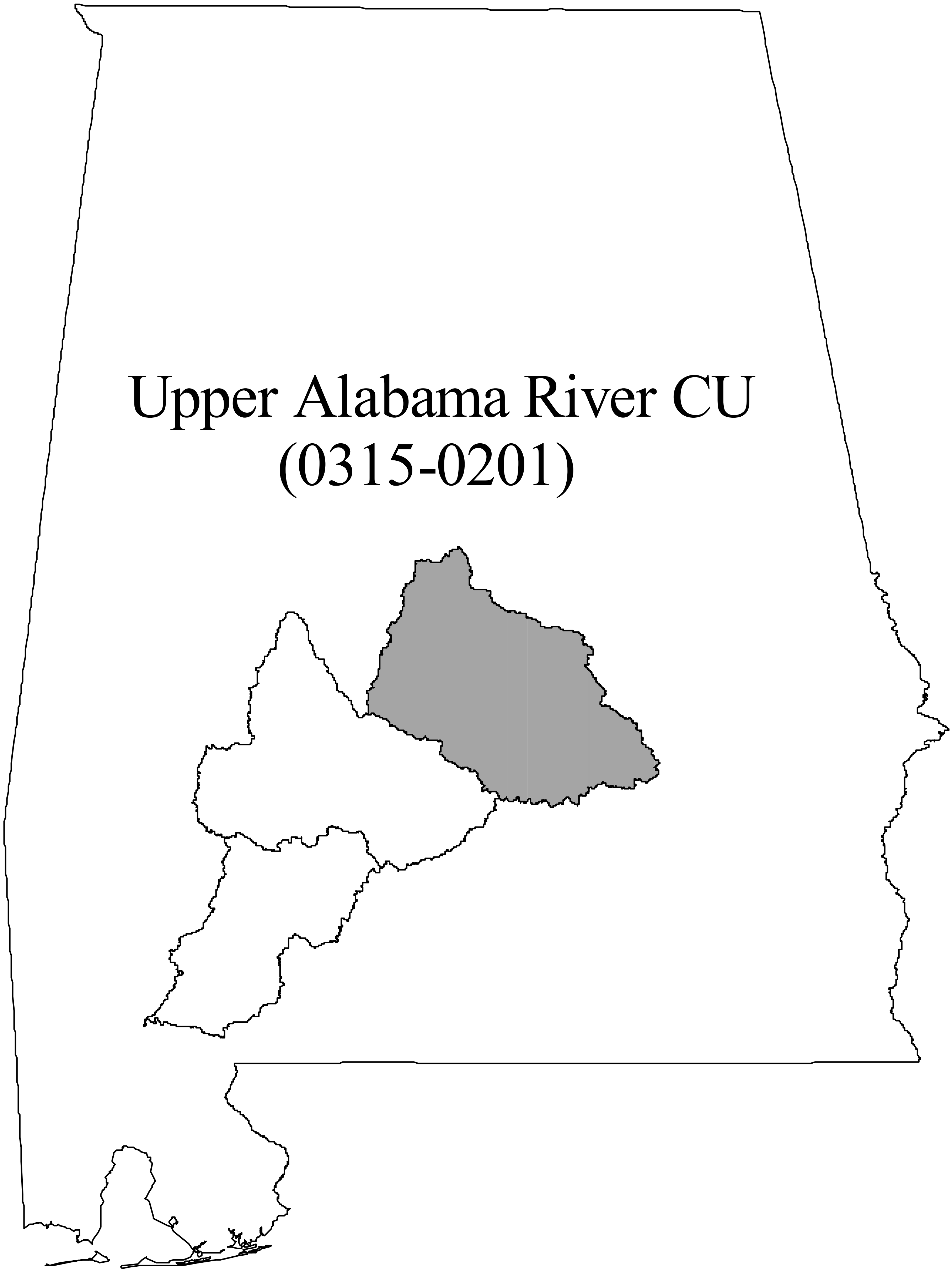
Upper Alabama River CU
(0315-0201)

Section I Summary: Upper Alabama River CU (0315-0201)

The Upper Alabama River CU contains 26 sub-watersheds located within central Alabama (Fig. 12). The CU drains approximately 2,396 square miles of the Coastal Plain, Major Floodplains and Terraces, and the Blackland Prairie soil areas (ACES 1997) and is located in 5 subecoregions of the Southeastern Plains Ecoregion (Fig. 2) (Griffith et al. 2001).

Landuse: Land cover within the Upper Alabama River CU was primarily forest mixed with pasture, cropland, and urban areas. Approximately 53,000 acres of crop and pastureland (3% of total area) were treated with pesticides and/or herbicides. A 23-mile section of Catoma Creek is currently on Alabama's draft 2000 §303(d) list of impaired waterbodies due to organic enrichment and low dissolved oxygen concentrations. Suspected sources of the impairment include urban runoff and pasture grazing (ADEM 2001b).

Percent land cover estimated by local SWCD (ASWCC 1998)

Forest	Row crop	Pasture	Mining	Urban	Open Water	Other
53%	8%	26%	<1%	8%	2%	2%

NPS impairment potential: The primary NPS concerns within the Upper Alabama River CU were pasture, forestry, row crops, and animal husbandry. A total of 20 sub-watersheds were estimated to have a *moderate* or *high* potential for impairment from nonpoint sources. However, 14 of these sub-watersheds also had a *moderate* or *high* potential for impairment from urban and point sources (Table 7a). Only 1 sub-watershed (210) had a *low* potential for impairment from both rural and urban nonpoint sources.

Number of sub-watersheds with (M)oderate or (H)igh ratings for each NPS category (Table 7a).

Category	Overall Potential	Animal husbandry	Aqua-culture	Row crop	Pasture	Mining	Forestry	Sediment
Moderate	15	7	0	10	12	3	12	3
High	5	0	0	2	5	1	1	1

Number of sub-watersheds with (M)oderate or (H)igh ratings for each point source category (Table 7a).

Category	% Urban	Development	Septic tank failure
Moderate	6	5	5
High	4	3	1

Historical data/studies: Table 8a lists the sub-watersheds and waterbodies in which data has been previously collected in conjunction with other monitoring programs. The appendices where the data are provided in this report are also listed. Recent assessment information has been collected from 20 of the 26 sub-watersheds. Fifteen of these sub-watersheds were estimated to have a *moderate* or *high* potential for impairment from nonpoint sources (Table 7a).

Assessments conducted during this project: Five sub-watersheds in the Upper Alabama River CU were targeted for assessment during this project because they had a *moderate* or *high* potential for impairment from nonpoint sources, *low* potential for impairment from urban or point sources, and relatively little recent assessment data (Table 8a). These included Ramer Creek (070), Upper Pintlalla Creek (090), Lower Pintlalla Creek (110), Tallawassee Creek (140), and Upper Big Swamp (180) sub-watersheds.

Sub-watershed summaries: Current and historical monitoring data were combined to provide a comprehensive assessment. A summary of the information available for each of the 26 sub-watersheds is provided. Each summary discusses landuse, NPS impairment potential, assessments conducted within the sub-watershed, and NPS priority rating based on available data. The summaries point out significant data and reference appropriate tables and appendices. Assessment of habitat, biological, and chemical conditions is based on long-term data from ADEM's Ecoregional Reference Site Program (ADEM 2000a). Tables referenced in the summaries are located at the end of the summary section. Appendices are located at the end of the report.

Sub-watershed assessments: Habitat, chemical/physical, and biological indicators of water quality were monitored in 15 sub-watersheds (Table 10a). Habitat quality was generally assessed as *excellent* or *good.* Macroinvertebrate assessments were conducted at 24 stations (Fig. 12a). Results of these assessments indicated the macroinvertebrate community to be in *excellent* condition at 4 (17%) stations, *good* condition at 12 (50%) stations, and *fair* condition at 6 (25%) stations. The macroinvertebrate community was assessed as *poor* at 2 (8%) stations. Results of fish IBI assessments conducted at 10 of these sites indicated the condition of the fish community to be *good* at 2 (20%) stations, *fair* at 6 (60%) stations, and *poor* at 2 (20%) stations (Fig. 12b). At 60% of the stations where the macroinvertebrate and fish communities were assessed, results of the fish IBI assessments indicated a higher degree of impairment.

Overall condition for each station was rated as the lowest assessment result obtained (Table 10a). Three (12%) and 9 (38%) stations were assessed as *excellent* and *good*, respectively. Nine (38%) stations were assessed as *fair* and 4 (17%) were assessed as *poor*. Of the 13 stations assessed as *fair* or *poor*, 5 were primarily impacted by urban sources. Flow regulation and modification may have affected water quality at 1 station. The remaining 7 stations were located in 5 sub-watersheds (Fig. 12c).

NPS priority sub-watersheds: Figure 12c shows the location of the 5 sub-watersheds recommended as priority sub-watersheds. These included Upper Catoma Creek (060), Ramer Creek (070), Upper Mulberry Creek (220), Soapstone Creek (230), and Valley Creek (250).

Figure 12a. Habitat and aquatic macroinvertebrate assessments conducted in the Upper Alabama River Cataloging Unit.

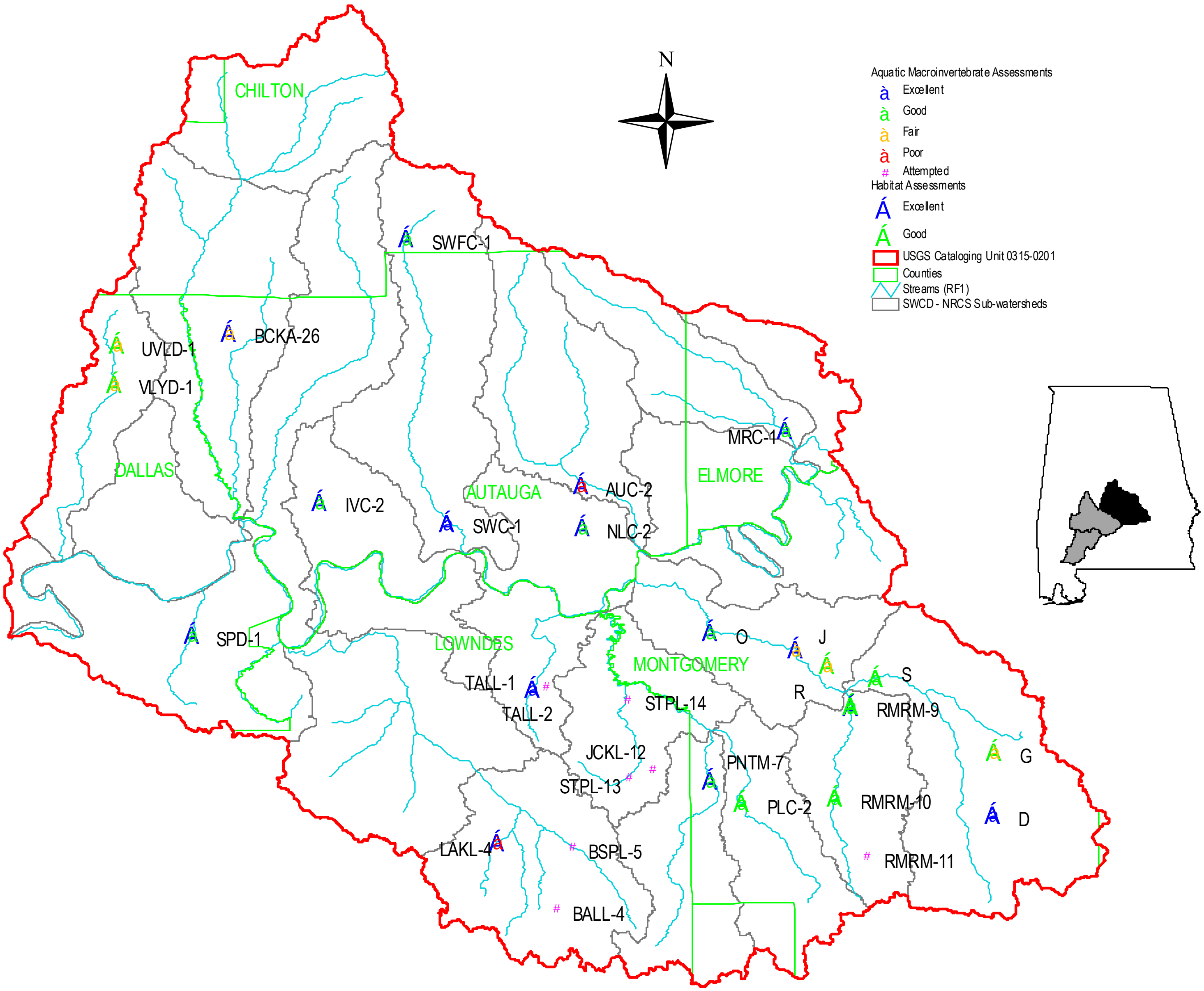

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Figure 12b. Fish IBI assessments conducted in the Upper Alabama River Cataloging Unit.

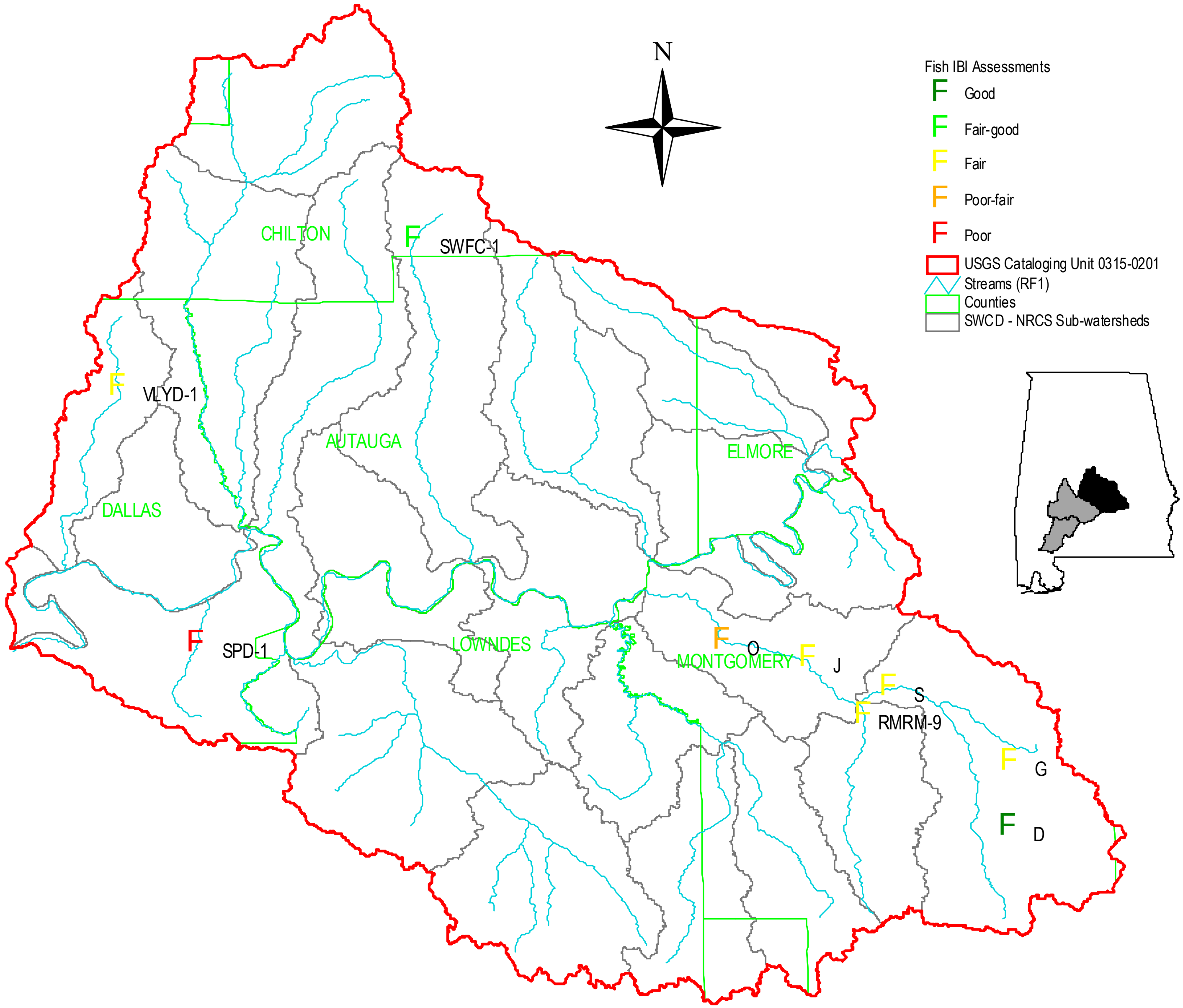

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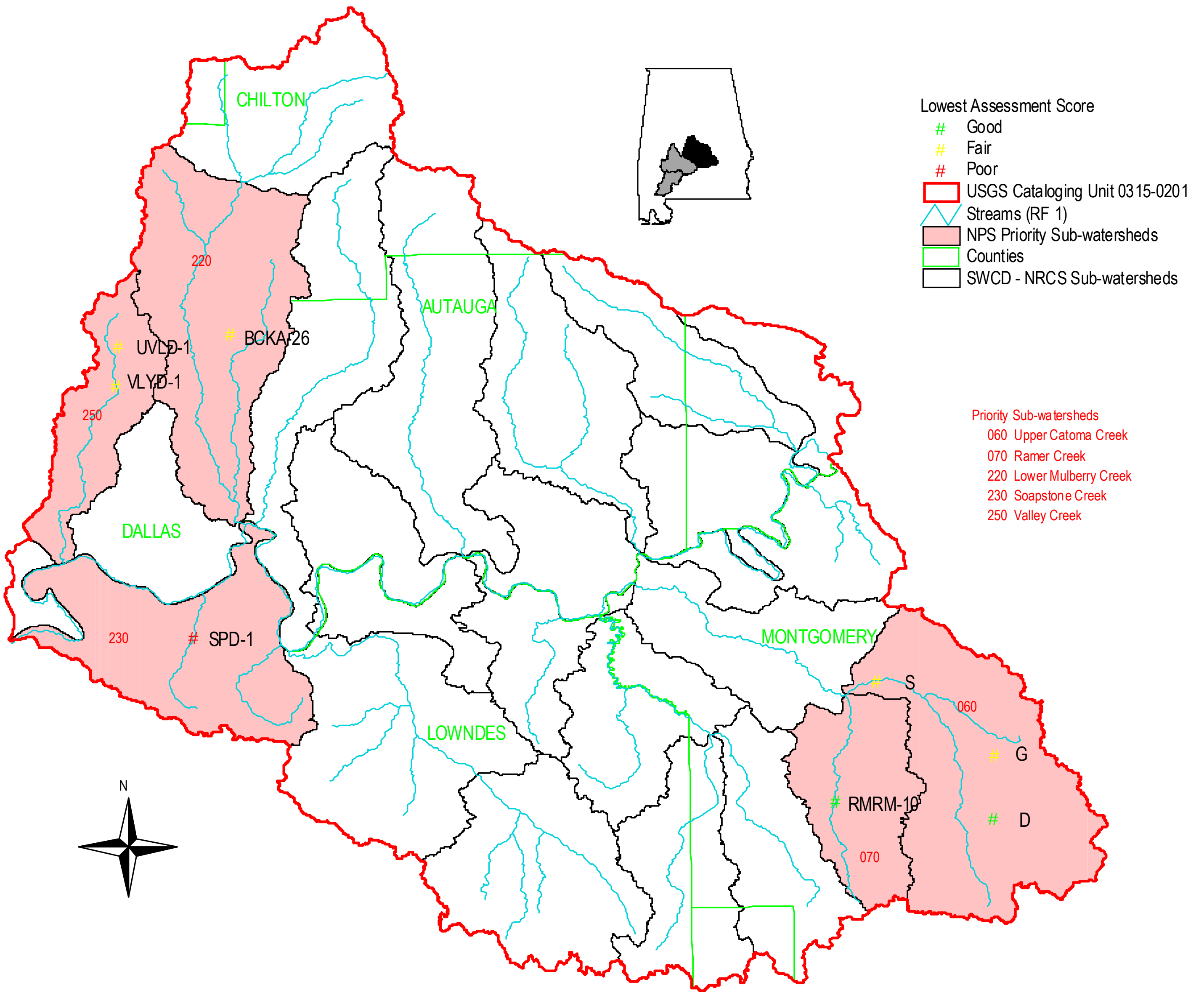
Figure 12c. Priority sub-watersheds within the Upper Alabama CU. Overall assessment results for stations located in priority sub-watersheds are also shown.



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Sub-watersheds recommended for NPS priority status.

Sub-watershed Number	Sub-watershed Name	Lowest Station Assessment	Suspected Cause(s)	Suspected nonpoint source(s)
060	Upper Catoma Creek	Fair	Nutrient enrichment	Forestry, pasture runoff, animal husbandry
070	Ramer Creek	Fair	Nutrient enrichment	Pasture runoff, animal husbandry
220	Lower Mulberry Creek	Fair	Nutrient enrichment	Forestry
230	Soapstone Creek	Poor	Nutrient enrichment	Agriculture
250	Valley Creek	Fair	Pathogens, nutrient enrichment	Silviculture, flow modification

Upper Catoma Creek (060): Impaired biological conditions and elevated nutrient concentrations identified Upper Catoma Creek as a priority sub-watershed. Pastureland comprised 55% of the total land area within the sub-watershed. Cattle concentrations indicated a *moderate* potential for impairment.

Ramer Creek (070): Three macroinvertebrate assessments and one fish community assessment have been conducted within the sub-watershed. Although the macroinvertebrate communities were in relatively *good* condition, the fish community was assessed as *fair*, identifying Ramer Creek as a priority sub-watershed. Nutrient concentrations were elevated. Landuse estimates also indicate a *high* potential for impairment from nonpoint sources.

Lower Mulberry Creek (220): Biological conditions at BCKA-26, an ecoregional reference site, were assessed as *fair*. The immediate sub-watershed may have been affected by recent silvicultural activity.

Soapstone Creek (230): The fish community was assessed as *poor* during 2000. Although the aquatic macroinvertebrate community was assessed as *good*, results have indicated declining water quality at Soapstone Creek since 1991 (Appendix F-1b). Agricultural activities comprised 50% of land cover within the sub-watershed.

Valley Creek (250): Biological conditions within the Valley Creek sub-watershed were assessed as *fair*. Water quality data indicated elevated fecal coliform concentrations and biochemical oxygen demand after a rain storm event. Biological impairment may be caused by silvicultural activities within the sub-watershed or impoundment of Valley Creek Lake upstream of the sampling stations.

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Sub-Watershed: Calloway Creek NRCS Sub-Watershed Number 010

Landuse: The Calloway Creek sub-watershed drains approximately 35 mi^2 in Autauga and Elmore Counties. Land cover within the sub-watershed was primarily forest mixed with row crop, pasture, and urban areas. Two current construction/stormwater authorizations, and 1 mining and 2 semi public/private NPDES permits have been issued in the sub-watershed (Table 6a).

Percent land cover estimated by local SWCD (Table 5a, ASWCC 1998)

Forest	Row crop	Pasture	Mining	Urban	Open Water	Other
57%	18%	14%	0%	10%	<1%	0%

NPS impairment potential: The potential for NPS impairment from pasture and row crop was *moderate* (Table 7a). Overall potential for NPS impairment was *low*, however. The NPS impairment potential from urban areas was *moderate* (Table 7a).

Values and NPS ratings for each NPS category estimated by local SWCD.

Category	Overall Potential	Animal husbandry	Aqua-culture	Row crop	Pasture	Mining	Forestry	Sediment
Value	10	0.02 AU/ac	0.00%	18%	14%	0%	---	2.6 (tons/ac/yr)
NPS Potential	L	L	L	M	M	L	---	L
Table	7a	11a	11a	5a	5a	5a	12a	12a

Assessments: An assessment was not conducted during the ACT Basin NPS Screening Assessment due to the *low* potential for impairment from nonpoint sources. However, intensive water quality data was collected at BTCAUM-1 from December of 1998 through December of 1999 to study nutrient concentrations below Bouldin dam (Appendix F-7). Dissolved oxygen and pH measurements were within numeric criteria for the Fish & Wildlife water use classification. Comparison to historical ambient monitoring data for large rivers did not appear to indicate nutrient enrichment (Appendix F-7a).

Assessment stations located within the sub-watershed. Descriptions are provided in Appendix E.

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
BTCAUM-1	Chemical	1998	Bouldin Hydro Plant Tailrace (19N/18E/34)	14,817	Fish & Wildlife

NPS priority status: The level of NPS impairment within the sub-watershed could not be evaluated from available data. However, Calloway Creek was not at a high risk for impairment from nonpoint sources.

Sub-Watershed: Mortar Creek NRCS Sub-Watershed Number 020

Landuse: The Mortar Creek sub-watershed drains approximately 80 mi^2 in Autauga and Elmore Counties. Land cover within the sub-watershed was primarily forest mixed with pasture and croplands. Thirteen current construction/stormwater, 1 non-coal mining <5 acres/ stormwater, and 1 CAFO authorizations have been issued in the sub-watershed (Table 6a). Four mining and 2 semi-public/private NPDES permits have also been issued.

Percent land cover estimated by local SWCD (Table 5a, ASWCC 1998)

Forest	Row crop	Pasture	Mining	Urban	Open Water	Other
78%	10%	7%	0%	<1%	1%	2%

NPS impairment potential: There was a *moderate* potential for impairment associated with runoff from crop and pasture lands and erosion of forestry areas. The overall potential for impairment was estimated as *moderate*. The number of construction/stormwater authorizations indicated a *moderate* potential for impairment from urban development (Table 7a).

Values and NPS ratings for each NPS category estimated by local SWCD.

Category	Overall Potential	Animal husbandry	Aqua-culture	Row crop	Pasture	Mining	Forestry	Sediment
Value	11	0.06 AU/ac	<0.01%	10%	7%	0%	26%	3.4 tons/ac/yr
NPS Potential	M	L	L	M	M	L	M	L
Table	7a	11a	11a	5a	5a	5a	12a	12a

Assessments: Mortar Creek was not assessed during the ACT Basin NPS Screening Assessment. However, Mortar Creek at MRC-1 and MRC-2 was monitored as part of ADEM's CWA §303(d) Monitoring Program (Appendix F-3). A 3rd assessment at UTMC-1 could not be conducted due to low flow conditions. A station located on Pierce Creek was evaluated during ADEM's 1999 ALAMAP Project (Appendix F-8).

Assessment stations located within the sub-watershed. Descriptions are provided in Appendix E.

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
MRC-1	Chemical, Habitat, Biological	1999	Mortar Creek at Elmore CR 23 (Coosada Rd) (18N/17E/24)	77	Fish & Wildlife
MRC-2	Chemical	1999	Mortar Creek @ Politic Rd (18N/17E/13)	49	Fish & Wildlife
AR07U3-57	Chemical, Habitat	1999	Pierce Creek 100 yards west of I-65 southbound (18N/16E/2)	2	Fish & Wildlife
UTMC-1	None conducted	1999	Unnamed tributary to Mortar Creek @ Elmore Sand and Gravel facility (18N/17E/11)	<1	Fish & Wildlife

Mortar Creek: Mortar Creek at MRC-1 is a riffle-run stream characterized by sand and gravel substrates (Appendix F-3a). Despite some bank erosion and sedimentation, the habitat was assessed as e*xcellent* for this subecoregion (Appendix F-3a). Six EPT families were collected, indicating the aquatic macroinvertebrate community to be in g*ood* condition (Appendix F-3b).

Chemical sampling was conducted from May through August of 1999 (Appendix F-3c). Ammonia-nitrogen was higher than normal on 3 out of 4 sampling events. Concentrations of both total phosphorus (Total-P; 0.33 mg/L) and ammonia-nitrogen (NH_3-N; 0.58 mg/L) were highest during the August sampling event. Fecal coliform counts and total suspended solids were elevated during a high flow event in July.

Water samples were also collected on Mortar Creek (MRC-2) upstream of MRC-1, May-August, 1999. (Appendix F-3c). Concentrations of total phosphorus (Total-P) were similar to MRC-1. Total ammonia-nitrogen was much higher at this site, however (Appendix F-3c). Fecal coliform counts, turbidity, and total suspended solids were elevated during July.

Pierce Creek: At AR07U3-57, Pierce Creek is a small, sandy-bottom, low-gradient stream located in the Flatwoods/ Blackland Prairie Margins subecoregion (65b). Habitat quality was assessed as *excellent* for this subecoregion. (Appendix F-8a) The pH was 4.7 s.u. (Appendix F-8b). Nutrient concentrations appeared normal for this stream type and subecoregion.

NPS priority status: Macroinvertebrate assessments did not indicate a high level of impairment to biological condition. Nutrient enrichment and other water quality problems were most likely from urban sources.

Sub-Watershed: Hudson Creek NRCS Sub-Watershed Number 030

Landuse: The Hudson Creek sub-watershed drains approximately 72 mi^2 in Autauga and Elmore Counties. It contained the 2nd highest percent of urban area within the Upper Alabama River CU (Table 5a). Row crop and pastureland were also present within the sub-watershed. A total of 43 NPDES permits and current construction/stormwater authorizations have been issued in the sub-watershed (Table 6a).

Percent land cover estimated by local SWCD (Table 5a, ASWCC 1998)

Forest	Row crop	Pasture	Mining	Urban	Open Water	Other
23%	13%	16%	1%	43%	4%	1%

NPS impairment potential: Percent urban area (43%) and the number of current storm-water/construction authorizations (43) indicated a *high* impairment potential from urban runoff and development (Table 7a). The sedimentation rate (22.4 tons/acre/year), primarily from developing urban lands (20.4 tons/acre/year), was the highest estimated within the Alabama River basin (Table 12a). Potential for NPS impairment from row crops and pasture was *moderate*. Although access of livestock to streams was identified as a resource concern within the sub-watershed (Table 12a), potential impairment from animal husbandry activities within the sub-watershed were estimated as *low*.

Values and NPS ratings for each NPS category estimated by local SWCD.

Category	Overall Potential	Animal husbandry	Aqua-culture	Row crop	Pasture	Mining	Forestry	Sediment
Value	17	0.04 AU/ac	0.00%	13%	16%	<1%	2%	22.4 tons/ac/yr
NPS Potential	H	L	L	M	M	M	L	H
Table	7a	11a	11a	5a	5a	5a	12a	12a

Assessments*:* An assessment was not conducted due to the high percentage of urban area within this sub-watershed.

NPS priority status*:* Although the SWCD landuse estimates indicated significant NPS concerns within the sub-watershed, the greatest source of impairment was from urban development.

Sub-Watershed: Galbraith Mill Creek NRCS Sub-Watershed Number 040

Landuse: The Galbraith Mill Creek sub-watershed drains approximately 72 mi^2 within Montgomery County. Land cover within the sub-watershed was primarily urban. A total of 48 NPDES permits and current construction/stormwater authorizations have been issued within the sub-watershed (Table 6a).

Percent land cover estimated by local SWCD (Table 5a, ASWCC 1998)

Forest	Row crop	Pasture	Mining	Urban	Open Water	Other
7%	7%	6%	3%	75%	<1%	3%

NPS impairment potential: The main NPS concerns within the sub-watershed were sedimentation, mining, and row crops. The primary source of sedimentation was from sand and gravel pits (4.6 tons/ac/yr, Table 12a). There was a *high* potential for impairment from urbanization and development (Table 7a). Galbraith Mill Creek was given a 3rd priority sub-watershed rating by the SWCD. Resource concerns within the sub-watershed included excessive sediment from urban development, bacteria and other organisms in surface waters, and livestock overgrazing pastures (Table 12a).

Values and NPS ratings for each NPS category estimated by local SWCD.

Category	Overall Potential	Animal husbandry	Aqua-culture	Row crop	Pasture	Mining	Forestry	Sediment
Value	15	0.02 AU/ac	0.00%	7%	6%	3%	2%	5.6 tons/ac/yr
NPS Potential	H	L	L	M	L	H	L	M
Table	7a	11a	11a	5a	5a	5a	12a	12a

Asessments: A NPS assessment of this sub-watershed was not conducted due to the *high* percentage of urban area.

NPS priority status: The SWCD landuse estimates indicated a potential for impairment from both rural and urban sources.

Sub-Watershed: Autauga Creek NRCS Sub-Watershed Number 050

Landuse: The Autauga Creek sub-watershed drains approximately 121 mi^2 in Autauga and Chilton Counties. Land cover was mainly forest mixed with urban, pasture, and cropland. A total of 17 current construction/stormwater authorizations and NPDES permits have been issued within the sub-watershed (Table 6a).

Percent land cover estimated by local SWCD (Table 5a, ASWCC 1998)

Forest	Row crop	Pasture	Mining	Urban	Open Water	Other
81%	6%	7%	0%	7%	<1%	0%

NPS impairment potential*:* Potential for NPS impairment from forestry was *moderate*. Potential for impairment from other nonpoint sources was *low*. Percent urban area (7%) and the number of current construction/stormwater authorizations indicated a *moderate* potential for impairment from urban runoff and development (Table 7a). Autauga Creek was given a 2nd priority sub-watershed rating by the SWCD. Resource concerns within the sub-watershed included excessive sediment from urban development and nutrients in surface waters (Table 12a).

Values and NPS ratings for each NPS category estimated by local SWCD.

Category	Overall Potential	Animal husbandry	Aqua-culture	Row crop	Pasture	Mining	Forestry	Sediment
Value	9	0.08 AU/ac	<0/01%	6%	7%	0%	38%	1.4 tons/ac/yr
NPS Potential	L	L	L	L	L	L	M	L
Table	7a	11a	11a	5a	5a	5a	12a	12a

Assessments*:* An assessment of the sub-watershed was not conducted during this project because of the high number of point source discharges, potential water quality impairment from the Prattville area, and *low* potential for NPS impairment. However, intensive water quality data and macroinvertebrate assessment information has been recently collected at 2 stations on Autauga Creek (AUC-2 and AUC-1) in conjunction with ADEM's §303(d) Monitoring Program (Appendix F-3). A third location on Autauga Creek (AUCAUM-1) was monitored during 1999 as part of a statewide tributary nutrient study (Appendix F-7).

Assessment stations located within the sub-watershed. Descriptions are provided in Appendix E.

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
AUC-1	Chemical	1999	Autauga Creek @ Autauga County Road 4E. (17N/16E/28)	121	Fish & Wildlife
AUCAUM-1	Chemical	1999	Autauga Creek AL Hwy 14 (17N/16E/17)	116	Fish & Wildlife
AUC-2	Chemical, Habitat, Macroinvertebrate	1999	Autauga Creek adjacent to US Hwy 82, 1/4 mile downstream of Breakfast Creek (17N/15E/12)	118	Swimming/ Fish & Wildlife

Autauga Creek: At AUC-2, Autauga Creek is a low-gradient, sand and gravel bottomed stream located in the Fall Line Hills (65i) subecoregion (Appendix F-3a). Habitat quality was assessed as *excellent* for this stream type. However, only 4 EPT families were collected at the site, indicating the macroinvertebrate community to be in *poor* condition (Appendix F-3b).

Monthly chemical sampling was conducted at AUC-2 in May through September of 1999 (Appendix F-3c). Concentrations of total phosphorus (Total-P) were slightly elevated (0.12-0.16 mg/l) during all 4 sampling events. Total ammonia-nitrogen was elevated during 2 of the 4 (50%) sampling events.

ADEM conducted intensive water quality sampling on Autauga Creek at AUC-1, downstream of AUC-2 (Appendix E). Results are presented in Appendix F-3c. Fecal coliform concentrations at AUC-1 (440-682 colonies/100 mL) were approximately 5.5 times higher than at AUC-2 (~60-147 colonies/100 mL). Total phosphorus (Total-P) concentrations were slightly higher than values measured at AUC-2, ranging from 0.19-0.23 mg/L. Total ammonia-nitrogen concentrations were high on 3 out of 4 sampling events. Nitrate-nitrite nitrogen was measured at 0.53 mg/L during August of 1999 and undetectable during all other sampling events.

Chemical sampling was conducted biweekly on Autauga Creek at AUCAUM-1 from December of 1998 to November of 1999 (Appendix F-7a). During May-September, nutrient levels were generally less than values obtained by ADEM at both AUC-2 and AUC-1 (Appendix F-3c).

NPS priority status*:* Although biological conditions at AUC-2 were assessed as *poor*, the station was primarily impacted by urban development. Autauga Creek was therefore not classified as a NPS priority sub-watershed.

Sub-Watershed: Upper Catoma Creek NRCS Sub-Watershed Number 060

Landuse: The Upper Catoma Creek sub-watershed drains approximately 180 mi^2 in Montgomery and Bullock Counties. Percent land cover of the sub-watershed was primarily pasture and forest. Nineteen current construction/stormwater authorizations and 3 semi-public/private NPDES permits have been issued in the sub-watershed (Table 6a).

Percent land cover estimated by local SWCD (Table 5a, ASWCC 1998)

Forest	Row crop	Pasture	Mining	Urban	Open Water	Other
33%	5%	55%	0%	3%	1%	3%

NPS impairment potential: The NPS categories of primary concern within the sub-watershed were animal husbandry, primarily cattle operations, and runoff from pasture. The overall potential for impairment from nonpoint sources was estimated as *moderate*. There was a *moderate* potential for impairment from urban development (Table 7a). Local SWCD identified the sub-watershed as a priority due to resource concerns including overgrazing of pastures, access of livestock to streams, and bacteria and other organisms in surface waters (Table 12a).

Values and NPS ratings for each NPS category estimated by local SWCD.

Category	Overall Potential	Animal husbandry	Aqua-culture	Row crop	Pasture	Mining	Forestry	Sediment
Value	13	0.16 AU/ac	0.00%	5%	55%	0%	4%	0.7 tons/ac/yr
NPS Potential	M	M	L	L	H	L	L	L
Table	7a	11a	11a	5a	5a	5a	12a	12a

Assessments: Upper Catoma Creek was not assessed during the NPS Screening Assessment of the ACT basins because of the availability of recent assessment data collected in conjunction with an on-going longterm watershed monitoring project (Montgomery Water Works and the Sanitary Sewer Board of the City of Montgomery, Alabama). Monitoring stations were located on Basin Mill Creek, Catoma Creek, and Little Catoma Creek. Water quality data were collected at 3 stations as part of ADEM's CWA §303(d) Monitoring Program.

Baskin Mill Creek: Since 1995, Baskin Mill Creek at Station D has been used as a reference station for the Catoma Creek watershed project. The area is primarily forested, with some low-density development and pasture (CH2M-Hill 2000). Although substrate composition was not reported, the habitat quality at Baskin Mill Creek was assessed as *good* (Appendix F-4a). The macroinvertebrate and fish communities were assessed as *excellent* and *good*, respectively (Appendix F-4b).

Assessment stations located within the sub-watershed. Descriptions are provided in Appendix E.

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
D	Chemical, Habitat, Macroinvertebrates, Fish	1995, 1996, 1999, 2000	Baskins Mill Creek at Montgomery CR 70 (14N/19E/35)	18	Fish & Wildlife
G	Chemical, Habitat, Macroinvertebrates, Fish	1995, 1996, 1999, 2000	Little Catoma Creek at Montgomery CR 85 (14N/20E/7)	22	Fish & Wildlife
LCTM-1	Chemical	2000	Little Catoma Creek at US Hwy 231 (15S/19E/21)	51	Fish & Wildlife
S	Chemical, Habitat, Macroinvertebrates, Fish	1995, 1996, 1999, 2000	Catoma Creek @ Montgomery CR 39 (15N/8E/13)	159	Fish & Wildlife
CATM-2	Chemical	2000	Catoma Creek at Montgomery CR 39, Woodley Road (15N/18E/13)	159	Fish & Wildlife
F	Chemical	1995, 1996, 1999, 2000	Catoma Creek at Montgomery CR 22, Trotman Road (15N/19E/20)	60	Fish & Wildlife
CATM-1	Chemical	2000	Catoma Creek at Montgomery CR 22, Trotman Road (15N/19E/20)	60	Fish & Wildlife

Results of water quality data collected monthly at Station D are presented in Appendix F-4c. Nitrogen concentrations (NH_3-N and TKN) were high during several sampling events.

Little Catoma Creek: Little Catoma Creek at Station G is primarily forested with some recent silvicultural activity upstream (CH2M-Hill 2000). Habitat quality was similar to the study-specific reference station (Appendix F-4a). Comparison to Baskin Mill Creek indicated the macroinvertebrate community to be *moderately impaired* and the fish community to be in *fair* condition (Appendix F-4b).

Results of water quality sampling conducted at Station G are presented in Appendix F-4c. Biochemical oxygen demand (BOD-5) ranged from 1-7 mg/L. Total Kjeldahl nitrogen (TKN) concentrations ranged from <0.10-1.24 mg/L and were elevated during 11 of 17 (65%) sampling events. Fecal coliform samples collected at this location (LCTM-1) in conjunction with ADEM's §303(d) monitoring program from May through November of 2000, ranged from 4-200 colonies/100 mL (Appendix F-3c).

Catoma Creek: Catoma Creek at Station S is located within a wetland forest that drains pastures (CH2M-Hill 2000). Habitat quality was evaluated as *partially similar* to the study-specific reference station. The macroinvertebrate community was assessed as *slightly impaired*, while the fish community was in *fair* condition (Appendix F-4b).

Results from monthly water quality samples are presented in Appendix F-4c. Total Kjeldahl nitrogen (TKN) concentrations ranged from <0.10-1.15 mg/L and were elevated during 2 of 17 (12%) sampling events. Fecal coliform samples collected by ADEM at this location (CATM-2) did not indicate impairment (Appendix F-3c).

Catoma Creek at station F drains forest, pasture, and low density urban areas of the Upper Catoma Creek sub-watershed (CH2M-Hill 2000). Water quality data collected at this site are presented in Appendix F-4c. Total Kjeldahl nitrogen (TKN) concentrations ranged from <0.10-1.34 mg/L and were elevated during 7 of 17 (41%) sampling events. Cadmium was detected (39 μg/L) during October of 1998. Fecal coliform samples collected at this location (CATM-1) by ADEM during May through November of 2000 did not indicate impairment (Appendix F-3c).

***NPS priority status*:** Upper Catoma Creek was identified as a priority sub-watershed due to impaired biological conditions and elevated nutrient concentrations at Catoma Creek and Little Catoma Creek (Table 10a; Fig 12c). Pastureland comprised 55% of the total land area within the sub-watershed. Cattle concentrations indicated a *moderate* potential for impairment.

Sub-Watershed: Ramer Creek NRCS Sub-Watershed Number 070

***Landuse**:* The Ramer Creek sub-watershed drains approximately 83 mi^2 in Montgomery County. Percent pasture was the 2^{nd} highest within the Upper Alabama River CU (Table 5a). One non-coal mining <5 acres stormwater authorization and 2 current construction/stormwater authorizations have been issued in the sub-watershed (Table 6a).

Percent land cover estimated by local SWCD (Table 5a, ASWCC 1998)

Forest	Row crop	Pasture	Mining	Urban	Open Water	Other
31%	4%	60%	0%	1%	2%	2%

NPS impairment potential: The overall potential for impairment from nonpoint sources was *moderate*. The NPS categories of primary concern were pasture runoff and animal husbandry, primarily cattle. Ramer Creek was given a 4^{th} priority sub-watershed by the SWCD for resource concerns listed in Table 12a.

Values and NPS ratings for each NPS category estimated by local SWCD.

Category	Overall Potential	Animal husbandry	Aqua-culture	Row crop	Pasture	Mining	Forestry	Sediment
Value	13	0.19 AU/ac	---	4%	60%	0%	11%	0.1 tons/ac/yr
NPS Potential	M	M	---	L	H	L	L	L
Table	7a	11a	11a	5a	5a	5a	12a	12a

Assessments: Ramer Creek was monitored at 2 locations during the 2000 NPS screening assessment because of the high percentage of pasture and concentration of cattle within the sub-watershed. Three additional stations on Ramer Creek, an unnamed tributary to Ramer Creek, and Waller Creek have been monitored or evaluated in conjunction with other studies (Appendix E).

Ramer Creek: Ramer Creek is a low gradient, glide-pool stream located in the Blackland Prairie (65a) subecoregion. Habitat quality was assessed as *excellent* at RMRM-9 and *good* at RMRM-10 (Table 14a). The macroinvertebrate community was in *good* condition at both stations (Table 15a). Similar results (Appendices F-4a and F-4b) were obtained at station H during the Catoma Creek watershed project (CH2M-Hill 2000). A fish assessment conducted at Station H indicated the fish community to be in *fair* condition (Appendix F-4b). In-situ field parameters collected in May did not indicate impairment (Appendix D-1). Water quality samples could not be collected at either station during September due to low flow conditions. Filamentous and floating algae were noted at RMRM-9 during the September site visit.

Assessment stations located within the sub-watershed. Descriptions are provided in Appendix E.

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
RMRM-9	Habitat, Macroinvertebrate	2000	Ramer Creek @ Montgomery CR 25 15N/18E/27)	14	Fish & Wildlife
RMRM-10	Habitat, Macroinvertebrate	2000	Ramer Creek @ Montgomery CR 24 (14N/18E/28)	27	Fish & Wildlife
H	Habitat, Macroinvertebrate, Fish, Chemical	1995, 1996, 1998, 2000	Ramer Creek @ Montgomery CR 18 (15N/18E/27)	80	Fish & Wildlife
A	Chemical	1998-2000	Tributary to Ramer Creek @ Montgomery CR 65 (13N/18E/4)	8	Fish & Wildlife
AR05U2-28	Chemical, Habitat	1998	Waller Creek approximately 4.0 mi. upstream of confluence with Ramer Creek (14N/18E/11)	18	Fish & Wildlife

Water quality samples collected at station H and station A (Appendix F-4c) indicated high total Kjeldahl nitrogen (TKN) concentrations. Chromium was detected at both stations during January of 1999. Five-day biochemical oxygen demand (BOD-5) at station A was above 3.0 mg/L during May of 1999 and August to November of 1999.

Waller Creek: A chemical assessment of Waller Creek was conducted at AR05U2-28 during the 1998 ALAMAP monitoring project (Appendix F-8b). The dissolved oxygen concentration was measured at 2.4 mg/L, much lower than required to meet the “Fish and Wildlife” Classification. However, at the time the sample was collected in August, the stream was not flowing and present only as standing pools.

***NPS priority status*:** Three macroinvertebrate assessments and 1 fish community assessment have been conducted within the sub-watershed. Although the macroinvertebrate communities were in relatively *good* condition, the fish community was assessed as *fair*, identifying Ramer Creek as a priority sub-watershed (Table 14a; Fig 12c). Intensive chemical sampling indicated nutrient enrichment at 2 locations on Ramer Creek. Landuse estimates also indicate a *high* potential for impairment from nonpoint sources.

Sub-Watershed: Lower Catoma Creek NRCS Sub-Watershed Number 080

Landuse: The Lower Catoma Creek sub-watershed drains approximately 98 mi^2 in Montgomery County, including most of the city of Montgomery. Land cover was a mixture of urban, forest, and pasture. Twenty-two current construction/stormwater authorizations and 1 mining and 1 municipal NPDES permits have been issued in the sub-watershed (Table 6a). A 23-mile section of Catoma Creek is also currently on Alabama's FY 2000 draft CWA §303(d) list of impaired waterbodies. It is only partially meeting it's "Fish and Wildlife" classification due to organic enrichment and low dissolved oxygen concentrations. Suspected sources of the impairment include urban runoff and pasture grazing (ADEM 2001b).

Percent land cover estimated by local SWCD (Table 5a, ASWCC 1998)

Forest	Row crop	Pasture	Mining	Urban	Open Water	Other
30%	2%	20%	1%	40%	2%	5%

NPS impairment potential: Although runoff from mining and pasture landuses was a significant NPS concern within the sub-watershed, there was a much greater potential for impairment from urban sources. Percent urban land indicated a *high* potential for impairment (Table 7a). The number of current stormwater authorizations issued within the sub-watershed also indicated a *high* potential for impairment from urban development. Lower Catoma Creek was given a 1st priority sub-watershed rating by the SWCD. Resource concerns are listed in Table 12a.

Values and NPS ratings for each NPS category estimated by local SWCD.

Category	Overall Potential	Animal husbandry	Aqua-culture	Row crop	Pasture	Mining	Forestry	Sediment
Value	11	0.06	---	2%	20%	1%	2%	2.4 tons/ac/yr
NPS Potential	M	L	---	L	M	M	L	L
Table	7a	11a	11a	5a	5a	5a	12a	12a

Assessments: An in-stream assessment was not conducted during the NPS screening assessment because of the high percent urban land. Catoma Creek has been assessed in conjunction with several of ADEM's monitoring programs (Appendices F-3, F-6, and F-10). Two stations have been assessed in conjunction with the Catoma Creek Watershed Longterm Monitoring Project (Appendix F-4). Three additional stations on Hannon Slough, Whites Slough, and Caney Branch have also been assessed (Appendix F-4).

Assessment stations located within the sub-watershed. Descriptions are provided in Appendix E.

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
L	Chemical	1999	Hannon Slough @ Montgomery CR 46 (15N/18E/5)	3	Fish & Wildlife
R	Chemical, Habitat, Macroinvertebrate, Fish	1999	Whites Slough @ Montgomery CR 33 (15N/18E/9)	7	Fish & Wildlife
Q	Chemical	1999	Caney Branch south of AL Hwy 80 (15N/17E/)	13	Fish & Wildlife
CATM-3	Chemical	2000	Catoma Creek @ US Hwy 331 (15N/17E/1)	290	Fish & Wildlife
AL01	Chemical	1996	Catoma Creek @ US Hwy 331 (15N/17E/1)	290	Fish & Wildlife
J	Chemical, Habitat, Macroinvertebrate, Fish	1995, 1996, 1999, 2000	Catoma Creek @ Montgomery CR 21 (15N/18E/6)	294	Fish & Wildlife
CACAUM-1	Chemical	1999	Catoma Creek @ Montgomery CR 21 (15N/18E/6)	294	Fish & Wildlife
CATM-4	Chemical	2000	Catoma Creek @ US Hwy 31 (16N/17E/34)	310	Fish & Wildlife
CATM-5	Chemical	2000	Catoma Creek @ the end of Hayneville Rd (16N/17E/32)	338	Fish & Wildlife
O	Chemical, Habitat, Macroinvertebrate, Fish	1999	Catoma Creek @ the end of Hayneville Rd (16N/17E/32)	338	Fish & Wildlife
CATM-6	Chemical	2000	Catoma Creek @ Montgomery CR 54 (16N/17E/20)	340	Fish & Wildlife
AL02	Chemical	1996	Catoma Creek @ Montgomery CR 54 (16N/17E/20)	340	Fish & Wildlife
WOOD-4	Chemical	2000	Main channel of Catoma Creek, approximately 0.5 miles upstream of confluence with Alabama River (16N/16E/16)	354	Fish & Wildlife

Hannon Slough: Hannon Slough at station L is channelized and drains a highly developed area of south Montgomery. Chemical parameters collected monthly at station L since October of 1998 indicate nutrient enrichment (Appendix F-4c). Total suspended solids (TSS) and 5-day biochemical oxygen demand (BOD-5) were also periodically elevated. One metal, chromium (Cr), was detected during the January of 1999 sampling event.

Whites Slough: Whites Slough was assessed at station R during May of 2000 in conjunction with the Catoma Creek Watershed Longterm Monitoring Project (CH2M-Hill 2000). It drains urban areas of south Montgomery. Habitat quality at Whites Slough was assessed as *partially similar* to a study-specific reference site (Appendix F-4a). The macroinvertebrate community was evaluated as *moderately impaired* (Appendix F-4b).

Monthly water quality data collected at station R indicate elevated nutrient levels (Appendix F-4c). Five-day biochemical oxygen demand (BOD-5) was measured above 3 mg/L (range 4-5 mg/l) during 2 sampling events (12%).

Caney Branch: Caney Branch drains a light industrial area of south Montgomery. Monthly water quality data collected at Station Q indicate nutrient enrichment (Appendix F-4c). Total suspended solids (TSS), total dissolved solids (TDS), and 5-day biochemical oxygen demand (BOD-5) were elevated during several sampling events. Chromium (Cr) was detected during August of 1999.

Catoma Creek: Habitat and biological assessments of Catoma Creek were conducted at stations J and O during the Catoma Creek Watershed Longterm Monitoring Project (CH2M-Hill 2000). Station J drains primarily pasture, light and dense residential areas, some silviculture, and undeveloped forested land in the headwaters. Station O is located at the lower end of the sub-watershed.

Habitat quality at stations J and O was assessed as *similar* to a study-specific reference site (Appendix F-4a). Macroinvertebrate and fish assessments indicated biological impairment at both stations (Appendix F-4b).

Intensive water quality samples have been collected monthly at stations J and O since October of 1998 (Appendix F-4c). Total suspended solids (TSS) and 5-day biochemical oxygen demand (BOD-5) were periodically high (Appendix F-4c). Nutrient concentrations were elevated during several sampling events. These results are supported by intensive water quality data (CACAUM-1) collected by Auburn University in Montgomery (Appendix F-7a).

Fecal coliform concentrations were high at CATM-3, CATM-4, CATM-5, and CATM-6 during several sampling events (Appendix F-3c). Dissolved oxygen concentrations at CATM-3 and CATM-4 were below "Fish and Wildlife" water use classification criteria during 4 sampling events. Data collected at CATM-3 (AL01) and CATM-6 (AL02) during ADEM's 1996 Clean Water Strategy Program (Appendix F-10a) indicated Catoma Creek to be meeting its "Fish and Wildlife" water use classification at these sites.

Water quality samples were collected during ADEM's Reservoir Monitoring Program at the mouth of Catoma Creek (WOOD-4) during April, June, and August of 2000. The data will be used to evaluate nutrient and sediment loading from this tributary as a source of water quality impairment to Woodruff Reservoir. Results of these analyses were reported in ADEM's Annual Reservoir Monitoring Program Report (ADEM, in press).

NPS priority status: Biological conditions were *moderately* to *severely impaired* at Hannon Slough (Station L), Whites Slough (Station R), and Catoma Creek (Stations J and O) (Table 10a). However, the sub-watershed is primarily influenced by urban runoff and development. It is therefore not recommended as a NPS priority sub-watershed.

Sub-Watershed: Upper Pintlalla Creek NRCS Sub-Watershed Number 090

Landuse: The Upper Pintlalla Creek sub-watershed drains approximately 87 mi^2 in Crenshaw and Montgomery Counties. Land cover of this sub-watershed was primarily pasture and forest. Estimates of landuse (Table 5a) by the EPA were higher for forest (58%) and row crops (16%) and lower for pasture (19%). Two current semi public/private NPDES permits and 1 current construction stormwater authorization have been issued in the sub-watershed (Table 6a).

Percent land cover estimated by local SWCD (Table 5a, ASWCC 1998)

Forest	Row crop	Pasture	Mining	Urban	Open Water	Other
39%	1%	55%	0%	0%	2%	4%

NPS impairment potential: The main NPS concerns within the sub-watershed were pasture runoff and animal husbandry, primarily cattle. The overall potential for impairment from nonpoint sources was estimated as *moderate*.

Values and NPS ratings for each NPS category estimated by local SWCD.

Category	Overall Potential	Animal husbandry	Aqua-culture	Row crop	Pasture	Mining	Forestry	Sediment
Value	13	0.20 AU/ac	0.00%	1%	55%	0%	16%	0.3 tons/ac/yr
NPS Potential	M	M	L	L	H	L	L	L
Table	7a	11a	11a	5a	5a	5a	12a	12a

Assessments: Pintlalla Creek was selected for assessment during the ACT Basin NPS Screening Assessment because of the high percent pastureland and concentration of cattle within the sub-watershed. Three stations were established for assessment, one of which, PNTM-8, could not be assessed due to low flow conditions. Intensive water quality and assessment data have also been recently collected in conjunction with ADEM's 1999 CWA §303(d) Monitoring Program (Appendix F-3).

Pintlalla Creek: Pintlalla Creek at PNTM-8a is a riffle-run stream characterized by bedrock, cobble, and sand substrates. Habitat quality was assessed as *excellent* for this stream type (Table 14a). A bioassessment indicated the macroinvertebrate community to be in *excellent* condition (Table 15a).

Pintlalla Creek at PNTM-7 was a low gradient, sandy-bottomed creek. Habitat quality was assessed as *excellent* (Table 14a). The macroinvertebrate community was in *good* condition (Table 15a). Pintlalla Creek was also monitored at this location (PLC-2) in conjunction with ADEM's 1999 CWA §303(d) Monitoring Program (Appendix F-3). Results of habitat (Appendix F-3a) and macroinvertebrate (Appendix F-3b) assessments were very similar between the 2 programs.

Assessment stations located within the sub-watershed. Descriptions are provided in Appendix E.

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
PLC-3	Chemical	1999	unnamed tributary to Pintlalla Creek @ Montgomery CR 14 (13N/17E/14	5	Swimming/ Fish &Wildlife
PNTM-8a	Habitat, Macroinvertebrate	2000	Pintlalla Creek @ Montgomery CR 24 off of CR 19 (14N/17E/34)	59	Swimming/ Fish &Wildlife
PNTM-7	Habitat, Macroinvertebrate	2000	Pintlalla Creek @ Montgomery CR 24 near Pintlalla (14N/17E/20)	70	Swimming/ Fish &Wildlife
PLC-2	Chemical, Habitat, Macroinvertebrate	1999	Pintlalla Creek @ Montgomery CR 24(14N/17E/20)	70	Swimming/ Fish &Wildlife
PNTM-8	None conducted	2000	Pintlalla Creek @ US 31 near Pintlalla (14N/17E/15)	74	Swimming/ Fish &Wildlife
PLC-1	Chemical	1999	Pintlalla Creek @ US 31 near Pintlalla (14N/17E/15)	74	Swimming/ Fish &Wildlife

Water quality data collected at PNTM-8a and PNTM-7 are presented in Appendix D-1. Dissolved oxygen concentrations at PNTM-7 were below “Fish and Wildlife” water use classification criteria during May and September of 2000. Stream flow at this station was 1.2 cfs in May and 0.3 cfs in September. Low dissolved oxygen concentrations would be expected during low flow conditions.

Water quality data were collected monthly from May to September of 1999 at PLC-1 and PLC-2 (Appendix F-3c). Results indicated high ammonia (NH_3-N) concentrations at both sites. Fecal coliform concentrations were also high at PLC-1.

Unnamed tributary to Pintlalla Creek: Water quality data were collected at PLC-3 during June of 1999 (Appendix F-3c). Concentrations of total suspended solids (TSS) and ammonia-nitrogen (NH_3-N) were slightly elevated.

NPS priority status: Macroinvertebrate assessments did not indicate the biological communities to be in *fair* or *poor* condition, although ammonia nitrogen, fecal coliform, and total suspended solids were higher than normal throughout the sub-watershed.

Sub-Watershed: Upper Pinchoy Creek NRCS Sub-Watershed Number 100

Landuse: The Pinchoy Creek sub-watershed drains approximately 91 mi^2 in Crenshaw, Lowndes, and Montgomery Counties. Land cover of Pinchoy Creek was primarily forest and pasture. Estimates of landuse by the EPA were higher for cropland (15%) and lower for pasture (18%) (Table 5a). Four current construction/stormwater authorizations, 3 non-coal mining/stormwater authorizations (<5 acres), two mining NPDES permits, and 1 CAFO registration have been issued in the sub-watershed (Table 6a).

Percent land cover estimated by local SWCD (Table 5a, ASWCC 1998)

Forest	Row crop	Pasture	Mining	Urban	Open Water	Other
59%	1%	34%	<1%	1%	2%	3%

NPS impairment potential: There was a *moderate* potential for impairment from forestry, pasturelands, and animal husbandry. The dominant animals within the sub-watershed were cattle and poultry (Table 11a). The overall potential for impairment from nonpoint sources was estimated as *moderate*.

Values and NPS ratings for each NPS category estimated by local SWCD.

Category	Overall Potential	Animal husbandry	Aqua-culture	Row crop	Pasture	Mining	Forestry	Sediment
Value	13	0.14 AU/ac	0.00%	1%	34%	<1%	38%	2.7 tons/ac/yr
NPS Potential	M	M	L	L	M	L	M	L
Table	7a	11a	11a	5a	5a	5a	12a	12a

Assessments: An in-stream assessment was not conducted during the 2000 NPS screening assessment.

NPS Priority Status: Although Upper Pinchoy Creek was not assessed during the 2000 ACT Basin NPS Screening Assessment, impairment from nonpoint sources was a concern within the sub-watershed. It should be considered for assessment during the 2005 ACT basin assessment.

Sub-Watershed: Lower Pintlalla Creek   NRCS Sub-Watershed Number 110

Landuse: Lower Pintlalla Creek drains approximately 91 mi^2 in Lowndes and Montgomery Counties. This sub-watershed contained the highest percent pasture within the Upper Alabama River CU. Estimates of landuse by the EPA were lower for pasture and higher for cropland and forest (Table 5a). Four current construction/stormwater authorizations, and 1 semi-public/private NPDES permit have been issued in the sub-watershed (Table 6a).

Percent land cover estimated by local SWCD (Table 5a, ASWCC 1998)

Forest	Row crop	Pasture	Mining	Urban	Open Water	Other
24%	5%	64%	0%	2%	3%	2%

NPS impairment potential: There was a *high* potential for impairment from pasture runoff. Animal concentrations, primarily cattle, indicated a *moderate* potential for impairment. The overall potential for impairment from nonpoint sources was estimated as *moderate*. Lower Pintlalla Creek was given a 3rd priority sub-watershed rating by the SWCD. Resource concerns included erosion and excessive sediment from multiple sources, overgrazing of pastures, and access of livestock to streams (Table 12a).

Values and NPS ratings for each NPS category estimated by local SWCD.

Category	Overall Potential	Animal husbandry	Aqua-culture	Row crop	Pasture	Mining	Forestry	Sediment
Value	13	0.29 AU/ac	0.00%	5%	64%	0%	13%	3.1 tons/ac/yr
NPS Potential	M	M	L	L	H	L	L	L
Table	7a	11a	11a	5a	5a	5a	12a	12a

Assessments: Lower Pintlalla Creek was targeted during the ACT Basin NPS Screening Assessment because of the high percent pasture and concentration of cattle and poultry within the sub-watershed. It could not be assessed due to severe low flow conditions. An ALAMAP station located on Steep Creek (AR4U4-21) was also not assessed due to low flow conditions.

Assessment stations located within the sub-watershed. Descriptions are provided in Appendix E.

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
JCKL-12	None conducted	2000	Jack Creek @ Lowndes CR 26 (14N/16E/15)	6	Swimming/ Fish & Wildlife
STPL-13	None conducted	2000	Steep Creek @ Lowndes CR 26 (14N/16E/20)	10	Swimming/ Fish & Wildlife
STPL-14	None conducted	2000	Steep Creek @ Lowndes CR 32 (15N/16E/20)	40	Swimming/ Fish & Wildlife
AR4U4-21	None conducted	2000	Steep Creek @ 1.25 miles east of Lowndes CR 37 (15N/16E/32)	36	Swimming/ Fish & Wildlife
WOOD-5	Chemical	2000	Main channel of Pintlalla Creek approximately 0.5 miles upstream of the confluence with the Alabama River (16N/16E/30)	264	Swimming/ Fish & Wildlife

Water quality samples were collected during ADEM's Reservoir Monitoring Program at the mouth of Pintlalla Creek (WOOD-5) during April, June, and August of 2000. The data will be used to evaluate nutrient and sediment loading from this tributary as a source of water quality impairment to Woodruff Reservoir. Results of these analyses were reported in ADEM's Annual Reservoir Monitoring Program Report (ADEM, in press).

NPS priority status: There were significant NPS concerns within the sub-watershed. Lower Pintlalla Creek should be considered for assessment during the 2005 ACT Basin NPS Screening Assessment.

Sub-Watershed: Alabama River NRCS Sub-Watershed Number 120

Landuse: The Alabama River sub-watershed drains approximately 2 mi^2 in Montgomery County. Percent land cover of this sub-watershed was not estimated by the local SWCD due to the small drainage area. The EPA estimated the primary landuses as forest, open water, pasture, and cropland (Table 5a). No current construction/stormwater authorizations, NPDES permits, or CAFO registrations have been issued within the sub-watershed (Table 6a).

***NPS impairment potential**:* Due to the small size of the sub-watershed, animal concentrations and sedimentation rates were not estimated by the SWCD.

Assessments: An assessment of this sub-watershed was not conducted during the ACT Basin NPS Screening Assessment.

Sub-Watershed: Noland Creek NRCS Sub-Watershed Number 130

Landuse: Noland Creek drains approximately 64 mi^2 in Autauga County. Percent land cover of this sub-watershed was primarily forest, pasture, and row crop. Five current construction/stormwater authorizations, two non-coal mining/stormwater authorizations (<5 acres), 1 municipal NPDES permit, and 1 industrial NPDES permit have been issued in the sub-watershed (Table 6a).

Percent land cover estimated by local SWCD (Table 5a, ASWCC 1998)

Forest	Row crop	Pasture	Mining	Urban	Open Water	Other
50%	13%	23%	<1%	5%	<1%	2%

***NPS impairment potential**:* Percent row crop, pasture, and forestry lands indicated a *moderate* potential for NPS impairment. The overall potential for impairment from nonpoint sources was estimated as *moderate*. There was a *moderate* potential for impairment from urbanization and development (Table 7a). Noland Creek was given a 3rd priority sub-watershed rating by the SWCD. Resource concerns included road and road bank erosion and nutrients in surface waters (Table 12a).

Values and NPS ratings for each NPS category estimated by local SWCD.

Category	Overall Potential	Animal husbandry	Aqua-culture	Row crop	Pasture	Mining	Forestry	Sediment
Value	13	0.06 AU/ac	0.00%	13%	23%	<1%	28%	1.8 tons/ac/yr
NPS Potential	M	L	L	M	M	L	M	L
Table	7a	11a	11a	5a	5a	5a	12a	12a

Assessments: An assessment was not conducted during the ACT Basin NPS Screening Assessment because of the potential for impairment from urban areas and development. Data have been recently collected in conjunction with ADEM's CWA §303(d) Monitoring (Appendix F-3) and ALAMAP (Appendix F-8) Programs.

<u>Noland Creek</u>: At NLC-2, Noland Creek is a riffle-run stream characterized by gravel and sand substrates. Habitat quality was assessed as *excellent* for this stream type (Appendix F-3a). Seven EPT families were collected at this site, indicating the macroinvertebrate community to be in *good* condition (Appendix F-3b).

Assessment stations located within the sub-watershed. Descriptions are provided in Appendix E.

Station	**Assessment Type**	**Date**	**Location**	**Area (mi^2)**	**Classification**
NLC-1	Chemical	1999	Noland Creek @ Washington Ferry Road (16N/15E/1)	14	Fish & Wildlife
NLC-2	Chemical, Habitat, Macroinvertebrate	1999	Noland Creek @ AL Hwy 14 (17N/15E/24)	4	Fish & Wildlife
AR01U1	Chemical	1997	Unnamed tributary, approximately 2.3 miles upstream of confluence with Alabama River (16N/15E/24)	4	Fish & Wildlife

Water quality data collected on Noland Creek at NLC-2 and NLC-1 from May through July of 1999 did not indicate impairment (Appendix F-3c). Low flow conditions prevented collection of some samples during July through September of 1999.

Unnamed tributary to the Alabama River: Water quality data collected at AR01U1 indicated elevated nitrate-nitrite nitrogen (0.98 mg/l) during the August 1997 sampling event (Appendix F-8b).

NPS priority status: A macroinvertebrate assessment and intensive water quality data did not demonstrate a high level of impairment within the Noland Creek sub-watershed.

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Sub-Watershed: Tallawassee Creek   NRCS Sub-Watershed Number 140

***Landuse**:* The Tallawassee Creek sub-watershed drains approximately 54 mi^2 in Lowndes County. Land cover was primarily forest and pasture. Two current construction/stormwater authorizations, 1 non-coal mining/stormwater authorization (<5 acres), and 3 mining NPDES permits have been issued in the sub-watershed (Table 6a).

Percent land cover estimated by local SWCD (Table 5a, ASWCC 1998)

Forest	Row crop	Pasture	Mining	Urban	Open Water	Other
52%	9%	33%	0%	1%	3%	2%

***NPS impairment potential**:* There was a *moderate* potential for impairment associated with cropland, pasture, and forestry. There was also a *moderate* potential for impairment from sedimentation caused by erosion of sand and gravel pits (4.0 tons/acre/year), dirt roads and road banks (1.7 tons/acre/year), and critical areas (1.2 tons/acre/year) (Table 12a). The overall potential for impairment from nonpoint sources was estimated as *high*. Tallawassee Creek was given a 5th priority rating by the local SWCD. Resource concerns included erosion of agricultural land, roads and road banks, poor cropland soil condition, and overgrazing of pastures (Table 12a).

Values and NPS ratings for each NPS category estimated by local SWCD.

Category	Overall Potential	Animal husbandry	Aqua-culture	Row crop	Pasture	Mining	Forestry	Sediment
Value	15	0.10 AU/ac	0.00%	9%	33%	0%	35%	8.4 tons/ac/yr
NPS Potential	H	L	L	M	M	L	M	M
Table	7a	11a	11a	5a	5a	5a	12a	12a

***Assessments**:* Two locations on Tallawassee Creek (TALL-1 and TALL-2) were scheduled for assessment during the ACT Basin NPS Screening Assessment (Table 9a). However, an assessment could not be conducted at TALL-2 due to low flow conditions. Tallawassee Creek and the Alabama River have been evaluated in conjunction with ADEM's ALAMAP (Appendix F-8) and Ambient Monitoring (Appendix F-9) Programs.

Tallawassee Creek: Tallawassee Creek at TALL-1 was characterized by cobble-gravel riffles (Table 14a). Habitat quality was assessed as *excellent* for this stream type and region. Ten EPT families were collected at this site, indicating that the macroinvertebrate community was in *excellent* condition (Table 15a). In-situ field parameters did not indicate impairment (Appendix D-1).

Assessment stations located within the sub-watershed. Descriptions are provided in Appendix E.

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
TALL-1	Habitat, Macroinvertebrate	2000	Tallawassee Creek @ US Hwy 80 (15N/15E/16)	10	Fish & Wildlife
TALL-2	None conducted	2000	Unnamed tributary to Tallawassee Creek @ US Hwy 80 (15N/15E/15)	5	Fish & Wildlife
AR05U3-9	Chemical	1999	Tallawassee Creek approximately 0.5 mi. downstream of AL Hwy 80	10	Fish & Wildlife
A-1a	Chemical	1996	Alabama River @ RM 266.8, approximately 0.25 miles upstream of Tallawassee Creek (16N/15E/26)	15,870	Swimming/ Fish & Wildlife

Tallawassee Creek at AR05U3-9 is a riffle-run, sand and gravel stream (Appendix F-8a). Habitat quality was assessed as *excellent* for this stream type and region. Water quality data did not indicate impairment (Appendix F-8b).

Alabama River: The Alabama River at A-1a was sampled in conjunction with ADEM's Ambient Monitoring Program, from 1982 through 1996 (Appendix F-9). Sample collection at this station was discontinued in 1996 to place more emphasis on monitoring smaller tributaries. Macroinvertebrate assessments were last conducted in 1993 (ADEM 1994). Water quality data collected in 1996 are provided in Appendix F-9a.

NPS priority status: Although a macroinvertebrate assessment conducted at Tallawassee Creek did not indicate biological impairment, an extensive assessment of the sub-watershed was prevented by low flow conditions. It is recommended that the sub-watershed be re-assessed during the 2005 ACT basin assessment because of the high potential for NPS impairment within the sub-watershed.

Sub-Watershed: Swift Creek NRCS Sub-Watershed Number 150

Landuse*:* The Swift Creek sub-watershed drains approximately 161 mi^2 in Chilton and Autauga Counties. Land cover was estimated as forest mixed with pasture and row crop. Four current construction/stormwater authorizations, 2 mining NPDES permits, and 1 municipal NPDES permit have been issued in the sub-watershed (Table 6a).

Percent land cover estimated by local SWCD (Table 5a, ASWCC 1998)

Forest	Row crop	Pasture	Mining	Urban	Open Water	Other
73%	10%	12%	<1%	<1%	<1%	1%

NPS impairment potential: The primary NPS concerns within the sub-watershed were runoff from cropland and forestry areas. Potential for impairment from other nonpoint sources was *low*. Swift Creek was given a 1st priority sub-watershed rating by the local SWCD. Resource concerns are listed in Table 12a.

Values and NPS ratings for each NPS category estimated by local SWCD.

Category	Overall Potential	Animal husbandry	Aqua-culture	Row crop	Pasture	Mining	Forestry	Sediment
Value	11	0.03 AU/ac	<0.01%	10%	12%	<1%	30%	1.2 tons/ac/yr
NPS Potential	M	L	L	M	L	L	M	L
Table	7a	11a	11a	5a	5a	5a	12a	12a

Assessments: An assessment was not conducted within the sub-watershed during the ACT Basin NPS Screening Assessment. Swift Creek has been monitored at 5 stations in conjunction with ADEM's CWA §303d Monitoring (Appendix F-3), Ecoregional Reference Site (Appendix F-1), and Reservoir Tributary Monitoring (Appendix F-6) Programs. One station on Indian Creek was evaluated during ADEM's ALAMAP Program (Appendix F-8).

Swift Creek: Since 1993, Swift Creek at SWFC-1 has been monitored as an ecoregional reference site. It is characterized by small gravel riffles and a shaded canopy (Appendix F-1a). Bottom substrates are generally composed of gravel and sand with lesser amounts of silt and detritus. Habitat quality has been assessed as *excellent* for this stream type and region since 1998. Ten EPT families were collected during 2000, indicating the macroinvertebrate community to be in *good* condition (Appendix F-1b). However, EPT taxa richness has been steadily declining since 1993, suggesting that changes in the sub-watershed may be affecting water quality and habitat conditions at the site. Results of the fish IBI assessment conducted during 2000 indicated the fish community to be in *fair-good* condition (Appendix F-1b). Chemical samples collected at the station have not indicated a source of the impairment (Appendix F-1c).

Assessment stations located within the sub-watershed. Descriptions are provided in Appendix E.

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
AR04U3-20	Chemical, Habitat	1999	Indian Creek downstream of Autauga CR 55 (20N/14E/2)	5	Fish & Wildlife
SWFC-1	Chemical, Habitat, Macroinvertebrate, Fish	1995, 1998-2000	Swift Creek @ Chilton CR 24 (20N/14E/8)	25	Fish & Wildlife
SWC-3	Chemical	1999	Swift Creek @ Autauga CR 69 (19N/14E/21)	61	Fish & Wildlife
SWC-2	Chemical	1999	Swift Creek @ Autauga CR 40 (18N/14E/20)	105	Fish & Wildlife
SWC-1	Chemical, Habitat, Macroinvertebrate	1999	Swift Creek @ AL Hwy 14 (17N/14E/22)	135	Fish & Wildlife
WOOD-6	Chemical	2000	Main channel of Swift Creek, approximately 0.5 miles upstream of Alabama River (17N/14E/35)	139	Fish & Wildlife

Swift Creek was monitored at SWC-1, SWC-2, and SWC-3 during ADEM's 1999 CWA §303d Monitoring Program (Appendix F-3). Swift Creek at SWC-1 is characterized by a low-gradient and small gravel riffles. Habitat quality was assessed as *excellent* (Appendix F-3a). Nine EPT families were collected at this site, indicating the macroinvertebrate community to be in *good* condition (Appendix F-3b).

Water quality data indicated high total phosphorus and ammonia nitrogen concentrations at SWC-1, SWC-2, and SWC-3 (Appendix F-3c). The pH was measured below the Fish and Wildlife Criteria of 6.0 su during 2 of the 5 sampling events at SWC-1. Characterized by riverine wetlands, a low pH may be natural for some some stretches of Swift Creek.

Water quality samples were collected at the mouth of Swift Creek (WOOD-6) during April, June, and August of 2000 (Appendix F-6a). The data will be used to evaluate nutrient and sediment loading from this tributary as a source of water quality impairment to Woodruff Reservoir. Results of these analyses were reported in ADEM's Annual Reservoir Monitoring Program Report (ADEM, in press).

Indian Creek: Indian Creek at AR04U3-20 is characterized by cobble-gravel riffles (Appendix F-8a). Habitat quality at this site was assessed as *excellent*. Water quality data indicated a pH lower than Fish and Wildlife Criteria of 6.0 su. (Appendix F-8b). The concentrations of nitrate-nitrite nitrogen (0.53 mg/L) and chlorides (5.89 mg/L) were elevated.

NPS priority status: Since 1993, biological conditions appear to have been deteriorating at SWFC-1, an ecoregional reference site located in the headwaters of Swift Creek. Water quality data suggest that total phosphorus and ammonia-nitrogen were slightly elevated from the headwaters to the mouth of Swift Creek. It is recommended that the sub-watershed be re-evaluated using ADEM's intensive macroinvertebrate and fish community bioassessment methods to determine if Swift Creek should be classified as a priority NPS sub-watershed.

Sub-Watershed: Ivy Creek NRCS Sub-Watershed Number 160

***Landuse**:* Ivy Creek drains approximately 70 mi^2 in Autauga County. Land cover of the sub-watershed was primarily forest, pasture, and cropland. One current construction/stormwater authorization has been issued in the sub-watershed (Table 6a).

Percent land cover estimated by local SWCD (Table 5a, ASWCC 1998)

Forest	Row crop	Pasture	Mining	Urban	Open Water	Other
68%	11%	16%	0%	0%	<1%	1%

***NPS impairment potential**:* The SWCD estimates indicated *moderate* potentials for impairment associated with crop and pasture lands and forestry activities. Potential for impairment from other nonpoint sources was *low*. Ivy Creek was given a 4th priority sub-watershed rating by the local SWCD. Resource concerns included erosion and poor soil condition of cropland (Table 12a).

Values and NPS ratings for each NPS category estimated by local SWCD.

Category	Overall Potential	Animal husbandry	Aqua-culture	Row crop	Pasture	Mining	Forestry	Sediment
Value	13	0.11 AU/ac	0.01%	11%	16%	0%	38%	1.3 tons/ac/yr
NPS Potential	M	L	L	M	M	L	M	L
Table	7a	11a	11a	5a	5a	5a	12a	12a

***Assessments**:* Ivy Creek has been previously assessed at 3 locations in conjunction with ADEM's §303(d) Monitoring Program. Water quality data were collected on Alabama River at ALRAUM-1 by Auburn University in Montgomery under contract with ADEM (Appendix F-7). No in-stream assessments were conducted within the sub-watershed during the ACT Basin NPS Screening Assessment.

Assessment stations located within the sub-watershed. Descriptions are provided in Appendix E.

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
ALRAUM-1	Chemical	1999	Alabama River below Robert F. Henry dam (16N/13E/32)	16,233	Fish & Wildlife
IVC-1	Chemical	1999	Ivy Creek @ Autauga CR 9 (17N/13E/32)	21	Fish & Wildlife
IVC-2	Chemical, Habitat, Macroinvertebrate	1999	Ivy Creek @ AL Hwy 14 (17N/13E/17)	11	Fish & Wildlife
IVC-3	Chemical	1999	Ivy Creek @ Autauga CR 44 (18N/13E/31)	4	Fish & Wildlife

<u>Ivy Creek</u>: Ivy Creek at IVC-2 is a riffle-run stream. The dominant substrate types were sand and clay (Appendix F-3a). Habitat quality was assessed as *excellent* for this stream type and region. Nine EPT families were collected, indicating the macroinvertebrate community to be in *good* condition (Appendix F-3b).

Water quality data collected at IVC-2 and IVC-1 indicated elevated concentrations of total phosphorus (Total-P) and ammonia-nitrogen (NH_3-N) (Appendix F-3c).

NPS priority status: Water quality data suggested that nutrient enrichment may be a problem within the Ivy Creek sub-watershed. However, the macroinvertebrate community at IVC-2 did not show a high level of impairment.

Sub-Watershed: Cypress Creek NRCS Sub-Watershed Number 170

***Landuse**:* Cypress Creek drains approximately 45 mi^2 in Lowndes County. Land cover of the sub-watershed was evenly divided among crop, forest, and pasture. Two current construction/stormwater authorizations and 1 CAFO registration have been issued in the sub-watershed (Table 6a).

Percent land cover estimated by local SWCD (Table 5a, ASWCC 1998)

Forest	Row crop	Pasture	Mining	Urban	Open Water	Other
30%	32%	29%	0%	3%	3%	1%

NPS impairment potential: Percent row crop within this sub-watershed was the highest estimated within the Upper Alabama River CU and indicated a *high* potential for impairment from runoff and erosion (Table 5a). Percent pasture and silviculture indicated a *moderate* potential for impairment. The overall potential for impairment from nonpoint sources was estimated as *high.*

Values and NPS ratings for each NPS category estimated by local SWCD.

Category	Overall Potential	Animal husbandry	Aqua-culture	Row crop	Pasture	Mining	Forestry	Sediment
Value	15	0.09 AU/ac	0.00%	32%	29%	0%	20%	3.6 tons/ac/yr
NPS Potential	H	L	L	H	M	L	M	L
Table	7a	11a	11a	5a	5a	5a	12a	12a

***Assessments**:* An assessment of the Cypress Creek sub-watershed was not conducted during the ACT Basin NPS Screening Assessment. However, water quality samples were collected during ADEM's Reservoir Monitoring Program at the mouth of Cypress Creek during April, June, and August of 2000 (Appendix F-6). The data will be used to evaluate nutrient and sediment loading from this tributary as a source of water quality impairment to Woodruff Reservoir. Results of these analyses were reported in ADEM's Annual Reservoir Monitoring Program Report (ADEM, in press).

Assessment stations located within the sub-watershed. Descriptions provided in Appendix E.

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
WOOD-7	Chemical	2000	Main channel of Cypress Creek approximately 0.5 miles upstream of confluence with the Alabama River (16N/14E/20)	11	Fish & Wildlife

NPS priority status: NPS priority status of Cypress Creek could not be evaluated.

Sub-Watershed: Upper Big Swamp Creek NRCS Sub-Watershed Number 180

***Landuse**:* The Upper Big Swamp Creek sub-watershed drains approximately 130 mi^2 in Lowndes County. Land cover of the sub-watershed was primarily forest and pasture. Five construction/stormwater authorizations, 1 non-coal mining/stormwater authorization (< 5 acres), 1 municipal NPDES permit, and 1 CAFO registration have been issued in the sub-watershed (Table 6a).

Percent land cover estimated by local SWCD (Table 5a, ASWCC 1998)

Forest	Row crop	Pasture	Mining	Urban	Open Water	Other
68%	1%	26%	0%	1%	2%	2%

***NPS impairment potential**:* The primary NPS concerns within the sub-watershed were associated with pasture runoff and forestry activities. Percent forest in need of improvement within this sub-watershed was the highest within the Upper Alabama River CU (Table 12a). Potential for impairment from pasture runoff was *moderate*. There was a *moderate* potential for impairment from urban development and septic tank failure (Table 7a). Upper Big Swamp Creek sub-watershed was given a 2nd priority rating by the local SWCD. Resource concerns included erosion, poor condition of cropland soils, overgrazing of pastures, and access of livestock to streams (Table 12a).

Values and NPS ratings for each NPS category estimated by local SWCD.

Category	Overall Potential	Animal husbandry	Aqua-culture	Row crop	Pasture	Mining	Forestry	Sediment
Value	13	0.09 AU/ac	0.00%	1%	26%	0%	46%	2.5 tons/ac/yr
NPS Potential	M	L	L	L	M	L	H	L
Table	7a	11a	11a	5a	5a	5a	12a	12a

***Assessments**:* Three stations were scheduled for assessment during the ACT Basin NPS Screening Assessment. Two of these stations (BALL-4 and BSPL-5) could not be assessed due to severe low flow conditions. A macroinvertebrate assessment was conducted at Lake Creek (LAKL-4). Cherry Creek was evaluated during 1999 in conjunction with ADEM's ALAMAP Project (Appendix F-8).

Lake Creek: Lake Creek at LAKL-4 is a sandy-bottomed, glide-pool stream (Table 14a). Habitat quality was assessed as *excellent* for this stream type and region. Four EPT families were collected at this site, indicating the macroinvertebrate community to be in *poor* condition (Table 15a). However, low flow was a confounding factor in this assessment (Appendix D-1). The stream channel was dry during a September site visit to collect water quality samples.

Assessment stations located within the sub-watershed. Descriptions are provided in Appendix E.

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
BALL-4	None conducted	2000	Ballards Creek @ unnamed dirt road near Lowndes CR 33 and CR 37 (12N/15E/3)	14	Fish & Wildlife
BSPL-5	None conducted	2000	Big Swamp Creek @ Lowndes CR 37 (13N/15E/14)	37	Fish & Wildlife
LAKL-4	Habitat, Biological	2000	Lake Creek @ Lowndes CR 33 (13N/15E/7)	23	Fish & Wildlife
AR06U3-55	Chemical	1999	Cherry Creek approximately 0.5 miles upstream of unnamed Lowndes CR (12N/16E/5)	5	Fish & Wildlife

Cherry Creek: The dissolved oxygen concentration of 4.1 mg/L measured at AR06U3-55 did not meet Fish and Wildlife Criteria (Appendix F-8b). The chloride concentration was elevated (6.49 mg/L) for this stream type and region. Stream flow was measured at 0.1 cfs.

NPS priority status: Macroinvertebrate assessments and chemical sampling indicated impaired water quality at Lake Creek and Cherry Creek. However, it is probable that results were affected by the extreme drought conditions experienced during 1999 and 2000. Based on these data, Upper Big Swamp Creek cannot be recommended as a priority sub-watershed, but should be re-evaluated during the 2005 NPS Screening Assessment.

Sub-Watershed: Lower Big Swamp Creek NRCS Sub-Watershed Number 190

***Landuse**:* The Lower Big Swamp Creek sub-watershed drains approximately 167 mi^2 in Lowndes County. Land cover of the sub-watershed was primarily pasture and forest. The EPA estimated lower percent pasture landuse (26%) and higher percent row crop (15%) than the SWCD data. Two semi-public/private NPDES permits and 1 construction/ stormwater authorization have been issued in the sub-watershed (Table 6a).

Percent land cover estimated by local SWCD (Table 5a, ASWCC 1998)

Forest	Row crop	Pasture	Mining	Urban	Open Water	Other
42%	6%	47%	0%	1%	3%	2%

NPS impairment potential: The SWCD estimates of percent pastureland indicated a *high* potential for NPS impairment. There was a *moderate* potential for impairment from activities associated with cattle operations (animal husbandry) and forestry. The overall potential for impairment from nonpoint sources was estimated as *high*. There was a *moderate* potential for impairment from septic tank failure (Table 7a). Lower Big Swamp Creek sub-watershed was given a 1st priority rating by the SWCD. Resource concerns included erosion, poor cropland soil condition, and overgrazing of pastures (Table 12a). EPA landuse maps showed pasturelands to be concentrated along the mainstem of Lower Big Swamp Creek.

Values and NPS ratings for each NPS category estimated by local SWCD.

Category	Overall Potential	Animal husbandry	Aqua-culture	Row crop	Pasture	Mining	Forestry	Sediment
Value	15	0.14 AU/ac	0.00%	6%	47%	0%	28%	3.0 tons/ac/yr
NPS Potential	H	M	L	L	H	L	M	L
Table	7a	11a	11a	5a	5a	5a	12a	12a

***Assessments**:* ADEM's current assessment methods and NPS management practices are more effective in smaller watersheds. Therefore, the Lower Big Swamp Creek sub-watershed was not assessed during the ACT Basin NPS Screening Assessment. The NPS assessment of Big Swamp Creek was concentrated in the headwaters (Upper Big Creek sub-watershed 180). Big Swamp Creek has been previously monitored at two locations. Halls Branch at AR04U2-16, which was scheduled for assessment during ADEM's 1998 ALAMAP Project, could not be evaluated due to low flow conditions.

Assessment stations located within the sub-watershed. Descriptions are provided in Appendix E.

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
BSCAUM-1	Chemical	1999	Big Swamp Creek @ US Hwy 80 (15N/14E/19)	244	Fish & Wildlife
X	Habitat, Biological	1999	Big Swamp Creek at 1st road crossing upstream of confluence with the Alabama River (15N/13E/5)	279	Fish & Wildlife
AR04U2-16	None conducted	1998	Halls Branch, approximately 1.9 miles upstream of confluence with Ash Creek (14N/13E/26)	7	Fish & Wildlife

Big Swamp Creek: Big Swamp Creek at Station X was used as a study-specific reference site for the Catoma Creek Watershed Long-term Monitoring Project (CH2M-Hill 2000; Appendix F-4). Although stream characteristics were not reported, habitat quality (Appendix F-4a) was assessed as *excellent.* Bioassessments (Appendix F-4b) conducted at this station indicated the macroinvertebrate community to be *unimpaired* and the fish community to be in *good* condition.

Water quality data collected upstream of this site at BSCAUM-1 are provided in Appendix F-7a. Dissolved oxygen concentrations were below the 5.0 mg/L criteria for a Fish & Wildlife Water Use Classification during 5 of 22 (23%) sampling events.

NPS priority status: Biological assessments conducted close to the mouth of Big Swamp Creek have shown macroinvertebrate and fish communities to be in *good* condition.

Sub-Watershed: Little Mulberry Creek   NRCS Sub-Watershed Number 200

***Landuse**:* The Little Mulberry Creek sub-watershed drains approximately 138 mi^2 in Autauga and Chilton Counties. Primary landuses within the sub-watershed were forest, row crop, and pasture. Four current construction stormwater authorizations and 1 non-coal mining/stormwater authorization (<5 acres) have been issued in the sub-watershed (Table 6a).

Percent land cover estimated by local SWCD (Table 5a, ASWCC 1998)

Forest	Row crop	Pasture	Mining	Urban	Open Water	Other
71%	13%	10%	0%	<1%	<1%	2%

NPS impairment potenial: The SWCD estimates indicated *moderate* potential for impairment from row crops, cattle production, and silviculture. Potential for impairment from other nonpoint sources was *low*. Little Mulberry Creek was given a 3rd and 5th priority sub-watershed rating by the local SWCDs. Resource concerns are listed in Table 12a.

Values and NPS ratings for each NPS category estimated by local SWCD.

Category	Overall Potential	Animal husbandry	Aqua-culture	Row crop	Pasture	Mining	Forestry	Sediment
Value	13	0.14 AU/ac	0.03%	13%	10%	0%	42%	1.5 tons/ac/yr
NPS Potential	M	M	L	M	L	L	M	L
Table	7a	11a	11a	5a	5a	5a	12a	12a

Assessments: The Little Mulberry Creek sub-watershed was not assessed during the ACT Basin NPS Screening Assessment. Station AR6U5-38 could not be evaluated during ADEM's 2001 ALAMAP project due to severe low flow conditions during the sampling event.

Assessment stations located within the sub-watershed. Descriptions provided in Appendix E.

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
AR6U5-38	None conducted	2001	Tributary to Little Mulberry Creek, approximately 0.5 miles upstream of Autauga CR 1 (19N/13E/15)	2	Fish & Wildlife

NPS priority status: Forestry, cropland, and animal husbandry were NPS concerns within the Little Mulberry Creek sub-watershed. It should be considered for assessment during the 2005 ACT basin assessment.

Sub-Watershed: Upper Mulberry Creek NRCS Sub-Watershed Number 210

***Landuse**:* The Upper Mulberry Creek sub-watershed drains approximately 109 mi^2 in Bibb and Chilton Counties. The sub-watershed was estimated as 84% forest. No current construction/stormwater authorizations, NPDES permits, or CAFO registrations have been issued in the sub-watershed (Table 6a).

Percent land cover estimated by local SWCD (Table 5a, ASWCC 1998)

Forest	Row crop	Pasture	Mining	Urban	Open Water	Other
84%	4%	10%	0%	<1%	<1%	2%

NPS impairment potential: Potential for impairment from nonpoint sources was *low* throughout the sub-watershed. The overall potential for impairment from nonpoint sources was the lowest estimated within the Upper Alabama River CU (Table 7a). However, it was rated as a priority sub-watershed by the SWCD (Table 12a).

Values and NPS ratings for each NPS category estimated by local SWCD.

Category	Overall Potential	Animal husbandry	Aqua-culture	Row crop	Pasture	Mining	Forestry	Sediment
Value	7	<0.01 AU/ac	0.00%	4%	10%	0%	10%	1.6 tons/ac/yr
NPS Potential	L	L	L	L	L	L	L	L
Table	7a	11a	11a	5a	5a	5a	12a	12a

***Assessments**:* An assessment was not conducted within this sub-watershed during the ACT Basin NPS Screening Assessment because of the *low* potential for impairment from nonpoint sources.

Pate Creek and Morgan Creek were scheduled for water quality sampling during ADEM's ALAMAP Program (Appendix F-8). Pate Creek (AR03U3-45) could not be assessed due to severe low flow conditions (Appendix F-8b). Data from Morgan Creek at AR4U5-31 will be reported in ADEM's ALAMAP Program 5-year report (ADEM, in prep).

Assessment stations located within the sub-watershed. Descriptions are provided in Appendix E.

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
AR03U3-45	None conducted	1999	Pate Creek upstream of Chilton CR 5 (23N/13E/3)	1	Fish & Wildlife
AR4U5-31	Chemical, Habitat	2001	Morgan Creek approximately 0.1 miles upstream of confluence with Little Mulberry Creek (21N/12E/4)	8	Fish & Wildlife

NPS priority status: Given the low potential for impairment from both point and nonpoint sources, Upper Mulberry Creek should be considered as a least-impaired reference sub-watershed.

Sub-Watershed: Lower Mulberry Creek NRCS Sub-Watershed Number 220

Landuse: The Lower Mulberry Creek sub-watershed drains approximately 168 mi^2 in Autauga, Chilton, and Dallas Counties. Land cover within the sub-watershed was estimated as 80% forest. Two current construction/stormwater authorizations, 2 mining NPDES permits, and 1 semi-public/private NPDES permit have been issued in the sub-watershed (Table 6a).

Percent land cover estimated by local SWCD (Table 5a, ASWCC 1998)

Forest	Row crop	Pasture	Mining	Urban	Open Water	Other
80%	6%	8%	0%	1%	<1%	2%

NPS impairment potential: The potential for impairment from forestry activities was estimated as *moderate.* The potential for impairment from other nonpoint sources was *low*. However, Lower Mulberry Creek was given a 4th priority sub-watershed rating by the local SWCD. Resource concerns included erosion and excessive sediment, poor soil condition of crop and pasture land, inadequate management of animal waste, nutrients in surface waters, and bacteria and other organisms in surface and ground waters (Table 12a).

Values and NPS ratings for each NPS category estimated by local SWCD.

Category	Overall Potential	Animal husbandry	Aqua-culture	Row crop	Pasture	Mining	Forestry	Sediment
Value	9	0.02 AU/ac	<0.01%	6%	8%	0%	22%	1.4 tons/ac/yr
NPS Potential	L	L	L	L	L	L	M	L
Table	7a	11a	11a	5a	5a	5a	12a	12a

Assessments: An assessment was not conducted within this sub-watershed during ACT Basin NPS Screening Assessment because of the *low* potential for impairment from nonpoint sources. Two stations have been monitored within the Lower Mulberry Creek sub-watershed in conjunction with ADEM's Ecoregional Reference Site (Appendix F-1) and Reservoir Monitoring (Appendix F-6) Programs. Mulberry Creek was intensively sampled during the University Tributary Monitoring Project (Appendix F-7). An assessment of Boggles Creek (AR8U5-42) could not be conducted due to severe low flow conditions.

Buck Creek: Buck Creek at BCKA-26 was sampled as an ecoregional reference site for the Fall Line Hills (65i) subecoregion of the Southeastern Plains Ecoregion. At this site, Buck Creek is a shaded, low-gradient stream (Appendix F-1a). Bottom substrates were primarily composed of sand, detritus, and clay. Habitat quality was assessed as *excellent* (Appendix F-1a). However, only 6 EPT families were collected at this site, indicating the macroinvertebrate community to be in *fair* condition (Appendix F-1b). Water quality data collected during September of 2000 did not indicate a cause of impairment (Appendix F-1c).

Assessment stations located within the sub-watershed. Descriptions are provided in Appendix E.

Station	**Assessment Type**	**Date**	**Location**	**Area (mi^2)**	**Classification**
BCKA-26	Chemical, Habitat, Biological	2000	Buck Creek @ Autauga CR 16 (19N/12E/28)	20	Fish & Wildlife
AR8U5-42	None conducted	2001	Boggles Creek approximately 3.5 miles upstream of confluence with Mulberry Creek (21N/12E/4)	9	Fish & Wildlife
MUCAUM-1	Chemical	1999	Mulberry Creek @ Dallas CR 52 (19N/12E/31)	203	Fish & Wildlife
DAN-5	Chemical	2000	Main channel of Mulberry Creek, approximately 0.5 miles upstream of confluence with Alabama River (17N/12E/21)	275	Fish & Wildlife

<u>Mulberry Creek</u>: Twenty-two intensive water quality samples were collected at MUCAUM-1 from December of 1998 through December of 1999 (Appendix F-7a). Water quality samples were also collected during ADEM's Reservoir Monitoring Program at the mouth of Mulberry Creek (DAN-5) during April, June, and August of 2000 (Appendix F-6a). The data from both studies will be used to evaluate nutrient and sediment loading from this tributary as a source of water quality impairment to Dannelly Reservoir.

NPS priority status: Biological conditions at BCKA-26, an ecoregional reference site, were assessed as *fair* (Table 10a). The immediate sub-watershed may have been affected by recent silvicultural activity. Therefore, Buck Creek is recommended as a priority NPS sub-watershed.

Sub-Watershed: Soapstone Creek NRCS Sub-Watershed Number 230

***Landuse**:* The Soapstone Creek sub-watershed drains approximately 125 mi^2 in Dallas and Chilton Counties. There were differences between percent landuse estimated by local SWCD and the EPA (Table 2a). Recent research has suggested that these differences may reflect landuse changes that have occurred since the Landsat dataset, used by EPA to estimate percent land cover, was compiled (Olson and Gore 2000, Pitt 2000). The EPA estimated slightly lower percent urban and cropland, and a higher percent forest (Table 2a). Four semi-public/private NPDES permits, 2 current construction/stormwater authorizations, 1 mining NPDES permit, and 1 municipal NPDES permit have been issued in the sub-watershed (Table 6a).

Percent land cover estimated by local SWCD (Table 5a, ASWCC 1998)

Forest	Row crop	Pasture	Mining	Urban	Open Water	Other
39%	30%	20%	0%	5%	1%	5%

***NPS impairment potential**:* Runoff from crop and pasture lands was the primary nonpoint concern within the sub-watershed. Potential for impairment from other nonpoint sources was *low*. There was a *moderate* potential for impairment from urbanization and septic tank failure (Table 7a). Soapstone Creek was given a 3rd priority sub-watershed rating by the SWCD. Resource concerns are listed in Table 12a.

Values and NPS ratings for each NPS category estimated by local SWCD.

Category	Overall Potential	Animal husbandry	Aqua-culture	Row crop	Pasture	Mining	Forestry	Sediment
Value	13	0.06 AU/ac	0.00%	30%	20%	0%	12%	1.7 tons/ac/yr
NPS Potential	M	L	L	H	M	L	L	L
Table	7a	11a	11a	5a	5a	5a	12a	12a

***Assessments**:* Since 1991, ADEM has sampled Soapstone Creek (SPD-1) as a least-impaired, ecoregional reference site for the Flatwood/Blackland Prairie Margins subecoregion (65b) (Appendix E).

Assessment stations located within the sub-watershed. Descriptions provided in Appendix E.

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
SPD-1	Chemical, Habitat, Macroinvertebrate	1991-1995 2001	Soapstone Creek @ US Hwy 80 (16N/12E/31)	22	Fish & Wildlife

<u>Soapstone Creek</u>: Soapstone Creek at SPD-1 is a low-gradient stream characterized by clay bedrock and small gravel-riffles (Appendix F-1a). Habitat quality is generally assessed as *good* or *excellent* for this subecoregion. During 2001, the condition of the macroinvertebrate community was assessed as *good* (Appendix F-1b), but the condition of the fish community was assessed as *poor* (Appendix F-1b).

Water quality data collected at this station since 1991 has not indicated nutrient enrichment or other water quality problems (Appendix F-1c).

NPS priority status: The fish community was assessed as *poor* during 2001. Although the aquatic macroinvertebrate community was assessed as *good*, results have indicated declining water quality at Soapstone Creek since 1991 (Appendix F-1b). Agricultural activities comprised 50% of land cover within the sub-watershed. It is recommended that Soapstone Creek be classified as a priority NPS sub-watershed.

Sub-Watershed: Bluegirth-Beech Creek NRCS Sub-Watershed Number 240

***Landuse**:* The Bluegirth-Beech Creek sub-watershed drains approximately 73 mi^2 in Dallas County. Percent land cover was primarily forest and pasture. Four current construction/ stormwater authorizations, 2 non-coal mining/stormwater authorizations (<5 acres), 3 semi-public/private NPDES permits, 2 mining NPDES permits, and 1 industrial NPDES permit have been issued in the sub-watershed (Table 6a).

Percent land cover estimated by local SWCD (Table 5a, ASWCC 1998)

Forest	Row crop	Pasture	Mining	Urban	Open Water	Other
55%	4%	20%	1%	7%	8%	5%

***NPS impairment potential**:* The potential for impairment associated with pasture and mining was estimated as *moderate*. The potential for impairment from other nonpoint sources was *low*. There was a *moderate* potential for impairment from urbanization and a *high* potential for impairment from failing septic tanks.

Values and NPS ratings for each NPS category estimated by local SWCD.

Category	Overall Potential	Animal husbandry	Aqua-culture	Row crop	Pasture	Mining	Forestry	Sediment
Value	11	0.07 AU/ac	0.21%	4%	20%	1%	10%	3.5 tons/ac/yr
NPS Potential	M	L	L	L	M	M	L	L
Table	7a	11a	11a	5a	5a	5a	12a	12a

Assessments: The Bluegirth-Beech sub-watershed was not assessed during the ACT Basin NPS Screening Assessment because of the potential for impairment from urban sources.

Sub-Watershed: Valley Creek NRCS Sub-Watershed Number 250

***Landuse**:* The Valley Creek sub-watershed drains approximately 67 mi^2 in Chilton and Dallas Counties. There were differences between percent landuse estimated by the local SWCD and the EPA (Table 2a). Recent research suggests that these differences may reflect urbanization that has occurred since the Landsat dataset was collected (Table 2a). The EPA landuse estimates, based on Landsat data from 1993, indicated a lower percent urban and higher percent forest (Table 2a). Three current construction stormwater authorizations have been issued in the sub-watershed (Table 6a).

Percent land cover estimated by local SWCD (Table 5a, ASWCC 1998)

Forest	Row crop	Pasture	Mining	Urban	Open Water	Other
66%	5%	5%	0%	20%	1%	3%

***NPS impairment potential**:* The potential for impairment from silvicultural activities was *moderate.* These estimates were verified during ground-truthing reconnaissance that found silviculture to be the primary landuse activity of the sub-watershed above Paul M. Grist State Park (ADEM 1999). The overall potential for impairment from nonpoint sources was estimated as *low*. There was a *moderate* potential for impairment from urbanization and septic tank failure. Valley Creek was given a 5th priority sub-watershed rating by the SWCD. Resource concerns included erosion, bacteria and other organisms in surface and ground waters, and access of livestock to streams (Table 12a).

Values and NPS ratings for each NPS category estimated by local SWCD.

Category	Overall Potential	Animal husbandry	Aqua-culture	Row crop	Pasture	Mining	Forestry	Sediment
Value	9	0.02 AU/ac	0.00%	5%	5%	0%	19%	0.8 tons/ac/yr
NPS Potential	L	L	L	L	L	L	M	L
Table	7a	11a	11a	5a	5a	5a	12a	12a

***Assessments**:* An assessment of the sub-watershed was not conducted during the ACT Basin NPS Screening Assessment because of the availability of recent assessment information and the relatively *low* potential for NPS impairment.

Three locations were previously monitored during an intensive assessment of surface waters within the Paul M. Grist State Park during ADEM's 1998 State Parks Monitoring Project (Appendix E, ADEM 1999d). An evaluation of an unnamed tributary to Valley Creek (AR01U2-33) scheduled during ADEM's 1998 ALAMAP Program was not conducted due to severe low flow conditions (Appendix F-8b).

Valley Creek: Valley Creek at VLYD-1 is located approximately 1.5 miles downstream of Valley Creek Lake, a 100-acre impoundment within the Paul M. Grist State Park. The morphology of the site was glide-pool (Appendix F-2a). Habitat quality was assessed as *good* for this stream type and region, but was impaired by sediment deposition and

Assessment stations located within the sub-watershed. Descriptions are provided in Appendix E.

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
VLYD-1	Chemical, Habitat, Macroinvertebrate, Fish	1993, 1998	Upstream of Dallas CR 222 (19N/11E/5)	16	Fish & Wildlife
VLYD-2	Chemical	1998	Upstream of Dallas CR 37 within Paul M. Grist State Park (1N/11E/20)	7	Fish & Wildlife
UVLD-1	Chemical, Habitat, Macroinvertebrate	1998	Unnamed tributary to east of Valley Creek, approximately 0.8 miles west of unnamed road (18N/11E/21)	0.3	Fish & Wildlife
AR01U2-33	None conducted	1998	Tributary to Valley Creek, approximately 0.5 miles upstream of confluence with Valley Creek (19N/11E/8)	6	Fish & Wildlife

decreased in-stream habitat (ADEM 1999d). Percent substrate composition was 82% gravel and 10% sand. Eight EPT families were collected, indicating the macroinvertebrate community to be in *fair* condition (Appendix F-2b). A fish IBI assessment resulted in a score of 43, indicating that the fish community was also in *fair* condition (Appendix F-2b).

Water quality assessments found fecal coliform bacteria count of 1050 colonies/100 mL and 5-day biochemical oxygen demand (BOD-5) of 4.4 mg/L during the July 1998 sampling event (Appendix F-2c).

Valley Creek at VLYD-2 is located approximately 1.0 mile upstream of Valley Creek Lake, immediately below the dam of a small impoundment. Water quality data collected at this site was similar to the downstream site (VLYD-1) (Appendix F-2c).

Unnamed tributary to Valley Creek: An unnamed tributary at the north end of Valley Creek Lake was sampled outside the park at UVLD-1. Bottom substrates were primarily composed of sand (40%) and clay (40%). Habitat quality was assessed as *good* for this stream type and region (Appendix F-2a). Six EPT families were collected, indicating the macroinvertebrate community to be in *fair* condition (Appendix F-2b). Fecal coliform bacteria counts were 630 colonies/100 mL (Appendix F-2c). Five-day biochemical oxygen demand (BOD-5) of 2.7 mg/L was measured during the September 1998 sampling event (Appendix F-2c).

NPS priority status: Biological conditions within the Valley Creek sub-watershed were assessed as *fair* (Table 10a). Water quality data indicated elevated fecal coliform concentrations and biochemical oxygen demand after a rain storm event. Biological impairment may be caused by silvicultural activities within the sub-watershed or the impoundment of Valley Creek Lake upstream of the sampling stations.

Sub-Watershed: Beaver Dam Creek NRCS Sub-Watershed Number 260

Landuse*:* The Beaver Dam Branch sub-watershed drains approximately 12 mi^2 in Dallas County. Land cover of the sub-watershed was a mix of forest, urban, row crop, and pasture. EPA Landsat data estimated a much lower percentage of urban area in the sub-watershed (Table 5a). Two current construction/stormwater authorizations and 2 mining NPDES permits have been issued in the sub-watershed (Table 6a).

Percent land cover estimated by local SWCD (Table 5a, ASWCC 1998)

Forest	Row crop	Pasture	Mining	Urban	Open Water	Other
38%	20%	15%	0%	25%	1%	1%

NPS impairment potential*:* The primary NPS concerns within the sub-watershed were runoff from crop and pasturelands and sedimentation (Table 12a) from sand and gravel pits (2.3 tons/acre/year) and stream banks (2.0 tons/acre/year). There was a *high* potential for impairment from urban runoff and a *moderate* potential for impairment from septic tank failure (Table 7a).

Values and NPS ratings for each NPS category estimated by local SWCD.

Category	Overall Potential	Animal husbandry	Aqua-culture	Row crop	Pasture	Mining	Forestry	Sediment
Value	13	<0.01 AU/ac	---	20%	15%	0%	16%	5.1 tons/ac/yr
NPS Potential	M	L	---	M	M	L	L	M
Table	7a	11a	11a	5a	5a	5a	12a	12a

Assessments*:* The Beaver Dam Creek sub-watershed was not monitored during the ACT Basin NPS Screening Assessment due to the small size of the sub-watershed and *high* potential for impairment from urban areas.

Table 5a. Landuse percentages for the Upper Alabama CU (0315-0201) from EPA landuse categories (EPA 1997) and local SWCD Conservation Assessment Worksheet landuse estimates (ASWCC 1998).

Sub-watershed	Percent Total Landuse													
	Open Water		Urban		Mines		Forest		Pasture		Row Crops		Other	
	SWCD	EPA	SWCD	EPA	SWCD	EPA	SWCD	EPA	SWCD	EPA	SWCD	EPA	SWCD	EPA
Upper Alabama (0315-0201)														
010	<1	5	10	<1	0	0	57	36	14	22	18	24	0	12
020	1	1	<1	1	0	<1	78	65	7	11	10	16	2	6
030	4	5	43	5	<1	<1	23	44	16	15	13	16	1	14
040	<1	4	75	30	3	1	7	27	6	10	7	12	3	17
050	<1	<1	7	2	0	0	81	69	7	5	6	16	0	8
060	1	1	3	1	0	0	33	60	55	15	5	12	3	11
070	2	1	1	<1	0	0	31	36	60	34	4	21	2	7
080	2	1	40	18	1	0	30	30	20	22	2	14	5	15
090	2	1	0	<1	0	0	39	58	55	19	1	16	4	6
100	2	1	1	<1	<1	0	59	59	34	18	1	15	3	6
110	3	1	2	1	0	0	24	33	64	35	5	20	2	10
120	---	21	---	<1	---	0	---	45	---	19	---	12	---	4
130	<1	5	5	1	<1	<1	50	52	23	14	13	18	2	11
140	3	2	1	1	0	<1	52	43	33	25	9	18	2	10
150	<1	<1	<1	<1	<1	<1	73	68	12	7	10	14	1	10
160	<1	4	0	<1	0	<1	68	63	16	12	11	18	1	2
170	3	6	3	<1	0	0	30	35	29	19	32	24	1	15
180	2	<1	1	<1	0	0	68	65	26	17	1	8	2	10
190	3	<1	1	<1	0	0	42	41	47	26	6	15	2	17
200	<1	1	<1	<1	0	<1	71	75	10	8	13	10	2	7
210	<1	<1	<1	<1	0	<1	84	80	10	8	4	6	2	5
220	<1	<1	1	<1	0	<1	80	83	8	5	6	6	2	5
230	1	2	5	1	0	<1	39	56	20	17	30	14	5	10
240	8	3	7	4	1	<1	55	42	20	9	4	13	5	28
250	1	<1	20	3	0	0	66	81	5	5	5	7	3	5
260	1	8	25	3	0	<1	38	29	15	11	20	29	1	20

Table 6a. Summary of the number of current construction/stormwater authorizations, non-coal <5 acres/stormwater authorizations, NPDES permits, and CAFO registrations issued within each sub-watershed of the Upper Alabama River CU. Those sub-watersheds with more than five authorizations, permits, or registrations in a category are in bold.

Sub-watershed	# Authorizations, NPDES permits, and CAFO Registrations							
	Total Number of Permits and Authorizations	Construction/ Stormwater Authorizations (a)	Non-Coal Mining <5 Acres / Stormwater Authorizations (a)	Mining NPDES (c)	Municipal NPDES (b)	Semi Public/ Private NPDES (b)	Industrial Process Wastewater - NPDES Majors (b)	CAFO Registrations (c)
010	5	2		1		2		
020	21	13	1	4		2		1
030	43	37	2	2	2			
040	48	37	1	7	2		1	
050	17	13	2		1	1		
060	22	19				3		
070	3	2	1					
080	24	22		1	1			
090	3	1				2		
100	10	4	3	2				1
110	6	4				1	1	
120								
130	9	5	2		1		1	
140	6	2	1	3				
150	7	4		2	1			
160	1	1						
170	3	2						1
180	8	5	1		1			1
190	3	1				2		
200	5	4	1					
210								
220	5	2		2		1		
230	9	2		1	1	5		
240	12	4	2	2		3	1	
250	3	3						
260	4	2		2				

(a) Source: ADEM Mining and Nonpoint Source Unit, Field Operations, database retrieval (7/18/00)

(b) Source: 1996 CWS Report (ADEM 1999a)

(c) Source: ADEM Mining and Nonpoint Source Unit, Field Operations, database retrieval (08/11/00)

Table 7a. Estimation of potential sources of NPS impairment for subwatersheds in the Upper Alabama cataloging unit (0315-0201). Source categories are based upon information provided by the local Soil and Water Conservation Districts (SWCD) on Conservation Assessment Worksheets completed in 1998, and from current construction/stormwater authorization information provided by the Mining and NPS Unit of ADEM. *Rural landuse sources were used to develop the NPS potential. The presence of a CWA §303(d) stream segment within a subwatershed raised the subwatershed to the top of the prioritization ranking.

Subwatershed	Overall NPS Impairment Score	Potential NPS Impairment	Potential Sources of Impairment									
			Rural Landuses							Urban / Suburban / Residential Landuses		
			Animal Husbandry	Aquaculture	Row Crops	Pasture Runoff	Mining	Forestry Practices	Sedimentation	Urban	Development	Septic Tank Failure
Raw Data Table			12a	12a	5a	5a	5a	13a	13a	5a	6a	13a
010	10	L	L	L	M	M	L	---	L	M	L	L
020	11	M	L	L	M	L	L	M	L	L	M	L
030	17	**H**	L	L	M	M	M	L	**H**	**H**	**H**	L
040	15	**H**	L	L	M	L	H	L	M	**H**	**H**	L
050	9	L	L	L	L	L	L	M	L	M	M	L
060	13	M	M	L	L	**H**	L	L	L	L	M	L
070	13	M	M	L	L	**H**	L	L	L	L	L	L
080	11	M	L	L	L	M	M	L	L	**H**	**H**	L
090	13	M	M	L	L	**H**	L	L	L	L	L	L
100	13	M	M	L	L	M	L	M	L	L	L	L
110	13	M	M	L	L	**H**	L	L	L	L	L	L
120	---	---	---	---	---	---	---	---	---	---	L	---
130	13	M	L	L	M	M	L	M	L	M	M	L
140	15	**H**	L	L	M	M	L	M	M	L	L	L
150	11	M	L	L	M	L	L	M	L	L	L	L
160	13	M	L	L	M	M	L	M	L	L	L	L
170	15	**H**	L	L	**H**	M	L	M	L	L	L	L
180	13	M	L	L	L	M	L	H	L	L	M	M
190	15	**H**	M	L	L	**H**	L	M	L	L	L	M
200	13	M	M	L	M	L	L	M	L	L	L	L
210	7	L	L	L	L	L	L	L	L	L	L	L
220	9	L	L	L	L	L	L	M	L	L	L	L
230	13	M	L	L	**H**	M	L	L	L	M	L	M
240	11	M	L	L	L	M	M	L	L	M	L	**H**
250	9	L	L	L	L	L	L	M	L	M	L	M
260	13	M	L	L	M	M	L	L	M	**H**	L	M

Table 8a. List of other water quality assessments conducted on streams within the Upper Alabama River CU from 1990-2000. Data are provided by project and assessment type in the Appendices listed.

Sub-watershed	*Waterbody*	*Date(s)*	*Assessment Type* [a]	*Appendices*
000	Alabama River	1990-1996	M, C	F-1
010	Bouldin Trace Canal	1999	C	F-5
020	Mortar Creek	1999	C, H	F-4, F-6
020	Unnamed tributary to Mortar Creek	1999	C, H	F-4
050	Autauga Creek	1999	C, H	F-4, F-5
060	Baskin Mills Creek	1995, 1996, 1999, 2000	M, F, C, H	F-8
060	Little Catoma Creek	1995, 1996, 1999, 2000	M, F, H, C	F-8, F-5
060	Catoma Creek	1995, 1996, 1999, 2000	M, F, H, C	F-8, F-5
070	Unnamed tributary to Ramer Creek	2000	C	F-8
070	Waller Creek	1998	C, H	F-6
070	Ramer Creek	1995, 1996, 1999, 2000	M, F, C, H	F-8
080	Catoma Creek	1996, 1999, 2000	C, H	F-4, F-5, F-8, F-9
080	Hannon Slough	2000	C	F-8
080	Caney Branch	2000	C	F-8
080	Whites Slough	2000	C	F-8
090	Unnamed tributary to Pintlalla Creek	1999	C, H	F-9
090	Pintlalla Creek	1999, 2000	M, C, H	F-4
110	Pintlalla Creek	2000	C	F-9
110	Steep Creek	2000	C, H	F-6
130	Noland Creek	1999	M, C, H	F-4
130	Unnamed tributary to Alabama River	1997	C, H	F-6
140	Alabama River	1996	C	F-1
140	Tallawassee Creek	1999	C, H	F-6
150	Swift Creek	1993-1995, 1998-2000	M, C, H	F-3, F-4, F-9
150	Indian Creek	1999	M, C	F-6
160	Ivy Creek	1999	C, H	F-4
160	Alabama River	1999	C	F-5
170	Cypress Creek	2000	C	F-9
180	Cherry Creek	1999	C, H	F-6
190	Halls Branch	1998	C, H	F-6
190	Big Swamp Creek	1995, 1996, 1999, 2000	M, F, H, C	F-5, F-8
200	Tributary to Little Mulberry Creek	2001	C, H	F-6
210	Pate Creek	1999	C, H	F-6
210	Morgan Creek	2001	C, H	F-6
220	Boggles Creek	2001	C, H	F-6
220	Buck Creek	2000	M, C, H	F-6
220	Mulberry Creek	1999	C	F-5, F-9
230	Soapstone Creek	1991-1995, 2000	M, H, C	F-3
250	Valley Creek	1998	M, F, C, H	F-2
250	Unnamed tributary to Valley Creek Lake	1998	C, H	F-6
250	Unnamed tributary to Valley Creek Lake	1998	M, F, C, H	F-2

a. H= Habitat, M=Macroinvertebrate, F=Fish, C=Chemical

Table 9a. List of stations located within the Upper Alabama River CU assessed or attempted as part ACT Basin NPS Screening Assessment.

Sub-watershed	Stream	Station	Basin Size (est. mi^2)	Assessment Type[a]	Subregion[b]	County	T / R / S
070	Ramer Creek	RMRM-9	60	H, M, C*	65a	Montgomery	15N/18E/27
070	Ramer Creek	RMRM-10	26	H, M, C*	65a	Montgomery	14N/18E/28
070	Ramer Creek	RMRM-11	11	N/A	65a	Montgomery	13N/18E/14
090	Pintlala Creek	PNCM-8a		H, M	65a	Montgomery	14N/17E/20
090	Pintlala Creek	PNTM-6	57	N/A	65a	Montgomery	14N/17E/15
090	Pintlala Creek	PNTM-7	52	H, M, F, C	65a	Montgomery	14N/17E/24
090	Pintlala Creek	PNTM-8	37	N/A	65a	Montgomery	14N/17E/27
110	Jack Creek	JCKL-12	6	N/A	65a	Lowndes	14N/16E/15
110	Steep Creek	STPL-13	8	N/A	65a	Lowndes	14N/16E/20
110	Steep Creek	STPL-14	35	N/A	65a	Lowndes	15N/16E/20
140	Tallawassee Creek	TALL-1	7	H, M	65a	Lowndes	15N/15E/16
140	UT to Tallawassee Creek	TALL-2	5	N/A	65a	Lowndes	15N/15E/15
180	Ballards Creek	BALL-4	6	N/A	65e	Lowndes	12N/15E/3
180	Big Swamp Creek	BSPL-5	11	N/A	65a	Lowndes	13N/15E/14
180	Fort Deposit Creek	FTDL-3	9	N/A	65e	Lowndes	13N/15E/32
180	Lake Creek	LAKL-4		H, M, C	65a	Lowndes	13N/15E/7

a. Assessment Type: C=Chemical; C*= Chemical Assessment attempted, stream dry or intermittant pools; H= Habitat; M=Aquatic Macroinvertebrate Community; F=Fish Community; *NA* = Not Assessed (dry/not flowing/beaver dam, etc)

b. Level IV Ecoregions of Alabama (Griffith, et al. 1999)

Table 10a. Summary of assessments conducted within the Upper Alabama CU as a part of the Alabama River Basin NPS project and other available biological and chemical data collected since 1992.

Sub-watershed	Station Number	*Habitat*	*Macroinv.*	*Fish*	*Chemical data available*	*Lowest assessment score*
020*	MRC-1	Excellent	Good	---	X	Good
020*	AR07U3-57	Excellent	---	---	X	---
050*	AUC-2	Excellent	Poor	---	X	**Poor**
060	D[a]	Reference	Excellent	Good	X	Good
060	G[a]	Good	Fair	Fair	X	**Fair**
060	S[a]	Good	Good	Fair	X	**Fair**
070	H[a]	Good	Good	Fair	X	**Fair**
070	RMRM-9	Excellent	Good	---	FP-only	Good
070	RMRM-10	Good	Good	---	FP-only	Good
070	RMRM-11	---	---	---	---	---
080*	J[a]	Excellent	Fair	Fair	X	**Fair**
080*	L[a]	---	---	Poor	X	**Poor**
080*	O[a]	Excellent	Good	Poor/Fair	X	**Fair**
080*	R[a]	Good	Fair	---	X	**Fair**
090	PNTM-6	---	---	---	---	---
090	PNTM-7	Excellent	Good	---	---	Good
090	PNCM-8a	Excellent	Excellent	---	FP-only	Excellent
090	PLC-2	Good	Good	---	X	Good
110	JCKL-12	---	---	---	---	---
110	STPL-13	---	---	---	---	---
110	STPL-14	---	---	---	---	---
130	NLC-2	Excellent	Good	--	X	Good
140	TALL-1	Excellent	Excellent	---	FP-only	Excellent
140	TALL-2	---	---	---	---	---
140	AR05U3-9	Excellent	---	---	X	---
150	SWFC-1	Excellent	Good	Fair/Good	X	Good
150	SWC-1	Excellent	Excellent	---	X	Excellent
150	AR04U3-20	Excellent	---	---	X	---
160	IVC-2	Excellent	Good	---	X	Good
180	BALL-4	---	---	---	---	---
180	BSPL-5	---	---	---	---	---
180	FTDL-3	---	---	---	---	---
180	LAKL-4**	Excellent	Poor	---	FP-only	**Poor**
180	AR06U3-55	Excellent	---	---	X	---
220	BCKA-26	Excellent	Fair	---	X	**Fair**
230	SPD-1	Excellent	Good	Poor	X	**Poor**
250	VLYD-1	Good	Fair	Fair	X	**Fair**
250	VLYD-2	---	---	---	X	---
250	UVLD-1	Good	Fair	---	X	**Fair**

a. data from Catoma Creek Watershed Long-term Monitoring Program: habitat assessments of similar to reference and partially similar to reference were converted to excellent and good, respectively; macroinvertebrate assessments of *slightly impaired* and *moderately impaired* were converted to *good* and *fair*, respectively.
*impairment caused by urban sources
**low flow conditions

Table 11a. Estimates of animal concentrations, animal units (AU), percent aquaculture, and percent of acres where pesticides/herbicides have been applied in the Upper Alabama River CU (0315-0201). Numbers of animals and pesticides/herbicides listed by acreage and subwatershed were provided by the local SWCDs on Conservation Assessment Worksheets completed in 1998.

		Subwatershed									
		010	020	030	040	050	060	070	080	090	100
County (s)		Autauga* Elmore	Autauga Elmore	Autauga Elmore	Montgomery	Autauga Chilton*	Bullock* Montgomery	Montgomery	Montgomery	Crenshaw Montgomery	Crenshaw Lowndes Montgomery
Acres Reported (% of Total)		100	100	100	100	97	99	100	100	100	100
Pesticides Applied	Est. % Reported	*	*	14	*	*	*	*	*	*	*
Cattle	# / Acre	0.02	0.06	0.03	0.02	0.08	0.16	0.17	0.06	0.16	0.10
	A.U./Acre	**0.02**	**0.06**	**0.03**	**0.02**	**0.08**	**0.16**	**0.17**	**0.06**	**0.16**	**0.10**
Dairy	# / Acre	---	<0.01	<0.01	---	---	---	---	---	0.01	---
	A.U./Acre	---	**<0.01**	**<0.01**	---	---	---	---	---	**0.01**	---
Swine	# / Acre	---	<0.01	0.02	---	0.01	---	---	<0.01	---	---
	A.U./Acre	---	**<0.01**	**0.01**	---	**<0.01**	---	---	**<0.01**	---	---
Poultry - Broilers	# / Acre	---	---	---	---	---	---	1.89	---	1.80	5.17
	A.U./Acre	---	---	---	---	---	---	**0.02**	---	**0.01**	**0.04**
Poultry - Layers	# / Acre	---	---	---	---	---	---	---	---	2.43	---
	A.U./Acre	---	---	---	---	---	---	---	---	**0.02**	---
Total	A.U./Acre	**0.02**	**0.06**	**0.04**	**0.02**	**0.08**	**0.16**	**0.19**	**0.06**	**0.20**	**0.14**
Potential NPS Impairment		Low	Low	Low	Low	Low	Mod	Mod	Low	Mod	Mod.
Aquaculture	% total acres	0.00	<0.01	0.00	0.00	<0.01	0.00	0.00	0.00	0.00	0.00
Potential NPS Impairment		Low	Low	Low	Low	Low	Low	Low	Low	Low	Low

* No data reported for this portion of the subwatershed; nd = no data

Table 11a, cont. Estimates of animal concentrations, animal units (AU), percent aquaculture, and percent of acres where pesticides/herbicides have been applied in the Upper Alabama River CU (0315-0201). Numbers of animals and pesticides/herbicides listed by acreage and subwatershed were provided by the local SWCDs on Conservation Assessment Worksheets completed in 1998.

		Subwatershed									
		110	120	130	140	150	160	170	180	190	200
County (s)		Lowndes Montgomery	Montgomery*	Autauga	Lowndes	Autauga Chilton	Autauga	Lowndes	Lowndes	Lowndes	Autauga Chilton
Acres Reported (% of Total)		100	0	100	100	100	100	100	100	100	100
Pesticides Applied	Est. % Total Reported Acres	*	*	5	4	2	3	5		5	8
Cattle	# / Acre	0.19	---	0.06	0.10	0.02	0.11	0.09	0.08	0.14	0.12
	A.U./Acre	**0.19**	---	**0.06**	**0.10**	**0.02**	**0.11**	**0.09**	**0.08**	**0.14**	**0.12**
Dairy	# / Acre	<0.01	---	---	---	---	---	---	<0.01	---	0.01
	A.U./Acre	**<0.01**	---	---	---	---	---	---	**<0.01**	---	**0.01**
Swine	# / Acre	---	---	---	---	0.01	0.01	---	---	---	0.02
	A.U./Acre	---	---	---	---	**<0.01**	**<0.01**	---	---	---	**0.01**
Poultry - Broilers	# / Acre	10.52	---	---	---	---	---	---	---	---	---
	A.U./Acre	**0.08**	---	---	---	---	---	---	---	---	---
Poultry - Layers	# / Acre	1.64	---	---	---	---	---	---	---	---	---
	A.U./Acre	**0.01**	---	---	---	---	---	---	---	---	---
Total	A.U./Acre	**0.29**	**---**	**0.06**	**0.10**	**0.03**	**0.11**	**0.09**	**0.08**	**0.14**	**0.14**
Potential NPS Impairment		Mod	---	Low	Low	Low	Low	Low	Low	Mod	Mod
Aquaculture	% Total Acres	0.00	---	0.00	0.00	<0.01	0.01	0.00	0.00	0.00	0.03
Potential NPS Impairment		Low	Low	Low	Low	Low	Low	Low	Low	Low	Low

* No data reported for this portion of the subwatershed; nd = no data

Table 11a, cont. Estimates of animal concentrations, animal units (AU), percent aquaculture, and percent of acres where pesticides/herbicides have been applied in the Upper Alabama River CU (0315-0201). Numbers of animals and pesticides/herbicides listed by acreage and subwatershed were provided by the local SWCDs on Conservation Assessment Worksheets completed in 1998.

		Subwatershed						
		210	220	230	240	250	260	Total
County (s)		Bibb Chilton	Autauga	Dallas Lowndes*	Dallas	Chilton* Dallas	Dallas	
Acres Reported (% of Total)		100	100	96	100	98	100	99
Pesticides Applied	Est. % Reported	*	*	30	*	*	20	3
Cattle	# / Acre	<0.01	0.02	0.06	0.07	0.02	<0.01	0.08
	A.U./Acre	**<0.01**	**0.02**	**0.06**	**0.07**	**0.02**	**<0.01**	0.08
Dairy	# / Acre	---	---	---	---	---	---	0.00
	A.U./Acre	---	---	---	---	---	---	0.00
Swine	# / Acre	---	---	---	---	---	---	0.00
	A.U./Acre	---	---	---	---	---	---	0.00
Poultry - Broilers	# / Acre	---	---	---	---	---	---	0.73
	A.U./Acre	---	---	---	---	---	---	0.01
Poultry - Layers	# / Acre	---	---	---	---	---	---	0.15
	A.U./Acre	---	---	---	---	---	---	0.00
Total	A.U./Acre	**<0.01**	**0.02**	**0.06**	**0.07**	**0.02**	**<0.01**	**0.09**
Potential NPS Impairment		Low	Low	Low	Low	Low	Low	Low
Aquaculture	% Total Acres	0.00	<0.01	0.00	0.21	0.00	0.00	0.01
Potential NPS Impairment		Low	Low	Low	Low	Low	Low	Low

* No data reported for this portion of the subwatershed; nd = no data

Table 12a. Sedimentation estimates by source, forest condition, septic tank information and resource concerns by subwatershed in the Upper Alabama cataloging unit (315-0201) as provided by the local Soil and Water Conservation Districts (SWCD) on Conservation Assessment Worksheets (ASWCC 1998). (* Indicates not reported)

Subwatershed	**010**	**020**	**030**	**040**	**050**	**060**	**070**	**080**	**090**	**100**
Forest condition										
% Needing forest improvement	*	26	2	2	38	4	11	2	16	38
Potential for forestry NPS	*	Mod	Low	Low	Mod	Low	Low	Low	Low	Mod
Sedimentation rates (tons/acre/year)										
Cropland	0.6	0.5	0.4	0.1	0.2	0.1	<0.1	<0.1	<0.1	<0.1
Sand & gravel pits		0.9	0.8	4.6	0.2			1.6		<0.1
Mined land										0.5
Developing urban land	1.6	0.7	20.4	0.9	0.1	0.1	<0.1	0.5	<0.1	<0.1
Critical areas		0.1	0.3	0.0	<0.1	0.3	<0.1	0.2	0.9	1.2
Gullies		0.3	0.2	0.1	0.2	0.1			0.2	0.6
Stream banks	<0.1	0.2	0.1		0.1	<0.1	<0.1	<0.1	<0.1	0.1
Dirt roads and roadbanks	<0.1	0.3	0.1		0.3	0.1	<0.1		0.1	0.1
Woodlands	0.3	0.1	0.1		0.2	<0.1	<0.1	<0.1	<0.1	0.1
Total sediment	2.6	3.4	22.4	5.6	1.4	0.7	0.1	2.4	0.3	2.7
Potential for sediment NPS	Low	Low	**High**	Mod	Low	Low	Low	Low	Low	Low
Septic Tanks										
# Septic tanks per acre	0.03	0.06	0.09	*	0.04	<0.01	*	*	<0.01	0.01
# Septic tanks failing per acre	0.001	0.001	0.002	*	0.001	<0.001	*	*	<0.001	0.002
# of alternative septic systems			10							5
Resource Concerns in the Subwatershed										
Excessive erosion on cropland									X	
Gully erosion on agricultural land									X	X
Road and roadbank erosion									X	X
Poor soil condition (cropland)		X	X						X	X
Excessive animal waste applied to land										
Excessive pesticides applied to land										
Excessive sediment from cropland										
Excessive sediment from roads/road banks			X						X	X
Excessive sediment from urban development	X	X	X	X	X				X	
Inadequate management of animal wastes										
Nutrients in surface waters			X		X			X		
Pesticides in surface waters										
Bacteria and other organisms in surface waters				X		X	X	X	X	X
Low dissolved oxygen in surface waters								X		
Livestock are overgrazing pastures				X		X	X	X	X	X
Livestock Commonly have access to streams	X	X	X	X		X	X	X	X	X

Table 12a, cont. Sedimentation estimates by source, forest condition, septic tank information and resource concerns by subwatershed in the Upper Alabama River CU (315-0201) as provided by the local Soil and Water Conservation Districts (SWCD) on Conservation Assessment Worksheets (ASWCC 1998). (* Indicates not reported)

Subwatershed	**110**	**120***	**130**	**140**	**150**	**160**	**170**	**180**	**190**	**200**
Forest condition										
% Needing forest improvement	13	*	28	35	30	38	20	46	28	42
Potential for forestry NPS	Low	*	Low	Mod	Mod	Mod	Mod	High	Mod	Mod
Sedimentation rates (tons/acre/year)										
Cropland	0.2	*	0.4	0.3	0.3	0.4	1.0	<0.1	0.2	0.4
Sand & gravel pits		*	0.1	4.0	0.2	0.1	0.2		0.1	0.1
Mined land		*								
Developing urban land	0.1	*	0.2	<0.1	<0.1		<0.1	<0.1	<0.1	<0.1
Critical areas	1.5	*	<0.1	1.2	<0.1	<0.1	1.1	1.1	1.4	<0.1
Gullies	0.8	*	0.2	0.8	0.2	0.3	0.7	0.7	0.9	0.3
Stream banks	0.3	*	<0.1	0.2	0.1	0.1	0.2	0.3	0.2	0.1
Dirt roads and roadbanks	0.2	*	0.3	1.7	0.3	0.3	0.3	0.2	0.1	0.2
Woodlands	0.1	*	0.4	0.2	0.1	0.2	0.1	0.2	0.1	0.3
Total sediment	3.1	*	1.8	8.4	1.2	1.3	3.6	2.5	3.0	1.5
Potential for sediment NPS	Low	*	Low	Mod	Low	Low	Low	Low	Low	Low
Septic tanks										
# Septic tanks per acre*	<0.01	*	0.05	0.01	0.03	0.04	0.01	0.01	0.01	0.02
# Septic tanks failing per acre*	<0.001	*	0.001	0.002	0.001	0.001	0.002	0.004	0.003	0.001
# of alternative septic systems	100	*		20			10	30	30	
Resource concerns in the subwatershed										
Excessive erosion on cropland	X				X	X				
Gully erosion on agricultural land	X			X	X	X	X	X	X	
Road and roadbank erosion	X		X	X	X	X	X	X	X	X
Poor soil condition (cropland)	X			X	X	X	X	X	X	X
Excessive animal waste applied to land										
Excessive pesticides applied to land										
Excessive sediment from cropland	X				X	X				X
Excessive sediment from roads/roadbanks	X			X	X	X	X	X	X	X
Excessive sediment from urban development										
Inadequate management of animal wastes										
Nutrients in surface waters			X		X					X
Pesticides in surface waters										
Bacteria and other organisms in surface waters					X					
Low dissolved oxygen in surface waters										
Livestock are overgrazing pastures	X			X			X	X	X	X
Livestock commonly have access to streams	X			X	X		X	X		X

Table 12a, cont. Sedimentation estimates by source, forest condition, septic tank information and resource concerns by subwatershed in the Upper Alabama River CU (315-0201) as provided by the local SWCD on Conservation Assessment Worksheets (ASWCC 1998). (* Indicates not reported)

Subwatershed	**210**	**220**	**230**	**240**	**250**	**260**
Forest condition						
% Needing forest improvement	10	22	12	10	19	16
Potential for forestry NPS	Low	Mod	Low	Low	Mod	Low
Sedimentation rates (tons/acre/year)						
Cropland	0.2	0.2	0.7	<0.1	0.1	0.3
Sand & gravel pits	0.3	0.4	0.5	1.5		2.3
Mined land						
Developing urban land	<0.1	<0.1		0.6	0.1	
Critical areas	0.1	<0.1	0.1		0.1	
Gullies	0.2	0.1	<0.1	1.0	0.1	
Stream banks	0.2	0.1	0.1	<0.1	<0.1	2.0
Dirt roads and roadbanks	0.4	0.3	0.2	0.1	0.3	0.3
Woodlands	0.2	0.2	0.1	0.2	0.2	0.1
Total sediment	1.6	1.4	1.7	3.5	0.8	5.1
Potential for sediment NPS	Low	Low	Low	Low	Low	Mod
Septic tanks						
# Septic tanks per acre*	0.01	0.02	0.02	0.04	0.05	0.03
# Septic tanks failing per acre*	0.001	0.001	0.005	0.017	0.005	0.007
# of alternative septic systems			5	20	25	
Resource concerns in the subwatershed						
Excessive erosion on cropland	X	X				
Gully erosion on agricultural land		X				
Road and roadbank erosion	X	X	X	X	X	
Poor soil condition (cropland)		X				
Excessive animal waste applied to land						
Excessive pesticides applied to land						
Excessive sediment from cropland		X				
Excessive sediment from roads/roadbanks	X	X				
Excessive sediment from urban development						
Inadequate management of animal wastes		X				
Nutrients in surface waters		X				
Pesticides in surface waters						
Bacteria and other organisms in surface waters	X	X	X	X	X	X
Low dissolved oxygen in surface waters						
Livestock are overgrazing pastures	X	X				
Livestock commonly have access to streams	X	X	X	X	X	

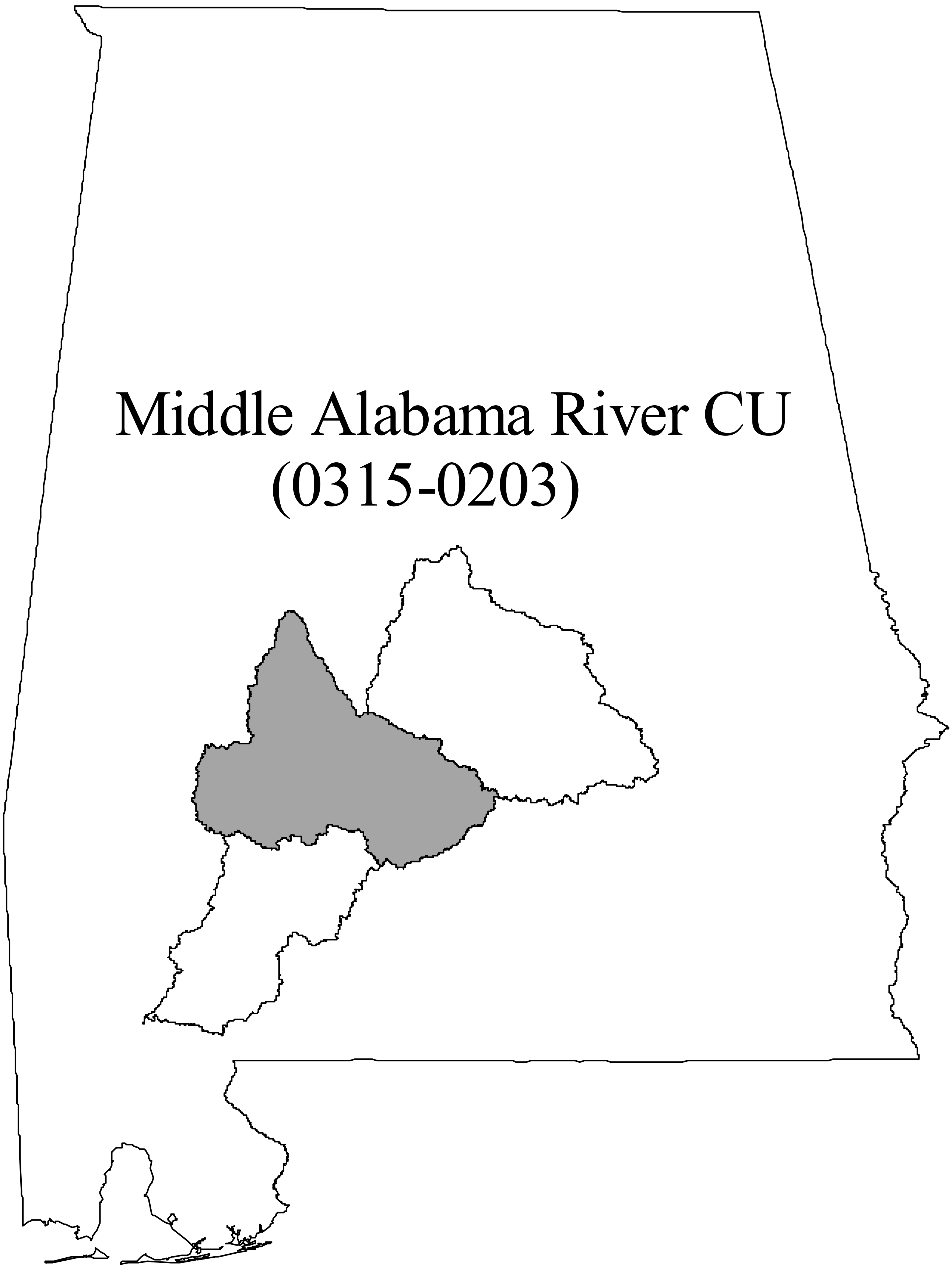
Table 13a. Physical characteristics and habitat quality of sites assessed in the Upper Alabama River CU (0315-0201) in conjunction with the ACT Basin NPS Screening Assessment.

		Station					
		RMRM-9	RMRM-10	PNTM-8a	PNTM-7	TALL-1	LAKL-4
Subwatershed #		070	070	090	090	140	180
Date (YYMMDD)		000504	000504	000509	000509	000509	000509
Ecoregion/ subregion		65a	65a	65a	65a	65a	65a
Drainage area (mi^2)		14	27	59	70	10	23
Width (ft)		10	10	14	10	25	20
Canopy cover[a]		50/50	MS	MS	S	O	MS
Depth (ft)	Riffle	---	---	0.3	---	---	---
	Run	---	---	0.5	0.5	---	---
	Pool	3.0	2.0		2.0	3.5	2.0
Substrate (%)	Bedrock	---	---	45	---	---	---
	Boulder	---	---	---	---	---	---
	Cobble	---	---	7	---	10	---
	Gravel	---	---	5	---	55	---
	Sand	55	75	30	80	20	92
	Silt	10	15	10	2	10	---
	Detritus	22	10	3	18	5	6
	Clay	13	---	---	---	---	2
	Organic silt	---	---	---	---	---	---
Habitat assessment form		GP	GP	RR	GP	RR	GP
Habitat survey (% maximum)							
	Instream habitat quality	53	36	65	37	62	50
	Sediment deposition	73	66	70	55	58	63
	Sinuosity	48	48	80	65	65	45
	Bank and vegetative stability	63	56	70	60	73	58
	Riparian measurements	81	48	100	100	79	65
Habitat assessment score		138	109	177	138	166	132
% Maximum		63	50	74	63	69	60
Assessment		Excellent	Good	Excellent	Excellent	Excellent	Excellent

a. Canopy cover: S=shaded, MS=mostly shaded, 50/50=50% shaded, MO=mostly open, O=open
b. Habitat assessment form: GP=glide/pool, RR=riffle/run

Table 14a. Results of bioassessment conducted in the Upper Alabama River CU (0315-0201) in conjunction with the ACT Basin NPS Screening Assessment. No fish assessments were conducted.

Sub-watershed	070	070	090	090	140	180
Station	RMRM-9	RMRM-10	PNCM-8	PNTM-7	TALL-1	LAKL-4
Ecoregion/ subregion	65a	65a	65a	65a	65a	65a
Drainage area (mi^2)	14	27	59	70	10	23
Macroinvertebrate community						
Date (yymmdd)	000504	000504	000509	000509	000509	000509
# EPT families	6	8	11	6	10	4
Assessment	Good	Good	Excellent	Good	Excellent	Poor


Middle Alabama River CU
(0315-0203)

Section II: Middle Alabama River Cataloging Unit (0315-0203) Summary

The Middle Alabama River CU of the Alabama River Basin contains 22 sub-watersheds, draining approximately 2,228 square miles of central Alabama (Fig. 1). The CU drains 5 subecoregions of the Southeastern Plains Ecoregion (65) (Fig. 2) (Griffith et al. 2001). These subecoregions consist of the Coastal Plain, Major Floodplains and Terraces, and the Blackland Prairie soil areas (ACES 1997).

Landuse: Based on the conservation assessment worksheets completed (1998) by the local SWCDs, the primary landuses throughout the Middle Alabama River CU were forest, pasture, and cropland. Approximately 75,000 acres of crop and pastureland (5% of total area) were treated with pesticides and/or herbicides. There are 4 stream or river segments currently on ADEM's 2000 §303(d) list of priority water bodies (Table 15b).

Percent land cover estimated by local SWCD (ASWCC 1998)

Forest	Row crop	Pasture	Mining	Urban	Open Water	Other
71%	10%	16%	0%	1%	1%	1%

NPS impairment potential: The primary NPS concerns within the Middle Alabama River CU were pasture, row crops, forestry, and aquaculture. Eight sub-watersheds were estimated to have a *moderate* or *high* potential for impairment from nonpoint sources. However, 3 of these sub-watersheds also had a *moderate* potential for impairment from urban development (Table 7b). Five sub-watersheds (110, 170, 190, 200, and 210) had a *low* potential for impairment from all rural and urban NPS categories (Table 7b).

Number of sub-watersheds with (M)oderate or (H)igh ratings for each NPS category (Table 7b).

Category	Overall Potential	Animal husbandry	Aqua-culture	Row crop	Pasture	Mining	Forestry	Sediment
Moderate	4	1	2	4	10	0	5	0
High	4	0	2	4	1	0	1	0

Number of sub-watersheds with (M)oderate or (H)igh ratings for each point source category (Table 7b).

Category	Urban	Development	Septic tank failure
Moderate	0	3	5
High	0	0	0

Historical data/studies: Table 8b lists the sub-watersheds and waterbodies in which data have been previously collected and the appendices where these data are provided. Recent assessment information has been collected in 4 of the 8 sub-watersheds estimated to have a *moderate* or *high* potential for impairment from nonpoint sources.

Assessments conducted during the ACT Basin NPS Screening Assessment: Five sub-watersheds were targeted for assessment during the ACT Basin NPS Screening Assessment because they had a *moderate* or *high* potential for impairment from nonpoint sources. These included the Dry Creek (030), Mush Creek (040), Upper Boguechitto Creek (080), Lower Boguechitto Creek (090), and Chilatchee Creek (100) sub-watersheds (Table 9b).

Sub-watershed summaries: Current and historical monitoring data were combined to provide a comprehensive assessment. A summary of the information available for each of the 22 sub-watersheds is provided in the following section. Each summary discusses landuse, NPS impairment potential, assessments conducted within the sub-watershed, and NPS priority status based on available data. The summaries point out significant data and reference appropriate tables and appendices. Assessment of habitat, biological, and chemical conditions within each sub-watershed are based on long-term data from ADEM's Ecoregional Reference Site Program (ADEM 2000a). Tables referenced in the summaries are located at the end of the summary section. Appendices are located at the end of the report.

Sub-watershed assessments: Habitat, chemical/physical, and biological indicators of water quality were monitored in 8 sub-watersheds (Table 10b). Habitat quality was assessed at 25 stations and was generally assessed as *excellent* or *good* throughout the CU (Fig. 12a). Macroinvertebrate assessments were conducted at 20 stations (Fig. 12a). Results of these assessments indicated the macroinvertebrate community to be in *excellent* condition at 5 stations (25%), *good* condition at 7 stations (35%), *fair* at 7 stations (35%), and *poor* at one station (5%) (Fig. 12a). Results of fish IBI assessments conducted at 5 of these stations indicated the fish community to be in *good* condition at 1 station (20%), *fair* or *fair/poor* condition at 2 stations (40%), and *poor* or *very poor* condition at 2 stations (40%) (Fig. 13b). Results of fish IBI assessments indicated a higher degree of impairment at 3 of these stations. This is most likely because fish IBI assessments are only conducted at stations impacted by sedimentation and habitat degradation.

The overall condition for each station was rated as the lowest assessment result obtained (Table 10b). Four (20%) and 7 (35%) stations were assessed as *excellent* and *good*, respectively. Six (30%) stations were assessed as *fair* and 3 (15%) were assessed as *poor*. The 9 stations assessed as *fair* or *poor* were primarily impacted by nonpoint sources and located in three sub-watersheds (080, 090, 100) (Fig. 13c).

NPS priority sub-watersheds: Figure 13c shows the location of the three sub-watersheds recommended as priority sub-watersheds. These included Upper Boguechitto Creek (080), Lower Boguechitto Creek (090), and Chilatchee Creek (100).

Figure 13a. Habitat and aquatic macroinvertebrate assessments conducted in the Middle Alabama River Cataloging Unit.

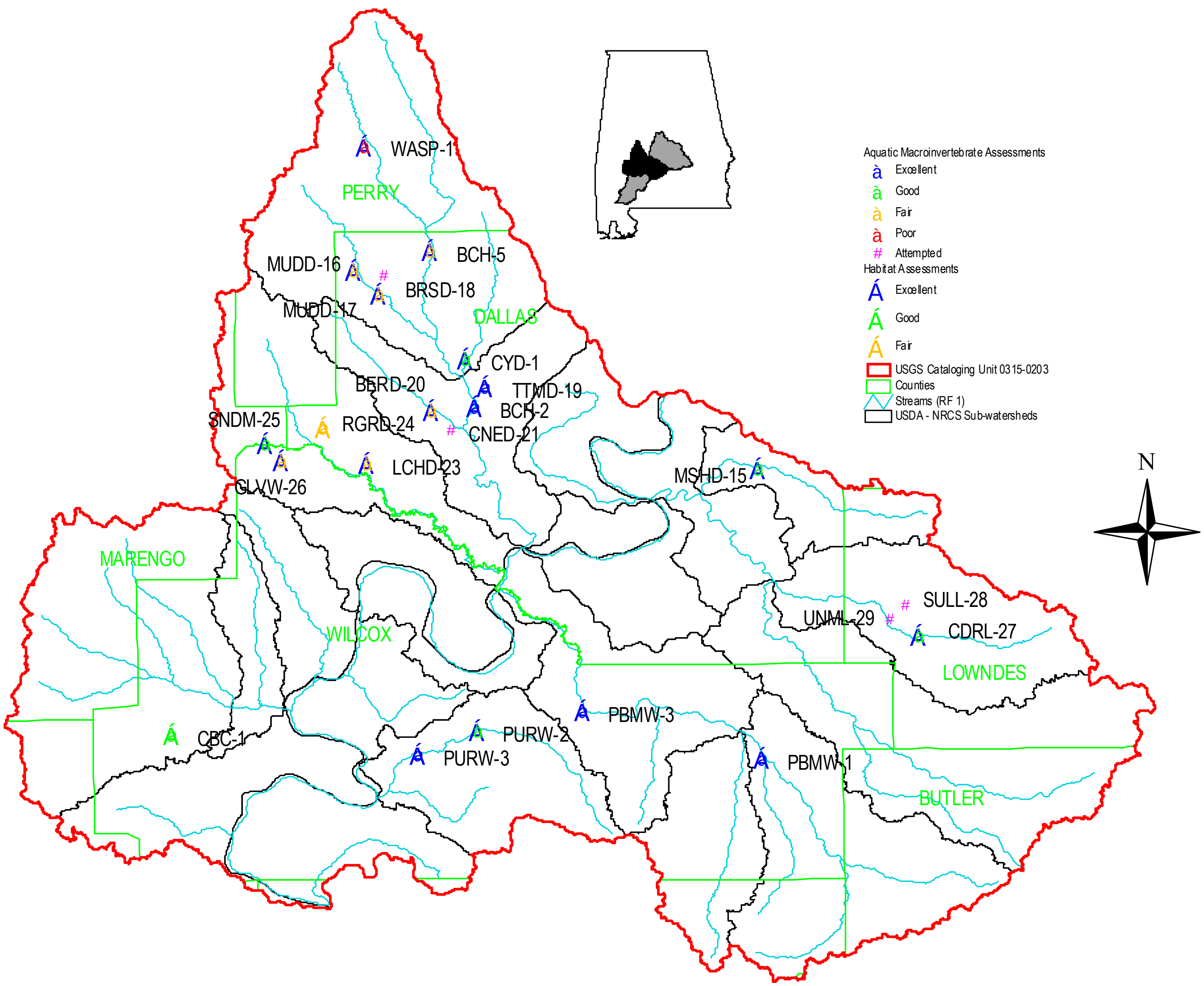


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Figure 13b. Fish IBI assessments conducted in the Middle Alabama River Cataloging Unit.

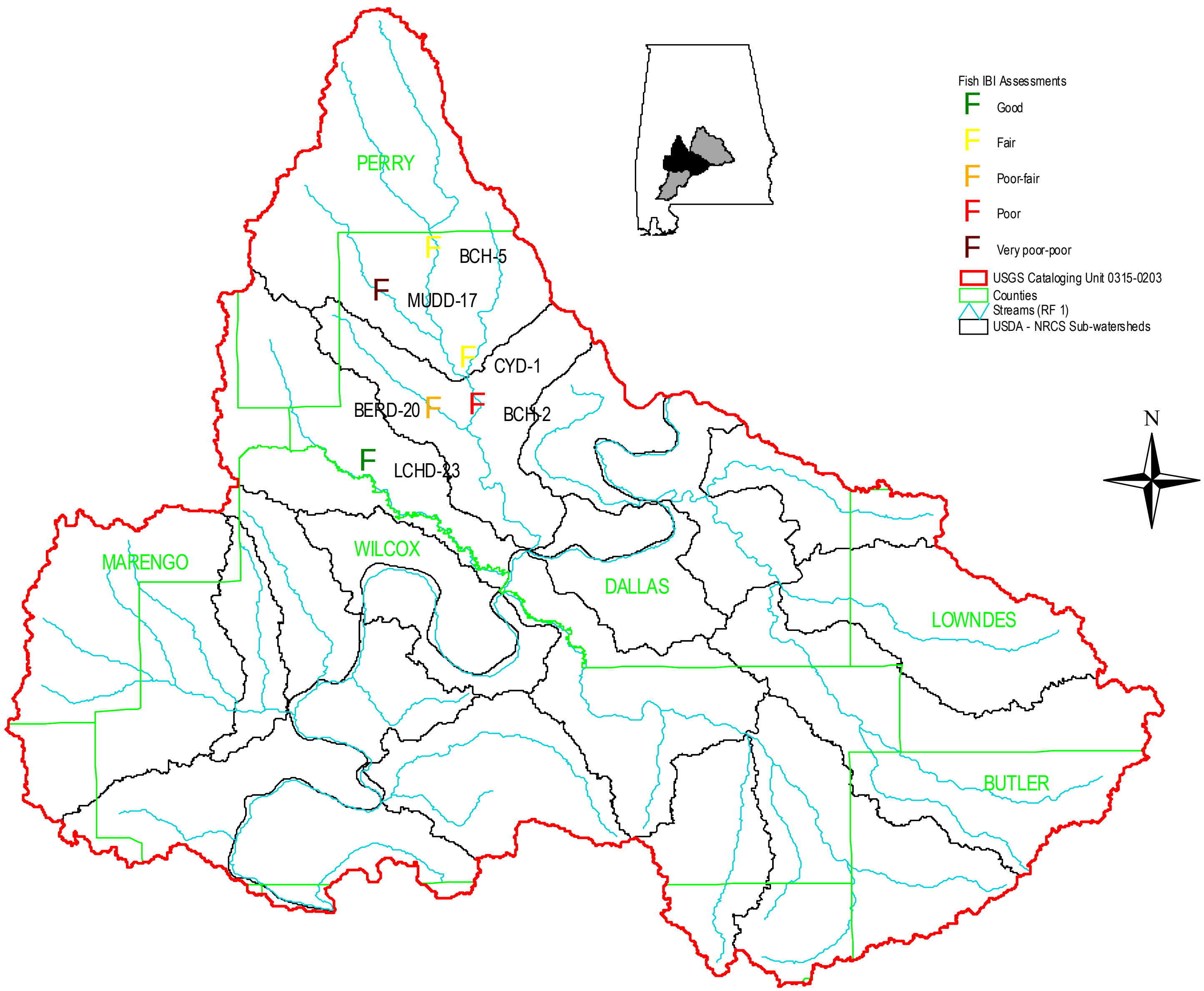

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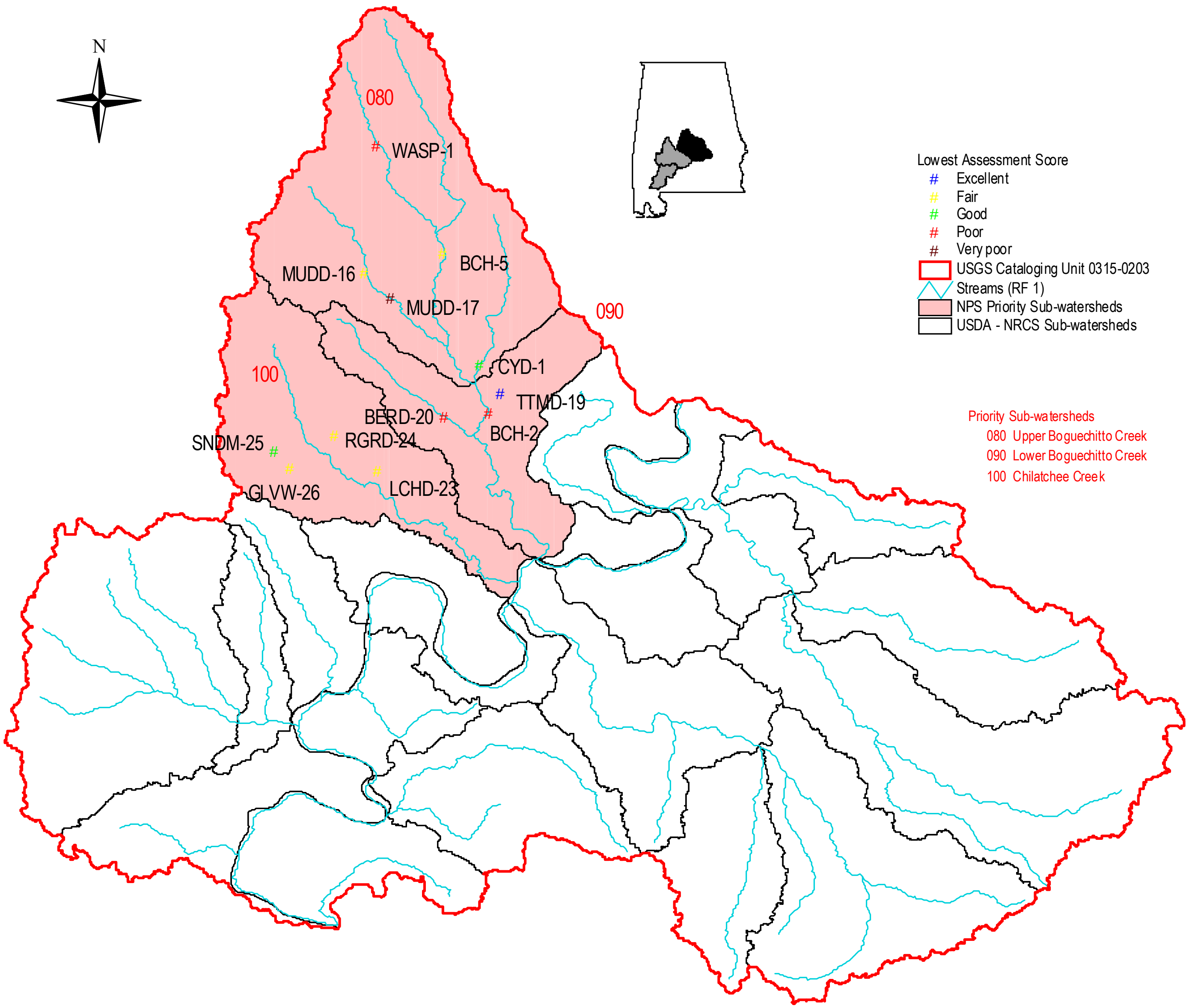
Figure 13c. Priority sub-watersheds within the Middle Alabama River CU. Overall assessment results for stations located in priority sub-watersheds are also shown.



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Sub-watersheds recommended for NPS priority status.

Sub-watershed Number	Sub-watershed Name	Lowest Station Assessment	Suspected Cause(s)	Suspected nonpoint source(s)
080	Upper Boguechitto Creek	Poor	Nutrient enrichment	Forestry, pasture runoff, animal husbandry
090	Lower Boguechitto Creek	Poor	Nutrient enrichment	Pasture runoff, animal husbandry
100	Chilatchee Creek	Fair	Nutrient enrichment	Forestry

Upper Boguechitto Creek (080) Macroinvertebrate and fish assessments indicated impaired biological conditions at Washington Creek, Mud Creek, and Boguechitto Creek. Water quality data indicated slight nutrient enrichment at Boguechitto Creek. Crop and pasturelands comprised 72% of the sub-watershed. Percent aquaculture landuse was the highest within the Alabama River basin.

Lower Boguechitto Creek (090)**:** Macroinvertebrate and fish assessments indicated biological impairment at Bear Creek (BERD-20) and Lower Boguechitto Creek (BCH-2). Water quality sampling showed nutrient enrichment along Lower Boguechitto Creek. The main NPS concerns within the sub-watershed included runoff from pasture and croplands. Animal husbandry and aquaculture were also prevalent throughout the sub-watershed.

Chilatchee Creek (100): Macroinvertebrate assessments conducted at Glover Creek, Rogers Creek, and Little Chilatchee Creek indicated impaired biological conditions. In-situ water quality parameters did not indicate the source(s) of impairment, but pasture, row crop, and aquaculture comprised 45% of total land area within the sub-watershed.

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Sub-Watershed: Big Swamp Creek NRCS Sub-Watershed Number 010

***Landuse**:* The Big Swamp Creek sub-watershed drains approximately 56 mi^2 in Dallas County. Land cover was primarily forest mixed with row crop and pasture. One current construction/stormwater authorization has been issued in the sub-watershed (Table 6b).

Percent land cover estimated by local SWCD (Table 5b, ASWCC 1998)

Forest	Row crop	Pasture	Mining	Urban	Open Water	Other
65%	20%	10%	0%	1%	1%	3%

***NPS impairment potential**:* Runoff from forestry and cropland was the primary NPS concern within the sub-watershed. Overall potential for impairment from nonpoint sources was estimated as *moderate.* There was a *moderate* potential for impairment from septic tank failure (Table 7b).

Values and NPS ratings for each NPS category estimated by local SWCD.

Category	Overall Potential	Animal husbandry	Aqua-culture	Row crop	Pasture	Mining	Forestry	Sediment
Value	11	0.04 AU/ac	0.00%	20%	10%	0%	18%	1.1 tons/ac/yr
NPS Potential	M	L	L	M	L	L	M	L
Table	7b	11b	11b	5b	5b	5b	12b	12b

Assessments: Big Swamp Creek was not assessed during the ACT Basin NPS Screening Assessment.

Sub-Watershed: Upper Cedar Creek NRCS Sub-Watershed Number 020

***Landuse**:* The Upper Cedar Creek sub-watershed drains approximately 216 mi^2 in Butler, Dallas, Lowndes, and Wilcox Counties. The sub-watershed was primarily forest mixed with pasture. Four current construction/stormwater authorizations, 1 non-coal mining <5 acres/stormwater authorization, 1 municipal NPDES permit, and 1 CAFO registration have been issued in the sub-watershed (Table 6b).

Percent land cover estimated by local SWCD (Table 5b, ASWCC 1998)

Forest	Row crop	Pasture	Mining	Urban	Open Water	Other
86%	1%	12%	0%	<1%	1%	1%

NPS impairment potential: The potential for impairment from forestry activities was *moderate*. Potential for impairment from other nonpoint sources was relatively *low*.

Values and NPS ratings for each NPS category estimated by local SWCD.

Category	Overall Potential	Animal husbandry	Aqua-culture	Row crop	Pasture	Mining	Forestry	Sediment
Value	9	0.04 AU/ac	0.00%	1%	12%	0%	23%	1.1 tons/ac/yr
NPS Potential	L	L	L	L	L	L	M	L
Table	7b	11b	11b	5b	5b	5b	12b	12b

Assessments: The Upper Cedar Creek sub-watershed was not assessed during the ACT Basin NPS Screening Assessment because of the *low* potential for impairment from nonpoint sources.

NPS priority status: NPS priority status could not be determined with the available data. However, the sub-watershed was not at a *high* risk for impairment from nonpoint sources.

Sub-Watershed: Dry Cedar Creek NRCS Sub-Watershed Number 030

***Landuse**:* The Dry Cedar Creek sub-watershed drains approximately 129 mi^2 in Dallas, Lowndes, and Wilcox Counties. Land cover was mainly forest and pasture. Two current construction/stormwater authorizations, and 1 non-coal mining <5 acres/stormwater authorization have been issued in the sub-watershed (Table 6b).

Percent land cover estimated by local SWCD (Table 5b, ASWCC 1998)

Forest	Row crop	Pasture	Mining	Urban	Open Water	Other
76%	1%	19%	0%	0%	2%	2%

NPS impairment potential: The potential for impairment from forestry activities was *high*. The potential for impairment from pasture runoff was estimated as *moderate*. Dry Cedar Creek was given a 4th priority sub-watershed rating by the SWCD for resource concerns listed in Table 12b.

Values and NPS ratings for each NPS category estimated by local SWCD.

Category	Overall Potential	Animal husbandry	Aqua-culture	Row crop	Pasture	Mining	Forestry	Sediment
Value	13	0.07 AU/ac	0.00%	1%	19%	0%	51%	2.1 tons/ac/yr
NPS Potential	M	L	L	L	M	L	H	L
Table	7b	11b	11b	5b	5b	5b	12b	12b

***Assessments**:* Three stations located on Cedar Creek, Sullivan Creek, and Dry Cedar Creek were selected for assessment during ACT Basin NPS Screening Assessment. However, two of these stations could not be monitored due to severe low flow conditions. Sullivan Creek (AR02U1) has been previously evaluated in conjunction with ADEM's ALAMAP Program (Appendix F-8).

Assessment stations located within the sub-watershed. Descriptions are provided in Appendix E.

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
CDRL-27	Habitat, Macroinvertebrate, Chemical	2000	Cedar Creek at Lowndes County 7.	62	Fish & Wildlife
SULL-28	None	2000	Sullivan Creek at Lowndes County 7.	12	Fish & Wildlife
UNML-29	None	2000	Dry Cedar Creek at Lowndes County Road 16.	5	Fish & Wildlife
AR02U1	Chemical, Habitat	1997	Sullivan Branch approx. 4.1 miles upstream of Dry Cedar Creek.	4	Fish & Wildlife

<u>Cedar Creek</u>: At CDRL-27, Cedar Creek is a relatively low-gradient, sand and clay bottom stream located in the Flatwoods/Blackland Prairie Margins (65b) subecoregion. Habitat condition was assessed as *excellent* for this stream type (Table 13b). Six EPT families were collected, indicating the macroinvertebrate community to be in *good* condition (Table

14b). The concentration of total dissolved solids (TDS) was elevated (Appendix D-1). Water quality parameters could not be collected in September due to low flow conditions.

Sullivan Branch: At AR02U1, Sullivan Branch is a relatively low-gradient, sand and gravel stream located in the Flatwoods/Blackland Prairie Margins (65b) subecoregion. Habitat condition was assessed as *excellent* for this stream type (Appendix F-8a). The concentration of total dissolved solids (TDS) was elevated (Appendix F-8b).

NPS priority status: Habitat assessments and chemical sampling did not indicate impaired water quality at Cedar Creek or Sullivan Branch. However, a complete assessment of the sub-watershed could not be conducted due to low flow conditions. It is recommended that the sub-watershed be monitored during the 2005 ACT River basin assessment.

Sub-Watershed: Mush Creek NRCS Sub-Watershed Number 040

Landuse: The Mush Creek sub-watershed drains approximately 60 mi^2 in Dallas and Lowndes Counties. Land cover was a mixture of forest, pasture, and row crops. Two current construction/stormwater authorizations have been issued in the sub-watershed (Table 6b).

Percent land cover estimated by local SWCD (Table 5b, ASWCC 1998)

Forest	Row crop	Pasture	Mining	Urban	Open Water	Other
52%	28%	18%	0%	0%	2%	1%

NPS impairment potential: The primary NPS concerns within the sub-watershed were runoff from crop and pasturelands, forestry, and aquaculture. The overall potential for impairment from nonpoint sources was estimated as *high.*

Values and NPS ratings for each NPS category estimated by local SWCD.

Category	Overall Potential	Animal husbandry	Aqua-culture	Row crop	Pasture	Mining	Forestry	Sediment
Value	17	0.06 AU/ac	0.52%	28%	18%	0%	24%	2.3 tons/ac/yr
NPS Potential	H	L	M	H	M	L	M	L
Table	7b	11b	11b	5b	5b	5b	12b	12b

Assessments: Mush Creek at MSHD-15 was assessed during the ACT Basin NPS Screening Assessment (Table 9b).

Assessment stations located within the sub-watershed. Descriptions are provided in Appendix E.

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
MSHD-15	Habitat, Macroinvertebrate, Chemical	2000	Mush Creek at AL Hwy 41 in Dallas County.	39	Fish & Wildlife

Mush Creek: At MSHD-15, Mush Creek is a low-gradient, predominantly clay-bottomed stream located in the Flatwoods/Blackland Prairie Margins (65b) subecoregion. Habitat condition was assessed as *excellent* for this stream type (Table 13b). Eight EPT families were collected at this site, indicating the macroinvertebrate community to be in *good* condition (Table 14b).

Water quality data collected at MSHD-15 in May and September of 2000 did not indicate impairment (Appendix D-1).

NPS priority status: Despite the *high* potential for NPS impairment, a macroinvertebrate assessment did not show a high level of biological impairment.

Sub-Watershed: Lower Cedar Creek NRCS Sub-Watershed Number 050

Landuse: The Lower Cedar Creek sub-watershed drains approximately 73 mi^2 in Dallas County. Land cover was a mixture of forest, pasture, and cropland. One current construction/stormwater authorization has been issued in the sub-watershed (Table 6b).

Percent land cover estimated by local SWCD (Table 5b, ASWCC 1998)

Forest	Row crop	Pasture	Mining	Urban	Open Water	Other
46%	30%	20%	0%	0%	2%	2%

NPS impairment potential: The overall potential for impairment from nonpoint sources was estimated as *moderate.* The primary NPS concerns within the sub-watershed were crop and pasture lands.

Values and NPS ratings for each NPS category estimated by local SWCD.

Category	Overall Potential	Animal husbandry	Aqua-culture	Row crop	Pasture	Mining	Forestry	Sediment
Value	13	0.10 AU/ac	0.00%	30%	20%	0%	14%	1.3 tons/ac/yr
NPS Potential	M	L	L	H	M	L	L	L
Table	7b	11b	11b	5b	5b	5b	12b	12b

Assessments: An assessment was not conducted during the ACT Basin NPS Screening Assessment.

NPS priority status: Runoff from crop and pasturelands was a concern within the Little Cedar Creek sub-watershed. Little Cedar Creek should be considered for assessment during the 2005 ACT basin assessments.

Sub-Watershed: Rum Creek NRCS Sub-Watershed Number 060

Landuse: The Rum Creek sub-watershed drains approximately 57 mi^2 in Dallas County. Land cover was primarily forest with some pastureland. One current construction/ stormwater authorization and 1 semi-public/private NPDES permit have been issued in the sub-watershed (Table 6b).

Percent land cover estimated by local SWCD (Table 5b, ASWCC 1998)

Forest	Row crop	Pasture	Mining	Urban	Open Water	Other
86%	1%	10%	0%	1%	1%	2%

NPS impairment potential: The potential for impairment from forestry activities was estimated as *moderate*. Potential for impairment from other nonpoint sources was *low*.

Values and NPS ratings for each NPS category estimated by local SWCD.

Category	NPS Score	Animal husbandry	Aqua-culture	Row crop	Pasture	Mining	Forestry	Sediment
Value	9	0.01 AU/ac	0.00%	1%	10%	0%	21%	1.7 tons/ac/yr
NPS Potential	L	L	L	L	L	L	M	L
Table	7b	11b	11b	5b	5b	5b	12b	12b

Assessments: An assessment was not conducted during the ACT Basin NPS Screening Assessment because of the *low* potential for NPS impairment.

NPS priority status: NPS priority status of the Rum Creek sub-watershed could not be evaluated, but was not at a high risk to impairment from nonpoint sources.

Sub-Watershed: Alabama River NRCS Sub-Watershed Number 070

Landuse: The Alabama River sub-watershed drains approximately 22 mi^2 in Dallas County. The main landuses were forest, pasture, and row crops. One current construction/ stormwater authorization has been issued in the sub-watershed (Table 6b).

Percent land cover estimated by local SWCD (Table 5b, ASWCC 1998)

Forest	Row crop	Pasture	Mining	Urban	Open Water	Other
62%	8%	28%	0%	0%	1%	1%

NPS impairment potential: Percent land cover indicated a *moderate* potential for impairment from crop and pasturelands. The overall potential for impairment from nonpoint sources was estimated as *moderate.*

Values and NPS ratings for each NPS category estimated by local SWCD.

Category	Overall Potential	Animal husbandry	Aqua-culture	Row crop	Pasture	Mining	Forestry	Sediment
Value	11	0.07 AU/ac	0.00%	8%	28%	0%	15%	0.8 tons/ac/yr
NPS Potential	M	L	L	M	M	L	L	L
Table	7b	11b	11b	5b	5b	5b	12b	12b

Assessments: An assessment was not conducted during the ACT Basin NPS Screening Assessment.

NPS priority status: NPS priority status could not be determined from available data.

Sub-Watershed: Upper Boguechitto Creek NRCS Sub-Watershed Number 080

Landuse: The Upper Boguechitto Creek sub-watershed drains approximately 244 mi^2 in Dallas and Perry Counties. Land cover was a mixture of forest, pasture, and cropland. Six current construction/stormwater authorizations and 1 CAFO registration have been issued in the sub-watershed (Table 6b).

Percent land cover estimated by local SWCD (Table 5b, ASWCC 1998)

Forest	Row crop	Pasture	Mining	Urban	Open Water	Other
20%	39%	33%	0%	3%	4%	<1%

NPS impairment potential: The overall potential for impairment from nonpoint sources was estimated as *high.* Percent cropland and aquaculture were the highest in the Middle Alabama River CU (Table 7b). Upper Boguechitto Creek was given a 1st priority sub-watershed rating by the SWCD. Resource concerns included erosion, bacteria and other organisms in surface waters, and overgrazing of pastures (Table 12b). There was a *moderate* potential for impairment from urban development and septic tank failures (Table 7b).

Values and NPS ratings for each NPS category estimated by local SWCD.

Category	Overall Potential	Animal husbandry	Aqua-culture	Row crop	Pasture	Mining	Forestry	Sediment
Value	17	0.10 AU/ac	13%	39%	33%	0%	12%	1.7 tons/ac/yr
NPS Potential	H	L	H	H	M	L	L	L
Table	7b	11b	11b	5b	5b	5b	12b	12b

Assessments: Two stations were monitored (MUDD-16, MUDD-17) during the ACT Basin NPS Screening Assessment (Table 9b). Brush Creek at BRSD-18 could not be monitored due to low flow conditions. Five stations have been previously monitored as part of ADEM's Ecoregional Reference Site (Appendix F-1) and §303(d) Monitoring (Appendix F-3) Programs. Beaver Creek was evaluated at one station during ADEM's 2000 ALAMAP Program (Appendix F-8). An unnamed tributary to Boguechitto Creek could not be assessed (AR02U2-25) during ADEM's ALAMAP program because of low flow conditions (Appendix F-8b).

Chaney Creek: ADEM has monitored Chaney Creek as a least-impaired reference site for Blackland Prairie (65a) streams since 1992 (Appendix F-1). At CYD-1, Chaney Creek is a low-gradient stream with a predominantly clay substrate (Appendix F-1a). Habitat condition is generally assessed as *excellent* for this stream type. The macroinvertebrate community was assessed as *excellent* during the May of 2000 assessment (Appendix F-1b).

Assessment stations located within the sub-watershed. Descriptions are provided in Appendix E.

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
CYD-1	Chemical, Habitat, Macroinvertebrate, Fish	2000, 1999	Chaney Creek at Dallas County Road 3.	42	Fish & Wildlife
WASP-1	Chemical, Habitat, Macroinvertebrate, Fish	2000, 1999	Washington Creek on AL Hwy 183 southwest of Marion.	16	Fish & Wildlife
BRSD-18	None conducted	2000	Brush Creek at US Hwy 80 in Dallas County.	14	Fish & Wildlife
MUDD-16	Habitat, Macroinvertebrate	2000	Mud Creek at US Hwy 80 in Dallas County.	19	Fish & Wildlife
MUDD-17	Chemical, Habitat, Macroinvertebrate, Fish	2000	Mud Creek at AL Hwy 5 in Dallas County.	83	Fish & Wildlife
BCH-5	Chemical, Habitat, Macroinvertebrate	1999	Boguechitto Creek at Dallas County Road 178.	89	Fish & Wildlife
BCH-4	Chemical, Habitat	1999	Boguechitto Creek at Dallas County Road 23.	99	Fish & Wildlife
BCH-3	Chemical, Habitat	1999	Boguechitto Creek at Dallas County Road 12.	198	Fish & Wildlife
AR02U2-25	None conducted	1998	Tributary to Boguechitto Creek approx. 6.3 miles upstream of confluence with Boguechitto Creek.	1	Fish & Wildlife
AR3U4-10	Chemical, Habitat	2000	Beaver Creek approximately 0.5 miles south of Autauga CR 78	6	Fish & Wildlife
AR7U5-40	None conducted	2001	Kendricks Branch approx. ½ mile upstream of confluence with Chaney Creek	8	Fish & Wildlife

Water quality data have also been collected at the site since 1991 (Appendices F-1c and F-1d). Nitrate-nitrite nitrogen concentrations were high in June of 1999. Impairment was not detected for other water quality parameters.

<u>Washington Creek</u>: Located in the Blackland Prairie (65a) subecoregion, Washington Creek has been monitored as a least-impaired ecoregional reference site. At this reach, it is a low-gradient, predominantly clay-bottomed stream. Habitat condition was assessed as *fair* in 1995 because of sand deposits at the site. During 2000, percent sand was lower and habitat quality was assessed as *excellent* (Appendix F-1a). However, the macroinvertebrate community was assessed as *good* in 1995 and *poor* in 2000 (Appendix F-1b). The apparent decline in biological conditions at the site may be the result of declining water quality or the severe drought conditions experienced during 1999 and 2000.

<u>Mud Creek</u>: Mud Creek at MUDD-16 and MUDD-17 is a low-gradient stream, characterized by a hard clay-bottom located in the Blackland Prairie subecoregion (65a) (Table 13b). Habitat condition at both sites was assessed as *excellent* (Table 13b). The macroinvertebrate community was assessed as *fair* at both sites (Table 14b).

In situ water quality parameters are provided in Appendix D-1. Dissolved oxygen concentrations at MUDD-16 (4.5 mg/L) and MUDD-17 (2.2 mg/L) did not meet Fish and Wildlife Use Classification criteria. However, stream flows were 0.0 cfs at MUDD-16 and 0.1 cfs at MUDD-17. Water quality sampling could not be conducted at MUDD-17 during September due to low flow conditions.

Boguechitto Creek: Three stations (BCH-5, BCH-4, and BCH-3) on Boguechitto Creek were sampled during 1999 to determine if the creek was meeting its Fish and Wildlife Use Classification (L. Sisk, pers. comm.). At these sites, Boguechitto Creek is a low-gradient stream flowing through the Flatwoods/Blackland Prairie Margins (65b) subecoregion. Substrate composition varied among the 3 sites (Appendix F-3a). At BCH-5, substrates were composed primarily of sand mixed with clay and detritus. Bottom substrates at BCH-4 and BCH-3 were characterized by less sand and more silt. However, habitat quality was assessed as *excellent* at BCH-5, BCH-4, and BCH-3 (Appendix F-3a).

Macroinvertebrate and fish assessments were conducted at BCH-5, the upstream-most station (Appendix F-3b). Results indicated both communities to be in *fair* condition.

Intensive water quality data were collected at BCH-5, BCH-4, and BCH-3 from June to September of 1999 (Appendix F-3c). Ammonia-nitrogen concentrations were elevated at all three stations during July and August and appeared to increase slightly downstream. Total phosphorus was elevated (0.21 mg/L) at BCH-3 during July. Low dissolved oxygen concentrations (1.4 mg/L) at BCH-5 during August may have resulted from low flow conditions (0.3 cfs) (Appendix F-3c).

Beaver Creek: At AR3U4-10, Beaver Creek is a small stream located in the Flatwoods/Blackland Prairie Margins (65b) subecoregion characterized by gravel and sand substrates (Appendix F-8a). Habitat quality was assessed as *excellent* (Appendix F-8a).

Water quality samples collected in August of 2000 did not indicate impairment (Appendix F-8b).

NPS priority status: Macroinvertebrate and fish assessments indicated impaired biological conditions at Washington Creek, Mud Creek, and Boguechitto Creek. Water quality data collected at Boguechitto Creek indicated slight nutrient enrichment. There was a *high* potential for impairment from nonpoint sources (Table 7b). Boguechitto Creek is recommended as a NPS priority sub-watershed.

Sub-Watershed: Lower Boguechitto Creek NRCS Sub-Watershed Number 090

Landuse: The Lower Boguechitto Creek sub-watershed drains approximately 114 mi^2 in Dallas and Perry Counties. Forest, pasture, and row crops comprised 94% of the sub-watershed. One current construction/stormwater authorization and 2 semi-public/private NPDES permits have been issued in the sub-watershed (Table 6b).

Percent land cover estimated by local SWCD (Table 5b, ASWCC 1998)

Forest	Row crop	Pasture	Mining	Urban	Open Water	Other
25%	29%	40%	0%	1%	2%	3%

NPS impairment potential: The overall potential for impairment from nonpoint sources was estimated as *high.* Percent pasture and cropland indicated a *high* potential for impairment from nonpoint sources. Animal husbandry and aquaculture were also prevalent throughout the sub-watershed. The Lower Boguechitto Creek sub-watershed was given a 2nd priority sub-watershed rating by the SWCD.

Values and NPS ratings for each NPS category estimated by local SWCD.

Category	Overall Potential	Animal husbandry	Aqua-culture	Row crop	Pasture	Mining	Forestry	Sediment
Value	19	0.17 AU/ac	1.43%	29%	40%	0%	9%	1.3 tons/ac/yr
NPS Potential	H	M	M	H	H	L	L	L
Table	7b	11b	11b	5b	5b	5b	12b	12b

Assessments: Two stations (BERD-20, TTMD-19) were monitored during the ACT Basin NPS Screening Assessment (Table 9b). Low flow conditions prevented an assessment of Cane Creek at CNED-21. Three stations on Boguechitto Creek have been previously monitored (BCH-1, BCH-2, DAN-7) in conjunction with ADEM’s §303(d) (Appendix F-3) and Reservoir Monitoring (Appendix F-6) Programs. Boguechitto Creek at BCH-2 (BCCAUM01) was also monitored by AUM in conjunction with a statewide study to evaluate nutrient loading of Alabama’s reservoirs (Appendix F-7).

Assessment stations located within the sub-watershed. Descriptions are provided in Appendix E.

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
BERD-20	Chemical, Habitat, Macroinvertebrate, Fish	2000	Bear Creek at AL Hwy 22 in Dallas County.	28	Fish & Wildlife
CNED-21	None	2000	Cane Creek at AL Hwy 22 in Dallas County.	9	Fish & Wildlife
TTMD-19	Habitat, Macroinvertebrate	2000	Tatum Creek at Dallas County road 11.	26	Fish & Wildlife
BCH-2	Chemical, Habitat, Macroinvertebrate, Fish	1999	Boguechitto Creek at AL Hwy 22 west of Orrville	283	Fish & Wildlife
BCCAUM01	Chemical	1999	Boguechitto Creek at AL Hwy 22 west of Orrville.	283	Fish & Wildlife
BCH-1	Chemical, Habitat	1999	Boguechitto Creek at Dallas County Road 115.	328	Fish & Wildlife
DAN-7	Chemical	2000	Boguechitto Creek embayment	363	Fish & Wildlife

Bear Creek: Located in the Blackland Prairie (65a) subecoregion, Bear Creek at BERD-20 is a low-gradient stream with a predominantly clay substrate. Habitat condition was assessed as *excellent* for this stream type (Table 13b). Five EPT families were collected at this site, indicating the macroinvertebrate community to be in *fair* condition (Table 14b). In-situ water quality parameters indicated that Bear Creek at BERD-20 was meeting its Water Use Classification of "Fish and Wildlife" at the time of sampling (Appendix D-1).

Tatum Creek: Tatum Creek at TTMD-19 is a riffle-run stream located in the Blackland Prairie (65a) subecoregion. It is characterized by bedrock, sand, and gravel substrates. Habitat condition was assessed as *excellent* (Table 13b). Nine EPT families were collected at this site, indicating the macroinvertebrate community to be in *excellent* condition (Table 14b). In-situ water quality parameters are provided in Appendix D-1.

Lower Boguechitto Creek: Lower Boguechitto Creek is a low gradient stream located in the Flatwoods/Blackland Prairie Margins (65b) subecoregion. Bottom substrates were dominated by clay and gravel at BCH-2. Bottom substrates at BCH-1 were a mixture of clay, sand, detritus, and organic silt (Appendix F-3a). However, habitat condition was assessed as *excellent* at both stations. Macroinvertebrate and fish assessments were conducted at BCH-2 (Appendix F-3b). Eleven EPT families were collected at this site, indicating the macroinvertebrate community to be in *excellent* condition. The fish community was assessed as *poor*.

Intensive chemical sampling was conducted at BCH-2 and BCH-1 during the months of June through September of 1999 (Appendix F-3c). Ammonia-nitrogen and total phosphorus concentrations were periodically high. Water quality data collected at BCH-2 (BCCAUM01) by AUM showed lower ammonia-nitrogen concentrations, but still indicated high concentrations of total Kjeldahl nitrogen (TKN), total phosphorus (Total-P), and orthophosphorus (Ortho-P) (Appendix F-7a).

Intensive water quality data collected from Lower Boguechitto Creek embayment area on Dannelly Reservoir (DAN-7) during April, June, and August of 2000 are provided in

Appendix F-6a. Results of these analyses were also reported in ADEM's Annual Reservoir Monitoring Program Report (ADEM, in press).

NPS priority status: Macroinvertebrate and fish assessments indicated biological impairment at Bear Creek (BERD-20) and Lower Boguechitto Creek (BCH-2), respectively. Water quality sampling showed nutrient enrichment along Lower Boguechitto Creek. Runoff from pasture and croplands was a concern within the sub-watershed. Animal husbandry and aquaculture were also prevalent. Lower Boguechitto Creek is recommended as a NPS priority sub-watershed.

Sub-Watershed: Chilatchee Creek NRCS Sub-Watershed Number 100

Landuse: The Chilatchee Creek sub-watershed drains approximately 154 mi^2 in Dallas, Marengo, Wilcox, and Perry Counties. Land cover was primarily forest with some pasture and croplands. Five current construction/stormwater authorizations and 1 non-coal mining/<5 acre stormwater authorization have been issued in the sub-watershed (Table 6b).

Percent land cover estimated by local SWCD (Table 5b, ASWCC 1998)

Forest	Row crop	Pasture	Mining	Urban	Open Water	Other
62%	12%	24%	0%	1%	1%	1%

NPS impairment potential: The overall potential for impairment from nonpoint sources was estimated as *high.* There was a *moderate* potential for impairment associated with pasture and croplands and a *high* potential for impairment from aquaculture.

Values and NPS ratings for each NPS category estimated by local SWCD.

Category	Overall Potential	Animal husbandry	Aqua-culture	Row crop	Pasture	Mining	Forestry	Sediment
Value	15	0.07 AU/ac	9.25%	12%	24%	0%	13%	1.1 tons/ac/yr
NPS Potential	H	L	H	M	M	L	L	L
Table	7b	11b	11b	5b	5b	5b	12b	12b

Assessments: Five stations were monitored during the ACT Basin NPS Screening Assessment (Table 9b). One station has been previously evaluated (AR03U2-8) in conjunction with ADEM's ALAMAP program (Appendix F-8).

Glover Creek: At GLVW-26, Glover Creek is a low-gradient, clay and sand bottom stream located in the Flatwoods/Blackland Prairie Margins (65b) subecoregion. Habitat condition was assessed as *excellent* (Table 13b). Five EPT families were collected at this site, indicating the macroinvertebrate community to be in *fair* condition (Table 14b).

Water quality sampling was conducted during May and September of 2000 (Appendix D-1). During September, the dissolved oxygen concentration was measured at 2.3 mg/L, well below numeric criteria for the "Fish and Wildlife" water use classification. The total phosphorus concentration (0.21 mg/L) was high during the September sampling event.

Little Chilatchee Creek: Little Chilatchee Creek at LCHD-23 is a low-gradient, predominantly clay substrate stream (Table 13b). Habitat condition was assessed as *excellent*. Bioassessments conducted at the station indicated the macroinvertebrate and fish communities to be in *fair* and g*ood* condition, respectively (Table 14b).

Assessment stations located within the sub-watershed. Descriptions are provided in Appendix E.

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
GLVW-26	Chemical, Habitat, Macroinvertebrate	2000	Glover Creek at unnamed Wilcox County Rd.	8	Fish & Wildlife
LCHD-22	None conducted	2000	Little Chilatchee Creek at AL Hwy 5 in Dallas County.	11	Fish & Wildlife
LCHD-23	Habitat, Chemical, Macroinvertebrate, Fish	2000	Little Chilatchee Creek at AL Hwy 6 in Dallas County.	7	Fish & Wildlife
RGRD-24	Habitat, Chemical, Macroinvertebrate	2000	Rogers Creek at AL Hwy 66 in Dallas County	12	Fish & Wildlife
SNDM-25	Chemical, Habitat, Macroinvertebrate	2000	Sand Creek at AL Hwy 66 in Marengo County.	17	Fish & Wildlife
AR03U2-8	Chemical, Habitat	1998	Chilatchee Creek approx. 14.8 miles upstream of confluence with Alabama River	134	Swimming/ Fish & Wildlife

In-situ water quality parameters indicated that Little Chilatchee Creek at LCHD-23 was meeting its Water Use Classification of “Fish and Wildlife” (Appendix D-1). Water quality data could not be collected during September due to low flow conditions.

Rogers Creek: At RGRD-24, Rogers Creek is a riffle-run stream located in the Blackland Prairie (65a) subecoregion (Table 13b). Habitat condition was assessed as *fair*. Five EPT families were collected at this site, indicating the macroinvertebrate community to be in *fair* condition (Table 14b). In-situ water quality parameters collected in May did not indicate impairment (Appendix D-1). Low stream flow prevented collection of water quality samples during September.

Sand Creek: At SNDM-25, Sand Creek is a riffle-run stream with a predominantly bedrock substrate. Habitat condition was assessed as *excellent* (Table 13b). Six EPT families were collected at this site, indicating the macroinvertebrate community to be in *good* condition (Table 14b). In-situ water quality parameters collected during May are provided in Appendix D-1. Water quality samples could not be collected in September due to low flow conditions.

Chilatchee Creek: At AR03U2-8, Chilatchee Creek is a low gradient stream characterized by clay and sand substrates. Habitat condition was assessed as *excellent* for this stream type (Appendix F-8a). Water quality parameters collected in August of 2000 did not indicate water quality impairment (Appendix F-8b).

NPS priority status: Macroinvertebrate assessments conducted at Glover Creek, Rogers Creek, and Little Chilatchee Creek indicated impaired biological conditions. In-situ water quality parameters did not indicate the source(s) of impairment, but pasture, row crop, and aquaculture comprised 45% of total land area within the sub-watershed.

Sub-Watershed: Upper Pine Barren Creek NRCS Sub-Watershed Number 110

Landuse: The Upper Pine Barren Creek sub-watershed drains approximately 163 mi^2 in Butler, Wilcox, and Monroe Counties. The sub-watershed is mainly forest with some pastureland. Two current construction/stormwater authorizations, 1 non-coal mining <5 acres/stormwater authorizations, and 1 CAFO registration have been issued in the sub-watershed (Table 6b).

Percent land cover estimated by local SWCD (Table 5b, ASWCC 1998)

Forest	Row crop	Pasture	Mining	Urban	Open Water	Other
86%	3%	11%	0%	<1%	<1%	<1%

NPS impairment potential: The potential for impairment from all rural and urban NPS categories was estimated as *low* (Table 7b). However, the Upper Pine Barren Creek sub-watershed was given a 5th priority sub-watershed rating by the SWCD for resource concerns listed in Table 12b.

Values and NPS ratings for each NPS category estimated by local SWCD.

Category	Overall Potential	Animal husbandry	Aqua-culture	Row crop	Pasture	Mining	Forestry	Sediment
Value	7	0.06 AU/ac	0.00%	3%	11%	0%	13%	0.8 tons/ac/yr
NPS Potential	L	L	L	L	L	L	L	L
Table	7b	11b	11b	5b	5b	5b	12b	12b

Assessments: One station has been monitored on Pine Barren Creek (PBMW-1) in conjunction with ADEM's CWA §303(d) Monitoring Program (Appendix F-3).

Assessment stations located within the sub-watershed. Descriptions are provided in Appendix E.

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
PBMW-1	Chemical, Habitat, Macroinvertebrate	2001, 2000	Pine Barren Creek upstream of Wilcox County Road 59.	150	Swimming/ Fish & Wildlife

Pine Barren Creek: At PBMW-1, Pine Barren Creek is a low-gradient, sand-bottomed stream located in the Southeastern Plains and Hills (65e) subecoregion. Habitat condition was assessed as *excellent* (Appendix F-3a). Thirteen EPT families were collected at this site, indicating the macroinvertebrate community to be in *excellent* condition (Appendix F-3b).

Chemical sampling conducted from April of 2000 through February of 2001 indicated fecal coliform counts above 400 colonies/100 mL during 2 sampling events (30%) (Appendix F-3c).

NPS priority status: The potential for impairment from urban and rural sources was *low*. A bioassessment conducted at PBMW-1 indicated the macroinvertebrate community to be in *excellent* condition. Upper Pine Barren Creek should be considered as a least-impaired reference sub-watershed.

Sub-Watershed: Bear Creek NRCS Sub-Watershed Number 120

Landuse: The Bear Creek sub-watershed drains approximately 77 mi^2 in Wilcox and Monroe Counties. Land cover was forest with some pasture. One current construction/ stormwater authorization has been issued in the sub-watershed (Table 6b).

Percent land cover estimated by local SWCD (Table 5b, ASWCC 1998)

Forest	Row crop	Pasture	Mining	Urban	Open Water	Other
90%	<1%	8%	0%	1%	<1%	1%

NPS impairment potential: Potential for impairment from forestry activities was estimated as *moderate*. Potential for impairment from other nonpoint sources was *low*.

Values and NPS ratings for each NPS category estimated by local SWCD.

Category	Overall Potential	Animal husbandry	Aqua-culture	Row crop	Pasture	Mining	Forestry	Sediment
Value	9	0.01 AU/ac	0%	<1%	8%	0%	21%	0.5 tons/ac/yr
NPS Potential	L	L	L	L	L	L	M	L
Table	7b	11b	11b	5b	5b	5b	12b	12b

Assessments: Bear Creek has been evaluated 5 times in conjunction with ADEM's ALAMAP Program (Appendix F-8). It was sampled during the 2001 ALAMAP Program. These data will be available in the ALAMAP 5-year Program Report to be published by ADEM in 2002.

Bear Creek: Bear Creek was assessed at ALAMAP1 in 1997 (AR03U1) and 1999 (AR02U3-2) (Appendix F-8a). It is a small, shaded stream located in the Southeastern Plains and Hills (65e) subecoregion. Bottom substrates were dominated by sand. Habitat condition was assessed as *excellent* during both sampling events (Appendix F-8a).

Bear Creek at AR07U2-2, downstream of ALAMAP1, was assessed during 1998. It is a small, sandy-bottomed, glide-pool stream reach (Appendix F-8a). Habitat quality was assessed as *excellent.*

Bear Creek at AR1U4-2 is characterized by clay and sand substrates (Appendix F-8a). Cows have direct access to the creek throughout the reach. At this site, habitat quality was assessed as *fair* due to poor bank stability and a lack of riparian buffer (Appendix F-8a).

Assessment stations located within the sub-watershed. Descriptions are provided in Appendix E.

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
AR07U2-2	Chemical, Habitat	1998	Bear Creek approx. 2.2 miles east of AL Hwy 21 and 0.2 miles upstream of confluence with unnamed tributary.	6	Fish & Wildlife
ALAMAP1 (AR03U1)	Chemical, Habitat	1997	Bear Creek approx. 20 miles upstream of confluence with Pine Barren Creek.	13	Fish & Wildlife
ALAMAP1 (AR02U3-2)	Chemical, Habitat	1999	Bear Creek approx. 20 miles upstream of confluence with Pine Barren Creek.	13	Fish & Wildlife
AR1U4-2	Chemical, Habitat	2000	Bear Creek approx. 20 miles upstream of confluence with Pine Barren Creek.	13	Fish & Wildlife
AR1U5-2	Chemical, Habitat	2001	Bear Creek approx. 20 miles upstream of confluence with Pine Barren Creek.	13	Fish & Wildlife
AR06U2-18	Chemical, Habitat	1998	Bear Creek approx. 3.2 miles east of McWilliams Church.	15	Fish & Wildlife

Bear Creek was evaluated at AR06U2-18 during 1998. It is a sandy-bottomed, glide-pool stream reach. Habitat quality was assessed as *excellent*, despite the lack of a good riparian buffer zone (Appendix F-8a).

Results of chemical sampling are provided in Appendix F-8b. Fecal coliform counts have been consistently high at all locations on Bear Creek, ranging from >400 colonies/100 mL in 1999 to 1,500 colonies/100 mL during 2000. Nutrient concentrations were similar to least-impaired reference conditions. At AR1U4-2, the dissolved oxygen concentration was 4.6 mg/L, below the 5.0 mg/L criteria for Alabama "Fish & Wildlife" use classification; however, flow was very low (<0.1 cfs) (Appendix F-8b).

NPS priority status: NPS impairment of the Bear Creek sub-watershed cannot be assessed from the available data.

Sub-Watershed: Lower Pine Barren Creek NRCS Sub-Watershed Number 130

Landuse: The Lower Pine Barren Creek sub-watershed drains approximately 129 mi^2 in Wilcox and Dallas Counties. Land cover was mainly forest mixed with pasture. Two current construction/stormwater authorizations have been issued in the sub-watershed (Table 6b).

Percent land cover estimated by local SWCD (Table 5b, ASWCC 1998)

Forest	Row crop	Pasture	Mining	Urban	Open Water	Other
83%	1%	15%	0%	<1%	<1%	1%

NPS impairment potential: Percent pasture landuse indicated a *moderate* potential for impairment. The overall potential for impairment from nonpoint sources was estimated as *low*.

Values and NPS ratings for each NPS category estimated by local SWCD.

Category	Overall Potential	Animal husbandry	Aqua-culture	Row crop	Pasture	Mining	Forestry	Sediment
Value	9	0.03 AU/ac	0%	1%	15%	0%	11%	0.7 tons/ac/yr
NPS Potential	L	L	L	L	M	L	L	L
Table	7b	11b	11b	5b	5b	5b	12b	12b

Assessments: An assessment was not conducted during this study because of the *low* potential for impairment from nonpoint sources. However, Pine Barren Creek was monitored at 4 locations in conjunction with ADEM's CWA §303(d) Monitoring (Appendix F-3) and Reservoir Monitoring (Appendix F-6) Programs and a tributary monitoring program conducted by AUM (Appendix F-7).

Pine Barren Creek: Pine Barren Creek is located in the Southeastern Plains and Hills (65e) subecoregion. Habitat condition was assessed as *good* at PBMW-2 and *excellent* at the downstream station, PBMW-3 (Appendix F-3a). A bioassessment conducted at PBMW-3 indicated the macroinvertebrate community to be in *excellent* condition (Appendix F-3b).

Intensive water quality sampling was conducted at PBCAUM-1 (Appendix F-7a) during December of 1998 through December of 1999 and at PBMW-3 and PBMW-4 (Appendix F-3c) in April of 2000 through February of 2001. Analyses of data collected at PBMW-3 and PBMW-4 did not indicate water quality impairment (Appendix F-3c). Data collected at PBCAUM-1 is provided in Appendix F-7a.

Assessment stations located within the sub-watershed. Descriptions are provided in Appendix E.

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
PBMW-2	Chemical, Habitat	2000	Pine Barren Creek upstream of AL Hwy 21.	261	Swimming/ Fish & Wildlife
PBCAUM-1	Chemical	1999	Pine Barren Creek at AL Hwy 21 west of Snow Hill.	261	Swimming/ Fish & Wildlife
PBMW-3	Chemical, Habitat, Macroinvertebrate	2000	Pine Barren Creek upstream of Steele Bridge road.	325	Swimming/ Fish & Wildlife
PBMW-4	Chemical	2000	Pine Barren Creek upstream of AL Hwy 41.	345	Swimming/ Fish & Wildlife
AR2U4-8	None conducted	2000	Pine Barren Creek at T13N, R8E, S11.	365	Swimming/ Fish & Wildlife
DAN-8	Chemical	2000	Pine Barren Creek embayment.	367	Swimming/ Fish & Wildlife

At DAN-8, Pine Barren Creek is an embayment area on the Dannelly Reservoir located in the Southeastern Floodplains and Low Terraces (65p) subecoregion. Intensive water quality data were collected at this station during April, June, and August of 2000 (Appendix F-6a). The data will be used to evaluate nutrient and sediment loading from this tributary as a source of water quality impairment to Dannelly Reservoir. Results of these analyses were reported in ADEM's Annual Reservoir Monitoring Program Report (ADEM, in press).

NPS priority status: Although intensive water quality sampling indicated some nutrient enrichment at PBCAUM-1, a macroinvertebrate assessment conducted downstream of this site did not show impairment to biological condition. The Pine Barren Creek sub-watershed was not at a high risk to impairment from nonpoint sources and is not recommended as a NPS priority sub-watershed.

Sub-Watershed: Foster Creek NRCS Sub-Watershed Number 140

Landuse: The Foster Creek sub-watershed drains approximately 57 mi^2 in Wilcox County. The primary land cover was forest with some pasture. Two current construction/ stormwater and 1 non-coal mining <5 acres/stormwater authorizations have been issued in the sub-watershed (Table 6b).

Percent land cover estimated by local SWCD (Table 5b, ASWCC 1998)

Forest	Row crop	Pasture	Mining	Urban	Open Water	Other
85%	<1%	14%	0%	<1%	<1%	1%

NPS impairment potential: Percent pasture landuse indicated a *moderate* potential for impairment. The potential for impairment from other nonpoint sources was estimated as *low*.

Values and NPS ratings for each NPS category estimated by local SWCD.

Category	Overall Potential	Animal husbandry	Aqua-culture	Row crop	Pasture	Mining	Forestry	Sediment
Value	8	<0.01 Au/ac	0.00%	<1%	14%	0%	11%	0.7 tons/ac/yr
NPS Potential	L	L	L	L	M	L	L	L
Table	7b	11b	11b	5b	5b	5b	12b	12b

Assessments: An assessment of Foster Creek was not conducted during the ACT Basin NPS Screening Assessment due to the *low* potential for NPS impairment.

NPS priority status: NPS priority status was not determined during the ACT Basin NPS Screening Assessment, but Foster Creek was not at a high risk to impairment from nonpoint sources.

Sub-Watershed: Alabama River–Dannelly Reservoir NRCS Sub-Watershed Number 150

Landuse: The Alabama River–Dannelly Reservoir sub-watershed drains approximately 38 mi^2 in Wilcox County. Forest and pasture comprised 95% of SWCD estimated percent land cover. Two current construction/stormwater authorizations, 1 non-coal mining <5 acres/stormwater authorization, and 1 semi-public/private NPDES permit have been issued in the sub-watershed (Table 6b).

Percent land cover estimated by local SWCD (Table 5b, ASWCC 1998)

Forest	Row crop	Pasture	Mining	Urban	Open Water	Other
71%	<1%	24%	0%	2%	<1%	3%

NPS impairment potential: The potential for impairment caused by runoff from pasturelands was estimated as *moderate*. Potential for impairment from other nonpoint sources was *low*. However, the Alabama River was given a 1st priority sub-watershed rating by the SWCD. Resource concerns included erosion from roads, overgrazing of pastures and access of livestock to streams (Table 12b). The potential for impairment from septic failure was estimated to be *moderate* (Table 7b).

Values and NPS ratings for each NPS category estimated by local SWCD.

Category	Overall Potential	Animal husbandry	Aqua-culture	Row crop	Pasture	Mining	Forestry	Sediment
Value	9	<0.01 AU/ac	0%	<1%	24%	0%	10%	0.5 tons/ac/yr
NPS Potential	L	L	L	L	M	L	L	L
Table	7b	11b	11b	5b	5b	5b	12b	12b

Assessments: An assessment of this sub-watershed was not conducted during the ACT Basin NPS Screening Assessment.

NPS priority status: NPS priority status of the Alabama River–Dannelly Reservoir was not evaluated.

Sub-Watershed: Rockwest Creek NRCS Sub-Watershed Number 160

Landuse: The Rockwest Creek sub-watershed drains approximately 56 mi^2 in Wilcox County. Land cover was primarily forest mixed with pasture. One current construction/ stormwater authorization, 2 non-coal mining <5 acres/stormwater authorizations, 2 mining NPDES permits, and 1 municipal NPDES permit have been issued in the sub-watershed (Table 6b).

Percent land cover estimated by local SWCD (Table 5b, ASWCC 1998)

Forest	Row crop	Pasture	Mining	Urban	Open Water	Other
67%	<1%	25%	0%	4%	<1%	3%

NPS impairment potential: The overall potential for impairment from nonpoint sources was estimated as *low.* Percent pasture indicated a *moderate* potential for impairment. There was a *moderate* potential for impairment from urban areas and septic tank failure (Table 7b).

Values and NPS ratings for each NPS category estimated by local SWCD.

Category	NPS Score	Animal husbandry	Aqua-culture	Row crop	Pasture	Mining	Forestry	Sediment
Value	9	<0.01 AU/ac	0%	<1%	25%	0%	9%	0.6 tons/ac/yr
NPS Potential	L	L	L	L	M	L	L	L
Table	7b	11b	11b	5b	5b	5b	12b	12b

Assessments: An assessment of the sub-watershed was not conducted during the ACT Basin NPS Screening Assessment.

NPS priority status: NPS priority status of the Rockwest Creek sub-watershed was not assessed. However, the potential for impairment from nonpoint sources was *low*.

Sub-Watershed: Dixon Creek **NRCS Sub-Watershed Number 170**

Landuse: The Dixon Creek sub-watershed drains approximately 54 mi^2 in Marengo and Wilcox Counties. Percent land cover was estimated as 92% forest. Three current construction/ stormwater authorizations have been issued in the sub-watershed (Table 6b).

Percent land cover estimated by local SWCD (Table 5b, ASWCC 1998)

Forest	Row crop	Pasture	Mining	Urban	Open Water	Other
92%	1%	4%	0%	<1%	1%	1%

NPS impairment potential: There was a *low* potential for impairment from all urban and rural NPS categories (Table 7b).

Values and NPS ratings for each NPS category estimated by local SWCD.

Category	NPS Score	Animal husbandry	Aqua-culture	Row crop	Pasture	Mining	Forestry	Sediment
Value	7	<0.01 AU/ac	0.01%	1%	4%	0%	12%	0.7 tons/ac/yr
NPS Potential	L	L	L	L	L	L	L	L
Table	7b	11b	11b	5b	5b	5b	12b	12b

Assessments: An assessment was not conducted during the ACT Basin NPS Screening Assessment due to the *low* potential for impairment from nonpoint sources. An assessment of the Alabama River could not be conducted during the 1999 ALAMAP Program because the stream reach was not wadeable.

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
AR01U3-7	None conducted	1999	Alabama R. approximately 11.7 miles upsteam of confluence with Big Swamp Creek.	undetermined	Fish & Wildlife

NPS priority status: Given the *low* potential for impairment from both urban and rural nonpoint sources, Dixon Creek should be considered as a least-impaired reference sub-watershed.

Sub-Watershed: Beaver Creek **NRCS Sub-Watershed Number 180**

Landuse: The Beaver Creek sub-watershed drains approximately 218 mi^2 in Wilcox, Clarke, and Marengo Counties. The sub-watershed was primarily forested. Six current construction/stormwater authorizations, 2 non-coal mining <5 acres/stormwater authorizations, and 1 municipal NPDES permit have been issued in the sub-watershed (Table 6b). An 8-mile segment of Cub Creek is currently on Alabama's CWA §303(d) list of impaired waterbodies for not meeting its "Fish and Wildlife" water use classification because of nutrients, organic enrichment, and low dissolved oxygen concentrations (<5mg/L) (Table 15b). The source(s) of impairment is unknown.

Percent land cover estimated by local SWCD (Table 5b, ASWCC 1998)

Forest	Row crop	Pasture	Mining	Urban	Open Water	Other
92%	<1%	4%	0%	2%	<1%	2%

NPS impairment potential: The potential for impairment from nonpoint sources was estimated as *low*. There was a *moderate* potential for impairment from urban development and septic tank failures (Table 7b). Reconnaissance of the Cub Creek watershed did not indicate a source of impairment upstream of Pine Hill.

Values and NPS ratings for each NPS category estimated by local SWCD.

Category	Overall Potential	Animal husbandry	Aqua-culture	Row crop	Pasture	Mining	Forestry	Sediment
Value	7	0.01 AU/ac	0.01%	<1%	4%	0%	12%	2.0 tons/ac/yr
NPS Potential	L	L	L	L	L	L	L	L
Table	7b	11b	11b	5b	5b	5b	12b	12b

Assessments: An assessment of the sub-watershed was not conducted as part of the ACT Basin NPS Screening Assessment. However, Beaver Creek has been previously monitored at two stations during ADEM's CWA §303(d) and Reservoir Monitoring Programs (Appendix F-3 and Appendix F-6, respectively). Cub Creek was monitored at 3 stations during ADEM's CWA §303(d) Monitoring Program (Appendix F-3).

Beaver Creek: Field parameters were collected at BEVW-1 during May of 2000 (Appendix F-3c). The dissolved oxygen concentration (D.O.) was measured at 3.0 mg/L, below "Fish and Wildlife" water use classification criteria.

At Claiborne-3, Beaver Creek is an embayment area on the Claiborne Reservoir located in the Southeastern Floodplains and Low Terraces (65p) subecoregion. Intensive water quality data collected during April, June, and August of 2000, was used to evaluate nutrient and sediment loading from this tributary as a source of water quality impairment to Claiborne Reservoir (Appendix F-6a). Results of these analyses were reported by ADEM's Annual Reservoir Monitoring Program Report (ADEM, in press).

Assessment stations located within the sub-watershed. Descriptions are provided in Appendix E.

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
BEVW-1	Chemical	2000	Beaver Creek at Wilcox County Rd. 9 crossing.	34	Fish & Wildlife
Claiborne-3	Chemical	2000	Beaver Creek embayment.	256	Fish & Wildlife
CBC-2	Chemical, Habitat	1999	Cub Creek at AL Hwy 5.	6	Fish & Wildlife
CBC-1	Chemical, Habitat, Macroinvertebrate	1999	Cub Creek at Wilcox County Rd. 27.	13	Fish & Wildlife
CUBW-30	Chemical	2000	Cub Creek at Wilcox County Rd. 9 crossing.	13	Fish & Wildlife

Cub Creek: Cub Creek is a relatively low-gradient stream located in the Southeastern Plains and Hills (65e) subecoregion. Habitat condition was assessed as *good* at CBC-1 and *excellent* at CBC-2 (Appendix F-3a). A bioassessment conducted at CBC-1 indicated the macroinvertebrate community to be in *good* condition (Appendix F-3b).

Intensive water quality sampling was conducted 8 times at 3 stations on Cub Creek (Appendix F-3c). Dissolved oxygen concentrations were below the Fish and Wildlife Use Classification criteria of 5.0 mg/L during all 8 sampling events. Five-day biochemical oxygen demands (BOD-5) were elevated. However, D.O. concentrations and BOD-5 were similar at CBC-2 and CBC-1, upstream and downstream of Pine Hill, suggesting that the municipality was not a source of impairmnt to the creek. Fecal coliform counts were high (>990 colonies/100 mL) at CBC-1 during one sampling event. Stream flow at CBC-1 ranged from 0.0-0.4 cfs.

NPS priority status: A bioassessment conducted at CBC-1 indicated the macroinvertebrate community to be in *good* condition. Dissolved oxygen concentrations were low at 3 stations on Cub Creek. An intensive investigation of the watershed suggested that these conditions are naturally occurring.

Sub-Watershed: Red Creek **NRCS Sub-Watershed Number 190**

Landuse: The Red Creek sub-watershed drains approximately 42 mi^2 in Wilcox and Marengo Counties. Land cover was primarily forest mixed with pasture. Two current construction/stormwater authorizations have been issued in the sub-watershed (Table 6b).

Percent land cover estimated by local SWCD (Table 5b, ASWCC 1998)

Forest	Row crop	Pasture	Mining	Urban	Open Water	Other
88%	1%	7%	0%	<1%	<1%	4%

NPS impairment potential: The potential for impairment from all point and NPS categories was estimated as *low* (Table 7b).

Values and NPS ratings for each NPS category estimated by local SWCD.

Category	NPS Score	Animal husbandry	Aqua-culture	Row crop	Pasture	Mining	Forestry	Sediment
Value	7	<0.01 AU/ac	0.00%	1%	7%	0%	16%	0.8 tons/ac/yr
NPS Potential	L	L	L	L	L	L	L	L
Table	7b	11b	11b	5b	5b	5b	12b	12b

Assessments: An assessment of Red Creek was not conducted during the ACT Basin NPS Screening Assessment due to the *low* potential for impairment from nonpoint sources.

NPS priority status: The local SWCD estimates of percent land cover indicated a *low* potential for impairment from both rural and urban nonpoint sources, suggesting that Red Creek may be suitable as a least-impaired reference sub-watershed.

Sub-Watershed: Pursley Creek NRCS Sub-Watershed Number 200

Landuse: The Pursley Creek sub-watershed drains approximately 106 mi^2 in Wilcox County. Land cover was primarily forest with some pasture. One current construction/ stormwater authorization, 1 non-coal mining <5 acres/stormwater authorization, and 1 municipal NPDES permit have been issued in the sub-watershed (Table 6b).

Percent land cover estimated by local SWCD (Table 5b, ASWCC 1998)

Forest	Row crop	Pasture	Mining	Urban	Open Water	Other
90%	1%	8%	0%	1%	<1%	1%

NPS impairment potential: The potential for impairment from all urban and rural NPS categories was estimated as *low* (Table 7b).

Values and NPS ratings for each NPS category estimated by local SWCD.

Category	NPS Score	Animal husbandry	Aqua-culture	Row crop	Pasture	Mining	Forestry	Sediment
Value	7	<0.01 AU/ac	0%	1%	8%	0%	11%	0.6 tons/ac/yr
NPS Potential	L	L	L	L	L	L	L	L
Table	7b	11b	11b	5b	5b	5b	12b	12b

Assessments: ADEM has monitored 7 stations within the sub-watershed in conjunction with the CWA §303(d) and Reservoir Monitoring Programs (Appendix F-3 and Appendix F-6, respectively).

Assessment stations located within the sub-watershed. Descriptions are provided in Appendix E.

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
GRVW-1	Chemical, Habitat	2000	Gravel Creek at AL Hwy 41.	29	Fish & Wildlife
PURW-1	Chemical, Habitat	2000	Pursley Creek upstream of unnamed Wilcox County road.	22	Fish & Wildlife
PURW-2	Chemical, Habitat	2000	Pursley Creek upstream of AL Hwy 265.	45	Fish & Wildlife
PURW-3	Chemical, Habitat	2000	Pursley Creek upstream of AL Hwy 41.	64	Fish & Wildlife
Claiborne-4	Chemical	2000	Pursley Creek embayment.	104	Fish & Wildlife
CSWW-1	Chemical	2000	Camden South wastewater treatment plant outfall.	NA	Fish & Wildlife
TWNW-1	Chemical, Habitat	2000	Town Branch approx. 100 feet upstream of Camden South WWTP outfall	2	Fish & Wildlife

Gravel Creek: At GRVW-1, Gravel Creek is a riffle-run, sand and gravel stream located in the Southeastern Plains and Hills (65e) subecoregion (Appendix F-3a). Habitat condition was assessed as *good* for this stream type. Seven EPT families were collected at this site, indicating the macroinvertebrate community to be in *good* condition (Appendix F-3b).

Chemical sampling was conducted from April of 2000 through February of 2001 (Appendix F-3c). In-situ water quality parameters indicated that Gravel Creek at GRVW-1 was meeting its water use classification of "Fish and Wildlife", with the exception of one dissolved oxygen (DO) concentration in September of 2000 that may have been the result of low flow conditions.

Pursley Creek: Pursley Creek is a riffle-run stream located in the Southeastern Plains and Hills (65e) subecoregion. Habitat condition was assessed as *excellent* at PURW-1, PURW-2, and PURW-3 (Appendix F-3a). Bioassessment results indicated the macroinvertebrate community to be in *good* condition at PURW-2 and *excellent* condition at PURW-3 (Appendix F-3b).

Intensive water quality sampling was conducted at PURW-1, PURW-2, and PURW-3 from April of 2000 through February of 2001 (Appendix F-3c). Fecal coliform concentrations were periodically high at both PURW-1 and PURW-3. In-situ water quality parameters indicated that Pursley Creek was meeting its water use classification of "Fish and Wildlife", with the exception of 1 dissolved oxygen measurement at PURW-3 in September of 2000 (4.8 mg/L) that may have resulted from low flow conditions.

At Claiborne-4, Pursley Creek is an embayment area on the Claiborne Reservoir located in the Southeastern Floodplains and Low Terraces (65p) subecoregion. Intensive water quality data collected during April, June, and August of 2000 will be used to evaluate nutrient and sediment loading from this tributary as a source of water quality impairment to Claiborne Reservoir (Appendix F-6a). During April, the DO concentration at Claiborne-4 was 4.7 mg/L, below numeric criteria for Pursley Creek's water use classification of "Fish and Wildlife". Results of these analyses were reported in ADEM's Annual Reservoir Monitoring Program Report (ADEM, in press).

Town Branch: At TWNW-1, Town Branch is a relatively high-gradient, sand and gravel stream located in the Southeastern Plains and Hills (65e) subecoregion. Habitat condition (Appendix F-3a) was assessed as *excellent* for this stream type.

In-situ water quality parameters and chemical sampling (Appendix F-3c) conducted at TWNW-1 from April of 2000 through February of 2001 showed the dissolved oxygen concentration to be below the criteria to meet its water use classification of "Fish and Wildlife" during 2 (30%) sampling events. Nutrient concentrations (Total-P, NO_3+NO_2-N, NH_3-N, and TKN) were elevated during the September and January sampling events.

CSWW-1 is the Camden South wastewater treatment plant and discharges into Town Branch. In-situ water quality parameters and chemical sampling conducted in April of 2000 through February of 2001 indicated high conductivity, biochemical oxygen demand, and nutrient concentrations (Appendix F-3c).

NPS priority status: In-situ field measurements and intensive chemical sampling indicated D.O. concentrations below "Fish and Wildlife" classification criteria and nutrient enrichment at Gravel Creek, Pursley Creek, and Town Branch. Bioassessments conducted within the sub-watershed, however, did not suggest biological impairment. Additionally, the sub-watershed was at a *low* risk for NPS impairment. Pursely Creek is not recommended as a NPS priority sub-watershed.

Sub-Watershed: Bear Creek **NRCS Sub-Watershed Number 210**

Landuse: The Bear Creek sub-watershed drains approximately 87 mi^2 in Monroe, Wilcox, and Clarke Counties. The SWCD estimated percent land cover as 97% forest. One construction/stormwater and 1 industrial process wastewater authorization have been issued in the sub-watershed (Table 6b).

Percent land cover estimated by local SWCD (Table 5b, ASWCC 1998)

Forest	Row crop	Pasture	Mining	Urban	Open Water	Other
97%	0%	2%	0%	<1%	<1%	1%

NPS impairment potential: The potential for impairment from rural and urban nonpoint sources was estimated as *low* (Table 7b).

Values and NPS ratings for each NPS category estimated by local SWCD.

Category	NPS Score	Animal husbandry	Aqua-culture	Row crop	Pasture	Mining	Forestry	Sediment
Value	7	<0.01 AU/ac	0.02%	0%	2%	0%	16%	0.8 tons/ac/yr
NPS Potential	L	L	L	L	L	L	L	L
Table	7b	11b	11b	5b	5b	5b	12b	12b

Assessments: An assessment of Bear Creek was not conducted during the ACT Basin NPS Screening Assessment.

NPS priority status: Given the *low* potential for impairment from both urban and rural nonpoint sources, Bear Creek should be considered as a least-impaired reference sub-watershed.

Sub-Watershed: McCall Creek **NRCS Sub-Watershed Number 220**

Landuse: The McCall Creek sub-watershed drains approximately 76 mi^2 in Monroe and Wilcox Counties. Land cover was mainly forest mixed with pasture and croplands. One construction/stormwater authorization has been issued in the sub-watershed (Table 6b).

Percent land cover estimated by local SWCD (Table 5b, ASWCC 1998)

Forest	Row crop	Pasture	Mining	Urban	Open Water	Other
82%	9%	8%	0%	0%	<1%	1%

NPS impairment potential: The potential for impairment from nonpoint sources was estimated as *low*. However, the McCall Creek sub-watershed was given a 3rd priority sub-watershed rating by the SWCD (Table 12b).

Values and NPS ratings for each NPS category estimated by local SWCD.

Category	NPS Score	Animal husbandry	Aqua-culture	Row crop	Pasture	Mining	Forestry	Sediment
Value	9	<0.01 AU/ac	0.00%	9%	8%	0%	11%	1.1 tons/ac/yr
NPS Potential	L	L	L	M	L	L	L	L
Table	7b	11b	11b	5b	5b	5b	12b	12b

Assessments: An assessment of McCall Creek was not conducted during the ACT Basin NPS Screening Assessment.

NPS priority status: Given the *low* potential for impairment from both urban and rural nonpoint sources, McCall Creek should be considered as a least-impaired reference sub-watershed.

Table 5b. Landuse percentages for the Middle Alabama CU (0315-0203) from EPA landuse categories (EPA 1997) and local SWCD Conservation Assessment Worksheet landuse estimates (ASWCC 1998).

Sub-watershed	Percent Total Landuse													
	Open Water		Urban		Mines		Forest		Pasture		Row Crops		Other	
	SWCD	EPA	SWCD	EPA	SWCD	EPA	SWCD	EPA	SWCD	EPA	SWCD	EPA	SWCD	EPA
Middle Alabama (0315-0203)														
010	1	2	1	<1	0	0	65	41	10	12	20	10	3	35
020	1	<1	<1	<1	0	0	86	90	12	4	1	5	1	1
030	2	<1	0	<1	0	0	76	88	19	6	1	6	2	<1
040	2	1	0	<1	0	0	52	71	18	12	28	11	1	5
050	2	2	0	<1	0	<1	46	57	20	10	30	10	2	21
060	1	2	0	<1	0	0	86	81	10	3	1	2	2	12
070	1	5	0	<1	0	<1	62	27	28	15	8	15	1	38
080	4	1	3	<1	0	<1	20	34	33	28	39	26	<1	9
090	2	1	1	<1	0	<1	25	33	40	26	29	22	3	17
100	1	2	1	<1	0	0	62	63	24	16	12	11	1	8
110	<1	<1	<1	<1	0	<1	86	86	11	5	3	7	<1	2
120	<1	<1	1	<1	0	0	90	91	8	3	<1	3	1	3
130	<1	1	<1	<1	0	0	83	73	15	8	1	6	1	12
140	<1	11	<1	<1	0	<1	85	68	14	7	<1	6	1	7
150	<1	19	2	<1	0	<1	71	53	24	6	<1	7	3	15
160	<1	3	4	1	0	<1	67	54	25	11	<1	7	3	24
170	1	2	<1	<1	0	<1	92	61	4	8	1	10	1	19
180	<1	<1	2	<1	0	0	92	84	4	4	<1	4	2	7
190	<1	<1	<1	<1	0	0	88	78	7	1	1	3	4	18
200	<1	1	1	<1	0	0	90	88	8	5	1	4	1	3
210	<1	3	<1	<1	0	<1	97	70	2	1	0	3	1	22
220	<1	2	0	<1	0	0	82	48	8	8	9	6	1	36

Table 6b. Summary of the number of current construction/stormwater authorizations, non-coal <5 acres/stormwater authorizations, NPDES permits, and CAFO registrations issued within each subwatershed of the Middle Alabama River CU. Those subwatersheds with more than 5 authorizations, permits or registrations in a category are in bold.

Cataloging Unit and Subwatershed	# Authorizations, NPDES permits, and CAFO Registrations							
	Total Number of Permits and Authorizations	Construction/ Stormwater Authorizations (a)	Non-Coal Mining <5 Acres / Stormwater Authorizations (a)	Mining NPDES (c)	Municipal NPDES (b)	Semi Public/ Private NPDES (b)	Industrial Process Wastewater - NPDES Majors (b)	CAFO Registrations (c)
010	1	1						
020	7	4	1		1			1
030	3	2	1					
040	2	2						
050	1	1						
060	2	1				1		
070	1	1						
080	7	6						1
090	3	1				2		
100	6	5	1					
110	4	2	1					1
120	1	1						
130	2	2						
140	3	2	1					
150	4	2	1			1		
160	6	1	2	2	1			
170	3	3						
180	9	6	2		1			
190	2	2						
200	3	1	1		1			
210	2	1					1	
220	1	1						

(a) Source: ADEM Mining and Nonpoint Source Unit, Field Operations, database retrieval (7/18/00)

(b) Source: 1996 CWS Report (ADEM 1999a)

(c) Source: ADEM Mining and Nonpoint Source Unit, Field Operations, database retrieval (08/11/00)

Table 7b. Estimate of NPS impairment potential for the Middle Alabama River CU (0315-0203). Source categories are based on information provided by the local Soil and Water Conservation Districts (SWCD) on Conservation Assessment Worksheets completed in 1998, and from current construction/stormwater authorization information provided by the Mining and NPS Unit of ADEM. *Rural landuse sources were used to develop the NPS potential. The presence of a CWA §303(d) stream segment within a subwatershed raised the sub-watershed to the top of the prioritization ranking.

Subwatershed	Overall NPS Impairment Score	Potential NPS Impairment	Potential Sources of Impairment									
			Rural Landuses							Urban / Suburban / Residential Landuses		
			Animal Husbandry	Aquaculture	Row Crops	Pasture Runoff	Mining	Forestry Practices	Sedimentation	Urban	Development	Septic Tank Failure
Raw Data Table			12b	12b	5b	5b	5b	13b	13b	5b	6b	13b
010	11	M	L	L	M	L	L	M	L	L	L	M
020	9	L	L	L	L	L	L	M	L	L	L	L
030	13	M	L	L	L	M	L	**H**	L	L	L	L
040	17	**H**	L	M	**H**	M	L	M	L	L	L	L
050	13	M	L	L	**H**	M	L	L	L	L	L	L
060	9	L	L	L	L	L	L	M	L	L	L	L
070	11	M	L	L	M	M	L	L	L	L	L	L
080	17	**H**	L	**H**	**H**	M	L	L	L	L	M	M
090	19	**H**	M	M	**H**	**H**	L	L	L	L	L	L
100	15	**H**	L	**H**	M	M	L	L	L	L	M	L
110	7	L	L	L	L	L	L	L	L	L	L	L
120	9	L	L	L	L	L	L	M	L	L	L	L
130	9	L	L	L	L	M	L	L	L	L	L	L
140	8	L	L	L	L	M	L	L	L	L	L	L
150	9	L	L	L	L	M	L	L	L	L	L	M
160	9	L	L	L	L	M	L	L	L	L	L	M
170	7	L	L	L	L	L	L	L	L	L	L	L
180	7	L	L	L	L	L	L	L	L	L	M	M
190	7	L	L	L	L	L	L	L	L	L	L	L
200	7	L	L	L	L	L	L	L	L	L	L	L
210	7	L	L	L	L	L	L	L	L	L	L	L
220	9	L	L	L	M	L	L	L	L	L	L	L

Table 8b. List of other water quality assessments conducted on streams within the Middle Alabama River CU from 1990-2000. Data are provided by project and assessment type in the Appendices listed.

Sub-watershed	Waterbody	Date(s)	Assessment Typea	Appendices
000	Alabama River	1996	C	F-1, F-7
030	Sullivan Branch	1997	C, H	F-6
080	Kendricks Branch	2001	C, H	F-6
080	Chaney Creek	1992, 1993, 1995	M, C, H	F-3
080	Washington Creek	1995, 2000	M, C, H	F-3
080	Bogue Chitto Creek	1999	M, C, H	F-4
080	Unnamed tributary to Bogue Chitto Creek	1998	C, H	F-6
090	Bogue Chitto Creek	1999, 2000	M, C, H	F-4, F-5, F-9
100	Chilatchee Creek	1998	C, H	F-6
110	Pine Barren Creek	2000	C	F-5
120	Bear Creek	1997, 1998, 2001	C, H	F-6
130	Pine Barren Creek	1999, 2000	M, C, H	F-4, F-5, F-6, F-9
160	Alabama River	1999	C	F-5
170	Alabama River	1999	C	F-6
180	Cub Creek	1999, 2000	M, H, C	F-4a-d
180	Turkey Creek	1999	C	F-5
180	Beaver Creek	1999, 2000	C	F-4, F-9
200	Pursley Creek	2000, 2001	M, H, C	F-4, F-6, F-9
200	Town Branch	2000	C	F-4
200	Gravel Creek	2000	M, H, C	F-4

a. M= macroinvertebrate assessment, F=fish assessment, H= habitat assessment, C= chemical assessment

Table 9b. List of stations located within the Middle Alabama River CU assessed or attempted as part of the ACT Basin NPS Screening Assessment.

Sub-watershed	Stream	Station	Basin Size (est. mi^2)	Assessment Type[a]	Subregion[b]	County	T / R / S
030	Cedar Creek	CDRL-27	62	H, M, C	65b	Lowndes	13N/12E/26
030	Sullivan Creek	SULL-28	12	N/A	65b	Lowndes	13N/12E/15
030	Dry Cedar Creek	UNML-29	5	N/A	65b	Lowndes	13N/12E/21
040	Mush Creek	MSHD-15	39	H, M, C	65b	Dallas	15N/11E/29
080	Brush Creek	BRSD-18	14	N/A	65a	Dallas	17N/7E/16
080	Mud Creek	MUDD-16	19	H, M	65a	Dallas	17N/7E/17
080	Mud Creek	MUDD-17	83	H, M, F, C*	65a	Dallas	17N/7E/32
090	Bear Creek	BERD-20	28	H, M, F, C*	65a	Dallas	15N/7E/1
090	Cane Creek	CNED-21	9	N/A	65a	Dallas	15N/8E/7
090	Tatum Creek	TTMD-19	26	H, M	65a	Dallas	16N/8E/28
100	Glover Creek	GLVW-26	8	H, M, C	65b	Wilcox	15N/6E/21
100	Little Chilatchee Creek	LCHD-22	11	N/A	65a	Dallas	15N/7E/17
100	Little Chilatchee Creek	LCHD-23	7	H, M, F, C*	65b	Dallas	15N/7E/17
100	Rogers Creek	RGRD-24	12	H, M, F, C*	65a	Dallas	15N/6E/12
100	Sand Creek	SNDM-25	17	H, M, C*	65b	Marengo	15N/6E/17

a. Assessment Type: C=Chemical; C*= Chemical Assessment attempted, stream dry or intermittant pools; H= Habitat; M=Aquatic Macroinvertebrate Community; F=Fish Community; *NA* = Not Assessed (dry/not flowing/beaver dam, etc)

b. Level IV Ecoregions of Alabama (Griffith, et al. 1999)

Table 10b. Summary of Assessments conducted within the Middle Alabama River CU as a part of the ACT Basin NPS project and other available biological and chemical data collected since 1992.

Sub-watershed	Station	*Habitat*	*Macroinv.*	*Fish*	*Chemical data available*	*Lowest assessment score*
030	CDRL-27	Excellent	Good	---	X	Good
030	SULL-28	---	---	---	---	---
030	UNML-29	---	---	---	---	---
040	MSHD-15	Excellent	Good	---	X	Good
080	BRSD-18	---	---	---	---	---
080	MUDD-16	Excellent	Fair	---	---	**Fair**
080	MUDD-17	Excellent	Fair	Very Poor/Poor	---	**Poor**
080	CYD-1	Excellent	Good	---	X	Good
080	WASP-1	Excellent	Poor	---	X	**Poor**
080	BCH-3	Excellent	---	---	X	---
080	BCH-4	Excellent	---	---	X	---
080	BCH-5	Excellent	Fair	Fair	X	**Fair**
090	BCH-1	Excellent	---	---	X	**---**
090	BCH-2	Excellent	Excellent	Poor	X	**Poor**
090	BERD-20	Excellent	Fair	Poor/Fair	---	**Fair**
090	CNED-21	---	---	---	---	---
090	TTMD-19	Excellent	Excellent	---	X	Excellent
090	AR04U1	Excellent	---	---	X	---
100	GLVW-26	Excellent	Fair	---	X	**Fair**
100	LCHD-22	---	---	---	---	---
100	LCHD-23	Excellent	Fair	Good	---	**Fair**
100	RGRD-24	Fair	Fair	---	---	**Fair**
100	SNDM-25	Excellent	Good	---	---	Good
120	AR06U2-18	Excellent	---	---	X	---
120	AR07U2-2	Fair	---	---	X	---
130	PBMW-1	Excellent	Excellent	---	X	Excellent
130	PBMW-3	Excellent	Exellent	---	X	Excellent
130	AR1U4-2	Fair	---	---	X	---
160	AR3U4-10	Excellent	---	---	X	---
180	CBC-1	Good	Good	---	X	Good
180	CBC-2	Excellent	---	---	X	---
180	CUBW-30	---	---	---	X	---
180	BEVW-1	---	---	---	X	---
200	GRVW-1	Good	Good	---	X	Good
200	PURW-2	Excellent	Good	---	X	Good
200	PURW-3	Excellent	Excellent	---	X	Excellent

Table 11b. Estimates of animal concentrations, animal units (AU), percent aquaculture, and percent of acres where pesticides/herbicides have been applied in the Middle Alabama River CU (0315-0203). Numbers of animals and pesticides/herbicides listed by acreage and sub-watershed were provided by the local SWCDs on Conservation Assessment Worksheets completed in 1998 (ASCWCC 1998).

		Sub-watershed											
		010	020	030	040	050	060	070	080	090	100	110	120
County (s)		Dallas	Butler Dallas Lowndes Wilcox	Dallas Lowndes Wilcox*	Dallas Lowndes	Dallas	Dallas	Dallas	Dallas Perry	Dallas Perry*	Dallas Marengo Perry Wilcox	Butler Monroe Wilcox	Monroe Wilcox
Acres Reported (% of Total)		100	100	100	100	100	100	100	100	96	100	100	100
Pesticides Applied	Est. % Reported	3	<1	*	27	30	*	*	17	29	*	2	*
Cattle	# / Acre	0.04	0.02	0.05	0.06	0.07	0.01	0.07	0.09	0.15	0.07	0.03	0.01
	A.U./Acre	0.04	**0.02**	**0.05**	**0.06**	**0.07**	**0.01**	**0.07**	**0.09**	**0.15**	**0.07**	**0.03**	**0.01**
Dairy	# / Acre	---	<0.01	---	<0.01	---	---	---	<0.01	0.01	---	---	---
	A.U./Acre	---	**<0.01**	---	**<0.01**	---	---	---	**0.01**	**0.01**	---	---	---
Swine	# / Acre	---	<0.01	---	<0.01	0.06	---	---	---	**0.01**	<0.01	---	---
	A.U./Acre	---	**<0.01**	---	**<0.01**	**0.03**	---	---	---	**0.01**	**<0.01**	---	---
Poultry - Broilers	# / Acre	---	2.81	2.55	<0.01	---	---	---	---	<0.01	---	4.30	---
	A.U./Acre	---	**0.02**	**0.02**	**<0.01**	---	---	---	---	**<0.01**	---	**0.03**	---
Poultry - Layers	# / Acre	---	<0.01	---	<0.01	---	---	---	---	<0.01	---	0.33	---
	A.U./Acre	---	**<0.01**	---	**<0.01**	---	---	---	---	**<0.01**	---	**<0.01**	---
Total	A.U./Acre	**0.04**	**0.04**	**0.07**	**0.06**	**0.10**	**0.01**	**0.07**	**0.10**	**0.17**	**0.07**	**0.06**	**0.01**
Potential NPS Impairment		Low	Low	Low	Low	Low	Low	Low	Low	Mod	Low	Low	Low
Aquaculture	% Total Acres	0.00	0.00	0.00	0.52	0.00	0.00	0.00	13.46	1.43	9.25	0.00	0.00
Potential NPS Impairment		Low	Low	Low	Mod	Low	Low	Low	High	Mod	High	Low	Low

* No data reported for this portion of the subwatershed; nd = no data

Table 11b, cont. Estimates of animal concentrations, animal units (AU), percent aquaculture, and percent of acres where pesticides/herbicides have been applied in the Middle Alabama River CU (0315-0203). Numbers of animals and pesticides/herbicides listed by acreage and sub-watershed were provided by the local SWCDs on Conservation Assessment Worksheets completed in 1998 (ASWCC 1998).

		Sub-watershed										
		130	140	150	160	170	180	190	200	210	220	Total
County (s)		Dallas Wilcox	Wilcox	Wilcox	Wilcox	Marengo * Wilcox	Clarke Marengo Wilcox	Marengo * Wilcox	Wilcox	Clarke Monroe* Wilcox	Monroe* Wilcox	
Acres Reported (% of Total)		100	100	100	100	97	100	92	100	98	91	99
Pesticides Applied	Est. % Reported	*	*	*	*	*	*	*	*	*	*	5
Cattle	# / Acre	0.03	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	0.04
	A.U./Acre	**0.03**	**<0.01**	**<0.01**	**<0.01**	**<0.01**	**0.01**	**<0.01**	**<0.01**	**<0.01**	**<0.01**	**0.04**
Dairy	# / Acre	---	---	---	---	---	---	---	---	---	---	<0.01
	A.U./Acre	---	---	---	---	---	---	---	---	---	---	**<0.01**
Swine	# / Acre	---	---	---	---	---	<0.01	---	---	---	---	<0.01
	A.U./Acre	---	---	---	---	---	**<0.01**	---	---	---	---	**<0.01**
Poultry - Broilers	# / Acre	---	---	---	---	---	---	---	---	---	---	0.74
	A.U./Acre	---	---	---	---	---	---	---	---	---	---	**0.01**
Poultry - Layers	# / Acre	---	---	---	---	---	---	---	---	---	---	0.02
	A.U./Acre	---	---	---	---	---	---	---	---	---	---	**<0.01**
Total	A.U./Acre	**0.03**	**<0.01**	**<0.01**	**<0.01**	**<0.01**	**0.01**	**<0.01**	**<0.01**	**<0.01**	**<0.01**	**0.05**
Potential NPS Impairment		Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low
Aquaculture	% Total Acres	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.02	0.00	2.22
Potential NPS Impairment		Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Mod

* No data reported for this portion of the subwatershed; nd = no data

Table 12b. Sedimentation estimates by source, forest condition, septic tank information, and resource concerns by sub-watershed in the Middle Alabama CU (0315-0203) as provided by the local Soil and Water Conservation Districts (SWCD) on Conservation Assessment Worksheets (ASWCC 1998). (*Indicates not reported)

Subwatershed	**010**	**020**	**030**	**040**	**050**	**060**	**070**	**080**	**090**	**100**	**110**
Forest condition											
% Needing Forest Improvement	18	23	51	24	14	21	15	12	9	13	13
Potential for forestry NPS	Mod	Mod	High	Mod	Low	Mod	Low	Low	Low	Low	Low
Sedimentation rates (tons/acre/year)											
Cropland	0.4	<0.1	<0.1	0.5	0.6	<0.1	0.1	1.0	0.7	0.3	0.1
Sand & gravel pits	0.2	<0.1		0.5	0.4	1.0					<0.1
Mined land											
Developing urban land		<0.1						0.2		0.1	
Critical areas	<0.1	0.1	0.9	0.4	<0.1	<0.1		0.1	0.1	0.2	0.1
Gullies		0.2	0.6	0.3		0.1		0.1	0.3	0.1	0.2
Stream banks	<0.1	0.2	0.2	0.1	0.1	<0.1	<0.1	0.1	<0.1	<0.1	0.1
Dirt roads and roadbanks	0.3	0.3	0.2	0.3	<0.1	0.3	0.5	0.2	0.2	0.2	0.2
Woodlands	0.2	0.3	0.2	0.2	0.1	0.3	0.2	0.1	0.1	0.2	0.2
Total sediment	1.1	1.1	2.1	2.3	1.3	1.7	0.8	1.7	1.3	1.1	0.8
Potential for sediment NPS	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low
Septic tanks											
# Septic tanks per acre	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	0.01	<0.01	<0.01
# Septic tanks failing per acre	0.003	<0.001	0.001	0.001	<0.001	0.001	<0.001	0.003	0.002	0.002	<0.001
# of alternative septic systems	10	11	5	10	0	0	0	0	0	14	17
Resource concerns in the subwatershed											
Excessive erosion on cropland		X						X		X	X
Gully erosion on agricultural land		X	X	X				X	X		X
Road and roadbank erosion	X	X	X	X	X	X		X	X	X	X
Poor soil condition (cropland)		X	X	X							
Excessive animal waste applied to land		X									X
Excessive pesticides applied to land				X							
Excessive sediment from cropland		X									X
Excessive sediment from roads/roadbanks		X	X	X				X		X	X
Excessive sediment from urban development		X									
Inadequate management of animal wastes		X									X
Nutrients in surface waters				X					X		
Pesticides in surface waters				X							
Bacteria and other organisms in surface waters	X	X	X	X	X	X	X	X	X	X	
Low dissolved oxygen in surface waters											
Livestock are overgrazing pastures		X	X	X				X		X	X
Livestock commonly have access to streams	X	X	X	X	X			X	X	X	X

Table 12b, cont. Sedimentation estimates by source, forest condition, septic tank information and resource concerns by sub-watershed in the Middle Alabama CU (0315-0203) as provided by the local Soil and Water Conservation Districts (SWCD) on Conservation Assessment Worksheets (ASWCC 1998). (*Indicates not reported)

Subwatershed	**120**	**130**	**140**	**150**	**160**	**170**	**180**	**190**	**200**	**210**	**220**
Forest condition											
% Needing forest improvement	21	11	11	10	9	12	12	16	11	16	11
Potential for forestry NPS	Mod	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low
Sedimentation rates (tons/acre/year)											
Cropland	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		0.1
Sand & gravel pits					0.1				<0.1		0.1
Mined land											
Developing urban land							0.5			0.1	
Critical areas	<0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Gullies	<0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Stream banks	<0.1	0.0	<0.1	0.0	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1
Dirt roads and roadbanks	0.2	0.3	0.3	0.1	0.1	0.2	0.8	0.3	0.2	0.2	0.5
Woodlands	0.2	0.2	0.3	0.2	0.2	0.3	0.3	0.3	0.3	0.4	0.2
Total sediment	0.5	0.7	0.7	0.5	0.6	0.7	2.0	0.8	0.6	0.8	1.1
Potential for sediment NPS	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low
Septic tanks											
# Septic tanks per acre	<0.01	<0.01	<0.01	0.02	0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01
# Septic tanks failing per acre	<0.001	<0.001	0.001	0.004	0.003	<0.001	0.003	<0.001	<0.001	0.001	<0.001
# of alternative septic systems	4	5	21	75	28	21	16	7	4	7	8
Resource concerns in the subwatershed											
Excessive erosion on cropland											
Gully erosion on agricultural land											
Road and roadbank erosion	X	X	X	X	X	X	X	X	X	X	X
Poor soil condition (cropland)											
Excessive animal waste applied to land											
Excessive pesticides applied to land											
Excessive sediment from cropland											
Excessive sediment from roads/roadbanks	X	X	X	X	X	X	X	X	X	X	X
Excessive sediment from urban development											
Inadequate management of animal wastes											
Nutrients in surface waters											
Pesticides in surface waters											
Bacteria and other organisms in surface waters		X									
Low dissolved oxygen in surface waters											
Livestock are overgrazing pastures	X	X	X	X	X	X	X	X	X	X	X
Livestock commonly have access to streams	X	X	X	X	X	X	X	X	X	X	X

Table 13b. Physical characteristics and habitat quality of sites assessed in the Middle Alabama (0315-0203) basin.

		Station									
		CDRL-27	MSHD-15	MUDD-16	MUDD-17	BERD-20	TTMD-19	GLVW-26	LCHD-23	RGRD-24	SNDM-25
Subwatershed #		030	040	080	080	090	090	100	100	100	100
Date (YYMMDD)		000510	000509	000504	000504	000508	000504	000503	000508	000503	000503
Ecoregion/ subregion		65b	65b	65a	65a	65a	65a	65b	65b	65a	65b
Drainage area (mi^2)		62	39	19	83	28	26	8	7	12	17
Width (ft)		4	12	20	20	20	40	12	30		12
Canopy Cover*		50/50	MO	S	S	50/50	50/50	S	S	MS	S
Depth (ft)	Riffle	0.3	0.5	---	---	---	0.4	---	---	0.3	0.1
	Run	0.5	0.8	1.0	1.5	---	1.2	---	---	0.5	0.3
	Pool	0.5	---	1.5	2.0	2.5	3.0	---	1.0	1.0	0.8
Substrate (%)	Bedrock	---	---	40	30	---	35	---	---	50	81
	Boulder	---	3	---	---	---	2	---	---	10	---
	Cobble	---	10	---	---	---	3	---	8	10	5
	Gravel	2	8	---	10	1	20	---	12	5	2
	Sand	75	12	16	14	2	27	65	1	1	5
	Silt	1	15	---	---	---	10	15	---	20	5
	Detritus	2	2	4	6	3	3	7	2	4	2
	Clay	20	50	40	40	94	---	13	73	---	---
	Organic Silt	---	---	---	---	---	---	---	---	---	---
Habitat assessment form		RR	RR	GP	GP	GP	RR	GP	RR	RR	RR
Habitat Survey (% maximum)											
	Instream habitat quality	30	53	44	49	38	43	45	31	37	27
	Sediment deposition	44	61	78	70	80	76	73	66	83	91
	Sinuosity	88	18	40	70	40	18	75	13	25	83
	Bank and vegetative stability	86	73	60	54	74	81	68	68	48	66
	Riparian measurements	100	90	61	95	95	89	100	94	20	85
Habitat sssessment score		152	154	131	148	146	161	150	145	106	158
% Maximum		64	64	59	67	66	67	68	60	44	66
Assessment		Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Fair	Excellent

Table 14b. Bioassessment results conducted in the Middle Alabama basin (0315-0203) by ADEM during 2000.

Sub-watershed	030	040	080	080	090	090	100	100	100	100
Station	CDRL-27	MSDH-15	MUDD-16	MUDD-17	BERD-20	TTMD-19	GLVW-26	LCHD-23	RGRD-24	SNDM-25
Macroinvertebrate community										
Date (yymmdd)	000510	000509	000504	000504	000508	000504	000503	000508	000508	000503
# EPT families	6	8	3	5	5	9	5	5	5	6
Assessment	Good	Good	Fair	Fair	Fair	Excellent	Fair	Fair	Fair	Good
Fish community										
Date (yymmdd)				000711	000711			000711		
Time (min)				30	30			30		
Richness measures										
# species				10	16			21		
# darter species				3	2			3		
# minnow species				2	4			5		
# sunfish species				2	4			4		
# sucker species				0	1			3		
# intolerant species				1	0			0		
Composition measures										
% sunfish				33	15			4		
% omnivores and herbivores				48	42			11		
% insectivourous cyprinids				5	22			24		
% top carnivores				7	9			11		
Population measures										
Individuals				60	246			368		
# collected per hour				120	492			736		
% disease and anomalies				0	0			0.0		
IBI Score				26	36			50		
Assessment				Very Poor/Poor	Poor/Fair			Good		

Table 15b. List of waterbodies within the Middle Alabama River CU on ADEM's draft 2000 CWA §303(d) list due to unknown or NPS impacts. Sources and causes of impairment are listed (ADEM 2001c). Two segments (in italics) are included on the CWA §303(d) list with sources other than nonpoint.

Stream	Sub-watershed	Miles impaired	Use	Support Status	Suspected Sources	Cause(s) of Impairment
Cub Creek	180	8.1	F&W	Non	Unknown	Nutrients Organic Enrichment/ DO
Alabama River	----	12.6	PWS	Partial	*Industrial* Nonirrigated Crop production Pasture Grazing	*Nutrients* Organic Enrichment/ DO
Alabama River	----	*10.2*	*PWS*	*Partial*	*Dam construction* *Flow regulation/ modification*	*Nutrients* *Organic Enrichment/DO*
Alabama River	----	*5.0*	*PWS*	*Partial*	*Dam construction* *Flow regulation / modification*	*Nutrients* *Organic Enrichment/DO*

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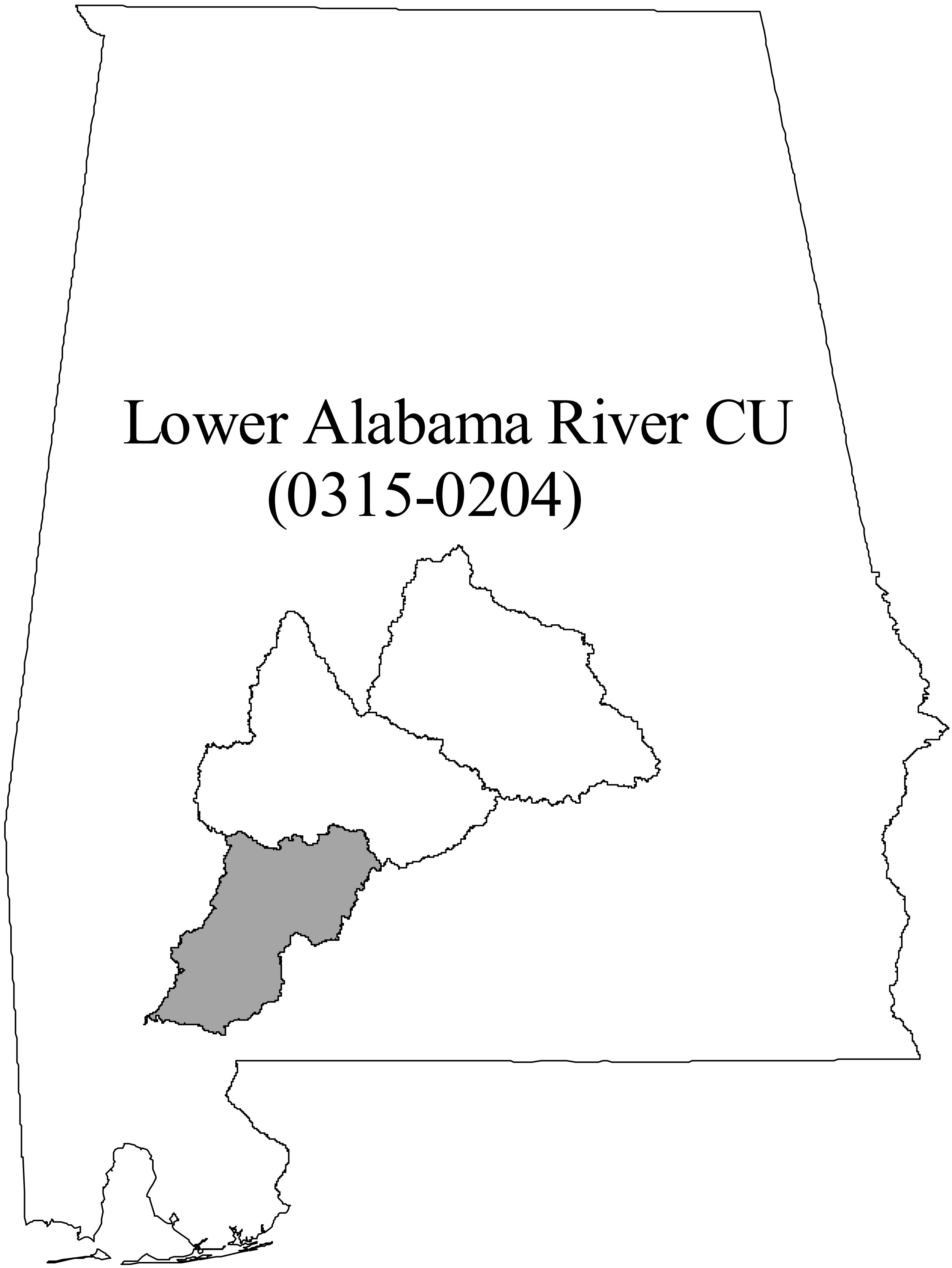
Lower Alabama River CU
(0315-0204)

Section III: Lower Alabama River Cataloging Unit (0315-0204) Summary

The Lower Alabama River CU of the Alabama River Basin contains 13 sub-watersheds located within a 5-county area of southwest Alabama (Fig. 1). The CU drains approximately 1,400 square miles of the Coastal Plain, Major Floodplains and Terraces, and the Coastal Marshes and Beaches soil areas (ACES 1997). It is located in 4 subecoregions of the Southeastern Plains Ecoregion (65) (Fig. 2) (Griffith et al. 2001).

Landuse: Based on the conservation assessment worksheets completed (1998) by the local SWCDs, forest comprised 87% of land cover within the Lower Alabama River CU. Approximately 27,000 acres of crop and pastureland (3% of total area) were treated with pesticides and/or herbicides.

Percent land cover estimated by local SWCD (ASWCC 1998)

Forest	Row crop	Pasture	Mining	Urban	Open Water	Other
87%	8%	3%	0%	1%	<1%	1%

NPS impairment potential: Potential for NPS impairment was generally *low*. Forestry and cropland were the main NPS concerns. Seven sub-watersheds were estimated to have a *moderate* potential for impairment from nonpoint sources. None of the sub-watersheds rated a *high* for overall potential for NPS impairment. However, impairment from forestry was a concern in all 13 sub-watersheds. Monroeville, located in the Limestone Creek sub-watershed (050), was the only large urban area in the CU.

Number of sub-watersheds with (M)oderate or (H)igh ratings for each NPS category (Table 7c).

Category	Overall Potential	Animal husbandry	Aqua-culture	Row crop	Pasture	Mining	Forestry	Sediment
Moderate	7	0	0	3	0	1	11	0
High	0	0	0	1	0	0	2	0

Number of sub-watersheds with (M)oderate or (H)igh ratings for each point source category (Table 7c).

Category	% Urban	Development	Septic tank failure
Moderate	1	1	3
High	0	0	0

Historical data/studies: Table 8c (pg. 171) lists the sub-watersheds and waterbodies in which data has been previously collected in conjunction with other monitoring programs. The table also lists the appendices where these data are provided. Recent assessment information has been collected in 1 of the 6 sub-watersheds estimated to have a *moderate* potential for impairment from nonpoint sources.

Assessments conducted during the ACT Basin NPS Screening Assessment: The Randons Creek (070) and Wallers Creek (090) sub-watersheds were targeted for assessment during the ACT Basin NPS Screening Assessment because they had a *moderate* potential for impairment from nonpoint sources (Table 9c).

Sub-watershed summaries: Current and historical monitoring data were combined to provide a comprehensive assessment. A summary of the information available for each of the 13 sub-watersheds is provided in the following section. Each summary discusses landuse, NPS impairment potential, assessments conducted within the sub-watershed, and NPS priority status based on available data. The summaries point out significant data and reference appropriate tables and appendices. Assessment of habitat, biological, and chemical conditions are based on long-term data from ADEM's Ecoregional Reference Site Program (ADEM 2000a). Tables referenced in the summaries are located at the end of the summary section. Appendices are located at the end of the report.

Sub-watershed assessments: Habitat, chemical/physical, and biological indicators of water quality were monitored in 5 sub-watersheds (Table 10c). Habitat quality was assessed as *excellent* or *good* at 15 stations throughout the CU (Fig. 14a). Macroinvertebrate assessments were conducted at 14 stations. Results of these assessments indicated the macroinvertebrate community to be in *excellent* condition at 3 stations (21%), *good* condition at 8 stations (57%), and *fair* at 3 stations (21%) (Fig. 14a). Results of fish IBI assessments conducted at 4 of these stations indicated the fish community to be in *fair* condition at 2 stations (50%), and *poor/fair* or *poor* at 2 stations (50%) (Fig. 14b).

The overall condition for each station was rated as the lowest assessment result obtained (Table 10c). Three (21%) and 7 (50%) stations were assessed as *excellent* and *good*, respectively. Three (21%) stations were assessed as *fair* and 1 (7%) station was assessed as *poor*. The 4 stations assessed as *fair* or *poor* were primarily impacted by nonpoint sources and located in 2 sub-watersheds (Fig. 14c).

NPS priority sub-watersheds: Two sub-watersheds, Randons Creek (070) and Wallers Creek (090), were recommended as priority sub-watersheds (Fig. 14c).

Figure 14a. Habitat and aquatic macroinvertebrate assessments conducted in the Lower Alabama River Cataloging Unit.

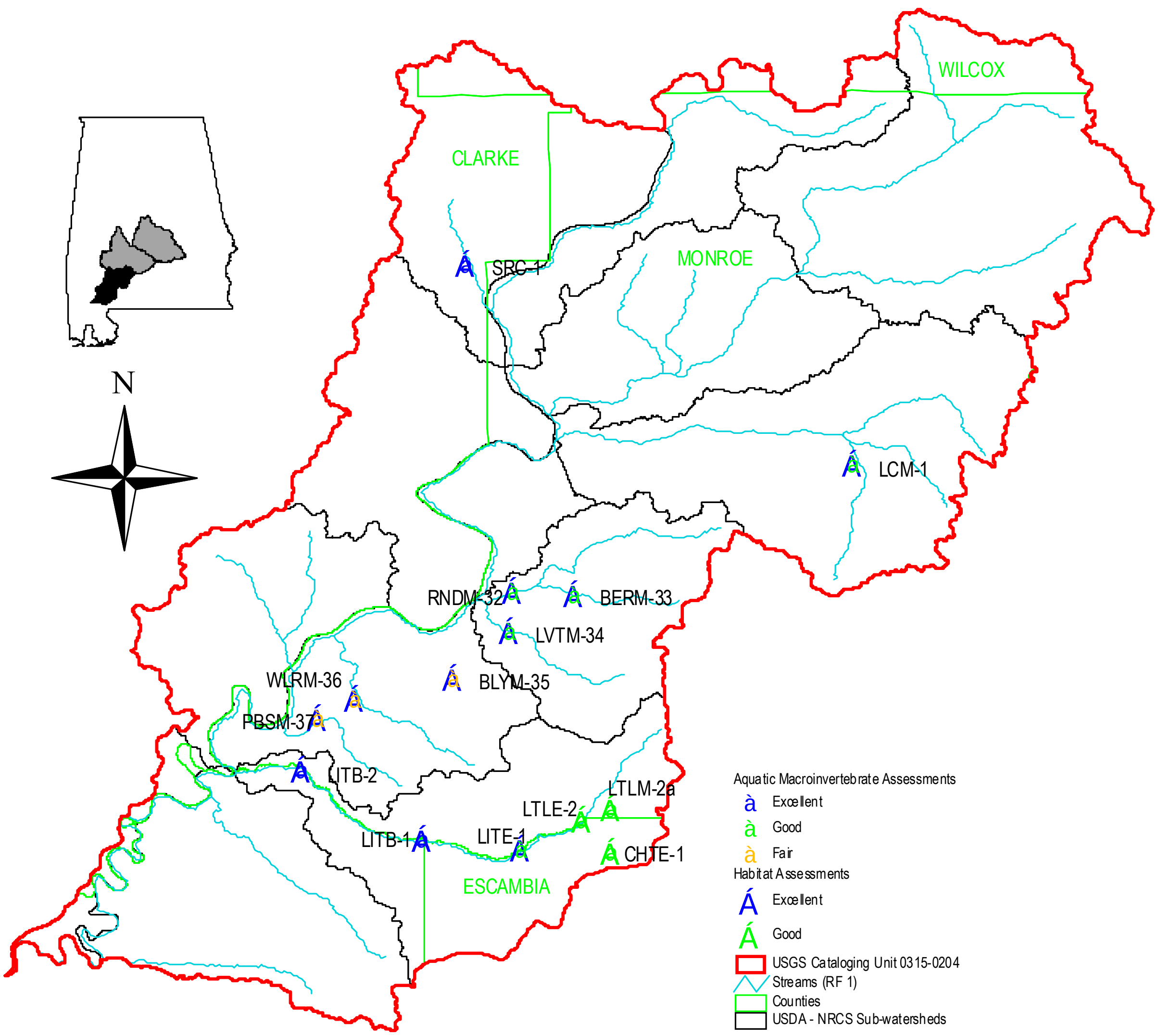

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Figure 14b. Results of fish IBI assessments conducted in the Lower Alabama River Cataloging Unit.

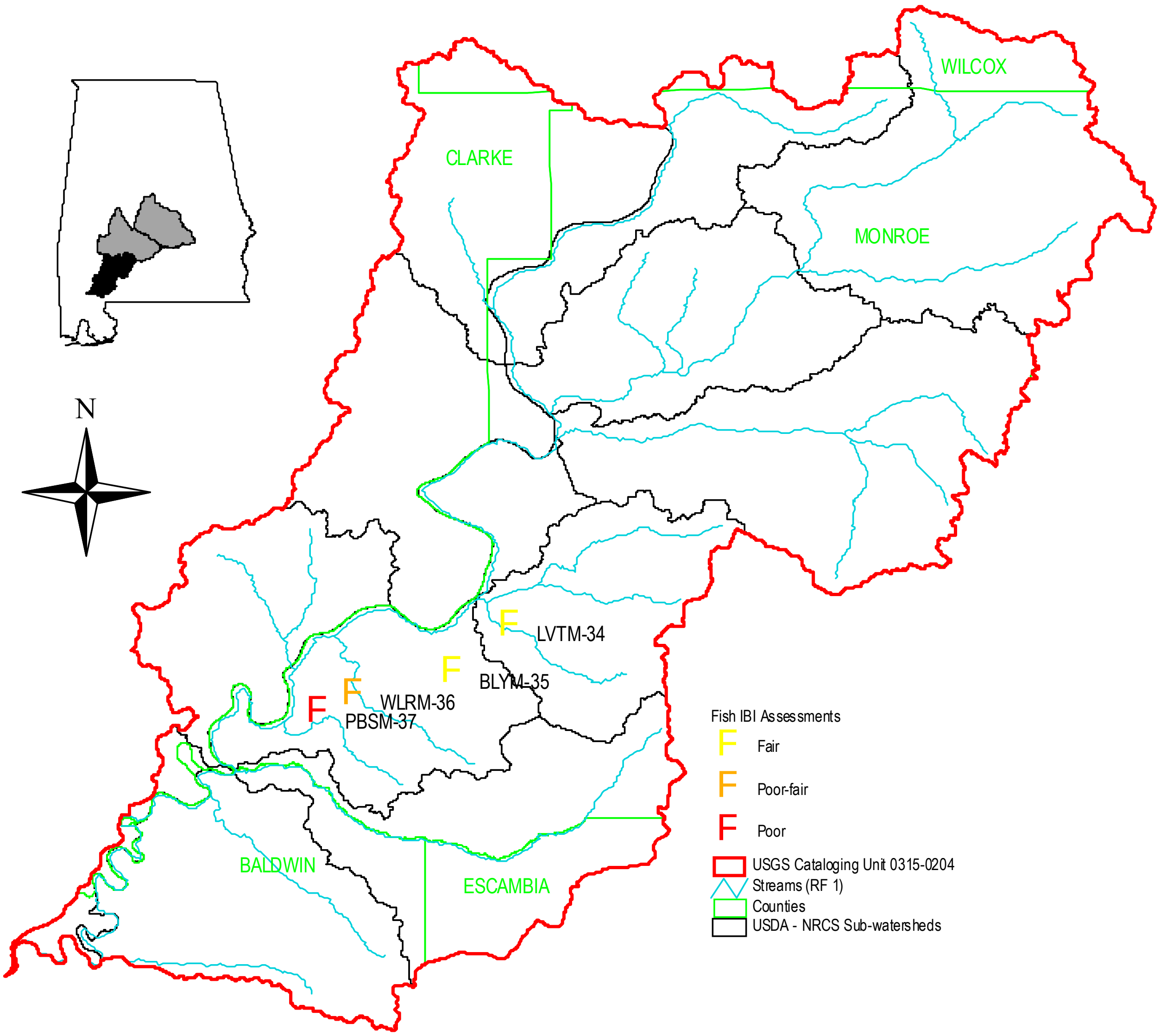

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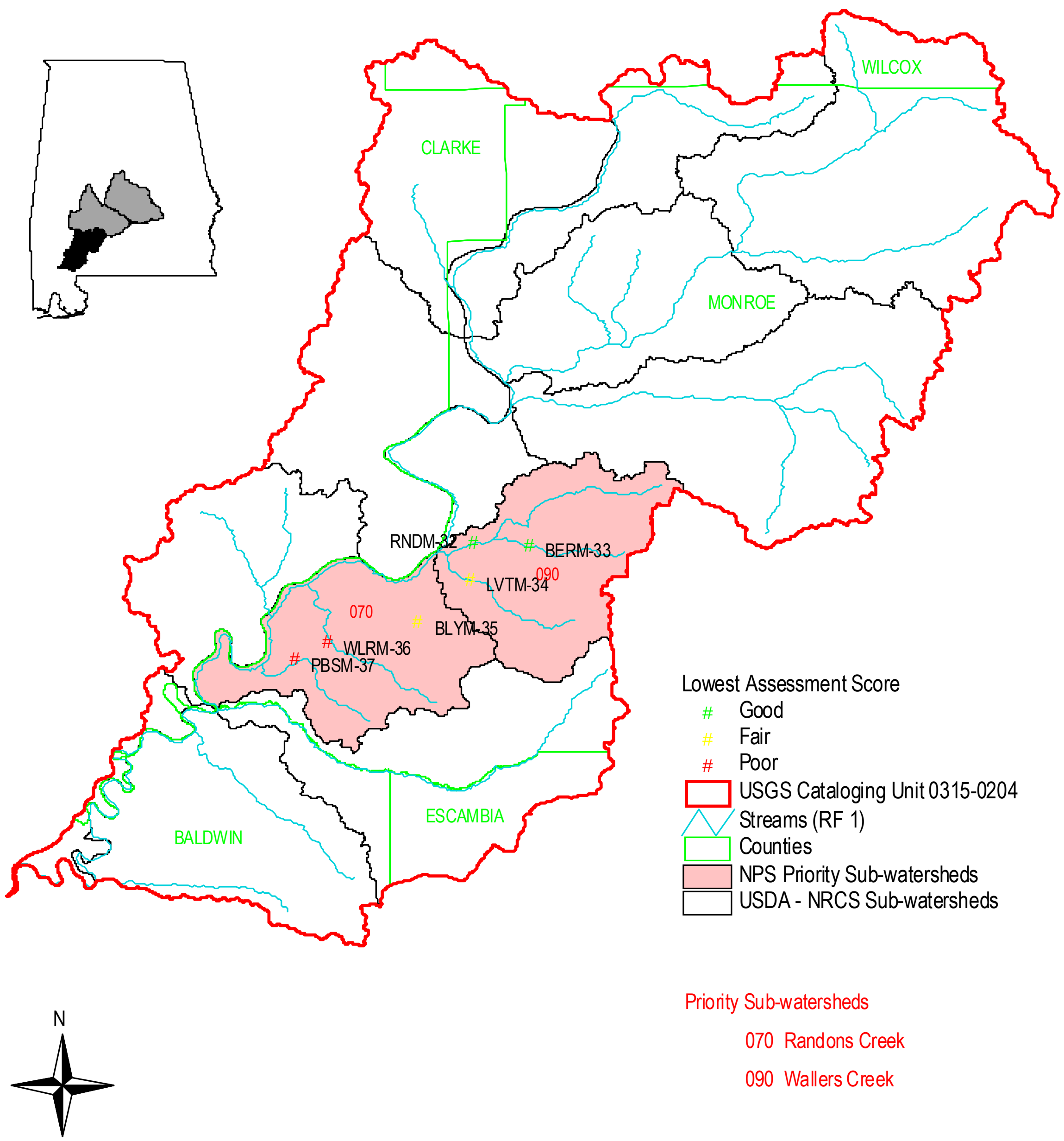
Figure 14c. Priority sub-watersheds within the Lower Alabama River CU. Overall assessment results for stations located in priority sub-watersheds are also shown.



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Sub-watersheds recommended for NPS priority status.

Sub-watershed Number	Sub-watershed Name	Lowest Station Assessment	Suspected Cause(s)	Suspected nonpoint source(s)
070	Randons Creek	Fair	Nutrient enrichment, Sedimentation	Forestry and croplands
090	Wallers Creek	Poor	Nutrient enrichment, Sedimentation	Forestry

Randons Creek (070): The fish IBI assessment conducted at Lovetts Creek indicated impaired biological conditions. Water quality data showed slight nutrient enrichment at the station. Percent cropland was the highest in the CU.

Wallers Creek (090): Macroinvertebrate and fish assessments conducted at 3 stations indicated biological impairment at Baileys Creek, Potts Bayou Shomo Creek, and Wallers Creek. Water quality sampling showed nutrient enrichment to be a problem throughout the sub-watershed. Runoff from forestry and croplands were concerns.

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Sub-Watershed: Silver Creek NRCS Sub-Watershed Number 010

Landuse: The Silver Creek sub-watershed drains approximately 115 mi^2 in Clarke, Monroe, and Wilcox Counties. The SWCD estimated land cover as 95% forest. Two current construction/stormwater authorizations have been issued in the sub-watershed (Table 6c).

Percent land cover estimated by local SWCD (Table 5c, ASWCC 1998)

Forest	Row crop	Pasture	Mining	Urban	Open Water	Other
95%	2%	2%	0%	0%	1%	1%

NPS impairment potential: The potential for impairment from forestry activities was *moderate*. Potential for impairment from other nonpoint sources was estimated as *low.*

Values and NPS ratings for each NPS category estimated by local SWCD.

Category	NPS Score	Animal husbandry	Aqua-culture	Row crop	Pasture	Mining	Forestry	Sediment
Value	9	<0.01 AU/ac	0.01%	2%	2%	0%	38%	0.9 tons/ac/yr
NPS Potential	L	L	L	L	L	L	M	L
Table	7c	11c	11c	5c	5c	5c	12c	12c

Assessments: One station was monitored by ADEM on Silver Creek (SRC-1) from 1991 to 1995 in conjunction with ADEM's Ecoregional Reference Site Program (Appendix F-1). ADEM conducted macroinvertebrate and fish community assessments at the site during 2001. These data will be reported in the ALAMAP 5-year report (ADEM, in prep).

Assessment stations located within the sub-watershed. Descriptions are provided in Appendix E.

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
SRC-1	Habitat, Macroinvertebrate, Fish, Chemical	1991-1995, 2001	Silver Creek in Clarke County on private property	23	Fish & Wildlife

Silver Creek: Silver Creek at SRC-1 is characterized by gravel riffles and a mostly-shaded canopy (Appendix F-1a). Habitat quality is *excellent* for this stream type and region. EPT taxa richness has ranged from 11 (1993) to 16 (1992) EPT taxa, indicating the macroinvertebrate community to be in *excellent* condition (Appendix F-1b).

Water quality data were collected in conjunction with each of the bioassessments conducted at this site (Appendix F-1c). Total Kjeldahl nitrogen was elevated during the 1991 sampling event (20%).

NPS priority status: NPS priority status was not determined during the ACT Basin NPS Screening Assessment. However, the potential for impairment was estimated as *low*.

Sub-Watershed: Tallatchee Creek NRCS Sub-Watershed Number 020

Landuse: The Tallatchee Creek sub-watershed drains approximately 85 mi^2 in Clarke, Monroe, and Wilcox Counties. The sub-watershed was primarily forested. Two current construction/stormwater authorizations have been issued in the sub-watershed (Table 6c).

Percent land cover estimated by local SWCD (Table 5c, ASWCC 1998)

Forest	Row crop	Pasture	Mining	Urban	Open Water	Other
95%	4%	1%	0%	0%	<1%	<1%

NPS impairment potential: The potential for impairment from forestry activities was *moderate*. Potential for impairment from other NPS categories was estimated as *low*.

Values and NPS ratings for each NPS category estimated by local SWCD.

Category	NPS Score	Animal husbandry	Aqua-culture	Row crop	Pasture	Mining	Forestry	Sediment
Value	9	0.01 AU/ac	0.00%	4%	1%	0%	20%	0.3 tons/ac/yr
NPS Potential	L	L	L	L	L	L	M	L
Table	7c	11c	11c	5c	5c	5c	12c	12c

Assessments: Water quality samples were collected during ADEM's Reservoir Monitoring Program at the mouth of Tallatchee Creek (Clairborne-5) during April, June, and August of 2000 (Appendix F-6). The data will be used to evaluate nutrient and sediment loading from this tributary as a source of water quality impairment to Clairborne Reservoir. Results of these analyses were reported in ADEM's Annual Reservoir Monitoring Program Report (ADEM, in press).

Assessment stations located within the sub-watershed. Descriptions are provided in Appendix E.

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
Claiborne-5	Chemical	2000	Tallatchee Creek in Monroe County in embayment approx. 0.5 miles upstream of Claiborne Lake confluence.	40	Fish & Wildlife

NPS priority status: NPS priority status could not be determined with the available data. However, Tallatchee Creek was not estimated to be at a high risk for impairment from nonpoint sources.

Sub-Watershed: Upper Big Flat Creek NRCS Sub-Watershed Number 030

Landuse: The Upper Big Flat Creek sub-watershed drains approximately 188 mi^2 in Monroe and Wilcox Counties. Land cover was primarily forest. Two current construction/stormwater authorizations, 2 non-coal mining <5 acres/stormwater authorizations, and 1 semi public/private NPDES permit have been issued in the sub-watershed (Table 6c).

Percent land cover estimated by local SWCD (Table 5c, ASWCC 1998)

Forest	Row crop	Pasture	Mining	Urban	Open Water	Other
95%	1%	3%	0%	1%	<1%	<1%

NPS impairment potential: The potential for impairment from forestry activities was *moderate*. Overall potential for impairment from nonpoint sources was *low*.

Values and NPS ratings for each NPS category estimated by local SWCD.

Category	NPS Score	Animal husbandry	Aqua-culture	Row crop	Pasture	Mining	Forestry	Sediment
Value	9	0.02 AU/ac	0.00%	1%	3%	0%	35%	0.4 tons/ac/yr
NPS Potential	L	L	L	L	L	L	M	L
Table	7c	11c	11c	5c	5c	5c	12c	12c

Assessments: An assessment of Upper Flat Creek was not conducted during the ACT Basin NPS Screening Assessment.

NPS priority status: NPS priority status could not be determined with the available data. However, the sub-watershed was not estimated to be at a high risk for impairment from nonpoint sources.

Sub-Watershed: Lower Big Flat Creek NRCS Sub-Watershed Number 040

Landuse: The Lower Big Flat Creek sub-watershed drains approximately 116 mi^2 in Monroe County. Land cover within the sub-watershed was primarily forest. Four current construction/stormwater authorizations, 5 non-coal mining <5 acres/stormwater authorizations, and 2 municipal NPDES permits have been issued in the sub-watershed (Table 6c).

Percent land cover estimated by local SWCD (Table 5c, ASWCC 1998)

Forest	Row crop	Pasture	Mining	Urban	Open Water	Other
93%	5%	2%	0%	0%	<1%	<1%

NPS impairment potential: There was a *moderate* potential for impairment from forestry activities. However, the overall potential for impairment from nonpoint sources was estimated as *low*.

Values and NPS ratings for each NPS category estimated by local SWCD.

Category	NPS Score	Animal husbandry	Aqua-culture	Row crop	Pasture	Mining	Forestry	Sediment
Value	9	0.01 AU/ac	0.00%	5%	2%	0%	38%	0.3 tons/ac/yr
NPS Potential	L	L	L	L	L	L	M	L
Table	7c	11c	11c	5c	5c	5c	12c	12c

Assessments: An assessment was not conducted within the sub-watershed during the ACT Basin NPS Screening Assessment.

NPS priority status: NPS priority status was not determined during ACT Basin Screening Assessment, but Lower Big Flat Creek was not estimated to be at a high risk to NPS impairment.

Sub-Watershed: Limestone Creek NRCS Sub-Watershed Number 050

Landuse: The Limestone Creek sub-watershed drains approximately 179 mi^2 in Monroe County. Land cover was primarily forest. The sub-watershed contained the highest percentage of urban landuse within the Lower Alabama River basin (Table 5c). One current construction/stormwater authorization, 2 non-coal mining <5 acres/stormwater authorizations, and 1 NPDES permit have been issued in the sub-watershed (Table 6c).

Percent land cover estimated by local SWCD (Table 5c, ASWCC 1998)

Forest	Row crop	Pasture	Mining	Urban	Open Water	Other
86%	6%	1%	0%	7%	<1%	<1%

NPS impairment potential: The overall potential for impairment from nonpoint sources was estimated as *low.* There was a *moderate* potential for impairment from forestry activities. Sedimentation estimates indicated a *low* potential for NPS impairment. However, resource concerns listed by the local SWCD included excessive sediment from urban development and timberland (Table 12c). Limestone Creek was given a # 3 priority by the local SWCD.

Values and NPS ratings for each NPS category estimated by local SWCD.

Category	NPS Score	Animal husbandry	Aqua-culture	Row crop	Pasture	Mining	Forestry	Sediment
Value	9	<0.01 AU/ac	---	6%	1%	0%	35%	0.4 tons/ac/yr
NPS Potential	L	L	L	L	L	L	M	L
Table	7c	11c	11c	5c	5c	5c	12c	12c

Assessments: An assessment was not conducted of Limestone Creek during the ACT Basin NPS Screening Assessment because it drains the Monroeville area. The sub-watershed is characterized by riverine swamps, which are not monitored effectively with ADEM's current bioassessment method (ADEM 1999). Limestone Creek has been previously monitored at 2 stations (Appendix F-5). The purpose of these assessments was to evaluate any water quality impairments caused by the Monroeville wastewater treatment facility (ADEM 1992).

Limestone Creek: Limestone Creek at LCM-1, upstream of the Monroeville treatment facility, was a low-gradient, glide-pool stream (Appendix F-5a). Substrate composition was characterized by gravel and sand. Habitat quality was assessed as *excellent* for this stream type and region (Appendix F-5a). Eleven EPT families were collected, indicating the macroinvertebrate community to be in *good* condition (Appendix F-5b). Conductivity was slightly elevated during this sampling event (120 µmhos at $25^{o}C$) (Appendix F-5c).

Assessment stations located within the sub-watershed. Descriptions are provided in Appendix E.

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
LMC-1	Chemical, Habitat, Macroinvertebrate	1992	Limestone Creek approximately 100 yards upstream of the Monroeville WWTP (7N/8E/33)	31	Fish & Wildlife
LCM-2	Chemical, Habitat, Macroinvertebrate	1992	Limestone Creek @ unnamed CR crossing near Renson (7N/8E/20)	37	Fish & Wildlife

Limestone Creek at LCM-2, downstream of the wastewater treatment facility, was physically similar to LCM-1 (Appendix F-5a). Percent substrate composition was primarily sand, however, and habitat quality was assessed as *good* (Appendix F-5a). The macroinvertebrate community appeared to be unaffected by the Monroeville treatment facility (Appendix F-5b). However, conductivity (240 μmhos at 25°C), total dissolved solids (TDS) (147 mg/l), and chlorides (Cl^-) (9 mg/l) nearly doubled at this station (Appendix F-5c). Nitrate-nitrite nitrogen (1.51 mg/L) and total phosphorus (0.668 mg/l) were also elevated.

NPS priority status: Although chemical sampling suggested some water quality impairment, the macroinvertebrate community was not adversely affected by the Monroeville wastewater treatment facility. The Limestone Creek sub-watershed was not estimated to be at a high risk of impairment from rural NPS sources.

Sub-Watershed: Marshall Creek NRCS Sub-Watershed Number 060

Landuse: The Marshall Creek sub-watershed drains approximately 32 mi^2 in Monroe County. Land cover was primarily forest mixed with small areas of pasture. One current construction/stormwater authorization has been issued in the sub-watershed (Table 6c).

Percent land cover estimated by local SWCD (Table 5c, ASWCC 1998)

Forest	Row crop	Pasture	Mining	Urban	Open Water	Other
87%	3%	7%	1%	1%	2%	<1%

NPS impairment potential: The potential for impairment from mining and forestry activities within the sub-watershed was *moderate*. The potential for impairment from other NPS categories was estimated as *low*.

Values and NPS ratings for each NPS category estimated by local SWCD.

Category	NPS Score	Animal husbandry	Aqua-culture	Row crop	Pasture	Mining	Forestry	Sediment
Value	11	0.05 AU/ac	0.00%	3%	7%	1%	33%	0.6 tons/ac/yr
NPS Potential	M	L	L	L	L	M	M	L
Table	7c	11c	11c	5c	5c	5c	12c	12c

Assessments: Marshall Creek was not assessed during the ACT Basin NPS Screening Assessment.

NPS priority status: The NPS priority status of Marshall Creek was not evaluated. Mining and forestry were concerns within the sub-watershed. The Marshall Creek sub-watershed should be considered for assessment during the 2005 ACT basin assessment.

Sub-Watershed: Randons Creek NRCS Sub-Watershed Number 070

Landuse: The Randons Creek sub-watershed drains approximately 95 mi^2 in Monroe County. The SWCD estimated land cover as primarily forest and cropland. Two current construction/stormwater authorizations and 1 mining NPDES permit have been issued in the sub-watershed (Table 6c).

Percent land cover estimated by local SWCD (Table 5c, ASWCC 1998)

Forest	Row crop	Pasture	Mining	Urban	Open Water	Other
64%	32%	1%	0%	2%	<1%	<1%

NPS impairment potential: There was a *high* potential for impairment from cropland and a *moderate* potential for impairment from forestry activities. The overall potential for impairment from nonpoint sources was estimated as *moderate.* Randons Creek was given a 1st priority sub-watershed rating by the SWCD. Resource concerns included excessive pesticides applied to land, excessive sediment from roads and road banks and timberland, and access of livestock to streams (Table 12c).

Values and NPS ratings for each NPS category estimated by local SWCD.

Category	NPS Score	Animal husbandry	Aqua-culture	Row crop	Pasture	Mining	Forestry	Sediment
Value	13	0.01 AU/ac	0.00%	32%	1%	0%	26%	0.8 tons/ac/yr
NPS Potential	M	L	L	H	L	L	M	L
Table	7c	11c	11c	5c	5c	5c	12c	12c

Assessments: Three stations were monitored during the ACT Basin NPS Screening Assessment.

Assessment stations located within the sub-watershed. Descriptions are provided in Appendix E.

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
BERM-33	Habitat, Macroinvertebrate	2000	Bear Creek at unnamed Monroe County Road near Frisco City.	17	F&W
LVTM-34	Chemical, Habitat, Macroinvertebrate, Fish	2000	Lovetts Creek at Monroe County Road 1.	32	F&W
RNDM-32	Chemical, Habitat, Macroinvertebrate	2000	Randons Creek at Monroe County Road 1.	53	F&W

Bear Creek: At BERM-33, Bear Creek is a riffle-run stream located in the Southern Pine Plains and Hills (65f) subecoregion. Bottom substrates were primarily composed of gravel and sand (Table 14c). Habitat condition (Table 14c) was assessed as *excellent* for this subecoregion. Ten EPT families (Table 15c) were collected at this site, indicating the macroinvertebrate community to be in *good* condition. In-situ water quality parameters did not indicate impairment (Appendix D-1).

Lovetts Creek: At LVTM-34, Lovetts Creek is a low gradient, predominantly sand-bottomed stream located in the Southern Pine Plains and Hills (65f) subecoregion. Habitat condition was assessed as *excellent* (Table 14c). Twelve EPT families were collected at this site, indicating the macroinvertebrate community to be in *good* condition (Table 15c). Fish IBI assessment resulted in a score of 44, indicating the fish community to be in *fair* condition (Table 15c).

ADEM collected water quality data at this site during May and September 2000 (Appendix D-1). The nitrate-nitrite nitrogen concentration was elevated (0.777 mg/L) during September. Total phosphorus was less than the laboratory's minimum detection limit (0.004 mg/L).

Randons Creek: At RNDM-32, Randons Creek is a low-gradient, predominantly sand-bottomed stream. Habitat condition was assessed as *excellent* for this subecoregion (Table 14c). Nine EPT families were collected at this site, indicating the macroinvertebrate community to be in *good* condition (Table 15c).

In-situ water quality parameters collected in May of 2000 did not indicate water quality impairment at RNDM-32 (Appendix D-1).

NPS priority status: Randons Creek was identified as a priority sub-watershed due to condition of the fish community and elevated nutrient concentrations at Lovetts Creek (Table 10c).

Sub-Watershed: Pigeon Creek **NRCS Sub-Watershed Number 080**

Landuse: The Pigeon Creek sub-watershed drains approximately 112 mi^2 in Clarke and Monroe Counties. The sub-watershed supported a mixture of landuses, including forest, pasture, and row crops. One current construction/stormwater authorization and 1 non-coal mining <5 acres/stormwater authorization has been issued in the sub-watershed (Table 6c).

Percent land cover estimated by local SWCD (Table 5c, ASWCC 1998)

Forest	Row crop	Pasture	Mining	Urban	Open Water	Other
69%	20%	9%	0%	0%	<1%	1%

NPS impairment potential: The overall potential for impairment from nonpoint sources was estimated as *moderate.* There was a *moderate* potential for impairment from forestry and croplands.

Values and NPS ratings for each NPS category estimated by local SWCD.

Category	NPS Score	Animal husbandry	Aqua-culture	Row crop	Pasture	Mining	Forestry	Sediment
Value	11	0.02 AU/ac	0.01%	20%	9%	0%	33%	2.0 tons/ac/yr
NPS Potential	M	L	L	M	L	L	M	L
Table	7c	11c	11c	5c	5c	5c	12c	12c

Assessments: Two locations selected as NPS screening stations were not wadeable and could not be assessed during the ACT Basin NPS Screening Assessment.

NPS priority status: It is recommended that the sub-watershed be re-evaluated during the 2005 assessment of the ACT basins due to the potential for impairment from cropland and forestry.

Sub-Watershed: Wallers Creek NRCS Sub-Watershed Number 090

Landuuse: The Wallers Creek sub-watershed drains approximately 95 mi^2 in Clarke and Monroe Counties. Land cover was mainly forest mixed with small areas of cropland. One current construction/stormwater authorization and 1 non-coal mining <5 acres/stormwater authorization have been issued in the sub-watershed (Table 6c).

Percent land cover estimated by local SWCD (Table 5c, ASWCC 1998)

Forest	Row crop	Pasture	Mining	Urban	Open Water	Other
87%	10%	2%	0%	0%	1%	<1%

NPS impairment potential: The overall potential for impairment from nonpoint sources was estimated as *moderate.* The potential for impairment from cropland and forestry was estimated as *moderate*. Although sedimentation estimates indicated a *low* potential for NPS impairment, Wallers Creek was given a 4th priority sub-watershed rating by the SWCD for resource concerns including excessive erosion and sedimentation from roads and road banks and timber harvest (Table 12c). The potential for impairment from septic tank failures was estimated to be *moderate* (Table 12c).

Values and NPS ratings for each NPS category estimated by local SWCD.

Category	NPS Score	Animal husbandry	Aqua-culture	Row crop	Pasture	Mining	Forestry	Sediment
Value	11	0.05 AU/ac	0%	10%	2%	0%	33%	0.3 tons/ac/yr
NPS Potential	M	L	L	M	L	L	M	L
Table	7c	11c	11c	5c	5c	5c	12c	12c

Assessments: Three stations were monitored during the ACT Basin NPS Screening Assessment. One station has been previously evaluated (AR04U1) in conjunction with ADEM's ALAMAP Program (Appendix F-8).

Baileys Creek: Baileys Creek at BLMW-35 is a low-gradient, predominantly sand-bottomed stream. Habitat condition at BLMW-35 was assessed as *excellent* for this subecoregion (Table 14c). Bioassessments indicated the macroinvertebrate and fish communities to be in *fair* condition (Table 15c).

Water quality parameters collected in May and September of 2000 did not indicate chemical impairment (Appendix D-1).

Potts Bayou Shomo Creek: At PBSM-37, Potts Bayou Shomo Creek is a low-gradient, predominantly sandy-bottomed stream. Habitat condition was assessed as *excellent* (Table 14c). Bioassessments conducted at the station indicated the macroinvertebrate community to be in *fair* condition and the fish community to be in *poor* condition (Table 15c).

Chemical sampling conducted at PBSM-37 in May and September of 2000 did not indicate a cause of impairment (Appendix D-1).

Assessment stations located within the sub-watershed. Descriptions are provided in Appendix E.

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
BLYM-35	Chemical, Habitat, Macroinvertebrate, Fish	2000	Baileys Creek at Monroe County Road 1.	12	Fish & Wildlife
PBSM-37	Chemical, Habitat, Macroinvertebrate, Fish	2000	Potts Bayou Shomo Creek at Monroe County Road 8.	18	Fish & Wildlife
WLRM-36	Chemical, Habitat, Macroinvertebrate, Fish	2000	Wallers Creek at Monroe County Road 8.	14	Fish & Wildlife
AR04U1	Chemical, Habitat	1997	Wallers Creek approx. 10 miles upstream of confluence with Alabama River	7	Fish & Wildlife

Wallers Creek: Wallers Creek is a low-gradient stream located in the Southern Pine Plains and Hills (65f) subecoregion. At WLRM-36, it was characterized by a mixture of substrate types. The high percent clay at this station was unusual for the subecoregion (Table 14c). Substrate composition at AR04U1 was more typical for this stream type (Appendix F-8a). Habitat condition at WLRM-36 (Table 14c) and AR04U1 (Appendix F-8a) was assessed as *excellent*. Bioassessments conducted at WLRM-36 indicated the macroinvertebrate community to be in *fair* condition and the fish community to be in *poor/fair* condition (Table 15c).

Water quality data collected at WLRM-36 during May and September of 2000 did not indicate a cause of the biological impairment (Appendix D-1). Water quality data collected at AR04U1 during ADEM's 1997 ALAMAP Program showed the total phosphorus concentration (0.12 mg/L) to be slightly elevated (Appendix F-8a).

NPS priority status: Wallers Creek was identified as a priority sub-watershed due to biological conditions at Baileys Creek, Potts Bayou Shomo Creek, and Wallers Creek. (Table 10c).

Sub-Watershed: Reedy Creek NRCS Sub-Watershed Number 100

Landuse: The Reedy Creek sub-watershed drains approximately 89 mi^2 in Clarke County. The SWCD estimated the sub-watershed to be almost entirely forested. One current construction/stormwater authorization and 1 non-coal mining <5 acres/stormwater authorization has been issued in the sub-watershed (Table 6c).

Percent land cover estimated by local SWCD (Table 5c, ASWCC 1998)

Forest	Row crop	Pasture	Mining	Urban	Open Water	Other
94%	1%	4%	0%	0%	<1%	1%

NPS impairment potential: The potential for impairment from forestry activities was *high*. The overall potential for impairment from nonpoint sources was estimated as *moderate.*

Values and NPS ratings for each NPS category estimated by local SWCD.

Category	NPS Score	Animal husbandry	Aqua-culture	Row crop	Pasture	Mining	Forestry	Sediment
Value	11	<0.01 AU/ac	0.00%	1%	4%	0%	46%	0.9 tons/ac/yr
NPS Potential	M	L	L	L	L	L	H	L
Table	7c	11c	11c	5c	5c	5c	12c	12c

Assessments: An assessment of Reedy Creek was not conducted during the ACT Basin NPS Screening Assessment.

NPS priority status: Forestry was a concern within the sub-watershed. It is recommended that the sub-watershed be re-evaluated during the 2005 assessment of the ACT basins.

Sub-Watershed: Little River NRCS Sub-Watershed Number 110

Landuse: The Little River sub-watershed drains approximately 148 mi^2 in Baldwin, Escambia, and Monroe Counties. The sub-watershed is located within the Southern Pine Plains and Hills (65f) subecoregion. Land cover was primarily forest with some cropland. The sub-watershed also contains the Claude D. Kelley State Park. Four current construction/stormwater authorizations and 3 non-coal mining <5 acres/stormwater authorizations have been issued in the sub-watershed (Table 6c).

Percent land cover estimated by local SWCD (Table 5c, ASWCC 1998)

Forest	Row crop	Pasture	Mining	Urban	Open Water	Other
78%	16%	3%	<1%	1%	<1%	2%

NPS impairment potential: The potential for impairment from forestry and cropland was estimated as *moderate*. Reconnaissance of the area surrounding Claude D. Kelly State Park support these estimates (ADEM 1999d). The overall potential for impairment from nonpoint sources was estimated as *moderate* (Table 5c). Little River was given a 4th and 5th priority sub-watershed rating by the local SWCDs for resource concerns including excessive erosion and sediment from cropland and roads and road banks, pesticides in surface waters, and access of livestock to streams (Table 12c).

Values and NPS ratings for each NPS category estimated by local SWCD.

Category	NPS Score	Animal husbandry	Aqua-culture	Row crop	Pasture	Mining	Forestry	Sediment
Value	11	0.03 AU/ac	0.02%	16%	3%	<1%	22%	1.3 tons/ac/yr
NPS Potential	M	L	L	M	L	L	M	L
Table	7c	11c	11c	5c	5c	5c	12c	12c

Assessments: The Little River sub-watershed was not assessed during the ACT Basin NPS Screening Assessment. However, Little River has been previously monitored at 6 locations in conjunction with ADEM's 1998 State Parks Assessment (LTLM-2a, LTLE-2; Appendix F-2), a special study conducted by ADEM in 1996 (LITE-1, LITB-1, LITB-2; Appendix F-5), and ADEM's ALAMAP Program (AR08U2-10; Appendix F-8). Water quality and habitat assessment data were collected at 2 locations on Butterfork Creek and Chitterling Creek as part of ADEM's ALAMAP Program (Appendix F-8). A station located on Brickyard Creek could not be evaluated due to low flow conditions.

Assessment stations located within the sub-watershed. Descriptions are provided in Appendix E.

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
AR08U2-10	Chemical, Habitat	1998	Little River approx. 25.8 miles upstream of confluence with Alabama River.	16	Swimming/ Fish & Wildlife
LTLM-2a	Chemical, Habitat, Macroinvertebrate	1998	Little River at unnamed road approx. 0.5 miles upstream of Claude D. Kelly State Park.	16	Swimming/ Fish & Wildlife
LTLE-2	Chemical, Habitat, Macroinvertebrate	1998	Little River at AL Hwy 21.	32	Swimming/ Fish & Wildlife
LITE-1	Chemical, Macroinvertebrate	1996	Little River at Monroe County Road 11.	57	Swimming/ Fish & Wildlife
LITB-1	Chemical, Macroinvertebrate	1996	Little River at Escambia County Road 1.	93	Swimming/ Fish & Wildlife
LITB-2	Macroinvertebrate	1996	Little River at AL Hwy 59.	137	Swimming/ Fish & Wildlife
AR09U2-39	None conducted	1998	Brickyard Creek approx. 3.4 miles upstream of confluence with Alabama River.	2	Fish & Wildlife
AR3U5-26	Chemical, Habitat	2001	Butterfork Creek approx. 1/8 mile upstream of unnamed Monroe County road.	15	Fish & Wildlife
CHTE-1	Chemical, Habitat, Macroinvertebrate	1998	Chitterling Creek within the Claude D. Kelly State Park.	6	Fish & Wildlife

Little River: Little River is a low-gradient stream located in the Southern Pine Plains and Hills (65f) subecoregion. Bottom substrates tended to be dominated by sand at the upstream stations (AR08U2-10, Appendix F-8a; LTLM-2a and LTLE-2, Appendix F-2a). The lower reaches were characterized by sand and gravel riffles (LITE-1, LITB-1, and LITB-2, Appendix F-5a). Habitat condition was assessed as *good* or *excellent* at all locations. However, reconnaissance showed silviculture to be the dominant landuse upstream of LITE-1. The macroinvertebrate community was assessed as *excellent* at both the upstream (LTLM-2a and LTLE-2; Appendix F-2b) and downstream (LITE-1, LITB-1, and LITB-2; Appendix F-5b) reaches.

Chemical sampling was conducted at LTLM-2a and LTLE-2 (Appendix F-2c) in May, July and October of 1998. Conductivity and pH were characteristically low for this subecoregion. Nutrient concentrations did not suggest enrichment and did not differ greatly between the 2 stations. Fecal coliform concentrations and biochemical oxygen demand were highest at both stations during July of 1998 after a heavy rainfall (ADEM 1999). A chemical sample collected at AR08U2-10 during August of 1998 (Appendix F-8b) did not indicate impairment at this location. In-situ water quality parameters collected at LITB-1 and LITB-2 in December of 1996 did not indicate impairment (Appendix F-5c).

Chitterling Creek: At CHTE-1, Chitterling Creek is a low-gradient stream located in the Southern Pine Plains and Hills (65f) subecoregion. Bottom substrates were composed primarily of sand, gravel and clay. Habitat condition was assessed as *good* for this subecoregion (Appendix F-2a). Fourteen EPT families were collected at this site, indicating the macroinvertebrate community to be in *excellent* condition (Appendix F-2b).

Chemical sampling was conducted at CHTE-1 in May, July and October of 1998 (Appendix F-2c). Fecal coliform counts were lower at this station than at the Little River stations, but other parameters were similar and did not suggest impairment.

Butterfork Creek: Butterfork Creek were evaluated at AR3U5-26 during 2001 during ADEM's ALAMAP program. These data will be reported in the 5-year ALAMAP Program Report (ADEM in prep).

NPS priority status: The stream segments surrounding Claude D. Kelley State Park have been recommended for a water use classification upgrade to Outstanding Alabama Water (OAW) (ADEM 1999d). Macroinvertebrate assessments have indicated highly diverse communities throughout the Little River sub-watershed, suggesting that these segments should also be considered for OAW status. Cropland and forestry activities were shown to be concerns by both SWCD landuse information and ground reconnaissance.

Sub-Watershed: Pine Log Creek NRCS Sub-Watershed Number 120

Landuse: The Pine Log Creek sub-watershed drains approximately 126 mi^2 in Baldwin County. The sub-watershed was almost entirely forested. Two current construction/ stormwater authorizations and 2 non-coal mining <5 acres/stormwater authorizations have been issued in the sub-watershed (Table 6c).

Percent land cover estimated by local SWCD (Table 5c, ASWCC 1998)

Forest	Row crop	Pasture	Mining	Urban	Open Water	Other
96%	3%	1%	<1%	<1%	0%	<1%

NPS impairment potential: The potential for impairment from forestry activities was the highest in the Alabama River basin (Tables 12a, 12b, and 12c). The potential for impairment from other NPS categories was *low*.

Values and NPS ratings for each NPS category estimated by local SWCD.

Category	NPS Score	Animal husbandry	Aqua-culture	Row crop	Pasture	Mining	Forestry	Sediment
Value	11	0.01 AU/ac	0.00%	3%	1%	<1%	87%	1.7 tons/ac/yr
NPS Potential	M	L	L	L	L	L	H	L
Table	7c	11c	11c	5c	5c	5c	12c	12c

Assessments: A NPS assessment was not conducted during the ACT Basin NPS Screening Assessment.

NPS priority status: Forestry was a concern within the sub-watershed. It is recommended that the sub-watershed be re-evaluated during the 2005 assessment of the ACT basins.

Sub-Watershed: Alabama River NRCS Sub-Watershed Number 130

Landuse: The Alabama River sub-watershed drains approximately 20 mi^2 in Baldwin and Clarke Counties. The local SWCD estimated land cover within the sub-watershed to be primarily forested. No authorizations or permits have been issued in the sub-watershed (Table 6c).

Percent land cover estimated by local SWCD (Table 5c, ASWCC 1998)

Forest	Row crop	Pasture	Mining	Urban	Open Water	Other
95%	2%	1%	<1%	<1%	<1%	2%

NPS impairment potential: The potential for impairment from forestry was *moderate*. The overall potential for impairment from nonpoint sources was estimated as *low*.

Values and NPS ratings for each NPS category estimated by local SWCD.

Category	NPS Score	Animal husbandry	Aqua-culture	Row crop	Pasture	Mining	Forestry	Sediment
Value	9	<0.01 AU/ac	0.00%	2%	1%	<1%	40%	1.7 tons/ac/yr
NPS Potential	L	L	L	L	L	L	M	L
Table	7c	11c	11c	5c	5c	5c	12c	12c

Assessments: An assessment was not conducted within this sub-watershed during the ACT Basin NPS Screening Assessment because of the *low* potential for impairment from nonpoint sources.

NPS priority status: NPS priority status was not assessed, but this sub-watershed was not at a high risk from NPS impairment.

Table 5c. Land use percentages for the Lower Alabama CU (0315-0204) from EPA landuse categories (EPA 1997) and local SWCD Conservation Assessment Worksheet landuse estimates (ASWCC 1998).

Sub-watershed	Percent Total Landuse													
	Open Water		Urban		Mines		Forest		Pasture		Row Crops		Other	
	SWCD	EPA	SWCD	EPA	SWCD	EPA	SWCD	EPA	SWCD	EPA	SWCD	EPA	SWCD	EPA
Lower Alabama (0315-0204)														
010	1	2	0	<1	0	0	95	78	2	1	2	1	1	17
020	<1	1	0	<1	0	0	95	83	1	3	4	2	<1	10
030	<1	<1	1	<1	0	0	95	91	3	2	1	3	<1	4
040	<1	<1	0	<1	0	<1	93	81	2	3	5	3	<1	13
050	<1	<1	7	1	0	<1	86	87	1	4	6	4	<1	4
060	2	3	1	<1	1	1	87	60	7	8	3	3	<1	25
070	<1	<1	2	<1	0	0	64	75	1	10	32	10	<1	5
080	<1	2	0	<1	0	<1	69	71	9	4	20	4	1	19
090	1	2	0	<1	0	<1	87	62	2	7	10	5	<1	24
100	<1	2	0	<1	0	<1	94	81	4	2	1	2	1	14
110	<1	<1	1	<1	<1	<1	78	71	3	10	16	13	2	5
120	0	2	<1	<1	<1	<1	96	68	1	2	3	2	<1	27
130	<1	14	<1	<1	<1	<1	95	3	1	<1	2	1	2	82

Table 6c. Summary of the number of current construction/stormwater authorizations, non-coal <5 acres/stormwater authorizations, NPDES permits, and CAFO registrations issued within each sub-watershed of the Lower Alabama River CU. Those subwatersheds with more than five authorizations, permits or registrations in a category are in bold.

Sub-watershed	# Authorizations, NPDES permits, and CAFO Registrations							
	Total Number of Permits and Authorizations	Construction/ Stormwater Authorizations (a)	Non-Coal Mining <5 Acres / Stormwater Authorizations (a)	Mining NPDES (c)	Municipal NPDES (b)	Semi Public/ Private NPDES (b)	Industrial Process Wastewater-NPDES Majors (b)	CAFO Registrations (c)
010	2	2						
020	2	2						
030	5	2	2			1		
040	4	1	2				1	
050	11	4	5		2			
060	1	1						
070	3	2		1				
080	2	1	1					
090	2	1	1					
100	2	1	1					
110	7	4	3					
120	4	2	2					
130								

(a) Source: ADEM Mining and Nonpoint Source Unit, Field Operations, database retrieval (7/18/00)

(b) Source: 1996 CWS Report (ADEM 1999a)

(c) Source: ADEM Mining and Nonpoint Source Unit, Field Operations, database retrieval (08/11/00)

Table 7c. Estimates of NPS impairment potential for sub-watersheds in the Lower Alabama River CU (0315-0204). Source categories are based on information provided by the local Soil and Water Conservation Districts (SWCD) on Conservation Assessment Worksheets completed in 1998, and from current construction/stormwater authorization information provided by the Mining and NPS Unit of ADEM. *Rural landuse sources were used to develop the NPS impairment potential. The presence of a CWA 303(d) stream segment within a sub-watershed raised the subwatershed to the top of the prioritization ranking.

Sub-watershed	Overall NPS Impairment Score	Potential NPS Impairment	Potential Sources of Impairment									
			Rural Landuses							Urban / Suburban / Residential Landuses		
			Animal Husbandry	Aquaculture	Row Crops	Pasture Runoff	Mining	Forestry Practices	Sedimentation	Urban	Development	Septic Tank Failure
Raw Data Table			12a	12a	5a	5a	5a	13a	13a	5a	6a	13a
010	9	L	L	L	L	L	L	M	L	L	L	M
020	9	L	L	L	L	L	L	M	L	L	L	L
030	9	L	L	L	L	L	L	M	L	L	L	L
040	9	L	L	L	L	L	L	M	L	L	L	L
050	9	L	L	L	L	L	L	M	L	M	M	L
060	11	M	L	L	L	L	M	M	L	L	L	L
070	13	M	L	L	**H**	L	L	M	L	L	L	L
080	11	M	L	L	M	L	L	M	L	L	L	L
090	11	M	L	L	M	L	L	M	L	L	L	M
100	11	M	L	L	L	L	L	**H**	L	L	L	L
110	11	M	L	L	M	L	L	M	L	L	L	L
120	11	M	L	L	L	L	L	**H**	L	L	L	L
130	9	L	L	L	L	L	L	M	L	L	L	M

Table 8c. List of other water quality assessments conducted on streams within the Lower Alabama River CU from 1990-2000. Data are provided by project and assessment type in the Appendices listed.

Sub-watershed	Waterbody	Date(s)	Assessment Type[a]	Appendices
010	Silver Creek	1991-1995	M, H, C	F-3a-d
020	Tallatchee Creek	2000	C	F-9a
050	Limestone Creek	1992	M, H, C	F-10a
090	Wallers Creek	1997	C, H	F-6a-b
110	Little River	1996, 1998	M, H, C	F-2a-c, F-6a-b, F-10a
110	Chitterling Creek	1998	M, H, C	F-2a-c
110	Brickyard Creek	1998	C, H	F-6a-b
110	Butterfork Creek	2001	C, H	F-6a-b

a. M=macroinvertebrate, H=habitat, C=chemical

Table 9c. List of stations located within the Lower Alabama River CU assessed or attempted as part of the ACT Basin NPS Screening Assessment.

Sub-watershed	Stream	Station	Basin Size (mi^2)	Assessment Type*	Sub-ecoregion	County	T / R / S
070	Bear Creek	BERM-33	15	H, M	65f	Monroe	6N/6E/32
070	Lovetts Creek	LVTM-34	31	H, M, C, F	65f	Monroe	5N/5E/11
070	Randons Creek	RNDM-32	60	H, M, C	65f	Monroe	6N/6E/35
090	Bailey's Creek	BLYM-35	11	H, M, C, F	65f	Monroe	5N/5E/29
090	Potts Bayou Shamo Creek	PBSM-37	20	H, M, C, F	65f	Monroe	7N/5E/7
090	Wallers Creek	WLRM-36	14	H, M, C, F	65f	Monroe	5N/5E/33

Table 10c. Summary of assessments conducted within the Lower Alabama CU as a part of the Alabama River Basin NPS project and other available biological and chemical data collected since 1992.

Sub-watershed	Station Number	*Habitat*	*Macroinv.*	*Fish*	*Chemical data available*	*Lowest assessment score*
010	SRC-1	Excellent	Excellent	---	X	Excellent
050	LCM-1	Excellent	Good	---	X	Good
070	BERM-33	Excellent	Good	---	---	Good
070	LVTM-34	Excellent	Good	Fair	X	**Fair**
070	RNDM-32	Excellent	Good	---	X	Good
090	BLYM-35	Excellent	Fair	Fair	X	**Fair**
090	PBSM-37	Excellent	Fair	Poor	X	**Poor**
090	WLRM-36	Excellent	Fair	Poor-Fair	X	**Poor**
110	CHTE-1	Good	Good	---	X	Good
110	LITB-1	Excellent	Excellent	---	---	Excellent
110	LITB-2	Excellent	Excellent	---	---	Excellent
110	LITE-1	Excellent	Good	---	---	Good
110	LTLE-2	Good	Good	---	X	Good
110	LTLM-2a	Good	Good	---	X	Good
110	AR08U2-10	Excellent	---	---	X	---

Table 11c. Estimates of animal concentrations, animal units (AU), percent aquaculture, and percent of acres where pesticides/herbicides have been applied in the Lower Alabama River CU (0315-0204). Numbers of animals and pesticides/herbicides listed by acreage and sub-watershed were provided by the local SWCDs on Conservation Assessment Worksheets completed in 1998.

		Subwatershed													
		010	020	030	040	050	060	070	080	090	100	110	120	130	Total
County (s)		Clarke Monroe Wilcox	Clarke* Monroe Wilcox	Monroe Wilcox	Monroe	Monroe	Monroe	Monroe	Clarke Monroe	Clarke* Monroe	Clarke	Baldwin Escambia Monroe	Baldwin	Baldwin Clarke	
Acres Reported (% of Total)		100	100	100	100	100	100	100	100	100	100	100	100	100	100
Pesticides Applied	Est. % Reported	*	*	*	*	*	*	20	<1	6	*	12	*	<1	3
Cattle	# / Acre	<0.01	0.01	0.02	0.01	<0.01	0.05	0.01	0.02	0.03	<0.01	0.02	0.01	<0.01	0.01
	A.U./Acre	**<0.01**	**0.01**	**0.02**	**0.01**	**<0.01**	**0.05**	**0.01**	**0.02**	**0.03**	**<0.01**	**0.02**	**0.01**	**<0.01**	**0.01**
Dairy	# / Acre	---	---	---	---	---	---	---	---	---	---	<0.01	---	---	0.00
	A.U./Acre	---	---	---	---	---	---	---	---	---	---	**<0.01**	---	---	**0.00**
Swine	# / Acre	---	---	---	---	---	---	---	---	0.06	---	0.01	---	---	0.01
	A.U./Acre	---	---	---	---	---	---	---	---	**0.02**	---	**<0.01**	---	---	**0.00**
Poultry - Broilers	# / Acre	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	A.U./Acre	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Poultry - Layers	# / Acre	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	A.U./Acre	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Total	A.U./Acre	**<0.01**	**0.01**	**0.02**	**0.01**	**<0.01**	**0.05**	**0.01**	**0.02**	**0.05**	**<0.01**	**0.03**	**0.01**	**<0.01**	**0.01**
Potential NPS Impairment		Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low
Aquaculture	% Total Acres	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.02	0.00	0.00	<0.01
Potential NPS Impairment		Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low

* No data reported for this portion of the subwatershed; nd = no data

Table 12c. Sedimentation estimates by source, forest condition, septic tank information and resource concerns by subwatershed in the Lower Alabama CU (0315-0204) as provided by the local Soil and Water Conservation Districts (SWCD) on Conservation Assessment Worksheets (ASWCC 1998). (*Indicates not reported)

Subwatershed	**010**	**020**	**030**	**040**	**050**	**060**	**070**	**080**	**090**	**100**	**110**	**120**	**130**
Forest condition													
% Needing forest improvement	38	20	35	38	35	33	26	33	33	46	22	87	40
Potential for forestry NPS	Mod	Mod	Mod	Mod	Mod	Mod	Mod	Mod	Mod	High	Mod	High	Mod
Sedimentation rates (tons/acre/year)													
Cropland	<0.1	0.1	<0.1	0.1	0.1	0.1	0.6	0.4	0.2	<0.1	0.3	0.1	<0.1
Sand & gravel pits	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	0.6	<0.1	0.0	0.4	<0.1	0.0
Mined land	0.0	0.0	0.0	0.0		0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Developing urban land	0.0	0.0	0.0	0.0	<0.1		0.0	0.0	0.0	0.0	<0.1	<0.1	0.0
Critical areas	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.3	<0.1	0.1	<0.1	0.1	0.4
Gullies	0.2	<0.1	<0.1	<0.1	<0.1	0.1	<0.1	0.3	<0.1	0.3	0.1	0.3	0.4
Stream banks	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dirt roads and roadbanks	0.1	<0.1	0.1	<0.1	<0.1	<0.1	0.1	0.2	<0.1	0.1	0.2	0.5	0.4
Woodlands	0.4	0.2	0.2	0.1	0.1	0.1	0.1	0.3	0.1	0.3	0.2	0.6	0.5
Total sediment	0.9	0.3	0.4	0.3	0.4	0.6	0.8	2.0	0.3	0.9	1.3	1.7	1.7
Potential for sediment NPS	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low
Septic tanks													
# Septic tanks per acre	0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	0.01	0.01	0.01	*
# Septic tanks failing per acre	0.004	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.003	0.001	0.009	0.001	<0.001	*
# of alternative septic Systems	9	0	17	6	10	0	16	0	0	0	42	48	0
Resource concerns in the subwatershed													
Excessive erosion on cropland											X		
Gully erosion on agricultural land						X						X	X
Road and roadbank erosion	X	X	X		X		X	X	X		X	X	
Poor soil condition (cropland)													
Excessive animal waste applied to land													
Excessive pesticides applied to land							X						
Excessive sediment from cropland				X							X		
Excessive sediment from roads/roadbanks	X	X	X	X	X	X	X		X		X	X	
Excessive sediment from urban development					X								
Inadequate management of animal wastes													
Nutrients in surface waters											X	X	X
Pesticides in surface waters											X		
Bacteria and other organisms in surface waters													X
Low dissolved oxygen in surface waters													
Livestock are overgrazing pastures	X	X	X					X					
Livestock commonly have access to streams	X	X	X	X		X	X	X	X		X		

Table 13c. Physical characteristics and habitat quality of sites assessed in the Lower Alabama River CU (0315-0204) as part of the ACT Basin NPS Screening Assessment.

		BERM-33	LVTM-34	RNDM-32	BLYM-35	PBSM-37	WLRM-36
Subwatershed #		070	070	070	090	090	090
Date (YYMMDD)		000503	000502	000503	000502	000502	000502
Ecoregion/ subregion		65f	65f	65f	65f	65f	65f
Drainage area (mi^2)		17	32	53	12	18	14
Width (ft)		20	35	20	20	10	20
Canopy cover[a]		50/50	O	MO	50/50	MS	50/50
Depth (ft)	Riffle	0.5	---	---	0.4	---	---
	Run	1.0	---	---	1.0	---	---
	Pool	2.0	2.0	4.0	3.0	3.5	3.0
Substrate (%)	Bedrock	---	---	---	---	---	---
	Boulder	---	---	---	---	---	1
	Cobble	---	---	---	---	---	---
	Gravel	19	6	6	5	---	10
	Sand	75	90	85	85	71	31
	Silt	1	1	4	1	2	3
	Detritus	5	3	5	8	25	15
	Clay	---	---	---	1	2	35
	Organic silt	---	---	---	---	---	5
Habitat assessment form[b]		RR	GP	GP	RR	GP	GP
Habitat survey (% maximum)							
	Instream habitat quality	62	39	55	52	63	57
	Sediment deposition	50	59	68	34	85	85
	Sinuosity	28	45	75	65	85	75
	Bank and vegetative stability	78	84	78	73	65	53
	Riparian measurements	93	90	83	84	95	85
Habitat assessment score		168	140	156	158	170	156
% Maximum		70	64	71	66	78	71
Assessment		Excellent	Excellent	Excellent	Excellent	Excellent	Excellent

a. Canopy cover: S=shaded, MS=mostly shaded, 50/50=50% shaded, MO=mostly open, O=open

b. Habitat assessment form: GP=glide/pool, RR=riffle/run

Table 14c. Results of bioassessments conducted in the Lower Alabama River CU (0315-0204) in conjunction with ADEM's ACT Basin NPS Screening Assessment.

Station	BERM-33	LVTM-34	RNDM-32	BLYM-35	PBSM-37	WLRM-36
Sub-watershed	070	070	070	090	090	090
Macroinvertebrate community						
Date (yymmdd)	000503	000502	000503	000502	000502	000502
# EPT families	10	12	9	8	8	8
Assessment	Good	Good	Good	Fair	Fair	Fair
Fish community						
Date (yymmdd)		000712		000712	000712	000712
Time (min)		30		30	30	30
Richness measures						
# species		16		11	12	19
# darter species		2		2	1	3
# minnow species		8		5	3	6
# sunfish species		2		2	2	2
# sucker species		1		1	0	2
# intolerant species		0		1	0	0
Composition measures						
% sunfish		3		3	16	3
% omnivores and herbivores		3		8	0	6
% insectivourous cyprinids		85		82	35	73
% top carnivores		0		0	8	0
Population measures						
Individuals		128		219	63	390
# collected per hour		256		438	126	780
% disease and anomalies		0		0	0	8
IBI Score		44		42	32	38
Assessment		Fair		Fair	Poor	Poor/Fair

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APPENDICES

Appendix A-1a. Land use percentages for the Upper Alabama River cataloging unit (0315-0201) from EPA landuse subcategory data (EPA 1997).

	Percent Total Landuse (Category and Subcategory)													
	Open Water	Urban			Mining	Forest				Pasture/ Hay	Row Crops	Other		
Sub-watershed	Open Water	Low Intensity Residential	High Intensity Residential	High Intensity Commercial/ Industrial/ Transportation	Quarries/ Strip Mines/ Gravel Pits	Transitional Forest	Deciduous Forest	Evergreen Forest	Mixed Forest	Pasture/ Hay	Row Crops	Other Grasses	Woody Wetlands	Herbaceous Wetlands
Upper Alabama (0315-0201)														
010	5	<1	<1	<1		1	11	10	14	22	24	<1	11	1
020	1	<1	<1	<1	<1	<1	22	15	28	11	16	<1	6	<1
030	5	3	1	1	<1	<1	19	7	17	15	16	1	18	1
040	4	13	6	11	1	<1	16	2	9	10	12	7	9	1
050	<1	1	<1	<1		1	22	19	26	5	16	<1	8	<1
060	1	1	<1	<1		2	24	12	22	15	12	<1	10	<1
070	1	<1		<1		<1	16	6	15	34	21	<1	7	<1
080	1	11	4	3		<1	18	2	10	22	14	3	11	<1
090	1	<1	<1	<1		1	22	11	24	19	16	<1	6	<1
100	1	<1	<1	<1		1	22	12	24	18	15	<1	6	<1
110	1	<1	<1	<1		<1	17	4	12	35	20	<1	10	<1
120	21						28	1	16	19	12		4	
130	5	<1	<1	1	<1	1	22	9	20	14	18	<1	9	2
140	2	<1	<1	1	<1	<1	24	4	15	25	18	<1	8	1
150	<1	<1	<1	<1	<1	2	23	18	26	7	14	<1	10	1
160	4	<1		<1	<1	1	26	9	27	12	18		2	<1
170	6	<1		<1		<1	20	2	14	19	24	<1	13	2
180	<1	<1	<1	<1		4	24	13	23	17	8	<1	10	<1
190	<1	<1	<1	<1		<1	20	6	15	26	15	<1	17	1
200	1	<1	<1	<1	<1	3	25	19	29	8	10	<1	7	<1
210	<1	<1	<1	<1	<1	3	29	17	31	8	6	<1	5	<1
220	<1	<1	<1	<1	<1	2	21	26	34	5	6	<1	5	<1
230	2	<1	<1	1	<1	<1	22	9	25	17	14	1	8	<1
240	3	2	1	2	<1	<1	24	3	14	9	13	1	24	3
250	<1	2	<1	<1		1	22	23	34	5	7	1	4	<1
260	8	3	<1	<1	<1	<1	17	2	10	11	29	1	19	<1

Appendix A-1b. Land use percentages for Middle Alabama River cataloging unit (0315-0203) from EPA landuse subcategory data (EPA 1997).

	Percent Total Landuse (Category and Subcategory)													
	Open Water	Urban			Mining	Forest				Pasture/ Hay	Row Crops	Other		
Sub-watershed	Open Water	Low Intensity Residential	High Intensity Residential	High Intensity Commercial/ Industrial/ Transportation	Quarries/ Strip Mines/ Gravel Pits	Transitional Forest	Deciduous Forest	Evergreen Forest	Mixed Forest	Pasture/ Hay	Row Crops	Other Grasses	Woody Wetlands	Herbaceous Wetlands
Middle Alabama (0315-0203)														
010	2	<1		<1		2	15	10	14	12	10	<1	34	1
020	<1	<1		<1		3	27	25	35	4	5	<1	1	<1
030	<1	<1		<1		5	23	28	31	6	6	<1	<1	<1
040	1	<1		<1		1	23	16	31	12	11	<1	5	<1
050	2	<1		<1	<1	4	15	17	21	10	10	<1	20	1
060	2	<1		<1		<1	17	31	33	3	2	<1	11	1
070	5			<1	<1	<1	9	9	9	15	15		36	2
080	1	<1	<1	<1	<1	<1	16	5	13	28	26	<1	8	1
090	1	<1	<1	<1	<1	<1	14	7	12	26	22	<1	16	1
100	2	<1		<1		3	19	18	23	16	11	<1	8	<1
110	<1	<1		<1	<1	4	18	28	36	5	7	<1	2	<1
120	<1	<1		<1		6	17	29	40	3	3	<1	3	<1
130	1	<1		<1		1	20	23	28	8	6	<1	11	<1
140	11	<1	<1	<1	<1	3	17	21	27	7	6	<1	7	1
150	19	<1		<1	<1	4	12	18	19	6	7	<1	14	1
160	3	1	<1	<1	<1	<1	14	21	19	11	7	<1	23	<1
170	2	<1		<1	<1	5	23	17	16	8	10	<1	18	<1
180	<1	<1	<1	<1		3	17	32	32	4	4	<1	7	<1
190	<1	<1		<1		1	15	32	29	1	3	<1	18	<1
200	<1	<1	<1	<1		5	17	32	34	5	4	<1	2	<1
210	3	<1		<1	<1	4	15	20	31	1	3	<1	22	<1
220	2	<1	<1	<1		3	10	18	18	8	6	<1	35	1

Appendix A-1c. Land use percentages for Lower Alabama River cataloging unit (0315-0204) from EPA landuse subcategory data (EPA 1997).

	Percent Total Landuse (Category and Subcategory)													
	Open Water	Urban			Mining	Forest				Pasture/ Hay	Row Crops	Other		
Subwatershed	Open Water	Low Intensity Residential	High Intensity Residential	High Intensity Commercial/ Industrial/ Transportation	Quarries/ Strip Mines/ Gravel Pits	Transitional Forest	Deciduous Forest	Evergreen Forest	Mixed Forest	Pasture/ Hay	Row Crops	Other Grasses	Woody Wetlands	Herbaceous Wetlands
Lower Alabama (0315-0204)														
010	2	<1		<1		3	7	41	27	1	1	<1	17	<1
020	1	<1		<1		3	9	35	36	3	2	<1	10	<1
030	<1	<1	<1	<1		4	19	28	40	2	3	<1	4	<1
040	<1	<1		<1	<1	4	11	34	33	3	3	<1	13	<1
050	<1	1	<1	1	<1	2	15	32	37	4	4	<1	3	<1
060	3	<1		<1	1	8	6	23	23	8	3	<1	25	<1
070	<1	<1	<1	<1		5	11	32	27	10	10	<1	4	<1
080	2	<1		<1	<1	<1	14	25	32	4	4		19	<1
090	2	<1		<1	<1	5	7	32	18	7	5	<1	24	<1
100	2	<1		<1	<1	2	8	43	28	2	2		14	<1
110	<1	<1	<1	<1	<1	7	7	38	20	10	13	<1	5	<1
120	2	<1		<1	<1	8	5	41	14	2	2		27	<1
130	14			<1	<1	<1	2	<1	<1	<1	1		81	<1

APPENDIX A-2

EROS Land Cover Data Set

--South-Central Portion of EPA Region IV--

VERSION 1

INTRODUCTION

The main objective of this project was to generate a generalized and consistent (i.e. seamless) land cover data layer for the South-central portion of EPA Region IV, which includes most of Alabama, Western Georgia, Eastern Mississippi, and the Florida Panhandle. This data set was developed by personnel at the EROS Data Center (EDC), Sioux Falls, SD. The project was initiated during the summer of 1997, and a first draft product was completed in November, 1997 (Version 1). The write-up that follows pertains to Version 1. Questions about the data set can be directed to Terry Sohl (EDC; email sohl@edcmail.cr.usgs.gov; telephone 605-594-6537).

GENERAL PROCEDURES

Data sources: The primary source of data for this project was leaves-off (primarily spring) Landsat TM data, acquired in 1988, 1990, 1991, 1992 and 1993. While most of the leaves-off data sets were acquired in spring, a few were from late autumn due to the difficulties in acquiring cloud-free TM data. These data sets were referenced to Albers Conical Equal Area coordinates (see table 1). Additionally, leaves-on (summer) TM data sets were acquired and referenced. The south-central and north-central portions of Region IV were processed as one unit and later split for distribution purposes; in total, 40 TM scenes were analyzed. Data sets used are provided in Table 2. In addition, other intermediate scale spatial data were acquired and utilized. These included 3-arc second Digital Terrain Elevation Dataset (DTED) and derivative DTED products (slope, shaded relief, and relative elevation), population density and housing units density data at the census block level, USGS land use and land cover data (LUDA), National Wetlands Inventory (NWI) data, and STATSGO soils information (available water and organic carbon).

Methods: The general procedure of this project was to (1) mosaic multiple spring TM scenes and classify them using an unsupervised classification algorithm, (2) interpret and label classes into sixteen land cover categories using aerial photographs as reference data, (3) resolve confused classes using the appropriate ancillary data source(s), and (4) incorporate land cover information from leaves-on TM data, NWI data, and other data sources to refine and augment the "basic" classification developed above. The entire area (north-central and south-central portions of Region IV) was analyzed as one large mosaic consisting of 20 leaves-off scenes. For mosaicing purposes, a base scene was selected, and other scenes were normalized to mimic spectral properties of the base scene following histogram equalization using pixels in regions of spatial overlap.

Following mosaicing, mosaiced scenes were clustered into 100 spectrally distinct classes using the Cluster algorithm developed by Los Alamos [1]. Clusters were assigned into Anderson level 1 and 2 land cover classes using National High Altitude Photography program (NHAP) aerial photographs as reference information. Almost invariably, individual spectral classes were confused between/among two or more "targeted" land cover classes. Separation of spectral classes into meaningful land cover units was accomplished using ancillary data. Briefly, for a given confused spectral class, digital values of the various ancillary data layers were compared to determine: (1) which data layers were the most effective for splitting the confused class into the appropriate land cover units, and (2) the appropriate thresholds for splitting the classes. Models were then developed using one to several data sets to split each confused class into the desired land cover categories. As an example, a spectral class might be confused between row crop and high-intensity residential areas. In order to split this particular class into more meaningful land cover units, population density and housing units density data were assessed to determine if they could be used to split the class into the respective categories, and if so, to define the appropriate thresholds to be used in the class splitting model.

Following the above class splitting steps, a "first order" classification product was constructed from the clustered leaves-off data. Leaves-on data were then clustered with the goal of refining certain land cover features not easily discriminated using leaves-off TM data. Land cover classes that were spatially but not spectrally distinct in the leaves-off data (barren areas, clearcuts) were digitized off the screen from the leaves-on data. These digitized data layers were used in conjunction with clustered leaves-on data to define barren and cleared areas that were then incorporated into the classification product. A digitized layer outlining wetland areas was also used to refine the wetlands information. "Other grasses", consisting largely of parks, urban lawns, and golf courses, were defined at this point by using hand-digitized information and

LUDA urban information to separate "other grasses" from "hay/pasture". Similarly, high-intensity residential and high-intensity commercial/industrial areas were separated by using a threshold in the population density data.

The resulting classification (Version 1) includes the following. Please note that not all classes were used for this region:

Water
- 11 Open Water
- 12 Perennial Ice/Snow

Developed
- 21 Low Intensity Residential
- 22 High Intensity Residential
- 23 High Intensity Commercial/Industrial/Transportation

Barren
- 31 Bare Rock/Sand
- 32 Quarries/Strip Mines/Gravel Pits
- 33 Transitional

Natural Forested Upland (non-wet)
- 41 Deciduous Forest
- 42 Evergreen Forest
- 43 Mixed Forest

Natural Shrubland
- 51 Deciduous Shrubland
- 52 Evergreen Shrubland
- 53 Mixed Shrubland

Non-Natural Woody
- 61 Planted/Cultivated (orchards, vineyards, groves)

Herbaceous Upland Natural/Semi-Natural Vegetation
- 71 Grassland/Herbaceous

Herbaceous Planted/Cultivated
- 81 Pasture/Hay
- 82 Row Crops

83 Small Grains

84 Bare Soil

85 Other Grasses (Urban/recreational; e.g. parks, lawns, golf courses)

Wetlands

91 Woody Wetlands

92 Herbaceous Wetlands

Current definitions of the classes are as follows; percentages given must be viewed as guidelines.

Water - All areas of open water or permanent ice/snow cover

Water - all areas of open water, generally with less than 25% cover of vegetation/land cover.

Perennial Ice/Snow - all areas characterized by yearlong surface cover of ice and/or snow.

Developed - areas characterized by high percentage (approximately 30% or greater) of construction materials (e.g. asphalt, concrete, buildings, etc).

Low Intensity Residential - Land includes areas with a mixture of constructed materials and vegetation or other cover. Constructed materials account for 30-80 percent of the total area. These areas most commonly include single-family housing areas, especially suburban neighborhoods. Generally, population density values in this class will be lower than in high intensity residential areas.

High Intensity Residential - Includes heavily built-up urban centers where people reside. Examples include apartment complexes and row houses. Vegetation occupies less than 20 percent of the landscape. Constructed materials account for 80-100 percent of the total area. Typically, population densities will be quite high in these areas.

High-Intensity Commercial/Industrial/Transportation - Includes all highly developed lands not classified as High Intensity Residential, most of which is Commercial/Industrial/Transportation.

Barren - Bare rock, sand, silt, gravel, or other earthen material with little or no vegetation regardless of its inherent ability to support life. Vegetation, if present, is more widely spaced and scrubby than that in the vegetated categories.

Bare Rock / Sand - Includes areas of bedrock, desert pavement, scarps, talus, slides, volcanic material, glacial debris, and other accumulations of rock without vegetative cover.

Quarries / Strip Mines / Gravel Pits - Areas of extractive mining activities with significant surface expression.

Transitional - Areas dynamically changing from one land cover to another, often because of land use activities. Examples include forestlands cleared for timber, and may include both freshly cleared areas as well as areas in the earliest stages of forest regrowth.

Natural Forested Upland (non-wet) - A class of vegetation dominated by trees generally forming > 25 percent canopy cover.

Deciduous Forest - Areas dominated by trees where 75 percent or more of the tree species shed foliage simultaneously in response to an unfavorable season.

Evergreen Forest - Areas dominated by trees where 75 percent or more of the tree species maintain their leaves all year. Canopy is never without green foliage.

Mixed Forest - Areas dominated by trees where neither deciduous nor evergreen species represent more than 75 percent of the cover present. Natural Shrubland - A class of vegetation defined by areas dominated by shrubs generally less than 6 meters tall with individuals or clumps not touching to interlocking. The species may include true shrubs or trees and shrubs that are small or stunted because of environmental conditions. Shrub canopy cover is generally greater than 25 percent when tree canopy is less than 25 percent. Shrub cover may be less than 25 percent if cases when the cover of each other life form (herbaceous, tree) is less than 25 percent and shrubs exceed the cover of the other life forms. Not currently represented in the central portion of the EPA Region IV data set.

Deciduous Shrubland - Areas dominated by shrubs where 75 percent or more of the shrub species shed foliage simultaneously in response to an unfavorable season.

Evergreen Shrubland - Areas dominated by shrubs where 75 percent or more of the shrub species maintain their leaves all year. Canopy is never without green foliage.

Mixed Shrubland - Areas dominated by shrubs where neither deciduous nor evergreen species represent more than 75 percent of the cover present. Non-Natural Woody - Areas dominated by non-natural woody plant species such as orchards, vineyards, and groves. The classification of

Non-Natural Woody is subject to availability of sufficient ancillary data to differentiate from natural woody vegetation. Not currently represented in the central portion of the EPA Region IV data set.

Planted / Cultivated - Orchards, Vineyards, and tree plantations planted for the production of fruit, nuts, fiber (wood), or ornamental. Herbaceous Upland Natural/Semi-Natural Vegetation - Areas comprised of natural or semi-natural upland herbaceous vegetation.

Grassland/Herbaceous - A class of vegetation dominated by natural upland grasslands, i.e. neither planted nor cultivated by humans, as well as other non-woody plants known as herbs (graminoids, Forbes, and ferns). The grasses/herbs generally form at least 25 percent cover. Trees and shrubs generally have less than 25 percent cover. In rare cases, herbaceous cover is less than 25 percent but exceeds the combined cover of other life forms present.

Herbaceous Planted / Cultivated - Areas dominated with vegetation which has been planted in its current location by humans, and/or is treated with annual tillage, a modified conservation tillage, or other intensive management or manipulation. The majority of vegetation in these areas is planted and/or maintained for the production of food, feed, fiber, or seed.

Pasture / Hay - Grasses, legumes, or grass-legume mixtures planted for livestock grazing or the production of seed or hay crops.

Row Crops - All areas used for the production of crops, such as corn, soybeans, vegetables, tobacco, and cotton.

Small Grains - All areas used for the production of graminoid crops such as wheat and rice. Not represented in the central portion of the EPA Region IV data set.

Bare Soil - Areas within planted or cultivated regions that have been tilled or plowed and do not exhibit any visible cover of vegetation. Not represented in the central portion of the EPA Region IV data set.

Other Grasses - Vegetation planted in developed settings for recreation, erosion control, or aesthetic purposes. Examples include parks, lawns, and golf courses.

Wetlands - Non-woody or woody vegetation where the substrate is periodically saturated with or covered with water as defined by Cowardin et al. [2].

Woody Wetlands - Areas of forested or shrubland vegetation where the soil or substrate is periodically saturated with or covered with water as defined by Cowardin et al. [2].

Emergent Woodlands - Non-woody vascular perennial vegetation where the soil or substrate is periodically saturated with or covered with water as defined by Cowardin et al. [2].

CAVEATS AND CONCERNS

While we believe that the approach taken has yielded a very good general land cover classification product for a very large region, it is important to indicate to the user where there might be some potential problems. The biggest concerns are listed below:

1) Quantitative accuracy checks have yet to be conducted. We plan to make comparisons with existing data sets in order to develop a general overview regarding the quality of the land cover data set developed. Feedback from users of the data will be greatly appreciated.

2) Some of the leaves-off data sets were not temporally ideal. In this project, leaves-off data sets are heavily relied upon for discriminating between hay/pasture and row crop, and also for discriminating between forest classes. The success of discriminating between these classes using leaves-off data sets hinges on the time of data acquisition. When hay/pasture areas are non-green, they are not easily distinguishable from other agricultural areas using remotely sensed data. However, there is a temporal window during which hay and pasture areas green up before most other vegetation (excluding evergreens, which have different spectral properties); during this window these areas are easily distinguishable from other crop areas. The discrimination between evergreen and deciduous forest is likewise optimized by selecting data in a temporal window where deciduous vegetation has yet to leaf out. Due to double-cropping practices and the long-growing season in this portion of the country, it's difficult to acquire a single-date of imagery that adequately differentiates between both deciduous/conifer and hay-pasture/row crop.

3) The data sets used cover a range of years, and changes that have taken place across the landscape over the time period may not have been captured. While this is not viewed as a major problem for most classes, it is possible that some land cover features change more rapidly than might be expected (e.g. hay one year, row crop the next).

4) Wetlands classes are extremely difficult to extract from Landsat TM spectral information alone. The use of ancillary information such as National Wetlands Inventory (NWI) data is highly desirable. NWI data were not available in digital format for much of this area. Manual digitizing was used in combination with spectral information to derive much of the wetlands information, a procedure that isn't able to provide the level of detail of NWI data. It is suspected that forested wetlands are underestimated in areas where NWI wasn't available.

5) Accurate definition of the transitional barren class was extremely difficult. The majority of pixels in this class correspond to clear-cut forests in various stages of regrowth. Spectrally, fresh clear-cuts are very similar to row-crops in the leaves-off data. Manual correction of coding errors was performed to improve differentiation between row-crops and clear-cuts, but some errors may still be found. As regrowth occurs in a clear-cut region, the definition of transitional barren verses a forested class becomes problematic. An attempt was made to classify only fresh clear-cuts or those in the earliest stages of regrowth, but there are likely forested regions classed as transitional barren and vice versa.

6) Due to the confusion between clear-cuts, regrowth in clear-cuts, forested areas, and shrublands, no attempts were made to populate the shrubland classes. Any shrubland areas that exist in this area are classed in their like forest class, i.e. deciduous shrubland is classed as deciduous forest, etc.

ACKNOWLEDGMENTS

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REFERENCE

[1] Kelly, P.M., and White, J.M., 1993. Preprocessing remotely sensed data for efficient analysis and classification, Applications of Artificial Intelligence 1993: Knowledge-Based Systems in Aerospace and Industry, Proceedings of SPIE, 1993, 24-30.

[2] Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe, 1979. Classification of Wetlands and Deepwater Habitats of the United States, Fish and Wildlife Service, U.S. Department of the Interior, Washington, D.C.

Table C-1. Projection Information

The initial Landsat TM mosaics, all ancillary data sets, and the final classification product are all map-registered to an Albers Conical Equal Area projection. The following represents projection information for the final classification product:

Projection: Albers Conical Equal Area
Datum: NAD83
Spheroid: GRS80
Standard Parallels: 29.5 degrees North Latitude 45.5 degrees North Latitude
Central Meridian: 96 degrees West Longitude
Origin of the Projection: 23 degrees North Latitude
False Easting: 0 meters
False Northing: 0 meters
Number of Lines: 17220
Number of Samples: 21773
Number of Bands: 1
Pixel size: 30 X 30 meters
Upper Left Corner: 591953 meters (X), 1301000 meters (Y)
Upper Right Corner: 1245113 meters (X), 1301000 meters (Y)
Lower Left Corner: 591953 meters (X), 784430 meters (Y)
Lower Right Corner: 1245113 meters (X), 784430 meters (Y)

Table C-2. MRLC Landsat thematic mapper (TM) data sets used to develop north-central and south-central portions of the EPA Region IV data set.

No asterisk represents scenes used in south-central portion only
* Represents scenes used in north-central portion only.
** Represents scenes used in both the north-central and south-central portion

Path/Row	Date	EOSAT-ID
19/33	12/14/90	5019033009034810*
19/33	09/20/94	5019033009426310*
19/34	10/03/93	5019034009327610*
19/34	11/20/93	5019034009332410*
19/35	11/12/90	5019035009031610*
19/35	09/30/92	5019035009227410*
19/36	09/28/91	5019036009127110**
19/36	11/17/92	5019036009232210**
19/37	03/09/93	5019037009306810
19/37	10/03/93	5019037009327610
19/38	02/16/91	5019038009104710
19/38	10/03/93	5019038009327610
19/39	02/16/91	5019039009104710
19/39	10/03/93	5019039009327610
20/33	08/02/91	5020033009121410*
20/33	11/22/91	5020033009132610*
20/34	11/29/88	5020034008833410*
20/34	08/02/91	5020034009121410*
20/35	11/29/88	5020035008833410*
20/35	10/07/92	5020035009228110*
20/36	03/11/91	5020036009107010**
20/36	07/22/93	5020036009320310**
20/37	11/29/88	5020037008833410
20/37	10/23/92	5020037009229710
20/38	02/10/92	5020038009204110
20/38	10/23/92	5020038009229710
20/39	01/22/91	5020039009102210
20/39	11/06/91	5020039009131010
21/34	04/05/92	5021034009209610*
21/34	10/14/92	5021034009228810*
21/35	04/05/92	5021035009209610*
21/35	08/30/93	5021035009324210*
21/36	09/10/91	5021036009125310**
21/36	12/15/91	5021036009134910**
21/37	02/03/93	5021037009303410
21/37	10/01/93	5021037009327410
21/38	02/14/91	5021038009104510
21/38	10/12/91	5021038009128510
21/39	09/26/91	5021039009126910
21/39	02/01/92	5021039009203210

APPENDIX B-1.

ADEM-FIELD OPERATIONS-ECOLOGICAL STUDIES
RIFFLE/RUN HABITAT ASSESSMENT FIELD DATA SHEET

Name of Waterbody ______________________ Date: ______________

Station Number ______________ Investigators ______________________

Habitat Parameter	Category			
	Optimal	Suboptimal	Marginal	Poor
1 **Instream Cover**	>50% mix of boulder, cobble, submerged logs, undercut banks, or other stable habitat.	50-30% mix of boulder, cobble, or other stable habitat; adequate habitat.	30-10% mix of boulder, cobble, or other stable habitat; habitat availability less than desirable.	<10% mix of boulder, cobble, or other stable habitat; lack of habitat is obvious.
Score ______	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
2 **Epifaunal surface**	Well developed riffle and run; riffles as wide as stream and length extends 2x the width of stream; abundance of cobble.	Riffle is as wide as stream but length is <2 times width; abundance of cobble; boulders and gravel common.	Run area may be lacking; riffle not as wide as stream and its length is <2 times the stream width; gravel or large boulders and bedrock prevalent; some cobble present.	Riffles or run virtually non existent; large boulders and bedrock prevalent; cobble lacking.
Score ______	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
3 **Embeddedness**	Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment.	Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment.	Gravel, cobble and boulder particles are 50-75% surrounded by fine sediment.	Gravel, cobble and boulder particles are >75% surrounded by fine sediment.
Score ______	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
4 **Velocity/Depth Regimes**	All 4 velocity/depth regimes present (slow-deep, slow-shallow, fast-shallow, fast-deep).	Only 3 of 4 regimes present. (if fast-shallow is missing, score lower.)	Only 2 of 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/depth regime (usually slow-deep).
Score ______	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
5 **Channel Alteration**	No Channelization or dredging present.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization (>20 years) may be present, but not recent.	New embankments present on both banks; and 40 - 80% of stream reach is channelized and disrupted.	Banks shored with gabion or cement; >80% of the stream reach channelized and disrupted.
Score ______	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
6 **Sediment Deposition**	Little or no enlargement of islands or point bars and less than 5 % of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from coarse gravel; 5-30% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel coarse sand on old and new bars; 30-50% of the bottom affected; sediment deposits at obstruction, constriction,, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; > 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
Score ______	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
7 **Frequency of Riffles**	Occurrence of riffles relatively frequent; distance between riffles divided by stream width equals 5-7; variety of habitat.	Occurrence of riffles relatively infrequent; distance between riffles divided by the stream width equals 7-15.	Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided stream width is 15-25.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by stream width >25.
Score ______	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
8 **Channel flow Status**	Water reaches base of both lower banks and minimal amount t of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
Score ______	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
9 **Condition of Banks**	Banks stable; no evidence of erosion or bank failure.	Moderately stable; infrequent, small areas of erosion mostly healed over.	Moderately unstable; up to 60% of banks in reach have areas of erosion.	Unstable; many eroded areas; "raw" areas frequent Along straight section and bends; on side slopes, 60-100% of bank has erosional scars.
Score ______	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
10 **Bank Vegetative Protection**	>90% of the stream bank surfaces covered by vegetation.	90-70% of the streambank surfaces covered by vegetation.	70-50% of the stream bank surfaces covered by vegetation.	<50% of the streambank surfaces covered by vegetation.
Score (LB) ______	10 9 8	7 6	5 4 3	2 1 0
Score (RB) ______	10 9 8	7 6	5 4 3	2 1 0
11 **Grazing or other disruptive pressure**	Vegetative disruption, through grazing or mowing, minimal or not evident; almost all plants allowed to grow naturally.	Disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	Disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Disruption of stream bank vegetation is very high; vegetation has been removed to 2 inches or less in average stubble height.
Score (LB) ______	10 9 8	7 6	5 4 3	2 1 0
Score (RB) ______	10 9 8	7 6	5 4 3	2 1 0
12 **Riparian vegetative zone (each bank)**	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clearcuts, lawns, or crops) have not impacted zone.	Width of riparian zone 18-12 meters; human activities have impacted zone only minimally.	Width of riparian zone 12-6 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters;: little or no riparian vegetation due to human activities.
Score (LB) ______	10 9 8	7 6	5 4 3	2 1 0
Score (RB) ______	10 9 8	7 6	5 4 3	2 1 0

APPENDIX B-2.

ADEM-FIELD OPERATIONS-ECOLOGICAL STUDIES
GLIDE/POOL HABITAT ASSESSMENT FIELD DATA SHEET

Name of Waterbody ______________________ Date: ______________

Station Number ______________ Investigators ______________________

Habitat Parameter	Category			
	Optimal	Suboptimal	Marginal	Poor
1 **Instream Cover**	> 50% mix of snags, submerged logs, undercut banks, or other stable habitat; rubble, gravel may be present.	50-30% mix of stable habitat; adequate habitat for maintenance of populations.	30-10% mix of stable habitat; habitat availability less than desirable.	<10% stable habitat; lack of habitat is obvious.
Score ______	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
2 **Pool Substrate Characterization**	Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant ; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan clay or bedrock; no root mat or vegetation.
Score ______	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
3 **Pool Variability**	Even mix of large-shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
Score ______	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
4 **Channel Alteration**	No Channelization or dredging present.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization (>20 years) may be present, but not recent.	New embankments present on both banks; channelization may be extensive, usually in urban or agriculture lands; and > 80% of stream reach is channelized and disrupted.	Extensive channelization; banks shored with gabion or cement; heavily urbanized areas; instream habitat greatly altered or removed entirely.
Score ______	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
5 **Sediment Deposition**	<20% of bottom affected; minor accumulation of fine and coarse material at snags and submerged vegetation; little or no enlargement of islands or point bars.	20-50% affected; moderate accumulation; substantial sediment movement only during major storm event; some new increase in bar formation.	50-80% affected; major deposition; pools shallow, heavily silted; embankments may be present on both banks; frequent and substantial sediment movement during storm events.	Channelized; mud, silt, and/or sand in braided or non-braided channels; pools almost absent due to deposition.
Score ______	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
6 **Channel Sinuosity**	Bends in stream increase stream length 3 to 4 times longer than if it was in a straight line.	Bends in stream increase stream length 2 to 3 times longer than if it was in a straight line.	Bends in stream increase the stream length 2 to 1 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.
Score ______	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
7 **Channel flow Status**	Water reaches base of both lower banks and minimal amount t of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
Score ______	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
8 **Condition of Banks**	Banks stable; no evidence of erosion or bank failure; <5% affected.	Moderately stable; infrequent, small areas of erosion mostly healed over; 5-30% affected.	Moderately unstable; 30-60% of banks in reach have areas of erosion.	Unstable; many eroded areas; "raw" areas frequent Along straight section and bends; on side slopes, 60-100% of bank has erosional scars.
Score ______	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
9 **Bank Vegetative Protection (each bank)**	> 90% of the stream bank surfaces covered by vegetation.	90-70% of the streambank surfaces covered by vegetation.	70-50% of the stream bank surfaces covered by vegetation.	<50% of the streambank surfaces covered by vegetation.
Score (LB) ______	10 9 8	7 6	5 4 3	2 1 0
Score (RB) ______	10 9 8	7 6	5 4 3	2 1 0
10 **Grazing or other disruptive pressure (each bank)**	Vegetative disruption, through grazing or mowing, minimal or not evident; almost all plants allowed to grow naturally.	Disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	Disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Disruption of stream bank vegetation is very high; vegetation has been removed to 2 inches or less in average stubble height.
Score (LB) ______	10 9 8	7 6	5 4 3	2 1 0
Score (RB) ______	10 9 8	7 6	5 4 3	2 1 0
11 **Riparian vegetative zone Width (each bank)**	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clearcuts, lawns, or crops) have not impacted zone.	Width of riparian zone 18-12 meters; human activities have impacted zone only minimally.	Width of riparian zone 12-6 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.
Score (LB) ______	10 9 8	7 6	5 4 3	2 1 0
Score (RB) ______	10 9 8	7 6	5 4 3	2 1 0

APPENDIX C.

ADEM-FIELD OPERATIONS-ECOLOGICAL STUDIES
PHYSICAL CHARACTERIZATION / WATER QUALITY FIELD DATA SHEET-Wadeable Streams

Station # ______________ Date: ______________ Collector Names ______________

Reach Description: ______________

WATERSHED CHARACTERISTICS

Watershed Land Use: Forest Pasture Ag. Residential Commercial Ind. Other: ______

Local Watershed Erosion: None Slight Moderate Heavy

Local Watershed NPS Pollution: No Evidence Potential sources Obvious Sources

REACH CHARACTERISTICS

Land Use at Reach: Pasture Crops Residential Forest Commercial Ind. Other: ______

Est. Stream Width: ____ ft *Depth:* Mid Channel ____ ft Riffle: ____ ft Run: ____ ft Pool: ____ ft

Length of Reach: ______ ft *Stream Gradient:* ______ ft drop in 25 feet (representative seg.) *Channelized:* Y N

Rosgen Stream Type: ______ *Bank Height:* ______ ft *High Water Mark:* ______ ft *Dam Present:* Y N

Prev. 7 day precip: Fl. Flood Heavy Mod. light none *Macrophytes:* None Rare Common Abundant

Canopy Cover: Open 0-20% Mostly Open 20-40% Est. 50/50 40-60% Mostly Shaded 60-80% Shaded 80-100% *Canopy Type:* ______

SEDIMENT / SUBSTRATE CHARACTERISTICS

Odors: Normal Sewage Petroleum Chemical Anaerobic Other: ______

Oils: Absent Slight Moderate Profuse

Deposits: Sludge Sawdust Paper-Fiber Sand Relict Shells Other: ______

Are the undersides of stones not deeply embedded, black? Y N N/A

WATER QUALITY CHARACTERISTICS

Water Odors: Normal Sewage Petroleum Chemical Other: ______

Water Surface Oils: None Slick Sheen Globs Flecks

Water Color: Clear Sl. Tannic Mod. Tannic Dk Tannic Green Gray Other: ______

Weather Conditions: Clear P/C Mostly Cloudy Cloudy Raining

Biological Indicators: Periphyton Macrophytes Fish Filamentous Slimes Others

PHOTOS Roll # ______

Picture # ____ Description ______________ Picture # ____ Description ______________

EST. % COMP. IN SAMPLING AREA			FIELD NOTES	WATER QUALITY
Inorganic + Organic = 100%				
Type	Diameter	Percent		Time ______ hrs (24hrs)
Bedrock		____ %		
Boulder	>10 in.	____ %		Mid Channel Depth ______ ft
Cobble	2.5 - 10 inches	____ %		Sample Depth ______ ft
Gravel	0.1 - 2.5 inches	____ %		
Sand	gritty	____ %		T-Air ______ C
Silt		____ %		T-H2O ______ C
Clay	slick	____ %		pH ______ s.u.
Detritus	Stick, Wood	____ %		Cond. ______ umhos @ 25c
	CPOM	____ %		D.O. ______ mg/l
Mud-Muck	fine organic	____ %		Turb. ______ ntu
Marl	Gray Shell Frag.	____ %		

Appendix D-1. Results of physical/chemical data collected during May and September of 2000 as part of the nonpoint source screening assessment of the Alabama River Basin.

Sub-Watershed	Station	Date (YYMMDD)	Time (24hr)	Water Temp. (^oC)	Dissolved Oxygen (mg/L)	pH (s.u.)	Conductivity (umhos @ 25^oC)	Turbidity (ntu)	Flow (cfs)	Fecal Coliform (col/100mL)	ALK (mg/L)	TOC (mg/L)	TSS (mg/L)	TDS (mg/L)	NO_2/NO_3 (mg/L)	NH_3-N (mg/L)	TKN (mg/L)	Total-P (mg/L)	BOD-5 (mg/L)	Hardness (mg/L)
Upper Alabama (03150201)																				
070	RMRM-9	000504	0750	34	5.9	7.6	318	13.8	1.8											
070	RMRM-9	000913	0845	---	---	---	---	---	NF											
070	RMRM-10	000504	1000	37	6.9	7.5	174	20.5	0.6											
070	RMRM-10	000913	0915	---	---	---	---	---	NF											
090	PNCM-8a	000509	0810	22	5.6	7.6	234	9.8	1.5											
090	PNTM-7	000509	1030	22	4.2	7.4	229	11.6	1.2											
090	PNTM-7	000913	1030	28	3.1	---	128	1.3	0.3	110			7	120	0.068		0.503	0.17	3.6	49.4
140	TALL-1	000509	1340	26	9.4	7.9	352	3.5	0.6											
140	TALL-2	000509	1330	---	---	---	---	---	NF											
180	LAKL-4	000509	1320	24	5.7	7.5	318	8.4	<0.1											
180	LAKL-4	000913	1140	---	---	---	---	---	NF											
Middle Alabama (03150203)																				
030	CDRL-27	000510	0830	23	8.2	8.0	260	2.6	0.8											
030	CDRL-27	000913	1210	35	8.4	---	813	<1.0	<0.1	50 est.	80	5.327	5	641	0.017	<0.015	0.34	0.01	1.1	394.0
040	MSHD-15	000509	1120	24	7.8	7.8	238	4.2	4.4											
040	MSHD-15	000912	1520	30	8.5	8.3	215	1.0	1.2	40 est.	89	5.855	4	140	0.01	<0.015	<0.15	0.03	0.6	96.1
080	MUDD-16	000504	0800	19	4.5	7.4	298	13.2	0.0											
080	MUDD-17	000504	0930	22	2.2	7.5	505	13.2	0.1											
080	MUDD-17	000912	1227	---	---	---	---	---	NF											
090	BERD-20	000508	1030	22	5.1	7.5	500	5.4	<0.1											
090	BERD-20	000912	1310	---	---	---	---	---	NF											
090	TTMD-19	000504	1200	21	8.7	7.7	107	7.4	0.9											
100	GLVW-26	000503	1414	20	6.8	7.4	272	5.4	<0.1											

Appendix D-1. Results of physical/chemical data collected during May and September of 2000 as part of the nonpoint source screening assessment of the Alabama River Basin.

Sub-Watershed	Station	Date (YYMMDD)	Time (24hr)	Water Temp. (^oC)	Dissolved Oxygen (mg/L)	pH (s.u.)	Conductivity (umhos @ 25^oC)	Turbidity (ntu)	Flow (cfs)	Fecal Coliform (col/100mL)	ALK (mg/L)	TOC (mg/L)	TSS (mg/L)	TDS (mg/L)	NO_2/NO_3 (mg/L)	NH_3-N (mg/L)	TKN (mg/L)	Total-P (mg/L)	BOD_5 (mg/L)	Hardness (mg/L)
Middle Alabama (03150203), cont.																				
100	GLVW-26	000912	1045	25	2.3	7.1	273	1.0	---	173	97	2.501	6	164	<0.003	0.097	<0.15	0.21	3.6	108.0
100	LCHD-23	000508	1315	24	8.9	7.8	507	3.4	0.0											
100	LCHD-23	000912	1255	---	---	---	---	---	NF											
100	RGRD-24	000503	1645	25	10.1	8.3	344	12.9	0.1											
100	RGRD-24	000912	1245	---	---	---	---	---	NF											
100	SNDM-25	000503	1250	26	6.9	8.4	308	3.4	0.7											
100	SNDM-25	000912	1125	---	---	---	---	---	NF											
Lower Alabama (03150204)																				
070	BERM-33	000503	0740	30	8.4	6.9	56	3.7	13.7											
070	LVTM-34	000502	1700	30	8.0	7.1	65	4.0	25.3											
070	LVTM-34	000912	1235	26	8.1	7.4	70	4.6	26.0	127	22	0.972	7	47	0.777	<0.015	0.194	<0.004	0.6	22.8
070	RNDM-32	000503	1050	34	8.9	7.6	119	6.2	30.8											
090	BLYM-35	000502	1500	28	8.1	7.0	36	5.8	11.9											
090	BLYM-35	000912	1135	24	8.1	7.0	44	4.5	10.2	185	5	1.737	6	36	0.238	0.104	<0.15	<0.004	0.9	13.6
090	PBSM-37	000502	0950	23	6.6	5.9	29	2.6	3.6											
090	PBSM-37	000912	1000	23	5.8	5.7	45	2.0	2.7	123	1	5.699	3	41	0.098	<0.015	0.437	0.02	1.4	8.6
090	WLRM-36	000502	1250	23	8.3	7.0	70	2.6	7.5											
090	WLRM-36	000912	1055	24	7.9	7.1	73	3.0	5.5	140	20	2.360	1	47	0.208	0.070	0.321	0.03	1.0	25.5

NF=no flow, samples not collected (---)

Appendix D-2. Results of pesticide samples collected as part of the nonpoint source screening assessment of the Alabama River Basin, 2000.

Sub-Watershed Number	Station Number	Date (YYMMDD)	Time (24hr)	Alachlor (ug/L)	Bis (2-Ethylhexyl) phthalate (ug/L)	Simazine (ug/L)	Atrazine (ug/L)
Lower Alabama (0315-0204)							
070	LVTM-34	000912	1235	<0.10	0.18	<0.10	<0.10
070	RNDM-32	000912	1310	<0.10	<0.10	<0.10	<0.10
090	BLYM-35	000912	1135	<0.10	0.14	<0.10	<0.10
090	PBSM-37	000912	1000	<0.10	0.16	<0.10	<0.10
090	WLRM-36	000912	1055	<0.10	0.19	<0.10	<0.10

Bis (2-Ethylhexyl) phthalate, a common plastisizer, is likely a laboratory contaminant. No detectable concentrations were collected for the following constituents during any of the sampling events: Aldrin, Benzo(a)pyrene, Bis(2-Ethylhexyl)adipate, Chlorethoxyfos (Fortress), Chlorimuron ethyl, cis-Cypermethrin, Cyanazine (Bladex), Dieldrin, Endrin, Esfenvalerate (Assana), Heptachlor, Heptachlor epoxide, Hexachlorobenzene, Hexaclhorocyclopentadiene, Norflurazon, Pendimethlin, Propachlor, Tetrachlorvinphos (Rabon), Trifluralin

Appendix D-3. Concentrations of total metals measured at nonpoint source screening assessment stations located within the Alabama River basin.

Sub-Watershed Number	Station Number	Date (YYMMDD)	Time (24hr)	Al (mg/L)	Ca (mg/L)	Fe (mg/L)	Mg (mg/L)	Mn (mg/L)
Upper Alabama (0315-0201)								
090	PNTM-7	000913	1030	<0.2	17.8	1.44	1.21	0.13
220	BCKA-26	000913	1505	<0.2	0.928	2.64	0.56	0.78
Middle Alabama (0315-0203)								
030	CDRL-27	000913	1210	<0.2	141	0.12	10.10	0.03
040	MSHD-15	000912	1520	<0.2	36.1	0.17	1.45	<0.02
100	GLVM-26	000912	1045	<0.2	39	1.28	2.69	0.16
Lower Alabama (0315-204)								
070	LVTM-34	000912	1235	<0.2	7.33	0.45	1.08	<0.02
070	RNDM-32	000912	1310	<0.2	20.5	0.38	1.31	0.04
090	BLYM-35	000912	1135	<0.2	3.86	0.59	0.95	0.03
090	PBSM-37	000912	1000	<0.2	1.75	1.00	1.02	0.09
090	WLRM-36	000912	1055	<0.2	7.97	0.64	1.35	0.04

Appendix E-1. Description of stations established within the Alabama River basin.

Sub-watershed	County	Station	Drainage Area (mi^2)	Ecoregion	Waterbody	Purpose	Location	T / R / S	Latitude	Longitude
Upper Alabama (0315-0201)										
000	Dallas	A-2	17,192	65p	Alabama River	Ambient trend monitoring	@ RM 207.7 above confluence with Cahaba River	16N/10E/15	32.3728	-87.0523
010	Elmore	BTCAUM-1	14,817	65i	Bouldin Tailrace Canal	University Reservoir Tributary Nutrient Study 1999	Bouldin Hydro Plant Tailrace (BODT)	19N/18E/34	32.5831	-86.2839
020	Elmore	MRC-2	49	65p	Mortar Creek	FY 99 303(d) Monitoring	@ Politic Rd.	18N/17E/13	32.5405	-86.3219
020	Elmore	MRC-1	77	65p	Mortar Creek	FY 99 303(d) Monitoring	@ Elmore CR 23 (Coosada Rd)	18N/17E/24	32.5281	-86.3105
020	Autauga	AR07U3-57	2	65i	Pierce Creek	FY 99 ALAMAP	100 yards west of I-65 southbound.	18N/16E/22	32.5223	-86.4410
020	Elmore	UTMC-1	<1	65i	Unnamed tributary to Mortar Creek	FY 99 303(d) Monitoring	@ Elmore Sand and Gravel facility.	18N/17E/11	32.5570	-86.3305
050	Autauga	AUCAUM-1	116	65i	Autauga Creek	University Reservoir Tributary Nutrient Study 1999	@ AL Hwy 14 (AUTA)	17N/16E/17	32.4592	-86.4750
050	Autauga	AUC-2	118	65i	Autauga Creek	FY 99 303(d) Monitoring	adjacent to US Hwy 82, 1/4 mile downstream of Breakfast Creek.	17N/15E/12	32.4727	-86.516
050	Autauga	AUC-1	120	65p	Autauga Creek	FY 99 303(d) Monitoring	@ Autauga CR 4E.	17N/16E/28	32.4276	-86.462
060	Montgomery	D-Study specific reference	35	65a	Baskins Mill Creek	Catoma Creek Watershed Monitoring	@ Montgomery CR 70 (Goodwin Road)	14N/19E/35	32.1410	-86.1014
060	Montgomery	CATM-1	60	65a	Catoma Creek	FY00 303(d) Monitoring	@ Montgomery CR 22 (Trotman Rd.).	15N/19E/29	32.2564	-86.1742
060	Montgomery	F	60	65a	Catoma Creek	Catoma Creek Watershed Monitoring	@ Montgomery CR 22 (Trotman Rd.).	15N/19E/29	32.3594	-86.1742
060	Montgomery	CATM-2	159	65a	Catoma Creek	FY00 303(d) Monitoring	@ Montgomery CR 39 (Woodley Rd.).	15N/18E/13	32.2786	-86.2192
060	Montgomery	S	159	65a	Catoma Creek	Catoma Creek Watershed Monitoring	@ Montgomery CR 39 (Woodley Rd.).	15N/18E/13	32.2786	-86.2192
060	Montgomery	G	22	65a	Little Catoma Creek	Catoma Creek Watershed Monitoring	@ Montgomery CR 85	14N/20E/7	32.2048	-86.1001
060	Montgomery	LCTM-1	51	65a	Little Catoma Creek	FY00 303(d) Monitoring	@ US Hwy 231.	15S/19E/21	32.2682	-86.1668
070	Montgomery	RMRM-11	9	65a	Ramer Creek	FY 00 NPS Screen	@ Montgomery CR 61	13N/18E/14	32.0995	-86.2302
070	Montgomery	RMRM-9	14	65a	Ramer Creek	FY 00 NPS Screen	@ Montgomery CR 65	13N/18E/4	32.2503	-86.2447
070	Montgomery	RMRM-10	27	65a	Ramer Creek	FY 00 NPS Screen	@ Montgomery CR 24	14N/18E/28	32.1583	-86.2604
070	Montgomery	H	77	65a	Ramer Creek	Catoma Creek Watershed Monitoring	@ Montgomery CR 18	15N/18E/27	32.2508	-86.2449
070	Montgomery	A	8	65a	Unnamed tributary to Ramer Creek	Catoma Creek Watershed Monitoring	@ Montgomery CR 65	13N/18E/4	32.1301	-86.2649
070	Montgomery	AR05U2-28	18	65a	Waller Creek	FY 98 ALAMAP	approx. 4.0 miles upstream of confluence with Ramer Creek.	14N/18E/11	32.2090	-86.2346
080	Montgomery	J	289	65a	Catoma Creek	Catoma Creek Watershed Monitoring	@ Montgomery CR 21 (Norman Bridge Road)	15N/18E/6	32.3076	-86.3001
080	Montgomery	AL01	290	65a	Catoma Creek	96 CWS	@U.S. Hwy 331	15N/17E/1	32.3073	-86.3074
080	Montgomery	CATM-3	290	65a	Catoma Creek	FY00 303(d) Monitoring	@ US Hwy 331.	15N/17E/1	32.3073	-86.3074
080	Montgomery	CACAUM-1	290	65a	Catoma Creek	University Reservoir Tributary Nutrient Study 1999	@ Old U.S. Highway 331 Bridge (CATO)	15N/18E/6	32.3072	-86.2994
080	Montgomery	CATM-4	310	65a	Catoma Creek	FY00 303(d) Monitoring	@ US Hwy 31.	16N/17E/34	32.3208	-86.3485
080	Montgomery	CATM-5	338	65a	Catoma Creek	FY00 303(d) Monitoring	@ the end of Hayneville Rd.	16N/17E/32	32.3274	-86.3849
080	Montgomery	O	338	65a	Catoma Creek	Catoma Creek Watershed Monitoring	@ the end of Hayneville Rd.	16N/R17/32	32.3248	-86.3855
080	Montgomery	AL02	340	65b	Catoma Creek	96 CWS	@ Montgomery CR 54 (Old Selma Hwy)	16N/17E/20	32.3435	-86.3920
080	Montgomery	CATM-6	340	65b	Catoma Creek	FY00 303(d) Monitoring	@ Montgomery CR 54 (Old Selma Hwy)	16N/17E/20	32.3435	-86.3920

Appendix E-1. Description of stations established within the Alabama River basin.

Sub-watershed	County	Station	Drainage Area (mi^2)	Ecoregion	Waterbody	Purpose	Location	T / R / S	Latitude	Longitude
Upper Alabama, continued (0315-0201)										
080	Montgomery	Q	13	65a	Caney Branch	Catoma Creek Watershed Monitoring	south of AL Hwy 80	15N/17E/	32.3095	-86.3749
080	Montgomery	WOOD-4	354	65p	Catoma Creek	ADEM Tributary Monitoring 2000	@ deepest point, main creek channel, Catoma Creek embayment, approximately 0.5 miles upstream of lake confluence.	16N/16E/16	32.3711	-86.4584
080	Montgomery	L	3	65a	Hannon Slough	Catoma Creek Watershed Monitoring	@ Seibles Road (Montgomery CR 46) in south Montgomery	15N/18E/5	32.3081	-86.2825
080	Montgomery	R	7	65a	Whites Slough	Catoma Creek Watershed Monitoring	@ Montgomery CR 33	15N/18E/9	32.2919	-86.2688
090	Montgomery	PLC-2	59	65a	Pintlalla Creek	FY 99 303(d) Monitoring	@ Montgomery CR 24 off of CR 19	14N/17E/34	32.1530	-86.3536
090	Montgomery	PNTM-8	59	65a	Pintlalla Creek	FY 00 NPS Screen	@ Montgomery CR 24 off of CR 19	14N/17E/34	32.1530	-86.3535
090	Montgomery	PNTM-7	70	65a	Pintlalla Creek	FY 00 NPS Screen	@ Montgomery CR 24 near Pintlalla	14N/17E/22	32.1764	-86.3855
090	Montgomery	PLC-1	74	65a	Pintlalla Creek	FY 99 303(d) Monitoring	@ US Hwy 31.	14N/17E/15	32.1932	-86.3569
090	Montgomery	PNTM-8a	74	65a	Pintlalla Creek	FY 00 NPS Screen	@ US Hwy 31.	14N/17E/15	32.1933	-86.3563
090	Montgomery	PLC-3	5	65a	Tributary to Pintlalla Creek	FY 99 303(d) Monitoring	@ Montgomery CR 14.	13N/17E/14	32.1080	-86.3280
110	Lowndes	JCKL-12	6	65a	Jack Creek	FY 00 NPS Screen	@ Lowndes CR 26	14N/16E/15	32.1867	-86.4457
110	Montgomery	WOOD-5	264	65p	Pintlalla Creek	ADEM Tributary Monitoring 2000	@ deepest point, main creek channel, Pintlalla Creek embayment, approximately 0.5 miles upstream of lake confluence.	16N/16E/30	32.3402	-86.4992
110	Lowndes	STPL-13	10	65a	Steep Creek	FY 00 NPS Screen	@ Lowndes CR 26	14N/16E/20	32.1790	-86.4698
110	Lowndes	AR4U4-21	36	65a	Steep Creek	ALAMAP 2000	1.25 miles east of Lowndes CR 37	15N/16E/32	32.2357	-86.4727
110	Lowndes	STPL-14	40	65a	Steep Creek	FY 00 NPS Screen	@ Lowndes CR 32	15N/16E/20	32.2568	-86.4707
130	Autauga	NLC-2	4	65p	Noland Creek	FY 99 303(d) Monitoring	@ AL Hwy 14; approx. 5.9 miles upstream of confluence with Alabama River.	17N/15E/24	32.4308	-86.5147
130	Autauga	NLC-1	14	65p	Noland Creek	FY 99 303(d) Monitoring	@ Washington Ferry Road; approximately 2.4 miles upstream of confluence with Alabama River.	16N/15E/1	32.4045	-86.5153
130	Autauga	AR01U1	4	65p	Tributary to Alabama River	FY 97 ALAMAP	approx. 2.3 miles upstream of confluence with Alabama River.	16N/15E/24	32.3648	-86.5288
140	Lowndes	A-1a	15,870	65p	Alabama River	Ambient trend monitoring	@ RM 266.8, 0.25 mi. upstream of Tallawassee Creek	16N/15E/26	32.3383	-86.5325
140	Lowndes	TALL-1	10	65a	Tallawassee Creek	FY 00 NPS Screen	@ US Hwy 80	15N/15E/16	32.2688	-86.5640
140	Lowndes	AR05U3-9	10	65a	Tallawassee Creek	FY 99 ALAMAP	approx. 1/2 mile downstream of US Hwy 80.	15N/15E/1	32.2765	-86.5603
140	Lowndes	TALL-2	5	65a	Tributary to Tallawassee Creek	FY 00 NPS Screen	@ US Hwy 80	15N/15E/15	32.2692	-86.5530
150	Autauga	AR04U3-20	5	65i	Indian Creek	FY 99 ALAMAP	downstream of Autauga CR 55.	20N/14E/2	32.6940	-86.6674
150	Chilton	SWFC-1	25	65i	Swift Creek	Ecoregional Reference	@ Chilton CR 24	20N/14E/8	32.7214	-86.6906
150	Autauga	SWC-3	61	65i	Swift Creek	FY 99 303(d) Monitoring	@ Autauga CR 69 near Vida.	19N/14E/21	32.6079	-86.6669
150	Autauga	SWC-2	105	65i	Swift Creek	FY 99 303(d) Monitoring	@ Autauga CR 40.	18N/14E/20	32.5240	-86.6905
150	Autauga	SWC-1	135	65p	Swift Creek	FY 99 303(d) Monitoring	@ AL Hwy 14.	17N/14E/22	32.4353	-86.6496
150	Autauga	WOOD-6	139	65p	Swift Creek	ADEM Tributary Monitoring 2000	Swift Creek embayment at deepest point of main channel, 0.5 miles upstream of lake confluence.	17N/14E/35	32.4111	-86.6321
160	Autauga	ALRAUM-1	16233	65p	Alabama River	University Reservoir Tributary Nutrient Study 1999	Robert F. Henry Dam Tailrace (HENY)	16N/13E/32	32.3244	-86.7842
160	Autauga	IVC-3	4	65i	Ivy Creek	FY 99 303(d) Monitoring	@ Autauga CR 44	18N/13E/31	32.4954	-86.8076
160	Autauga	IVC-2	11	65i	Ivy Creek	FY 99 303(d) Monitoring	@ AL Hwy 14	17N/13E/17	32.4563	-86.7781
160	Autauga	IVC-1	21	65i	Ivy Creek	FY 99 303(d) Monitoring	@ Autauga CR 9	17N/13E/32	32.4094	-86.7870

Appendix E-1. Description of stations established within the Alabama River basin.

Sub-watershed	County	Station	Drainage Area (mi^2)	Ecoregion	Waterbody	Purpose	Location	T / R / S	Latitude	Longitude
Upper Alabama, continued (0315-0201)										
170	Lowndes	WOOD-7	11	65p	Cypress Creek	ADEM Tributary Monitoring 2000	Deepest point, main creek channel, Cypress Creek embayment, approximately 0.5 miles upstream of lake confluence.	16N/14E/20	32.3521	-86.6796
180	Lowndes	BALL-4	14	65e	Ballards Creek	FY 00 NPS Screen	@ unnamed dirt road nr Lowndes CR 33 and CR 37 crossing	12N/15E/3	32.0462	-86.5425
180	Lowndes	BSPL-5	37	65a	Big Swamp Creek	FY 00 NPS Screen	@ Lowndes CR 37	13N/15E/14	32.1082	-86.5265
180	Lowndes	AR06U3-55	5	65e	Cherry Creek	FY 99 ALAMAP	approx. 1/2 mile upstream of unnamed Lowndes CR near Sandy Ridge.	12N/16E/5	32.0520	-86.4752
180	Lowndes	LAKL-4	23	65a	Lake Creek	FY 00 NPS Screen	@ Lowndes CR 33	13N/15E/7	32.1136	-86.6000
190	Lowndes	BSCAUM-1	244	65p	Big Swamp Creek	University Reservoir Tributary Nutrient Study 1999	@ US Hwy 80 west of Lowndesboro (BIGS)	15N/14E/19	32.2661	-86.6944
190	Lowndes	X-Study specific reference	279	65p	Big Swamp Creek	Catoma Creek Watershed Monitoring	1.4 mi. east of Benton at 1st road crossing upstream of confluence with the Alabama River.	15N/13E/5	32.3008	-86.7934
190	Lowndes	AR04U2-16	7	65a	Halls Branch	FY 98 ALAMAP	approx. 1.9 miles upstream of confluence with Ash Creek.	14N/13E/26	32.1540	-86.7284
200	Autauga	AR6U5-38	2	65i	Tributary to Little Mulberry Creek	FY 01 ALAMAP	approx. 1/2 mile upstream of Autauga CR 1.	19N/13E/15	32.6244	-86.7578
210	Chilton	AR4U5-31	8	65i	Morgan Creek	FY 01 ALAMAP	approx. 1/8 mile upstream of confluence with Little Mulberry Creek.	21N/12E/4	32.8272	-86.8722
210	Chilton	AR03U3-45	1	65i	Pate Creek	FY 99 ALAMAP	upstream of Chilton CR 5.	23N/13E/3	32.9347	-86.7617
220	Chilton	AR8U5-42	9	65i	Boggles Creek	FY 01 ALAMAP	approx. 3.5 miles upstream of confluence with Mulberry Creek.	21N/11E/36	32.7633	-86.9246
220	Autauga	BCKA-26	20	65i	Buck Creek	Reference	@ Autauga CR 16	19N/12E/28	32.6265	-86.8693
220	Dallas	MUCAUM-1	203	65i	Mulberry Creek	University Reservoir Tributary Nutrient Study 1999	@ Dallas CR 52 Bridge (MULB)	19N/12E/31	32.5828	-86.9036
220	Chilton	MULC-1	112		Mulberry Creek		@ US Hwy 82 crossing	21N/12E/33	32.7515	-86.8686
220	Dallas	DAN-5	275	65i	Mulberry Creek	ADEM Tributary Monitoring 2000	Deepest point, main creek channel of embayment, approximately 0.5 miles upstream of lake confluence.	17N/12E/21	32.4386	-86.8655
230	Dallas	SPD-1	22	65b	Soapstone Creek	Ecoregional Reference	@ US Hwy 80 east of Selma	16N/12E/31	32.3221	-86.9065
250	Dallas	AR01U2-33	6	65i	Tributary to Valley Creek	FY 98 ALAMAP	approx. 0.5 miles upstream of confluence with Valley Creek.	19N/11E/8	32.6476	-86.9945
250	Dallas	VLYD-2	7	65i	Valley Creek	FY98 State Park Study	Upstream of Dallas CR 37 within Paul M. Grist State Park	18N/11E/20	32.6212	-86.9955
250	Dallas	VLYD-1	16	65i	Valley Creek	FY98 State Park Study	Upstream of Dallas CR 222 approximately 1.0 mi. downstream of Paul M. Grist State Park	18N/11E/5	32.5750	-86.9847
Middle Alabama (0315-0203)										
000	Wilcox	A-3		65p	Alabama River	Ambient trend monitoring	@ RM 114.6, at Burlington Northern RR bridge near Pine Hill	11N/6E/17	31.9257	-87.4862
000	Wilcox	AL03		65p	Alabama River	96 CWS	@ RM 114.6, at Burlington Northern RR bridge	11N/6E/17	31.9257	-87.4862
030	Lowndes	CDRL-27	54	65b	Cedar Cr	FY 00 NPS Screen	@ Lowndes CR 7	13N/12E/26	32.0762	-86.8298
030	Lowndes	UNML-29	73	65b	Dry Cedar Cr	FY 00 NPS Screen	@ Lowndes CR 16	13N/12E/21	32.0927	-86.8617
030	Lowndes	AR02U1	4	65b	Sullivan Branch	FY 97 ALAMAP	approx. 4.1 miles upstream of confluence with Dry Cedar Creek.	13N/12E/1	32.1236	-86.8229
030	Lowndes	SULL-28	10	65b	Sullivan Cr	FY 00 NPS Screen	@ Lowndes CR 7	13N/12E/15	32.1065	-86.8450

Appendix E-1. Descriptions of stations established within the Alabama River basin.

Sub-watershed	County	Station	Drainage Area (mi^2)	Ecoregion	Waterbody	Purpose	Location	T / R / S	Latitude	Longitude
Middle Alabama (0315-0203)										
040	Dallas	MSHD-15	44	65b	Mush Creek	FY 00 NPS Screen	@ AL Hwy 41	15N/11E/29	32.2442	-86.9934
080		AR3U4-10	6	65b	Beaver Creek	FY 00 ALAMAP	Beaver Creek approximately 0.5 miles south of Autauga CR 78	17N/13E/26	32.4278	-86.7365
080	Dallas	BCH-5	89	65a	Boguechitto Creek	FY 99 303(d) Monitoring	@ Dallas CR 178.	17N/7E/12	32.4643	-87.3247
080	Dallas	BCH-4	99	65a	Boguechitto Creek	FY 99 303(d) Monitoring	@ Dallas CR 23.	17N/7E/25	32.4149	-87.3339
080	Dallas	BCH-3	198	65a	Boguechitto Creek	FY 99 303(d) Monitoring	@ Dallas CR 12.	16N/7E/12	32.3697	-87.3211
080	Dallas	BRSD-18	21	65a	Brush Creek	FY 00 NPS Screen	@ US Hwy 80	17N/7E/16	32.4388	-87.3738
080	Dallas	CYD-1	42	65a	Chaney Creek	Ecoregional Reference	@ Dallas CR 3	16N/8E/17	32.3544	-87.2894
080	Dallas	AR7U5-40	8	65a	Kendricks Branch	FY 01 ALAMAP	approx. 1/2 mile upstream of confluence with Chaney Creek.	16N/8E/9	32.3951	-87.2512
080	Dallas	MUDD-16	19	65a	Mud Creek	FY 00 NPS Screen	@ AL US Hwy 80	17N/7E/17	32.4445	-87.4029
080	Dallas	MUDD-17	83	65a	Mud Creek	FY 00 NPS Screen	@ AL Hwy 5	17N/7E/32	32.4204	-87.3770
080	Dallas	AR02U2-25	1	65a	Tributary to Bogue-chitto Creek	FY 98 ALAMAP	approx. 6.3 miles upstream of confluence with Bogue Chitto Creek.	16N/7E/15	32.3601	-87.3563
080	Perry	WASP-1	16	65a	Washington Creek	Ecoregional Reference	@ Hwy 183	19N/7E/32	32.5700	-87.3914
090	Dallas	BERD-20	26	65a	Bear Creek	FY 00 NPS Screen	@ AL Hwy 22	15N/7E/1	32.3029	-87.3239
090	Dallas	BCCAUM01	283	65a	Boguechitto Creek	University Reservoir Tributary Nutrient Study 1999	@ AL Hwy 22 (BOGC)	15N/8E/4	32.3064	-87.2892
090	Dallas	BCH-2	283	65a	Boguechitto Creek	FY 99 303(d) Monitoring	@ AL Hwy 22	15N/8E/4	32.3065	-87.2803
090	Dallas	BCH-1	328	65a	Boguechitto Creek	FY 99 303(d) Monitoring	@ Dallas CR 115.	15N/8E/16	32.2768	-87.2817
090	Dallas	DAN-7	363	65p	Boguechitto Creek	ADEM Tributary Monitoring 2000	Deepest point, main creek channel of the embayment, approximately 0.5 miles upstream of lake confluence.		32.1713	-87.2257
090	Dallas	CNED-21	3	65a	Cane Creek	FY 00 NPS Screen	@ AL Hwy 22	15N/8E/7	32.2832	-87.3048
090	Dallas	TTMD-19	24	65a	Tatum Creek	FY 00 NPS Screen	@ Dallas CR 11	16N/8E/28	32.3268	-87.2686
100	Dallas	AR03U2-8	134	65b	Chilatchee Creek	FY 98 ALAMAP	approx. 14.8 miles upstream of confluence with Alabama River.	14N/7E/11	32.2020	-87.3545
100	Wilcox	GLVW-26	5	65b	Glover Creek	FY 00 NPS Screen	@ unnamed Wilcox CR, 2 miles NE of AL Hwy 28	15N/6E/21	32.2524	-87.4756
100	Dallas	LCHD-23	7	65b	Little Chilatchee Creek	FY 00 NPS Screen	@ AL Hwy 6	15N/7E/17	32.2498	-87.3899
100	Dallas	RGRD-24	12	65a	Rogers Creek	FY 00 NPS Screen	@ AL Hwy 66	15N/6E/12	32.2852	-87.4327
100	Marengo	SNDM-25	16	65b	Sand Creek	FY 00 NPS Screen	@ AL Hwy 66	15N/6E/17	32.2697	-87.4920
110	Wilcox	PBMW-1	150	65e	Pine Barren Creek	FY00 303(d) Monitoring	upstream of Wilcox CR 59	11N/11E/5	31.9527	-86.9890
120	Monroe	AR07U2-2	6	65e	Bear Creek	FY 98 ALAMAP	approx. 2.2 miles east of AL Hwy 21and 0.2 miles upstream of confluence with unnamed tributary.	10N/10E/27	31.8099	-87.0441
120	Monroe	AR03U1	13	65e	Bear Creek	FY 97 ALAMAP	approx. 20 miles upstream of confluence with Pine Barren Creek.	10N/10E/26	31.8102	-87.0434
120	Monroe	AR1U5-2	13	65e	Bear Creek	FY 01 ALAMAP	approx. 20 miles upstream of confluence with Pine Barren Creek.	10N/10E/26	31.8087	-87.0424
120	Monroe	AR06U2-18	15	65e	Bear Creek	FY 98 ALAMAP	approx. 3.2 miles east of McWilliams Church upstream of confluence with Pine Barren Creek.	10N/10E/23	31.8159	-87.0369
120	Monroe	AR02U3-2	13	65e	Bear Creek	FY 99 ALAMAP	approx. 20 miles upstream of confluence with Pine Barren Creek.	10N/10E/26	31.8103	-87.0425
120	Monroe	AR1U4-2	13	65e	Bear Creek	FY 00 ALAMAP	approx. 20 miles upstream of confluence with Pine Barren Creek.	10N/10/E/26	31.8086	-87.0423

Appendix E-1. Descriptions of stations established within the Alabama River basin.

Sub-watershed	County	Station	Drainage Area (mi^2)	Ecoregion	Waterbody	Purpose	Location	T / R / S	Latitude	Longitude
Middle Alabama, continued (0315-0203)										
130	Wilcox	PBCAUM-1	261	65e	Pine Barren Creek	University Reservoir Tributary Nutrient Study 1999	@ AL Hwy 21 west of Snow Hill (PINE)	12N/10E/21	31.9963	-87.0700
130	Wilcox	PBMW-2	261	65e	Pine Barren Creek	FY00 303(d) Monitoring	upstream of AL Hwy 21	12N/10E/21	31.9964	-87.0684
130	Wilcox	PBMW-3	325	65e	Pine Barren Creek	FY00 303(d) Monitoring	upstream of Steele Bridge Road	12N/9E/21	32.0004	-87.1702
130	Wilcox	PBMW-4	345	65e	Pine Barren Creek	FY00 303(d) Monitoring	upstream of AL Hwy 41	13N/9E/28	32.0633	-87.1759
130	Dallas	AR2U4-8	365	65p	Pine Barren Creek	FY 00 ALAMAP	approximately 2.5 RM from mouth	13N/8E/11	32.1098	-87.2352
130	Dallas	DAN-8	367	65p	Pine Barren Creek	ADEM Tributary Monitoring 2000	Deepest point, main creek channel, Pine Barrens Creek embayment, approximately 0.5 miles upstream of lake confluence.		32.1231	-87.2548
160	Wilcox	ALRAUM02		65p	Alabama River	University Reservoir Tributary Nutrient Study 1999	Millers Ferry Dam Tailrace (MILL)	13N/7E/20	32.1000	-87.3978
170	Dallas	AR01U3-7		65p	Alabama River	FY 99 ALAMAP	approx. 11.7 miles upstream of confluence with Big Swamp Creek.	15N/10E/8	32.2859	-87.0859
180	Wilcox	BEVW-1	34	65e	Beaver Creek	FY00 303(d) Monitoring	@ Wilcox CR 9	12N/5E/33	31.9681	87.5841
180	Wilcox	CLAIBORN E-3	256	65p	Beaver Creek	FY00 ADEM Tributary Monitoring	Deepest point, main creek channel, Beaver Creek embayment, approximately 0.5 miles upstream of lake confluence.		32.0028	-87.4806
180	Wilcox	CBC-2	6	65e	Cub Creek	FY 99 303(d) Monitoring	@ AL Hwy 5	12N/4E/36	31.9721	-87.6312
180	Wilcox	CBC-1	13	65e	Cub Creek	FY 99 303(d) Monitoring	@ Wilcox CR 27	12N/5E/28	31.9767	-87.5867
180	Wilcox	CUBW-30	13	65e	Cub Creek	FY00 303(d) Monitoring	@ Wilcox CR 9	12N/5E/28	31.9764	-87.5866
180	Wilcox	TUCAUM01		65e	Turkey Creek	University Reservoir Tributary Nutrient Study 1999	@ Wilcox CR 3 north of Pine Hill (TURK)	12N/5E/5	32.0369	-87.6050
200	Wilcox	CSWW-1		65e	Camden South WWTP	FY00 303(d) Monitoring	Camden South Waste Water Treatment Plant outfall	12N/8E/29	31.9765	-87.2950
200	Wilcox	GRVW-1	29	65e	Gravel Creek	FY00 303(d) Monitoring	@ AL Highway 41	11N/7E/15	31.9179	87.3591
200	Wilcox	AR2U5-9	21	65e	Pursley Creek	FY 01 ALAMAP	approx. 1/2 mile downstream of unnamed Wilcox Co. Rd.	11N/9E/5	31.9489	-87.1943
200	Wilcox	PURW-1	22	65e	Pursley Creek	FY00 303(d) Monitoring	upstream of unnamed road	11N/9E/8	31.9409	-87.1862
200	Wilcox	PURW-2	45	65e	Pursley Creek	FY00 303(d) Monitoring	upstream of AL Hwy 265	12N/8E/29	31.9796	-87.2776
200	Wilcox	PURW-3	64	65e	Pursley Creek	FY00 303(d) Monitoring	upstream AL Hwy 41	11N/7E/2	31.9559	-87.3375
200	Wilcox	CLAIBORN E-4	104	65p	Pursley Creek	FY00 ADEM Tributary Monitoring	Deepest point, main creek channel, Pursley Creek embayment, approximately 0.5 miles upstream of lake confluence.		31.9155	-87.3705
200	Wilcox	TWNW-1	2	65e	Town Branch	FY00 303(d) Monitoring	approximately 100 feet upstream of Camden South WWTP outfall	12N/8E/29	31.9764	-87.2945

Appendix E-1. Description of stations established within the Alabama River basin.

Sub-watershed	County	Station	Drainage Area (mi^2)	Ecoregion	Waterbody	Purpose	Location	T / R / S	Latitude	Longitude
Lower Alabama (0315-0204)										
010	Clarke	SRC-1	23	65d	Silver Creek	Ecoregional Reference	on private property	8N/5E/32	31.6952	-87.5816
020	Monroe	CLAIBORNE-5	40	65p	Tallatchee Creek	FY00 ADEM Tributary Monitoring	Deepest point, main creek channel, Tallatchee Creek embayment, @ 0.5 miles upstream of lake confluence.	10N/6E/25	31.8029	-87.4253
050	Monroe	LCM-1	31	65d	Limestone Creek	Limestone Creek WQDS at Monroeville	approximately 100 yards upstream of WWTP	7N/8E/33	31.5381	-87.2781
050	Monroe	LCM-2	37	65d	Limestone Creek	Limestone Creek WQDS at Monroeville	@ unnamed CR near Renson	7N/8E/20	31.5546	-87.2831
070	Monroe	BERM-33	17	65f	Bear Creek	FY 00 NPS Screen	@ unnamed Monroe CR nr Frisco City	6N/6E/32	31.4364	-87.4963
070	Monroe	LVTM-34	32	65f	Lovetts Creek	FY 00 NPS Screen	@ Monroe CR 1	5N/5E/11	31.4074	-87.5467
070	Monroe	RNDM-32	53	65d	Randons Creek	FY 00 NPS Screen	@ Monroe CR 1	6N/6E/35	31.4387	-87.5446
090	Monroe	BLYM-35	12	65f	Baileys Creek	FY 00 NPS Screen	@ Monroe CR 1	5N/5E/29	31.3708	-87.5916
090	Monroe	PBSM-37	18	65f	Potts Bayou Shomo Creek	FY 00 NPS Screen	@ Monroe CR 8	4N/5E/7	31.3392	-87.6971
090	Monroe	WLRM-36	14	65f	Wallers Creek	FY 00 NPS Screen	@ Monroe CR 8	5N/5E/33	31.3538	-87.6690
090	Monroe	AR04U1	7	65e	Wallers Creek	FY 97 ALAMAP	approx. 10.1 miles upstream of confluence with Alabama River.	4N/5E/7	31.8105	-87.0424
110	Baldwin	AR09U2-39	2	65p	Brickyard Creek	FY 98 ALAMAP	approx. 3.4 miles upstream of confluence with Alabama River.	4N/3E/25	31.2768	-87.7244
110	Monroe	AR3U5-26	15	65f	Butterfork Creek	FY 01 ALAMAP	approx. 1/8 mile upstream of unnamed Monroe CR	3N/5E/1	31.2509	-87.5246
110	Escambia	CHTE-1	6	65f	Chitterling Creek	FY 98 State Parks Monitoring	within the Claude D. Kelly State Park	3N/6E/9	31.2343	-87.4677
110	Monroe	AR08U2-10	16	65f	Little River	FY 98 ALAMAP	approx. 25.8 miles upstream of confluence with Alabama River.	4N/6E/28	31.2796	-87.4777
110	Monroe	LTLM-2a	16	65f	Little River	FY 98 State Parks Monitoring	@ unnamed road approximately 0.5 RM upstream of Claude D. Kelley State Park	3N/7E/33	31.2674	-87.4680
110	Escambia	LTLE-2	32	65f	Little River	FY 98 State Parks Monitoring	@ AL Hwy 21 within Claude D. Kelley State Park	3N/6E/5	31.2596	-87.4903
110	Escambia	LITE-1	57	65f	Little River	USEPA Region IV Joint Bioassessment	@ Monroe CR 11 between Escambia and Monroe Counties	3N/5E/11	31.2364	-87.5376
110	Escambia	LITB-1	93	65f	Little River	USEPA Region IV Joint Bioassessment	@ Escambia CR 1; defines border between Escambia, Monroe, and Baldwin Counties	3N/5E/7	31.2438	-87.6160
110	Baldwin	LITB-2	137	65p	Little River	USEPA Region IV Joint Bioassessment	@ AL Hwy 59 between Baldwin and Monroe Counties	4N/4E/19	31.2984	-87.7103

Appendix F-1. Ecoregional Reference Site Program

Lead agency: ADEM

Purpose: Ecoregions are relatively homogeneous ecological areas defined by similarity of climate, landform, soil, potential natural vegetation, hydrology, or other ecologically relevant variables. Since 1991, ADEM has maintained a network of least-impaired ecoregional reference sites. Intensive monitoring assessments, including chemical, physical, habitat, and biological data, are collected to develop baseline reference conditions for each of Alabama's 29 Level IV subecoregions (Griffith et al. 2001). The reference condition establishes the basis for making comparisons and detecting use impairment.

Appendix F-1a. Habitat assessment data

Appendix F-1b. Biological assessment data

Appendix F-1c. Physical/ chemical data

Appendix F-1d. Water column metals and hardness data

References:

ADEM. 2000a. Ecoregional reference site data collected by ADEM 1992 to 2000 (unpublished). Field Operations Division, Alabama Department of Environmental Management. Montgomery, AL.

Appendix F-1a. Physical characteristics of ecoregional reference sites located within the Alabama River Basin and assessed by ADEM, 1991-2000. Habitat parameter categories are presented as percent of maximum score.

Station		SWFC-1	SWFC-1	SWFC-1	SWFC-1	SWFC-1	SWFC-1	BCKA-26
CU - Sub-watershed		0201-150	0201-150	0201-150	0201-150	0201-150	0201-150	0201-220
Ecoregion/Subregion		65i	65i	65i	65i	65i	65i	65i
Drainage area (mi^2)		25	25	25	25	25	25	20
Date (yymmdd)		930706	940608	950517	980506	990527	000510	000510
Width (ft)		28	30	25	45	30	20	15
Canopy Cover[a]		MS	MS	MS	MS	50/50	S	S
Depth (ft)	Riffle	0.4	---	---	0.5	0.2	0.3	---
	Run	0.6	1.0	1.0	1.0	1.0	0.5	---
	Pool	1.5	---	1.5	2.5	3.0	1.0	3.5
Substrate (%)	Bedrock							
	Boulder							
	Cobble				5	2		
	Gravel	13	3	13	20	10	20	
	Sand	80	85	80	62	79	60	50
	Silt	5	7	1	3	3	14	5
	Detritus	2	5	5	10	5	6	25
	Clay			1		1		20
Habitat assessment form[b]		O	O	O	O	GP	RR	GP
Habitat Survey (% maximum)								
Instream Habitat Quality		53	55	48	65	45	48	53
Sediment Deposition		29	23	30	63	45	31	80
Sinuosity		67	67	70	80	30	85	70
Bank and Vegetative Stability		70	70	70	75	60	84	63
Riparian Measurements		80	80	75	80	100	95	95
Habitat Assessment Score		69	67	69	98	140	159	158
% Maximum		51	50	51	73	64	66	72
Assessment		Good	Good	Good	Excellent	Excellent	Excellent	Excellent

a. Canopy cover: S=shaded; MS=mostly shaded; 50/50=50% shaded; MO=mostly open; O=open
b. Habitat assessment form: O=Original (EPA 1989); RR=riffle/run (EPA Barbour et al. 1999); GP=glide/pool (Barbour et al. 1999)

Appendix F-1a, cont. Physical characteristics of ecoregional reference sites located within the Alabama River Basin and assessed by ADEM, 1991-2000. Habitat parameter categories are presented as percent of maximum score.

Station		SPD-1	SPD-1	SPD-1	SPD-1	SPD-1a	SPD-1a	SPD-1	CYD-1	CYD-1	CYD-1	CYD-1
CU - Sub-watershed		0201-230	0201-230	0201-230	0201-230	0201-230	0201-230	0201-230	0203-080	0203-080	0203-080	0203-080
Ecoregion/Subregion		65b	65b	65b	65b	65b	65b	65b	65a	65a	65a	65a
Drainage area (mi^2)		22	22	22	22	22	22	22	42	42	42	42
Date (yymmdd)		910620	920625	920916	930617	940609	950613	000509	920625	930617	950509	000504
Width (ft)		12	10	12	18	20	15	25	22	12	15	30
Canopy Cover[a]		MO	MS	MS	MS	MO	50/50	MO	S	MS	50/50	50/50
Depth (ft)	Riffle	0.4	0.3	0.2	0.4	0.5	0.5	---	---	0.1	---	0.4
	Run	0.8	0.3	0.5	0.8	1.0	0.5	---	0.5	1.0	0.8	1.3
	Pool	1.0	0.8	1.0	2.5	2.0	1.5	2.5	1.0	1.5	1.5	2.0
Substrate (%)	Bedrock	38 (Clay)	38 (Clay)	70 (Clay)	65 (Clay)	70 (Clay)	30 (Clay)	10 (Clay)	68 (Clay)	70 (Clay)	65 (Clay)	43 (Clay)
	Boulder	10 (Clay)	1 (Clay)	5 (Clay)		6 (Clay)	5 (Clay)	5 (Clay)			6 (Clay)	2 (Clay)
	Cobble	1	10 (Clay)	10 (Clay)	5 (Clay)	10 (Clay)	10 (Clay)	15 (Clay)	8 (Clay)	10 (Clay)	5 (Clay)	10 (Clay)
	Gravel	23	37	5	15	8	40	30	15	7	20	30
	Sand	24	10	5	10		5	25	2	1	1	10
	Silt	2	2		2	2	2	10	5	10	1	1
	Detritus	3	2	5	3	4	2	5	2	2	2	2
	Clay						6					
Habitat assessment form[b]		O	O	O	O	O	O	GP	O	O	O	RR
Habitat Survey (% maximum)												
Instream Habitat Quality		75	53	35	55	68	59	67	45	43	56	38
Sediment Deposition		51	63	60	74	80	74	79	66	71	80	81
Sinuosity		80	67	53	60	73	80	50	80	93	87	18
Bank and Vegetative Stability		80	45	55	70	70	80	53	70	75	80	89
Riparian Measurements		80	80	80	80	80	85	88	80	80	80	95
Habitat Assessment Score		91	77	71	90	97	98	154	82	88	97	165
% Maximum		67	57	53	67	72	72	70	61	65	72	69
Assessment		Excellent	Good	Good	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent

a. Canopy cover: S=shaded; MS=mostly shaded; 50/50=50% shaded; MO=mostly open; O=open
b. Habitat assessment form: O=Original (EPA 1989); RR=riffle/run (EPA Barbour et al. 1999); GP=glide/pool (Barbour et al. 1999)

Appendix F-1a, cont. Physical characteristics of ecoregional reference sites located within the Alabama River Basin and assessed by ADEM, 1991-2000. Habitat parameter categories are presented as percent of maximum score.

Station		WASP-1	WASP-1	SRC-1	SRC-1	SRC-1	SRC-1	SRC-1
CU - Sub-watershed		0203-080	0203-080	0204-010	0204-010	0204-010	0204-010	0204-010
Ecoregion/Subregion		65a	65a	65d	65d	65d	65d	65d
Drainage area (mi^2)		16	16	23	23	23	23	23
Date (yymmdd)		950608	000508	910625	920707	930608	940614	950607
Width (ft)		15	20	45	20	30	40	25
Canopy Cover[a]		50/50	S	MO	MS	MS	MS	50/50
Depth (ft)	Riffle	---	---	0.3	0.3	0.5	0.5	0.3
	Run	---	2.0	1.0	0.5	1.3	1.0	1.0
	Pool	---	3.0	1.5	1.0	2.0	1.3	2.0
Substrate (%)	Bedrock	14 (Clay)	35 (Clay)					
	Boulder							
	Cobble	11 (Clay)	26 (Clay)	10	1	8	10	7
	Gravel	11 (Clay)	26 (Clay)	43	47	27	30	60
	Sand	50	1	43	46	60	56	28
	Silt	10	10	1	2	2	1	1
	Detritus	4	2	2	4	3	3	4
	Clay		87					
Habitat assessment form[b]		O	GP	O	O	O	O	O
Habitat Survey (% maximum)								
Instream Habitat Quality		29	38	88	70	78	85	78
Sediment Deposition		23	71	66	63	66	60	66
Sinuosity		37	23	87	87	80	93	97
Bank and Vegetative Stability		43	64	90	75	65	75	73
Riparian Measurements		80	95	100	80	80	80	80
Habitat Assessment Score		46	138	110	93	97	103	100
% Maximum		34	63	81	69	72	76	74
Assessment		Fair	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent

a. Canopy cover: S=shaded; MS=mostly shaded; 50/50=50% shaded; MO=mostly open; O=open
b. Habitat assessment form: O=Original (EPA 1989); RR=riffle/run (EPA Barbour et al. 1999); GP=glide/pool (Barbour et al. 1999)

Appendix F-1b. Aquatic macroinvertebrate and fish community bioassessment results for ecoregional reference sites located in the Upper Alabama River Basin and assessed by ADEM, 1991 - 2000.

Station Number	SWFC-1	SWFC-1	SWFC-1	SWFC-1	SWFC-1	SWFC-1	BCKA-26
Sub-watershed #	150	150	150	150	150	150	220
Subecoregion #	65i	65i	65i	65i	65i	65i	65i
Macroinvertebrate community							
Assessment Date	930706	940608	950517	980506	990527	000510	000510
# EPT families	16	16	15	13	11	10	6
Assessment	Excellent	Excellent	Excellent	Excellent	Good	Good	Fair
Fish community							
Assessment Date						000713	000714[a]
Time (min)						30	---
Richness measures							
# species						20	---
# darter species						4	---
# minnow species						6	---
# sunfish species						2	---
# sucker species						2	---
# intolerant species						0	---
Composition measures							
% sunfish						0.8	---
% omnivores and herbivores						6.6	---
% insectivourous cyprinids						58.8	---
% top carnivores						1.7	---
Population measures							
Individuals						532	---
# collected per hour						1064	---
% disease and anomalies						0	---
IBI Score						46	---
Assessment						Fair-Good	---

a. Assessment attempted, but not conducted due to low flow conditions

Appendix F-1b. Aquatic macroinvertebrate and fish community bioassessment results for ecoregional reference sites located in the Upper Alabama River Basin and assessed by ADEM, 1991 - 2000.

Station Number	SPD-1	SPD-1	SPD-1	SPD-1	SPD-1a	SPD-1a	SPD-1
Sub-watershed #	230	230	230	230	230	230	230
Subecoregion #	65b	65b	65b	65b	65b	65b	65b
Macroinvertebrate community							
Assessment Date	910620	920625	920916	930617	940609	950613	010509
# EPT families	11	9	8	10	8	9	7
Assessment	Excellent	Excellent	Good	Excellent	Good	Excellent	Good
Fish community							
Assessment Date							000711
Time (min)							30
Richness measures							
# species							14
# darter species							1
# minnow species							5
# sunfish species							2
# sucker species							1
# intolerant species							0
Composition measures							
% sunfish							36.1
% omnivores and herbivores							28.4
% insectivourous cyprinids							21.1
% top carnivores							1.5
Population measures							
Individuals							194
# collected per hour							388
% disease and anomalies							0.0
IBI Score							32
Assessment							Poor

a. Assessment attempted, but not conducted due to low flow conditions

Appendix F-1b. Aquatic macroinvertebrate and fish community bioassessment results for ecoregional reference sites located in the Upper Alabama River Basin and assessed by ADEM, 1991 - 2000.

Station Number	CYD-1	CYD-1	CYD-1	CYD-1	WASP-1	WASP-1	SRC-1	SRC-1	SRC-1	SRC-1	SRC-1
Cataloging unit and Sub-watershed #	0203-080	0203-080	0203-080	0203-080	0203-080	0203-080	0204-010	0204-010	0204-010	0204-010	0204-010
Subecoregion #	65a	65a	65a	65a	65a	65a	65d	65d	65d	65d	65d
Macroinvertebrate community											
Assessment Date	920625	930617	950509	000504	950608	000508	910625	920707	930608	940614	950607
# EPT families	10	9	8	9	6	2	13	16	11	13	13
Assessment	Excellent	Excellent	Good	Excellent	Good	Poor	Excellent	Excellent	Good	Excellent	Excellent
Fish community											
Assessment Date						000714[a]					
Time (min)						---					
Richness measures											
# species						---					
# darter species						---					
# minnow species						---					
# sunfish species						---					
# sucker species						---					
# intolerant species						---					
Composition measures											
% sunfish						---					
% omnivores and herbivores						---					
% insectivourous cyprinids						---					
% top carnivores						---					
Population measures											
Individuals						---					
# collected per hour						---					
% disease and anomalies						---					
IBI Score						---					
Assessment						---					

a. Assessment attempted, but not conducted due to low flow conditions

Appendix F-1c. Physical/chemical data collected by ADEM at ecoregional reference sites located in the Alabama River Basin, 1991-2000.

Sub-Watershed	Stream	Station	Date	Time	Air Temp.	Water Temp.	Dissolved Oxygen	pH	Conductivity	Turbidity	Stream Flow	Fecal Coliform	BOD-5	TSS	TDS	TOC	ALK	Total-P	NO_3+ NO_2	NH_3-N	TKN	o-PO_4
			yymmdd	*24hr*	*^oC*	*^oC*	*mg/L*	*s.u.*	*umhos @25^oC*	*NTU*	*cfs*	*col./100mL*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*
Upper Alabama (0315-0201)																						
150	Swift Creek	SWFC-1	930706	0840	26	23	7.5	6.5	36	16	7.0	21	---	---	---	2.9	11.0	0.011	0.130	<0.015	0.150	---
150	Swift Creek	SWFC-1	940608	1200	30	24	7.7	6.8	30	14	14.9	51	---	---	---	6.7	9.0	0.011	0.330	<0.015	<0.150	---
150	Swift Creek	SWFC-1	950517	1305	32	24	8.0	6.7	36	5	13.2	290	---	---	---	3.1	9.0	0.08	0.450	<0.015	0.182	---
150	Swift Creek	SWFC-1	980506	1515	26	22	8.6	5.7	34	9.9	24.4	130	0.6	9	30	---	5.0	0.04	0.510	<0.015	<0.15	---
150	Swift Creek	SWFC-1	990512	1425	25	21	8.9	6.8	30	35.9	24.7	>700	0.9	29	---	3.7	---	---	---	---	---	---
150	Swift Creek	SWFC-1	990527	1150	28	20	8.2	6.9	34	---	10.9	---	---	---	---	---	---	---	---	---	---	---
150	Swift Creek	SWFC-1	990602	1345	27	26	8.5	7.1	45	12.9	9.9	130	0.3	7	---	2.7	---	0.02	0.280	<0.015	<0.15	---
150	Swift Creek	SWFC-1	990728	1230	30	29	7.8	7.3	40	9.85	16.8	200	0.2	8	---	2.5	---	<0.004	0.320	<0.015	<0.150	---
150	Swift Creek	SWFC-1	990927	1030	26	22	8.3	7.0	30	2.45	3.8	55	2.1	10	---	1.9	---	0.02	0.400	<0.015	0.210	---
150	Swift Creek	SWFC-1	000510	1530	26	22	8.1	5.9	19	8.91	7.5	---	---	---	---	---	---	---	---	---	---	---
150	Swift Creek	SWFC-1	000914	0925	33	25	6.5	6.9	38	53.9	9.3	---	0.7	42	51	5.7	10.0	0.04	0.271	<0.015	0.522	0.01
220	Buck Creek	BCKA-26	000510	1400	26	22	7.6	6.3	21	8	9.0	---	---	---	---	---	---	---	---	---	---	---
220	Buck Creek	BCKA-26	000913	1505	30	27	6.3	---	26	---	5.1	---	1.1	20	39	2.7	3.0	<0.004	<0.003	<0.015	<0.150	0.01
230	Soapstone Creek	SPD-1	910620	0930	19	18	8.0	8.0	143	3	3.5	24	---	---	---	4.8	52.0	0.033	0.190	0.200	<0.040	---
230	Soapstone Creek	SPD-1	920625	1122	29	26	9.9	8.6	129	1.2	1.1	5	---	---	---	3.5	52.0	0.037	0.020	0.041	0.189	
230	Soapstone Creek	SPD-1	930617	1155	28	28	9.1	8.5	137	2.2	1.2	20	---	---	---	5.8	52.0	0.011	0.018	<0.015	0.356	---
230	Soapstone Creek	SPD-1a	940609	1050	30	27	7.8	8.1	135	3.8	1.6	40	---	---	---	12.8	31.0	0.028	0.069	0.025	0.195	---
230	Soapstone Creek	SPD-1	950613	1015	18	19	8.6	7.6	124	1	1.3	51	---	---	---	4.2	48.0	0.06	0.072	<0.015	0.154	---
230	Soapstone Creek	SPD-1	000509	0910	23	22	7.7	7.7	127	1.66	3.5	---	---	---	---	---	---	---	---	---	---	---
230	Soapstone Creek	SPD-1	000913	1350	29	28	5.7	---	161	---	---	---	0.7	1	88	2.5	72.0	0.02	0.110	<0.015	0.265	---
Middle Alabama (0315-0203)																						
080	Chaney Creek	CYD-1	910730	1445	27	27	7.0	8.0	320	29	---	---	---	---	---	37.3	123	0.16	0.05	<0.100	0.4	---
080	Chaney Creek	CYD-1	920625	0922	25	24	4.8	7.6	234	6.8	0.1	6	---	---	---	8.9	82	0.046	0.026	0.076	0.475	---
080	Chaney Creek	CYD-1	930617	0930	26	24	4.4	7.5	242	7.8	0.1	24	---	---	---	4.1	86	0.055	0.03	<0.015	0.309	---
080	Chaney Creek	CYD-1	950509	1125	26	22	8.6	8.0	244	4	0.5	11	---	---	---	5.34	70	0.033	0.3	<0.015	0.262	---
080	Chaney Creek	CYD-1	990608	1400	29	28.5	6.0	7.7	240	12.2	0?	---	3.7	15	---	9.32	---	0.09	3.26	0.02	0.39	---
080	Chaney Creek	CYD-1	990719	1420	---	---	8.8	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Appendix F-1c. Physical/chemical data collected by ADEM at ecoregional reference sites located in the Alabama River Basin, 1991-2000.

Sub-Watershed	Stream	Station	Date	Time	Air Temp.	Water Temp.	Dissolved Oxygen	pH	Conductivity	Turbidity	Stream Flow	Fecal Coliform	BOD-5	TSS	TDS	TOC	ALK	T-PO4	NO3+ NO2	NH3-N	TKN	o-PO4
			yymmdd	*24hr*	*° C*	*° C*	*mg/L*	*s.u.*	*umhos @25° C*	*NTU*	*cfs*	*col./100mL*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*
Middle Alabama (0315-0203), cont.																						
080	Chaney Creek	CYD-1	990912	1345	35	29	6.1	7.6	385	---	---	---	1.5	2	251	7.52	126	0.08	0.017	<0.015	0.727	0.02
080	Washington Creek	WASP-1	950608	1206	29	26	7.7	7.7	108	4	0.5	77	---	---	---	6.24	46	0.09	0.13	<0.015	0.312	---
080	Washington Creek	WASP-1	000508	1500	30	23	7.1	7.5	129	10.5	<1	---	---	---	---	---	---	---	---	---	---	---
080	Washington Creek	WASP-1	990609	0930	27	25.4	5.9	8.0	230	8.09	0?	68	2.1	13	---	---	---	0.06	0.01	<0.015	0.33	---
080	Washington Creek	WASP-1	990720	0950	30	26.2	7.5	7.8	170	17.8	1.1	90	2.7	3	---	8.95	---	0.09	0.09	<0.015	0.3	---
Lower Alabama (0315-0204)																						
010	Silver Creek	SRC-1	910625	1235	28	23	7.6	6.8	74	8	33.4	62	---	---	---	7.6	28.0	<0.02	<0.04	<0.2	1.710	---
010	Silver Creek	SRC-1	920707	1228	31	24	7.8	7.6	102	2	4.5	2	---	---	---	4.6	43.0	0.012	0.011	<0.015	0.160	---
010	Silver Creek	SRC-1	930608	1115	30	24	7.7	7.5	102	5.1	14.1	17	---	---	---	3.8	40.0	0.015	0.008	<0.015	0.229	---
010	Silver Creek	SRC-1	940614	1225	30	24	7.9	7.5	76	6.1	17.7	40	---	---	---	5.1	31.0	0.021	0.017	<0.015	0.431	---
010	Silver Creek	SRC-1	950607	1050	28	24	8.0	7.5	82	3	10.8	22	---	---	---	7.7	31.0	0.06	0.050	<0.015	0.191	---

Appendix F-1d. Total water column metals and total hardness data collected from ecoregional reference sites in the Alabama River Basin during the various water quality monitoring activities conducted by ADEM since 1991.

Sub-Watershed #	Stream Name	Station #	Date yymmdd	Time 24hr	Hardness mg/l $CaCO_3$	Al mg/L	Ag mg/L	As ug/L	Cd mg/L	Ca mg/L	Cr-T mg/L	Cr+6 mg/L	Cu mg/L	Fe mg/L	Hg ug/L	Pb ug/L	Mg mg/L	Mn mg/L	Se mg/L	Zn mg/L	Ni mg/L
Upper Alabama (0315-0201)																					
150	Swift Creek	SWFC-1	000510	1530	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
150	Swift Creek	SWFC-1	990512	1425	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
150	Swift Creek	SWFC-1	990527	1150	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
150	Swift Creek	SWFC-1	990602	1345	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
150	Swift Creek	SWFC-1	990728	1230	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
150	Swift Creek	SWFC-1	000914	0925	9.7	<0.2	---	<10	0.003	0.003	---	---	<0.02	0.816	---	<2	1.21	0.120	<10	<0.03	---
150	Swift Creek	SWFC-1	990927	1030	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
220	Buck Creek	BCKA-26	000510	1400	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
220	Buck Creek	BCKA-26	000913	1505	4.61	<0.2	---	---	---	0.928	---	---	---	2.64	---	---	---	0.781	---	---	---
230	Soapstone Creek	SPD-1	910620	0930	68	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
230	Soapstone Creek	SPD-1	920625	1122	69	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
230	Soapstone Creek	SPD-1	930617	1155	76	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
230	Soapstone Creek	SPD-1a	940609	1050	70	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
230	Soapstone Creek	SPD-1	950613	1015	54	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
230	Soapstone Creek	SPD-1	000509	0910	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
230	Soapstone Creek	SPD-1	000913	1350	69.2	<0.2	---	---	---	25.6	---	---	---	0.241	---	---	1.27	0.034	---	---	---
Middle Alabama (0315-0203)																					
080	Chaney Creek	CYD-1	910730	1445	141	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
080	Chaney Creek	CYD-1	920625	0922	113	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
080	Chaney Creek	CYD-1	930617	0930	115	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
080	Chaney Creek	CYD-1	950509	1125	95	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
080	Chaney Creek	CYD-1	990719	1420	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
080	Chaney Creek	CYD-1	990608	1400	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
080	Chaney Creek	CYD-1	000912	1345	173	<0.2	---	---	0.003	64.6	---	---	<0.02	0.25	---	<2	2.79	0.281	<10	<0.03	---
080	Washington Creek	WASP-1	950608	1206	48	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
080	Washington Creek	WASP-1	990609	0930	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
080	Washington Creek	WASP-1	990720	0950	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
080	Washington Creek	WASP-1	000508	1500	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Lower Alabama (0315-0204)																					
010	Silver Creek	SRC-1	910625	1235	45	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
010	Silver Creek	SRC-1	920707	1228	66	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
010	Silver Creek	SRC-1	930608	1115	67	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
010	Silver Creek	SRC-1	940614	1225	60	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
010	Silver Creek	SRC-1	950607	1050	35	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Appendix F-2. State Parks Monitoring Project

***Lead agency*: ADEM**

***Purpose*:** The objectives of the State Parks Monitoring Project were to assess water quality of streams located in Alabama's state parks, to identify current and potential causes and sources of impairments, and to identify non- or minimally-impaired streams that may be considered for water use classification upgrade to Outstanding Alabama Water (OAW) (ADEM 1999d). Intensive monitoring assessments, including chemical, physical, habitat, and biological data, were conducted at 34 sites in or near 9 state parks during 1998. All samples and in-situ measures were collected in accordance with ADEM Standard Operating Procedures and Quality Assurance/Quality Control manuals (ADEM 1999f).

Appendix F-2a. Habitat assessment data

Appendix F-2b. Biological assessment data

Appendix F-2c. Physical/chemical data

References:

ADEM. 1999d. Monitoring of watersheds associated with Alabama state parks utilizing chemical, physical and biological assessments. Field Operations Division, Alabama Department of Environmental Management. Montgomery, Alabama.

Appendix F-2a. Physical characteristics and habitat assessment results for sites located in the Alabama River Basin and assessed as part ADEM's 1998 State Parks Monitoring Project. Values for each of 3 major habitat parameter categories are presented as percent of maximum score to compare habitat quality among stations.

Station		UVLD-1	VLYD-1	CHTE-1	LTLE-2	LTLM-2
CU - Sub-watershed		0201-250	0201-250	0204-110	0204-110	0204-110
Ecoregion/Subregion		65i	65i	65f	65f	65f
Drainage area (Approx. mi^2)		<1	16	5	20	18
Date (YYMMDD)		980506	980506	980527	980527	980527
Width (ft)		7	20	12	18	20
Canopy Covera		MS	MO	S	MS	S
Depth (ft)	Riffle	---	---	---	---	---
	Run	1.5	1.2	1.5	2.0	1.0
	Pool	2.0	2.5	3.0	4.5	2.0
Substrate (%)	Bedrock					
	Boulder					
	Cobble					
	Gravel		82	10	3	1
	Sand	40	10	60	82	84
	Silt		3	2	3	3
	Detritus	20	1	8	12	7
	Clay	40	4	20		5
Habitat Assessment Form[b]		GP	GP	GP	GP	GP
Habitat Survey (% maximum)						
Instream Habitat Quality		43	54	59	56	53
Sediment Deposition		81	76	84	84	80
Sinuosity		38	48	73	70	65
Bank and Vegetative Stability		74	74	48	46	55
Riparian Measurements		83	95	78	93	90
Habitat Assessment Score		146	154	150	153	150
% Maximum		66	70	68	69	68
Assessment		Good	Good	Good	Good	Good

a. Canopy cover: S=shaded; MS=mostly shaded; 50/50=50% shaded; MO=mostly open; O=open

b. Habitat Assessment Form: GP=glide/pool (Barbour et al. 1999)

Appendix F-2b. Aquatic macroinvertebrate and fish community bioassessment results for Alabama River Basin sites assessed as part of the 1998 State Parks Monitoring Project.

Station Number	UVLD-1	VLYD-1	CHTE-1	LTLE-2	LTLM-2
CU - Subwatershed #	0201-250	0201-250	0204-110	0204-110	0204-110
Subecoregion #	65i	65i	65f	65f	65f
Macroinvertebrate community					
Assessment Date	980506	980506	980527	980527	980527
# EPT families	6	8	14	17	18
Assessment	Fair	Fair	Excellent	Excellent	Excellent
Fish community					
Assessment Date		980713			
Time (min)		30			
Richness measures					
# species		14			
# darter species		2			
# minnow species		6			
# sunfish species		2			
# sucker species		2			
# intolerant species		0			
Composition measures					
% sunfish		7			
% omnivores and herbivores		11			
% insectivourous cyprinids		76			
% top carnivores		1			
Population measures					
Individuals		132			
# collected per hour		264			
% disease and anomalies		0			
IBI Score		43			
Assessment		Fair			

Appendix F-2c. Physical / chemical data collected as part of the 1998 State Parks Monitoring Project conducted by ADEM. (ADEM 1999a)

Sub-Watershed	Stream Name	Station	Date	Time	Air Temp.	Water Temp.	Dissolved Oxygen	pH	Conductivity	Turbidity	Stream Flow	Fecal Coliform	BOD-5	TSS	TDS	Alkalinity	Hardness	Total-P	NO_3+ NO_2	NH_3-N	TKN	Cl-
#		#	*yymmdd*	24hr	*°C*	*°C*	*mg/L*	*s.u.*	*umhos @25°C*	*NTU*	*cfs*	*col/100mL*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*
Upper Alabama (0315-0201)																						
250	Valley Creek	VLYD-1	980506	1120	28	23	8.0	6.0	34	6.4	8.7	87	2.7	5	35	6	8.0	<0.004	0.040	<0.015	0.22	3.64
250	Valley Creek	VLYD-1	980713	1030	33	27	6.6	6.5	32	8.8	5.1	>1050	4.4	14	60	15	11.5	0.040	0.050	<0.015	0.74	3.82
250	Valley Creek	VLYD-1	980908	1008	33	23	6.0	6.2	30	6.8	0.7	160	0.6	2	45	10	10.9	<0.004	0.080	<0.015	<0.15	4.57
250	Valley Creek	VLYD-2	840712	0925	22	22	7.9	5.9	31	10.2	4.4	16	2.2	2	30.0	8	8.1	0.004	0.030	<0.015	0.3	3.56
250	UT to Valley Creek[a]	UVLD-1	980506	1015	25	20	6.9	5.9	38	29.1	1.3	140	0.9	6	17	7	8.6	<0.004	0.090	0.070	0.47	3.76
250	UT to Valley Creek[a]	UVLD-1	980713	0920	35	25	5.8	6.5	38	27.9	1.4	>110	0.6	4	59	15	12.0	0.004	0.080	<0.015	<0.15	4.62
250	UT to Valley Creek[a]	UVLD-1	980908	0922	29	23	5.4	6.2	40	16.4	0.1	>680	2.7	6	52	20	11.8	0.020	0.110	<0.015	0.8	3.76
Lower Alabama (0315-0203)																						
110	Chitterling Creek	CHTE-1	980527	1030	29	23	6.6	5.5	22	7.0	5.9	35	0.9	4	28	2	4.9	<0.004	0.400	<0.015	<0.15	5.60
110	Chitterling Creek	CHTE-1	980714	0955	35	24	6.1	5.2	30	---	8.0	173	1.1	6	47	10	6.1	0.006	0.200	<0.015	0.15	7.25
110	Chitterling Creek	CHTE-1	981005	0935	25	23	6.6	4.9	22	5.7	10.1	190	1.4	13	45	3	5.7	0.005	0.160	<0.015	<0.15	6.22
110	Little River	LTLE-2	980527	1210	35	22	7.0	5.7	22	8.5	14.5	32	0.8	5	34	3	5.3	<0.004	0.350	<0.015	0.23	5.36
110	Little River	LTLE-2	980714	1055	35	24	5.8	4.8	24	10.0	66.3	>650	2.8	24	58	5	5.5	0.030	0.240	<0.015	0.57	4.81
110	Little River	LTLE-2	981005	1015	27	23	7.0	5.2	22	9.0	45.0	160	0.9	11	50	6	6.1	0.010	0.170	<0.015	<0.15	6.05
110	Little River	LTLM-2a	980527	1345	32	22.5	7.1	5.7	22	9.8	10.6	133	0.8	5	41	4	5.6	<0.004	0.310	<0.015	<0.15	5.60
110	Little River	LTLM-2a	980714	1210	36	24	6.4	5.2	24	10.5	36.2	400	2.8	20	53	9	5.7	0.020	0.240	<0.015	<0.15	1.32
110	Little River	LTLM-2a	981005	1105	25.5	23	7.1	5.3	23	9.6	44.3	140	0.9	17	14	4	6.2	0.010	0.160	<0.015	<0.15	6.19

a. Unnamed tributary to Valley Creek

Appendix F-3. §303(d) Waterbody Monitoring Project

***Lead agency*: ADEM**

***Purpose*:** In accordance with Section 303(d) of the Federal Clean Water Act, each state must identify its polluted waterbodies that do not meet surface water quality standards and submit this list to the EPA. In an effort to address water quality problems within Alabama, some waterbodies included on ADEM's §303(d) list are only suspected to have water quality problems based on evaluated assessment data. ADEM conducts monitored assessments of impaired waterbodies to support §303(d) listing and de-listing decisions. The program includes intensive chemical, habitat, and biological data collected using ADEM's SOPs and QA/QC manuals.

Appendix F-3a. Habitat assessment data

Appendix F-3b. Biological assessment data

Appendix F-3c. Physical/ chemical data

Appendix F-3d. Water column metals and hardness data

References:

ADEM. 2000c. Water quality monitoring data collected by ADEM in support of CWA §303(d) listing and de-listing decisions 1999-2000 (unpublished). Field Operations Division, Alabama Department of Environmental Management. Montgomery, AL.

Appendix F-3a. Physical characteristics and habitat assessment results for sites located in the Alabama River Basin and assessed as part of the CWA Section 303(d) Monitoring Program during 1999 and 2000. Values are presented as percent maximum score for each of three major habitat parameter categories.

Station Number		MRC-1	AUC-2	PLC-2	NLC-2	SWC-1[a]	IVC-2	BCH-3[a]	BCH-4[a]	BCH-5	BCH-1[a]	BCH-2
CU		0201	0201	0201	0201	0201	0201	0203	0203	0203	0203	0203
Sub-watershed		020	050	090	130	150	160	080	080	080	090	090
Ecoregion/Subregion		65b	65i	65a	65b	65b	65i	65b	65b	65b	65b	65b
Drainage area (mi^2)		77	118	59	4	135	11	198	99	89	328	283
Date (yymmdd)		990511	990913	990511	990527	990615	990513	990525	990525	990622	990525	990610
Width (ft)		30	50	25	6	40	15	40	25	25	55	12
Canopy Cover[b]		O	MO	MS	S	O	50/50	50/50	MS	50/50	MO	MO
Depth (ft)	Riffle	1.0	---	---	---	---	0.3	---	---	---	---	---
	Run	1.0	---	---	0.3	---	0.3	---	---	2.0	---	1.5
	Pool	2.5	3.5	2.3	1.5	---	1.5	---	---	3.5	---	---
Substrate (%)	Bedrock	---	---	---	---	---	---	---	---	---	---	---
	Boulder	---	---	---	---	---	2	---	---	---	---	---
	Cobble	---	3	---	2	---	---	2	7	---	---	---
	Gravel	52	45	---	40	70	1	3	3	2	5	40
	Sand	40	43	80	52	26	73	20	15	70	25	5
	Silt	1	1	1	2	2	1	30	---	3	---	5
	Detritus	7	7	19	3	2	3	25	20	9	15	5
	Clay	---	1	---	1	---	20			15	45	45
	Org. Silt	---	---	---	---	---	---	20	55	1	10	---
Habitat assessement form[c]		RR	GP	GP	RR	GP	RR	GP	GP	GP	GP	GP
Habitat Survey (% maximum)												
Instream Habitat Quality		72	64	34	50	48	50	47	61	45	55	55
Sediment Deposition		59	86	66	54	64	64	79	79	73	84	68
Sinuosity		93	50	75	85	40	85	45	60	43	88	25
Bank and Vegetative Stability		46	71	23	79	88	59	59	63	55	73	75
Riparian Measurements		58	60	44	53	89	90	89	100	90	100	90
Habitat Assessment Score		158	154	104	144	152	162	136	152	136	163	142
% Maximum		66	70	47	60	69	68	62	69	62	74	64
Assessment		Excellent	Excellent	Good	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent

a. Stream depths not estimated

b. Canopy cover: S=shaded; MS=mostly shaded; 50/50=50% shaded; MO=mostly open; O=open

c. Habitat assessment form: RR=riffle/run (Barbour et al. 1999); GP=glide/pool (Barbour et al. 1999)

Appendix F-3a, cont. Physical characteristics and habitat assessment results for sites located in the Alabama River Basin and assessed as part of the CWA Section 303(d) Monitoring Program during 1999 and 2000. Values are presented as percent maximum score for each of three major habitat parameter categories.

Station Number		PBMW-1	PBMW-2	PBMW-3	CBC-1	CBC-2[a]	GRVW-1	PURW-1	PURW-2	PURW-3	TWNW-1
CU		0203	0203	0203	0203	0203	0203	0203	0203	0203	0203
Sub-watershed		110	130	130	180	180	200	200	200	200	200
Ecoregion/Subregion		65e	65e	65e	65e	65e	65e	65e	65e	65e	65e
Drainage area (mi^2)		150	261	325	13	6	29	22	45	64	2
Date (yymmdd)		000502	000427	000502	990610	990525	000502	000426	000503	000502	000426
Width (ft)		60	60	85	20	8	12	30	15	15	15
Canopy Cover[b]		O	O	O	S	MS	S	50/50	50/50	MS	S
Depth (ft)	Riffle	---	---	0.75	---	---	0.2	0.5	0.3	0.25	0.3
	Run	1.0	0.5	1.5	1.5	---	0.9	1.0	---	1.0	0.5
	Pool	---	3.0	1.0	2.0	---	1.5	2.0	2.5	1.5	3.0
Substrate (%)	Bedrock	---	---	---	---	---	1	24	---	---	1
	Boulder	---	---	---	---	---	---	1	---	---	---
	Cobble	---	---	5	2	---	5	5	5	10	1
	Gravel	---	2	20	17	---	20	50	30	40	45
	Sand	92	93	30	55	5	50	14	40	30	45
	Silt	5	2	1	4	---	15	1	13	15	1
	Detritus	2	2	4	10	60	9	5	2	5	5
	Clay	1	1	40	11	10	---	---	10	1	1
	Org. Silt	---	---	---	1	25	---	---	---	---	---
Habitat assessement form[c]		GP	RR	RR	GP	GP	RR	RR	RR	RR	RR
Habitat Survey (% maximum)											
Instream Habitat Quality		29	25	72	38	65	48	62	61	72	62
Sediment Deposition		55	8	83	45	88	33	78	50	38	70
Sinuosity		38	0	95	18	50	33	30	73	73	90
Bank and Vegetative Stability		75	50	86	53	73	35	85	59	81	85
Riparian Measurements		68	95	95	78	63	78	95	90	90	100
Habitat Assessment Score		119	111	205	109	156	121	180	159	168	185
% Maximum		54	46	85	49	71	50	75	66	70	77
Assessment		Excellent	Good	Excellent	Good	Excellent	Good	Excellent	Excellent	Excellent	Excellent

a. Stream depths not estimated

b. Canopy cover: S=shaded; MS=mostly shaded; 50/50=50% shaded; MO=mostly open; O=open

c. Habitat assessment form: RR=riffle/run (Barbour et al. 1999); GP=glide/pool (Barbour et al. 1999)

Appendix F-3b. Aquatic macroinvertebrate and fish community bioassessment results for sites located within the Alabama River Basin and assessed as part of the CWA Section 303(d) Monitoring Program, 1999-2000.

	Upper Alabama ('0201)						Middle Alabama ('0203)							
Station Number	MRC-1	AUC-2	PLC-2	NLC-2	SWC-1	IVC-2	BCH-5	BCH-2	PBMW-1	PBMW-3	CBC-1	GRVW-1	PURW-2	PURW-3
Sub-watershed	020	050	090	130	150	160	080	090	110	130	180	200	200	200
Subecoregion	65b	65i	65a	65b	65b	65i	65b	65b	65e	65e	65e	65e	65e	65e
Macroinvertebrate community														
Assessment Date	990511	990513	990511	990527	990615	990513	990610	990610	000502	000502	990610	000502	000503	000502
# EPT families	6	4	6	7	9	9	5	11	13	12	6	7	8	10
Assessment	Good	Poor	Good	Good	Good	Good	Fair	Excellent	Excellent	Excellent	Good	Good	Good	Excellent
Fish community														
Assessment Date							990506	990506						
Time (min)							30	30						
Richness measures														
# species							17	17						
# darter species							1	1						
# minnow species							7	7						
# sunfish species							2	4						
# sucker species							2	1						
# intolerant species							0	0						
Composition measures														
% sunfish							41	56						
% omnivores and herbivores							11	18						
% insectivorous cyprinids							30	10						
% top carnivores							4	0						
Population measures														
Individuals							99	263						
# collected per hour							198	526						
% disease and anomalies							0.0	0.19						
IBI Score							40	34						
Assessment							Fair	Poor						

Appendix F-3c. Physical/chemical data collected from stations located in the Alabama River Basin as part of the CWA § 303(d) Monitoring Program, 1999-2000 (ADEM 2000c).

Sub-Watershed	Stream	Station	Date	Time	Air Temp.	Water Temp.	Dissolved Oxygen	pH	Conductivity	Turbidity	Flow	Fecal Coliform	BOD-5	TSS	TOC	Total-P	NO_3+ NO_2	NH_3-N	TKN	Hardness
		#	*yymmdd*	*24hr*	*^oC*	*^oC*	*mg/L*	*s.u.*	*umhos @ 25^{o}C*	*NTU*	*cfs*	*col/100mL*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*
Upper Alabama (0315-0201)																				
020	Mortar Creek	MRC-1	990511	1130	28	20	8.4	6.4	33	7.4	51.9									
020	Mortar Creek	MRC-1	990519	1130	26	24	7.7	7.3	35	19.2	84.1	67		20		0.16		0.47		0.12
020	Mortar Creek	MRC-1	990602	0950	27	24	8.1	7.2	35	9.4	54.6	37		10		0.20		0.42		0.09
020	Mortar Creek	MRC-1	990708	0900	26	24	6.5	7.1	40	32.0	high	520		55		0.20		<0.15		0.09
020	Mortar Creek	MRC-1	990831	0920	26	27	6.8	7.1	50		22.0	38		13		0.33		0.58		0.07
020	Mortar Creek	MRC-2	990519	1121	26	24	8.3	7.5	40	16.7		40 est.								
020	Mortar Creek	MRC-2	990602	1030	28	26	8.1	7.2	35	11.0		20		7		0.10		0.71		0.17
020	Mortar Creek	MRC-2	990708	0915	30	26	6.8	7.0	50	32.0		260		68		0.13		0.70		0.21
020	Mortar Creek	MRC-2	990831	1005	25	26	7.2	7.2	50	9.8		20		33		0.26		0.65		0.22
050	Autauga Creek	AUC-1	990603	1310	27	26	8.7	6.6	30	7.4		570		1		0.19	<0.015	0.43		0.14
050	Autauga Creek	AUC-1	990726	1335	34	29	7.5	7.0	40	7.6		440	0.30	5	3.27	0.23	<0.015	0.42		0.01
050	Autauga Creek	AUC-1	990824	1020	34	26	9.2	7.3	30	11.5		600	1.70	14	3.26	0.22	0.53	0.53		0.01
050	Autauga Creek	AUC-1	990908	1125	34	26	9.5	7.0	40	5.8		682	1.50	5	3.35	0.22	<0.015	<0.15		0.01
050	Autauga Creek	AUC-2	990513	1330	23.5	22	12.5	6.0	18	7.5	118.3									
050	Autauga Creek	AUC-2	990603	1020	35	24	8.5	7.0	20	9.9		60 est.		4		0.13	<0.015	<0.15		0.02
050	Autauga Creek	AUC-2	990726	1430	32	27	7.5	6.7	30	16.3		133	0.30	6	4.06	0.16	<0.015	0.42		0.01
050	Autauga Creek	AUC-2	990824	1145	36	28	8.4	7.0	30	6.0		147	1.40	11	3.15	0.12	<0.015	0.37		<0.004
050	Autauga Creek	AUC-2	990908	1005	36	27	8.6	6.7	30	6.4		77	2.60	55	3.45	0.13	<0.015	<0.15		0.03
060	Catoma Creek	CATM-1	000706	0905	30	24	4.0	7.6	195			10 est.								
060	Catoma Creek	CATM-1	001004	0944	22	21	5.0	6.99	130		0.1	9 est.								
060	Catoma Creek	CATM-1	000502	0940	23	20	6.0	7.4	150	20	3.5	57 est.								
060	Catoma Creek	CATM-1	000530	0900	23	22	4.0	7.5	200		0.5	54								
060	Catoma Creek	CATM-1	000621	0910	30	25	4.0	7.4	180		0.7	113								
060	Catoma Creek	CATM-1	000516	0919								26								
060	Catoma Creek	CATM-1	000522	0924								67								
060	Catoma Creek	CATM-1	000524	0922								29								

Appendix F-3c. Physical/chemical data collected from stations located in the Alabama River Basin as part of the CWA § 303(d) Monitoring Program, 1999-2000 (ADEM 2000c).

Sub-Watershed	Stream	Station	Date	Time	Air Temp.	Water Temp.	Dissolved Oxygen	pH	Conductivity	Turbidity	Flow	Fecal Coliform	BOD-5	TSS	TOC	Total-P	NO_3+ NO_2	NH_3-N	TKN	Hardness
		#	*yymmdd*	*24hr*	*^oC*	*^oC*	*mg/L*	*s.u.*	*umhos @ 25^oC*	*NTU*	*cfs*	*col/100mL*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*
Upper Alabama (0315-0201), cont.																				
060	Catoma Creek	CATM-1	001128	0948	13	11	9.1	6.95	90	17.9	16.0`	127								
060	Catoma Creek	CATM-1	001108	0925			0.0													
060	Catoma Creek	CATM-1	010108	0950								70								
060	Catoma Creek	CATM-1	010116	0835								26								
060	Catoma Creek	CATM-1	010110	0935	4	5	12.0	6.7	80	11.2	16.7	17 est.								
060	Catoma Creek	CATM-2	000706	0930	30	26	3.0	7.5	210			12 est.								
060	Catoma Creek	CATM-2	000502	1000	23	20	6.0	7.4	150	17		90								
060	Catoma Creek	CATM-2	001004	1020	24	21	4.0	7.1	140			51								
060	Catoma Creek	CATM-2	000621	0935	30	26	3.0	7.4	220			63								
060	Catoma Creek	CATM-2	000530	0930	26	24	3.0	7.49	230			140								
060	Catoma Creek	CATM-2	000524	0930								150								
060	Catoma Creek	CATM-2	000522	0933								42								
060	Catoma Creek	CATM-2	000516	0925								55								
060	Catoma Creek	CATM-2	001128	1023	19	12	8.9	6.83	100	17.9		87								
060	Catoma Creek	CATM-2	010108	0957								73								
060	Catoma Creek	CATM-2	010116	0845								26								
060	Catoma Creek	CATM-2	010110	1008	9	6	12.4	6.1	90	10.7		4 est.								
060	Catoma Creek	CATM-2	001108	0932	25	21	2.1	7.25	150	6.2		180								
060	Little Catoma Creek	LCTM-1	000502	0900	22	20	4.0	7.2	200	15.2		200								
060	Little Catoma Creek	LCTM-1	000706	0850	29	27	1.0	7.4	380			> 66								
060	Little Catoma Creek	LCTM-1	001004	0920	21	22	3.0	7.3	260			26								
060	Little Catoma Creek	LCTM-1	000621	0840	27	27	2.0	7.3	380			113								
060	Little Catoma Creek	LCTM-1	000530	0840	21	25	1.0	7.26	310			53								
060	Little Catoma Creek	LCTM-1	000524	0918								127								
060	Little Catoma Creek	LCTM-1	000522	0919								200								
060	Little Catoma Creek	LCTM-1	000516	0914								25								

Appendix F-3c. Physical/chemical data collected from stations located in the Alabama River Basin as part of the CWA § 303(d) Monitoring Program, 1999-2000 (ADEM 2000c).

Sub-Watershed	Stream	Station	Date	Time	Air Temp.	Water Temp.	Dissolved Oxygen	pH	Conductivity	Turbidity	Flow	Fecal Coliform	BOD-5	TSS	TOC	Total-P	NO_3+ NO_2	NH_3-N	TKN	Hardness
		#	*yymmdd*	*24hr*	*^oC*	*^oC*	*mg/L*	*s.u.*	*umhos @ 25^oC*	*NTU*	*cfs*	*col/100mL*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*
Upper Alabama (0315-0201), cont.																				
060	Little Catoma Creek	LCTM-1	001128	0935	16	11	6.5	7.37	70	31.3		57 est.								
060	Little Catoma Creek	LCTM-1	010108	0945								66								
060	Little Catoma Creek	LCTM-1	010116	0830								35								
060	Little Catoma Creek	LCTM-1	010110	0915	10	7	9.5	7.6	120	16.2		4 est.								
060	Little Catoma Creek	LCTM-1	001108	0905	26	21	2.5	7.21	270	13.5		107								
080	Catoma Creek	CATM-3	000706	0955	30	26	5.0	7.7	260			1 est.								
080	Catoma Creek	CATM-3	000502	1025	25	21	8.0	7.5	220	11		10 est.								
080	Catoma Creek	CATM-3	001004	1115	27	23	8.0	7.9	270			2 est.								
080	Catoma Creek	CATM-3	000621	1000	27.5	30	4.0	7.63	260			50								
080	Catoma Creek	CATM-3	000530	1000	29	24	4.0	7.7	240			57								
080	Catoma Creek	CATM-3	000516	0943								30								
080	Catoma Creek	CATM-3	000524	0942								220								
080	Catoma Creek	CATM-3	000522	0947								>8600								
080	Catoma Creek	CATM-3	001128	1102	19	12	9.7	6.91	120	16		210								
080	Catoma Creek	CATM-3	010108	1010								966								
080	Catoma Creek	CATM-3	010116	0855								20 est.								
080	Catoma Creek	CATM-3	010110	1033	7	6	12.0	6.9	130	12.8		67 est.								
080	Catoma Creek	CATM-3	001108	0950	28	23	3.6	7.42	210	5.13		>3867								
080	Catoma Creek	CATM-4	000502	1045	25	22	8.0	7.6	230	9.19		73								
080	Catoma Creek	CATM-4	000706	1015	31	26	4.0	7.6	270			50 est.								
080	Catoma Creek	CATM-4	000621	1020	31	28	4.0	7.5	190			200								
080	Catoma Creek	CATM-4	000530	1018	30	25	5.0	7.7	250			220								
080	Catoma Creek	CATM-4	000516	0955								97								
080	Catoma Creek	CATM-4	000524	0952								340								
080	Catoma Creek	CATM-4	000522	0957								>10000								
080	Catoma Creek	CATM-4	001128	1125	19	12	9.9	7.36	130	13.3		120 est.								

Appendix F-3c. Physical/chemical data collected from stations located in the Alabama River Basin as part of the CWA § 303(d) Monitoring Program, 1999-2000 (ADEM 2000c).

Sub-Watershed	Stream	Station	Date	Time	Air Temp.	Water Temp.	Dissolved Oxygen	pH	Conductivity	Turbidity	Flow	Fecal Coliform	BOD-5	TSS	TOC	Total-P	NO_3+ NO_2	NH_3-N	TKN	Hardness
		#	*yymmdd*	*24hr*	*^oC*	*^oC*	*mg/L*	*s.u.*	*umhos @ 25^oC*	*NTU*	*cfs*	*col/100mL*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*
Upper Alabama (0315-0201), cont.																				
080	Catoma Creek	CATM-4	010108	1020								766								
080	Catoma Creek	CATM-4	010116	0910								27 est.								
080	Catoma Creek	CATM-4	010110	1054	14	7	12.9	6.01	130	12.5		67 est.								
080	Catoma Creek	CATM-4	001108	1010	27	23	4.0	7.44	230	4.5		>4000								
080	Catoma Creek	CATM-4	001004	1135	28	23	9.0	8	250			20								
080	Catoma Creek	CATM-5	000502	1100	27	23	9.0	8	230	4.78		20								
080	Catoma Creek	CATM-5	001004	1155	29	23	10.0	8.4	240			13 est.								
080	Catoma Creek	CATM-5	000621	1040	30	29	8.0	8.1	225			20								
080	Catoma Creek	CATM-5	000530	1037	32	26	69.0	8.01	250			50								
080	Catoma Creek	CATM-5	000706	1035	32	26	6.0	7.9	230			1 est								
080	Catoma Creek	CATM-5	000524	1003								212								
080	Catoma Creek	CATM-5	000516	1013								12 est.								
080	Catoma Creek	CATM-5	000522	1008								>27000								
080	Catoma Creek	CATM-5	001128	1146	20	13	11.1	7.45	150	10.4		60 est.								
080	Catoma Creek	CATM-5	010108	1030								>2466								
080	Catoma Creek	CATM-5	010116	0920								2700								
080	Catoma Creek	CATM-5	001108	1020	27	23	5.5	7.62	170	12.1		>2867								
080	Catoma Creek	CATM-5	010110	1111	8	6	13.1	6.6	150	12		1167								
080	Catoma Creek	CATM-6	000502	1120	29	23	7.0	7.5	250	15.5		46								
080	Catoma Creek	CATM-6	000706	1055	32	27	6.0	7.5	250			3 est.								
080	Catoma Creek	CATM-6	000530	1100	27.7	31	4.0	7.45	280			270								
080	Catoma Creek	CATM-6	000621	1100	31	29	6.0	7.3	290			120								
080	Catoma Creek	CATM-6	000524	1015								>1000								
080	Catoma Creek	CATM-6	000516	1022								12 est.								
080	Catoma Creek	CATM-6	000522	1018								58								
080	Catoma Creek	CATM-6	001128	1210	23	13	10.3	7.2	150	11.2		110 est.								

Appendix F-3c. Physical/chemical data collected from stations located in the Alabama River Basin as part of the CWA § 303(d) Monitoring Program, 1999-2000 (ADEM 2000c).

Sub-Watershed	Stream	Station	Date	Time	Air Temp.	Water Temp.	Dissolved Oxygen	pH	Conductivity	Turbidity	Flow	Fecal Coliform	BOD-5	TSS	TOC	Total-P	NO_3+ NO_2	NH_3-N	TKN	Hardness
		#	*yymmdd*	*24hr*	*^oC*	*^oC*	*mg/L*	*s.u.*	*umhos @ 25^oC*	*NTU*	*cfs*	*col/100mL*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*
Upper Alabama (0315-0201), cont.																				
080	Catoma Creek	CATM-6	010108	1037								1100								
080	Catoma Creek	CATM-6	010116	0930								870								
080	Catoma Creek	CATM-6	010110	1136	11	7	11.3	6.4	190	12.2		370								
080	Catoma Creek	CATM-6	001004	1220	32	26	9.0	7.4	290			22								
080	Catoma Creek	CATM-6	001108	1035	25	23	5.5	7.46	150	36.5		>3933								
090	Pintlalla Creek	PLC-1	990602	1250	35		9.4			28.1		490	2.40	27	10.17	0.09	<0.015	0.29		0.15
090	Pintlalla Creek	PLC-1	990726	1210	38	28	6.0	7.3	230	24.0		510	1.40	22	9.64	0.13	<0.015	0.94		0.11
090	Pintlalla Creek	PLC-1	990824	1245	34	28	7.7	6.9	220	16.9		>640	2.00	23	7.57	0.09	0.21	0.71		0.13
090	Pintlalla Creek	PLC-1	990908	1215																
090	Pintlalla Creek	PLC-2	990511	1440	30	21	7.2	7.2	207	13.9	7.6									
090	Pintlalla Creek	PLC-2	990602	1230	36		9.1		150	23.9		157	2.00	19	9.01	0.07	0.10	0.85		0.11
090	Pintlalla Creek	PLC-2	990726	1150	38	27	6.5	7.2	230	12.8		70	0.80	9	7.61	0.16	<0.015	0.54		0.06
090	Pintlalla Creek	PLC-2	990824	1300	33	26	8.6	7.1	180	7.6		190	2.50	10	7.63	0.09	<0.015	0.68		0.03
090	Pintlalla Creek	PLC-2	990908	1230	35	27	6.7	6.9	200	5.6		93	1.10	3	7.50	0.04	<0.015	<0.15		0.07
090	Pintlalla Creek	PLC-3	990602	1155	32		7.7		200	20.6		190	3.10	26	10.29	0.16	0.05	0.43		0.14
090	Pintlalla Creek	PLC-3	990726	1135							0.00									
090	Pintlalla Creek	PLC-3	990824	1320																
090	Pintlalla Creek	PLC-3	990908	1245																
130	Noland Creek	NLC-1	990603	1120						12.5		70		8		0.18	<0.015	<0.15		0.05
130	Noland Creek	NLC-1	990726	1405							0.00									
130	Noland Creek	NLC-1	990824	1110																
130	Noland Creek	NLC-1	990908	0915																
130	Noland Creek	NLC-2	990527	0755	23	22	7.8	6.9	55		0.4									
130	Noland Creek	NLC-2	990603	1035	38	29	10.0	7.3	50	2.9		369		2		0.07	<0.015	<0.15		0.01
130	Noland Creek	NLC-2	990726	1350	36	30	8.1	7.3	70	4.9		130	0.90	3	1.94	0.06	<0.015	<0.15		0.01
130	Noland Creek	NLC-2	990824	1120																

Appendix F-3c. Physical/chemical data collected from stations located in the Alabama River Basin as part of the CWA § 303(d) Monitoring Program, 1999-2000 (ADEM 2000c).

Sub-Watershed	Stream	Station	Date	Time	Air Temp.	Water Temp.	Dissolved Oxygen	pH	Conductivity	Turbidity	Flow	Fecal Coliform	BOD_5	TSS	TOC	Total-P	NO_3+ NO_2	NH_3-N	TKN	Hardness
		#	*yymmdd*	*24hr*	*^oC*	*^oC*	*mg/L*	*s.u.*	*umhos @ 25^{o}C*	*NTU*	*cfs*	*col/100mL*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*
Upper Alabama (0315-0201), cont.																				
130	Noland Creek	NLC-2	990908	0940																
150	Swift Creek	SWC-1	990511	1005	27	25	8.5	5.7	30		22.8	80		23		0.19		0.24		0.06
150	Swift Creek	SWC-1	990602	0920	26	23	8.3	6.7	20	40.0	112.9	140		43		0.18		<0.15		0.05
150	Swift Creek	SWC-1	990615	0835	27.5	26	7.5	5.9	27	51.6	75.4									
150	Swift Creek	SWC-1	990727	0945	34	28	8.0	7.1	20	23.3	99.1	100		24		0.18		<0.15		0.01
150	Swift Creek	SWC-1	990927	1330	26	24	9.6	6.8	20	9.8	54.1	68		7		0.17		<0.15		0.05
150	Swift Creek	SWC-2	990511	1130	28	21	8.6	6.4	23		67.8	30		7		0.26		0.34		<0.004
150	Swift Creek	SWC-2	990603	1120	29	23	8.1	6.8	25	11.0	57.8	37		15		0.17		<0.15		0.02
150	Swift Creek	SWC-2	990728	1000	30	27	8.3	7.1	40	22.7	76.2	200		10		0.20		<0.15		<0.004
150	Swift Creek	SWC-2	990928	1030	26	23	8.2	7.0	20	4.0	35.9	16 est.		5		0.19		<0.15		0.04
150	Swift Creek	SWC-3	990511	1520	25	23	9.5	6.8	30		50.7	45		7		0.28		0.43		<0.004
150	Swift Creek	SWC-3	990603	1430	25	25	8.1	6.6	30	9.7	35.5	50		12		0.24		<0.15		0.01
150	Swift Creek	SWC-3	990728	1115	31	26	8.0	7.2	25	7.2	45.6	127		10		0.22		<0.15		<0.004
150	Swift Creek	SWC-3	990927	1620	26	23	8.3	7.2	20	2.0	21.2	25		4		0.24		<0.15		0.02
160	Ivy Creek	IVC-1	990512	1000	23	19	9.0	7.3	70	6.2	9.6	70 est.		5		0.93		0.24		0.03
160	Ivy Creek	IVC-1	990602	1030	29	24	8.8	7.4	100	8.1	8.2	153		3		0.80		<0.15		0.04
160	Ivy Creek	IVC-1	990727	1100	36	27	8.6	7.5	80	7.3	8.4	410		7		0.80		<0.15		0.03
160	Ivy Creek	IVC-1	990927								0.00									
160	Ivy Creek	IVC-2	990512	1100	24	20	9.6	6.8	25	5.3	3.5	67		2		0.57		0.33		0.01
160	Ivy Creek	IVC-2	990513	0930	23	18	8.9	6.2	30	5.8	3.0									
160	Ivy Creek	IVC-2	990602	1100	35	23	9.7	6.9	40	7.2	3.2	33		2		0.53		<0.15		0.02
160	Ivy Creek	IVC-2	990727	1145	29	27	8.3	7.3	40	7.5	2.6	420		5		0.80		<0.15		0.01
160	Ivy Creek	IVC-2	990927	1500	25	23	8.5	7.0	30	1.3	1.5	51		2		0.66		<0.15		0.03

Appendix F-3c. Physical/chemical data collected from stations located in the Alabama River Basin as part of the CWA § 303(d) Monitoring Program, 1999-2000 (ADEM 2000c).

Sub-Watershed	Stream	Station	Date	Time	Air Temp.	Water Temp.	Dissolved Oxygen	pH	Conductivity	Turbidity	Flow	Fecal Coliform	BOD_5	TSS	TOC	Total-P	NO_3+ NO_2	NH_3-N	TKN	Hardness
		#	yymmdd	24hr	°C	°C	mg/L	s.u.	umhos @ 25°C	NTU	cfs	col/100mL	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Middle Alabama (0315-0203)																				
080	Boguechitto Creek	BCH-3	990608	1425	32	30	9.0	8.0	220	7.3		no data	2.00	12	6.54	0.04	<0.015	<0.15		0.04
080	Boguechitto Creek	BCH-3	990719	1450	32	29	9.5	8.5	200	19.0		110 est.	2.20	6	8.46	0.21	<0.015	0.39		0.11
080	Boguechitto Creek	BCH-3	990825	1410	33	29	8.9	7.9	290	3.8		>700	1.30	21	7.62	0.01	<0.015	0.62		0.12
080	Boguechitto Creek	BCH-3	990915	1425	33	28	8.9	8.1	240	2.1		>1860	1.20	11	8.36	0.01	<0.015	<0.15		0.11
080	Boguechitto Creek	BCH-4	990608	1500	30	28	8.2	7.7	170	7.4		no data	1.70	12	5.70	0.09	<0.015	<0.15		0.05
080	Boguechitto Creek	BCH-4	990720	1125	30	27	7.7	7.8	140	17.7		190 est.	0.90	5	7.30	0.15	<0.015	0.33		0.09
080	Boguechitto Creek	BCH-4	990825	1500	30	27	6.0	7.8	290	4.0		279	0.70	29	6.82	0.01	<0.015	0.43		0.01
080	Boguechitto Creek	BCH-4	990915	1500	33	27	8.1	8.1	270	1.5		49	0.60	10	7.39	<0.003	<0.015	<0.15		0.05
080	Boguechitto Creek	BCH-5	990609	1040	27	26	6.9	7.8	110	11.6	1.4	93	1.10	18	5.37	0.08	<0.015	0.18		0.05
080	Boguechitto Creek	BCH-5	990610	1355	33	27	6.4	7.4	126	9.7										
080	Boguechitto Creek	BCH-5	990720	1045	30	26	7.2	7.7	120	20.6	10.7	340	0.80	4	7.28	0.16	<0.015	0.37		0.08
080	Boguechitto Creek	BCH-5	990826	1100	31	25	1.4	7.5	250	9.1	0.3	39	1.60	30	8.24	0.01	<0.015	0.57		0.02
080	Boguechitto Creek	BCH-5	990916																	
090	Boguechitto Creek	BCH-1	990608	1200	30	28	8.1	7.8	210	25.9		47 est.	4.20	22	9.78	0.98	0.04	1.17		0.11
090	Boguechitto Creek	BCH-1	990719	1250	32	28	7.9	7.7	210	20.3		193	3.90	12	10.30	0.23	<0.015	0.93		0.11
090	Boguechitto Creek	BCH-1	990825	1225	33	28	7.5	8.2	250	5.8		195	1.50	10	7.06	0.05	<0.015	0.33		0.03
090	Boguechitto Creek	BCH-1	990915	1215	30	26	7.0	7.8	160	5.0		18 est.	0.90	9	7.16	0.15	<0.015	<0.15		0.15
090	Boguechitto Creek	BCH-2	990608	1250	27	29	8.5	7.5	215	18.5	2.6	80	2.70	27	7.15	0.82	<0.015	0.25		0.08
090	Boguechitto Creek	BCH-2	990610	1300	28	27	6.1	7.9	255.40	15.8	4.1									
090	Boguechitto Creek	BCH-2	990719	1345	34	29	8.2	8.1	200	23.8	34.1	120 est.	2.40	12	10.00	0.17	<0.015	0.56		0.15
090	Boguechitto Creek	BCH-2	990825	1305	33	27	6.2	7.7	150	11.2	4.9	187	0.90	16	5.48	0.16	<0.015	0.52		0.09
090	Boguechitto Creek	BCH-2	990915	1320	30	26	8.7	7.7	170	8.1	0.3	14 est.	1.20	14	5.42	0.15	<0.015	<0.15		0.20

Appendix F-3c. Physical/chemical data collected from stations located in the Alabama River Basin as part of the CWA § 303(d) Monitoring Program, 1999-2000 (ADEM 2000c).

Sub-Watershed	Stream	Station	Date	Time	Air Temp.	Water Temp.	Dissolved Oxygen	pH	Conductivity	Turbidity	Flow	Fecal Coliform	BOD_5	TSS	TOC	Total-P	NO_3+ NO_2	NH_3-N	TKN	Hardness
		#	*yymmdd*	*24hr*	*°C*	*°C*	*mg/L*	*s.u.*	*umhos @ 25°C*	*NTU*	*cfs*	*col/100mL*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*
Middle Alabama (0315-0203), cont.																				
110	Pine Barren Creek	PBMW-1	000502	1330	22	22	8.0	7.6	90.5	10.8										
110	Pine Barren Creek	PBMW-1	000427	0825	16	14	9.0	7.2	80	11.7	44.0	210	<1.0	9		0.036	0.264	0.03	0.43	38
110	Pine Barren Creek	PBMW-1	000518	0855	24	22	8.0	7.3	80	11.7	20.3	280	<2.0	7		0.039	0.27	0.03	0.34	38
110	Pine Barren Creek	PBMW-1	000608	0810	20	20	7.9	7.1	70	14.1	16.8	280	<0.1	5		0.031		0.01	0.48	33
110	Pine Barren Creek	PBMW-1	000925	1445	30	29	7.5	7.3	50	8.1	18.2	420	<1.0	9		0.026	0.196	0.03	0.35	23
110	Pine Barren Creek	PBMW-1	010117	1000	13	9	11.0	7.4	100	24	181	700	<2.0	27		0.079	0.182	<0.01	0.64	55
110	Pine Barren Creek	PBMW-1	010221	0940	20	14	10.1	7.1	90	8.9	73.1	160	<1.0	9		0.032	0.123	0.02	0.34	41
130	Pine Barren Creek	PBMW-2	000427	1150	19	18	10.0	7.4	120											
130	Pine Barren Creek	PBMW-2	000518	0830	24	24	6.9	7.4	120											
130	Pine Barren Creek	PBMW-2	000607	1743	26	28	8.3	7.8	100											
130	Pine Barren Creek	PBMW-2	000925	1530	30	29	8.0	7.7	60											
130	Pine Barren Creek	PBMW-2	010117	0940	11	9	11.1	7.4	120											
130	Pine Barren Creek	PBMW-2	010220	1715	19	14	10.0	7.5	130											
130	Pine Barren Creek	PBMW-3	000427	1010	22	18	9.0	7.5	150	11.1	109.0	44	<1.0	11		0.038	0.13	0.01	0.43	73
130	Pine Barren Creek	PBMW-3	000502	1055	24.5	21	9.0	7.75	154	13.2										
130	Pine Barren Creek	PBMW-3	000517	1610	32	27	8.5	7.8	140	8.6	26.8	36	<2.0	8		0.041	0.04	0.02	0.34	71
130	Pine Barren Creek	PBMW-3	000608	0922	22	26	8.2	7.8	120	16.2	21.4	44	<0.1	15		0.043		<0.01	0.61	58
130	Pine Barren Creek	PBMW-3	000926	0805	16	25	6.9	7.1	80	5.6	19.7	280		7		0.028	0.082	0.02	0.29	35
130	Pine Barren Creek	PBMW-3	010117	0845	8	9	11.1	7.4	130	17.6	278	430	<2.0	23		0.053	0.146	<0.01	0.46	63
130	Pine Barren Creek	PBMW-3	010221	0825	20	14	10.0	6.9	160	8.8	158	93	<1.0	9		0.036	0.038	0.01	0.39	73
130	Pine Barren Creek	PBMW-4	000427	1320	19	18	9.0	7.5	170	12		88	<1.0	12		0.044	0.103	0.02	0.47	81
130	Pine Barren Creek	PBMW-4	000518	0745	22	26	6.6	7.4	150	11.1		60	<2.0	9		0.045	0.021	0.03	0.45	69
130	Pine Barren Creek	PBMW-4	000608	0720	19	24	6.5	7.3	130	15.8		80	<0.1	18		0.046		0.01	0.41	72
130	Pine Barren Creek	PBMW-4	000925	1635	27	29	7.7	7.6	80	7.7		380	1.1	16		0.031	0.029	0.02	0.38	42
130	Pine Barren Creek	PBMW-4	010117	0820	8	9	11.0	7.3	130	13		210	<2.0	15		0.042	0.14	0.08	0.4	63
130	Pine Barren Creek	PBMW-4	010221	0800	17	14	9.8	7	170	9.6		54	<1.0	11		0.037	0.029	0.01	0.54	81

Appendix F-3c. Physical/chemical data collected from stations located in the Alabama River Basin as part of the CWA § 303(d) Monitoring Program, 1999-2000 (ADEM 2000c).

Sub-Watershed	Stream	Station	Date	Time	Air Temp.	Water Temp.	Dissolved Oxygen	pH	Conductivity	Turbidity	Flow	Fecal Coliform	BOD_5	TSS	TOC	Total-P	NO_3+ NO_2	NH_3-N	TKN	Hardness
		#	*yymmdd*	*24hr*	*^oC*	*^oC*	*mg/L*	*s.u.*	*umhos @ 25^oC*	*NTU*	*cfs*	*col/100mL*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*
Middle Alabama (0315-0203), cont.																				
180	Beaver Creek	BEVW-1	000503	1030	26	19	3.0	7	192	32.2										
180	Cub Creek	CBC-1	990608	1100	30	24	3.9	6.8	190	10.6	0.00	123	3.40	14	6.54	0.04	<0.015	0.17		0.11
180	Cub Creek	CBC-1	990610	0930	24	23	2.5	7.0	197	9.1	0.4									
180	Cub Creek	CBC-1	990719	1140	35	27	4.0	7.1	160	28.2	0.2	90	2.00	20	12.10	0.11	<0.015	0.18		0.12
180	Cub Creek	CBC-1	990825	1130	33	26	1.1	6.9	200	6.8	0.1	107	2.00	6	9.86	0.02	<0.015	0.38		0.17
180	Cub Creek	CBC-1	990915	1115	30	23	2.5	7.4	210	5.0	0.2	>990	6.40	58	9.02	<0.003	0.06	<0.15		0.17
180	Cub Creek	CBC-2	990608	1020	31	24	2.9	7.0	170	20.8		93	4.40	25	10.59	0.02	0.03	0.41		0.09
180	Cub Creek	CBC-2	990719	1050	35	26	3.8	6.4	160	35.4		210	2.80	7	11.10	0.09	<0.015	0.53		0.15
180	Cub Creek	CUBW-30	000503	1020	25	18	4.0	6.9	241	11.5										
200	Camden South WWTP	CSWW-1	000426	1123	20	22	17.0	9.3	830	7.9	0.245	>400	9.0	27		0.728	9.54	0.01	1.9	30
200	Camden South WWTP	CSWW-1	000517	1030	28	27	11.2	8.8	1060	4	0.28	4	7.0	11		1.460	11.8	0.03	1.6	24
200	Camden South WWTP	CSWW-1	000607	1315	26	30	10.0	8.5	850	3	0.22	60	1.6	5		2.280		0.33	1.5	26
200	Camden South WWTP	CSWW-1	000925	1255	31	29	14.6	9	1100	19	0.14	95	7.1	31		2.780	15.6	0.05	0.82	20
200	Camden South WWTP	CSWW-1	010116	1125	10	12	10.4	7.9	710	2.1	0.29	420	<2.0	5		0.274	12.8	<0.01	0.67	33
200	Camden South WWTP	CSWW-1	010220	1350	21	16	10.9	8.1	560	2.1	0.37	460	<1.0	5		0.335	7.35	0.02	0.92	43
200	Gravel Creek	GRVW-1	000426	1440	20	17	9.0	7.7	290	2.6	3.6	48	<1.0	6		0.020	<0.005	0.01	0.32	129
200	Gravel Creek	GRVW-1	000517	1245	33	23	6.9	7.5	310	4.1	1.2	210	<2.0	5		0.040	<0.005	0.03	0.36	132
200	Gravel Creek	GRVW-1	000607	1100	25	21	7.9	7.4	270	4.3	1.2	88	<0.1	5		0.031		0.01	0.32	128
200	Gravel Creek	GRVW-1	000925	1130	31	26	4.6	7.3	270	6.5	0.6	210	<1.0	13		0.051	<0.005	0.02	0.38	115
200	Gravel Creek	GRVW-1	010116	1510	8	9	10.8	7.6	340	3.9	10.0	150	<2.0	5		0.026	0.051	<0.01	0.38	160
200	Gravel Creek	GRVW-1	010220	1140	21	14	10.7	7.6	290	1.8	8.9	58	<1.0	5		0.020	0.013	<0.01	0.47	134
200	Pursley Creek	PURW-1	000426	1735	17	18	10.0	7.8	210	6.4	2.5	96	<1.0	7		0.035	0.01	0.02	0.39	91

Appendix F-3c. Physical/chemical data collected from stations located in the Alabama River Basin as part of the CWA § 303(d) Monitoring Program, 1999-2000 (ADEM 2000c).

Sub-Watershed	Stream	Station	Date	Time	Air Temp.	Water Temp.	Dissolved Oxygen	pH	Conductivity	Turbidity	Flow	Fecal Coliform	BOD_5	TSS	TOC	Total-P	NO_3+ NO_2	NH_3-N	TKN	Hardness
		#	*yymmdd*	*24hr*	*°C*	*°C*	*mg/L*	*s.u.*	*umhos @ 25°C*	*NTU*	*cfs*	*col/100mL*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*
Middle Alabama (0315-0203), cont.																				
200	Pursley Creek	PURW-1	000517	1515	34	25	9.1	7.9	270	2.2	0.1	110	<2.0	5		0.037	0.019	0.03	0.44	119
200	Pursley Creek	PURW-1	000607	1519	26	27	8.1	7.7	220	2.1	0.1	20	<0.1	5		0.025		0.02	0.62	106
200	Pursley Creek	PURW-1	000925	1405	30	26	6.4	7.2	190	4	0.0	610	1.2	6		0.038	0.031	0.08	0.58	84
200	Pursley Creek	PURW-1	010116	1315	8	9	11.1	7.4	180	10	11.7	1000	<2.0	5		0.052	0.034	<0.01	0.44	83
200	Pursley Creek	PURW-1	010220	1620	18	15	10.6	7.7	160	6.6	10.7	230	<1.0	8		0.030	0.025	<0.01	0.32	65
200	Pursley Creek	PURW-2	000503	0800	19	22	8.0	7.8	226	6.18										
200	Pursley Creek	PURW-2	000426	1600	20	19	8.0	7.9	200	3.7	6.7	24	<1.0	6		0.028	<0.005	0.01	0.44	89
200	Pursley Creek	PURW-2	000517	1410	33	26	8.1	7.8	250	1.6	0.4	16	<2.0	5		0.030	0.01	0.01	0.43	115
200	Pursley Creek	PURW-2	000607	1418	27	26	8.4	7.9	230	2.2	0.5	16	<0.1	5		0.026		<0.01	0.49	111
200	Pursley Creek	PURW-2	000925	1335	31	33	9.4	8	260	3.7	0.0	300	1.9	5		0.028	0.014	0.01	0.71	108
200	Pursley Creek	PURW-2	010116	1230	10	9	11.4	7.5	180	5.3	15.3	36	<2.0	5		0.024	0.02	<0.01	0.42	82
200	Pursley Creek	PURW-2	010220	1520	22	14	10.4	7.6	160	5.3	25	83	<1.0	5		0.026	0.048	<0.01	0.37	72
200	Pursley Creek	PURW-3	000502	1800	22	21	9.0	7.8	217	4.81										
200	Pursley Creek	PURW-3	000426	1119	19	17	9.0	7.7	200	5.7	11.9	640	<1.0	7		0.061	0.216	0.09	0.51	77
200	Pursley Creek	PURW-3	000517	1155	28	23	7.6	7.8	260	2.2	2.4	300	<2.0	5		0.047	0.179	0.03	0.33	91
200	Pursley Creek	PURW-3	000607	1210	26	22	7.9	7.7	210	3.2	1.5	120	<1.0	5		0.057		0.03	0.42	77
200	Pursley Creek	PURW-3	000925	1215	31	26	4.8	7.4	270	3.4	0.6	240	1.2	11		0.066	0.037	0.04	0.47	80
200	Pursley Creek	PURW-3	010116	1420	8	9	11.0	7.6	200	5.5	23.2	680	<2.0	6		0.060	0.266	0.03	0.56	81
200	Pursley Creek	PURW-3	010220	1300	21	14	12.7	8.3	170	5	36	510	<1.0	6		0.039	0.159	<0.01	0.45	63
200	Town Branch	TWNW-1	000426	1210	20	15	8.0	7.4	190	6	0.3	76	<1.0	8		0.029	0.204	0.03	0.42	58
200	Town Branch	TWNW-1	000517	1040	28	20	4.6	7.2	190	4.4	0.1	100	<2.0	5		0.038	0.064	0.04	0.43	56
200	Town Branch	TWNW-1	000607	1340	26	21	5.8	7.3	170	3.9	0.1	210	<0.1	5		0.039		0.03	0.4	56
200	Town Branch	TWNW-1	000925	1300	31	26	2.6	7.6	620	5	0.1	440	4.1	5		1.410	0.031	10.4	10.8	44
200	Town Branch	TWNW-1	010116	1135	10	9	9.4	7.5	210	8.3	1.2	100	<2.0	9		0.037	0.614	0.02	0.52	72
200	Town Branch	TWNW-1	010220	1410	20	14	10.9	7.6	180	6.7	1.4	110	1.2	13		0.031	0.23	0.01	0.47	60

Appendix F-3d. Results of total water column metals analyses from sites located within the Alabama River Basin as part of ADEM's CWA §303(d) Monitoring Program, 1999-2000 (ADEM 2000c).

Sub-Watershed #	Stream	Station #	Date (yymmdd)	Time (24hr)	Hardness mg/L	Fe mg/L	Cr mg/L	Mn mg/L	Cu mg/L	Zn mg/L	As ug/L	Cd mg/L	Pb ug/L	Hg ug/L	Al mg/L	Ni mg/L
Middle Alabama (0315-0203)																
110	Pine Barren Creek	PBMW-1	000502	1330												
110	Pine Barren Creek	PBMW-1	000427	0825	38											
110	Pine Barren Creek	PBMW-1	000518	0855	38											
110	Pine Barren Creek	PBMW-1	000608	0810	33											
110	Pine Barren Creek	PBMW-1	000925	1445	23											
110	Pine Barren Creek	PBMW-1	010117	1000	55											
110	Pine Barren Creek	PBMW-1	010221	0940	41											
130	Pine Barren Creek	PBMW-2	000427	1150												
130	Pine Barren Creek	PBMW-2	000518	0830												
130	Pine Barren Creek	PBMW-2	000607	1743												
130	Pine Barren Creek	PBMW-2	000925	1530												
130	Pine Barren Creek	PBMW-2	010117	0940												
130	Pine Barren Creek	PBMW-2	010220	1715												
130	Pine Barren Creek	PBMW-3	000502	1055												
130	Pine Barren Creek	PBMW-3	000427	1010	73											
130	Pine Barren Creek	PBMW-3	000517	1610	71											
130	Pine Barren Creek	PBMW-3	000608	0922	58											
130	Pine Barren Creek	PBMW-3	000926	0805	35											
130	Pine Barren Creek	PBMW-3	010117	0845	63											
130	Pine Barren Creek	PBMW-3	010221	0825	73											
130	Pine Barren Creek	PBMW-4	000427	1320	81											
130	Pine Barren Creek	PBMW-4	000518	0745	69											
130	Pine Barren Creek	PBMW-4	000608	0720	72											
130	Pine Barren Creek	PBMW-4	000925	1635	42											
130	Pine Barren Creek	PBMW-4	010117	0820	63											
130	Pine Barren Creek	PBMW-4	010221	0800	81											

Appendix F-3d. Results of total water column metals analyses from sites located within the Alabama River Basin as part of ADEM's CWA §303(d) Monitoring Program, 1999-2000 (ADEM 2000c).

Sub-Watershed #	Stream	Station #	Date (yymmdd)	Time (24hr)	Hardness mg/L	Fe mg/L	Cr mg/L	Mn mg/L	Cu mg/L	Zn mg/L	As ug/L	Cd ug/L	Pb ug/L	Hg ug/L	Al mg/L	Ni mg/L
Middle Alabama (0315-0203)																
200	Camden South WWTP	CSWW-1	000426	1123	30	<0.5	<0.03	0.1	<0.05	<0.02	<7	<0.25	<5	<0.5	<2	<0.070
200	Camden South WWTP	CSWW-1	000517	1030	24											
200	Camden South WWTP	CSWW-1	000607	1315	26	<1.0	<0.002	0.1	<0.006	0.02	<7	<0.25	<5	<0.5	<2	<0.007
200	Camden South WWTP	CSWW-1	000925	1255	20	<0.34	<0.1	0.1	0.013	0.02	<7	<0.25	<10	<0.5	<5	<0.100
200	Camden South WWTP	CSWW-1	010116	1125	33	<0.25	<0.003	0.04	<0.006	<0.02	<7	<0.25	<5	<0.5	<2.5	<0.004
200	Camden South WWTP	CSWW-1	010220	1350	43	<0.25	<0.003	0.04	<0.006	<0.02	<7	<0.25	<5	<0.5	<2.5	<0.007
200	Pursley Creek	PURW-1	000426	1735	91											
200	Pursley Creek	PURW-1	000517	1515	119											
200	Pursley Creek	PURW-1	000607	1519	106											
200	Pursley Creek	PURW-1	000925	1405	84											
200	Pursley Creek	PURW-1	010116	1315	83											
200	Pursley Creek	PURW-1	010220	1620	65											
200	Pursley Creek	PURW-2	000503	0800												
200	Pursley Creek	PURW-2	000426	1600	89	0.52	0.03	0.1	<0.05	<0.02	<7	<0.25	<5	<0.5	<2	<0.35
200	Pursley Creek	PURW-2	000517	1410	115	1	<0.007	0.1	<0.003	<0.02	<7	<0.25	<5		<2	<0.0035
200	Pursley Creek	PURW-2	000607	1418	111	1	<0.002	0.1	<0.006	<0.02	<7	<0.25	<5	<0.5	<2	<0.007
200	Pursley Creek	PURW-2	000925	1335	108	0.56	<0.1	0.1	0.012	<0.02	<7	<0.25	<10	<0.5	<5	<0.1
200	Pursley Creek	PURW-2	010116	1230	82	0.52	<0.003	0.04	<0.006	<0.02	<7	<0.25	<5	<0.5	<2.5	<0.0035
200	Pursley Creek	PURW-2	010220	1520	72	0.64	<0.003	0.04	0.01		<7	<0.25	<5	<0.5	<2.5	<0.007
200	Pursley Creek	PURW-3	000502	1800												
200	Pursley Creek	PURW-3	000426	1119	77	0.51	<0.03	0.1	<0.05	<0.02	<7	<0.25	<5	<0.5	<2	<0.07
200	Pursley Creek	PURW-3	000517	1155	91	1	<0.007	0.1	<0.003	<0.02	<7	<0.25	<5		<2	<0.0035
200	Pursley Creek	PURW-3	000607	1210	77	1	<0.002	0.1	0.013	<0.02	<7	<0.25	<5	<0.5	<2	<0.007
200	Pursley Creek	PURW-3	000925	1215	80	0.64	<0.1	0.13	<0.007	<0.02	<7	<0.25	<10	<0.5	<5	<0.1
200	Pursley Creek	PURW-3	010116	1420	81	0.6	<0.003	0.04	<0.006	<0.02	<7	<0.25	<5	<0.5	<2.5	<0.0035
200	Pursley Creek	PURW-3	010220	1300	63	0.58	<0.003	0.04	<0.006	<0.02	<7	<0.25	<5	<0.5	<2.5	<0.007

Appendix F-4. Catoma Creek Watershed Long-term Monitoring Project

***Lead agency*:** Water Works and Sewer Board of the City of Montgomery under contract with ADEM

***Purpose*:** The Water Works and Sewer Board of the City of Montgomery initiated a watershed management program (WMP) for the Catoma Creek Watershed in 1995 for the purpose of protecting the aquatic ecosystem and human health. The objectives of the project are to collect baseline chemical, habitat, and biological data; determine if the Catoma Creek watershed is meeting state-designated uses; document any changes in habitat or biological conditions; and, provide additional background information based on current landuse conditions for future management considerations.

The macroinvertebrate and fish communities were assessed using several community attributes as recommended by the USEPA (Plafkin et al. 1989) (CH2MHill 2000).

Appendix F-4a. Habitat assessment data

Appendix F-4b. Biological assessment data

Appendix F-4c. Physical/ chemical data

References:

CH2M-Hill. 2000. Catoma Creek Watershed long-term monitoring, draft. CH2M-Hill, Montgomery, Alabama. Prepared for the Water Works and Sanitary Sewer Board of the City of Montgomery, Alabama. 61 pp.

Appendix F-4a. Habitat quality estimates for longterm monitoring sites located within the Catoma Creek watershed and assessed by CH2M-Hill (CH2M-Hill 2000) using the riffle-run assessment matrix. Habitat parameter categories are presented as percent maximum score.

Station Number	D	R	G	Z*	H	S	X	J	O
Sub-watershed	060	080	060	140	070	060	190	080	080
Ecoregion/Subregion	65a	65a	65a	65a	65a	65a	65a	65a	65a
Instream Habitat Quality	23	25	20	---	32	18	63	43	41
Sediment Deposition	14	39	21	---	21	28	78	34	54
Sinuosity	5	5	3	---	5	0	68	35	25
Bank and Vegetative Stability	61	48	59	---	43	55	60	66	70
Riparian Measurements	100	74	85	---	90	93	88	79	93
Habitat Assessment Score	110	105	109	---	107	110	167	128	139
% Reference	---	63	65	---	64	66	---	77	83
Assessment (CH2M-Hill)	Reference	Partially similar	Partially similar	Reference	Partially similar	Partially similar	Reference	Similar	Similar
% Maximum	50	48	50	---	49	50	76	58	63
Assessment	Good	Good	Good	---	Good	Good	Excellent	Excellent	Excellent

* not located in this basin

Appendix F-4b. Aquatic macroinvertebrate and fish community bioassessment results from the Catoma Creek watershed long-term monitoring project conducted by CH2M-Hill in May, 2000 (CH2M-Hill 2000). Macroinvertebrate assessments are based on comparison to study-specific reference sites. A fish IBI assessment was not conducted at station R.

Station Number	D	G	R	Z*	H	S	X	J	O
CU - Subwatershed #	060	060	080	140	070	060	190	080	080
Subecoregion #	65a	65a	65a	65a	65a	65a	65a	65a	65a
Macroinvertebrate community									
Assessment Date (mm/yy)	05/00	05/00	05/00	05/00	05/00	05/00	05/00	05/00	05/00
Total # taxa	78	54	37	48	50	65	65	46	52
% contribution of dominant (Total)	0.13	0.21	0.29	0.20	0.39	0.27	0.23	0.22	0.49
# EPT taxa	16	5	2	11	11	15	17	7	6
EPT/Chironomidae	0.44	0.06	0.03	0.85	0.33	0.19	0.90	0.22	0.05
Biotic Index	6.32	7.85	7.06	6.80	7.58	6.36	5.84	6.24	6.13
Scrapers/filtering collectors	0.76	0.11	0.38	0.72	1.13	0.16	0.17	0.91	7.40
Shredders/Total # organisms	0.02	0.00	0.42	0.04	0.67	0.12	0.33	0.04	0.43
Total Score	42	14	22	42	34	30	40	20	22
% similarity to reference	---	33	52	---	81	71	---	50	55
Assessment	Reference	Moderately impaired	Moderately impaired	Reference	Slightly impaired	Slightly impaired	Reference	Moderately impaired	Slightly impaired
Fish community									
Assessment Date	05/00	05/00		05/00	05/00	05/00	05/00	05/00	05/00
Time (min)									
Richness measures									
# species	20	15		21	20	22	30	16	15
# darter species	3	2		5	4	5	6	3	2
# minnow species	6	3		5	6	6	8	5	5
# sunfish species	3	5		5	6	5	3	5	4
# intolerant species	3	2		2	3	4	6	4	3
Composition measures									
% bluntnose minnow, western	8	42		46	35	17	3	19	7
% hybrids	0	0		0	0	0	0	0	0
% omnivores	6	14		11	8	10	14	16	7
% insectivourous cyprinids	63	14		5	11	23	31	66	88
% top carnivores	1	2		0	1	2	2	0	0
Population measures									
# collected per hour	712	164		146	237	464	842	348	404
% disease and anomalies	0.7	25		4.3	7.6	9.0	4.8	3	3.8
IBI Score	52	40		38	40	42	50	44	38
Assessment	Good	Fair		Poor-Fair	Fair	Fair	Good	Fair	Poor-Fair

Appendix F-4c. Physical / chemical data collected from October1998 to February 2000 as part of the Catoma Creek Watershed long-term monitoring project conducted by the Montgomery Water Works and Sanitary Sewer Board of the city of Montgomery.

Sub-watershed	Stream	Station	Date	T-H_20	pH	Conductivity	Turbidity	Total coliform	E. coli	Toxicity	BOD-5	TSS	TDS	Total-P	NO_3	NH_3-N	TKN	ALK	Cd	Cr	Pb
		#	*yymmdd*	*^oC*	*s.u.*	*umhos @25^{o}C*	*NTU*	*col/500 mL*	*col/500 mL*	*EC50*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*
Upper Alabama (0315-0201)																					
070	Tributary to Ramer Creek	A	981021	19.0	7.4	226	6.4	>200.5	47.8	>100%	1	6	122	0.14	0.03	0.03	0.19	80.8	<20	<20	<50
070	Tributary to Ramer Creek	A	981118	16.2	7.3	190	12.3	>200.5	>200.5	>100%	3	20	109	<0.1	0.03	<0.02	0.51	65.2	<20	<20	<50
070	Tributary to Ramer Creek	A	981216	13.0	7.4	168	11.4	>200.5	65.9	>100%	1	42	94	0.28	0.23	0.19	0.17	76.2	<20	<20	<50
070	Tributary to Ramer Creek	A	990120	13.4	7.5	205	11.2	>200.5	>200.5	>100%	1	2	117	<0.1	0.03	0.06	0.26	74.0	<20	36	<50
070	Tributary to Ramer Creek	A	990217	16.6	7.1	236	11.4	>200.5	>200.5	>100%	1	14	121	0.34	0.04	0.03	0.17	73.6	<20	<20	<50
070	Tributary to Ramer Creek	A	990317	12.6	7.6	153	24.4	>200.5	>200.5	>100%	1	22	82	<0.1	0.04	0.06	0.26	47.2	<20	<20	<50
070	Tributary to Ramer Creek	A	990421	19.3	7.3	152	9.8	>200.5	>200.5	>100%	1	9	76	<0.1	0.03	<0.02	0.52	72.9	<20	<20	<50
070	Tributary to Ramer Creek	A	990519	21.6	7.7	97	86.2	>200.5	>200.5	>100%	5	127	47	0.60	0.06	<0.02	1.34	31.7	<20	<20	<50
070	Tributary to Ramer Creek	A	990619	23.2	7.1	218	9.8	>200.5	>200.5	>100%	1	19	103	<0.1	0.16	0.10	0.44	87.4	<20	<20	<50
070	Tributary to Ramer Creek	A	990728	26.6	7.7	392	11.7	>200.5	>200.5	>100%	1	23	171	0.18	0.07	0.03	0.79	108.0	<20	<20	<50
070	Tributary to Ramer Creek	A	990825	24.0	6.8	180	284.0	>200.5	>200.5	>100%	7	16	87	0.98	0.26	1.25	3.14	48.2	<20	<20	<50
070	Tributary to Ramer Creek	A	990915	21.0	7.7	248	13.6	>200.5	4.2	>100%	4	25	125	0.18	0.03	<0.02	1.14	97.5	<20	<20	<50
070	Tributary to Ramer Creek	A	991020	17.1	7.4	238	5.9	>200.5	42.9	>100%	4	21	131	0.26	0.03	<0.02	1.54	90.4	<20	<20	<50
070	Tributary to Ramer Creek	A	991117	9.7	7.8	205	8.4	>200.5	83.1	>100%	6	18	124	0.24	<0.02	<0.02	<0.1	92.6	<20	<20	<50
070	Tributary to Ramer Creek	A	991215	13.3	7.3	146	10.9	200	200.0	>100%	1	3	86	<0.1	<0.02	0.04	0.46	64.3	<20	<20	<50
070	Tributary to Ramer Creek	A	000119	13.3	7.9	242	18.4	200	200.0	>100%	2	19	115	<0.1	<0.02	0.14	0.89	90.6	<20	<20	<50
070	Tributary to Ramer Creek	A	000216	12.9	8.5	270	16.1	200	200.0	>100%	1	25	129	<0.1	<0.02	<0.02	0.51	71.7	<20	<20	<50
060	Baskins Mill Creek	D	981021	17.7	7.3	112	9.1	>200.5	165.2	>100%	1	2	65	0.32	0.04	<0.02	0.52	36.0	<20	<20	<50
060	Baskins Mill Creek	D	981118	14.8	6.9	94	6.3	>200.5	>200.5	>100%	2	6	58	<0.1	0.03	<0.02	0.21	32.1	<20	<20	<50
060	Baskins Mill Creek	D	981216	11.9	7.6	82	11.4	>200.5	>200.5	>100%	2	1	50	0.34	0.03	0.23	0.21	36.0	<20	<20	<50
060	Baskins Mill Creek	D	990120	12.6	7.5	96	11.8	>200.5	65.9	>100%	1	6	58	<0.1	0.03	0.04	0.21	34.2	<20	<20	<50
060	Baskins Mill Creek	D	990217	15.5	7.1	180	12.2	>200.5	165.2	>100%	1	14	79	0.28	0.04	0.07	0.33	32.5	<20	<20	<50
060	Baskins Mill Creek	D	990317	12.0	7.4	72	24.6	>200.5	>200.5	>100%	1	26	46	<0.1	0.05	0.04	0.21	19.1	<20	<20	<50
060	Baskins Mill Creek	D	990421	17.2	7.2	74	14.3	>200.5	>200.5	>100%	1	8	37	<0.1	0.05	0.03	0.53	36.2	<20	<20	<50
060	Baskins Mill Creek	D	990519	19.9	7.6	77	102.0	>200.5	>200.5	>100%	4	150	41	0.16	0.10	<0.02	1.11	27.7	<20	<20	<50
060	Baskins Mill Creek	D	990619	22.8	6.9	101	23.1	>200.5	>200.5	>100%	1	50	46	<0.1	0.07	0.08	0.72	36.9	<20	<20	<50
060	Baskins Mill Creek	D	990728	25.7	7.1	140	14.8	>200.5	>200.5	>100%	1	18	66	0.11	0.05	<0.02	0.77	40.0	<20	<20	<50
060	Baskins Mill Creek	D	990825	24.0	6.8	105	20.3	>200.5	>200.5	>100%	2	26	50	0.16	0.07	<0.02	0.90	28.9	<20	<20	<50
060	Baskins Mill Creek	D	990915	20.3	7.5	123	8.9	>200.5	>200.5	>100%	1	3	65	0.20	0.08	<0.02	0.40	40.9	<20	<20	<50
060	Baskins Mill Creek	D	991020	17.5	7.3	112	6.8	>200.5	165.2	>100%	1	3	63	0.24	0.03	<0.02	0.84	39.0	<20	<20	<50
060	Baskins Mill Creek	D	991117	8.0	7.9	92	7.2	>200.5	144.5	>100%	2	7	66	<0.1	<0.02	<0.02	<0.1	33.4	<20	<20	<50
060	Baskins Mill Creek	D	991215	10.8	7.5	79	11.6	200	200.0	>100%	1	1	52	<0.1	<0.02	<0.02	0.37	32.6	<20	<20	<50
060	Baskins Mill Creek	D	000119	12.9	8.2	123	10.0	200	118.4	>100%	1	10	58	0.24	<0.02	<0.02	0.53	33.7	<20	<20	<50
060	Baskins Mill Creek	D	000216	12.3	8.0	130	15.7	200	200.0	>100%	1	19	62	0.34	<0.02	<0.02	0.53	32.6	<20	<20	<50

Appendix F-4c. Physical / chemical data collected from October1998 to February 2000 as part of the Catoma Creek Watershed long-term monitoring project conducted by the Montgomery Water Works and Sanitary Sewer Board of the city of Montgomery.

Sub-Water-shed	Stream	Station	Date	T-H_20	pH	Conductivity	Turbidity	Total coliform	E. coli	Toxicity	BOD-5	TSS	TDS	Total P	NO_3	NH_3-N	TKN	ALK	Cd	Cr	Pb
		#	*yymmdd*	*^oC*	*s.u.*	*umhos @25^{o}C*	*NTU*	*col/500 ml*	*col/500 ml*	*EC50*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*
Upper Alabama (0315-0201)																					
060	Upper Catoma Creek	F	981021	18.9	7.1	163	6.0	>200.5	88.5	>100%	1	3	91	0.44	0.03	<0.02	0.73	57.9	39	<20	<50
060	Upper Catoma Creek	F	981118	15.6	6.8	130	4.8	109	109.1	>100%	1	16	79	0.18	0.03	<0.02	0.31	48.4	<20	<20	<50
060	Upper Catoma Creek	F	981216	11.6	7.5	118	9.6	>200.5	118.4	>100%	1	3	76	0.12	0.03	0.20	0.25	48.5	<20	<20	<50
060	Upper Catoma Creek	F	990120	13.0	7.5	144	14.1	>200.5	109.1	>100%	1	6	84	0.12	0.03	0.06	0.31	66.5	<20	<20	<50
060	Upper Catoma Creek	F	990217	15.4	7.0	189	17.2	>200.5	>200.5	>100%	1	9	88	0.50	0.03	0.10	0.42	50.0	<20	<20	<50
060	Upper Catoma Creek	F	990317	12.8	7.3	77	46.1	>200.5	>200.5	>100%	2	40	46	0.12	0.04	0.05	0.31	25.3	<20	<20	<50
060	Upper Catoma Creek	F	990421	18.1	7.1	87	25.6	>200.5	>200.5	>100%	1	9	44	0.15	0.07	0.04	0.76	44.5	<20	<20	<50
060	Upper Catoma Creek	F	990519	21.7	7.5	189	16.5	>200.5	>200.5	>100%	3	21	98	<0.1	0.06	0.03	1.34	94.4	<20	<20	<50
060	Upper Catoma Creek	F	990619	23.8	6.8	133	21.8	>200.5	>200.5	>100%	1	17	62	<0.1	0.14	0.03	0.63	54.8	<20	<20	<50
060	Upper Catoma Creek	F	990728	25.9	7.1	158	21.6	>200.5	>200.5	>100%	1	17	71	0.16	0.08	<0.02	0.93	38.9	<20	<20	<50
060	Upper Catoma Creek	F	990825	25.0	7.0	155	12.2	>200.5	>200.5	>100%	1	12	74	0.24	0.13	0.06	0.84	45.2	<20	<20	<50
060	Upper Catoma Creek	F	990915	21.9	7.4	188	6.2	>200.5	73.8	>100%	1	2	96	0.20	0.09	<0.02	0.52	61.6	<20	<20	<50
060	Upper Catoma Creek	F	991020	18.2	7.2	139	7.2	>200.5	27.1	>100%	1	13	76	0.48	0.07	0.03	0.83	44.1	<20	<20	<50
060	Upper Catoma Creek	F	991117	10.1	7.8	141	4.7	>200.5	22.2	>100%	1	1	97	<0.1	<0.02	<0.02	<0.1	60.5	<20	<20	<50
060	Upper Catoma Creek	F	991215	11.9	7.3	99	8.6	200	129.8	>100%	1	1	63	<0.1	<0.02	<0.02	0.35	44.1	<20	<20	<50
060	Upper Catoma Creek	F	000119	13.1	8.1	151	13.2	200	83.1	>100%	1	7	71	<0.1	<0.02	<0.02	0.58	48.9	<20	<20	<50
060	Upper Catoma Creek	F	000216	14.1	8.0	187	19.4	200	200.0	>100%	1	29	89	0.50	<0.02	<0.02	0.77	48.7	<20	<20	<50
060	Little Catoma Creek	G	981021	18.3	7.1	160	11.8	>200.5	88.5	>100%	1	7	93	0.30	0.03	<0.02	0.82	57.5	<20	<20	<50
060	Little Catoma Creek	G	981118	15.0	6.7	172	9.8	>200.5	>200.5	>100%	4	11	103	<0.1	0.03	<0.02	0.72	78.2	<20	<20	<50
060	Little Catoma Creek	G	981216	11.5	7.4	154	24.4	>200.5	144.5	>100%	3	3	101	0.34	0.03	0.33	1.24	83.9	<20	<20	<50
060	Little Catoma Creek	G	990120	11.4	7.3	138	34.6	>200.5	>200.5	>100%	2	15	85	<0.1	0.03	0.09	0.72	49.4	<20	<20	<50
060	Little Catoma Creek	G	990217	15.2	6.9	204	22.8	>200.5	>200.5	>100%	2	12	103	0.66	0.03	0.11	0.56	49.0	<20	<20	<50
060	Little Catoma Creek	G	990317	11.5	7.6	95	55.0	>200.5	>200.5	>100%	2	25	64	<0.1	0.03	0.09	0.72	22.3	<20	<20	<50
060	Little Catoma Creek	G	990421	16.8	7.1	81	44.0	>200.5	>200.5	>100%	2	24	47	<0.1	0.09	0.06	1.08	36.1	<20	<20	<50
060	Little Catoma Creek	G	990519	19.4	7.5	147	34.5	>200.5	>200.5	>100%	2	27	80	0.60	0.12	0.07	0.86	57.3	<20	<20	<50
060	Little Catoma Creek	G	990619	23.5	6.8	163	30.8	>200.5	>200.5	>100%	2	36	77	0.12	0.07	0.13	0.88	64.4	<20	<20	<50
060	Little Catoma Creek	G	990728	25.2	7.1	135	51.2	>200.5	>200.5	>100%	2	65	65	0.14	0.12	0.04	1.20	29.7	<20	<20	<50
060	Little Catoma Creek	G	990825	24.0	7.0	182	50.6	>200.5	>200.5	>100%	2	38	87	0.20	0.10	0.06	1.23	48.4	<20	<20	<50
060	Little Catoma Creek	G	990915	21.6	7.4	191	7.7	>200.5	94.5	>100%	3	2	101	0.28	0.03	<0.02	0.58	62.7	<20	<20	<50
060	Little Catoma Creek	G	991020	17.8	7.3	152	9.4	>200.5	144.5	>100%	2	17	87	0.44	0.03	<0.02	0.95	44.7	<20	<20	<50
060	Little Catoma Creek	G	991117	9.7	8.1	140	7.6	>200.5	53.1	>100%	7	21	100	0.24	<0.02	<0.02	<0.1	116.0	<20	<20	<50
060	Little Catoma Creek	G	991215	9.9	7.2	145	17.8	200	200.0	>100%	5	15	101	<0.1	<0.02	0.03	1.01	70.6	<20	<20	<50
060	Little Catoma Creek	G	000119	12.3	7.9	179	32.3	200	101.3	>100%	2	11	84	0.12	<0.02	<0.02	0.92	50.6	<20	<20	<50
060	Little Catoma Creek	G	000216	13.0	7.7	170	52.2	200	200.0	>100%	1	32	81	0.54	<0.02	<0.02	1.11	31.5	<20	<20	<50

Appendix F-4c. Physical / chemical data collected from October1998 to February 2000 as part of the Catoma Creek Watershed long-term monitoring project conducted by the Montgomery Water Works and Sanitary Sewer Board of the city of Montgomery.

Sub-Water-shed	Stream	Station	Date	T-H_20	pH	Conductivity	Turbidity	Total coliform	E. coli	Toxicity	BOD-5	TSS	TDS	Total P	NO_3	NH_3-N	TKN	ALK	Cd	Cr	Pb
		#	*yymmdd*	*^oC*	*s.u.*	*umhos @25^oC*	*NTU*	*col/500 ml*	*col/500 ml*	*EC50*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*
Upper Alabama (0315-0201)																					
070	Ramer Creek	H	981021	18.8	7.2	283	5.9	>200.5	47.8	>100%	1	3	150	0.28	0.03	<0.02	0.33	121.0	<20	<20	<50
070	Ramer Creek	H	981118	16.4	7.3	231	5.8	130	129.8	>100%	1	14	135	<0.1	0.03	<0.02	0.59	99.1	<20	<20	<50
070	Ramer Creek	H	981216	11.2	7.8	214	6.8	31	30.6	>100%	1	1	141	<0.1	0.03	0.21	0.35	119.0	<20	<20	<50
070	Ramer Creek	H	990120	13.9	7.9	207	15.1	>200.5	94.5	>100%	1	9	116	<0.1	0.03	0.07	0.61	89.6	<20	32	---
070	Ramer Creek	H	990217	15.3	7.0	191	12.0	>200.5	144.5	>100%	2	16	96	0.24	0.03	0.08	0.53	107.0	<20	<20	<50
070	Ramer Creek	H	990317	13.6	7.5	171	43.6	>200.5	>200.5	>100%	2	74	92	<0.1	0.05	0.07	0.61	64.2	<20	<20	<50
070	Ramer Creek	H	990421	19.6	7.3	156	20.7	>200.5	>200.5	>100%	2	13	78	<0.1	0.05	0.05	0.78	84.5	<20	<20	<50
070	Ramer Creek	H	990519	21.1	7.7	241	86.3	>200.5	>200.5	>100%	2	134	124	0.12	0.08	<0.02	1.00	109.0	<20	<20	<50
070	Ramer Creek	H	990619	24.1	7.1	207	15.5	>200.5	47.8	>100%	1	19	96	<0.1	0.11	0.03	1.01	87.9	<20	<20	<50
070	Ramer Creek	H	990728	26.3	7.5	302	20.7	>200.5	>200.5	>100%	1	17	136	0.14	0.08	0.02	1.20	99.8	<20	<20	<50
070	Ramer Creek	H	990825	24.0	7.2	378	8.6	>200.5	129.8	>100%	5	18	179	0.28	0.03	<0.02	0.68	25.4	<20	<20	<50
070	Ramer Creek	H	990915	21.0	7.7	382	2.6	>200.5	8.7	>100%	1	1	194	0.22	0.03	<0.02	0.38	148.0	<20	<20	<50
070	Ramer Creek	H	991020	18.0	7.4	291	4.1	>200.5	62.4	>100%	1	1	156	0.32	0.03	<0.02	0.73	118.0	<20	<20	<50
070	Ramer Creek	H	991117	10.6	7.8	247	8.0	>200.5	4.2	>100%	2	5	144	<0.1	<0.02	<0.02	0.10	100.5	<20	<20	<50
070	Ramer Creek	H	991215	14.3	7.5	238	6.6	200	200.0	>100%	3	1	143	<0.1	<0.02	<0.02	0.84	147.0	<20	<20	<50
070	Ramer Creek	H	000119	13.2	8.1	276	14.4	200	165.2	>100%	2	13	131	0.52	<0.02	<0.02	0.89	118.0	<20	<20	<50
070	Ramer Creek	H	000216	14.7	8.2	251	34.3	200	200.0	>100%	1	133	119	1.34	0.04	<0.02	0.48	78.7	<20	<20	<50
080	Catoma Creek	J	981021	19.7	7.3	247	7.0	>200.5	165.2	>100%	1	9	134	0.24	0.03	<0.02	0.47	97.9	<20	<20	<50
080	Catoma Creek	J	981118	16.3	7.3	249	4.6	48	47.8	>100%	1	24	138	0.12	0.03	<0.02	0.49	95.4	<20	<20	<50
080	Catoma Creek	J	981216	10.7	7.6	189	4.7	>200.5	>200.5	>100%	2	11	125	0.50	0.24	0.25	0.50	102.0	<20	<20	<50
080	Catoma Creek	J	990120	12.3	7.7	181	13.3	>200.5	74.0	>100%	1	17	104	<0.1	0.03	0.06	0.33	76.7	<20	27	<50
080	Catoma Creek	J	990217	14.7	7.2	188	14.4	>200.5	53.1	>100%	2	16	92	0.50	0.03	0.05	0.42	65.5	<20	<20	<50
080	Catoma Creek	J	990317	13.9	7.7	87	54.0	>200.5	>200.5	>100%	2	40	49	<0.1	0.03	0.06	0.33	29.8	<20	<20	<50
080	Catoma Creek	J	990421	19.7	7.4	116	24.4	>200.5	>200.5	>100%	2	13	58	<0.1	0.07	0.04	0.93	60.2	<20	<20	<50
080	Catoma Creek	J	990519	21.9	7.7	164	76.3	>200.5	>200.5	>100%	4	104	83	1.00	0.23	<0.02	1.15	68.8	<20	<20	<50
080	Catoma Creek	J	990619	24.4	7.1	202	17.9	>200.5	144.5	>100%	1	23	93	<0.1	0.09	0.04	0.21	79.6	<20	<20	<50
080	Catoma Creek	J	990728	26.4	7.5	221	27.3	>200.5	118.4	>100%	1	27	96	0.11	0.10	<0.02	0.77	64.2	<20	<20	<50
080	Catoma Creek	J	990825	24.0	7.1	248	25.8	>200.5	>200.5	>100%	3	96	118	0.24	0.56	<0.02	1.21	66.2	<20	<20	<50
080	Catoma Creek	J	990915	22.6	7.7	283	9.2	>200.5	16.4	>100%	2	4	143	0.24	0.03	<0.02	0.44	85.7	<20	<20	<50
080	Catoma Creek	J	991020	18.9	7.3	228	8.7	>200.5	109.1	>100%	1	4	123	0.26	0.03	<0.02	0.23	69.6	<20	<20	<50
080	Catoma Creek	J	991117	10.6	7.8	258	34.7	>200.5	53.1	>100%	3	130	159	0.36	<0.02	<0.02	<0.1	48.7	<20	<20	<50
080	Catoma Creek	J	991215	13.2	7.7	228	8.0	200	200.0	>100%	1	1	141	<0.1	0.17	<0.02	0.48	91.1	<20	<20	<50
080	Catoma Creek	J	000119	13.2	8.2	221	11.1	200	62.4	>100%	2	3	104	0.20	<0.02	<0.02	0.70	79.4	<20	<20	<50
080	Catoma Creek	J	000216	14.9	8.3	228	34.2	200	200.0	>100%	1	108	109	0.48	0.07	<0.02	0.80	65.3	<20	<20	<50

Appendix F-4c. Physical / chemical data collected from October1998 to February 2000 as part of the Catoma Creek Watershed long-term monitoring project conducted by the Montgomery Water Works and Sanitary Sewer Board of the city of Montgomery.

Sub-Water-shed	Stream	Station	Date	T-H_2O	pH	Conductivity	Turbidity	Total coliform	E. coli	Toxicity	BOD-5	TSS	TDS	Total P	NO_3	NH_3-N	TKN	ALK	Cd	Cr	Pb
		#	*yymmdd*	*^oC*	*s.u.*	*umhos @25^oC*	*NTU*	*col/500 ml*	*col/500 ml*	*EC50*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*
Upper Alabama (0315-0201)																					
080	Hannon Slough	L	981021	18.6	7.4	291	2.6	>200.5	109.1	>100%	1	5	160	0.30	0.03	<0.02	0.31	103.0	<20	<20	<50
080	Hannon Slough	L	981118	14.6	7.3	205	5.4	145	144.5	>100%	2	12	123	<0.1	0.03	<0.02	0.46	87.0	<20	<20	<50
080	Hannon Slough	L	981216	10.0	8.1	198	16.4	>200.5	65.9	>100%	3	1	132	0.14	0.03	0.23	0.52	86.7	<20	<20	<50
080	Hannon Slough	L	990120	13.2	7.7	253	2.3	>200.5	>200.5	>100%	3	5	146	0.28	0.03	0.21	0.65	86.4	<20	21	<50
080	Hannon Slough	L	990217	15.0	7.2	181	2.4	>200.5	56.0	>100%	2	3	83	0.20	0.03	0.04	0.28	110.0	<20	<20	<50
080	Hannon Slough	L	990317	12.3	7.7	342	7.2	>200.5	>200.5	>100%	1	11	197	0.28	0.06	0.21	0.65	157.0	<20	<20	<50
080	Hannon Slough	L	990421	18.6	7.3	258	1.7	>200.5	>200.5	>100%	2	1	129	<0.1	0.03	<0.02	0.96	119.0	<20	<20	<50
080	Hannon Slough	L	990519	20.7	7.6	204	7.0	>200.5	>200.5	>100%	4	19	107	0.24	0.33	<0.02	1.16	94.3	<20	<20	<50
080	Hannon Slough	L	990619	24.6	7.0	291	3.4	>200.5	>200.5	>100%	1	17	139	<0.1	0.03	<0.02	0.45	114.0	<20	<20	<50
080	Hannon Slough	L	990728	26.0	7.5	412	2.8	>200.5	165.2	>100%	1	3	177	0.11	0.03	<0.02	0.76	107.0	<20	<20	<50
080	Hannon Slough	L	990825	25.0	6.9	146	12.3	>200.5	>200.5	>100%	4	30	70	0.42	0.50	<0.02	1.09	38.8	<20	<20	<50
080	Hannon Slough	L	990915	22.6	7.7	291	1.8	>200.5	>200.5	>100%	1	3	146	<0.1	0.03	0.07	0.38	77.8	<20	<20	<50
080	Hannon Slough	L	991020	18.6	7.4	351	4.2	>200.5	65.9	>100%	1	4	190	0.24	0.03	<0.02	0.19	107.0	<20	<20	<50
080	Hannon Slough	L	991117	10.2	7.8	324	2.4	>200.5	30.6	>100%	2	7	208	<0.1	<0.02	<0.02	<0.1	130.5	<20	<20	<50
080	Hannon Slough	L	991215	12.6	7.6	295	4.3	200	200.0	>100%	1	1	188	<0.1	0.15	<0.02	0.50	154.0	<20	<20	<50
080	Hannon Slough	L	000119	13.3	8.2	384	2.0	200	50.4	>100%	1	9	183	<0.1	<0.02	<0.02	0.36	140.0	<20	<20	<50
080	Hannon Slough	L	000216	13.3	8.3	417	4.3	200	200.0	>100%	1	51	200	0.16	<0.02	<0.02	0.81	124.0	<20	<20	<50
080	Catoma Creek	O	981021	20.6	7.9	268	3.0	>200.5	47.8	>100%	1	3	141	0.22	0.03	<0.02	0.59	101.0	<20	<20	<50
080	Catoma Creek	O	981118	17.2	7.4	268	1.7	101	101.3	>100%	1	10	147	<0.1	0.03	<0.02	0.26	96.7	<20	<20	<50
080	Catoma Creek	O	981216	13.2	8.2	216	2.3	>200.5	38.4	>100%	2	1	143	0.14	0.03	0.23	0.45	99.4	<20	<20	<50
080	Catoma Creek	O	990120	13.5	8.0	217	7.1	>200.5	19.2	>100%	1	4	119	<0.1	0.03	0.05	0.42	76.2	<20	<20	<50
080	Catoma Creek	O	990217	15.8	7.5	225	11.0	>200.5	65.9	>100%	1	3	116	0.30	0.03	0.07	0.31	84.8	<20	<20	<50
080	Catoma Creek	O	990317	14.7	7.7	83	57.8	>200.5	>200.5	>100%	2	81	41	<0.1	0.04	0.05	0.42	28.7	<20	<20	<50
080	Catoma Creek	O	990421	20.8	7.4	125	16.0	>200.5	>200.5	>100%	2	2	63	<0.1	0.07	0.03	0.95	63.1	<20	<20	<50
080	Catoma Creek	O	990519	21.3	7.7	143	70.5	>200.5	>200.5	>100%	6	92	76	0.48	0.38	<0.02	1.28	60.1	<20	<20	<50
080	Catoma Creek	O	990619	25.8	7.3	240	5.3	>200.5	>200.5	>100%	1	9	111	<0.1	0.10	<0.02	0.40	94.6	<20	<20	<50
080	Catoma Creek	O	990728	27.3	7.8	229	21.9	>200.5	165.2	>100%	1	16	93	<0.1	0.11	<0.02	0.76	62.6	<20	<20	<50
080	Catoma Creek	O	990825	24.0	7.1	250	28.3	>200.5	>200.5	>100%	4	132	119	0.36	0.21	<0.02	0.95	67.9	<20	<20	<50
080	Catoma Creek	O	990915	22.8	7.8	343	1.5	>200.5	13.7	>100%	1	2	167	0.12	<0.02	0.05	0.18	105.0	<20	<20	<50
080	Catoma Creek	O	991020	18.4	7.6	259	4.4	>200.5	36.4	>100%	1	1	144	0.38	<0.02	<0.02	0.34	80.7	<20	<20	<50
080	Catoma Creek	O	991117	11.6	7.8	273	1.7	>200.5	36.4	>100%	1	8	149	<0.1	<0.02	0.04	<0.1	106.0	<20	<20	<50
080	Catoma Creek	O	991215	15.0	7.8	192	5.1	200	129.8	>100%	1	5	113	<0.1	0.08	<0.02	0.33	73.1	<20	<20	<50
080	Catoma Creek	O	000119	13.1	8.1	242	8.9	200	42.9	>100%	1	1	115	<0.1	<0.02	0.03	0.83	89.4	<20	<20	<50
080	Catoma Creek	O	000216	15.2	8.4	233	23.4	200	200.0	>100%	1	102	111	0.98	0.10	<0.02	0.68	69.6	<20	<20	<50

Appendix F-4c. Physical / chemical data collected from October1998 to February 2000 as part of the Catoma Creek Watershed long-term monitoring project conducted by the Montgomery Water Works and Sanitary Sewer Board of the city of Montgomery.

Sub-Water-shed	Stream	Station	Date	T-H_20	pH	Conductivity	Turbidity	Total coliform	E. coli	Toxicity	BOD-5	TSS	TDS	Total P	NO_3	NH_3-N	TKN	ALK	Cd	Cr	Pb
		#	*yymmdd*	*^oC*	*s.u.*	*umhos @25^{o}C*	*NTU*	*col/500 ml*	*col/500 ml*	*EC50*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*
Upper Alabama (0315-0201)																					
080	Caney Branch	Q	981021	19.0	7.3	426	2.4	>200.5	>200.5	>100%	2	3	227	0.20	0.03	<0.02	0.56	149.0	<20	<20	<50
080	Caney Branch	Q	981118	16.0	7.2	415	9.4	>200.5	>200.5	>100%	4	25	235	<0.1	0.03	<0.02	0.54	129.0	<20	<20	<50
080	Caney Branch	Q	981216	10.6	7.9	331	5.9	>200.5	144.5	>100%	2	14	215	0.20	0.03	0.21	0.33	137.0	<20	<20	<50
080	Caney Branch	Q	990120	14.2	7.7	398	11.3	>200.5	88.5	>100%	1	7	221	<0.1	0.03	<0.02	<0.1	89.1	<20	<20	<50
080	Caney Branch	Q	990217	15.0	7.4	181	4.7	>200.5	32.4	>100%	2	8	94	0.34	0.03	0.04	0.31	179.0	<20	<20	<50
080	Caney Branch	Q	990317	13.6	7.7	261	19.2	>200.5	>200.5	>100%	2	18	140	<0.1	0.04	<0.02	<0.1	138.0	<20	<20	<50
080	Caney Branch	Q	990421	20.8	7.3	330	3.9	>200.5	>200.5	>100%	2	1	165	<0.1	0.03	0.04	0.67	169.0	<20	<20	<50
080	Caney Branch	Q	990519	20.7	7.6	202	41.9	>200.5	>200.5	>100%	5	44	105	0.20	0.40	0.03	1.29	87.7	<20	<20	<50
080	Caney Branch	Q	990619	23.8	7.1	323	8.8	>200.5	83.1	>100%	1	14	151	0.26	0.04	0.04	0.31	124.0	<20	<20	<50
080	Caney Branch	Q	990728	27.0	7.7	412	7.9	>200.5	>200.5	>100%	1	7	173	0.25	0.08	<0.02	0.95	102.0	<20	<20	<50
080	Caney Branch	Q	990825	25.0	6.9	202	390.0	>200.5	>200.5	>100%	3	442	97	0.40	0.50	<0.02	1.23	216.0	<20	25	<50
080	Caney Branch	Q	990915	20.9	7.6	472	6.4	>200.5	2.0	>100%	1	10	236	<0.1	0.03	<0.02	<0.1	158.0	<20	<20	<50
080	Caney Branch	Q	991020	16.2	7.4	478	1.9	>200.5	27.1	>100%	1	18	269	0.18	0.03	<0.02	<0.1	144.0	<20	<20	<50
080	Caney Branch	Q	991117	9.9	7.7	354	4.3	>200.5	4.2	>100%	6	16	209	<0.1	<0.02	<0.02	<0.1	153.0	<20	<20	<50
080	Caney Branch	Q	991215	14.2	7.7	281	17.6	200	200.0	>100%	2	6	166	<0.1	<0.02	<0.02	0.57	128.0	<20	<20	<50
080	Caney Branch	Q	000119	13.5	8.1	344	7.5	200	109.1	>100%	2	1	163	<0.1	<0.02	<0.02	0.76	30.4	<20	<20	<50
080	Caney Branch	Q	000216	14.5	8.2	402	10.3	200	200.0	>100%	1	16	193	0.44	<0.02	<0.02	0.91	150.0	<20	<20	<50
080	Whites Slough	R	981021	18.8	7.1	363	1.4	>200.5	83.1	>100%	1	2	200	0.22	0.06	<0.02	0.60	132.0	<20	<20	<50
080	Whites Slough	R	981118	16.5	7.2	204	5.2	>200.5	>200.5	>100%	2	16	115	<0.1	0.03	<0.02	0.37	75.8	<20	<20	<50
080	Whites Slough	R	981216	11.3	7.6	193	10.1	>200.5	118.4	>100%	2	3	127	<0.1	0.05	0.20	0.55	97.4	<20	<20	<50
080	Whites Slough	R	990120	12.8	7.6	395	2.7	>200.5	144.5	>100%	1	1	231	<0.1	0.03	0.06	0.35	141.0	<20	<20	---
080	Whites Slough	R	990217	14.7	7.5	217	2.5	>200.5	73.8	>100%	2	8	109	0.28	0.03	0.06	0.41	144.0	<20	<20	<50
080	Whites Slough	R	990317	13.8	7.3	311	12.3	>200.5	>200.5	>100%	1	13	180	<0.1	0.54	0.06	0.35	109.3	<20	<20	<50
080	Whites Slough	R	990421	18.1	7.1	284	5.1	>200.5	>200.5	>100%	2	1	142	<0.1	0.03	<0.02	0.52	127.0	<20	<20	<50
080	Whites Slough	R	990519	20.7	7.7	192	48.6	>200.5	>200.5	>100%	4	60	100	0.44	0.53	0.04	1.42	78.3	<20	<20	<50
080	Whites Slough	R	990619	25.2	7.0	211	4.6	>200.5	>200.5	>100%	1	15	10	<0.1	0.05	<0.02	0.52	62.2	<20	<20	<50
080	Whites Slough	R	990728	28.2	7.3	348	3.8	>200.5	>200.5	>100%	1	5	147	<0.1	0.15	<0.02	0.56	56.3	<20	<20	<50
080	Whites Slough	R	990825	24.0	6.8	265	33.9	>200.5	>200.5	>100%	5	60	126	0.52	0.09	<0.02	0.91	65.1	<20	<20	<50
080	Whites Slough	R	990915	21.7	7.5	354	1.0	>200.5	>200.5	>100%	1	7	180	0.18	0.03	<0.02	<0.1	98.2	<20	<20	<50
080	Whites Slough	R	991020	18.6	7.2	399	1.0	>200.5	78.2	>100%	1	1	215	0.24	<0.02	<0.02	<0.1	96.7	<20	<20	<50
080	Whites Slough	R	991117	10.8	7.6	476	2.8	>200.5	>200.5	>100%	2	5	310	<0.1	0.03	<0.02	<0.1	90.5	<20	<20	<50
080	Whites Slough	R	991215	12.4	7.4	313	4.9	200	200.0	>100%	1	1	202	<0.1	<0.02	<0.02	0.60	102.0	<20	<20	<50
080	Whites Slough	R	000119	13.7	8.0	416	2.9	200	27.1	>100%	1	5	198	<0.1	0.04	<0.02	0.37	123.0	<20	<20	<50
080	Whites Slough	R	000216	14.0	8.3	452	3.9	200	69.7	>100%	1	14	216	0.22	<0.02	<0.02	0.47	144.0	<20	<20	<50

Appendix F-4c. Physical / chemical data collected from October1998 to February 2000 as part of the Catoma Creek Watershed long-term monitoring project conducted by the Montgomery Water Works and Sanitary Sewer Board of the city of Montgomery.

Sub-Water-shed	Stream	Station	Date	T-H_2O	pH	Conductivity	Turbidity	Total coliform	E. coli	Toxicity	BOD-5	TSS	TDS	Total P	NO_3	NH_3-N	TKN	ALK	Cd	Cr	Pb
		#	*yymmdd*	*^oC*	*s.u.*	*umhos @25^oC*	*NTU*	*col/500 ml*	*col/500 ml*	*EC50*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*	*mg/l*
Upper Alabama (0315-0201)																					
060	Middle Catoma Creek	S	981021	19.3	7.2	195	5.1	>200.5	94.5	>100%	1	12	103	0.30	0.03	<0.02	0.51	69.9	<20	<20	<50
060	Middle Catoma Creek	S	981118	15.9	7.0	181	3.1	66	65.9	>100%	1	12	109	<0.1	0.03	<0.02	0.31	75.1	<20	<20	<50
060	Middle Catoma Creek	S	981216	11.4	7.3	127	7.2	>200.5	118.4	>100%	1	2	83	0.18	0.03	0.25	0.53	57.8	<20	<20	<50
060	Middle Catoma Creek	S	990120	13.5	7.5	153	12.6	>200.5	144.5	>100%	1	2	88	<0.1	0.03	0.08	0.37	58.5	<20	<20	<50
060	Middle Catoma Creek	S	990217	15.0	7.6	163	16.0	>200.5	101.3	>100%	2	11	71	0.42	0.03	0.12	0.37	59.3	<20	<20	<50
060	Middle Catoma Creek	S	990317	13.1	7.3	80	55.5	>200.5	>200.5	>100%	2	54	47	<0.1	0.04	0.08	0.37	27.1	<20	<20	<50
060	Middle Catoma Creek	S	990421	19.0	7.1	96	24.3	>200.5	>200.5	>100%	2	26	48	<0.1	0.07	0.03	0.70	44.2	<20	<20	<50
060	Middle Catoma Creek	S	990519	20.1	7.7	143	29.1	>200.5	>200.5	>100%	1	19	73	0.16	0.16	<0.02	0.61	59.0	<20	<20	<50
060	Middle Catoma Creek	S	990619	24.4	6.8	133	18.0	>200.5	65.9	>100%	1	12	63	<0.1	0.11	<0.02	0.64	58.1	<20	<20	<50
060	Middle Catoma Creek	S	990728	26.1	7.2	166	26.6	>200.5	165.2	>100%	1	37	72	<0.1	0.08	<0.02	0.63	46.2	<20	<20	<50
060	Middle Catoma Creek	S	990825	25.0	6.9	201	17.6	>200.5	>200.5	>100%	1	24	95	0.34	0.06	<0.02	1.15	58.9	<20	<20	<50
060	Middle Catoma Creek	S	990915	22.2	7.3	193	6.3	>200.5	30.6	>100%	1	4	99	0.12	<0.02	<0.02	0.47	67.1	<20	<20	<50
060	Middle Catoma Creek	S	991020	18.3	7.2	151	7.2	>200.5	36.4	>100%	1	2	70	0.30	0.03	<0.02	<0.1	45.7	<20	<20	<50
060	Middle Catoma Creek	S	991117	10.4	7.6	157	4.2	>200.5	16.4	>100%	1	5	101	<0.1	<0.02	<0.02	0.76	58.1	<20	<20	<50
060	Middle Catoma Creek	S	991215	12.5	7.2	143	4.8	200	94.5	>100%	1	1	91	<0.1	<0.02	<0.02	0.49	58.3	<20	<20	<50
060	Middle Catoma Creek	S	000119	13.2	7.9	174	11.4	200	56.0	>100%	1	1	82	0.14	<0.02	<0.02	0.40	48.7	<20	<20	<50
060	Middle Catoma Creek	S	000216	14.2	7.8	208	51.1	200	200.0	>100%	1	15	98	<0.1	0.04	<0.02	0.44	51.1	<20	<20	<50

Appendix F-5. ADEM Special Studies

Lead agency**:** ADEM

Purpose**:** Two special studies have been conducted by ADEM in the Lower Alabama River Basin since 1992. A Water Quality Demonstration Study (WQDS) of Limestone Creek was conducted in September of 1992. The purpose of this study was to evaluate any water quality impairment caused by the Monroeville Wastewater Treatment Facility (ADEM 1992c). Habitat, chemical/physical, toxicological, and biological data were collected using standard methods, procedures, and quality control/quality assurance manuals used by ADEM during 1992.

The EPA Region IV sponsored a pilot study to address issues related to bioassessment method comparability. Ten state and federal agencies conducted side-by-side bioassessments of Little River in Baldwin County, Alabama, to compare metrics and assessments generated using each agency's standard protocols and to evaluate the EPA's performance-based method system as a way to compare methods based on precision and sensitivity (Barbour et al. 1999). Habitat and biological data were collected by all 10 agencies. In-situ water quality parameters were collected by ADEM using standard operating procedures.

References:

ADEM. 1992. Water quality demonstration study of Limestone Creek at Monroeville, Alabama. Field Operations Division, Alabama Department of Environmental Management, Montgomery, AL.

ADEM. 1996. Development of fall/winter evaluation guidelines for ecoregion 65f (unpublished data). Field Operations Division, Alabama Department of Environmental Management, Montgomery, AL.

Houston, L.S., M.T. Barbour, D. Lenat, and D. Penrose. 2000. Multi-agency comparison of aquatic invertebrate bioassessment methodologies used in USEPA Region IV. Unpublished manuscript.

Appendix F-5a. Physical characteristics and habitat assessment results for sites located in the Alabama River Basin and assessed as part special studies conducted by ADEM, 1992-2000. Values are presented as percent maximum score for each of three major habitat parameter categories.

Station Number		LCM-1	LCM-2	LITB-1	LITB-2	LITE-1
CU		0204	0204	0204	0204	0204
Sub-watershed		050	050	110	110	110
Ecoregion/Subregion		65f	65f	65f	65f	65f
Drainage area (mi^2)		31	37		137	57
Date (yymmdd)		920915	920915	961210	961210	961210
Width (ft)		30	30	25	25	25
Canopy Cover[a]		MS	MO	O	MO	O
Depth (ft)	Riffle	---	---	---	---	---
	Run	0.8	0.8	1.3	1.3	2.0
	Pool	1.5	2.0	2.0	2.5	3.0
Substrate (%)	Bedrock					
	Boulder					
	Cobble					
	Gravel	31		34	15	15
	Sand	50	79	60	80	65
	Silt	2	2		1	7
	Detritus	5	4	5	4	12
	Clay	2		1		1
	Org. Silt		15			
Habitat assessment form[b]		GP	GP	GP	GP	GP
Habitat Survey (% maximum)						
Instream habitat quality		75	48	55	57	67
Sediment deposition		60	23	75	68	65
Sinuosity		87	87	45	50	70
Bank and vegetative stability		75	65	25	68	35
Riparian measurements		80	80	15	83	73
Habitat assessment score		99	64	96	144	135
% Maximum		73	47	44	65	61
Assessment		Excellent	Good	Good	Excellent	Excellent

a. Canopy cover: S=shaded; MS=mostly shaded; 50/50=50% shaded; MO=mostly open; O=open
b. Habitat assessment form: GP=glide/pool (Barbour et al. 1999)

Appendix F-5b. Aquatic macroinvertebrate bioassessment results for sites assessed during two special studies conducted in the Lower Alabama River Basin. Fish IBI assessments were not conducted.

Station	LCM-1	LCM-2	LITB-1	LITB-2	LITE-1
Sub-watershed	050	050	110	110	110
Ecoregion/Subecoregion	65f	65f	65f	65f	65f
Macroinvertebrate community					
Assessment Date	920915	920915	961210	961210	961210
# EPT families	11	11	18	16	14
Assessment	Good	Good	Excellent	Excellent	Excellent
Fish community					
Assessment Date					
Time (min)					
Richness measures					
# species					
# darter species					
# minnow species					
# sunfish species					
# sucker species					
# intolerant species					
Composition measures					
% sunfish					
% omnivores and herbivores					
% insectivourous cyprinids					
% top carnivores					
Population measures					
Individuals					
# collected per hour					
% disease and anomalies					
IBI Score					
Assessment					

Appendix F-5c. Physical/chemical data collected during 2 special studies conducted by ADEM.

Sub-Watershed	Stream	Station	Date	Time	Water Temp.	D.O.	pH	Cond.	Turb.	Flow	Alk.	Hard.	BOD-5	TDS	TSS	TKN	NH_3-N	NO_3/ NO_2-N	TON	Total-P	Cl^-
			yymmdd	*24hr*	*^oC*	*mg/L*	*s.u.*	*umhos @ 25^oC*	*NTU*	*cfs*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*
Lower Alabama (0315-0204)																					
050	Limestone Creek	LCM-1	920915	1015	20	7.8	7.3	120	6.1	19.0	51	59	<1	79	3	0.12	<0.05	0.414	0.12	<0.005	4
050	Limestone Creek	LCM-2	920915	1313	23	7.2	6.9	240	5.7	21.3	64	48	1.6	147	3	0.31	<0.05	1.51	0.31	0.668	9
110	Little River	LITB-1	961210	1041	12	10.4	5.7	22	2.7												
110	Little River	LITB-2	961104	0900		9.6	6.3	28													
110	Little River	LITE-1	961210	0906	11	10.5	5.6	22	3.2												

Appendix F-6. ADEM Reservoir Tributary Monitoring Program

Lead Agency: ADEM

Purpose: The purpose of ADEM's Reservoir Tributary Monitoring Program is to assess and report water quality conditions and tributary loadings of publicly-owned lakes and reservoirs. These data will be essential as the Department begins to address lake eutrophication concerns across the state. Objectives are to develop an adequate water quality database for all publicly owned lakes in the state, establish trends in trophic status that can only be established through long-term monitoring efforts, and determine water quality conditions of reservoirs located throughout the state. Intensive water quality monitoring was conducted at major tributaries of the Alabama, Coosa, and Tallapoosa Rivers during April, June, and August, 2000. Chlorophyll a samples were collected as indicators of biological conditions at each site. All samples and in-situ measures were collected in accordance with ADEM Standard Operating Procedures and Quality Assurance/Quality Control Manual, Volume I (ADEM 2000f).

Appendix F-6a. Physical/ chemical data

References:

ADEM. 2000d. Water quality monitoring data from tributaries of the Alabama River basin reservoirs collected by ADEM (2000, unpublished). Field Operations Division, Alabama Department of Environmental Management. Montgomery, Alabama.

Appendix F-6a. Physical / chemical data collected during April, June, and August, 2000, from major tributaries of Woodruff, Dannelly, and Claiborne Reservoirs on the Alabama River as part of ADEM's reservoir monitoring program. (ADEM 2001)

Sub-watershed	Stream	Station	Date	Time	Secchi	Photo	Depth	Water Temp.	D.O.	pH	Conductivity	Turbidity	Fecal coliform	TSS	TDS	TOC	Total P	Total N	NO_3+ NO_2-N	NH_3-N	TKN	TN: TP	Chl a	TSI	Hard	ALK
		#	*yymmdd*	*24 hr*	*m*	*m*	*m*	*°C*	*mg/L*	*s.u.*	*mS/cm*	*NTU*	*col/100mL*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*		*ug/L*	*mg/L*	*mg/L*	*mg/L*
Upper Alabama (0315-0201)																										
080	Catoma Creek	WOOD-4	000413	1230	0.70	1.72	1.5	19.5	8.5	7.3	0.194	10.8	17	52	110	10.300	0.090	0.642	0.002	0.080	0.640	7	4.27	45	98.0	81
080	Catoma Creek	WOOD-4	000622	1124	0.49	2.17	1.5	28.5	7.2	7.6	0.125	11.6	4	17	145	3.666	0.130	1.350	0.020	0.008	1.330	10	40.60	67	47.2	46
080	Catoma Creek	WOOD-4	000824	1150	0.69	2.16	1.5	29.9	6.9	7.6	0.153	11.5	1	13	118	3.483	0.054	0.426	0.419	0.008	0.007	8	33.11	65	46.5	46
110	Pintlalla Creek	WOOD-5	000413	1345	0.47	1.62	1.5	18.1	8.6	7.3	0.145	19.1	42	21	102	8.320	0.080	0.962	0.062	0.080	0.900	12	21.36	61	89.0	67
110	Pintlalla Creek	WOOD-5	000622	1100	0.61	2.51	1.5	28.7	7.7	7.7	0.147	10.0	4	14	133	3.756	0.080	1.590	0.070	0.008	1.520	20	29.90	64	47.3	55
110	Pintlalla Creek	WOOD-5	000824	1121	0.77	2.44	1.5	29.8	5.6	7.4	0.174	11.6	1	15	121	3.582	0.054	0.360	0.303	0.008	0.057	7	32.04	65	52.5	57
150	Swift Creek	WOOD-6	000412	1720	0.56	1.45	1.5	18.5	9.6	6.8	0.030	26.4	18	18	74	4.600	0.050	0.731	0.151	0.160	0.580	15	11.75	55	10.0	10
150	Swift Creek	WOOD-6	000622	0930	0.92	2.96	1.5	29.0	8.6	7.9	0.121	8.0	1	11	86	2.925	0.060	1.370	0.040	0.091	1.330	23	21.90	61	29.7	35
150	Swift Creek	WOOD-6	000824	0957	0.87	2.40	1.5	29.8	7.1	7.4	0.131	11.1	10	10	107	3.211	0.002	0.304	0.229	0.037	0.075	152	25.63	62	33.8	40
170	Cypress Creek	WOOD-7	000413	1030	0.62	2.20	1.5	18.1	9.6	7.1	0.112	17.7	9	23	58	4.510	0.050	1.221	0.141	0.080	1.080	24	17.09	58	38.0	41
170	Cypress Creek	WOOD-7	000622	1258	0.95	2.88	1.5	29.5	10.5	8.7	0.142	7.5	2	8	101	3.566	0.080	1.010	0.020	0.110	0.990	13	31.00	64	36.9	39
170	Cypress Creek	WOOD-7	000824	0926	0.72	2.18	1.5	30.1	7.1	7.4	0.151	11.0	1	10	120	3.614	0.029	0.077	0.002	0.120	0.075	3	28.63	63	38.2	53
220	Mulberry Creek	DAN-5	000412	1600	0.51	1.30	0.3	20.2	9.4	6.8	0.034	32.8		18	75	1.990	0.010	0.240	0.165	0.200	0.075	24	0.53	24	13.0	4
220	Mulberry Creek	DAN-5	000621	1630	0.30	0.30	0.3	30.6	7.8	7.1	0.037	6.6	44	11	95	1.626	0.002	0.175	0.100	0.008	0.075	88	2.10	38	10.8	12
220	Mulberry Creek	DAN-5	000823	1513	0.30	0.30	0.3	30.7	9.2	8.0	0.037	5.5	38	13	4	1.177	0.002	0.102	0.002	0.160	0.100	51	8.01	51	9.9	1
Middle Alabama (0315-0203)																										
090	Bogue Chitto Creek	DAN-7	000410	1915	0.62	1.15	1.5	18.8	6.9	7.6	0.135	23.8	45	23	97	16.050	0.140	1.348	0.148	0.110	1.200	10	15.66	58	116.0	55
090	Bogue Chitto Creek	DAN-7	000621	1020	0.68	2.09	1.6	29.2	6.1	7.3	0.176	11.5	1	19	131	4.011	0.070	1.000	0.090	0.074	0.910	14	36.70	66	53.8	72
090	Bogue Chitto Creek	DAN-7	000823	0927	0.66	2.2	1.5	30.2	4.9	7.2	0.183	12.2	2	20	56	3.683	0.043	0.042	0.002	0.096	0.040	1	22.43	61	49.6	60
130	Pine Barren Creek	DAN-8	000410	0950	0.58	1.46	1.5	20.1	9.4	7.9	0.174	18.5	17	15	117	13.110	0.030	1.041	0.071	0.140	0.970	35	12.46	55	70.0	130
130	Pine Barren Creek	DAN-8	000621	0950	0.78	2.18	1.5	29.2	5.6	7.2	0.168	11.3	4	15	137	3.878	0.022	0.310	0.120	0.008	0.190	14	21.40	61	50.1	19
130	Pine Barren Creek	DAN-8	000823	0850	0.76	2.3	1.5	30.5	5.7	7.3	0.172	10.9	2	16	57	3.582	0.029	0.140	0.070	0.008	0.070	5	19.22	60	44.7	53
180	Beaver Creek	CLAIBORNE-3	000410	1600	0.49	0.97	1.5	15.8	4.7	7.3	0.088	33.5	48	24	57	17.490	0.080	1.059	0.139	0.100	0.920	13	1.07	31	31.0	27
180	Beaver Creek	CLAIBORNE-3	000620	1700	0.65	2.21	1.5	29.0	5.7	7.2	0.161	13.7	4	20	168	10.440	0.028	0.700	0.130	0.008	0.570	25	17.10	58	46.6	47
180	Beaver Creek	CLAIBORNE-3	000822	1605	0.92	2.3	1.0	30.9	6.1	7.3	0.190	9.86	10	18	59	3.522	0.012	0.279	0.209	0.008	0.070	23	15.66	58	47.6	57
200	Pursley Creek	CLAIBORNE-4	000410	1445	0.95	2.1	1.5	16.1	4.7	7.6	0.150	12.7	80	14	105	11.790	0.050	1.076	0.146	0.090	0.930	22	4.81	46	56.0	48
200	Pursley Creek	CLAIBORNE-4	000620	1600	0.45	0.6	0.2	31.4	7.8	7.7	0.171	21.3	16	4	175	4.364	0.024	0.300	0.060	0.056	0.240	13	34.70	65	47.3	55
200	Pursley Creek	CLAIBORNE-4	000822	1423	0.30	0.3	0.3	31.8	7.7	7.7	0.199	16.3	1	31	65	3.866	0.023	0.472	0.432	0.079	0.040	21	14.24	57	48.2	54
Lower Alabama (0315-0204)																										
020	Tallatchee Creek	CLAIBORNE-5	000410	1240	0.76	2.3	1.5	17.3	6.5	7.4	0.148	19	22	14	116	7.400	0.050	1.151	0.251	0.130	0.900	23	8.81	52	52.0	65
020	Tallatchee Creek	CLAIBORNE-5	000620	1400	0.53	1.3	0.3	34.1	9.7	7.8	0.134	19.4	10	20	112	5.415	0.068	0.343	0.003	0.008	0.340	5	31.00	64	31.3	1
020	Tallatchee Creek	CLAIBORNE-5	000822	1247	0.51	1.17	0.3	31.9	7.7	7.1	0.118	24.4	42	28	53	4.604	0.069	0.371	0.331	0.008	0.040	5	37.38	66	25.4	81

Appendix F-7. University Reservoir Tributary Nutrient Loading Study

Lead Agencies*:* Cooperative effort by the University of Alabama, Auburn University, Tennessee Valley Authority and Auburn University at Montgomery funded by ADEM

Purpose: Intensive chemical sampling was conducted October 1998-March 2000 to study nutrient loading from tributaries to 26 reservoirs in Alabama. These data were used to quantify tributary nutrient loads to reservoirs and to provide estimates of nonpoint source nutrient contributions. These loading estimates will be essential to the Department's effort to address lake eutrophication concerns across the state. Samples were collected monthly, June-November and biweekly, December-May. All samples and in-situ measures were collected in accordance with ADEM Standard Operating Procedures manual. Duplicate samples were collected at 10% of the stations.

Appendix F-7a. Physical/chemical data

References:

ADEM. 2000i. Water quality monitoring data from tributaries of the Alabama River basin reservoirs collected by Auburn University Montgomery (unpublished). Field Operations Division, Alabama Department of Environmental Management. Montgomery, Alabama.

Appendix F-7a. Physical / chemical data collected by Alabama Universities from tributaries to reservoirs located on the Alabama River, October 1998-September 1999 under contract with ADEM (ADEM 2000i).

Sub-watershed	Waterbody	ADEM Station ID	Date *yymmdd*	Time *24hr*	Air Temp. *°C*	Water Temp. *°C*	Dissolved Oxygen *mg/L*	pH *s.u.*	Conductivity *umhos @ 25°C*	Turbidity *NTU*	Stream Flow *cfs*	TSS *mg/L*	TDS *mg/L*	TKN *mg/L*	NH_3-N *mg/L*	NO_2+ NO_3 *mg/L*	Total-P *mg/L*	Ortho-P *mg/L*	Stream Depth *ft*	Sampling Depth *ft*
Upper Alabama (0315-0201)																				
010	Bouldin Tail-race	BTCAUM01	981208	1500	20	20	8.6	8.1	213	5		6	126	1.46	<0.015	0.090	0.030	0.03		1.6
010	Bouldin Tail-race	BTCAUM01	981215	1500	24	16	7.2	7.8	227	8		5	174	<0.15	<0.015	0.120	0.050	0.12		
010	Bouldin Tail-race	BTCAUM01	990104	1300	6	10	9.0	7.4	249	5		6	138	<0.15	0.090	0.110	0.040	0.41		3.3
010	Bouldin Tail-race	BTCAUM01	990118	1200	24	10	10.9	7.7	206	6		10	116	0.45	<0.015	0.200	0.040	0.05		3.3
010	Bouldin Tail-race	BTCAUM01	990201	1200	10	12	9.9	7.6	127	21		8	64	<0.15	0.020	0.410	0.070	0.02		3.3
010	Bouldin Tail-race	BTCAUM01	990215	1215	22	13	8.8	7.4	99	17		13	89	<0.15	<0.015	0.390	0.070	0.20		1.6
010	Bouldin Tail-race	BTCAUM01	990301	1130	31	13	9.4	7.5	111	9		8	72	0.37	<0.015	0.380	0.040	0.12	3.3	1.6
010	Bouldin Tail-race	BTCAUM01	990315	1215	22	12	10.1	7.6	118	8		8	54	0.2	<0.015	0.290	0.017	0.27		1.6
010	Bouldin Tail-race	BTCAUM01	990405	1130	38	20	8.7	7.4	128	6		11	97	0.38	<0.015	0.020	0.050	0.03	3.3	1.6
010	Bouldin Tail-race	BTCAUM01	990419	1110	28	19	9.7	7.4	116	48		3	77	0.29	<0.015	<0.003	0.010	0.05	11.8	9.0
010	Bouldin Tail-race	BTCAUM01	990510	1050	38	22	6.6	7.2	152	8		8	94	0.6	<0.015	0.120	0.030	0.08		1.6
010	Bouldin Tail-race	BTCAUM01	990510	1055	38	22	6.6	7.1	152	7		8	91	0.58	<0.015	0.120	0.020	0.10		1.6
010	Bouldin Tail-race	BTCAUM01	990608	1145	36	28	7.1	7.3	153	3		5	91	0.38	<0.015	0.050	0.020	0.18		3.3
010	Bouldin Tail-race	BTCAUM01	990608	1150	36	28	7.1	7.3	153	3		7	134	0.56	<0.015	0.050	0.020	0.18		3.3
010	Bouldin Tail-race	BTCAUM01	990706	1210	38	28	6.7	7.2	146	7		9	89	1.56	<0.015	<0.003	0.060	0.13		1.7
010	Bouldin Tail-race	BTCAUM01	990803	1115	36	32	6.3	7.5	147	2		8	99	1.18	<0.015	0.080	<0.004	0.15		3.3
010	Bouldin Tail-race	BTCAUM01	990803	1120	36	32	6.3	7.5	147	2		3	159	0.82	<0.015	0.060	<0.004	0.15		3.3
010	Bouldin Tail-race	BTCAUM01	990902	1045	33	30	5.3	7.6	152	3		7	87	0.97	<0.015	0.040	0.020	0.02		
010	Bouldin Tail-race	BTCAUM01	991001	1230	30	25	8.5	7.7	152	3		9	99	<0.15	<0.015	0.080	0.040	0.03		0.8
010	Bouldin Tail-race	BTCAUM01	991015	1415	29	24	6.8	7.4	171	5		2	85	0.67	<0.015	0.150	<0.004	0.06		0.8
010	Bouldin Tail-race	BTCAUM01	991029		24	21	8.8	7.6	172	2		2	115	<0.15	<0.015	0.010	<0.004	0.01		1.6
010	Bouldin Tail-race	BTCAUM01	991111	1400	27	19	7.8	7.6	180	3		8	120	<0.15	<0.015	0.010	0.100	0.01		1.6
010	Bouldin Tail-race	BTCAUM01	991128	1015	18	18	11.0	7.6	186	4		1	107	0.43	<0.015	0.100	<0.004	0.30	1.6	0.8
050	Autauga Creek	AUCAUM01	981210	1500	15	16	8.4	7.1	22	8	135.9	1	53	0.9	<0.015	0.070	<0.004	0.05	2.1	0.5

Appendix F-7a. Physical / chemical data collected by Alabama Universities from tributaries to reservoirs located on the Alabama River, October 1998-September 1999 under contract with ADEM (ADEM 2000i).

Sub-watershed	Waterbody	ADEM Station ID	Date *yymmdd*	Time *24hr*	Air Temp. *°C*	Water Temp. *°C*	Dissolved Oxygen *mg/L*	pH *s.u.*	Conductivity *umhos @ 25°C*	Turbidity *NTU*	Stream Flow *cfs*	TSS *mg/L*	TDS *mg/L*	TKN *mg/L*	NH_3-N *mg/L*	NO_2+ NO_3 *mg/L*	Total-P *mg/L*	Ortho-P *mg/L*	Stream Depth *ft*	Sampling Depth *ft*
Upper Alabama (0315-0201)																				
050	Autauga Creek	AUCAUM01	981214	1420	12	13	8.5	7.4	24	6	84.5	4	48	<0.15	<0.015	0.150	0.010	0.05	3.3	1.6
050	Autauga Creek	AUCAUM01	990106	1415	9	6	10.3	5.4	24	6	174.2	2	114	<0.15	<0.015	0.210	<0.004	0.02	2.1	1.0
050	Autauga Creek	AUCAUM01	990120	1400	23	13	10.1	7.0	19	7	116.7	3	32	0.35	0.060	0.180	<0.004	0.06	2.1	1.0
050	Autauga Creek	AUCAUM01	990120	1405	23	13	10.1	7.0	19	7	116.7	5	19	<0.15	<0.015	0.180	0.060	0.06	2.1	1.0
050	Autauga Creek	AUCAUM01	990123	0900	19	16	8.9	6.3	24	185	3702.3	95	89	<0.15	<0.015	0.160	0.070	0.05	2.5	1.2
050	Autauga Creek	AUCAUM01	990210	1320	28	17	10.8	6.8	20	10	191.1	7	43	<0.15	<0.015	0.170	0.040	0.03	2.5	1.2
050	Autauga Creek	AUCAUM01	990224	1245	25	9	11.0	6.5	17	6	141.4	6	30	<0.15	<0.015	0.200	0.030	0.04	1.8	1.1
050	Autauga Creek	AUCAUM01	990308	1330	17	13	10.6	7.0	17	7	260.1	2	24	<0.15	<0.015	0.160	0.010	0.06	2.4	1.6
050	Autauga Creek	AUCAUM01	990317	1400	27	15	9.2	6.3	25	12	261.0	7	24	<0.15	<0.015	0.170	0.010	0.03	2.1	1.3
050	Autauga Creek	AUCAUM01	990408	1750	29	21	8.1	6.7	17	8	137.9	18	32	0.42	<0.015	0.006	0.030	0.01	1.5	1.1
050	Autauga Creek	AUCAUM01	990422	1400	32	21	9.0	6.6	18	9	95.9	3	26	0.23	<0.015	<0.003	0.007	0.04	1.5	1.0
050	Autauga Creek	AUCAUM01	990507	1430	26	20	8.9	6.4	18	16	182.3	9	38	0.88	<0.015	0.150	0.010	0.05	1.8	1.0
050	Autauga Creek	AUCAUM01	990610	1230	37	26	7.7	6.9	19	6	63.2	4	38	0.64	<0.015	0.140	0.010	0.15	4.9	3.3
050	Autauga Creek	AUCAUM01	990708	1255	30	25	8.1	6.6	2	26	708.8	19	65	1.67	<0.015	0.110	0.060	0.02	3.6	0.6
050	Autauga Creek	AUCAUM01	990708	1300	30	25	8.1	6.6	2	26	708.8	23	71	1.2	<0.015	0.130	0.050	0.02	4.2	0.6
050	Autauga Creek	AUCAUM01	990805	1315	37	29	7.4	7.4	22	8	64.7	8	21	0.28	<0.015	0.130	<0.004	0.02	1.5	0.8
050	Autauga Creek	AUCAUM01	990907	1250	39	25	5.5	7.2	20	7	56.6	12	79	0.82	<0.015	0.130	0.008	0.71	1.2	0.6
050	Autauga Creek	AUCAUM01	991004	1430	23	21	8.6	7.3	19	8	92.3	7	37	0.35	<0.015	0.150	0.010	0.02	1.4	0.8
050	Autauga Creek	AUCAUM01	991006	1430	23	20	8.6	6.5	19	8	127.3	8	68	0.35	<0.015	0.160	0.030	0.05	1.4	0.7
050	Autauga Creek	AUCAUM01	991006	1435	23	20	8.6	6.5	19	8	127.3	10	62	0.37	<0.015	0.160	0.060	0.05	1.4	0.7
050	Autauga Creek	AUCAUM01	991027		25	14	9.6	6.9	17	5	69.6	3	34	<0.15	<0.015	0.217	0.007	0.04	1.3	0.8
050	Autauga Creek	AUCAUM01	991122	1530		15	10.7	6.7	17	5		6	33	0.21	<0.015	0.090	0.020	0.25	1.7	0.8
050	Autauga Creek	AUCAUM01	991126	1445	13	16	10.2	7.0	18	4	93.0	4	30	0.24	<0.015	0.110	<0.004	0.01	1.2	0.7

Appendix F-7a. Physical / chemical data collected by Alabama Universities from tributaries to reservoirs located on the Alabama River, October 1998-September 1999 under contract with ADEM (ADEM 2000i).

Sub-watershed	Waterbody	ADEM Station ID	Date *yymmdd*	Time *24hr*	Air Temp. *°C*	Water Temp. *°C*	Dissolved Oxygen *mg/L*	pH *s.u.*	Conductivity *umhos @ 25°C*	Turbidity *NTU*	Stream Flow *cfs*	TSS *mg/L*	TDS *mg/L*	TKN *mg/L*	NH_3-N *mg/L*	NO_2+ NO_3 *mg/L*	Total-P *mg/L*	Ortho-P *mg/L*	Stream Depth *ft*	Sampling Depth *ft*
Upper Alabama (0315-0201)																				
080	Catoma Creek	CACAUM01	981208	1315	28	24	5.8	7.8	256	5		2	173	1.3	<0.015	<0.003	0.060	0.11	2.1	1.0
080	Catoma Creek	CACAUM01	981215	1630	12	11	7.0		271	11		4	167	<0.15	<0.015	<0.003	0.080	0.19		1.6
080	Catoma Creek	CACAUM01	990108	1045	18	14	9.7	7.6	178	39		54	190	<0.15	<0.015	0.100	0.060	0.23	6.6	3.3
080	Catoma Creek	CACAUM01	990118	1445	28	14	9.3	7.8	253	13		69	154	0.38	<0.015	<0.003	0.050	0.10	1.6	0.8
080	Catoma Creek	CACAUM01	990123	1050	20	17	7.1	8.0	153	467		388	143	1.91	<0.015	0.460	0.840	1.42	8.2	3.9
080	Catoma Creek	CACAUM01	990201	1330	13	12	7.8	7.2	118	46		21	133	0.8	<0.015	0.080	0.280	0.56	24.6	9.8
080	Catoma Creek	CACAUM01	990215	1430	25	11	10.1	7.3	214	15		5	154	<0.15	<0.015	0.020	0.100	0.17	2.0	1.0
080	Catoma Creek	CACAUM01	990301	1330	31	15	9.8	7.6	230	15		7	154	0.4	<0.015	<0.003	0.060	0.11	1.4	0.8
080	Catoma Creek	CACAUM01	990315	1400	24	11	9.3	6.9	100	76		68	117	1.14	<0.015	0.140	0.250	0.41	13.2	6.6
080	Catoma Creek	CACAUM01	990405	1320	40	27	10.0	7.5	220	24		22	152	0.53	<0.015	0.020	0.080	0.28	1.7	1.0
080	Catoma Creek	CACAUM01	990419	1230	30	17	8.6	7.1	140	36		26	140	0.55	<0.015	<0.003	0.210	0.13	1.9	1.0
080	Catoma Creek	CACAUM01	990510	1230	33	23	7.9	7.3	158	26		.	.	1.29	<0.015	0.150	0.280	0.21	1.5	0.8
080	Catoma Creek	CACAUM01	990526	0850	28	24	5.8	7.3	225	22		75	140	0.57	<0.015	0.040	0.170	0.20	1.4	0.8
080	Catoma Creek	CACAUM01	990608	1435	34	28	7.0	7.4	161	22		16	157	0.73	<0.015	0.140	0.150	0.24	2.3	1.1
080	Catoma Creek	CACAUM01	990706	1412		30	6.2	7.2	199	22		27	134	1.5	<0.015	0.100	0.150	0.30	1.6	1.6
080	Catoma Creek	CACAUM01	990803	1315	38	31	7.4	7.6	222	9		6	139	0.6	<0.015	0.050	0.010	0.44	1.7	0.9
080	Catoma Creek	CACAUM01	990902	1400	35	27	5.3	7.5	198	11		7	133	1.27	<0.015	0.030	0.090	0.30		1.0
080	Catoma Creek	CACAUM01	991001	1345	32	19	5.0	7.4	262	3		6	168	0.36	<0.015	0.050	0.080	0.13	3.3	1.7
080	Catoma Creek	CACAUM01	991015	1630	31	22	7.3	7.4	168	10		6	104	0.8	<0.015	0.126	0.090	0.30	1.4	0.8
080	Catoma Creek	CACAUM01	991015	1635	31	22	7.3	7.4	168	10		9	47	1.1	<0.015	0.136	0.090	0.30	1.4	0.8
080	Catoma Creek	CACAUM01	991029	1415	26	14	7.9	7.4	257	6		3	161	0.23	<0.015	<0.003	0.060	0.16	1.9	2.0
080	Catoma Creek	CACAUM01	991111	1230	27	16	8.0	7.5	241	6		6	158	0.17	<0.015	<0.003	0.120	0.37	1.6	0.8
080	Catoma Creek	CACAUM01	991128	1300	19	10	5.7	7.1	276	5		9	181	0.64	<0.015	0.008	0.100	0.22	1.5	1.3

Appendix F-7a. Physical / chemical data collected by Alabama Universities from tributaries to reservoirs located on the Alabama River, October 1998-September 1999 under contract with ADEM (ADEM 2000i).

Sub-watershed	Waterbody	ADEM Station ID	Date *yymmdd*	Time *24hr*	Air Temp. *^{o}C*	Water Temp. *^{o}C*	Dissolved Oxygen *mg/L*	pH *s.u.*	Conductivity *umhos @ 25^{o}C*	Turbidity *NTU*	Stream Flow *cfs*	TSS *mg/L*	TDS *mg/L*	TKN *mg/L*	NH_3-N *mg/L*	NO_2+ NO_3 *mg/L*	Total-P *mg/L*	Ortho-P *mg/L*	Stream Depth *ft*	Sampling Depth *ft*
Upper Alabama (0315-0201), cont.																				
080	Catoma Creek	CACAUM01	991222	1030	15	11	9.1	7.3	193	126		149	172	1.47	0.330	<0.003	0.360		3.8	1.6
080	Catoma Creek	CACAUM01	991222	1035	15	11	9.1	7.3	193	126				1.9	0.820	0.690	0.320		3.8	1.6
160	Alabama River	ALRAUM01	981210	1115	18	19	7.4	7.5	157	11		8	134	0.96	<0.015	0.160	0.030	0.27		8.2
160	Alabama River	ALRAUM01	981214	1010	13	17	7.8	7.6	169	9		10	98	<0.15	<0.015	0.150	0.010	0.22		1.6
160	Alabama River	ALRAUM01	990106	1000	13	11	7.4	7.3	213	11		10	125	<0.15	<0.015	0.260	<0.004	0.08		1.6
160	Alabama River	ALRAUM01	990120	1000	20	11	10.5	7.7	198	8		14	164	0.52	0.040	0.110	0.050	0.05		1.6
160	Alabama River	ALRAUM01	990210	1000	21	14	8.6	7.1	96	18		14	73	<0.15	0.080	0.310	0.070	0.09		2.0
160	Alabama River	ALRAUM01	990224	0945	17	12	8.9	7.1	107	15		4	60	0.37	<0.015	0.360	0.060	0.13		1.6
160	Alabama River	ALRAUM01	990308	1045	15	13	9.9	7.4	108	9		7	70	0.17	<0.015	0.410	0.030	0.13		1.6
160	Alabama River	ALRAUM01	990317	1000	31	13	9.5	7.2	105	39		14	90	0.45	0.120	0.260	0.065	0.14		1.6
160	Alabama River	ALRAUM01	990408	1040	32	18	8.4	7.0	106	11		5	73	0.54	<0.015	0.009	0.080	0.08		1.5
160	Alabama River	ALRAUM01	990422	1015	28	21	9.4	7.5	132	11		9	100	<0.15	<0.015	<0.003	0.020	0.07		1.5
160	Alabama River	ALRAUM01	990507	1025	27	21	7.5	6.7	129	19		23	77	0.54	<0.015	0.150	0.050	0.01		1.6
160	Alabama River	ALRAUM01	990610	1005	31	27	6.5	7.2	157	7		6	115	0.74	<0.015	0.110	0.050	0.07		4.9
160	Alabama River	ALRAUM01	990708	0940	28	27	6.3	7.1	134	16		12	61	0.15	<0.015	0.140	0.060	0.38		2.5
160	Alabama River	ALRAUM01	990805	0950	37	32	6.9	7.9	132	8		11	73	<0.15	<0.015	0.070	<0.004	0.15		
160	Alabama River	ALRAUM01	990907	0930	35	29	4.4	7.2	137	11		15	95	0.35	<0.015	0.170	0.050	0.19		
160	Alabama River	ALRAUM01	991004	1030	69	24	6.5	7.6	143	7		12	89	0.43	<0.015	0.130	0.030	0.13		1.3
160	Alabama River	ALRAUM01	991006	1100	24	24	6.9	7.4	143	8		5	89	5.42	<0.015	0.160	0.050	0.01		2.1
160	Alabama River	ALRAUM01	991027	1050	19	21	7.0	7.3	143	9		7	82	0.37	<0.015	0.178	0.040	0.11		0.8
160	Alabama River	ALRAUM01	991122	1045		18	8.9	7.7	149	6		6	94	0.43	<0.015	0.150	0.060	3.64		3.3
160	Alabama River	ALRAUM01	991126	1030		17	8.8	7.3	148	7		5	93	0.51	<0.015	0.130	0.050	0.04	1.6	1.6
190	Big Swamp Creek	BSCAUM01	981209	1600	16	17	3.7	7.3	3	11	6.7	10	183	1.52	<0.015	0.260	0.030	0.14	2.3	0.7

Appendix F-7a. Physical / chemical data collected by Alabama Universities from tributaries to reservoirs located on the Alabama River, October 1998-September 1999 under contract with ADEM (ADEM 2000i).

Sub-watershed	Waterbody	ADEM Station ID	Date *yymmdd*	Time *24hr*	Air Temp. *°C*	Water Temp. *°C*	Dissolved Oxygen *mg/L*	pH *s.u.*	Conductivity *umhos @ 25°C*	Turbidity *NTU*	Stream Flow *cfs*	TSS *mg/L*	TDS *mg/L*	TKN *mg/L*	NH_3-N *mg/L*	NO_2+ NO_3 *mg/L*	Total-P *mg/L*	Ortho-P *mg/L*	Stream Depth *ft*	Sampling Depth *ft*
Upper Alabama (0315-0201)																				
190	Big Swamp Creek	BSCAUM01	981217	1430	13	10	7.0	7.5	357	11	3.4	32	226	<0.15	<0.015	0.190	0.060	0.08	2.6	1.6
190	Big Swamp Creek	BSCAUM01	990115	0915	6	10	9.2	7.5	326	15	23.7	13	195	<0.15	<0.015	0.170	<0.004	0.15	1.6	0.8
190	Big Swamp Creek	BSCAUM01	990127	1530	22	13	7.4	7.1	221	47	105.3	108	175	0.84	0.090	0.050	0.210	0.51	2.8	1.5
190	Big Swamp Creek	BSCAUM01	990208	1530	30	16	7.7	7.3	280	31	116.7	19	196	<0.15	0.020	0.050	0.120	0.22	4.9	2.5
190	Big Swamp Creek	BSCAUM01	990222	1500	16	11	9.3	7.3	261	31	69.7	15	188	0.41	<0.015	0.050	0.110	0.09	3.3	1.6
190	Big Swamp Creek	BSCAUM01	990310	1545	21	15	7.1	7.1	165	62	12155.9	76	137	0.81	0.030	0.020	0.180	0.40	9.0	6.7
190	Big Swamp Creek	BSCAUM01	990331	1615	22	18	8.2	7.3	329	31	131.4	52	205	0.86	<0.015	0.060	0.160	0.20	4.3	2.5
190	Big Swamp Creek	BSCAUM01	990412	1430	28	23	6.7	7.5	338	13	26.3	19	223	0.74	<0.015	<0.003	0.140	0.14	2.9	1.5
190	Big Swamp Creek	BSCAUM01	990427	1330	40	22	6.0	7.2	330	18	15.1	9	218	0.69	<0.015	0.220	0.170	0.39	1.9	1.0
190	Big Swamp Creek	BSCAUM01	990531	1345	32	23	5.6	7.2	279	25	3.6	39	167	0.92	<0.015	0.210	0.130	0.17	1.7	0.9
190	Big Swamp Creek	BSCAUM01	990622	1320	33	24	4.4	7.1	256	23	3.7	25	169	1.12	<0.015	0.170	0.140	0.48	1.5	0.7
190	Big Swamp Creek	BSCAUM01	990727	1411	38	27	5.5	7.3	206	26	72.3	34	144	0.59	<0.015	0.040	0.200	0.61	2.8	1.4
190	Big Swamp Creek	BSCAUM01	990819	1355	37	29	4.6	7.2	351	5	0.7	2	189	0.35	<0.015	0.110	0.040	0.17	1.4	0.7
190	Big Swamp Creek	BSCAUM01	990909	1440	31	26	4.9	7.2	262	7	0.6	9	157	<0.15	<0.015	0.040	0.040	0.15	1.3	0.6
190	Big Swamp Creek	BSCAUM01	990924	1605	25	19	6.2	7.3	234	4	1.1	7	151	<0.15	<0.015	0.050	0.080	0.18	2.5	1.2
190	Big Swamp Creek	BSCAUM01	991008	1415	23	21	8.6	7.7	198	4	0.1	3	92	0.43	<0.015	0.060	0.070	0.16	1.4	0.7
190	Big Swamp Creek	BSCAUM01	991011	0940	21	21	3.8	7.2	319	10	24.1	5	181	0.82	<0.015	0.300	0.150	0.38	2.5	1.3
190	Big Swamp Creek	BSCAUM01	991022	1530	27	17	6.5	7.3	209	6	3.3	4	137	0.96	<0.015	0.195	0.200	1.58	1.4	0.7
190	Big Swamp Creek	BSCAUM01	991105	1320	22	13	8.0	7.3	177	4	0.5	5	115	0.15	<0.015	0.350	0.070	0.18	2.5	0.8
190	Big Swamp Creek	BSCAUM01	991119	1335	23	12	5.2	7.2	217	4	39.1	12	140	0.55	<0.015	0.005	0.100	0.54	2.3	0.7
190	Big Swamp Creek	BSCAUM01	991221	0945	15	12	8.6	7.4	219	49	231.5	73	177	0.68	0.330	<0.003	0.310		4.9	1.6
220	Mulberry Creek	MUCAUM01	981210	1310	19	15	8.1	7.7	36	12		1	88	1.07	<0.015	0.090	0.010	0.09	2.0	1.0
220	Mulberry Creek	MUCAUM01	981214	1200	13	13	8.4	7.2	37	20		18	68	<0.15	<0.015	0.160	0.050	0.10	4.9	1.6

Appendix F-7a. Physical / chemical data collected by Alabama Universities from tributaries to reservoirs located on the Alabama River, October 1998-September 1999 under contract with ADEM (ADEM 2000i).

Sub-watershed	Waterbody	ADEM Station ID	Date *yymmdd*	Time *24hr*	Air Temp. *° C*	Water Temp. *° C*	Dissolved Oxygen *mg/L*	pH *s.u.*	Conductivity *umhos @ 25° C*	Turbidity *NTU*	Stream Flow *cfs*	TSS *mg/L*	TDS *mg/L*	TKN *mg/L*	NH_3-N *mg/L*	NO_2+ NO_3 *mg/L*	Total-P *mg/L*	Ortho-P *mg/L*	Stream Depth *ft*	Sampling Depth *ft*
Upper Alabama (0315-0201), cont.																				
220	Mulberry Creek	MUCAUM01	990120	1130	24	12	10.2	7.2	36	11		9	41	0.2	<0.015	0.190	0.060	0.17	2.5	1.1
220	Mulberry Creek	MUCAUM01	990210	1100	24	16	9.2	6.8	35	23		24	37	<0.15	<0.015	0.180	0.050	0.06	2.8	1.4
220	Mulberry Creek	MUCAUM01	990224	1045	20	8	11.1	6.7	32	9		7	44	<0.15	<0.015	0.160	0.040	0.08	2.4	1.2
220	Mulberry Creek	MUCAUM01	990308	1145	15	12	10.6	7.3	30	21		20	45	<0.15	<0.015	0.210	<0.004	0.08	3.3	1.6
220	Mulberry Creek	MUCAUM01	990317	1130	30	15	8.9	6.4	34	35		46	67	0.3	<0.015	0.160	0.022	0.05	1.6	0.7
220	Mulberry Creek	MUCAUM01	990408	1600	31	22	8.0	6.7	30	16		14	40	0.28	<0.015	0.005	0.040	0.05	2.5	0.8
220	Mulberry Creek	MUCAUM01	990408	1605	31	22	8.0	6.9	30	17		21	42	0.31	<0.015	0.005	0.040	0.06	3.0	1.5
220	Mulberry Creek	MUCAUM01	990422	1120	27	21	8.7	6.7	34	10		12	24	<0.15	<0.015	<0.003	0.006	0.04	1.8	1.0
220	Mulberry Creek	MUCAUM01	990507	1117	23	20	8.5	6.9	31	49		95	76	0.67	<0.015	0.190	0.040	0.05	2.3	1.0
220	Mulberry Creek	MUCAUM01	990610	1115	31	26	7.4	7.1	36	9		6	50	<0.15	<0.015	0.200	0.020	0.37	1.6	0.8
220	Mulberry Creek	MUCAUM01	990708	1100	28	25	7.8	6.9	29	68		71	63	0.9	<0.015	0.170	0.080	0.08	1.9	0.3
220	Mulberry Creek	MUCAUM01	990805	1115	38	28	7.4	7.5	41	6		10	29	<0.15	<0.015	0.200	<0.004	0.08	1.4	0.7
220	Mulberry Creek	MUCAUM01	990907	1030	29	24	5.4	7.3	36	16		20	69	0.2	<0.015	0.200	0.030	0.39	1.2	0.6
220	Mulberry Creek	MUCAUM01	991004	1230	22	21	7.7	7.3	22	4		707	52	20.4	<0.015	0.170	0.210	0.23	2.4	1.0
220	Mulberry Creek	MUCAUM01	991006	1215	22	19	8.8	6.9	33	57		38	68	0.73	<0.015	0.180	0.080	0.32	1.6	0.8
220	Mulberry Creek	MUCAUM01	991027	1200	24	14	9.8	7.0	32	5		9	61	<0.15	<0.015	0.194	0.006	0.58	0.9	0.4
220	Mulberry Creek	MUCAUM01	991122	1230		16	10.1	7.4	32	7		8	39	0.17	<0.015	0.080	0.030	0.25	8.2	3.3
220	Mulberry Creek	MUCAUM01	991126	1215	12	15	10.3	7.0	32	6		6	35	0.21	<0.015	0.100	0.020	0.02	1.6	1.0
220	Mulberry Creek	MUCAUM01	991221	1415	8	12		6.9	33	56		119	53	0.56	0.420	<0.003	0.050		3.7	1.6
Middle Alabama (0315-0203)																				
090	Boguechitto Creek	BCCAUM01	981209	1030	14	17	6.2	7.7	226	8	19.4	9	144	1.17	<0.015	0.090	0.180	0.18	3.3	1.6
090	Boguechitto Creek	BCCAUM01	981217	1030	14	9	7.2	7.4	161	15	25.8	36	111	<0.15	<0.015	0.040	0.080	0.11	3.3	1.6
090	Boguechitto Creek	BCCAUM01	990113	1145	22	9	10.9	7.4	174	28	87.6	26	144	0.44	<0.015	0.120	0.060	0.10	3.0	1.6
090	Boguechitto Creek	BCCAUM01	990113	1150	22	9	10.9	7.4	174	28	87.6	15	231	0.51	<0.015	0.110	0.040	0.10	3.0	1.6

Appendix F-7a. Physical / chemical data collected by Alabama Universities from tributaries to reservoirs located on the Alabama River, October 1998-September 1999 under contract with ADEM (ADEM 2000i).

Sub-watershed	Waterbody	ADEM Station ID	Date *yymmdd*	Time *24hr*	Air Temp. *°C*	Water Temp. *°C*	Dissolved Oxygen *mg/L*	pH *s.u.*	Conductivity *umhos @ 25°C*	Turbidity *NTU*	Stream Flow *cfs*	TSS *mg/L*	TDS *mg/L*	TKN *mg/L*	NH_3-N *mg/L*	NO_2+ NO_3 *mg/L*	Total-P *mg/L*	Ortho-P *mg/L*	Stream Depth *ft*	Sampling Depth *ft*
Middle Alabama (0315-0203), cont.																				
090	Boguechitto Creek	BCCAUM01	990127	1015	18	12	9.9	7.5	194	45	105.8	33	169	<0.15	<0.015	0.180	0.160	0.15	3.6	1.7
090	Boguechitto Creek	BCCAUM01	990208	1030	25	15	8.7	7.5	165	33	168.7	18	128	<0.15	<0.015	0.250	0.130	0.19	7.4	3.3
090	Boguechitto Creek	BCCAUM01	990208	1035	25	15	8.7	7.5	165	33	168.7	33	140	0.56	0.070	0.250	0.120	0.16	7.4	3.3
090	Boguechitto Creek	BCCAUM01	990222	1030	14	9	10.3	7.3	146	26	133.9	8	112	0.46	<0.015	0.100	0.080	0.17	4.9	2.5
090	Boguechitto Creek	BCCAUM01	990310	0930	25	15	7.9	7.2	106	141	52349.6	119	126	1.07	0.060	0.120	0.210	0.32	8.7	5.3
090	Boguechitto Creek	BCCAUM01	990310	0935	25	15	7.9	7.2	106	142	52349.6	89	146	0.72	0.040	0.090	0.190	0.30	8.7	5.3
090	Boguechitto Creek	BCCAUM01	990331	1040	22	16	9.1	6.9	156	22	217.7	29	65	0.83	<0.015	0.090	0.130	0.13	3.6	2.2
090	Boguechitto Creek	BCCAUM01	990412	1000	27	21	6.6	7.4	142	13	52.5	14	102	0.89	<0.015	0.050	0.160	0.17	3.8	1.9
090	Boguechitto Creek	BCCAUM01	990426	0950	28	22	6.4	7.3	146	21	33.4	14	112	0.71	<0.015	0.230	0.250	0.49	2.6	1.6
090	Boguechitto Creek	BCCAUM01	990529	1000	30	23	5.5	7.3	202	20	2.3	69	130	0.76	<0.015	0.280	0.110	0.11	2.5	1.3
090	Boguechitto Creek	BCCAUM01	990622	1100	28	22	6.8	7.5	93	371		503	97	2.46	<0.015	0.330	0.440	1.99	6.2	3.1
090	Boguechitto Creek	BCCAUM01	990624	1030		24	6.1	7.3	99	262	331.1	361	159	1.85	<0.015	0.130	0.310	0.32	5.0	2.5
090	Boguechitto Creek	BCCAUM01	990727	1020	40	28	6.5	7.7	187	12	11.5	16	131	0.35	0.070	0.140	0.080	0.28	2.6	1.3
090	Boguechitto Creek	BCCAUM01	990819	1032	39	29	5.6	7.5	227	7	1.9	7	129	1.13	<0.015	0.040	0.070	0.54	2.2	1.1
090	Boguechitto Creek	BCCAUM01	990909	1015	32	25	4.9	7.1	137	13	3.2	9	102	<0.15	<0.015	0.140	0.150	0.47	2.4	1.2
090	Boguechitto Creek	BCCAUM01	990924	1315	30	19	9.4	8.1	180	7	2.2	29	109	<0.15	<0.015	0.080	0.100	0.24	3.3	1.6
090	Boguechitto Creek	BCCAUM01	991008	1230	20	21	7.0	7.7	318	6	64.1	6	179	0.76	<0.015	0.040	0.050	0.08	3.6	1.2
090	Boguechitto Creek	BCCAUM01	991011	1245	29	22	6.6	7.3	129	71	1246.2	76	96	1.07	<0.015	0.580	0.270	0.66	6.2	3.3
090	Boguechitto Creek	BCCAUM01	991022	1400	22	17	10.1	8.0	371	11	27.9	16	204	1.44	<0.015	0.081	0.110	0.12	3.5	1.7
090	Boguechitto Creek	BCCAUM01	991105	1115	19	11	9.4	7.5	277	8	248.5	9	150	0.46	<0.015	0.020	0.110	0.26	4.6	4.9
090	Boguechitto Creek	BCCAUM01	991119	1215	23	13	8.6	7.5	345	4	10.8	12	222	0.23	<0.015	0.030	0.100	0.47	2.2	2.5
130	Pine Barren Creek	PBCAUM01	981211	0950	14	15	9.6	7.4	85	14		6	55	0.76	<0.015	0.150	0.030	0.11	8.2	3.3
130	Pine Barren Creek	PBCAUM01	981211	0955	14	15	9.6	7.4	85	14		7	119	0.67	<0.015	0.120	0.020	0.11	8.2	3.3
130	Pine Barren Creek	PBCAUM01	981216	1515	13	11	8.2	7.6	73	14		4	75	<0.15	<0.015	0.140	0.040	0.07	4.9	1.6

Appendix F-7a. Physical / chemical data collected by Alabama Universities from tributaries to reservoirs located on the Alabama River, October 1998-September 1999 under contract with ADEM (ADEM 2000i).

Sub-watershed	Waterbody	ADEM Station ID	Date *yymmdd*	Time *24hr*	Air Temp. *°C*	Water Temp. *°C*	Dissolved Oxygen *mg/L*	pH *s.u.*	Conductivity *umhos @ 25°C*	Turbidity *NTU*	Stream Flow *cfs*	TSS *mg/L*	TDS *mg/L*	TKN *mg/L*	NH_3-N *mg/L*	NO_2+ NO_3 *mg/L*	Total-P *mg/L*	Ortho-P *mg/L*	Stream Depth *ft*	Sampling Depth *ft*
Middle Alabama (0315-0203), cont.																				
130	Pine Barren Creek	PBCAUM01	981216	1520	13	11	8.2	7.6	73	14		6	81	<0.15	<0.015	0.140	0.020	0.07	4.9	1.6
130	Pine Barren Creek	PBCAUM01	990111	1530	16	11	10.8	7.5	83	13		25	188	<0.15	<0.015	<0.003	<0.004	0.13	13.1	6.6
130	Pine Barren Creek	PBCAUM01	990125	1530	23	13	9.7	7.3	91	60		78	108	0.16	<0.015	0.120	0.060	0.02	4.9	2.5
130	Pine Barren Creek	PBCAUM01	990203	1400	21	14	8.9	7.1	96	41		49	118	<0.15	<0.015	0.100	0.070	0.06	6.9	3.4
130	Pine Barren Creek	PBCAUM01	990217	1515	18	13	9.4	7.2	110	15		12	66	<0.15	<0.015	0.150	0.050	0.06	4.6	2.3
130	Pine Barren Creek	PBCAUM01	990303	1430	21	16	9.6	7.5	122	14		16	105	<0.15	<0.015	0.100	0.030	0.03	2.4	2.0
130	Pine Barren Creek	PBCAUM01	990322	1545	25	21	8.4	7.2	101	44		51	91	0.51	<0.015	0.160	0.100	0.05	5.6	4.3
130	Pine Barren Creek	PBCAUM01	990322	1550	25	18	7.9	7.4	103	41		48	59	0.67	<0.015	0.060	0.090	0.15	5.6	4.3
130	Pine Barren Creek	PBCAUM01	990415	1630	30	23	11.2	7.5	88	373		373	68	1.08	<0.015	<0.003	0.360	0.52	11.3	6.9
130	Pine Barren Creek	PBCAUM01	990429	1615	27	21	7.7	7.1	83	25		27	69	<0.15	<0.015	0.270	0.130	0.09	3.8	2.1
130	Pine Barren Creek	PBCAUM01	990527	1531	36	26	7.8	7.2	114	31		33	87	0.68	<0.015	0.150	0.060	0.08	5.2	2.6
130	Pine Barren Creek	PBCAUM01	990629	1305	34	25	5.5	6.6	67	97		123	98	0.23	<0.015	0.120	0.130	0.10	3.1	1.6
130	Pine Barren Creek	PBCAUM01	990720	1405	37	28	7.0	7.1	95	21		22	73	1.27	<0.015	0.180	0.030	0.13	4.1	0.6
130	Pine Barren Creek	PBCAUM01	990817	1400		31	7.3	7.6	89	10		8	64	0.93	<0.015	0.140	0.010	0.11	2.7	1.3
130	Pine Barren Creek	PBCAUM01	990922	1500	25	24	7.3	7.4	69	9		9	55	<0.15	<0.015	0.160	0.050	0.20	6.6	3.2
130	Pine Barren Creek	PBCAUM01	990929	1430	28	25	7.6	7.4	60	9		13	56	<0.15	<0.015	0.160	0.060	0.13	6.6	3.3
130	Pine Barren Creek	PBCAUM01	991018	1415	22	22	8.2	7.3	74	12		18	81	0.31	<0.015	0.161	0.030	0.06	2.7	1.4
130	Pine Barren Creek	PBCAUM01	991025	1330	21	14	9.8	7.3	69	8		7	73	0.23	<0.015	0.228	0.020	0.06	2.5	1.3
130	Pine Barren Creek	PBCAUM01	991025	1330	21	14	9.8	7.3	69	8		9	93	0.53	<0.015	0.032	0.020	0.06	2.5	1.3
130	Pine Barren Creek	PBCAUM01	991130	1400	12	11	12.1	7.1	73	6		3	58	0.247	0.050	0.010	0.030	0.06	3.6	1.8
130	Pine Barren Creek	PBCAUM01	991130	1405	12	11	12.1	7.1	73	6		5	63	0.233	0.060	<0.003	0.090	0.06	3.6	1.8
130	Pine Barren Creek	PBCAUM01	991207	1100	17	10	11.7	7.4	56	15		8	57	0.577	<0.015	<0.003	0.030	0.06	3.5	1.8
130	Pine Barren Creek	PBCAUM01	991221	1205	9	12		7.0	114	51		52	124	0.75	0.200	<0.003	0.120		5.9	1.6
160	Alabama River	ALRAUM02	981211	1317	18	18	6.4	7.6	160	15		8	114	1.18	<0.015	0.180	0.040	0.10	11.5	3.3

Appendix F-7a. Physical / chemical data collected by Alabama Universities from tributaries to reservoirs located on the Alabama River, October 1998-September 1999 under contract with ADEM (ADEM 2000i).

Sub-watershed	Waterbody	ADEM Station ID	Date	Time	Air Temp.	Water Temp.	Dissolved Oxygen	pH	Conductivity	Turbidity	Stream Flow	TSS	TDS	TKN	NH_3-N	NO_2+ NO_3	Total-P	Ortho-P	Stream Depth	Sampling Depth
			yymmdd	*24hr*	*^oC*	*^oC*	*mg/L*	*s.u.*	*umhos @ 25^oC*	*NTU*	*cfs*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*ft*	*ft*
Middle Alabama (0315-0203), cont.																				
160	Alabama River	ALRAUM03	981211	1410	18	18	6.0	7.6	180	15		7	119	0.64	<0.015	0.180	0.030	0.13	11.5	3.3
160	Alabama River	ALRAUM04	981216	1032	14	17	7.4	7.4	183	12		6	146	0.47	<0.015	0.190	0.010	0.15		4.9
160	Alabama River	ALRAUM05	990111	1100	22	11	8.8	7.8	186	12		10	187	0.28	<0.015	0.210	<0.004	0.22		6.6
160	Alabama River	ALRAUM06	990125	1015	20	13	9.6	7.9	202	33		35	135	0.25	0.100	0.170	0.100	0.16		1.6
160	Alabama River	ALRAUM07	990203	1030	16	13	8.9	7.3	119	65		37	70	0.4	0.060	0.270	0.100	0.16		2.5
160	Alabama River	ALRAUM09	990217	1030	22	14	8.8	7.1	100	15		13	105	<0.15	<0.015	0.310	0.070	0.08		2.5
160	Alabama River	ALRAUM08	990217	1035	22	14	8.8	7.1	100	15		11	48	<0.15	<0.015	0.320	0.060	0.07		2.5
160	Alabama River	ALRAUM10	990303	1015	14	14	9.6	7.4	122	12		8	99	<0.15	<0.015	0.220	0.040	0.09		3.3
160	Alabama River	ALRAUM11	990322	1100	21	20	8.1	6.9	124	22		14	70	0.57	<0.015	0.280	0.100	0.11		3.3
160	Alabama River	ALRAUM12	990415	1130	27	22	11.1	7.5	141	10		9	90	0.45	<0.015	<0.003	0.030	0.08		3.3
160	Alabama River	ALRAUM14	990429	1055	21	22	7.8	7.3	127	18		12	90	0.56	<0.015	0.130	0.140	0.04		3.0
160	Alabama River	ALRAUM13	990429	1100	21	22	7.8	7.3	132	20		19	97	<0.15	<0.015	0.140	0.140	0.03		3.0
160	Alabama River	ALRAUM15	990527	1055	35	26	6.7	7.2	158	14		18	116	0.33	<0.015	0.100	0.050	0.06		1.6
160	Alabama River	ALRAUM16	990629	1050	35	27	4.6	7.1	142	63		77	112	0.41	<0.015	0.220	0.130	1.02	1.6	0.8
160	Alabama River	ALRAUM17	990629	1115	35	27	4.6	7.1	142	60		76	139	0.69	<0.015	0.140	0.140	0.17	1.6	0.8
160	Alabama River	ALRAUM18	990720	1020	34	29	6.5	7.4	136	14		19	80	0.82	<0.015	0.140	0.050	0.16		1.6
160	Alabama River	ALRAUM19	990817	1030	35	33	3.7	7.7	158	6		12	77	1.03	<0.015	0.130	0.030	1.87		
160	Alabama River	ALRAUM21	990922	1100	26	25	4.7	7.5	159	16		15	110	<0.15	<0.015	0.140	0.080	0.61		5.8
160	Alabama River	ALRAUM20	990922	1105	26	25	4.7	7.5	159	16		14	96	<0.15	<0.015	<0.003	0.050	0.61		5.8
160	Alabama River	ALRAUM22	990929	1100	37	26	5.3	7.5	162	7		13	87	<0.15	<0.015	0.140	0.070	0.22		4.6
160	Alabama River	ALRAUM23	991018	1115	18	24	6.9	7.4	159	10		8	93	0.64	<0.015	0.185	0.040	0.07	9.8	4.9
160	Alabama River	ALRAUM24	991025	1050	16	21	6.6	7.4	159	12		14	85	0.44	<0.015	<0.003	0.040	0.07	11.5	5.7
160	Alabama River	ALRAUM25	991130	1020		16	9.2	7.3	160	7		8	107	0.291	0.100	<0.003	0.070	0.12		3.3
160	Alabama River	ALRAUM26	991207	1030	9	15	8.8	7.2	162	6		5	113	0.731	0.030	<0.003	0.050	0.13		3.3

Appendix F-7a. Physical / chemical data collected by Alabama Universities from tributaries to reservoirs located on the Alabama River, October 1998-September 1999 under contract with ADEM (ADEM 2000i).

Sub-watershed	Waterbody	ADEM Station ID	Date *yymmdd*	Time *24hr*	Air Temp. *°C*	Water Temp. *°C*	Dissolved Oxygen *mg/L*	pH *s.u.*	Conductivity *umhos @ 25°C*	Turbidity *NTU*	Stream Flow *cfs*	TSS *mg/L*	TDS *mg/L*	TKN *mg/L*	NH_3-N *mg/L*	NO_2+ NO_3 *mg/L*	Total-P *mg/L*	Ortho-P *mg/L*	Stream Depth *ft*	Sampling Depth *ft*
Middle Alabama (0315-0203), cont.																				
180	Turkey Creek	TUCAUM01	981216	1300	15	12	9.4	7.3	6	8	9.9	1	110	<0.15	<0.015	0.040	0.030	0.11	3.3	1.6
180	Turkey Creek	TUCAUM01	981231	1145	16	7	10.5	7.2	86	9	31.7	2	81	<0.15	<0.015	0.060	0.030	0.09	0.8	0.5
180	Turkey Creek	TUCAUM01	990111	1245	12	6	10.5	7.2	93	13	24.0	2	185	<0.15	<0.015	<0.003	<0.004	0.07	1.6	0.8
180	Turkey Creek	TUCAUM01	990125	1230	31	12	10.5	7.4	85	42	80.5	18	124	0.88	<0.015	0.060	0.020	0.05	3.3	1.6
180	Turkey Creek	TUCAUM01	990205	1020	23	12	9.6	6.8	75	30	331.6	19	78						0.1	4.9
180	Turkey Creek	TUCAUM01	990217	1215	24	13	9.9	6.9	78	12	81.5	9	120	<0.15	<0.015	0.080	0.050	0.18	1.3	0.6
180	Turkey Creek	TUCAUM01	990303	1130	15	14	9.6	7.2	74	62	151.7	66	89	0.58	<0.015	0.100	0.060	0.15	2.1	1.3
180	Turkey Creek	TUCAUM01	990322	1315	32	22	6.3	7.1	96	13	78.6	12	81	0.32	<0.015	0.100	0.080	0.05	1.1	0.6
180	Turkey Creek	TUCAUM01	990415	1300	30	22	9.7	7.2	90	97	153.9	105	80	1.52	<0.015	<0.003	0.220	0.31	2.1	1.1
180	Turkey Creek	TUCAUM01	990429	1340	31	20	8.8	7.0	84	15	18.0	13	72	0.29	<0.015	0.210	0.120	0.07	2.7	0.5
180	Turkey Creek	TUCAUM01	990527	1220	36	23	7.1	7.0	114	11	7.3	21	120	0.8	<0.015	0.040	0.070	0.09	0.8	0.4
180	Turkey Creek	TUCAUM01	990629	1200	28	25	6.8	6.9	63	48	40.2	27	92	0.64	<0.015	0.120	0.320	0.15	1.1	0.8
180	Turkey Creek	TUCAUM01	990720	1120	35	26	7.3	7.3	94	15	5.5	7	79	0.55	<0.015	0.120	0.040	0.20	0.8	0.1
180	Turkey Creek	TUCAUM01	990817	1145	39	28	5.5	7.3	112	5	0.5	4	62	0.46	<0.015	0.030	0.020	0.41	0.6	0.3
180	Turkey Creek	TUCAUM01	990922	1300	23	20	4.9	7.0	116	5	1.3	8	66	<0.15	<0.015	0.050	0.040	0.13	1.6	0.8
180	Turkey Creek	TUCAUM01	990929	1215	27	23	5.9	7.3	106	4	0.9	3	67	<0.15	<0.015	0.060	0.060	0.16	0.8	0.5
180	Turkey Creek	TUCAUM01	991018	1230	19	20	7.8	7.0	93	7	0.4	13	78	0.17	<0.015	0.045	0.020	0.17	0.7	0.3
180	Turkey Creek	TUCAUM01	991025	1218	19	11	9.4	7.2	95	5	0.4	6	91	0.6	<0.015	0.302	0.010	0.10	0.8	0.4
180	Turkey Creek	TUCAUM01	991130	1135		9	10.6	7.0	85	4	4.2	5	68	<0.15	<0.015	<0.003	0.040	0.14	0.5	0.2
180	Turkey Creek	TUCAUM01	991207	1215	11	9	11.3	6.9	77	5	6.6	5	78	0.757	0.020	<0.003	0.040	0.17	0.6	0.3

Appendix F-8. ALAMAP (Alabama Monitoring and Assessment Program)

Lead agencies**:** ADEM and USEPA

Purpose**:** ADEM's ALAMAP Program is a statewide monitoring effort to provide data that can be used to estimate the current status of all streams within Alabama. Evaluated assessment data, including chemical, physical, and habitat parameters are collected once at 250 stations, randomly selected by USEPA-Gulf Breeze over a 5-year period using ADEM's SOPs and QA/QC manuals.

Appendix F-8a. Habitat assessment data

Appendix F-8b. Physical/ chemical data

References:

ADEM. 2000b. Alabama Monitoring and Assessment Program (ALAMAP) data collected by ADEM 1997 to 2000 (unpublished). Field Operations Division, Alabama Department of Environmental Management. Montgomery, Alabama.

Appendix F- 8a. Physical characteristics and habitat parameters for sites assessed in the Upper Alabama River CU as part of the Alabama Monitoring and Assessment Program (ALAMAP). To compare levels of habitat degradation between stations, values given for each of three major habitat parameter categories are presented as percent of maximum score. (RR - Riffle/Run; GP - Glide/Pool; S - Shaded; MO - Mostly Open; MS - Mostly Shaded;, O - Open; 50/50 - Approx 50% Open/Shaded). *Indicates that stream reach could not be evaluated due to low flow or no flow conditions.

Cataloging Unit		0201	0201	0201	0201	0201	0201	0201	0201	0201	0201
Station		AR07U3-57	AR05U2-28[a]	AR4U4-21[a]	AR01U1	AR05U3-9	AR04U3-20	AR06U3-55	AR04U2-16[a]	AR03U3-45[a]	AR01U2-33[a]
Sub-watershed		020	070	110	130	140	150	180	190	210	250
Ecoregion/Subregion		65i	65a	65a	65p	65a	65i	65e	65a	65i	65i
Drainage area (mi^2)		2	18	36	4	10	5	5	7	1	6
Date (yymmdd)		990803	980804	000803	970812	990804	990803	990804	980810	990803	980810
Width (ft)		4	---	---	40	6	12	5	---	---	---
Canopy Cover[d]		S	---	---	MO	50/50	S	MS	---	---	---
Depth (ft)	Riffle	---	---	---	---	---	0.8	---	---	---	---
	Run	0.3	---	---	3.0	---	2.0	0.2	---	---	---
	Pool	0.5	---	---	3.5	---	3.0	1.0	---	---	---
Substrate (%)	Bedrock	---	---	---	---	---	---	---	---	---	---
	Boulder	---	---	---	---	---	---	---	---	---	---
	Cobble	---	---	---	---	---	20	---	---	---	---
	Gravel	8	---	---	---	50	20	---	---	---	---
	Sand	80	---	---	---	41	50	87	---	---	---
	Silt	4	---	---	---	1	2	1	---	---	---
	Detritus	8	---	---	---	7	5	12	---	---	---
	Clay	---	---	---	---	1	3	---	---	---	---
	Organic silt	---	---	---	---	---	---	---	---	---	---
Habitat assessment form[e]		GP	---	---	---	RR	RR	GP	---	---	---
Habitat survey (% maximum)											
	Instream habitat quality	37	---	---	---	70	63	37	---	---	---
	Sediment deposition	75	---	---	---	68	60	70	---	---	---
	Sinuosity	60	---	---	---	75	65	70	---	---	---
	Bank and vegetative stability	35	---	---	---	40	88	50	---	---	---
	Riparian measurements	93	---	---	---	90	95	70	---	---	---
Habitat assessment score		127	---	---	---	166	184	119	---	---	---
% Maximum		58	---	---	---	69	77	54	---	---	---
Assessment		Excellent	---	---	---	Excellent	Excellent	Excellent	---	---	---

a. Stream reach could not be evaluated due to low flow or no flow conditions.

b. Cows have access to stream.

c. Unwadeable stream reach.

d. Canopy cover: S=shaded; MS=mostly shaded; 50/50=50% shaded; MO=mostly open; O=open

e. Habitat assesment form: RR=riffle/run (Barbour et al. 1999); GP=glide/pool (Barbour et al. 1999)

UD=undetermined

Appendix F- 8a. Physical characteristics and habitat parameters for sites assessed in the Upper Alabama River CU as part of the Alabama Monitoring and Assessment Program (ALAMAP). To compare levels of habitat degradation between stations, values given for each of three major habitat parameter categories are presented as percent of maximum score. (RR - Riffle/Run; GP - Glide/Pool; S - Shaded; MO - Mostly Open; MS - Mostly Shaded;, O - Open; 50/50 - Approx 50% Open/Shaded). *Indicates that stream reach could not be evaluated due to low flow or no flow conditions.

Cataloging Unit		0203	0203	0203	0203	0203	0203	0203	0203	0203	0203	0203	0204	0204	204
Station-		AR02U1	AR02U2-25	AR3U4-10	AR03U2-8	AR07U2-2	AR03U1	AR02U3-2	AR1U4-2[b]	AR06U2-18	AR2U4-8[a]	AR01U3-7[c]	AR04U1	AR09U2-3[a]	AR08U2-10
Sub-watershed		030	080	080	100	120	120	120	120	120	130	170	090	110	110
Ecoregion/Subregion		65b	65a	65b	65b	65e	65e	65e	65e	65e	65p	65p	65e	65f	65f
Drainage area (mi^2)		4	1	6	134	15	13	13	13	13	365	UD	7	2	16
Date (yymmdd)		970812	980810	000803	980810	980903	970805	990819	001019	980908	000803	990804	970808	980827	980818
Width (ft)		12	---	7	15	15	10	10	24	30	---	---	15	---	15
Canopy Cover[d]		MS	---	S	S	MS	S	S	MS	50/50	---	---	S	---	MS
Depth (ft)	Riffle	---	---	0.4	---	0.33	---	---	---	0.3	---	---	---	---	---
	Run	---	---	0.5	---	0.3	0.5	0.5	0.1	0.3	---	---	3.0	---	1.5
	Pool	---	---	1.2	2.0	1.5	2.0	2.0	0.5	3.5	---	---	3.5	---	2.0
Substrate (%)	Bedrock		---	---	---	---	---	---	1	---	---	---	---	---	---
	Boulder		---	1	---	1	---	---	1	---	---	---	---	---	---
	Cobble	5	---	4	---	2	---	---	1	1	---	---	---	---	---
	Gravel	60	---	50	---	5	---	---	---	5	---	---	---	---	---
	Sand	15	---	35	40	90	85	85	43	90	---	---	60	---	70
	Silt	5	---	5	---	1	5	5	5	---	---	---	25	---	1
	Detritus	4	---	5	---	1	10	10	2	3	---	---	15	---	25
	Clay	10	---	---	60	---	---	---	42	1	---	---	---	---	1
	Organic silt		---	---	---	---	---	---	---	---	---	---	---	---	---
Habitat assessment form[e]		RR	---	RR	GP	RR	GP	GP	GP	GP	---	---	GP	---	GP
Habitat survey (% maximum)															
Instream habitat quality		68	---	62	52	35	38	38	27	57	---	---	65	---	80
Sediment deposition		73	---	40	75	48	73	73	68	73	---	---	83	---	85
Sinuosity		95	---	88	70	0	60	60	65	85	---	---	90	---	95
Bank and vegetative stability		33	---	63	53	43	40	40	25	63	---	---	70	---	83
Riparian measurements		100	---	79	60	30	70	70	38	35	---	---	80	---	100
Habitat assessment score		166	---	154	131	93	118	118	86	128	---	---	165	---	189
% Maximum		69	---	64	60	39	54	54	39	58	---	---	75	---	86
Assessment		Excellent	---	Excellent	Excellent	Fair	Excellent	Excellent	Fair	Excellent	---	---	Excellent	---	Excellent

a. Stream reach could not be evaluated due to low flow or no flow conditions

b. Cows have access to stream.

c. Unwadeable stream reach.

d. Canopy cover: S=shaded; MS=mostly shaded; 50/50=50% shaded; MO=mostly open; O=open

e. Habitat assesment form: RR=riffle/run (Barbour et al. 1999); GP=glide/pool (Barbour et al. 1999)

UD=undetermined

Appendix F-8b. Physical / chemical data collected within the Alabama River Basin from August 1997-2000 as part of the Alabama Monitoring and Assessment Program (ALAMAP) (ADEM 1997a)

Sub-watershed	Stream	Station	Date	Time	Air Temp.	Water Temp.	Dissolved Oxygen	pH	Conductivity	Turbidity	Stream Flow	Fecal Coliform	BOD-5	TDS	TSS	NO_2/ NO_3-N	Total-P	Cl^-
			yymmdd	*24hr*	*^oC*	*^oC*	*mg/L*	*s.u.*	*umhos @25^{o}C*	*NTU*	*cfs*	*col/100mL*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*
Upper Alabama (0315-0201)																		
020	Pierce Cr	AR07U3-57	990803	0800	25	22	7.2	4.7	9	3	0.2	est 19	0.8	7	4	0.05	<0.004	4.2
070	Waller Cr	AR05U2-28	980804	0815	24	21	2.4	7.4	236	56	SP	est 50	3.6	172	83	0.01	0.22	5.3
110	Steep Cr	AR4U4-21	000803								Dry							
130	Alabama R, UT to	AR01U1	970812	1215	32	29	7.5	6.8	114	6	0.4	est 13	0.8	121	9	0.98	0.14	12.2
140	Tallawassee Cr	AR05U3-9	990804	0820	28	27	5.6	7.1	343	2	0.7	>138	1.8	184	3	0.05	0.02	7.3
150	Indian Cr	AR04U3-20	990803	0915	24	23	7.8	5.3	20	3	5.7	310	0.8	30	3	0.53	<0.004	5.9
180	Cherry Cr	AR06U3-55	990804	1030	30	26	4.1	6.7	175	8	0.1	58	2.6	117	6	0.02	0.02	6.5
190	Halls Br	AR04U2-16	980810	0820							Dry							
210	Pate Cr	AR03U3-45	990803	1025							SP							
250	Valley Cr, UT to	AR01U2-33	980810	1020							SP							
Middle Alabama (0315-0203)																		
030	Sullivan Branch	AR02U1	970812	0940	27	25	5.6	7.7	526	1	0.0	est 17	0.7	267	3	0.02	0.12	10.9
080	Bogue Chitto Cr, UT to	AR02U2-25	980810	1450							Dry							
080	Beaver Cr	AR3U4-10	000803	0850	24	23	8.0	6.6	45.5	5	3.0	240	0.3	47	4	0.23	0.05	4.5
100	Chilatchee Cr	AR03U2-8	980810	1237	32	28	7.6	7.7	229	7	0.3	est 6	1.5	154	13	0.01	0.02	5.4
120	Bear Cr	AR07U2-2	980903	1330	30	25	7.6	7.4	102	20	0.6	600	<1	90	16	<0.005	---	5.6
120	Bear Cr	AR03U1	970805	1212	33	25	6.6	6.7	87	21	1.4	530	0.5	70	10	0.06	0.09	5.6
120	Bear Cr	AR02U3-2	990819	1140	31	27	6.5	6.9	100	12	0.5	>400	1.9	87	13	0.068	0.032	5.0
120	Bear Cr	AR1U4-2*	001019	1230	26	17	4.6	6.8	110	28	0.0	1500	5	94	30	0.118	0.091	8.0
120	Bear Cr	AR06U2-18	980908	1210	30	25	5.4	6.8	112	13	0.2	520	1.6	203	8	<0.005	---	6.0
130	Pine Barren Cr	AR2U4-8	000803								Dry							
170	Alabama R	AR01U3-7	990804								NW							
Lower Alabama (0315-0204)																		
090	Wallers Cr	AR04U1	970808	1216	29	23	7.4	5.3	34	4	7.8	133	0.2	24	<1	0.26	0.12	5.2
110	Brickyard Cr	AR09U2-3	980827	1300							Dry							
110	Little River	AR08U2-10	980818	1200	30	24	7.1	5.4	32	7	13.4	104	<1	1	1	0.093	<0.005	6.0

* Cattle have unlimited access to the creek throughout reach.

*****Flow comments:***

nw - not wadeable

Dry - streambed dry

sp - standing pools

Appendix F-9. Ambient Trend Monitoring Data

Lead agency: ADEM

***Purpose*:** Long-term water quality and biological monitoring has been conducted at fixed ambient monitoring stations located throughout Alabama. Stations were established primarily to monitor water quality below point source discharges. During 1996, with the addition of ADEM's ALAMAP Program, the ambient trend monitoring program was modified to focus on wadeable streams and rivers. Sites more applicable to the rivers and reservoirs were transferred to ADEM's Resevoir Monitoring Program.

Three ambient trend monitoring stations were established in the Alabama Basin along the mainstem of the Alabama River. In general, intensive water quality sampling was conducted at these sites using ADEM's SOP's and QA/QC manuals. However, most of these data are at least 5 years old, and are therefore considered evaluated assessments.

Appendix F-9a. Physical/chemical data

References:

ADEM. 1998. Water Quality Report to Congress for Calendar Years 1996 and 1997. Alabama Department of Environmental Management. Montgomery, Alabama.

Appendix F-9a. Physical/chemical data collected from stations in the Alabama River Basin as part of the ADEM Ambient Monitoring Program (ADEM 1998).

Sub-Watershed	Stream	Station	Date	Time	Water Temp.	Air Temp.	Dissolved Oxygen	pH	Conductivity	Turbidity	Fecal Coliform	BOD-5	TSS	TDS	Total-P	NO_2/NO_3-N	Cl^-	TKN	Hardness	Fe	Mn
#		#	*yymmdd*	*24hr*	*^oC*	*^oC*	*mg/L*	*s.u.*	*umhos @25^o C*	*NTU*	*col/100ml*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*
0201-000	Alabama River	A2	960604	1345	26	30	6.4	7.3	118	29	270	1.3	21	78	0.07	0.240	6.0	0.21	37.20	0.55	56
0201-000	Alabama River	A2	960709	1047	31	30	6.3	7.7	170	7	110	1.2	10	133	0.08	0.090	9.0	0.15	46.30		
0201-000	Alabama River	A2	960801	1055	29	27	5.4	7.5	130	15	23	0.8	18	91	0.02	0.110	6.0	0.30	47.20		
0201-000	Alabama River	A2	960917	1145	28	30	5.6	7.4	123	11	202	2.0	9	114	0.03	0.200	6.0	0.50	34.80	0.29	36
0201-000	Alabama River	A2	961015	1120	22	25	7.3	7.7	181	6	1	2.1	3	116	0.03	0.270	9.0	0.32	49.60		
0201-140	Alabama River	A1A	960604	1100	25	32	7.9	7.4	110	9	15	1.9	11	61	0.07	0.180	6.0	0.26	31.10	0.35	44
0201-140	Alabama River	A1A	960709	845	30	27	6.2	7.5	137	9	620	1.5	10	113	0.03	0.090	6.0	0.15	46.70		
0201-140	Alabama River	A1A	960801	841	28	25	6.3	7.5	123	10	107	0.8	15	80	0.03	0.130	6.0	0.40	41.60		
0201-140	Alabama River	A1A	960917	920	27	26	6.7	7.4	134	10	40	1.8	9	83	0.02	0.080	6.0	0.20	39.90	0.19	73
0201-140	Alabama River	A1A	961015	915	21	18	9.0	8.2	129	7	1	2.3	5	77	0.03	0.190	7.0	0.28	37.20		
0203-000	Alabama River	A3	960125	1000	7	7	11.3	7.4	122	18	250	1.9	18	124	0.004	0.270	4.0	0.63	49.30		
0203-000	Alabama River	A3	960215	1020	9	15	11.8	7.7	79	42	87	1.9	27	55	0.06	0.250	4.0	0.15	28.10		
0203-000	Alabama River	A3	960320	940	13	6	9.8	7.3	91	40	97	2.0	36	90	0.24	0.200	5.0	0.36	37.20	1.65	60
0203-000	Alabama River	A3	960417	935	17	17	9.6	7.7	106	7	20	1.2	10	71	0.007	0.250	6.0	0.37	38.70		
0203-000	Alabama River	A3	960516	940	26	26	7.4	7.7	194	6	1	1.3	10	62	0.09	0.110	6.0	0.15	44.30		
0203-000	Alabama River	A3	960606	1230	28	31	6.5	7.3	123	8	10	1.3	11	82	0.03	0.290	6.0	0.15	45.30	0.32	37
0203-000	Alabama River	A3	960710	950	30	28	4.8	6.9	155	7	4	1.0	5	123	0.05	0.140	7.0	0.15	48.90		
0203-000	Alabama River	A3	960808	1320	31	33	5.1	7.5	161	13	12	1.1	15	214	0.03	0.200	7.0	0.23	48.00		
0203-000	Alabama River	A3	960918	1345	29	27	5.9	7.6	158	8	3	1.1	11	95	0.03	0.210	7.0	0.27	42.00	0.24	45
0203-000	Alabama River	A3	961016	945	23	24	7.3	7.9	167	7	1	1.9	5	94	0.04	0.200	7.0	0.46	51.50		
0203-000	Alabama River	A3	970114	945	9	2	11.1	6.6	113	43	430	1.5	40	77	0.004	0.210	5.0	0.15	43.60		
0203-000	Alabama River	A3	970225	937	12	11	10.8	6.4	85	71	500	1.4	63	72	0.086	0.230	5.0	0.15	41.20		
0203-000	Alabama River	A3	970312	940	16	24	10.5	6.7	96	25	30	1.0	25	63	0.085	0.290	5.0	0.22	36.00	0.55	60
0203-000	Alabama River	A3	970422	1011	20	24	8.7	6.4	138	9	7	1.8	8	72	0.05	0.370	6.0	0.15	43.80		

*Metals sampled quarterly but not detected (detection limit): Cr (15 mg/l), Cu (20 ma/l), Zn (30 mg/l), As (10mg/l), Cd (3 mg/l), Pb (1 mg/l), Hg (0.5 mg/l)

Appendix F-10. Clean Water Strategy Project

Lead Agency: ADEM

Purpose: ADEM conducted intensive water quality monitoring during the 1996 Clean Water Strategy Project to evaluate the condition of the state's surface waters, identify or confirm problem areas, and to serve as a guide from which to direct future sampling efforts. Sampling stations were chosen where problems were known or suspected to exist, or where there was a lack of existing data. Data was collected monthly, June through October of 1996. All samples and in-situ measures were collected in accordance with ADEM SOP and QA/QC manuals.

Appendix F-10a. Physical/chemical data

References:

ADEM. 1999a. Alabama Clean Water Strategy Water Quality Assessment Report (1996). Alabama Department of Environmental Management. Montgomery, Alabama.

Appendix F-10a. Clean Water Strategy water quality data collected by ADEM during 1996 from stations located in the Alabama River Basin (ADEM 1999a).

Sub-watershed #	Stream	Station #	Date yymmdd	Time 24hr	Stream Depth ft	Sampling Depth ft	Air Temp. °C	Water Temp. °C	Dissolved Oxygen mg/L	pH s.u.	Conductivity umhos @25°C	Turbidity NTU	BOD-5 mg/L	TSS mg/L	NO_2/ NO_3-N mg/L	NH_3-N mg/L	TKN mg/L	Total-P mg/L
Upper Alabama (0315-0201)																		
	Catoma Cr	AL01	960613	0915				26	7.5	7.6	195		2.9		0.05	0.26	0.67	0.12
	Catoma Cr	AL01	960806	0906	2.0	1.0	30	30	5.9	7.6	197	46.0	1.5	60	0.21	<0.015	<0.150	0.1
	Catoma Cr	AL01	961002	1115			24	21	8.1	7.5	169	18.0	1.6	13	0.06	<0.015	0.21	0.12
	Catoma Cr	AL02	960613	0950				26	7.0	7.8	225		1.6		0.06	0.015	1.52	0.14
	Catoma Cr	AL02	960806	0940	9.2	5.0	30	28	6.4	7.6	199	22.0	0.8	27	0.2	0.05	0.71	0.12
	Catoma Cr	AL02	961002	1055			22	21	8.8	7.5	199	18.0	1.4	15	0.07	<0.02	0.74	0.15
Middle Alabama (0315-0203)																		
	Alabama R	AL03	960606	1230			31	28	6.5	7.3	116	7.9	1.3	11	0.29	0.18	<0.150	0.03
	Alabama R	AL03	960710	0950			28	30	4.8	6.9	141	6.6	1	5	0.14		<0.150	0.05
	Alabama R	AL03	960808	1320			33	31	5.1	7.5	144	13.0	1.1	15	0.2		0.23	0.03
	Alabama R	AL03	960918	1345			27	29	5.9	7.6	147	7.8	1.1	11	0.21		0.27	0.03
	Alabama R	AL03	951019	0955			22	22	6.2	7.4	135	7.4	2	10	0.21		0.26	0.051

AL03 is the same as Trend Station A-3